Kinship, Language, and Prehistory

Per Hage and the Renaissance in Kinship Studies

EDITED BY
Doug Jones and Bojka Milicic

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Cover image depicts an incised decoration from a Melanesian club. Versions of this pattern—repeated, stylized, interconnected human figures—are found in cultures all around the world. They may descend from an ancient iconography representing human kinship. From *Materials for the Study of Social Symbolism in Ancient and Tribal Art: A Record of Tradition and Continuity Based on the Researches and Writings of Carl Schuster*, edited and written by Edmund Carpenter, assisted by Lorraine Spiess, Volume 1, p. 55. New York and Boston: Rock Foundation, 1986. Used by permission of Edmund Carpenter.

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Abbreviations for Kin types

GP	grandparent
P	parent
M	mother
F	father
Z	sister
B	brother
G	sibling
W	wife
H	husband
E	spouse
D	daughter
S	son
C	child
m	man
w	woman
♀	female ego (or fs [female speaking] or ws [woman speaking])
♂	male ego (or ms [male/man speaking])
ss	same sex
os	opposite sex
e	older than ego or linking kin
y	younger than ego or linking kin
||	parallel (same-sex link)
X	cross (opposite-sex link)
G^0	ego's generation
G^+	ascending generation
G^-	descending generation

Introduction

1

Per Hage and the Renaissance in Kinship Studies

Doug Jones and Bojka Milicic

On November 19, 2006, at the 105th annual meeting of the American Anthropological Association in San Jose, California, a memorial session was held in honor of Per Hage, a longtime member of the anthropology department at the University of Utah. He had died in June 2004 at the age of sixty-nine after a long struggle with leukemia. His death was untimely, interrupting an extremely productive phase in his career. He worked until nearly the end of his life and left behind a substantial amount of unpublished material with his collaborators.

It is a truism in cultural anthropology that when the living gather to memorialize the dead, they do so with a double purpose. They gather, on the one hand, to mourn those they have lost. But they also gather to remind themselves of their inheritance from the departed and of a resulting shared identity outlasting the life of one individual. The 2006 memorial session followed this time-honored dualism of mourning and affirmation. The session itself was held on a Sunday, the last day of the meetings. Most of the participants had arrived several days ahead of time and had met on multiple occasions before the session itself over meals and drinks. The participants included colleagues, collaborators, and students of Hage, both longtime and more recent. Some were major, established figures in the anthropology of kinship, and others were neophytes. Per's widow, Andrea, was also present and very much involved. Much of the conversation that went on over the course of the meetings, and portions of the talks during the formal session, were given over to personal reminiscences.

But something else emerged over those few days of conversation and talks: there is a renaissance going on in the study of kinship, with Hage as one of its founding figures. This renaissance puts kinship studies squarely in the middle of two of the most exciting and rapidly advancing areas in the human sciences: tracing the movements of peoples and the transformations of their cultures in prehistory, and exploring the architecture of the human mind. In both of these areas, major advances are being made by synthesizing cutting-edge research with the knowledge that anthropologists have gained over more than a century of studying how kinship systems work, how they change over time, and how kinship is conceptualized.

This book is a chronicle of these advances. In seventeen chapters, the authors offer original papers demonstrating the continuing importance of the study of kinship to the human sciences. Most of the chapters were written by participants in the 2006 memorial session; three chapters offer previously unpublished work by Hage himself and coauthors. In the rest of this introduction, we summarize this work and provide our own, admittedly partial view of where it fits into what we are calling the renaissance in kinship studies.

Chapter 2, by David Jenkins, one of Hage's students, provides an overview of Hage's work from his early applications of graph theory to the analysis of social structure, to his recent research on the implications of kin terminologies for the study of prehistory and the human mind. The early work was largely carried out in collaboration with mathematician Frank Harary between 1980 and 1997, and resulted in the publication of three books and numerous articles. For Hage and Harary, graph theory enabled a mathematically sophisticated structuralist analysis of a wide range of social phenomena, including communication, language evolution, and kinship and other classification systems in a framework subtle enough to preserve culturally specific relations and abstract enough to allow

for genuine cross-cultural comparison. Hage's ability to grasp large, complex structures and his innovative approach to formalization in anthropology are evident in his later work as well. Jenkins ably summarizes this work, whose influence is apparent throughout this book.

The rest of the book is divided into two parts. Part 1 is devoted to kinship and prehistory, and Part 2 to kinship, language, and mind. For each part we briefly summarize striking recent advances in the field, arguing that these advances have exposed a kinship-shaped hole, a gap in our knowledge, that Hage and the other authors in this book have begun to fill in.

Kinship and Prehistory

The study of prehistory has experienced a revolution in the last several decades: varied lines of evidence have now identified a modest number of *demic expansions*—geographic expansions of populations from small focal areas over much larger areas. These expansions have been among the major engines of change in prehistory. Some of the most dramatic have involved the spread of farming populations into territories inhabited by hunter-gatherers (Bellwood 2005). Other expansions preceded and followed the spread of farming, made possible by competitive advantages in subsistence techniques, social organization, and other factors. Some of the most telling results of demic expansions are found in current distributions of languages and language families. Fifteen thousand years ago, judging by patterns of linguistic diversity among living hunter-gatherers, thousands of languages were spoken around the world. But of these ancient languages, just a few dozen have spread, diversified, and evolved to give rise to most of the languages spoken by most of the world today. Almost all the other languages of the time left no descendants.

In some respects this is very old news. In historic times, demic expansions—of Romans, Arabs, Turks, Spaniards, and others—and the accompanying dispersals of language and culture have been of evident importance. And the distributions of far-flung language families such as Indo-European and Austronesian have long been recognized as likely signatures of unrecorded demic expansions. But for much of the twentieth century, the systematic study of such expansions was hampered by methodological problems, and archeologists and others often displayed a pretty complete skepticism regarding migrations in prehistory. However, recent advances in several fields have resulted in changing attitudes. Prehistorians have now begun referring to an "emerging synthesis" (a phrase borrowed from archeologist Colin Renfrew [1991, 2000]) that brings together information from archeology, genetics, and linguistics to reconstruct past demic expansions. This synthesis has not only energized scholars, but has also caught the public imagination in popular works such as Jared Diamond's (1997) best-selling *Guns, Germs, and Steel*.

Both popular and scholarly treatments of the "emerging synthesis" often consider just three major sources of evidence: biological, archeological, and linguistic. Expanding populations bring their genes with them, generally incorporating the genes of earlier inhabitants as well, allowing geneticists to trace some ancient population spreads. Archeologists often find artifactual corroboration of demic expansions. Finally, knowledge of past expansions of peoples and cultures has been greatly enriched by findings from linguistics, including evidence of relationships among existing languages and of past cultures as attested to by reconstructed vocabularies.

But something is missing in many versions of the emerging synthesis: kinship (Jones 2003c). This would have surprised earlier generations of anthropologists, going back to Lewis Henry Morgan, who considered the reconstruction of past kinship systems to be central to understanding prehistory (Trautmann 1987). Unfortunately, the study of kinship has been so marginalized in recent anthropology that much of this earlier work has been forgotten. The chapters in Part 1 correct this neglect. They demonstrate, for areas ranging from Africa and Oceania to Mesoamerica, that reconstructing past kinship systems and their associations with major demic expansions is both possible and important. Reconstructing the cultural lexicons, and the kin lexicons in particular, of anciently spoken languages provides a unique window into past cultures, allowing us to explore, to an extent archaeology cannot, the structure of ideas, knowledge, and social relations among peoples of far-off times.

Below we review the chapters in this section, and end by noting some common themes.

The earliest demic expansions occurred among hunter-gatherers, starting with the greatest of all expansions, which saw modern humans moving out of Africa beginning perhaps 50,000 years ago. Some bold linguists have argued that comparative studies can reconstruct some of the vocabulary of this remote period of time. In Chapters 3 and 4, four contributors follow this line of inquiry into kin terminology. Pierre Bancel, Alain Matthey

de l'Etang, Merritt Ruhlen, and John Bengtson argue that the kinship terms *mama/nana* (mother), *papa/tata* (father), and *kaka* (brother/mother's brother) represent some of the oldest preserved words from a language ancestral to all existing languages. A large sample of world languages shows that these terms are extremely widespread. Their distribution has usually been explained as a result of convergent innovation constrained by the limited articulatory abilities of babies. But Bancel et al. mount a strong challenge to this position, arguing that the transmission of these terms is strongly conservative, with little evidence of innovation. They also point out that physiological and psychological constraints have a hard time explaining, for example, why *kaka* so widely means "Brother" or "Mother's Brother." Instead, they argue for a historical hypothesis: that these words sprang from a common source, the ancestor of all current languages.

The other contributors in Part 1 work with more recent timescales and more limited geographic areas. Several of them have investigated kinship systems in Africa, where the history of demic expansions—many associated with the spread of agriculture and agriculturalists—is relatively well understood. Recent work correlating reconstructed subsistence lexicons with paleoclimatic and archaeological findings has linked the first stage of expansion of each of the four recognized African language families—Nilo-Saharan, Niger-Kordofanian, Afroasiatic (Afrasian), and Khoisan—to the immediate postglacial amelioration of climate in Africa, 15,000–13,700 BP. The protolanguages of each of the four recognized families were probably spoken in that broad time range, which takes us more than a quarter of the time span back to the initial dispersal of humankind out of Africa. Reconstructing the kin lexicons of the protolanguages of the African families has the potential to provide information on kinship systems in the distant past. The phonological and lexical reconstructions of Nilo-Saharan, Afroasiatic, and Southern African Khoisan have now progressed to a point that allows detailed, if still provisional, reconstructions of the kin terminologies and kinship systems of the associated protolanguages and their subsequent evolution.

In Chapter 5, Christopher Ehret takes up the reconstruction of kinship terminology in Nilo-Saharan, a language family tracing back to the Sahel. Although Nilo-Saharan speakers in the ethnographic present are largely patrilineal, Ehret presents evidence, in reconstructed kin terminologies and the current distribution of kinship systems, that matrilineal descent is the ancestral state for many branches of the family—and maybe the family as a whole. This is of particular interest because early Nilo-Saharan speakers are generally agreed to have depended heavily on livestock herding. In recent millennia, the adoption of livestock herding in Africa and elsewhere has been associated with shifts to patrilineality. Apparently herding did not have the same social consequences in the more remote past. Bringing forward important new linguistic evidence, Ehret also infers the existence of prescriptive cross-cousin marriage in Proto-Nilo-Saharan, including a root word for a maternally close-related group of women, or sororal coalition.

Another of the great demic expansions in Africa is associated with the spread of the Niger-Kordofanian language family, which began in West Africa. The most geographically extensive subdivision of Niger-Kordofanian, Bantu, traces back to farmers who spread from a homeland on the current Nigeria-Cameroon border through most of central, eastern, and southern Africa. Several of the chapters in this volume take up Bantu kinship. In Chapter 6, "Proto-Bantu Descent Groups," Hage and Jeff Marck use historical linguistics and cross-cultural evidence to explore Proto-Bantu kinship organization. They take issue with an earlier reconstruction by Jan Vansina, who argued that the early Bantu were organized in cognatic descent groups centered around the households of big men. They present evidence that Proto-Bantu society was instead organized into matrilineal descent groups, probably within small-scale matrilineal chiefdoms.

Chapter 7 takes up kinship in East Bantu, one of the major subdivisions of Bantu. Here the authors present evidence from equations of affines and consanguines in reconstructed kin terms for cross-cousin marriage and matrilineal descent in Proto–East Bantu, with cousin-cousin marriage and associated kin terms surviving the shift to patrilineality in some of the daughter languages in the family.

The great demic expansions in Africa are rivaled by those in Oceania—especially the Austronesian expansion, in which farmers starting from Taiwan spread their genes, languages, and cultures across an immense expanse of ocean, first to island Southeast Asia, then to Madagascar in the west, and the farthest Pacific in the east. The major Pacific branch of Austronesian is Oceanic. The original speakers of Proto-Oceanic resided in Melanesia (which they shared with speakers of unrelated languages) and spread from there to Micronesia and Polynesia. Hage and his collaborators made enormous

progress in reconstructing ancestral Oceanic kinship systems and their transformations. Hage (1998) and Hage and Harary (1999) hypothesize that Proto-Oceanic societies were organized into matrilineal chiefdoms in which matrilocality, matrilineality, and bifurcate merging terminology were "perfectly aligned." Hage and Marck (2003) propose that in Oceania the loss of men due to the perils of seafaring could have been solved by replacing them with other men, Papuan as well as Oceanic. This would explain genetic evidence among current Polynesians for (1) the predominantly Asian origin of maternally transmitted mtDNA and (2) the significantly Melanesian/non-Austronesian origin of paternally transmitted Y chromosomes. This '"slow boat"' hypothesis suggesting matrilocal residence in ancient Polynesian societies has been recently confirmed in a study of mtDNA and Y chromosome gradients across the Pacific (Kayser et al. 2006).

In Chapter 8, Marck and Koen Boeston reprise this work with a comparison of Oceanic and Bantu kinship. There are some telling parallels in social evolution in the two language families. In both cases, the migratory founders were matrilocal and matrilineal, while many of their descendants eventually shifted to patrilineal and cognatic descent. These parallels suggest some general principles of social evolution at work, a topic to which we return below. In Chapter 9, Oceanic kin terms receive further attention from Hage, who argues that the three varieties of cross-cousin classification found in Oceanic groups are consistent with varieties of marital alliance.

In the case of Australia, there is less agreement than with Africa or Oceania on the role of demic expansions in prehistory. Agriculture never reached precolonial Australia, and in some accounts of prehistory Australia looks like "The Land That Time Forgot," without any major population spreads after its initial colonization more than 40,000 years ago; however, the true story may turn out to be more complicated. There is actually significant linguistic, genetic, and archeological evidence for a demic expansion out of Arnhem Land in the last 5,000 years. Patrick McConvell and Ian Keen are two of the major anthropologists active in working out the implications of this expansion for the development of the continent's distinctive social organization.

In Chapter 10 they take up the transition between Dravidian and matrilateral systems, which has received particular attention in anthropology since Lévi-Strauss (1969a) located the change from restricted to generalized exchange in this transformation. There is evidence that such transitions have occurred in Australia, and McConvell and Keen examine the case of the probable transition from Cape York Peninsula "Kariera" ("Dravidian"), with its variants, to the matrilateral system of the Yolngu of North-East Arnhem Land. Research on kinship evolution in anthropology has relied mainly on typology of systems. McConvell and Keen suggest that modeling of the structural transformations evident in reconstructed linguistic forms is a useful heuristic for investigating possible historical change. This work is important for the reconstruction of both Australia's distinctive social organization and of changes in kinship more generally.

Finally, in Chapter 11, Hage provides evidence that the evolution of kinship systems follows some of the same principles in the New World as in the Old. He proposes that Proto–Central Amerind kinship systems were Dravidian in type, based on the reconstructed equation "father's sister" = "mother's brother's wife" = "mother-in-law." Following Hocart, Granet, Trautmann, and Allen, he argues that alternate generation equations are a crucial tool for reconstructing kinship systems with cross-cousin marriage and marriage classes. His reconstruction of Proto–Central Amerind is consistent with the general evolutionary trend in which the breakdown of Dravidian terminologies leads to similar semantic shifts across cultures.

The chapters in Part 1 cover a wide range of geographic areas and modes of subsistence. It is interesting, then, that some of the same themes crop up repeatedly. One theme is the importance of matrilineal descent in the past. Even in culture areas where matrilineal descent groups are found only sporadically or not at all in the ethnographic present, they are often present in the reconstructed kinship systems of founding societies, including Proto-Nilo-Saharan, Proto-Bantu, and Proto-Oceanic. One possible explanation of this result is that matrilineality is a universal stage in human cultural evolution. This theory, favored by Morgan and other nineteenth-century evolutionists, has been revived by several recent authors. Chris Knight (2008) reviews genetic data regarding sub-Saharan dispersal patterns showing a tendency for matrilocality among hunting-gathering societies of the past. This is corroborated by a reexamination of ethnographic data on hunter-gatherer residence (Alvarez 2004). The reconstructions of ancestral kinship terms in Chapters 3 and 4, which might imply bifurcate merging uncle terms, are consistent with this possibility, although they do not strongly support it.

TABLE 1.1. Evidence of matrilinenality and cross-cousin marriage across the language families discussed in Part 1

Language Family/ Language	Evidence for Ancestral Matrilineality/Matrilocality	Evidence for Ancestral Cross-cousin Marriage or Direct Exchange
Nilo-Saharan	Chap. 5, Ehret	
Bantu/East Bantu	Chap. 6, Hage and Marck Chap. 7, Marck et al. Chap. 8, Marck and Bostoen	Chap. 7, Marck et al.
Oceanic	Chap. 8, Marck and Bostoen	Chap. 9, Hage
Yolngu		Chap. 10, McConvell and Keen
Central Amerind		Chap. 11, Hage

Universal early matrilocality is the extreme scenario. The evidence here suggests at least that matrilocality and matrilineality were more common in the past—*or* that they were more common among societies at the root of major demic expansions.

A related theme in Part 1 is the importance of bilateral cross-cousin marriage in reconstructed kinship systems, even where it is absent in descendant societies. The contributors to this volume reconstruct Dravidian-style equations of cross cousins and affines (implying cross-cousin marriage) for Proto–East Bantu, Pre-Yolngu, and Proto–Central Amerind. In each of these cases, some or all descendant groups have moved away from an original regime of direct alliance to asymmetrical or generalized exchange, or endogamy.

To appreciate the importance of these results, it helps to contrast them with a better-known body of literature on kinship and demic expansions in more recent times. In a number of instances in prehistoric and historic times, societies organized around segmentary patrilineages have expanded rapidly at the expense of their neighbors. This expansion has often been facilitated by the ease with which dominant patrilineages can expand by incorporating women from subordinate groups. Some of the most dramatic evidence regarding such expansions has come from geneticists working on the Y chromosome, portions of which are passed on patrilineally. This research shows that single individuals—including Genghis Khan, Nurhaci (founder of the Manchu Ch'in dynasty in China), and Niall of the Nine Hostages (ancestor of the O'Neill clan of Ireland, among others)—have sometimes managed to leave a conspicuous mark on Y chromosome distributions via the polygynous patrilineages they founded (Zerjal et al. 2003, Xue et al. 2005, Moore et al. 2006).

What the findings in this book point to is another, earlier mode of expansion, one involving matrilineal descent and direct marriage exchange. The association between matrilineality and frontier expansion is implicit in the work of Divale (1984), who argues that matrilocal residence is an adaptation to external war. Briefly, Divale's argument runs as follows: internal warfare—feuding within a society—encourages patrilocal residence because families try to keep their sons at home to strengthen them in their fights with neighboring villages. But in societies facing an external threat, these local quarrels are likely to be put aside. With internal conflicts less pressing, parents may try just as hard to attract sons-in-law to live with them as to hang on to sons. The result in many cases is matrilocality and, after some centuries, matrilineality. In support of this argument, Divale has assembled evidence that matrilocal societies are overwhelmingly frontier societies without significant internal warfare, but facing external threats from culturally alien neighbors; however, life on the frontier seems to be necessary but not sufficient for matrilocality: other frontier societies are patrilocal and patrilineal.

It seems that matrilocality enhances group solidarity in societies facing external threats, but this is apparently effective only below a population threshold somewhere in the low tens of thousands. Above this ceiling, matrilocality is rare. Symmetrical alliance may face similar scale limitations: prescriptive cross-cousin marriage is rare (but not unknown) in large-scale societies. Thus the results presented here regarding kinship systems and demic expansions suggest a hypothesis: if the segmentary patrilineage is an organization for predatory expansion in medium- to large-scale societies (Sahlins 1961), then the symmetrically allied matrilineage may be an

adaptation to frontier expansion where societies are organized on a smaller scale. For large areas of the world, this earlier mode of expansion has been a major force in social evolution.

Kinship, Language, and Mind

The study of prehistory has been revitalized by the (re)discovery that change in the past reflects not just in situ transformation but the movements and expansions of peoples, cultures, and languages. Meanwhile, the study of human cognition has been transformed by the realization that the human mind is not a blank slate, but incorporates an enormous array of evolved special-purpose mechanisms. Beginning with Chomsky's argument that the acquisition of syntax reflects the operation of a specialized "Language Acquisition Device," cognitive psychologists have now amassed evidence for an assortment of specialized mechanisms governing learning and reasoning in a variety of domains, including physical objects, space, and force; numbers; spatial navigation; living kinds; pollution avoidance; mental states; and social relationships and social obligations.

The (re)discovery that the human mind comes equipped—from the factory, as it were—with a great store of evolved structure has been enormously fruitful. It has invigorated cognitive psychology and has generated considerable popular interest as well (Pinker 1997). Yet here, too, a missing ingredient in most work in the field is kinship. This is unfortunate. Research in primatology suggests that concepts of kinship are some of the first abstract concepts, not tied to one sensory modality, that any animals ever had (Cheney and Seyfarth 2007). Yet when it comes to human kinship, the enormous anthropological literature on the topic has had scarcely any influence on the cognitive sciences. Anthropologists have long been aware that kinship and kin categorization are highly organized. Cross-cultural variation in kin terminology is tightly constrained, and known systems are only a tiny fraction of logically possible ones. The situation is parallel to that in phonology, syntax, and color terminology: in each of these cases variation seems to result from combining and recombining items from a limited menu of options, reflecting universals of perception and cognition. Thus the study of kinship and the new cognitive science would seem to be a natural fit for one another.

The chapters in Part 2 all set out to repair this omission. The authors' methods range from critical reviews of older studies to presentations of new data, from close ethnographic description to high-powered formal analyses of language and cognition. Yet these chapters also—so it will be argued below—converge on a strikingly consistent account of the relationship between universals and variation at the intersection of kinship, conceptual structure, and language.

One of the major challenges facing any would-be renaissance in kinship studies comes from the work of a generation of anthropological skeptics who deny that kinship shows interesting cross-cultural commonalities—or even that there is any such thing as "kinship" across cultures. In Chapter 12, Warren Shapiro tackles the kinship skeptics head on with a critical examination of Janet Carsten's work on Malay kinship. Carsten is one of the anthropologists who followed up on David Schneider's (1984) influential attack on kinship studies by proposing to replace the idea of kinship with the looser notion of "relatedness." She argues that, at least among the Malay, relatedness is thought to be as much the product of shared residence or shared food as of birth or sexual intercourse. But Shapiro's careful review of Malay ethnography raises serious questions about these claims. His discussion supports a positive conclusion: kinship—not just a weak concept of relatedness through shared substance, but a strong concept of genealogical connection—is a human universal, an instance of the psychic unity of mankind.

In Chapter 13, Dwight Read argues that kin terminology reflects the joint operation of two conceptual systems. On the one hand, kin terminology can be treated as an independent conceptual system with its own generative logic. American kin terminology, for example, involves structural equations like Parent of Child = Self for reciprocal, consanguineal relations and Child of Spouse = Child for affinal relations. The "kin term space" defined by the structural equations expressed using kin term products can be analyzed as a formal system without reference to genealogy. On the other hand, genealogy has its own conceptual system, which defines a "genealogical space." These two conceptual systems can be combined to form "kinship space," the mental space within which kinship is represented. Read's analysis demonstrates how human kinship combines general principles of categorization with "the facts of life" regarding kinship.

Giovanni Bennardo and Read, in Chapter 14, apply this theory to an empirical comparative study of Tongan and American conceptualizations of kin terms. They show different modes of conceptualizing kin terms among those two groups, with Americans thinking of kinship *vertically*, as a series of parent-child links, and Tongans thinking of kinship more *horizontally*, as a series of links

among siblings, especially same-sex siblings. The authors conclude that differences in the conceptual structure of different kinship terminologies influence the cognitive performance of speakers. They demonstrate, in other words, that knowing a kin terminology is not just a matter of brute force memorization, but involves mastering an abstract set of rules. These rules are not the analyst's invention, but can be shown to be at work in the heads of native speakers.

David Kronenfeld continues the investigation of general principles of categorization relevant to understanding kin classification in Chapter 15, focusing in this case on linguistic *markedness*. He shows how this ubiquitous feature of language—the linguistic counterpart of cognitive *prototypicality*—can be useful in reconstructing communication history in a language community. He first explicates his approach to marking and how it derives from the classic sources. Next, he analyzes three varieties of markedness in semantics and how these facilitate individuals' use of existing linguistic resources to adapt to changing cultural and communicative situations. This adaptive process often drives diachronic change and, in doing so, can leave behind evidence that contributes to understanding language change and how linguistic data relating to marking is used to unravel some of the history of the communities of the language speakers in question.

In Chapter 16 Doug Jones carries Kronenfeld's discussion a step further. Parallels between kin terminology and other areas of language, such as phonology, have been noted since the early days of structural linguistics; however, the study of phonology has advanced considerably since then. In particular, phonologists since the early 1990s have developed a new approach to universals and variation in rules of language called Optimality Theory (OT), which has pretty much taken over the field. OT turns the old generalizations about distinctive features and markedness into a generative theory of grammar. Jones argues that the principles of Optimality Theory are at work in several semantic domains, including kinship and color terminologies. Apparently, general principles of communicational economy operate in a wide array of linguistic domains—from phonology to syntax to semantics. This amounts to a resuscitation of the structuralist tenet that grammar is not just a synonym for syntax, but the product of a faculty active in a wide range of rule-governed communication.

The last chapter, by Bojka Milicic, a student of Hage's, draws on Hage's ideas in carrying out research in cross-cultural developmental psychology. Toward the end of his life, Hage grew interested in the theory of the modularity of the mind. He was interested in how research into children's early, accurate acquisition of kinship terminologies might contribute to debates about the nature and structure of kin terminologies, and about mental modularity. Milicic, in an innovative methodological approach to fieldwork with children, explores Chomsky's theory of the poverty of the stimulus in a special segment of language, kinship terminology. In her assessment of the modularity hypothesis, she argues that kinship calculus cannot be modular in the "strong" theory sense because it uses the same cognitive apparatus as language, but that current definitions of kinship as domain-specific are too weak. Following Greenberg's ([1980] 1990) position that conceptualizations of kinship are determined primarily by cognitive templates but also by social ones, she proposes that kinship terminology is a historical product depending partly on cognitive tools found in language, but also on special-purpose cognitive heuristics. Milicic ends the chapter with a series of questions: Are kinship terms the nucleus of human language? Could the cognitive heuristics used for kinship terms have provided the essential tools for handling social relationships? And has the need for social rules advanced the development of language itself?

We believe that the chapters Part 2, despite significant differences in theory and method, support some general conclusions about kinship and cognition. Taken together, they argue for the existence of two specialized conceptual systems, two "mental organs," that work together to generate representations of kinship. One of these systems is specially dedicated to reasoning about and negotiating kinship—conceptually focused on genealogy—and other social relations. The other system is dedicated to combinatorial, rule-governed categorization and communication—to "grammar"—probably not just for kinship but for other linguistic and cognitive domains as well. Some of the chapters in this section consider one or the other of these systems separately; others consider the two of them together.

Based on the evidence presented in this volume, what is the "kinship" part of the brain like? Contrary to some influential claims in cultural anthropology, genealogical connection seems to be a central part of the concept of kinship. Shapiro makes the case very strongly in his reconsideration of the ethnography of Malay kinship. In Read's discussion, genealogical space is one of the two conceptual systems that go into the making of kin terms. In Jones's analysis, genealogical distance is one of the

TABLE 1.2. The nature of kinship and semantic domains discussed in Part 2

The Nature of Kinship/ Kinship as Genealogy	Formal "Grammar" of Kin Terms or Other Semantic Domains
Chap. 12, Shapiro	
Chap. 13, Read	Chap. 13, Read
Chap. 14, Bennardo and Read	Chap. 14, Bennardo and Read
	Chap. 15, Kronenfeld
Chap. 16, Jones	Chap. 16, Jones
Chap. 17, Milicic	Chap. 17, Milicic

conceptual primitives that go into generating kin terms according to the principles of Optimality Theory. Together, these make a strong, albeit circumstantial, case for dedicated psychological machinery, which, in the face of a wide range of cultural inputs, converges on a concept of kinship as a genealogical connection resulting *from* parturition and sexual intercourse, and resulting *in* the sharing of an underlying substance between kin.

But something else is going on in the categorization of kin. A number of the authors in this section are concerned with general principles of categorization and communication that are not necessarily tied to genealogy per se and may operate far outside the domain of kinship. For Read, kin terminologies have their own generative logic, intersecting with, but conceptually independent of, genealogical concepts. Kronenfeld reviews the literature on markedness, which is important not just in kin terminology but in diachronic linguistic change very generally. Jones argues that there is a "grammar" part of the brain active not just in kin terminologies, but in other categorical domains such as color and space, and in phonology and syntax as well. Milicic concurs in finding both a social template and a cognitive/linguistic template implicated in kin categorization. There are considerable differences between these authors in their formal methods, but in each case their work points to an abstract combinatorial system—a "grammar faculty," perhaps—tied to language and communication, rather than to kinship per se, as a second component in the making of kin terminologies. This system is in all likelihood uniquely human, and a central factor in the uniquely human elaboration of kinship systems.

The Future of a Renaissance

In a recent article, D'Andrade (2003) ponders why the study of kinship went into decline from the late 1960s onward. Mostly he fingers broad sociological changes in the field of anthropology, but he suggests another reason as well: synchronic description outran theoretical explanation: "[O]ne of the things kinship theories failed to do is explain why anything was the way it was.... Structures emerged and structures were described. But questions about why kinship structures took the form they did were ignored.... [N]ot only were no causal models applied, causal theory was not even an ultimate goal" (311).

Any proper renaissance aims both to revive classical traditions and to surpass them. We believe that the renaissance in kinship studies must address the deeper theoretical questions left unresolved in classic kinship theory. The chapters in this book do this in two ways. The chapters in Part 1, on kinship and prehistory, investigate kinship systems not just as synchronic homeostatic structures, but as products of history. This amounts to a revival of one of the oldest programs in kinship studies: Morgan's ambition of recovering the deep history of kinship systems. But the revived version of Morgan's program draws on an interdisciplinary knowledge of prehistory not available even a few decades ago. The long-term aim is not merely a catalogue of past kinship systems, but an understanding of the place of kinship in social evolution and demic expansions.

The chapters in Part 2, on kinship and the mind, advance in another direction, moving past the kaleidoscopic variety of kinship across cultures to underlying universals in the conceptualization of kinship and the combinatorics of communication that together generate and constrain kin terminologies and kinship systems. Ultimately this line of advance promises to take the study of kinship even deeper into prehistory, into the phylogenesis of a complex evolved psychology partly shared with other primates and partly unique to our species. If, as many scholars believe, the complexities of social life in kin-structured society are some of the most important selection pressures on the evolution of primate and human intelligence, then the study of human kinship may even turn out to illuminate the nature of the mind itself.

Had Per Hage lived longer, he would have addressed these issues in many more articles and a book or two—at least. Although these articles and books can no longer be written, the intellectual program associated with Hage's work lives on in the following chapters.

| 2 |

Anthropology, Mathematics, and Per Hage's Contribution to Kinship Theory

David Jenkins

Over a long and productive career, Per Hage produced a diverse and influential body of work. He conceptualized and solved a range of anthropological problems, often with the aid of mathematical models from graph theory. In three books and many research articles, Hage—along with his collaborator, mathematician Frank Harary—developed innovative analyses of Oceanic exchange relations, including marriage, ceremonial, and resource exchange. They advanced network models for the study of communication, language evolution, kinship, and classification. They also demonstrated that graph theory provides an analytical framework that is both subtle enough to preserve culturally specific relations and abstract enough to allow for genuine cross-cultural comparison. With graph theory, two common analytical problems in anthropology can be avoided: the problem of hiding cultural phenomena with weak cross-cultural generalizations, and the problem of making misleading comparisons based on incomparable levels of abstraction.

Per Hage died in June 2004 after a long struggle with leukemia. He was sixty-nine years old, and despite his illness, he had remained engaged in a provocative study of kinship terminologies in the world's major language families, a study that brought him great pleasure and yielded a variety of new insights into the structure and evolution of kin terms. Frank Harary died a few months later, at the age of eighty-three, after a lifetime of prodigious mathematical output.[1]

In the following chapter I describe Hage's work and the mathematics he and Harary used in their diverse analyses, but not the mathematics itself. That task would be much too lengthy. The mathematical definitions, though reasonably straightforward, require careful description and example, which are readily accessible in Hage and Harary's publications. Let me simply note informally that a *graph* is a mathematical structure consisting of a finite set of nodes, some pairs of which are joined by edges. A research problem involving structure is first modeled as a graph, often presented in pictorial form, then solved by the application of the concepts, theorems, and algorithms from graph theory. By my count, Hage and Harary employed seventeen theorems in their first book, eighteen theorems in their second book, and eleven theorems and six algorithms in their third book. As they note in *Exchange in Oceania*: "We wish to emphasize right at the outset that the ultimate value of graph theory for anthropology will depend not just on the use of its pictorial representations, but also on the application of its theorems" (Hage and Harary 1991, 2). They go on to suggest that "By specifying properties of graphs that necessarily follow from given conditions, theorems enable one to draw conclusions about certain properties of a structure from knowledge about other properties. Thus the answer to many research questions depends not on the accumulation of more data but on the examination of the structural properties of graphs" (1991, 9).

In what follows I will sometimes refer to Hage as the author of the work under review, and sometimes to Hage and Harary. My understanding is that although for more than twenty years these two scholars collaborated on their joint venture of applying mathematical models to anthropological data, Hage typically drafted the article or chapter or book, and Harary clarified and extended the mathematical treatment.

Struc tural Models

In 1983 Hage and Harary published their first book, *Structural Models in Anthropology* (Cambridge University Press). It introduced a basic set of graph theoretic concepts, definitions, and theorems for the analysis of diverse cognitive, social, and cultural forms. An expanding field of mathematics, graph theory has significant applications in a wide range of disciplines, including computer science, operations research, chemistry, physics, economics, biology, architecture, and geography. As *Structural Models* shows, anthropology belongs with this range of disciplines and, like them, clearly benefits from the explicit adoption of mathematical models into its theoretical armamentarium.

In his forward to the book, J. A. Barnes notes that Hage and Harary's work gives social scientists renewed hope in the structuralist enterprise. They convincingly demonstrate that graph theory applied to ethnographic evidence produced "results that could not have been obtained with unassisted common sense, results that add significantly to our understanding of the social and cultural processes taking place in the real world." Barnes argues that the book represents a shift from rough carpentry to cabinetmaking, providing anthropologists with a shared technical vocabulary that cleared away much of the confusion about "structure" in the social sciences. "Here in this new book," Barnes says, "we have at last a comprehensive range of examples from graph theory being applied to data from the real world with the elegance and precision we rightly expect from pure mathematics."

Hage and Harary intended *Structural Models* as a concrete demonstration of the usefulness of graph theory for the analysis of diverse human phenomena. Its topics are varied and include Puluwatese navigation techniques and mnemonics; drift voyaging in Polynesia; Orokaiva gift exchange; Mayan ceremonial architecture; Melanesian social structure; New Guinea big-man leadership systems; kinship, alliance, and status structures in various places such as New Guinea, Tikopia, Tonga, Truk, the Solomon Islands, the western Carolines, India, Mexico, and the Kalahari; social group fission in a work group in Zambia; Shoshone piñon nut gathering strategies; Chinese five-element theory and the structure of the *I Ching*; Arapesh culinary symbolism; and Micronesian techniques for predicting the weather based on how crabs dig holes in the sand.

In the middle of the discussion of such diverse topics is the gem of the book: a clear and convincing demonstration of the underlying structure of Freud's Oedipus myth. Starting with Lévi-Strauss's observation that Freud's versions could be interpreted as transformations of the Greek myth,[2] Hage and Harary show that logical concepts from graph theory—specifically notions of *structural duality*—could advance myth analysis in new ways. Hage chose Freud as an irresistible topic for discussion, referring to him as "a Viennese autochthonous hero" (1979). With Freud as the topic, Hage and Harary proceeded to sort out the logical possibilities of the notoriously problematic notion of "opposition" in anthropological analyses of symbolic systems.

The point for Hage was not simply to catalogue interesting cultural bits and pieces from different places, but to show how these, and by implication many other, cultural phenomena could be analyzed with graph theoretic concepts and theorems. As Hage often pointed out, graph theoretic concepts are already in anthropological discourse, although in disguised or awkward form. At the beginning of *Structural Models in Anthropology* he says: "Anthropology is fundamentally the study of sets of social and cultural relations whose diversity and pervasiveness is illustrated by such terms as 'exchange,' 'hierarchy,' 'classification,' 'order,' 'opposition,' 'mediation,' 'inversion,' and 'transformation'" (Hage and Harary 1983b, 1). Hage goes on to say that the analysis of these kinds of relations presupposes some sort of model, usually and often inadequately described in everyday language. "The question thus arises," he notes, "as to whether, in many contexts, mathematical formulations might not be helpful; and if so, what kind of mathematics" (1).

Structural Models in Anthropology is an extended answer to this question. Hage and Harary use graphs, trees, blocks, signed graphs, directed graphs, networks, groups, matrices, and the concepts of structural duality and centrality in their analyses of the above-mentioned topics. Along the way they employ seventeen theorems whose usefulness in anthropological analyses remains underdeveloped.

Hage did not expect the wholesale adoption of mathematical models into anthropology. Social and cultural worlds are messy and contingent, and humans exhibit an impressive range of inventiveness and unpredictability. Ethnographic description of such worlds is itself fraught with difficulty, as is adequate interpretation. Still, it is not the case that anything goes, that patterns are absent from human behavior, and that all anthropologists can or should do is describe and interpret the fragments of

another's cultural world that they are privileged to witness. If the focus remains not within a culture but across all cultures, the question remains whether specific patterns of human behavior—for example, in social organization, kinship, cognition, or linguistic categories—can be found in all cultures; the associated question is whether there is an abstract analytical language that suffices for the analysis of these patterns.

Graph theory, as exemplified by the publication of *Structural Models*, provides one such language of analysis and comparison. Throughout this book, Hage and Harary demonstrate that social scientists need not shy away from the rapidly developing and increasingly sophisticated family of graph theoretic models—models that are especially well suited for the analysis of diverse human phenomena. These models have been used to great advantage in other disciplines and may provide one of the better means for adequate cultural comparison. The search for comparative tools for analyzing human behavior may never end, but at least in graph theory we have a useful starting point.[3]

"The legitimacy of the comparative method," Lévi-Strauss (1985, 77) emphasized in *The View from Afar*, "does not rest on massive and superficial resemblances." To the contrary, "Analysis has to take place on a level deep enough to allow us to discern, at the base of all social life, the simple features that combine into rudimentary systems, which may eventually become the stuff of more complex and more completely integrated systems with entirely new characteristics." Comparative analysis was Per Hage's great skill. He could see the underlying patterns that emerged in diverse cultures and developed the technical ability to analyze them.

Exchange

Between the 1983 publication of *Structural Models in Anthropology* and the 1991 publication of *Exchange in Oceania: A Graph Theoretic Analysis* (Oxford University Press),[4] Hage published a number of papers, notably a *Boolean group* analysis of Arapesh sexual symbolism (with Harary [1983a]) that analyzed the intricate relations involved with Arapesh notions of the body and its substances, and a *Markov chain* analysis of the *kula* exchange (with Harary and Brent James [1986b]) that simulated the flow of arm bands and necklaces around twenty islands off the east coast of New Guinea in order to study the distribution of these valuables and analyze the relationship between network position and social organization. But his primary concentration during this time was on exchange relations throughout Oceania and the development of graph theoretic models for their analysis.

Exchange in Oceania focused on Polynesian, Micronesian, and Melanesian societies. It developed a graph theoretic analysis of the great range and variety of the exchange systems found in those societies. Hage wrote:

> Our intention is not to give an encyclopaedic account or even a detailed survey of exchange forms in Oceania, but rather to demonstrate, with reference to diverse empirical cases, how graph theoretic models can contribute to the innovative as well as the rigorous analysis of these forms. While agreeing completely that the role of the structural anthropologist is only to discover and study the "structured or structurable islands" that bathe in an "ocean of contingency" (Lévi-Strauss in Bucher 1985), we none the less wish to indicate that the islands are more numerous and varied than commonly imagined, that the ocean resembles the Pacific more than it does the Atlantic. (Hage and Harary 1991, 1–2)

Prior anthropological studies of exchange in this region are devoted to a number of topics, among them kinship and marriage relations, communication and exchange networks, social organization, gender relations, ritual forms, and beliefs about bodily pollution. Hage and Harary set out to provide a model of exchange relations in general, a model that would describe and analyze such relations. They also wished to demonstrate that radically different ethnographic forms can have the same or similar logical structure.

As with their earlier book, a number of research problems are conceptualized and solved. For example, Hage and Harary provide a graph theoretic definition of dual organization, a widespread and probably archaic type of Melanesian social structure that exhibits a variety of empirically different forms. All of these forms can be characterized as a *bipartite graph*; that is, a graph whose node set V can be partitioned into two subsets V_1 and V_2 such that every edge of G joins (a node of) V_1 with (one in) V_2 (Hage and Harary 1991, 39). With this basic definition, it becomes clear that the empirically distinct forms of social organization among the Arapesh, Tonga, and Etoro are all bipartite; that is, they are all dual forms, even if these forms are implicit or hidden. Once the underlying bipartite organization is apparent, other, more complex

characteristics can be studied, such as the cyclical and relational properties of marriage, descent, and ceremonial transactions.

In addition to analyzing marriage and ritual exchange, Hage and Harary develop graph theoretic models of overseas trade networks, with a focus on reconstructing and studying the traditional exchange network that connected the islands in western Micronesia. They show that locational advantage in such networks is often more significant than either demographic or environmental factors in the development of social stratification or trading success. They also demonstrate the analytical usefulness of precisely defining different types of central location in order to study economic potential and success, emerging political hierarchies, and dominance between trading partners.[5]

They also extend their Markov chain analysis of the kula ring, which simulates the flow of valuables around a well-known exchange network initially described by Malinowski. Hage and Harary's simulation of the flow of arm bands and necklaces highlights a number of important aspects of the exchange network, such as the location of central and marginal islands, the uneven distribution of valuables around the kula ring, and the reasons for the development of political hierarchy on some islands but not on others. Their model additionally provides the occasion for informed speculation about the initial development of kula exchange.

One important emphasis in *Exchange in Oceania* is on enumerating all logically possible forms of an exchange relation. As an example, Hage and Harary provide a mathematical generalization of Lévi-Strauss's "atom of kinship."[6] For Lévi-Strauss, the atom of kinship is characterized by the group consisting of a husband, wife, offspring, and the representative of the social group that gave the woman to the man, for example (the simplest case) the wife's brother. There are six relations in the atom of kinship, four of which Lévi-Strauss analyzes: brother-sister, husband-wife, father-son, and mother's brother–sister's son. Hage and Harary's generalization shows that there are eight logically distinct sets of relations possible. Enumerating all eight "is not an idle exercise," they insist, "for it directs attention to those empirical structures which have already been studied by anthropologists, and those which remain to be studied" (1991, 193).

Finally, they describe the interactions between binary operations on graphs and mathematical groups. To this end, Hage and Harary analyze pollution beliefs in Highland New Guinea. In particular they show that pollution beliefs in Mount Hagen can be analyzed as a *transformation group* in which the entire system of beliefs is the object of study. They show that beliefs concerning menstrual pollution are logically related to beliefs about cooking, poison, and semen—all expressed in the idiom of marriage. The general point is to show that a particular belief should not be isolated from others, but studied as part of a set. In this way, the internal logic of a seemingly disparate set of beliefs is revealed. Additionally, the model of a transformation group, as Hage and Harary note, "permits the comparison of related belief systems, not term for term, but on the basis of an underlying system of relations, which is also the level to seek valid correlations between symbolic and social systems" (1991, 239). The approach is thus both mathematical and Durkheimian, clarifying the logic of cultural symbols that define and bound a set of relations, and demonstrating how certain of these symbols correspond to social organization.

Networks

After the 1991 publication of *Exchange in Oceania*, Hage published a number of papers on diverse topics, including an important clarification of the concept of hierarchical opposition (with Harary and Milicic [1995]), two papers on minimum spanning trees (with Harary [1995] and with Harary and James [1996]), and an unexpected and delightful analysis of tattooing, gender, and social stratification in Polynesia (with Harary and Milicic [1996]). Much of his effort during this time, however, was on network analysis.

Island Networks: Communication, Kinship, and Classification Structures in Oceania (Cambridge University Press) was published in 1996 and dedicated to Claude Lévi-Strauss. In the preface Hage and Harary refer to their earlier book, *Structural Models in Anthropology*, in this way: "Much of the inspiration for that book, as for all of our research, came from Claude Lévi-Strauss's (1949, 1962) theories, which focus on the logical, combinatorial, and isomorphic properties of kinship and classifications systems, prefiguring the application of finite mathematics to anthropology."

Island Networks is explicit in its mathematical applications, perhaps for some readers too much so. But for those with the patience to work through the mathematical notation and absorb the rationale behind the use of graph theory in analyzing various network problems, the results are compelling.

Beginning with a theorem defining the properties of *trees*,[7] the simplest of all graphs and network models,

Hage and Harary analyze as *rooted trees* the Yapese prestige-good system, which, based on three different types of gift relations, connected fourteen islands across 1,200 kilometers of ocean. They analyze as *twin binary trees* various classification systems organized by what anthropologists have called

- "recursive dualism" (Admiralty Islanders in Melanesia [Eyde 1983]);
- "perpetual dichotomy" (Lauan society in eastern Fiji [Hocart 1929, 1952]);
- "recursive complementarity" (eastern Indonesian cultures [J. Fox 1989]);
- "reciprocal logic" (Moalan society in Fiji [Sahlins 1976]);
- "relational contrast" (Balinese [Boon 1990]); and
- "hierarchical opposition" (India [Dumont 1980]).

In fact, however, these classification systems have the same underlying structure—a structure that is revealed once these diverse systems are analyzed graph theoretically. They analyze as *in trees* cognatic landholding descent groups among the Tuamotu atolls in East Polynesia, and they use the *cycle rank* of a graph to measure the network connectedness of exchange relations in West Polynesia and Melanesia.

A discussion of *minimum spanning trees* provides the opportunity to introduce three algorithms, which are then used to (1) analyze linguistic subgroups in the Tuamotu Islands in Polynesia and to show how and why dialect groups are partitioned, (2) suggest the pattern of the evolution of chiefdoms in the one hundred or so islands in the Lau Archipelago of eastern Fiji, and (3) improve a standard method of "close proximity analysis" in archeology, developed to analyze clusters of cultural similarity by showing how computation can be made more efficient, with the example of Lapita cultural spread throughout Oceania.

One major contribution of *Island Networks* is Hage and Harary's elucidation of the structure of the conical clan: a type of social organization that has been independently discovered, by Service's count (1985), five times, to which Hage and Harary add two more. The model they use is called a depth first search tree (DFST), familiar in computer science, and they show that the unique ranking of individuals in this type of social organization can be modeled in a way that "gives an exact, general, and intuitively appealing characterization of the conical clan in all of its forms" (Hage and Harary 1996, 91). Tongan, Marshallese, and Kachin variants, where rank is defined either by primogeniture or ultimogeniture, are shown to exhibit similar structures.[8]

Reading Hage's account of the conical clan is a lesson in the intellectual history of anthropology. One of his explicit aims was to incorporate into his analysis the important but frequently overlooked contributions of prior scholars. In the clarification of the structure of the conical clan, we find references to familiar names such as Raymond Firth, E. E. Evans-Pritchard, Edmund Leach, Marshall Sahlins, George Peter Murdock, and Leslie White, but he also refers to scholars whose contributions are central but less well known: Paul Kirchhoff, Edward Winslow Gifford, Wilhelm Milke, and Leonard Mason. The conical clan was first described in 1864, but despite considerable effort to clarify its structure, it wasn't until Hage and Harary's search tree analysis that its form was finally clarified.

Hage and Harary extend the discussion of search trees to develop, with evidence from historical linguistics, an analysis of Proto-Oceanic kinship systems, with a focus on descent, alliance, and kin terminology. They additionally use *digraphs*, which are graphs with arrows on their edges indicating relational direction, to clarify and improve existing evolutionary models of kinship organization, and *semilattices*, models that capture unilinear and multilinear, as well as diverging and converging, paths. This led to the second major contribution of *Island Networks*: a model of the evolution of Oceanic sibling terms and social organization based on Nerlove and Romney's (1967) study of the logically possible types of sibling terminologies, Murdock's (1967c) comparative study of kin terms, and Greenberg's (1966, [1980] 1990) study of language universals, together with the provocative work of specialists in Oceania.

As with his discussion of the conical clan, Hage explicitly recognizes earlier contributions to kinship research. He cites Murdock's (1967c) somewhat fanciful history of kinship studies, which begins with the Founder (Lewis Henry Morgan), followed by the Early Giants (Kroeber, Rivers, Radcliffe-Brown, Lowie), then the Later Masters (Firth, Fortes, Eggan, and Lévi-Strauss), and finally on to the Modern Innovators (Goodenough, Lounsbury, Romney, and D'Andrade, among others). In a footnote, Hage suggests that "the fourth stage is also the beginning of a decline in which [quoting Murdock] 'certain self-styled "social anthropologists" today no longer report kinship terms in their monographs or do so half-heartedly or incompletely—a tendency that would have profoundly shocked the Early Giants and the Later Masters'" (1996,

260–61). Hage goes on to comment: "One wonders how Murdock would have characterized the present period, when either the reality or the variety of kinship systems is denied—The Late Dwarfs, perhaps?"[9]

Hage had high hopes for *Island Networks*, his most sophisticated and innovative work. In the preface, he states that "The applications in this book are highly varied, and the interested reader will no doubt discover analogues to every research problem we present." A paragraph later, he suggests that "There is a parallel here with the second author's book, *Graph Theory*, published in 1969, which became in 1978–9 the fifth most cited reference in the research literature of mathematics. Virtually every section of every chapter of that book has become a special field of research and is now the subject of a separate book."

The interested reader of *Island Networks*, as well as Hage and Harary's earlier work, will no doubt discover analogues to each of the research problems they conceptualize and solve. The techniques they advance and the new lines of research they opened up provide points of departure for novel research in a surprising range of topics, only some of which I have described.

In the conclusion of the unedited manuscript of *Island Networks*, after listing all of the analytical advantages of network models in anthropology, Hage wrote as his final sentence, "Let the punishment fit the crime." He later removed this phrase, not wishing to sound flip at the completion of such a work. A few years later Per told me that as he and Frank worked through the final chapter together, Frank—a diminutive, quirky, and highly accomplished mathematician—danced around the room, singing from Gilbert and Sullivan's *Mikado*: "My object all sublime, I shall achieve in time—To let the punishment fit the crime—The punishment fit the crime.…" Frank Harary's dance was an expression of the joy and satisfaction they both felt at the completion of their third book, the emotional equivalent of the mathematician's Q.E.D.

Never one to remain idle, Hage next turned his full attention to kinship, one of the venerable topics in anthropology. His goal was to develop a world-historical analysis of the evolution of kinship systems.

Kinship Terminol ogy

After the publication of *Island Networks*, the pace of Hage's work accelerated. He was delighted to have come across Joseph Greenberg's 1966 study *Language Universals* and realized that Greenberg's remarkable analysis, neglected in cultural anthropology,[10] could be extended into a research program on the evolution of kin terminologies in all of the world's seventeen major language families (Ruhlen 1987).

Hage received two National Science Foundation (NSF) grants to support his new research interest. "Kinship terminologies," he wrote in his grant proposal, "are anthropology's treasure." Hage emphasized that of the various systems of classification anthropologists have gathered, kinship classifications are the most complete. About no other system of classification do we have such rich data. These data, moreover, have implications for understanding aspects of language, cognition, social organization, and historical change. Hage proposed an analysis of the evolution of kin terms in the world's major language families, based on clear preliminary evidence that kin terms evolve in predictable, albeit uneven, ways. Given the patterned changes in kin terms over time, it is possible to develop analyses of prehistoric kin terms and, from them, to make plausible reconstructions of prehistoric kinship systems. Coupled with archaeological and genetic evidence, reconstructed protokinship systems provide additional evidence about social organization, migration patterns, and language stability and change. One NSF reviewer thought that Hage's study would produce results as significant as Lévi-Strauss's *Elementary Structures of Kinship* (1969a). Another reviewer, in a response that mystified Hage, claimed to find nothing of value in the proposal and, indeed, could understand nothing about it.[11]

Hage published his results at a steady rate, working on his own and with several collaborators, among them Harary, the cultural anthropologist Bojka Milicic, and the linguists Mauricio Mixco and Jeff Marck. His enthusiasm for research on kin terminologies was boundless, despite his illness. He worked with great pleasure, but also a sense of urgency. He was, as he told me, very happy to start work each day and regretted having to stop at day's end. Over this time Hage published twenty journal articles and two book chapters, from "Unthinkable Categories and the Fundamental Laws of Kinship" (1997) to "Marking Universals and the Structure and Evolution of Kinship Terminologies: Evidence from Salish" (1999c), "Matrilineality and the Melanesian Origin of Polynesian Y Chromosomes" (2003, with Marck), and the posthumous "Dravidian Kinship Systems in Africa" (2006). His publications include work on Mayan, Bantu, Polynesian, Salish, Proto-Micronesian, Proto-Polynesian, and Proto-Nostratic systems, and he conducted considerable research on kin terms in many other language families.

He anticipated eventually publishing his research in book form.

"Unthinkable Categories" addresses an aspect of Françoise Héritier's (1981) general theory of kinship systems. In her seminal work, *L'Exercice de la parenté*, Héritier analyzes two "unthinkable" kinship categories implied in Lowie's (1928) and Murdock's (1949) typologies, which, though logically possible, are not empirically realized. Lowie argues that there are four types of male kinship terminologies in the first ascending generation:

1. Generational, where one term suffices for father, father's brother, and mother's brother: F = FB = MB.
2. Lineal, which has two terms: one for father, and another for father's brother and mother's brother: F ≠ FB = MB.
3. Bifurcate merging, which has two terms: one for both father and father's brother, and another for mother's brother: F = FB ≠ MB.
4. Bifurcate collateral, which has three terms: one for father, one for father's brother, and one for mother's brother: F ≠ FB ≠ MB.

Lowie did not consider the fifth logically possible type, perhaps because it does not occur:

5. F = MB ≠ FB.

Héritier accounts for the nonoccurrence of this fifth type with her first law of kinship, which, she argues, has far-reaching social implications: "cross-solidarity is never stronger than parallel solidarity and a cross-relation between individuals or groups is never the implicit basis of equivalence or identity" (1981, 38). Héritier further argues that it is "unthinkable that the relation between two men linked through a woman, sister of one, wife of the other, could be closer than the relation between two brothers" (1981, 42). Hence the kinship equation F = MB ≠ FB does not occur.

Héritier similarly considers four types of cousin terminologies, simplifying Murdock's (1949, 1970) typology.[12]

1. Parallel cousins = cross cousins = siblings (Hawaiian).
2. Parallel cousins ≠ cross cousins ≠ siblings (Sudanese).
3. Parallel cousins = cross cousins ≠ siblings (Eskimo).
4. Parallel cousins = siblings ≠ cross cousins (Iroquois, Crow, Omaha).

A fifth type, logically possible but not found, has one term for siblings and cross cousins, and a second term for parallel cousins. Héritier accounts for the nonoccurrence of this fifth type with her first law of kinship identity and difference.

5. Siblings = cross cousins ≠ parallel cousins.

As Hage points out, Greenberg explains the nonoccurrence of the empirically unrealized kinship categories not in sociological terms, but in cognitive-linguistic terms. His theory provides the means to predict the overall structure of kinship terminologies, whose analyses become more complicated when multiple characteristics are defining features—such as an elder/younger distinction, a male/female distinction, a cross/parallel distinction, and a sex of speaker/sex of referent distinction—and when distant relatives, descent relations, and alliance structures are taken into account. Additionally, Greenberg's theory allows one to analyze evolutionary changes to the structure of kinship terminologies, based on the successive addition or deletion of contrasting characteristics. By comparison, Héritier's theory allows for neither prediction of unrealized categories nor evolutionary analysis.[13]

Greenberg proposes two major determinants of kinship terminologies: the avoidance of disjunctive categories, and the effects of marking. Disjunctive categories are defined by different combinations of attributes rather than the joint presence of attributes. For example, in analyzing kin terms for female relatives in the first ascending generation, Greenberg ([1980] 1990, 320) makes the following observations:

> The principle involved is the avoidance of disjunctive definitions. There is no way of demarcating by a single set of defining properties a term which embraces the mother and the [father's] sister without including in its reference the [mother's] sister. This is because mother's sister shares matrilineality with mother and collaterality with father's sister, but there is no common property of mother and father's sister, the two most different terms, except female, first ascending generation, and this includes mother's sister in its reference.

Graphically, a disjunctive kinship category is one that cannot be represented by a single endnode of a twin binary tree, whereas a conjunctive category can be. Figure 2.1 shows five twin binary trees representing first ascending male kinship terminologies; the fifth is disjunctive. In these graphs, A, B, and C stand for kin categories. The

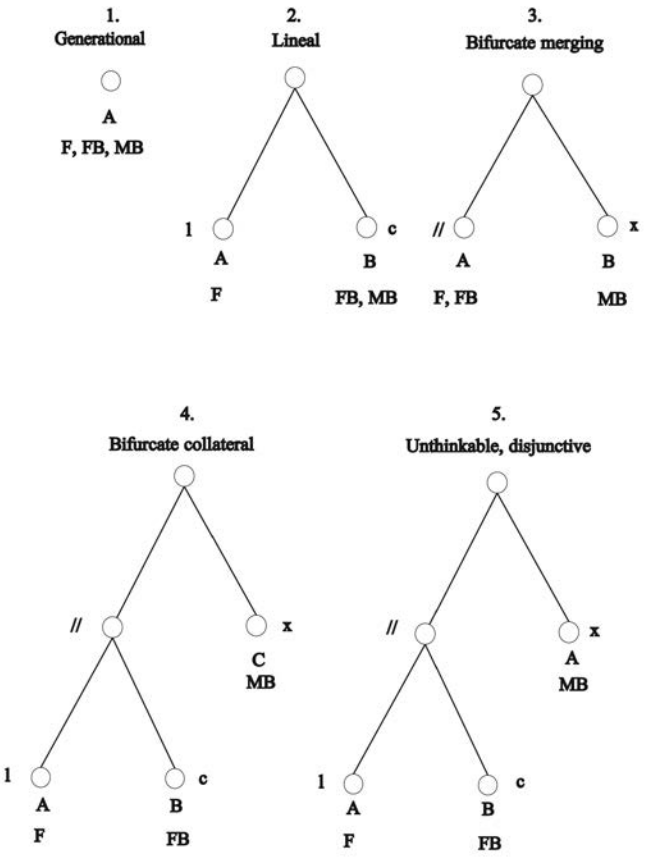


FIGURE 2.1. Conjunctive and disjunctive first ascending generation terminologies (after Hage 1997).

dimensions of contrast are lineal vs. collateral, and cross vs. parallel. Number 5, the unthinkable terminology, is one in which a single term refers to father and mother's brother, and another term refers to father's brother. It is disjunctive because term A (F, MB) is defined by incompatible combinations of attributes; that is, by both cross and parallel characteristics.

Hage shows, following Greenberg, that the absence of logically possible kin categories can be explained, initially, as an instance of a universal tendency to avoid disjunctive categories. This is true for cousin terminologies, grandparent terminologies, sibling terminologies, and for other categorical systems in general. For grandparent terminologies, Greenberg demonstrates that of the fifteen logically possible types, seven are disjunctive. Combining his sample of 100 kinship terminologies with Murdock's sample of 566 terminologies, Greenberg then discovered that the disjunctive types are very rare, occurring in as few as three societies.

Nerlove and Romney's (1967) analysis of sibling classification produced similar results (see also Jones, this volume). They found only four sibling terminologies with disjunctive categories in a sample of 240 terminologies. In their study, Nerlove and Romney point out that the number of logically possible sibling terms is 4,140, based on three dimensions of contrast: a cross/parallel distinction, an elder/younger distinction, and a male/female distinction. These three contrasts produce eight sibling kin types:

1. Cross, Elder, Brother
2. Parallel, Elder, Brother
3. Cross, Elder, Sister
4. Parallel, Elder, Sister
5. Cross, Younger, Brother
6. Parallel, Younger, Brother
7. Cross, Younger, Sister
8. Parallel, Younger, Sister

One sibling term subsumes all of the contrasts; two sibling terms partition these eight kin types in 27 ways; three sibling terms partition them in 966 ways; on through a logically possible 4,140 partitions. The majority of the logically possible terms are disjunctive; 146 are conjunctive. In addition to confirming the rarity of empirically occurring disjunctive sibling categories, Nerlove and Romney further predict that of the 146 conjunctive sibling categories, only 12 types will actually occur with any frequency—a prediction subsequently confirmed, in large part, in Murdock's (1967c) sample of 800 societies (Hage 1997).

In their combinatorial analysis of sibling terms, Nerlove and Romney (1967) reduce the logically possible conjunctive terms to twelve ideal types, based on one of Greenberg's marking hypotheses. Marking, or markedness, refers to a hierarchical relationship between values within the same level of contrast, in which the unmarked term of an opposition is more general and simpler than the marked term. In addition, the presence of a marked term implies the presence of the unmarked term, but not necessarily conversely. Trubetzkoy (1929, 1975) discovered marking effects in phonology, which Jakobson (1932) subsequently generalized to grammar. Greenberg then applied marking to kinship terminologies as part of his demonstration that marking effects are found at every level of language: phonological, grammatical, and lexical (Kronenfeld 1996, this volume).

Greenberg proposed ten criteria of markedness, five of which are applicable to kinship terminologies (Hage 1999a, 2001a):

1. *Universal implicational statement*. The presence of the marked term implies the presence of the unmarked term, but not necessarily the converse. For example, the presence of cross distinctions in cousin terms implies the presence of cross distinctions in uncle terms (D'Andrade 1971).

2. *Zero expression in the unmarked term*. The marked term is overtly indicated. For example, in English kin terminology the unmarked term *parent* is not overtly indicated, while the marked term *grandparent* is. Similarly in English, the consanguineal relation "father" is unmarked, whereas the affinal relation "father-in-law" is marked. In Chinese kin terms, affixes indicate marked terms and distinguish affinal vs. consanguineal, collateral vs. lineal, and nonpatrilineal vs. patrilineal relations (Lin 1986).

3. *Par excellence expression*. The unmarked term may represent the opposite of the marked term, the entire category, or both. For example, in Fijian the term for "younger parallel sibling" also means "sibling" generally, regardless of sex or age (Hage 2001a).

4. *Syncretization*. When categories intersect, the distinctions in the unmarked category are absent or neutralized in the marked category. Nerlove and Romney (1967) used this criterion in their sibling terminology analysis. For example, sex distinctions in English are present in sibling terms, but absent or neutralized in cousin terms. In Malay, sibling distinctions for sex and relative age are neutralized in cousin terms. Thus the terms for older brother (*abang*), older sister (*kakak*), and younger sibling of either sex (*adik*) "are all obliterated in the single [cousin] term *sa-pupu*" (Greenberg 1966, 75)

5. *Defectivation*. Certain categories in the unmarked term are absent in the marked term. In English there are terms for "brother-in-law" and "sister-in-law" but not for "cousin-in-law."

Based on a large database of kin terms from a variety of languages, Greenberg ([1980] 1990, 318) additionally suggests that "lineal is unmarked as against collateral, consanguineal is unmarked as against affinal, male is unmarked as against female in regard to sex of referent, older is unmarked in relation to younger." He goes on to note that "In general, the closer a generation is to ego, the more unmarked it is."

Greenberg intended each of these marking statements as hypotheses to be tested against contemporary kinship terminologies and against reconstructions of protokinship terminologies. For some categories, it may be impossible to find universal marking relations. Citing Lounsbury's ([1964] 1968) study of Iroquois, Greenberg (1966) notes, for instance, that "it may well be that neither male nor female can be described as the unmarked category on a universal basis," a prediction confirmed by Hage and Harary (1996). Nevertheless, the "master principle" of marked and unmarked categories provides an approach to analyzing kin terms analogous to analyzing marked and unmarked relations in phonology and grammar. The approach is deductive and comprehensive, and "leads to a general understanding of kinship terminologies as hierarchically ordered systems" (Hage 1999c, 424; see also Jones, this volume).

In his various papers on the evolution of kin terms, Hage demonstrates that Greenberg's theory can be interpreted diachronically and used to infer characteristics of prehistoric kinship systems. The universal implicational statement suggests that as kin terminologies change, marked terms are added last or lost first. The method to test this idea is straightforward. It consists of comparing cognate kin terms from different languages within the same language family—a method familiar in historical linguistics—and then inferring, based on marking effects, the direction of terminological change. I will provide two brief examples.

Figure 2.2 shows a semilattice model of the evolution of Salish terms for parents' siblings.[14] This model is based on Elmendorf's (1961) study of kinship terminologies for uncles, aunts, nephews, nieces, grandparents, and grandchildren in fourteen Salish languages, spoken in the Pacific Northwest of North America. Cognate terms for parents' siblings are shown; blank spaces indicate terms unique to particular languages. Elmendorf argued that Proto-Salish terminology was similar to Spokane, which had the most complex system, and is shown here as representative of the original system. The evolutionary trend is toward simplification. The first distinction to disappear is sex of speaker, represented in the model as man speaking ♂ and women speaking ♀. Next, the distinction in aunt or both aunt and uncle terms disappears. Finally, sexual distinctions are lost, leaving a single term for all parents' siblings.

Hage analyzes marking effects on Salish terminologies for siblings, first ascending generation male consanguines, grandparents, and parents' siblings. In this way the structure of Salish kin terms across fourteen languages becomes evident; the mechanism of change based on marking effects becomes evident as well. When combined with analyses of other language families, it is

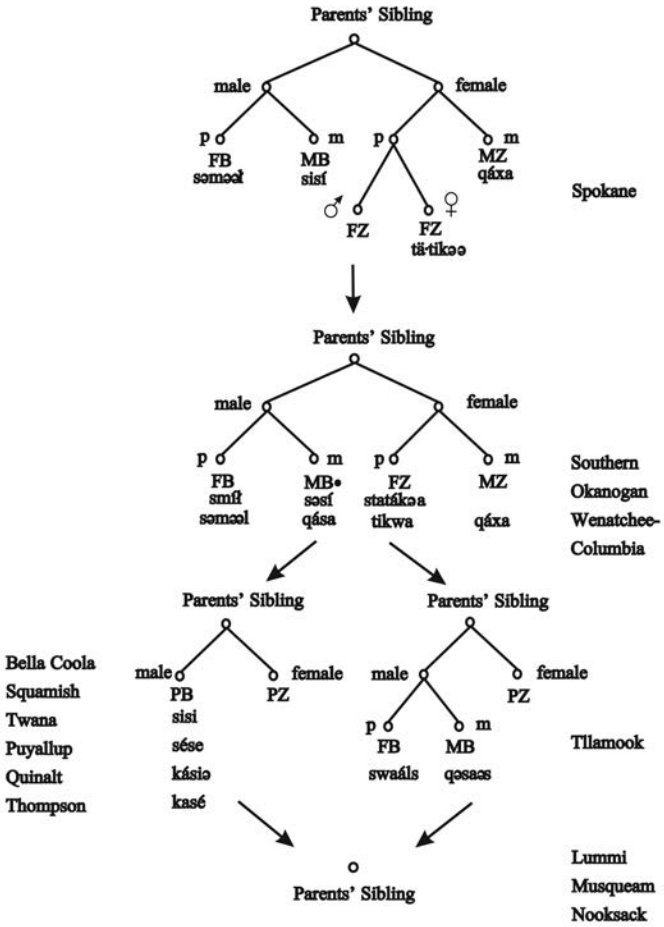


FIGURE 2.2. Evolution of Salish parent's sibling terminology (after Hage 1999).

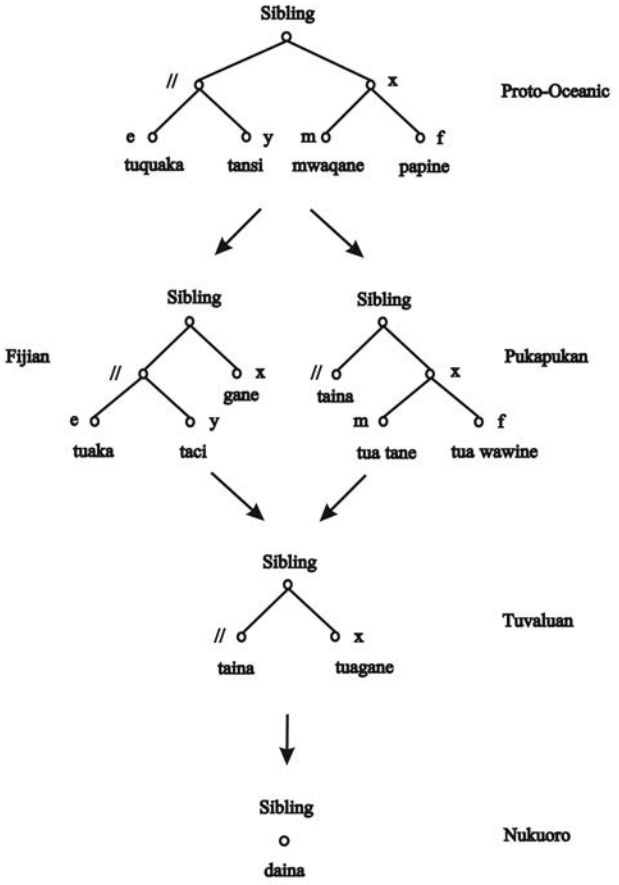


FIGURE 2.3. Evolution of Oceanic sibling terminologies (after Hage 2001).

increasingly clear that kin terms evolve in a predictable direction, with various forms of the marked categories becoming lost first.

The second example concerns the evolution of Proto-Oceanic sibling terms. Among kinship systems, the seniority (or relative age) distinction, when present, is not consistently marked. In Proto-Oceanic society, with a probable rule of primogeniture, the term for "elder sibling" was marked, indicating the position of heir among siblings and also relative rank (Hage 1999b). If the term for "elder sibling" was marked, then, predictably, it should be lost before any unmarked term for younger sibling. This pattern obtains among the related languages Pukapukan, Fijian, Tuvaluan, and Nukuoro, as shown in the semilattice model in Figure 2.3. Remarking on this model, Hage (2001b, 205) notes, "In the evolution of Oceanic sibling terminologies, when the seniority distinction is neutralized (lost) the term for younger parallel sibling invariably replaces the term for elder parallel sibling and stands for parallel sibling, and ultimately sibling in general." In Figure 2.3 the cognate terms for younger sibling are *tansi*, *taci*, *taina*, and *daina*.

Hage's first objective was to show that similar patterns of terminological change—based on the avoidance of disjunctive categories, marking effects, and the semantic fragmentation of terminologies over time—appear in all of the world's major language families. Because the order of kin term disappearance is predictable relative to particular languages, the basic type of protokinship system can be reconstructed from a small set of remaining diagnostic terms within those languages. For example, the presence of a term for "mother's brother" is sufficient to establish that a protosystem was most likely unilineal (Hage 1998). Historical linguistics and comparative ethnography are central to this effort.

Hage's second objective was to test N. J. Allen's (1986, 1989a, 1989b, 1998a, 1998b, 2000) tetradic theory of kinship. Allen's theory posits that all kinship systems origi-

nated from an elementary system organized by bilateral cross-cousin marriage,[15] exogamous descent moieties, and endogamous generation moieties. Tetradic systems distinguish only even generations (+2/0/−2) and odd generations (+1/−1), and are characterized by three types of kin term equations:

1. *Alternate generation equations* merge particular relations from one even generation with particular relations from another even generation, with odd generations similarly organized. For example, the term for parent's parent is the same as the term for child's child, merging +2 and −2 generations; the term for mother's brother is the same as the term for a man's sister's child, merging +1 and −1 generations.

2. *Prescriptive marriage equations*, consistent with a rule of cross-cousin marriage, merge affines and cognates, affines and affines, and cognates and cognates. For example, the term for mother's brother is the same as the term for spouse's father; the term for mother's brother's wife is the same as the term for wife's mother; and the term for mother's brother is the same as the term for father's father's sister's son.

3. *Classificatory equations* merge same-sex siblings. For example, the term for father is the same term for father's brother, and the term for brother is the same as the term for father's brother's son.

From this basic hypothetical system, it is possible to derive Dravidianate, classificatory, and cognatic kinship systems, based on the ordered disappearance of particular kin equations. Dravidianate systems have lost alternate generation equations; classificatory systems have lost alternate generation and prescriptive equations; and cognatic systems have lost alternate generation, prescriptive, and classificatory equations. Hage's work, including his analysis of Proto–Central Amerind (this volume), supports the importance of tetradic theory in kinship analyses, which proposes the ordered sequence, but also the multidirectionality, of change.[16]

Hage's third general objective was to reintegrate the disciplines of cultural anthropology, historical linguistics, archaeology, and genetics in the study of kinship systems worldwide. His paper with Jeff Marck (2003) contributes to this reintegration. Hage and Marck (2003, 123) define "Proto-Oceanic society" as that which "can be reconstructed, linguistically, about the social vocabulary of Proto-Oceanic-speakers and what we infer from that about their society." Historical linguistics provides methods for terminological reconstruction. Comparative ethnography provides the data to make inferences about social organization from reconstructed kin terms. Archaeology and historical linguistics provide the basic framework of the dispersal of Austronesian speakers, whose 450 or so languages most likely originated on Taiwan.[17] The expansion of Austronesian speakers began in Southeast Asia about 3000 BC and reached Melanesia by about 1450 BC, and the outer islands of Polynesia by about 950 BC. They moved through and interacted with indigenous non-Austronesian (Papuan) populations that had inhabited Near Oceania for close to 40,000 years, or perhaps considerably longer (Kirch 2000). Proto-Oceanic society was based on extensive exchange networks that required extremely skilled seafarers who embarked on frequent open-ocean voyages.

Linguists and archaeologists, working from very different data sets, have demonstrated that Austronesian speakers dispersed fairly rapidly throughout Polynesia (e.g., Blust 1995, Irwin 1992, Pawley and Ross 1993, Kirch 1997, 2000). The pattern of DNA distribution resulting from that dispersal is becoming clearer. Geneticists have shown that contemporary Polynesian populations have three haplotypes (lineages) of maternally transmitted mitochondrial DNA (mtDNA). The most common of these haplotypes has a 9-base-pair intergenic deletion shared generally with Asian populations and accounts for 90–95 percent of Polynesian mtDNA (Melton et al. 1995, Skyes et al. 1995). Geneticists have also discovered three haplotypes of paternally transmitted Polynesian Y chromosomes. The most common of these, the DYS 390.3 del/RPS4Y711T haplotype, originated in Melanesia about 11,500 years ago, well before the expansion of Austronesian speakers; it is not found in Asian or Southeast Asian populations (Kayser et al. 2000, Underhill et al. 2001). The dominant mtDNA haplotype of Asian origin is associated with Austronesian speakers; the dominant Y chromosome haplotype of Melanesian origin is associated with Papuan speakers. Having discovered the relative proportions of mtDNA and Y chromosomes in Polynesian populations, geneticists have been unable to explain the pattern.

Hage and Marck (2003) argue that matrilocal residence and matrilineal descent in Proto-Oceanic society account for the significant presence of Y chromosomes from Melanesia in the context of mitochondrial DNA from Asia. As they point out, if the Austronesian ancestors of contemporary Polynesian populations were patrilineal, "one would expect to find Polynesian Y chromosomes of predominantly Asian origin and mtDNA of mixed Asian

and Melanesian non-Austronesian origin, the frequency of the latter depending on the frequency with which Austronesian speaking men married indigenous non-Austronesian speaking women"; however, in Polynesia the clearly dominant Asian mtDNA and the significant frequency of Melanesian Y chromosomes "imply the presence of matrilocal residence and matrilineal descent in Proto-Oceanic society" (Hage and Marck 2003).

Linguistic evidence supporting matrilineal descent in Proto-Oceanic society comes from the reconstruction of Proto-Oceanic kinship terminology (Hage 1998, Marck 2008, Marck et al., this volume). This terminology was bifurcate merging, with one term, *tama*, for "father" and "father's brother," and a separate term, *matuqa*, for "mother's brother." Bifurcate merging terminologies are characteristic of unilineal (matrilineal or patrilineal) descent and unilocal residence, associated with the former 85 percent of the time, and with the latter 91 percent of the time (Hage 1999d).

Matrilineal descent, matrilocal residence, and long-distance voyaging were all related aspects of the colonization of Polynesia, probably additionally motivated by the practice of primogeniture. In this context, open-ocean colonizing expeditions may have been conducted by junior brothers who were precluded from inheriting rights to ancestral resources and consequently sought their own islands to inhabit. These expeditions no doubt included women, since the intention was colonization (Hage 1999b, 1999d; Hage and Marck 2002, 2003; Kirch 1997).

After colonization, matrilineal descent and matrilocal residence persisted in many areas under conditions of prolonged male absence for trade, warfare, or resource procurement (for comparative examples see Harris 1980, 1985; Hage and Marck, this volume; and Marck and Bostoen, this volume). Under these conditions, men who leave their social group for extended periods of time must rely on their lineage sisters to preserve and manage their common interests. Matrilineal descent and matrilocal residence, however, transform or disappear under conditions of relative social isolation because of the inherent instability of matrilineal institutions (Lévi-Strauss 1984).

Although no longer universal in Polynesian societies, matrilineal descent and matricentric institutions remain common features. Double descent is also common and probably indicates a shift from matrilineal to patrilineal orientations, but not the other way around (R. Fox 1983). In isolated atolls of the eastern Carolines, Marshalls, and other places where long-distance voyaging declined, patrilineal, double, or cognatic descent supplanted matrilineal descent. In some Proto-Oceanic daughter societies, bifurcate merging terminologies gave way to generational terminologies, and matrilocality gave way to avunculocality. These patterns are predictable given a starting point of matrilineality and matrilocality.

Hage argued that the demonstration of probable paths of evolutionary change in kinship systems throughout the world provides the means to make plausible reconstructions of early human social organization. This task requires the coordinated efforts of linguists, archaeologists, cultural anthropologists, and geneticists. The time depth to such reconstructions is open to debate, but surely the reconstructions can reach a time depth of 10,000 to 15,000 years, limited by the ability of historical linguists to piece together the traces of protolanguages from contemporary and historically known languages (Ehret, this volume; Ruhlen 1994). With certain kinship terms—*papa*, *tata*, *mama*, *nana*, and *kaka*—which have worldwide distribution, the time depth may be considerably greater, perhaps more than 40,000 years, as demonstrated by Matthey de l'Etang et al. and Bancel et al. (this volume). The project is worth pursuing for what it may tell us about kinship and social organization, and their evolutionary modifications through time.

In his afterword to the volume *Transformations of Kinship*, Maurice Godelier makes similar observations. He notes that so-called Eskimo terminology is found in Borneo, New Guinea, and North America, and emerged historically in Europe, and that this terminology has no obvious relation to any given mode of production or to any particular religious system. Given its apparently random geographic distribution, and the fact that Eskimo terminology has no correlation with other, dominant social factors, Godelier ask the general question: "how, then, are we to treat changes in kinship terminologies and systems?" Moreover, "Where are we to look for the reasons for these changes?" He goes on to say:

> Are the observed transformations erratic, contingent, without fixed direction, or do they follow a certain line with no going back—broadly speaking, are they irreversible? If this is the case . . . then terminologies not only change, they evolve. Now the cat is out of the bag. Not only do terminologies disappear or change in the sense of yielding to others, but those that replace them are not and cannot be just any terminology. If this were to be confirmed, kinship ter-

> minologies could be said to succeed each other along certain possible lines of evolution, laid out by the action of a few transformation rules. Furthermore, these transformations would be such that the new forms of terminology replacing the old ones would deviate ever further in structure from the starting point; the movement would be characterized by a tendency, a drift that never returns to the starting point. (Godelier 1998, 392)

Per Hage's research, following the pioneering work of Joseph Greenberg, demonstrates that the rules of terminological transformation are based on an avoidance of disjunctive categories and the effects of marking. The task for future research is to confirm these rules in diverse languages and language families. A number of intriguing questions are left for further investigation. Given the apparently limited number of evolutionary pathways open to terminological change, what were the local historically and culturally contingent motives for such changes? In contexts of rapid social changes, how resistant, or how accommodating, are kin terms to such changes? Are there terminologies that have great time depth with few if any changes? The disappearance of particular kin terms typically lags behind other changes in social organization. Does this lag time have a measurable and consistent pattern? What are the relationships, if any, between changes in kin terms and evolutionary shifts from elementary to complex systems (McConvell and Keen, this volume; R. Fox, 1994)? Are kinship terminologies primarily founded on genealogical relations (Shapiro, this volume), or do kinship terminologies follow other logics quite apart from such relations (Bennardo and Read, this volume; Read, this volume)?

It may be difficult to trace with any precision the historical timing, motivation, and social consequences of changes in proto–kin terms. But, as Hage argues, with a world-historical focus on the evolution of kin terms, tools from allied disciplines—history, archaeology, genetics, comparative ethnography—can be applied to the basic data in an attempt to better understand the relationships between kinship structures, as they evolve along particular pathways, and contingent historical events.[18] These relationships are particularly interesting in kinship terminologies, the most basic and persistent of all systems of classification.

A Concl usion

Per Hage's work—which spans close to forty years and covers a tremendous diversity of topics—is filled with references to prior generations of anthropologists. He felt compelled to read everything he could find on the topics of his research—in English, French, and German. He was well aware that the intellectual history of anthropology becomes lost when students are not encouraged to read what their predecessors had to say. Producing what comes after, they may not know what came before. It is easy to assume that prior generations of anthropologists were wrong if you do not bother to read what they wrote. In a response to a criticism of his analysis of the Polynesian conical clan, Hage was quite blunt on this point. He rightly noted that ignoring the accumulated ethnographic record does not promote the intellectual health of the discipline or provide the context for the advancement of anthropological knowledge. Under circumstances of disciplinary amnesia, elevating contemporary fieldwork to the status of final arbiter of the discipline appears to have hastened the fragmentation of anthropology, undermined the value of comparative research, and kept work focused not on the grander themes of cultural process and structure, but rather on the themes that are of the moment—themes that briefly capture attention, such as those falling under the categories of poststructuralism, deconstruction, postcolonialism, and their more recent consanguines and affines—but which then disappear beneath the waves and into the murky ocean of historical contingency that Lévi-Strauss spoke of.

By contrast, I think of Hage's, and Hage and Harary's, work as an island of analytical clarity—a conclusion, of sorts, to the life of mind of these two distinguished scholars, but also an encouragement that cumulative understanding is possible in a field whose subject matter is continually changing. Let the punishment fit the crime.

Notes

The initial version of this paper was prepared for the 105th annual meeting of the American Anthropological Association, San Jose, California, November 14–18, 2006. Session title: Kinship and Language: Per Hage (1935–2004) Memorial Session. A later version appeared in *Mathematical Anthropology and Cultural Theory*, Vol. 2, No. 3 (2008).

1. Although this chapter focuses on Hage's and Hage and Harary's work in anthropology, I should also mention Harary's accomplishments in mathematics and the applications of mathematics in diverse fields. He authored and coauthored more than 700 papers and eight books, edited ten books, and founded two influential journals (*Journal of Combinatorial Theory* and *Journal of Graph Theory*). He lectured all over the world. In recognition of his mathematical contributions, Harary received five honorary doctorates.
2. "…not only Sophocles but Freud himself, should be included among the recorded versions of the Oedipus myth on par with earlier or seemingly more 'authentic' versions" (Lévi-Strauss 1963b).
3. As Hage and Harary (1983a, 68) note in their analysis of Arapesh sexual symbolism, "Mathematical models are used in this paper not because of any wish to mathematize culture but because there are ethnographic advantages for doing so. The general advantage of group models, in contrast to thematic or typological models, is that they preserve and exploit the richness of the data rather than obliterating it through generalizations." They also suggest that "Mathematics is simplifying, but in a sense far different from that imagined by its critics." Tjon Sie Fat (1998, 59) makes a similar point in his analysis of Dravidian and Iroquois kin classifications: "Mathematics is about structure. It is effective because it captures the abstract form underlying the many apparently dissimilar patterns exhibited in the physical or social world."
4. *Exchange in Oceania* actually appeared considerably later than its date of completion. The first academic press to accept it for publication badly bungled the mathematical notation in the proofs, rendering the mathematics incomprehensible. Hage was forced to withdraw the book and start the publication process anew with Oxford University Press.
5. For an application, see Jenkins 2001a.
6. See Bernard Chapais 2008 for a discussion of the importance of Lévi-Strauss's "atom of kinship" in the evolution of human sociability, and Milicic (this volume) for an extension of Chapais's arguments to a discussion of the acquisition of kin terms in childhood.
7. For a graph G with p nodes and q edges, each of the following equivalent properties can define a tree (Harary 1969): (1) G is connected and acyclic. (2) G is connected, and $p = q + 1$. (3) G is acyclic, and if any two nonadjacent nodes of G are joined by an edge e, then $G + e$ has exactly one cycle. (4) Every two nodes of G are joined by a unique path. (5) G is connected, but loses this property if any edge e is deleted.
8. The Inka also had a similar structure, based not on primogeniture or ultimogeniture but on a primary son/secondary son contrast (Jenkins 2001b).
9. Marshall Sahlins makes a similar point about the decline of interest in kinship systems in his 1998 Huxley Lecture, in which he remarks apropos Leslie White's notion of the primacy of culture: "How would an ape be able to apply, let alone devise, a marriage rule that proscribes parallel cousins and enjoins unions with classificatory cross cousins?" He goes on to say, parenthetically, "In all fairness, current anthropology graduate students in America cannot do that either" (Sahlins 1998, 400).
10. Notable exceptions include Nerlove and Romney 1967 and Kronenfeld 1974, 1996.
11. Hage had applied for an NSF grant to support the writing of *Structural Models in Anthropology*. The consensus among the reviewers was that the project was too ambitious and could not be completed. I suspect that had Hage not received NSF support for his kin terminology project, it would not have mattered: he would have done it anyway.
12. Murdock's typology of six cousin categories is based on the classification of siblings, parallel cousins, and cross cousins, and on whether the patrilateral or matrilateral cross cousin is raised a generation. The latter characteristic differentiates Crow, Omaha, and Iroquois systems.
13. In a letter to Hage dated January 12, 1998, Lévi-Strauss remarks on Hage's "Unthinkable Categories" paper:

    > I agree that Françoise Héritier's "fundamental laws" are far from convincing. The "unthinkable" terminology would be quite congruent with a system wherein a man may marry either his elder or his younger sister but not the other one. Thus from ego's point of view the same term will apply to both the mother and the marriageable FZ while a special term will be needed for the MZ who is at the same time the nonmarriageable FZ. There are instances of such rules in the literature. However as this type of incestuous marriage would be the privilege of a small minority, no kinship terminology fitted for the use of the general population could possibly reflect it.

14. "Mathematically a *lattice* may be defined in a formal axiomatic manner as a *partially ordered set of elements (nodes) in which every two nodes have a least upper bound* (LUB) *and a greatest lower bound* (GLB).… [W]e may say that a *semilattice* is a *'partially ordered set' of nodes in which every two nodes have an* LUB. We should point out that the presence of a GLB is deliberately excluded from this definition. It therefore follows that every lattice is a semilattice but not vice versa. In this sense, a semilattice is a more general mathematical structure than a lattice. Every rooted tree…is likewise a semilattice, but the converse is not true" (Hage and Harary 1996, 251).
15. Allen (pers. comm.) points out that he avoids "saying that a tetradic society is 'organized by bilateral cross-cousin marriage' because the prescribed category contains members of all even-numbered generations, so not only cousins. English does not have an obvious phrase for this category." The discussion should be read with this qualification. See also Allen et al. 2008.
16. Read (this volume) finds Allen's tetradic theory unpersuasive and proposes an alternative view based on an algebraic analysis of ethnographically attested kin terms.

17. Austronesian languages number over 1,000. Of these, about 450 are spoken by indigenous peoples of Oceania (Pawley and Ross 1993).
18. Lévi-Strauss's (1969b, 8) observations about myth, and his challenge to history, come to mind: "…by demonstrating that myths from widely divergent sources can be seen objectively as a set, it presents history with a problem and invites it to set about finding a solution." He says further that "I have defined such a set, and I hope I have supplied proof of its being a set. It is the business of ethnographers, historians, and archeologists to explain how and why it exists." In many ways, the evidence from historical linguistics concerning sets of kin terms is stronger than the evidence concerning sets of myths. In both cases, however, the historical problems are similar, and the solutions require the coordinated efforts of cultural anthropologists, linguists, archaeologists, historians, and geneticists.

Part I

Kinship and Prehistory

3

Back to Proto-Sapiens (Part 1)

the Inherited Kinship terms *Papa*, *Mama* and *Kaka*

Alain Matthey de l'Etang, Pierre Bancel, and Merritt Ruhlen

The fact that nursery kinship terms such as *mama* and *papa* are very common worldwide (Map 3.1) was recognized during the second half of the nineteenth century (Buschmann 1852, 391; Lubbock [1870] 1889, 284–88). The reason why these terms were so widespread, these authors thought, was because they were "formed from the easiest sounds a child can produce" (Westermarck 1891, 86).

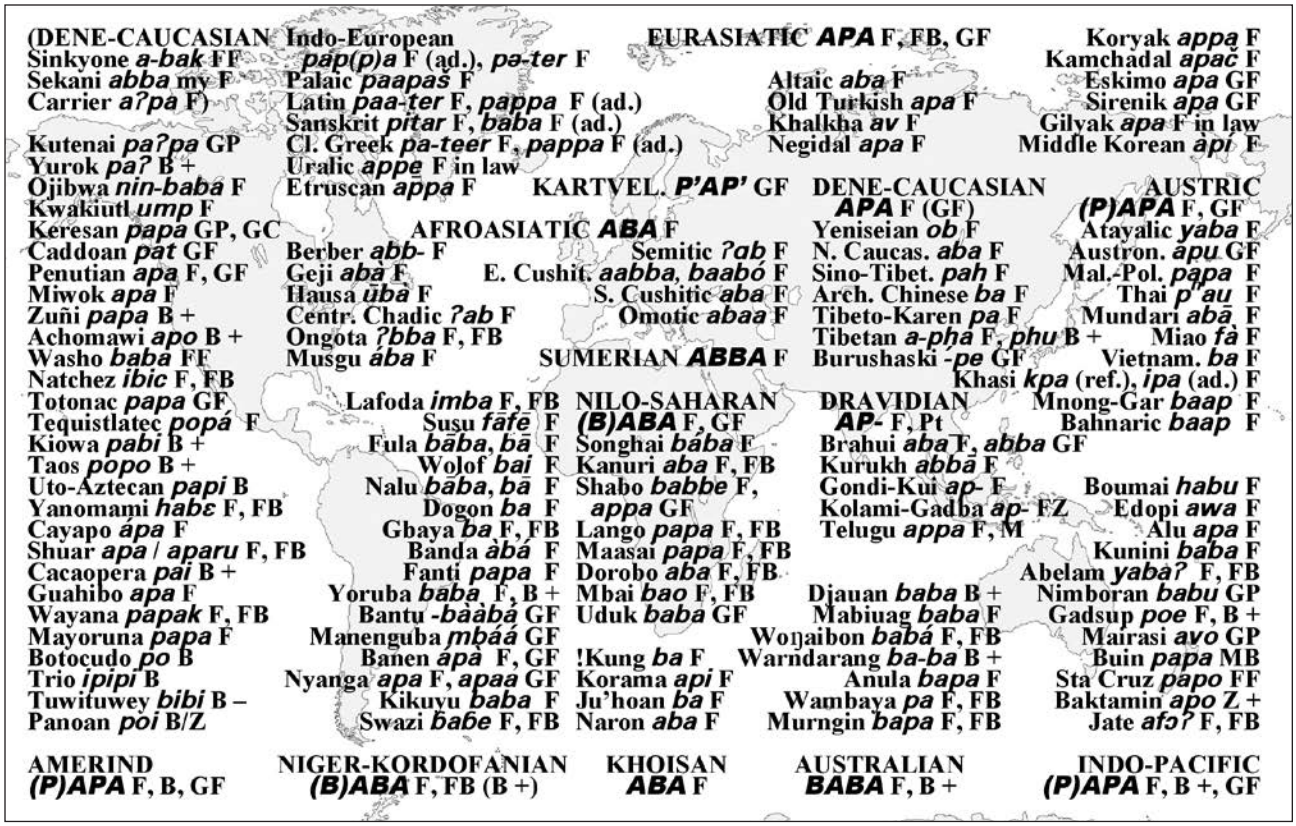
In the mid-twentieth century, Murdock (1957, 1959b) tackled this problem once again, taking a more substantial approach to this amazing universal distribution. On the one hand, he stated that nursery terms are subject to morphological and phonetic change, historical processes that can make them difficult for children to pronounce. As a consequence of these processes, newly coined nursery terms would tend to appear in historically unrelated languages. On the other hand, after having scanned words meaning "father" and "mother" from 565 societies, Murdock confirmed beyond any doubt that *papa* or *tata* forms meant "father" in most cases, while *mama* and *nana* forms mostly meant "mother." But the explanation for these universal semantic trends he left to people of "greater [linguistic] competence."

It was Roman Jakobson who took up the challenge. In his famous article "Why *Mama* and *Papa*?" ([1960] 1971), he explained the near ubiquity of *mama* and *papa* words in terms of sound symbolism and of convergent innovations resulting from infant-parent interaction in the first stages of language acquisition. More precisely, *mama* and *nana* words would stem from the nasal murmur (*mmm… mmm…*) of suckling babies. Babies, as it appears, would build some kind of Pavlovian association between their own nasal sounds and the mother and food. In languages where phonetic and morphological change had made the inherited words difficult to pronounce for babies, this (*mmm…* + "mother/food") association would result in new *mama* and *nana* words meaning "mother" spontaneously arising to replace ancient words. It would explain why such words are found in languages and language families which Murdock (1959b, 1) axiomatically took as unrelated.

The link between *papa* and *tata* words and the meaning "father" was left unexplained by Murdock and Jakobson, but the linguistic community did not find it a problem worth further examination and considered Murdock's and Jakobson's explanations the ultimate truth about the origin of kinship appellatives.

The first to challenge the Murdock-Jakobson doctrine was Ruhlen (1994, 122–24). He had discovered another globally distributed kinship appellative, *kaka* 'brother, uncle,' which had escaped the attention of linguists and anthropologists before him for more than a century after the ubiquity of *papa*, *tata*, *mama*, and *nana* words had become recognized. Obviously, this kinship term cannot be explained by any onomatopoeic motivation linking the velar consonant *k* to brothers and uncles. Hence, the *kaka* words that Ruhlen identified in numerous languages and language families from Asia, Oceania, and the Americas could not have resulted from the convergent spontaneous coining of similar words by independent languages. Rather, these words must have been inherited from a common ancestral Proto-Sapiens language. If so, Ruhlen went on, how could it be that *papa* and *mama* words were not also inherited? And he aptly concluded that Murdock and Jakobson's analysis, however smart and appealing, was certainly "exaggerated, if not completely mistaken" (Ruhlen 1994, 124).

The importance of Ruhlen's discovery led us to begin gathering vernacular kinship terms used worldwide. We



MAP 3.1. The global distribution of *papa* words. Sample data. Languages are grouped in phyla arranged in columns according to their approximate location on the planisphere in the background. Phylum names (e.g. DENE-CAUCASIAN) appear in capitals above or below each column, followed by the most likely original form and the kinship positions it most likely referred to; in each row, the language name (e.g., Zuñi) is followed by the vernacular word in italics (e.g., *páppa*), then by the abbreviated main meaning of the word (F (father), M (mother), etc.). For reasons of space, important secondary meanings of some words had to be omitted.

first enlarged the etymological basis of his *kaka* series to numerous other language families of the Americas (for Central Amerind, see Hage, this volume; for Quechua, see Milicic, this volume), Africa (for Nilo-Saharan, see Ehret, this volume), Eurasia and Oceania, and established that its most widely represented meanings were MB, EF, PF, and (e)B (Bancel and Matthey de l'Etang 2002, Matthey de l'Etang and Bancel 2002; Map 3.2).

Pursuing Ruhlen's line of reasoning, we will show here, through the systematic comparison of nursery kinship terms in our database (now including more than 2,000 languages), that these words are not being reinvented all the time. To the contrary, they are—even more than most other words—steadfastly transmitted from generation to generation in every language community (Matthey de l'Etang and Bancel 2005, 2008). Nor was a single case of innovation documented in the literature about language acquisition by children (Bancel and Matthey de l'Etang 2005). Rather, the few studies dedicated to these words show that parents teach them to the babies (Locke 1990). In Chapter 4 (Bancel, Matthey de l'Etang, and Bengtson, this volume), we conclude that the explanation by convergent innovations cannot be maintained, and that the worldwide distribution of nursery kinship terms with consistent and mutually exclusive meanings points to a common origin.

Undocumented Innovations

In the late 1950s, the study of language acquisition was in its infancy and few observations had been published. Murdock (1959b, 1) could thus legitimately hypothesize that *papa* ~ *tata* and *mama* ~ *nana* forms indicate that the replacement of "standard parental terms [having] become phonetically and morphologically modified in consequence of the normal process of linguistic change, [and having thus become] difficult for very young children to pronounce. Under such circumstances, simpler nursery forms tend to appear—carved, so to speak, out of infant babblings under parental encouragement."

Fifty years later, numerous studies have been pub-

MAP 3.2. The global distribution of *kaka* words. Sample data.

lished dealing with the early stages of child language acquisition, including cross-linguistic ones. In this literature, we have not found a single case of such a spontaneously "carved" term passing into general use. Rather, studies confirm that in every language community the particular meaning and phonetic shape of these words are transmitted by elders to the babies (Jakobson 1960, Locke 1990, Brigaudiot and Danon-Boileau 2002). As Jakobson (1960, 27) himself stated about *mama* words, "children, being prompted and instigated by the extant nursery words, gradually turn the nasal interjection into a parental term and adapt its expressive make-up to their regular phonemic pattern."

Behind his elliptic phrasing of "extant nursery words," Jakobson means that children learn the *mama*-like words from the adults around them, which makes these words no innovations at all, but a legacy transmitted from generation to generation—just like other inherited words.

Finally, a particularity in the order of word acquisition by children goes against the theory of the spontaneous invention of kinship appellatives. We have already quoted Locke (1983, 1) mentioning that the very first word of a child is "more often than not…*papa*," a fact which Jakobson (1960, 27) had already called attention to. Indeed, rather than being the exact phonetic form [papa], Locke may have meant that this first word is built from an oral rather than nasal anterior stop consonant. Locke (1990) confirmed this assumption in a subsequent study of the acquisition of parental appellatives. There he mentions several earlier studies, showing a very high preference of children for oral rather than nasal stops in babbling as well as in first words (Bateman 1917, Irwin 1947, Leopold 1948, Fisichelli 1950, Pierce and Hanna 1974). For instance, Fisichelli (1950) found that dental oral stops (as in *dada*) exceed bilabial nasals (as in *mama*) by 30 to 1, and bilabial oral stops (as in *papa*) exceed bilabial nasals by 5 to 1 in children's babbling.

As a consequence of this phonetic preference of babies for anterior oral stops, *papa*, *baba*, *tata*, or *dada* are more frequent than *nana* or *mama* as a baby's first word—just as the oral consonants *p*, *b*, *t*, *d* are far more frequent than nasals *n*, *m* in the earlier babbling. Since *papa*, *baba*, *tata*, and *dada* words with oral consonants are overwhelmingly paternal—rather than maternal—terms, the result is that the first word of a child is more often than not the father's appellative. Children who are one year old—the average age when they utter their first word—generally spend much more time with their mothers than

with their fathers, and the mother is usually responsible for the child's well-being. (This is still true today, but was much more so—and lasted much longer—in the preindustrial contexts in which most languages evolved.) Calling their mother is much more useful for children than calling their father.

Given the strong phonetic constraint on children to begin speaking using *papa* or *dada* rather than *mama* or *nana*, if worn-out ancient words were spontaneously replaced by words newly coined by babies, we would expect languages of the world to display more *papa* and *dada* words meaning "mother" than "father" because of the greater importance of the mother than the father for a baby. Since *papa* and *dada* words meaning "father" are much more numerous than those meaning "mother," they must not result from a spontaneous invention by babies and their parents, but rather from parental teaching of existing standard words, as Jakobson indirectly acknowledged.

Furthermore, as Locke (1990, 271) explicitly states, "parents interpret . . . *mommy*- and *daddy*-like forms to mean 'mother' and 'father.' And it reinforces the possibility that *daddy* and other 'baby words' may spring not so much from a desire to mean as from a spontaneous disposition to utter sound patterns which happen to resemble—to the hopeful parents—accepted units of reference [i.e., *standard words of their language*]. Parental repetition of these 'resemblances' encourages infants to discover word forms and to associate sound and meaning." Here we are: children always start speaking using the same, easiest sound sequences, in both their early babbling and first words. As soon as they master these sequences—that is, *papa*, *baba*, *tata*, *dada*, *mama*, *nana*—parents pick from these sound sequences those which resemble (or are identical to) kinship appellatives in their own language and reinforce them by different means (repeating the proper form in their language, pointing the index finger toward the parent referred to by the word, and so on) in order to teach the child to associate a meaning to a fixed sound sequence in their maternal language for the first time—and also teaching her, indeed, the principle of symbolic representation.

But there is more to this process. The fact that babies always start with the same sounds—because of mechanical constraints—does much for the phonetic stability of these words over time. A given phonetic change may modify the pronunciation of a kinship appellative. For instance, oral stops may evolve into the corresponding fricatives—a very common type of change, attested in various language families, through which *p* changes into *f*, *b* into *v*, *t* into *s*, and so on; however, the phonetic limitations of babies may often prevent the change from applying to the concerned appellative: babies must continue to utter first *papa*, *baba*, or *tata*, rather than *fafa*, *vava*, or *sasa*. Since a phonetic change typically takes a few decades, the adults would have learned these ancient canonical forms when they were babies themselves, and their babies continuously reactivate these forms while the phonetic change operates. As a result, a kinship nursery word, when liable to undergo an ongoing phonetic change, most of the time passes unchanged to the next generation.

Moreover, most phonetic changes are context-bound. For instance, it very often happens that unvoiced oral stops change to fricatives in word-initial or final position, but are preserved between vowels, so that *papa* should change to *fapa*, or *tata* to *sata*, and so on. In such cases, the reduplicative structure of these words, either total as in *pa-pa* and *ma-ma*, or partial as in *da-d* and *mu-m* or *a-ta* and *a-na*, also tends to interfere by preventing the change from applying to the appellatives in question. This preservative effect of reduplication is clearly seen in Latin *caca* 'pooh,' which passed intact into modern Romance languages (e.g., French *caca*), having irregularly escaped various regular (and drastic) phonetic changes. Conversely, its derivative *cacare* 'to pooh'—no more a reduplicative word but an ordinary word with two identical root consonants followed by a number of conjugational suffixes (*caco*, *cacemus*, *cacaverunt*, etc.)—was preserved in modern Romance languages but underwent regular sound changes in each language (e.g., Occitan or Spanish *cagar*). And its French descendant *chier* [šje] even lost any phonetic similitude with the original root *caca*, together with its childish semantic connotation: it does not mean "to pooh" anymore, but is a vulgar verb meaning "to shit."

Documented Millennial Preservation

Logically, the oral transmission of kinship appellatives has historical consequences: a careful examination of Trask's (2004) effort to document cases of innovated kinship nursery terms in different languages shows that none of his examples was a real innovation. On the contrary, most have been inherited from similar words in the concerned ancestral languages—which Trask incomprehensibly failed to discover in standard dictionaries (Matthey de l'Etang and Bancel 2008; Table 3.1).

TABLE 3.1. Alleged innovating kinship terms from various language families

	Ancient Situation			New Situation		
Factual Status	Term of Reference	Term of Reference or Address	Time Span	Term of Reference	Term of Reference or Address	Related Languages
Rumanian						
According to Trask	Classical Latin *mātĕr* M		2,000 y.	Derivative of Latin *mātĕr* M **lost**	mámă Mo, mum is **new**	Fr. *maman* mum Sp. *mama* 'mum' It. *mammà* 'mum'
In reality	*mātĕr* M	*mămma* mum			mámă is **inherited**	
According to Trask	Latin *pāter* F			Derivative of Latin *pāter* F **lost**	*tátă* Fa, dad is **new**	Ital. dial. *tatà* 'dad,' Catalan dial. *tata* 'dad'
In reality	*pāter* F	*tăta* dad			*tátă* is **inherited**	
Greek						
According to Trask	Classical Greek *máter* M		2,500 y.	*miteras* M **inherited**	*mama* mum is **new**	
In reality	*máter* M	*mámma* mum			*mama* is **inherited**	
According to Trask	Homeric Greek *páter* F		2,900 y.	*pateras* F **inherited**	*baba* dad is **new**	Modern Pontic Greek inherited *pápa* 'dad'
In reality	*páter* F	*páppa* dad			*baba* is a **Turkish borr.**	
Hindi–Bengali						
According to Trask	(Trask does not mention any ancient word.)		2,000 y.	*pita* F **inherited**	*bābā* dad, F is **new**	Dozens of other Indic languages have *bappa* ~ *bābā* F words.
In reality	Prakrit *pita* F	Prakrit *bappa* F			*bābā* is **inherited**	
Turkish						
According to Trask	Old Turkish *ata* F		1,200 y.	*ata* 'ancestor' **meaning shift**	*baba* F is **new**	Most Turkic languages preserve both *ata* and *apa* words
In reality	*ata* F	*apa* dad, Karakhanid *apa* F			*baba* is **borr. from Farsi**	
Welsh						
According to Trask	Welsh derivative of PIE *pater* Fa **lost**		1,200 y.	Derivative of PIE *pater* F **lost**	*tad* F, dad is **new**	Breton *tad*, Cornish *tat* 'F, dad' (Old Irish *data* *'foster F'*)
In reality	(**lost**)	Old Welsh *tat* F			*tad* is **inherited**	

Note: All of Larry Trask's (2004) examples of allegedly innovated kinship nursery terms are either very ancient words or notorious borrowings of an old word from another language. Each example is dealt with in two rows. First row ("According to Trask") presents the word as Trask himself does. In the first example, Trask asserts that Latin *mātĕr* 'mother' was lost in Rumanian and replaced (at some point within the 2,000 years separating Latin from Rumanian) by a new word, *mámă* 'mother, mum,' which he claims spontaneously arose from babies' babbling, as predicted by Murdock (1959). Second row ("In reality") describes the true status of Trask's allegedly new word. In the considered example, there existed in Latin not only a word *mātĕr* 'mother' but also a word *mămma* 'mum.' In the evolution from Latin to Rumanian, the descendant word of *mātĕr* 'mother' was lost, as Trask rightly claims; but the word that replaced it in Rumanian, *mámă* 'mother, mum,' rather than being new, as Trask wrongly claims, is obviously the preserved Latin word *mămma* 'mum,' whose use as an address term to one's own mother was extended to refer to any mother. This heavy trend to preservation, combined with parental transmission, explains why English babies learn *dad* and *mum*, while French babies learn *papa* and *maman*, Spanish babies *papá* and *mamá*, and so on. In and by itself, this apparently trivial fact forcefully testifies that kinship nursery terms, rather than being reinvented by every single generation—and as the spontaneous convergence theory would demand, by every single baby—are transmitted by elders with forms and meanings specific to each language.

For example, Italian *mammà* and Rumanian *mámă* 'mum,' are taken for new words by Trask, but both derive from Latin *mămma* 'mum' (Gaffiot [1934] 2001), also preserved in French *maman*, Occitan *mamà*, Spanish *mamá*, etc., over more than 2,000 years. Another of Trask's "new" words is Welsh *tad* 'father, dad,' which is attested in Old Welsh and Old Breton, and was preserved in all modern Brythonic languages (Breton, Welsh, and Cornish) over some 2,000 years as well. According to a specialist in Celtic (Charles-Edwards 2003, 169), the word goes back at least to the Romano-British period. And so on.

A few of Trask's examples, however, do not directly descend from their respective ancestral language—but they are not babies' innovations, either. Instead, they have been borrowed from other languages in particular historical circumstances. For instance, Modern Greek *baba* 'dad,' which replaced the Classical Greek word *páppa* 'dad' attested since Homeric times (2900 BP), is known to have been borrowed from Osmanli Turkish (Chantraine [1968] 2009, 825) during the Ottoman domination over Greece. The old Homeric form, however, remains to this day in the Pontic dialect of Greek (Fauvin and Nikaki, pers. comm.). It is also likely that English appellatives *dad* and *mum* have been borrowed from the corresponding Brythonic Celtic word *tat* and *mam*.

To be sure, a few cases exist of new formations—none of which was perceived by Trask, in his certitude that kin terms always should materialize from thin air. These new formations, indeed, have more palpable origins. Such is French *tata* 'auntie,' which reduplicates the initial part of *tante* 'aunt.' *Tante* derives from Latin *amita* 'paternal aunt,' regularly evolved into Old French *ante* 'aunt,' to which was prefixed a second-person feminine possessive *ta* 'thy' under its elided form *t'*, giving *t'ante*, hence *tante*.[1]

Such new formations are rooted in the particular language where they are found, and only reduplication is really a nursery feature. Of course, they do not obey the consonant distribution rule observed by Murdock: according to this rule, French *tata* 'auntie,' with its oral *t* consonant, would be expected to refer to the father, or at least to a male.[2]

Moreover, a general survey of ancient written languages with modern living descendant or related languages reveals that transmission of ancient forms without change (or with very little change) through several millennia is a general phenomenon, independent of geographical region and language family (Table 3.2).

This millennial preservation of nursery kinship terms in all language families with a written history testifies that, contrary to the unchecked assumption of the "spontaneous generative theory" drawn from Murdock's and Jakobson's works, they are not subject to permanent nor even frequent renewal, but are inherited from generation to generation—doubtless to the point of being among the handful of words that are the most resistant to change.

Nursery kinship terms have specific (idiosyncratic) phonetic shapes in their respective language families, generally characterized by variation in syllable structure and/or in root consonant voicing, both within the limits allowed by children's phonetic ability. Differences between Semitic *ʔab-* 'father,' Turkic *aba* 'father, dad,' Dravidian *appa* 'father, dad,' and so on, illustrate these variations. These particular forms are often preserved almost unchanged in most descendant languages of each family, as shown in Table 3.3 for the Semitic root *ʔab-* 'father,' transmitted from Proto-Semitic to its daughter languages over several millennia.

This historical review shows that kinship nursery words are extremely resistant to phonetic change and word loss, but are more prone to borrowing—the essential factor accounting for the observed discrepancies between related languages. They are not, however, *Wanderwörter*, traveling all around the globe with the animal (e.g., *koala*), plant (e.g., *tomato*), item (e.g., *alcohol*), or custom (e.g., *taboo*) they refer to. In most attested cases, kinship nursery terms have been borrowed in particular historical circumstances involving a good deal of bilingualism, often within mixed pairs after a conquest. Such was probably the case of English *dad* and *mum*, borrowed from Brythonic Celtic after the Germanic Angles and Saxons conquered Great Britain. Rumanian *tátă* 'father, dad,' in turn, a likely legacy of Latin *tăta* 'dad,' was probably helped to survive by the generality of *tata* 'dad' words in all the Slavic languages surrounding Rumanian. South American Spanish *tata* 'dad' was probably reinforced by the *tata* 'dad' words in the Amerind maternal languages of many women who married Spaniards and whose children first rooted Spanish in South America (see note 2). Similarly, Turkish *baba* 'dad' was borrowed from an Iranian language (probably Persian: witness the other Persian word *pedar* 'father,' borrowed into Turkish as *peder*) after the conquest of Anatolia by the Turks coming from Central Asia.

A few borrowings involve less close language contact but still imply a high-status language learned by a dominant fraction of a society; for example, Latin *pạpa*, used by

TABLE 3.2. Preservation of kinship terms in language families with a written history. The comparison of ancient written languages with modern related languages shows that, contrary to the ordinary assumption, kinship nursery terms are not renewed at a quick pace within each language's history, but are preserved unchanged over long time spans.

Ancient Languages	Modern Languages	Time Span (years)
Cognate *papa* words attested in ancient and modern languages		
Akkadian ***abu*** F of, ***abi*** my F	Arabic ***ʔabu*** F of, ***ʔabi*** my F	4,300
Old Chinese ***ba*** F	Beijing ***ba*** F	3,000
Homeric Greek ***páppa*** dad	Pontic Greek ***pápa*** dad	2,900
Prakrit ***bappa*** F	Hindi, Bengali, etc. ***bābā*** ~ ***bāp*** F, dad	2,200
Old Tamil ***appan*** F	Tamil ***appan*** F	1,300
Old Tibetan ***p^{h}a*** F	Tibetan ***p^{h}a*** F	1,300
Old Turkish ***apa*** ancestor, M, Z+	Bashkir ***apa*** F, Tatar apa M	1,200
Middle Korean ***àpí*** F	Korean ***appa*** F	1,000
Cognate *tata* words		
Avestan ***tā*** F	Ishkashmi ***tat***, Ossetic ***äda*** F	3,000
Sanskrit ***tāta*** dad, F	Romany ***tatta*** dad, Waigali ***tatá*** F	3,000
Classical Latin ***tăta*** dad	Italian dialects ***tata***, Rumanian ***tátă*** F, dad	2,100
Gotic ***atta*** F	German dialects ***ätte*** F	1,600
Old Turkish ***ata*** F	Azeri ***ata*** F	1,200
Old Welsh, Old Breton ***tat*** F	Welsh, Breton ***tad*** F	1,200
Old Slavon ***teta*** F	Bulgarian ***tata*** F	900
Cognate *mama* words		
Akkadian ***umm***, Eblaic ***ʔummum*** M	Arabic ***ʔumm*** M	4,300
Old Chinese ***mə*** M	Beijing ***ma***, Wenzhou ***mo*** M	3,000
Classical Greek ***mámma*** mum	Greek ***mama*** mum	2,500
Classical Latin ***măma*** mum	Italian ***mammà***, Rumanian ***mám ă*** mum	2,100
Pali ***ammā***, Prakrit ***amā*** mum	Sindhi, Nepali ***amā***, Hindi ***ammā*** M	2,000
Old Welsh, Old Breton ***mam*** M	Welsh, Breton ***mam*** M	1,200

early Christians as an appellative for their bishops (hence French *pape* 'pope'), was likely borrowed from Greek (see note 2). Similarly, Russian *papa* 'dad,' an isolated form within Slavic (whose other member languages all retained *tata* 'dad'), was probably borrowed from French by the (sometimes exclusively) French-speaking Russian aristocracy in the eighteenth and nineteenth centuries through their French nurses and teachers.

Concl usion

Murdock explicitly put forward the hypothesis that convergent new kinship terms should have spontaneously arisen from babies' babbling in unrelated language families. Jakobson, in turn, while apparently endorsing this hypothesis and adducing arguments supporting it, nevertheless carefully avoided taking a firm stance about its validity. The belief, common among linguists, that he had once and for all settled the question and verified Murdock's hypothesis cannot be held without sweeping under the rug many questions, some of which were asked by Jakobson himself—notably why *papa* and *tata* words should mean "father."

Nevertheless, Murdock and Jakobson recognized several crucial points. The first is that the bulk of *mama/papa* words may not be due to chance resemblances. Though they do not state it explicitly, it is implied by their own

TABLE 3.3. Stability of the Semitic root *ʔab-* 'father' since the beginnings of writing. The word *ʔab-* 'father' may be traced along the complete history of the Semitic family in all of its branches. The word was not only transmitted to nearly all modern Semitic languages, but was preserved with very little phonetic and no semantic change.

Date	Language	Vernacular word	Meaning
Ancient Semitic languages			
4,300 BP	Old Akkadian	***ab-u, ab-i***	F of…, my F
3,800 BP	Old Babylonian	***ab-u, ab-i***	F of…, my F
3,400 BP	Ugaritic	***ʔab(-u)***	F of…
3,300 BP	Middle Babylonian	***ab-i***	my F
2,900 BP	Phenician	***ʔab-i***	my F
2,900 BP	Moabite	***ʔab-i***	my F
2,800 BP	Old Aramaic	***ʔab-i***	my F
2,700 BP	Pre-Exilic Hebrew	***ʔāb***	F
2,700 BP	Epigr. Sth Arabian (Awsanite)	***ʔb-***	F
2,500 BP	Epigr. Sth Arabian (Qatabanic)	***ʔb-***	F
2,450 BP	Late Babylonian	***ʔab-i***	my F
2,000 BP	Judaic Aramaic	***ʔabbā***	F
1,700 BP	Mandaic Aramaic	***ab ~ aba***	F
1,600 BP	Ge'ez	***ʔab***	F
1,400 BP	Classical Arabic	***ʔab-u, ʔab-i***	F of…, my F
Modern Semitic languages			
	Arabic ***ʔab-u*** F of…, ***ʔab-i*** my F	Tigre ***ʔab*** F	Soqotri ***ʔab*** F
	Harsusi ***χayb*** F	Mehri ***χáyb*** F	Harari ***āw*** F
	Tigrinya ***ʔabbo*** F	Amharic ***abbat*** F	Gurage ***ab ~ a̱b ~ a̱bi*** F

tentative explanations relying on the babies' nasal murmur, which would have been meaningless if these authors had considered chance a possible explanation. They also acknowledged two other facts whose full import went unseen by them and their followers:

1. Phonetically, as Jakobson (1960) correctly noted on articulatory and auditory grounds, these words and their sounds are very easy to pronounce and perceive—and in fact are *the easiest words and sounds* for linguistically unskilled babies. This was later confirmed by cross-linguistic observations on language acquisition: babies have no real choice as to which sounds and syllables—nor, indeed, words—they will master first.

2. Semantically, the Murdock-Jakobson doctrine takes for granted that parental appellatives have to arise from the babies' earliest efforts to acquire articulate language. This is also true, to the extent that Locke (1983) remarked about the babies' very first word that it is "more often than not…*papa*." Clearly, there must also be something special in kinship appellatives making their meaning *especially fit to begin* speaking. And we think it is precisely their appellative nature, which makes them close to animal calls, with the result that children do not have to fully understand their symbolic value to use them efficiently—that is, to obtain help to satisfy their needs.

These two facts, as well as the physiological and behavioral factors determining them, have far-reaching consequences for our understanding of the ultimate origin of articulate language (see Bancel and Matthey de l'Etang 2005, 2006).

Finally, our historical survey unambiguously shows that, despite the reluctance of historical linguists to deal with kinship nursery terms, these are far from being spontaneous, ahistorical words. On the contrary, both their resistance to loss and their conditions of borrowability place them among the most heavily historically loaded words.

Notes

1. English *aunt* was borrowed from a nonprefixed form in the Norman dialect of Old French, together with *uncle* (French *oncle* < Latin *avunculus* 'maternal uncle'), again showing the borrowability of kinship terms.
2. The new French word *tata* 'auntie' does not descend from the old Latin word *tăta* 'dad,' with numerous corresponding words in various Indo-European branches, which was replaced by a derivative of *pappa* in most Romance languages—with the important exceptions of Rumanian *tátă* 'dad' and of various Italian and Catalan dialects having also inherited *tatà* 'dad.' *Tata* also existed in Middle Spanish and spread into South American Spanish, where it persists today, probably under the influence of *tata* 'dad' words existing in innumerable Amerind languages (e.g., Hopi *taʔta*, Nahuatl *tẹ̣tạt*, Mixtec *ta*, Guarani *tâʔ*, and so on). Latin *pạpạ* itself, not attested in Latin literature before ca. AD 100, is assumed to have been borrowed from Greek (Walde 1954, 249), probably via the Greek preceptors who taught their language and culture to upper-class Roman boys.

| 4 |

Back to Proto-Sapiens (Part 2)

The Global Kinship Terms *Papa*, *Mama*, and *Kaka*

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The Global Semantic Picture

If kinship nursery words had been "carved" out of babies' babbling again and again in many different languages, as Murdock (1959b) puts it, one would expect a great deal of semantic confusion between *mama*, *nana*, *papa*, *tata*, and *kaka* words. Words belonging to each series (defined by its root consonant and an optional reduplicative syllable structure) should be randomly spread over different kinship positions; that is, one should find some *mama*, some *papa*, and some *kaka* words meaning "mother," some meaning "father," others meaning "brother," and still others meaning "sister," with no special relation between any particular phonetic type and any particular meaning. The only possible exception—if one were to admit Murdock and Jakobson's theory linking the nasal murmur of suckling babies to the nasal consonants *m* and *n* of *mama* and *nana* words—could be that one might expect these latter to mean "mother" more frequently, while *papa*, *tata*, and *kaka* words should display a global mix of meanings.

In turn, an etymological hypothesis about kinship nursery words predicts that the various outcomes of an ancestral word in different languages should display not only a phonetic but also a semantic consistency. No one would expect that all words derived from the same ancestral word in different languages should have exactly the same meaning. The meaning of words, like their sounds, is known to evolve over time. Therefore, one would expect the original meaning of a particular word to be represented in only a fraction of the languages where this word survives, while it would have been transmitted in other descendant languages with an evolved meaning. Most such meanings should exhibit a strong relationship with the original—such as French *oncle* 'mother's or father's brother, mother's or father's sister's husband' with regard to its Latin origin, *avunculus* 'mother's brother.' Finally, a fraction of descendant words should display more unexpected meanings, since the human mind, even if it generally follows the same routes and routines, often discovers—and sometimes treads—more subtle paths, so that it must not astonish us too much that Latin *testa* 'clay pot' has erratically, though by no means illogically, become French *tête* 'head.'

In short, the convergent innovations theory predicts semantic incoherence for each word series (except perhaps for the *mama* and *nana* series) and thus a lot of semantic overlap between different series, while the etymological hypothesis predicts semantic coherence for each series, and no overlap between series (though linguistic evolution may have somewhat blurred these two features).

What do we find in reality? Within our 1,184 language sample, all phonetic types of kinship nursery terms display a strong semantic consistency—both within each series and between series (Table 4.1). Each phonetically defined type is centered on a meaning with high statistical prominence.

The *Papa* Series

Papa words meaning "father," together with those meaning both "father" and "father's brother" (in many kinship terminologies a single term refers to the father and his brothers), account for 59.2 percent of languages where a *papa* form is found. They are spread all over the globe and found in many language families. The 15 percent of languages with a *papa* word meaning strictly "father's brother" may not be added directly to the 59.2 percent

TABLE 4.1. Statistically most prominent meanings of *papa, kaka, nana,* and *mama*

Term / Meaning	PAPA Number	PAPA Percent tot. > 100	KAKA Number	KAKA Percent tot. > 100	NANA Number	NANA Percent tot. > 100	MAMA Number	MAMA Percent tot. > 100
F	288	59.2%	12	1.9%	38	5.6%	84	26.1%
F + FB	106		3	0.5%	4	0.6%	82	
FB	100	15.0%	59	9.2%	1	0.1%	7	1.1%
FZ	36	5.4%	10	1.6%	48	7.1%	31	4.9%
M	20	3.0%	14	2.2%	250	64.0%	232	43.1%
M + MZ	20	3.0%	5	0.8%	182		42	
MZ	8	1.2%	24	3.7%	48	7.1%	49	7.7%
MB	33	5.0%	221	34.5%	11	1.6%	105	16.5%
B+	100	15.0%	111	17.3%	28	4.1%	4	0.6%
Z+	27	4.1%	64	10.0%	59	8.7%	9	1.4%
S+	7	1.1%	32	5.0%	17	2.5%	9	1.4%
GF	134	20.1%	86	13.4%	16	2.4%	15	2.4%
GM	45	6.8%	61	9.5%	48	7.1%	52	8.2%
GP	15	2.3%	35	5.5%	4	0.6%	12	1.9%
GP + GC	42	6.3%	31	4.8%	4	0.6%	35	5.5%
GC	38	5.7%	28	4.4%	0	0.0%	6	0.9%
C	14	2.1%	3	0.5%	65	9.6%	35	5.5%
Total/ 1,184 languages	1,033 cognates in 666 languages (56% of sample)		799 cognates in 641 languages (54% of sample)		823 cognates in 675 languages (57% of sample)		809 cognates in 635 (54% of sample)	

Note: The statistics presented here are calculated from the 1,184 languages for which we had a nearly complete kinship terminology in 2006, in order to avoid the statistical bias favoring the most central kinship positions (F, M, B, Z) that would have been induced by languages for which we had incomplete data—such partial data bearing more often than not on these central positions. Not all kinship positions attested for each term are listed above: for each series, at least a dozen other positions are sporadically attested by a few items. Percentages have been calculated with regard to the number of languages attesting one or more word in the concerned series. Our database now includes more than 2,000 complete kinship terminologies, and the results would not be very different.

meaning "father ~ father + father's brother," because of frequent overlap (e.g., Latin *pater* 'father,' *patruus* 'father's brother'), but represent a direct evolution.

The other most widely represented meanings of *papa* words, namely "grandfather" (20.1 percent) and "(older) brother" (15 percent) are also strongly consistent with the central meaning of "father ~ father + father's brother." They also refer to very close parents of ego—all elder males in direct line, mostly on the father's side, except for the maternal grandfather, probably as a result of the strong tendency among languages from every part of the world to generalize a single term for both grandfathers or both grandmothers, or each pair of grandparents, or even all four. As a result, in many languages, the word for "grandmother" is a compound transparently meaning "she-grandfather" or "she-grandparent," as in the Caucasian language Rutul *baba* 'grandfather,' *baba-j* 'grandmother' (Starostin et al. 2003) or in the Mimboma dialect of Kongo *ŋkááka* 'grandfather,' *ŋkááka mááma* 'grandmother' (Koelle 1854). So not only the 20.1 percent of languages with a *papa* words referring to any or both of the two grandfathers, but also the 6.8 percent where it

means "grandmother" and the 2.3 percent where it means "grandparent" may accurately be taken as resulting from straightforward semantic evolutions from a meaning "grandfather." Similarly, *papa* words meaning "brother" might have given rise to those meaning "sister" (4.1 percent) and "sibling" (1.1 percent) by a semantic process similar to what is observed for "grandfather," "grandmother" and "grandparent."

Reciprocally, it is worth noting that the respective central meanings of *kaka* words, namely "mother's brother," and of *nana* and *mama* words, namely "mother ~ mother + mother's sister," are very weakly represented among *papa* words. Thus, the 5 percent of languages with a *papa* word meaning "mother's brother" and the 6 percent meaning "mother ~ mother + mother's sister" may be counted, like Latin *testa* 'clay pot' becoming French *tête* 'head,' in the number of erratic semantic evolutions.

The *TATA* Series

We have not dealt in Table 4.1 with statistics concerning *tata* words. Like *papa* words, they are spread all over the globe (though in a somewhat smaller proportion of languages, close to 50 percent instead of the 56 percent of languages having a *papa* word in our database). They are also found in very diverse language families. Moreover, their semantic distribution closely matches that of *papa* words, with strongly predominant "father ~ father + father's brother," followed by "grandfather" and "(elder) brother" in percentages very similar to those found for *papa* words. At the global level, it thus seems that *papa* and *tata* words are etymologically synonymous, at least in the present state of research. This point will be discussed below under the section dealing with the *mama* series.

The *KAKA* Series

In turn, *kaka* words meaning "mother's brother" alone accounts for 34.5 percent of languages where such a word appears, to which add 17.3 percent of languages with a *kaka* word meaning "(older) brother" and 13.4 percent of languages with a *kaka* word meaning "grandfather." All three meanings are found not only in numerous languages, but also in many language families worldwide. All refer to male elders on the mother's side, consequently opposing *papa* words, which refer to male elders on the father's side. To them may further be added the 9.5 percent meaning "grandmother" and the 5.5 percent meaning "grandparent" (both possibly derived from the meaning "grandfather"), as well as the 10 percent meaning "sister" and the 5 percent meaning "sibling" (both possibly derived from the meaning "brother").

A small proportion of *kaka* words meaning "father ~ father + father's brother" (2.4 percent) or "mother ~ mother + mother's sister" (3 percent) may be counted as erratic meaning shifts. The relatively higher minority of *kaka* words meaning "father's brother" (59 occurrences in our database, or 9.2 percent of languages having a *kaka* word) is essentially contributed by two language groups, namely Eskimo (10 occurrences) and the Indo-Aryan group of Indo-European (19 occurrences). In Eskimo, it is very widespread (e.g., East Greenlandic *akka* 'father's brother') and is reconstructed by Fortescue (1994) in Proto-Eskimo. Modern occurrences must thus count for only one erratic meaning shift in Proto-Eskimo, which was transmitted into all of its descendant languages through several millennia.

In Indo-Aryan, in turn, *kaka* 'father's brother,' e.g., Hindi *kākā* 'father's younger brother,' is almost general. No comparable *kaka* forms are found in other Indo-European languages, with the exception of some Iranian languages, a group closely related to Indo-Aryan within the Indo-Iranian primary branch of Indo-European. These Iranian languages are spoken in Pakistan and Afghanistan, e.g., Hazara *qɔqɔ* 'father's brother' (two occurrences) and form a geographical cluster with Indo-Aryan. Moreover, Indo-Aryan and southern Iranian languages also cluster with several Dravidian languages from northern India having *kaka* words meaning "father's brother," e.g., Kolami *kako* 'father's younger brother' (four occurrences), while southern Dravidian languages spoken outside of the Indo-Aryan influence area consistently have a different form, *akka* 'sister,' e.g, Telugu *akka* 'older sister' (seven occurrences). Finally, *kaka* 'father's brother' is also found in Munda languages, belonging to the Austroasiatic phylum and spoken in central and northeastern India under the influence of the dominant Indo-Aryan languages, e.g., Mundari *kākā* 'father's younger brother' (two occurrences), as well as in *kaku* 'father's younger brother' in the Tibetic language Byangsi, spoken in northern India. Since *kaka* words with this meaning are found only in Iranian, Dravidian, Munda, and Tibetic languages exposed to heavy Indo-Aryan influence, all of these are very likely borrowings from Indo-Aryan.

The absence of *kaka* words in all the other Indo-European primary branches strongly suggests that it was borrowed in Indo-Aryan as well, though the donor language is unknown; it cannot be a Dravidian nor a Munda

nor a Tibetic language, which themselves borrowed the word from Indo-Aryan. A range of Sanskrit words are known to have been borrowed from a "language X" that belonged to another family than those historically known to have been spoken in southern Asia and disappeared without leaving any other trace than these Sanskrit loanwords (Masica 1979). Thus, all the *kaka* words meaning "father's brother" in Indo-Aryan, northern Dravidian, southern Iranian, Munda, and Tibetan languages would represent a cascade of borrowings. The first occurred in early Indo-Aryan and was then faithfully transmitted into the descendant Indo-Aryan languages, from which it was borrowed again by some Dravidian, Iranian, Munda, and Tibetan languages submitted to Indo-Aryan influence. Thus, 28 *kaka* words from these four groups in our database would account for a single erratic meaning shift in the unknown language from which Indo-Aryan first borrowed it. Such a cascade of borrowings is not unlikely nor even really surprising. As we have seen with Trask's examples above, the strong resistance of kinship nursery terms to replacement over time (stronger than that of most other basic words) goes with a relatively strong propensity (much stronger than for other basic words) to be borrowed in cases of historically known bilingualism.

All in all, out of the 59 occurrences of *kaka* words meaning "father's brother," 38 depend directly on only two meaning shifts, in Proto-Eskimo and in "language X" of southern Asia. Thus, there remain only 21 *kaka* 'father's brother' in other language groups. Some of these remaining words are also found in languages forming smaller etymological clusters, so that fewer than a dozen languages originally shifted meaning from "mother's brother" to "father's brother."

Two other distributional particularities of *kaka* words are observed in Africa. The first is that they seem to be completely lacking in Khoisan. Since Khoisan probably is the first linguistic branch still alive today to have split from the common stem—as the consensus grows—it would mean that the word appeared after this split in the non-Khoisan branch, which includes all other human languages. The other possibility is that Khoisan languages had lost a Proto-Sapiens *kaka* word.

The second distributional particularity of African *kaka* words regards the two other exclusively African families, Niger-Kordofanian and Nilo-Saharan. As in most linguistic phyla from the rest of the world, *kaka* words are very widely represented in these two phyla. But, contrary to the rest of the world, where a great number of these words mean "mother's brother" (though "grandfather" and "brother" are well represented as well), this meaning is much more scarcely represented among African *kaka* words. The greatest number of African *kaka* words mean "grandfather" or "grandmother." The main meaning "mother's brother" found elsewhere is not absent from sub-Saharan Africa, but occurs only in a restricted though large northwestern area, and includes words from languages belonging to heterogeneous linguistic groups. In the Niger-Congo phylum, one finds words from a few West Atlantic languages like Fulfulde (Peul) *kàwó* 'mother's brother' and the Fulfulde-influenced Bedik *kàwó* 'mother's brother,' a few Mande languages like Soninke *kau* 'mother's brother' (Soninke speakers are frequently bilingual in Fulfulde), and in the Adamawa-Ubangian branch the heavily Fulfulde-influenced language Mbum from northern Cameroon (*kaawu* 'mother's brother'), and some Gbaya dialects, where it is suspected by Moñino (1995) to have been borrowed from Fulfulde (e.g., Gbaya Toongo *kàò*, Gbaya Boʔoro *ʔáù* 'mother's brother'); only the Banda group (southern Central African Republic), where forms like Banda Linda *ʔòʔú* or Mbanza *ʔàʔú* 'mother's brother' are general, is out of the Fulfulde influence area. The Chadic branch of Afroasiatic also contributes a few languages, like Hausa *kaawùù* or Zaar (northern Nigeria) *kááwuu* 'mother's brother,' to this cluster of African *kaka* words meaning "mother's brother."

This areal distribution and the near phonetic identity of all forms regardless of language groups strongly suggest a cascade of recent borrowings from a single language. The widespread vehicular languages Fulfulde and Hausa are likely donors to several other languages. Thus, contrary to many language families from the rest of the world, the meaning "mother's brother" may not be original in Niger-Kordofanian and Nilo-Saharan, where *kaka* originally meant "grandfather." How meanings differentiated in African and non-African language families, respectively, is left to future research.

Finally, it is worth noting that in northern Eurasia the meaning "brother" is strongly associated with the particular syllabic structure *aka*, as in Altaic (e.g., Turkish *ağa* 'brother,' Classical Mongolian *aqa* 'brother,' Ulcha *aɢa* 'brother'), Yukaghir (e.g., Kolyma Yukaghir *a'ka* 'elder brother'), Gilyak (*akand* 'elder brother'), Japanese-Ryukyuan (Ryukyuan *aka* 'brother'), Ainu (Ainu *ak* 'elder brother,' *aki* 'younger brother'), and Semitic (e.g., Arabic *ʔaχ* 'brother'). To these may be added the

above-mentioned southern Dravidian forms of *akka* 'sister,' which represent a natural meaning change. Most of these language groupings are members of the huge Eurasiatic phylum (Greenberg 2000), except for Semitic, Dravidian, and perhaps Ainu. It is tempting to consider most of these forms as a common trace of Proto-Eurasiatic, though some of them—including the possible Proto-Eurasiatic form itself—might result from borrowings, in particular among those language groups spoken along or near the northern Pacific coast of Asia.

The *Nana* Series

Nana words meaning "mother" (alone or together with the meaning "mother's sister") account for 64 percent of languages with a *nana* term. Just like *papa* and *kaka* words, very few *nana* words mean either "mother's brother" (1.6 percent) or "father ~ father + father's brother" (6.2 percent). The weaker representation of *nana* words meaning "sister" (8.7 percent) and "grandmother" (7.1 percent) than that of *papa* and *kaka* words meaning "brother" and "grandfather" is certainly a consequence of the widely attested spreading of *papa* and *kaka* words (and masculine terms in general) to feminine positions at the generations of grandparents and siblings.

The *Mama* Series

Highly unexpectedly, the *mama* series seems to provide an exception to several of the rules which other series apparently obey. The central meaning of the series is doubtlessly "mother ~ mother + mother's sister" (43.1 percent of languages), but one nevertheless also finds a high number of instances meaning "father" or "father + father's brother" (166 occurrences and 26.1 percent of languages) and "mother's brother" (105 occurrences and 16.5 percent of languages). Taken at face value, the *mama* series thus looks contradictory, with both the traditional explanation and the etymological hypothesis. The traditional explanation bases the maternal meaning of *mama* and *nana* words on the suckling baby's nasal murmur *mmm... mmm...*, and leaves unexplained *papa*, *tata*, and *kaka* words. According to this theory, the nursery kinship term for which one would expect the strongest semantic coherence is precisely *mama*. In reality, this word is the one exhibiting the weakest semantic coherence—both internally (with its mix of primary masculine and feminine meanings) and with regard to other series (with its marked semantic overlap with other series).

But this internal and external statistical semantic inconsistency of *mama* words also apparently contradicts the etymological hypothesis, which demands internal semantic coherence for each series and prohibits semantic overlap between series. However, when considered from a comparative-historical vantage point, the *mama* series does not behave very differently from other series. As we have seen for the erratic *kaka* words meaning "father's brother," many of the numerous *mama* words meaning "father ~ father + father's brother" occur in clusters of languages belonging to the same family. Such clusters must have resulted from a single erratic meaning shift early in the history of the family, whose result was then transmitted with the usual fidelity in the descendant languages. Most notably, the Austronesian family contributes 136 out of our 166 occurrences (81.2 percent) of *mama* words meaning "father," which all result from a single erratic meaning shift that was faithfully transmitted to most descendant Austronesian languages.

With regard to the 105 *mama* words meaning 'mother's brother,' the Dravidian family contributes 29 occurrences from both northern and southern languages, e.g., Brahui (Pakistan) *māmā* and Tamil (southern India) *māmā* 'mother's brother,' while the neighboring Indo-Aryan group of Indo-European contributes 22 occurrences, e.g., Punjabi *māmmā* 'mother's brother.' Like the *kaka* 'father's brother' cluster examined above, languages from other linguistic groups join this cluster: southern Iranian, e.g., Pashto *māmā* 'mother's brother' (two occurrences), as well as the whole Nuristani group (a small group of languages spoken in the Hindu Kush, constituting the third branch of Indo-Iranian), e.g., Katâvari *mâm* 'mother's brother' (eight occurrences). It is also found in Munda languages, e.g., Santali *māmā* 'mother's brother' (two occurrences), and in Tibetic languages from India, e.g., Dhimal *māmu̱* 'mother's brother' (three occurrences).

Thus, out of 105 occurrences of *mama* words meaning "mother's brother" in our database, a total of 66 Dravidian, Indo-Aryan, Iranian, Nuristani, Munda, and Tibetic words constitute a geographic cluster of nearly identical forms, obviously resulting from a cascade of borrowings. This cluster approximately covers the same area as that of *kaka* 'father's brother,' discussed above, with two important differences. In the present case, all Nuristani languages are included in the cluster, while they seem to lack *kaka* 'father's brother' words. Nuristani being the third primary branch of Indo-Iranian (together with Indo-Aryan and Iranian), it indicates that a word *mama* 'mother's brother' must have appeared early in this

family, a theoretical necessity confirmed by the presence of the ancient language Sanskrit *māmā* 'mother's brother' in the Indo-Aryan series, while Sanskrit is lacking from the list of Indo-Aryan languages having *kaka* 'father's brother' words.

The other important difference between the two series is that, in the case of *mama* 'mother's brother,' such words are found in nearly every Dravidian language from north to south. Thus, the word must have existed in Proto-Dravidian, long before the arrival of Indo-Aryan-speaking peoples in South Asia, as well as in all its descendant languages in the course of history. It is highly likely that Proto-Indo-Aryan and Proto-Nuristani borrowed *mama* 'mother's brother' from Dravidian. The word *mama* 'mother's brother' resulted from a single meaning shift in Proto-Dravidian that was then transmitted to the descendant Dravidian languages and, after its early borrowing by Proto-Indo-Aryan and Proto-Nuristani, to the descendant Indo-Aryan and Nuristani languages. Thus, all 66 occurrences mentioned result from a single meaning shift, which most probably occurred in Proto-Dravidian and was then borrowed—and preserved—by languages from various families in the region.

Of the remaining 39 occurrences of *mama* 'mother's brother,' some also form lesser clusters, as in the Central branch of Amerind 3 Tanoan languages, e.g., Taos *mimi* 'mother's brother,' or in the Pama-Nyungan branch of Australian 3 Karnic languages, e.g., Yandruwandha *ama* 'mother's brother.' As a result, the whole *mama* series is, at the global level, neither more nor less heterogeneous semantically than the other series, since most *mama* words with the deviant meanings "father" and "mother's brother" in fact pertain to a small number of clusters, each resulting from a single meaning change. Big clusters such as the Dravidian/Indo-Aryan/Nuristani/Iranian/Munda/Tibetic cluster of *mama* 'mother's brother' words simply date back to a relatively early meaning change in a successful language family in contact with other language families, while smaller clusters occurred more recently in language families that had less demographic success and/or less contact with other families.

When these borrowing clusters are duly taken into account, all series, including that of *mama* words, display a strong internal semantic consistency, and their respective central meanings display a very strong tendency not to overlap. These two facts are incompatible with the spontaneous innovation theory. On the contrary, they match exactly the predictions of the etymological hypothesis, according to which these words have been inherited from a common origin.

Remarkably, once cleared from its large borrowing clusters, the *mama* series seems globally synonymous with the *nana* series, much the same way as the *papa* and *tata* series. This apparent synonymy is dubious for two reasons. The first is historical, and relies on the observed general elimination or recycling of synonyms in the course of language history. The second is empirical, and relies on the numerous language groups and even individual languages where both forms are found, sometimes with parallel meanings, as seems to be the case in Altaic for the widespread *ata* and *apa* words, and sometimes with differentiated meanings, without a global coherence being easily drawn from our data. This question is left to further research.

Finally, we leave to the supporters of the "spontaneous generative theory" to explain how and why Austronesian babies consistently persisted over 8,000 years to derive *mama* words meaning "father" from their nasal suckling murmur in dozens and dozens of different Austronesian languages. And why Dravidian and Indo-Aryan babies continuously reinvented over 4,000 years or more a *mama* word meaning "mother's brother," again based on their nasal suckling murmur.

Proto-Sapiens Kinship Etymologies

We have shown in the preceding chapter (Matthey de l'Etang, Bancel, and Ruhlen, this volume) that rather than being subject to permanent changes followed by convergent renewals, kinship nursery terms have a long, continuous history in most language families. Nor have the would-be pervasive spontaneous innovations alleged by the traditional explanation of their global distribution been documented in language acquisition studies—not even a single time, it seems. To the contrary, after reviewing observational and experimental data, a leading specialist of language acquisition has come to the conclusion that both the meaning and the language-specific phonetic form of these words are taught to children by their parents (Locke 1990). Moreover, as observed by Ruhlen (1994), in the traditional explanation of the global distribution of *mama/nana* words, the sound-symbolic part—already uncomfortable at justifying *papa/tata* words—definitely fails to explain the globally distributed *kaka* words. Finally, the globally consistent semantic distribution of the different phonetic series also contradicts the spontaneous innovation theory.

We conclude from:

(i) the non-attested innovation of nursery kinship terms by babies, who instead learn the forms specific to the particular language spoken by their parents,

(ii) the attested long preservation of these words in most low-level language families, and

(iii) their both internal and external etymological coherence at the global level,

that the worldwide distribution of kinship nursery terms must be traced back to a very ancient common ancestry. Two types of cases account for the observed discrepancies in our data:

(i) relatively numerous but forcibly local borrowings—such as Persian *bābā* 'dad,' borrowed into Osmanli Turkish then from this latter into Greek, or Dravidian *māmā* 'mother's brother,' borrowed into Proto-Indo-Aryan, Proto-Nuristani, and southern Iranian languages, then from some of their descendant languages into some Munda and Tibetic languages, and

(ii) a minority of innovations not complying with the consonant distribution rule—such as French *tata* 'auntie.'

When and where was spoken the ancestral language from which most of these terms derive? No reliable linguistic method is able to date protolanguages. It has often been attempted to correlate linguistic families with archeologically dated cultures and sites, but at the regional level many such correlations have proved highly controversial and, in fact, impossible to determine. However, with regard to the ancestor of all human languages, archaeology and genetics give us interesting, if highly approximate, clues.

Our species, *Homo sapiens*, is archeologically known to have originated in Africa between 200,000 and 150,000 yBP. The oldest *H. sapiens* remains currently known are those of the Ethiopian Omo 1 and Omo 2 humans, long believed to date back to 130,000 yBP and recently redated to 194,000 yBP (McDougall, Brown, and Fleagle 2005), while Herto Man (*Homo sapiens idaltu*), also Ethiopian, is dated to 154,000 yBP (White et al. 2003). These dates today constitute the upper limit for *Homo sapiens* direct ancestry, and as such constitute the upper limit for an ancestral Proto-Sapiens language as well.

The lower limit for the unity of an ancestral Proto-Sapiens language is determined by the dispersion of our species. In the present state of our knowledge, its exit from Africa is an important landmark in this dispersion process. The most ancient fossil remains, testifying with clear certainty for this dispersion, are dated around 40,000 yBP. For instance, the currently oldest undisputed fossil *Homo sapiens* in Europe was found in Pestera cu Oase (Rumania) and is dated ca. 35,000 yBP (Trinkaus et al. 2003), while the most ancient *Homo sapiens* (and, for that matter, human) remains in Australia, those at Lake Mungo, date back to ca. 40,000 yBP (Bowler et al. 2003), though human (and in all likelihood *H. sapiens*) occupation of Australia dates back to at least 46,000 yBP (O'Connell and Allen 2004).

It must be emphasized that, until recently, nearly all known *Homo sapiens* remains prior to 100,000 yBP displayed archaic characters differentiating them from modern *H. sapiens*. Such are Omo and Herto Man, as well as the Jebel Irhoud (Morocco) fossils, dated ca. 160,000 yBP and assigned by Smith et al. (2007) to early *Homo sapiens*. Such are also—though to a much lesser extent—the more recent *Homo sapiens* from Qafzeh and Shkul (Palestine), dated around 90,000 ~ 100,000 yBP (Vandermeersch 1981; Valladas, Reyss et al. 1988; Valladas, Merrier et al. 1998), which are the most ancient human remains attributed to our species outside Africa. Moreover, archaic *Homo sapiens*, including those of Qafzeh, were associated with cultural remains close to those typical of their non-*sapiens* predecessors. This has led to a theory of a "*Homo sapiens* cultural burst" having occurred relatively late in the history of our species, just before the dates of the first findings outside Africa, around 50,000 yBP. This picture, however, could change rapidly due to a series of recent archaeological findings, mostly in South Africa.

The most ancient anatomically fully modern human remains had been found in the 1960s at Klasies River Mouth, South Africa, and dated back to between 110,000 yBP (Deacon 2001) and 125,000 yBP (Singer and Wymer 1982). Clues to the modern behavior of the Klasies River Mouth people, such as evidence of marine food consumption, the cooking of plants and meat on hearths with fire, and (assumedly decorative and symbolic) use of red ochre were found even in the most ancient layers. However, their significance was long doubted by many paleoanthropologists, precisely because the great antiquity of the site conflicted with the otherwise seemingly well established 50,000 yBP *H. sapiens* cultural burst. In the 1990s, Klasies River Mouth's findings were confirmed by excavations at Blombos Cave, also in South Africa, which revealed unambiguous traces of fully modern behavior: red ochre stones engraved with geometrical figures, polished bone tools, and sets of pierced shell beads in layers dated around 75,000 ~ 80,000 yBP (Henshilwood

et al. 2001, Henshilwood and d'Errico 2005, d'Errico et al. 2005). Even the most ancient layer, dated to 100,000 to 140,000 yBP, contains evidence of modern behavior similar to that of the contemporaneous Klasies River Mouth site. Quite recently, excavations at Pinnacle Point, also on the South African coast, would push marine food consumption, stone bladelets technology, and use of red ochre back to 164,000 yBP (Marean et al. 2007). These discoveries are, however, hotly disputed by some archaeologists (e.g., Klein et al. [2004]), though with rather indirect arguments.

In the last two decades, the new discipline of cladistics has invited itself into the debate, contributing genetic dates. Thus, the "mitochondrial Eve" was dated between 100,000 and 200,000 yBP (Cann, Stoneking, and Wilson 1987), the "Y-chromosomal Adam" around 50,000 yBP (Thomson et al. 2000), the genetic split between Khoisan and the rest of humankind between 100,000 and 130,000 yBP (Knight et al. 2003), the genetic split of the Andamanese from the rest of humans to 70,000 yBP, and so on.

While many things remain uncertain and controversial, particularly in cladistics (Blench 2004), one may take for granted that the period between 200,000 and 40,000 yBP includes the periods when an ancestral Proto-Sapiens language was spoken and when it first split into African and non-African branches. Recent archeological findings indicate with growing certitude that southern Africa was home to the most ancient anatomically modern humans, and that the region was the first scene of a long cultural evolution (rather than burst) from archaic to modern behavior. This archeological story is consistent with the most ancient split among present-day humans established by cladistics between the southern African Khoisan and the rest of humankind. Moreover, the story is also coherent with the most advanced linguistic view that the oldest branching within the world's languages would be between Khoisan and non-Khoisan languages, while the second oldest branching would be between African and non-African languages (Ruhlen 1994, 2007).

What do kinship nursery terms have to add to this story? At the moment, they seem to fit comfortably into the "southern African cultural evolutionist" model. The universality of *papa*, *tata*, *mama* and *nana* words warrants their common descent from an ancestral language. In particular, while *kaka* words are almost universally spread, their apparent absence in Khoisan may be explained in two ways. Either this word is a later innovation of non-Khoisan languages after their split with Khoisan, or if it existed before, it was lost by Khoisan and preserved by the non-Khoisan branch. Whatever hypothesis one would prefer, its preservation in most other language families in the world is indicative of a sharp distinction between Khoisan and non-Khoisan languages.

Furthermore, as was argued in detail in the *kaka* section above, there is also a clear-cut distinction between African and non-African *kaka* words. African *kaka* words refer quite predominantly to grandparents, and in particular to the grandfather, while non-African *kaka* words refer predominantly to the mother's brother (though reference to "grandfather" and "grandmother" is also widespread out of Africa). Whichever explanation may be given in the future to this semantic split between African and non-African *kaka* words, it is again consistent with the general model delineated by archeology, genetics, and the most progressive of linguistic taxonomists.

Saying that Proto-Sapiens kinship terms should revolutionize our understanding of human prehistory is an understatement. The existence of a kinship terminology at the Proto-Sapiens stage, even if it could be suspected before, had never been demonstrated, and the discovery of its elements offers the first insight into the social organization of our remote ancestors. The global semantic and anthropological study of these terms allows us to state that the first *Homo sapiens'* kinship system reckoned sex, age status, and filiation (Matthey de l'Etang and Bancel 2002, 2005).

Explaining how these words have been preserved over such huge time spans in so many languages has led us to discoveries about the role of kinship terms in the very origin of *phonetically* articulate language (Bancel and Matthey de l'Etang 2006; Bancel, Matthey de l'Etang, and Bengtson 2006). And understanding the semantic nature of kinship terms has also led us to build new hypotheses about the much more recent origin of *syntactically* articulate language (Bancel and Matthey de l'Etang 2008).

5

Reconstructing Ancient Kinship

Practice and Theory in an African Case Study

Christopher Ehret

The linguistic reconstruction of ancient kin terminologies is a high-potential approach for uncovering the features and structures of human kinship systems far back in time. The language families of Africa are of particular interest to this kind of study because of their great time depth, with the protolanguages of each family generally recognized by the scholars who study those families as dating back to more than 10,000 or more years ago (Ehret 2008). The Nilo-Saharan family offers an especially illuminating case study. The available lexical evidence for Nilo-Saharan kin terms allows not only the reconstruction of multiple lines of historical change in kin terminologies over very long periods of time, but the reconstruction of particular kin terms and terminological systems through a succession of periods back to the Proto-Nilo-Saharan language. Because of the great time depths involved, the findings provide new means for assessing the extent to which theories of change in kinship and kin terminology, based on evidence of significantly shallower time depth, hold up over much longer time spans.

More concretely, this chapter corrects and adds to the previous proposals on ancient kinship terminologies in Nilo-Saharan (Ehret 2008) by bringing new evidence to bear. The new data have made it possible to infer the customary kin relations of marriage, notably preferential cross-cousin marriage, far back in the history of the family. They allow inferences, as well, on the antiquity and persistence of matrilineal descent in the different branches and subgroups of the family. Intriguingly, the new evidence includes a Proto-Nilo-Saharan root word that can be interpreted as having possibly connoted a maternally related group of close female kin, of the kind envisioned by the Grandmother Hypothesis, in existence before the rise of more encompassing matrilineal institutions.

The overall history of Nilo-Saharan-speaking societies in time and place is broadly understood. The Proto-Nilo-Saharan language was spoken in the easternmost parts of the Sudan belt of Africa considerably earlier than 10,500 years ago (Ehret 2008). Archaeological correlations, based on extensive and detailed matches between archaeological findings and the reconstructed lexicon of material culture at the third, fourth, and fifth stages in the divergence of the family, place these particular periods in the evolution of the Nilo-Saharan family in, respectively, the ninth, late eighth, and middle-to-late seventh millennia BC (Ehret 1993, 1999, 2006). These periods were, in order, the Proto-Northern Sudanic era, dating to the period 8500–7500 BC; the Proto-Saharo-Sahelian era, around 7300–7000 BC; and the Proto-Sahelian era, belonging roughly to the span 6500–6000 BC.

From 6000 to 5500 BC a fourth period began, marked by the wide dispersal of cultures with these material developments across the then "green" southern Sahara and Sahel zones. This cultural dispersal is mirrored in Nilo-Saharan linguistic history by a parallel rapid divergence and dispersal of the descendant communities of the Proto-Sahelian stage across much the same span of territories. The boxes along the right side of Figure 5.1 depict the three-stage development in the Nilo-Saharan lexicon of material culture, juxtaposing it with the parallel three-stage sequence of material change in the archaeology of the period 8500–6000 BC (10,500–8000 BP), as well as the parallel geographical expansions of culture and language in the fourth period (8000 BP and after).

The two pre-8500 BC linguistic historical stages,

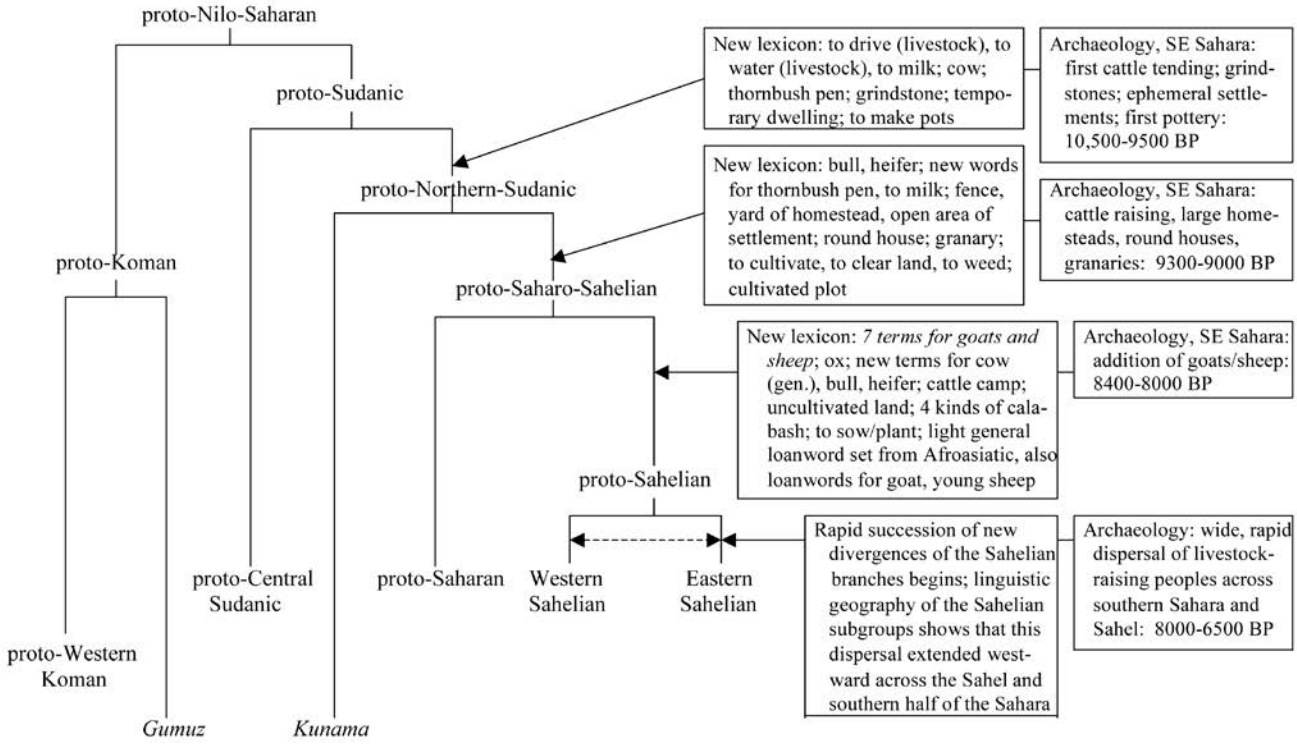


FIGURE 5.1. Nilo-Saharan family tree

Proto-Nilo-Saharan and Proto-Sudanic, thus date to before 10,500 years ago, and possibly well before that time. Their archaeological correlations remain to be found.

The more inclusive Nilo-Saharan family tree in Figure 5.2 portrays the overall linguistic stratigraphy of Nilo-Saharan history. Arrows point to the particular key nodes for reconstructing the history of early kin terms. A succession of dates runs along the right side of the figure. Two sets of dates, for 10,500–8000 BP and 3000–2000 BP, appear without question marks. The first set of unqueried dates rests, of course, on the archeological correlations already presented in Figure 5.1. The second set rests on a long-accepted set of archaeological correlations dating the Proto–Southern Nilotic society to the early third millennium BP (Ambrose 1982) and the Proto-Rub society to around 3000 BP (Ehret 1983, Heine 1976). The dates between those two periods, marked by question marks, are informed guesses as to what the time spans of the intervening episodes of language divergence might have been.

Despite the great time depth of this family, the data for Nilo-Saharan kinship reconstruction allow the recovery of many of the key early terms in the evolution of Nilo-Saharan kin terminology and structure. Early cousin and siblings' children terminologies remain less fully attested, but the lexical data relating to other categories of blood relationship and to affinal relations are substantial. In repeated instances the underlying derivations and the semantic histories of individual kin terms in different branches of the family reveal early marriage preferences and shed light on the history of unilineal descent among Nilo-Saharan-speaking societies.

The subclassification represented in Figures 5.1 and 5.2 rests on a multiplicity of convergent lines of evidence from phonological, morphological, semantic, and lexical histories in the family (Ehret 2001b, chaps. 4–8).

Ancient Kin Lexicon in Nilo-Saharan

The body of reconstructed root words for kin relations in early Nilo-Saharan is already relatively extensive. Appendix 5.2, "Nilo-Saharan Kin Lexeme Reconstructions and Semantic Histories," lists the particular terms and their proposed meanings currently traceable to each of the nine successive periods in Figure 5.2, from the Proto-Nilo-Saharan down to the Proto-Kir society. The kin terms fall into sections A through I, according to the nodes in the stratigraphy each root word can be traced back to. The published systematic phonological reconstruction of Nilo-Saharan (Ehret 2001b, 2003a) provides the analytical

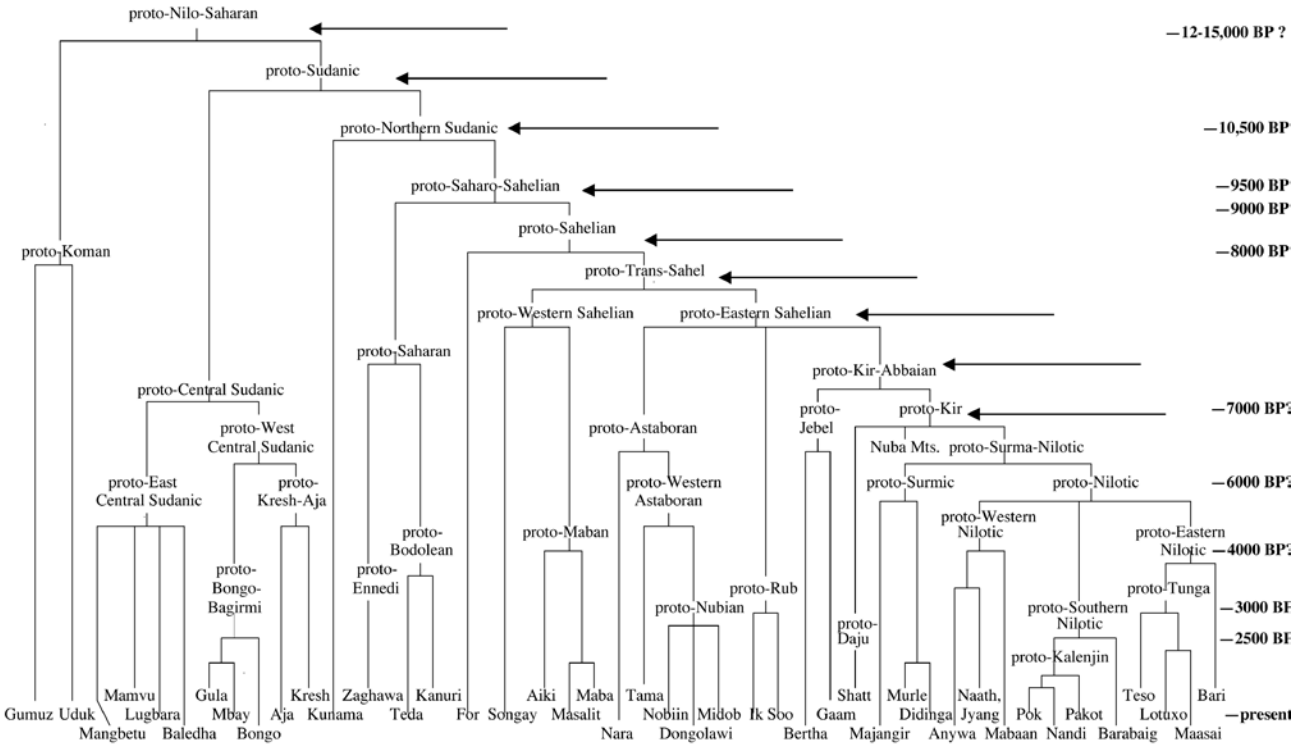


FIGURE 5.2. Nilo-Saharan linguistic stratigraphy.

framework for (1) validating the reconstruction of early Nilo-Saharan root words, including kin terms, and (2) tracing the existence of particular root words back to particular periods (linguistic "strata") in the stratigraphy.

Three additional sections, J, K, and L of Appendix 5.2, depict areally distributed terms—root words for kinship that appear to have diffused among a set of geographically adjacent societies but do not go back the earliest strata of Nilo-Saharan linguistic history. Section J contains terms distributed among a set of languages the speakers of which, in the last several thousand years BC, formed a clutch of interacting societies in the southern parts of the east-central Sahara and the adjacent Sahel zone. Section K adds a term limited to languages of the Nubian and Jebel subgroups of Eastern Sahelian, which were spoken in adjacent areas of the northern Middle Nile Basin for most of the period 400–1500; Section L contains a root limited to just the Rub and Surmic subgroups of Eastern Sahelian, which were formerly spoken in neighboring areas and have a known history of word borrowing from each other (Heine 1976; Ehret 1983, 2003a). The reflexes of the reconstructed kin terms in different Nilo-Saharan languages are presented in a large set of language-specific kin-term diagrams. (These are available at an online adjunct to this chapter: http://www.sscnet.ucla.edu/history/ehret/kinship/african_kinship_data.htm.)

Semantic historical criteria based on the normative directionalities of meaning change in kin terminology guided the reconstruction of the meanings of the root words and the inferring of their semantic histories in different branches and languages of the Nilo-Saharan family. As Ehret (2008) describes at greater length, the fit of kin terms within overall terminological systems limits the directions and varieties of meaning change possible. The basic guideline is this: In general, kin relations with concrete individual referents—father, mother, sibling, and child—can be extended to collateral relations of the same or alternate generations; but the opposite direction of shift, extending a term for a secondary relation to apply to a primary one, does not normally take place. Words for "father" in a great many cultures around the world, for example, have been extended in meaning to include "father's brothers." Once that extension has taken place, the term can extend further, from "father's brother" to "mother's brother," reflecting a cultural shift from a collateral to a generational identification of parent's brothers. But an opposite expansion of the kin category, in which a word originally referring solely to "father's

brother" developed into the primary term for "father," is highly improbable.

Similar constraints govern the directions of semantic extension in the history of cousin terms. An older root word for "sibling" can take on the additional meaning "parallel cousin," and from there can undergo a yet further meaning extension to include cross cousins as well. But the opposite direction of change is not likely to happen. When sibling terms include cousins, we must normally presume the sibling meaning to have been original.

A second normative semantic directionality is from consanguineal to affinal relationships, but not the other way around. If we find, for instance, that the term for spouse's sibling in one language, A, is cognate with the term for cross cousin in a related language, B, we can make two culture historical inferences: (1) the underlying root word originally connoted a cross cousin, and (2) language A at some earlier point in history added the meaning "spouse's sibling" in a social context of customary cross-cousin marriage. Similarly, if a kin term for "father's sister" in one language turns out to be cognate with the term for "spouse's mother" in a second, related language, the inferences again are that the blood relation, "father's sister," is primary, and that a history of cross-cousin marriage characterized the speakers of the language with the meaning "spouse's mother."

The normative directionalities of kin semantic shift can enable historical inference even at two and three removes from the original meaning of a root word. Consider the case of the term for "daughter's husband" (DH) in the Nilo-Saharan language Kunama (see Appendix 5.2, Section A, root 7, for this example). This term is a reflex of the Proto-Nilo-Saharan (PNS) root word for "father's sister" (FZ). Its meaning in Kunama can be taken to imply the existence of two mediating kinship system features at earlier periods in the historical descent of the Kunama language and thus in the social history of the society speaking the language. The former existence of a Crow system of cousin terms would account for an initial extension of the term to "father's sister's child" (FZC) as well as FZ. The presence of customary cross-cousin marriage then accounts for the second shift from FZC to DH, with only the last meaning, DH, preserved down to the present day in Kunama.

Examples of meaning extensions both from one consanguineal category to another and from consanguineal to affinal relations abound in Nilo-Saharan language history, and they allow a complex and extensive recovery of many of the details of Nilo-Saharan kinship history. Appendix 5.2 provides numerous explanatory notes on the semantic and derivational histories of particular roots, and these notes inform the historical arguments in the text. In a number of cases Appendix 5.2 directs attention, as well, to the cultural and social implications of particular meaning changes, and these implications figure prominently in the arguments on marriage and descent in early Nilo-Saharan history.

How did the lexicon of kinship evolve in early Nilo-Saharan, at least the portions of the lexicon that we can currently reconstruct? What does the history of that lexicon imply about developments in kinship among the early Nilo-Saharan-speaking societies?

Figure 5.3 displays the succession of kin terminologies encoded in the reconstructed lexical evidence for the nine successive early periods of Nilo-Saharan history extending from the Proto-Nilo-Saharan (PNS) era down to the Proto-Kir (PKir) society. Its listings of the particular terms present at each stage reveal both changes and long-term continuities in these systems. A question mark following a reconstructed root indicates a provisional semantic reconstruction. Question marks in parentheses identify gaps in the current reconstruction of kin terms. New work and new evidence adds a variety of reconstructed kin terms to, and requires significant correction and revision of, the previously published Nilo-Saharan reconstructions (Ehret 2008; and thus the list of terms given here in Appendix 5.2, and the conclusions drawn from that evidence, differ in major ways).

Parents' Siblings in Early Nilo-Saharan Kinship

A consistent feature that stands out in Figure 5.3 through the earliest periods in Nilo-Saharan kinship history is the ongoing existence of an at least partially bifurcate collateral reckoning of parents' siblings. Leaving aside the relation FB, from the Proto-Nilo-Saharan period down to the Proto-Saharo-Sahelian period, the pattern seems to have been to have separate and distinct terms for the other members of ego's first ascending generation, FB, F, M, MZ, MB, and FZ (see Figure 5.3b for the list of kin term abbreviations used here). For "father's brother" the evidence from the various descent lines in the family suggests that the word "father" may have served to address the father's brother in most of the early stages of Nilo-Saharan history and that in non-address contexts, a compound of the form "father's brother" may have been used. A particular root

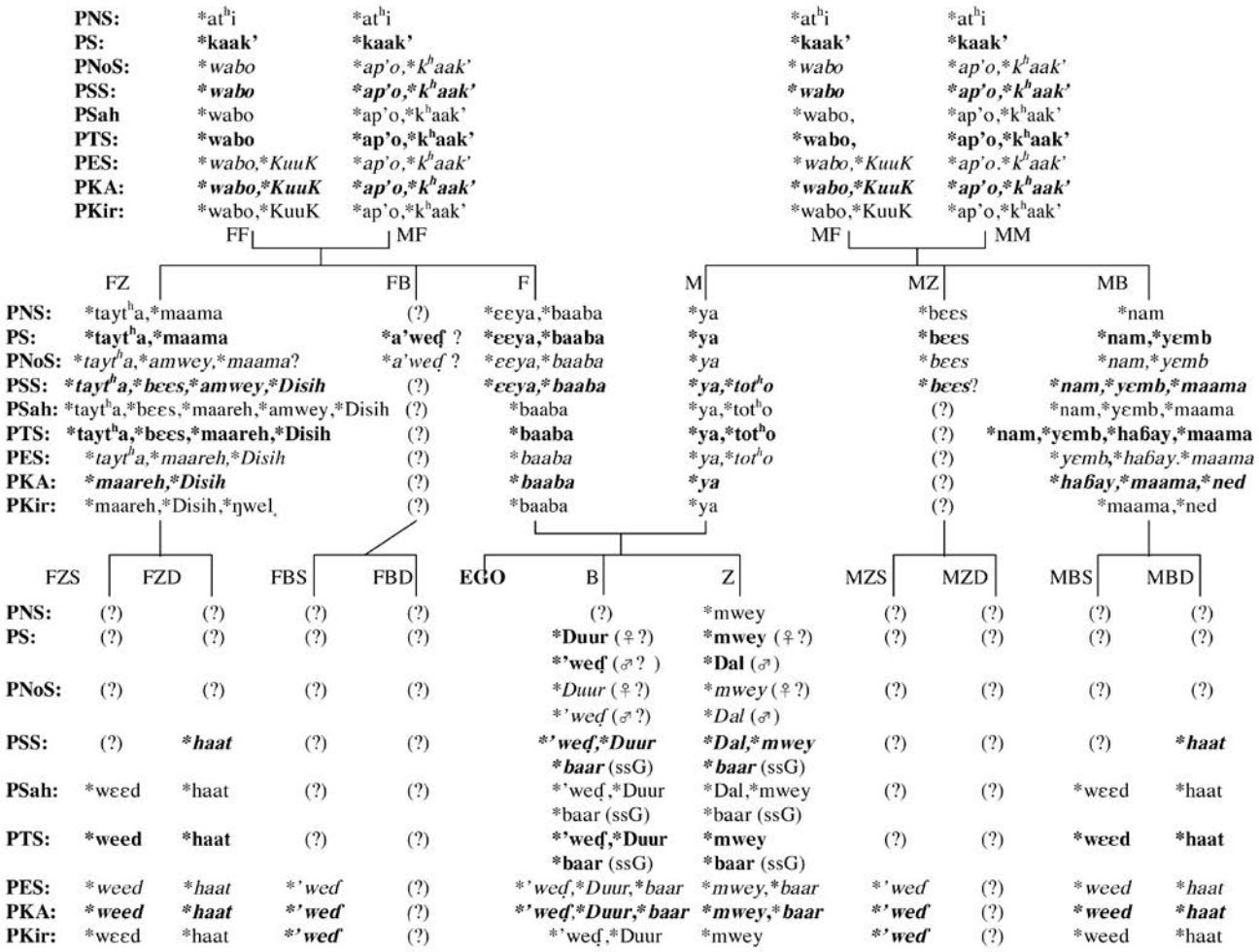


FIGURE 5.3a. Kin terms at nine protolanguage nodes of the Nilo-Saharan family.

word for FB is tentatively proposed for the Proto-Sudanic and Proto–Northern Sudanic nodes. The derivation of this term from an older root word for male sibling (Appendix 5.2, Section B, root 4) suggests that it originated as the abbreviated form of a compound descriptive term, "brother of father." The explanation below of the root *bɛɛs MZ suggests a further wrinkle, that this root may for a time have come to apply lineally to both PZ, bringing into fleeting existence a partially linear system at the Proto-Saharo-Sahelian node.

Interestingly, PNS appears to have had a supplementary root word of PG connotation, *k'wes, denoting the parent's opposite-sex sibling (PxG) relationship in general. Ehret (2008) previously proposed the meaning "father's brother" for this root, but that postulation required convoluted semantic histories. Positing an original meaning PxG for PNS *k'wes far more parsimoniously accounts for its semantic outcomes in the various Nilo-Saharan languages (see discussion, Appendix 5.2, Section A, root 11). Adding to the plausibility of this solution, it turns out that a term of this scope was not just an isolated occurrence of PNS, but seems rather to have been a recurring feature of Nilo-Saharan kin lexicon history. Other terms simultaneously applying to both relationships, FZ and MB, arose in later times along several separate lines of linguistic descent in the family. The social-historical significance of this kind of term is a point we shall return to below.

The reconstruction of PNS *bɛɛs as the root word for "mother's sister," differently from the other PG terms, depends primarily on argument from the directionalities of semantic change in kin terms. The reflexes of *bɛɛs occur in four meanings in present-day languages: (1) as "maternal relative" in general in Uduk; (2) as "matrilineage,

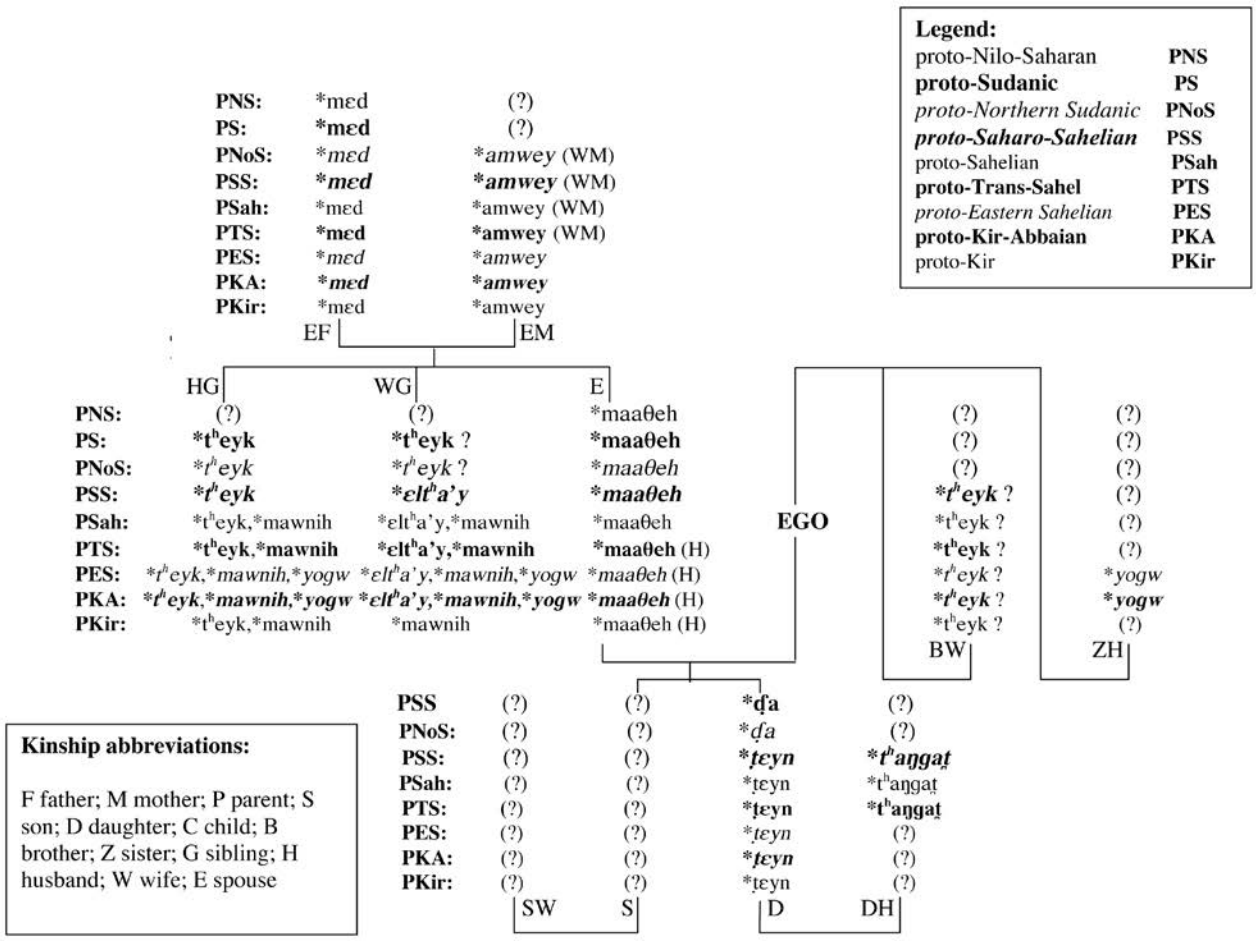


FIGURE 5.3b. Affinal kin terms at nine protolanguage nodes of the Nilo-Saharan family.

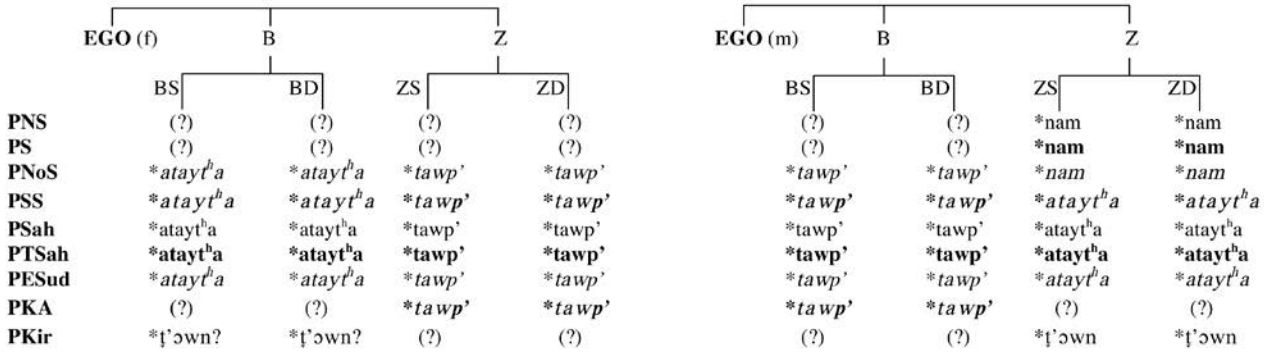


FIGURE 5.3c. Siblings' children terms at nine protolanguage nodes of the Nilo-Saharan family

matriclan" in Kunama; (3) as "father's sister" in the Tibu languages of the Saharan branch of Saharo-Sahelian; and (4) as FZC, MBC (cross cousin) in Songay, of the Sahelian branch of Saharo-Sahelian. The semantic outcomes in Saharo-Sahelian languages are explainable as straightforward outcomes of a Proto-Saharo-Sahelian meaning FZ. The development of a Crow naming system in pre-Songay accounts for the extension of the term to FZC, and a subsequent generalization of the term to both sets of cross cousins explains the modern-day Songay Iroquois cousin reckoning.

How does the meaning FZ connect up with the Uduk and Kunama meanings? If the Proto-Nilo-Saharan application of this root word was to MZ, only one or two simple meaning changes of commonly encountered kinds are required in each deep branch to explain the outcomes, to wit:

(1) in the line of linguistic descent leading to pre-Proto-Saharo-Sahelian, the term *bɛɛs underwent a semantic expansion to include both parents' sisters, MZ and FZ, and was then re-narrowed to just FZ;

(2) in the line of descent leading down to the Uduk language, the term was figuratively extended, via the addition of the PNS *a- attributive prefix, from MZ to all maternal kin.

(3) in the Kunama line of descent, the term was extended to a defined matrilineal institution by addition of the PNS *k^h- definite prefix.

Behind this proposed history lies a further backstory. The original tangible referent of *bɛɛs was "blood." Because tangible referents necessarily precede the metaphors based on them, the meaning MZ must be secondary. Uduk retains both the meaning "blood" and the extension of MZ to "maternal relative" in general. There is one particular belief, present in Uduk (James 1979) and also matrilineal societies in West Africa, notably the Akan, that generates this metaphorical connection in straightforward fashion—the belief that one's blood is transmitted from one's mother. In a quite literal sense the mother and her female kin, in particular, are blood relatives of ego, whereas the father and the paternal relatives are not.

The semantic outcomes of *bɛɛs make historical sense if this idea also existed among the speakers of Proto-Nilo-Saharan. The mediating metaphorical extension in the pre-Proto-Nilo-Saharan language would have been the application of this root word to the mother as well as her sisters (with social-historical implications that we will return to later). Positing a narrowing of *bɛɛs in the PNS language to just "mother's sister" then motivates the proposed alternative trajectories of semantic shift in Uduk of the Koman branch, and in Kunama and Proto-Saharo-Sahelian in the Sudanic branch.

Coincident with the economic shift to a full livestock-raising economy over the 1,000–1,500 years from the Proto-Saharo-Sahelian to Proto-Trans-Sahel periods, ca. 7300–6000 BC, a different striking development appears in the terminology for parents' siblings: the addition of several new synonyms, not for all PG, but for the two opposite-sex PG, "father's sister" and "mother's brother." These additions may reflect a combination of factors:

1. It was a period to some extent of territorial expansion and divergence, with dialect differences emerging, but with the diverging communities still forming an interacting dialect network. This kind of historical situation is one in which new terms innovated in one dialect often spread to other emerging dialects in the network. But that accounts only for the facility with which new terms might spread from one emerging dialect to another. Why was the spate of terminological innovation confined to just PxG?

2. It was also a period of the major growth of movable wealth in livestock. Might the emergence of the new terms have been a response to changes in economic scale of inheritance and in the kin relations of inheritance? As we will see later, the evidence is strong that matrilineal inheritance prevailed right through these periods and beyond.

A second relevant trait persisting through the era was the custom of cross-cousin marriage (see Figure 5.7 and the appurtenant discussions below). With a new kind and quantity of wealth passing through the mother's line—in a context of symmetrical cross-cousin marriage—the existing kin roles of both mother's brother and father's sister would have gained new salience in the governance of inheritance and reproduction. Such historical changes would likely have generated new terms descriptive of those relations. If so, uncovering the imageries and concrete features of such changes will depend on whether future work can discover semantically plausible and culturally instructive derivations of the new terms from older Nilo-Saharan root words.

In later eras a variety of modifications of the original semantic patterning of PG terms took place along different lines of linguistic and social descent. Fully bifurcate merging PG nomenclatures took hold subsequent to the earliest herding and cultivating eras, but still early, in sev-

eral distantly related groups of the family, notably in the Central Sudanic deep branch of the family and probably already in the protolanguage of the Saharo-Sahelian deep branch, and seem likely to have continued as the usual early patterns in the Kir-Abbaian and Western Astaboran subgroups of Eastern Sahelian. Alternative patterns of naming MZ and FZ lineally, with the same term encompassing both, or generationally, with MZ = FZ = M, but with maintenance of FB = F and a distinct "mother's brother" term, developed in a limited areal distribution of Nilotic and Rub languages in the past 3,000 years in the southernmost Sudan and northern parts of East Africa (see Figures 5.4a and 5.4b). Just two Nilo-Saharan languages, Gumuz and Teda-Daza, seem to have changed the earlier Nilo-Saharan pattern into a fully bifurcate collateral naming of parents' siblings, Gumuz in particular by adding distinct terms for FB and MZ. Distinct terms for FB arose also in the Uduk, Kunama, and Zaghawa languages (Figure 5.4a). But in each of these cases the individual word histories reveal that the language had previously gone through a period of fully bifurcate merging terminology, and each language retains the equation M = MZ, left over from that previous regime.

In two languages, Berti and Majangir, geographically distant from each other and belonging to distant sub-branches of the family, the evidence indicates a past period of time in which the same term came to cover both mother's siblings, i.e., MB = MZ; one language, Gaam, currently attests the same semantic equation.

Figures 5.4a and 5.4b trace the histories of change in the PG terminological patterns along each of the various branches of the Nilo-Saharan family tree, as diagrammed in Figures 5.3a, 5.3b, and 5.3c above. The arguments supporting different of these inferred histories appear under the various root entries in Appendix 5.2.

Siblings' Terminologies

The terms for siblings appear to have followed a persistent pattern from an early stage in Nilo-Saharan history down possibly to the Proto–Eastern Sahelian node.

A set of four sibling terms traces to at least the Proto-Sudanic stage. The most probable semantic solution is that the four terms distinguished opposite-sex siblings with respect to speaker—B(♀), B(♂), Z(♀), and Z(♂) (see discussion in Appendix 5.2, Section B, roots 2–4, and Section A, root 6). To this set the Proto-Saharo-Sahelian node added a fifth term, apparently covering the category of same-sex sibling in general (Appendix 5.2, Section D, root 2), but did so without immediately displacing from use the four more-specific terms. The gender-specific semantic reconstructions of the particular root words making up these proposed systems are, at this point, individually tentative. It is, rather, the interlocking patterns in the semantic histories of the roots that support the overall case.

Two additional sibling terms, not included in Figure 5.3a, are equally ancient in the family, one currently traceable to Proto–Northern Sudanic (Appendix 5.2, Section C, root 1) and the other apparently to Proto-Sudanic (Section B, root 5). Given the proposed meanings of the five sibling terms already considered, the remaining sibling application available to these two roots would be age distinction. That proposal is supported by the testimony of the one language, Kunama, that still retains both roots. In Kunama PNoS root 1 denotes specifically "younger sibling" (yG), and PS root 5, "elder sibling" (eG). The combined evidence implies that early Nilo-Saharan had a dual sibling nomenclature, distinguishing brothers and sisters by the sex of the speaker and the sex of the referent, and separately distinguishing them by relative age but without gender distinction. Just such a system in fact still characterizes at least two existing Nilo-Saharan languages, Zaghawa and For.

Parents' Siblings' Children Terminology in Early Nilo-Saharan

In contrast to the amount of lexical evidence relating to the reconstruction of sibling and parents' siblings terminologies, the evidence for early cousin nomenclature is much more fragmentary. The separate developments in a majority of the modern-day Nilo-Saharan languages of either Hawaiian, partially Hawaiian, or Sudanese cousin naming systems (see Figures 5a and 5b)—in the one case calling all cousins "brother" and "sister," and in the other case applying separate terms, usually but not always descriptive, to each kind of cousin—means that many language groups do not preserve any old Nilo-Saharan root words of original, specifically cousin reference. The result of the shift of so many Nilo-Saharan languages to these patterns is the loss of much potential evidence for reconstructing earlier cousin systems.

It is nevertheless likely that Iroquois cousin naming was the prevalent early pattern in Nilo-Saharan history. Two particular old Nilo-Saharan root words, *haat and *wɛɛd (Appendix 5.2, Section D, root 5, and Section A, root 5), are argued to have expressed the meanings "female cross cousin" and "male cross cousin" at or before

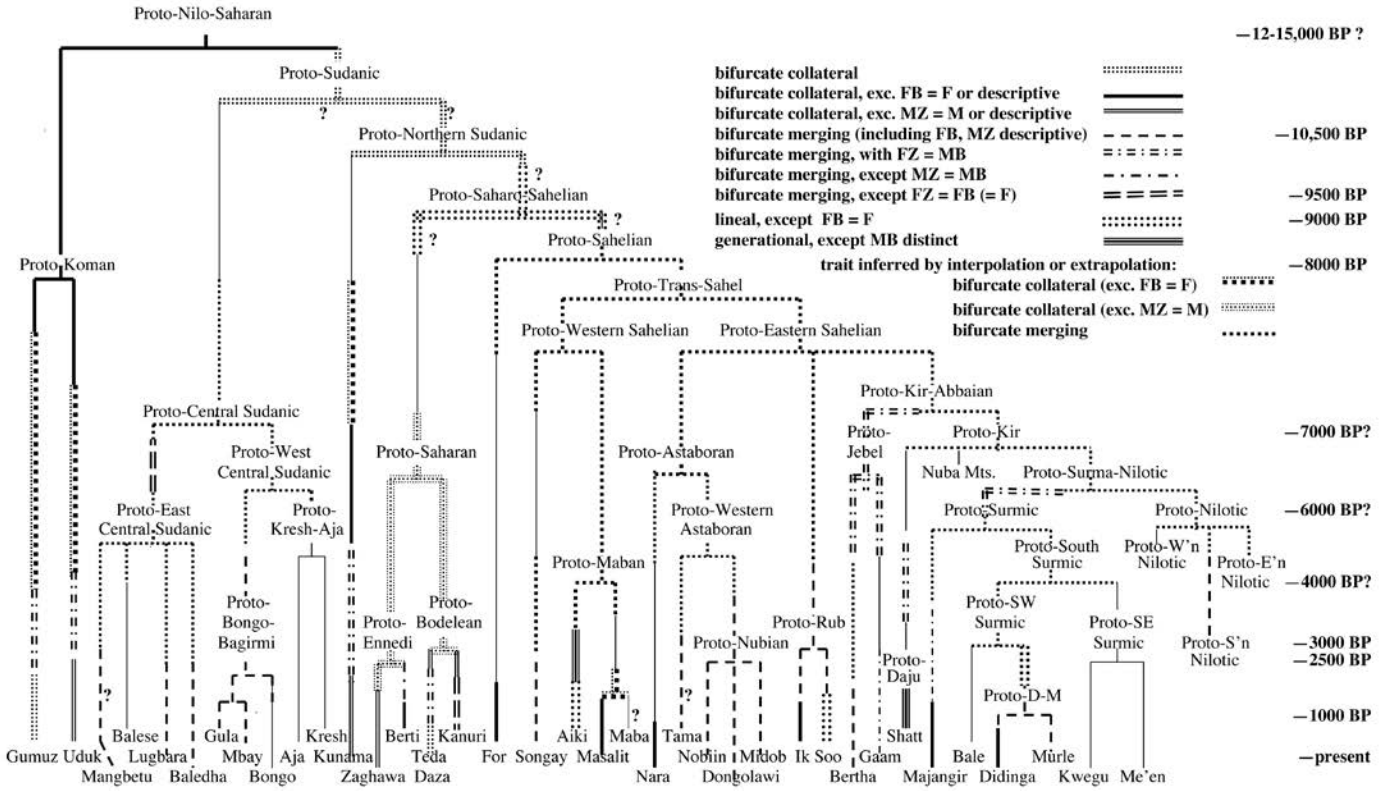


FIGURE 5.4a. History of parents' siblings' terminology in Nilo-Saharan.

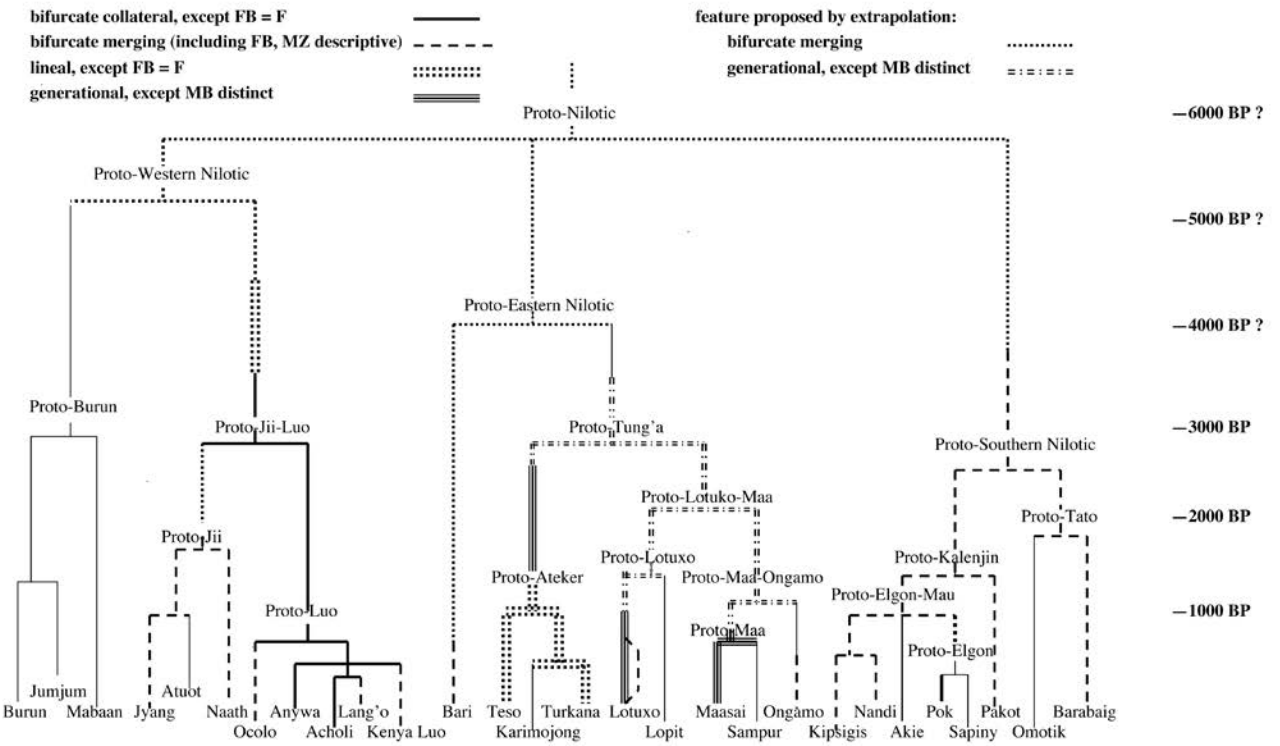


FIGURE 5.4b. History of parents' siblings' terminology in Nilotic subgroup.

the Proto-Saharo-Sahelian node on the Nilo-Saharan family tree (Figure 5.2). The criteria of normative directions of semantic change in kin terms are crucial to the argument, because the majority of the preserved reflexes of both roots in the Saharo-Sahelian languages today express various derived same-generation affinal meanings, such as "wife's brother" (WB) or "brother's wife" (BW), or sometimes "wife," for which the connecting semantic link is the cross-cousin relationship in a context of preferential cross-cousin marriage. Only one language fully preserves the proposed original application to female and male cross cousins. Appendix 5.2 presents the fuller evidence and arguments on these points.

It seems probable as well, although on the grounds of comparative ethnographic distribution rather than directly from lexical reconstruction, that the existence of Iroquois cousin reckoning can be pushed back still earlier to Proto-Nilo-Saharan. As Figure 5.5a reveals, all three lines of Nilo-Saharan language descent, connecting to Proto-Saharo-Sahelian at successively earlier stages in time, also either have Iroquois cousin terminology today or formerly had Iroquois or else Crow systems, which themselves commonly derive from Iroquois. The Kunama language, the next nearest relative of Saharo-Sahelian, preserves evidence of a formerly Crow reckoning of cousins (Appendix 5.2, Section A, root 7). Iroquois reckoning is reconstructed for Central Sudanic (Appendix 5.1) and recurs also today in both the Gumuz and Western subbranches of the Koman primary branch, which derives from the earliest divergence of all in the family. Evidence of earlier Crow terminology in Gumuz (Appendix 5.2, Section A, root 10) favors a previous, still earlier period of Iroquois nomenclature along the Gumuz line of descent as well. A conclusive projection of Iroquois kinship back to the Proto-Nilo-Saharan period, by reconstructing specific terms for cross cousins in PNS or in Proto–Northern Sudanic (PNoS), the intermediate common ancestor of the Kunama and Saharo-Sahelian divisions, is not yet and may never be possible, but extrapolating back from the existing reconstructions strongly favors that conclusion. Distinct terms for "cross cousin" are required, in any case, by the strong evidence of cross-cousin marriage back to the Proto-Nilo-Saharan society (see below).

One related issue should be kept in mind. With respect to first cousins, Iroquois and Dravidian terminologies coincide. What is usually lacking in the cases of reported or observed Iroquois reckoning in Nilo-Saharan is evidence for the terminology of descending generations of cousin relationships, so the possibility that Dravidian rather than Iroquois kinship existed here and there in early Nilo-Saharan periods cannot be ruled out (as Hage [2006] argues for the Yao and some other Bantu peoples of the Niger-Kordofanian language family). The pervasive presence of cross-cousin marriage in early Nilo-Saharan eras would, of course, fit this possibility as well.

Sibling's Children Terminologies

Reconstructing early Nilo-Saharan root words denoting nephews and nieces comes up against some of the same problems as for cousin nomenclatures: a wide tendency toward descriptive, linear, or generational patterns in modern-day descendant languages and, more than for cousin terms, gaps in the ethnographic collections of the terms for these categories.

A scatter of data, however, indicates that a bifurcate merging classification of one's siblings' children was the original Nilo-Saharan pattern. With respect to cross nieces/nephews, evidence from languages descending from the three earliest nodes of the Nilo-Saharan family tree—Uduk of the Koman primary branch, certain languages of the Central Sudanic group, and Kunama of Northern Sudanic (see Figure 5.2)—supports the proposition that the PNS root term for mother's brother applied reciprocally to male ego's sister's child (see Appendix 5.2, Section A, root 7). From at least the Proto–Northern Sudanic node, a parallel reciprocal application of the PNS root word for "father's sister" to "female ego's brother's child" is probable also (Appendix 5.2, Section C, root 2). Since the equivalent reciprocal naming of both sets of "cross" nephews/nieces would best make sense as poles of a culturally concurrent system, it may well be that the FZ = BC(♀) equation also goes back the PNS period; however, direct evidence for this particular equation earlier than Proto–Northern Sudanic is as yet lacking in the available sources.

As for the complementary positions of parallel niece/nephew ZC(♀) and BC(♂), in a bifurcate merging system these are equated with ego's daughter/son. There in fact exists a root word reconstructed to the Proto–Northern Sudanic node the modern-day semantic outcomes of which are most parsimoniously explained if it originally had just that set of meanings (Appendix 5.2, Section C, root 3). The combined evidence thus favors projecting bifurcate merging classification of sibling's children at least to Proto–Northern Sudanic and probably to the two earlier stages in Nilo-Saharan kin history as well.

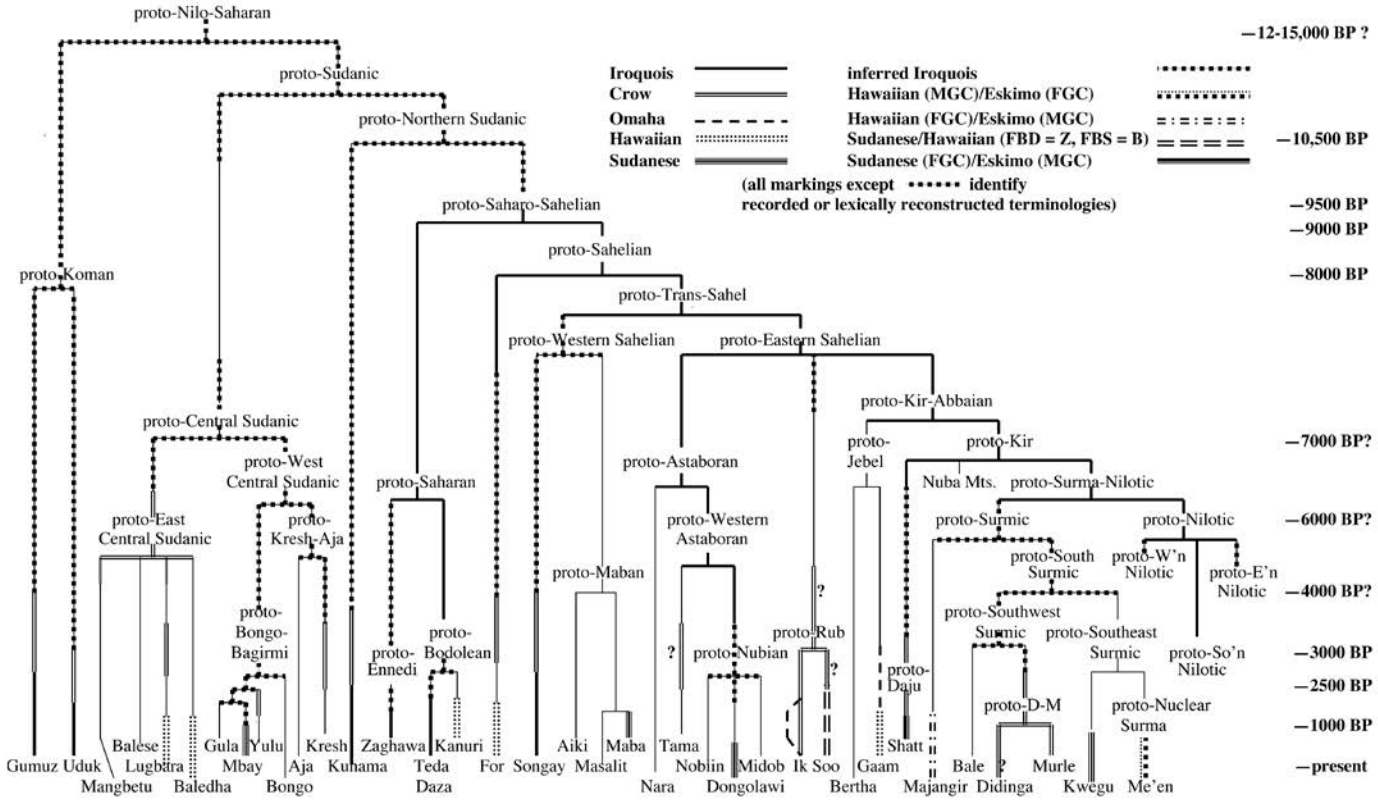


FIGURE 5.5a. Cousin terminology in early Nilo-Saharan history.

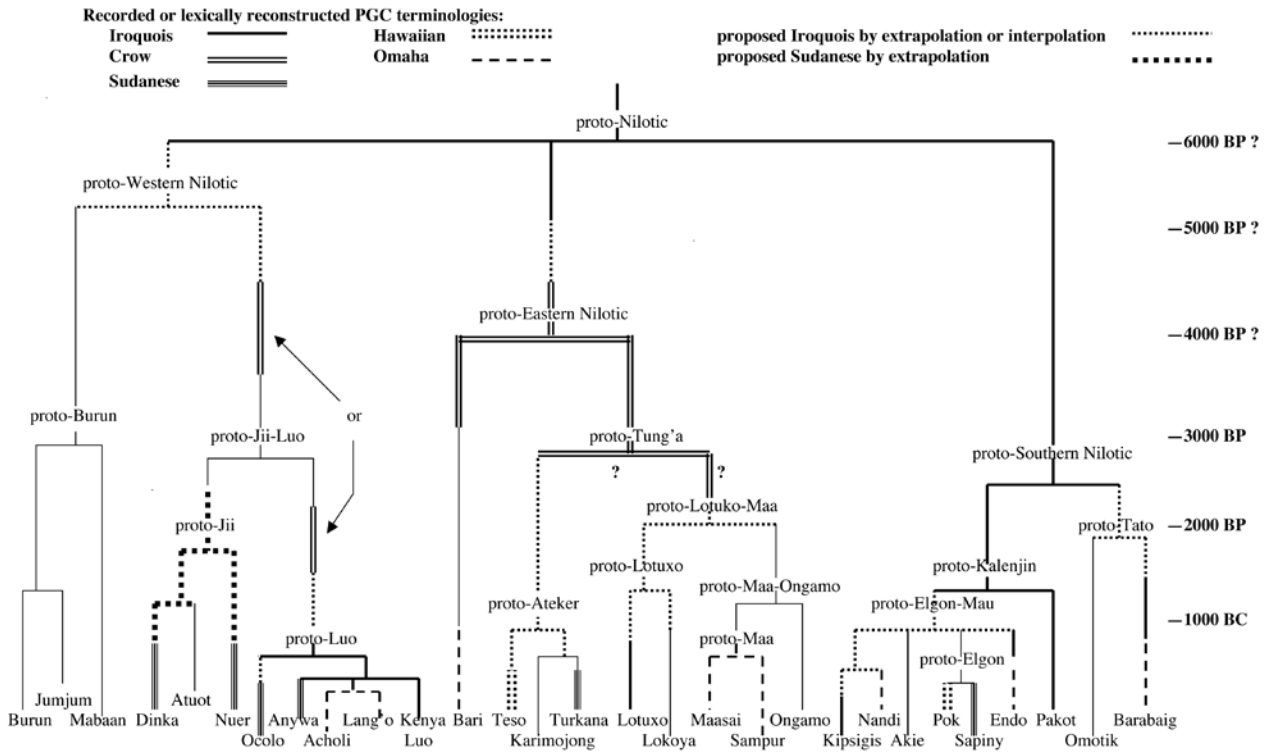


FIGURE 5.5b. History of cousin terminology in Nilotic subgroup.

New sets of terms expressive of bifurcate reckoning of nephews/nieces, most often of the merging variety, arose numerous times in the evolution of the branches and subgroups of Nilo-Saharan (solid single lines in Figures 5.6a and 5.6b represent bifurcate merging; solid double lines, bifurcate collateral). These data imply that a bifurcate merging conceptualization of the siblings' children relationship was a long-persisting cultural tendency in the family, in keeping with the reconstruction of Iroquois (or possibly Dravidianate?) nomenclature far back in Nilo-Saharan history.

Cross-Cousin Marriage in Early Nilo-Saharan History

The Nilo-Saharan kin lexicons, in addition, provide extensive evidence revelatory of earlier marriage patterns. In particular, the histories of terms for in-laws in different branches and subgroups of the Nilo-Saharan family reveal the formerly wide presence of symmetrical cross-cousin marriage practices. In Lugbara, for example, the term for "spouse's mother" (EM) derives from an older Nilo-Saharan root word for "father's sister." This meaning shift makes sense only in a cultural context in which one's spouse customarily was the child of one's actual or classificatory father's sister; i.e., was one's cross cousin or classificatory cross cousin. Comparable instances, in which the derivations of affinal kin terms imply cross-cousin marriage, occur in languages belonging to all the deep branches of the family and in most of the narrower subgroups of those branches.

The multiple lines of evidence combine in implying that cross-cousin marriage was a persistent feature over the very long term of Nilo-Saharan history. The last column of Appendix 5.1 cites twenty-six specific instances in which the semantic derivations of affine terms reveal the former presence of this custom in different languages, subgroups, and branches of the family. The semantic notes in Appendix 5.2 on particular root semantic histories present the specific arguments for nearly all of these cases. A few instances, based on root words of shallow time depth in the family, are explained in the fourth column of Appendix 5.1. The East Central Sudanic evidence locates this custom at or before the Proto–East Central Sudanic period, as well as separately attesting its continuing preservation into much later times in at least two of the four branches of East Central Sudanic (Appendix 5.1). The lexical evidence also separately argues for cross-cousin marriage in the Proto–Northern Sudanic society of ca. 8000 BC. Separate evidence attests the preservation of this trait recently in time in each of the deep sub-branches of Eastern Sahelian. The custom eventually widely lost currency, notable exceptions being the Nubian group and For (Appendix 5.1; also Figure 5.7), which preserve the trait.

An additional lexical signature of cross-cousin marriage, arising in multiple instances in the course of Nilo-Saharan linguistic history, was the existence of single terms covering both "father's sister" and "mother's brother." The social link between FZ and MB is that both are potential parents-in-law in the social-historical context of cross-cousin marriage. When a term specifically for PxG is present, it is prima facie evidence of contemporaneous, or the former existence of, cross-cousin marriage. As Appendix 2.1 reveals, and Figure 5.7 illustrates, PxG category terms were independently innovated in at least eight, and possibly nine, widely differing eras of time along often distantly related lines of Nilo-Saharan language descent: in the Proto–Northern Sudanic language; later, but still thousands of years ago, in Proto-Surmic; separately and much more recently in the Teda-Daza and in the Ennedi subgroups of the Saharan sub-branch of Saharo-Sahelian and in the Daju subgroup of Eastern Sahelian; and at uncertain times in the lines of descent leading down to Songay and Kunama, and also to Uduk and probably Gumuz of the Koman primary branch of Nilo-Saharan. The most notable point about the histories of these PxG terms, revealing that symmetrical cross-cousin marriage rules operated, is that the PxG terms arose in some cases through the generalization of terms originally connoting MB and, in other cases, of terms originally meaning FZ (for examples, see Appendix 5.2, Section A, roots 7, 8, 10, and 11; Section D, root 4; Section E, root 3; Section F, root 2; and Section I, root 2).

A different marriage preference pattern, sister exchange, today characterizes peoples of both the Gumuz and Koman branches of the Koman primary branch of Nilo-Saharan. At least one Eastern Sahelian people, the Bertha, who have long resided in the cultural sphere of Koman groups, and whose language contains Koman loanwords indicative of notable Koman influences (Ehret 2001b), also have adopted this custom. But the linguistic evidence of the separate development of PxG terms at earlier periods in both Gumuz and Western Koman, and in the Proto-Jebel language, ancestral to Bertha, as well

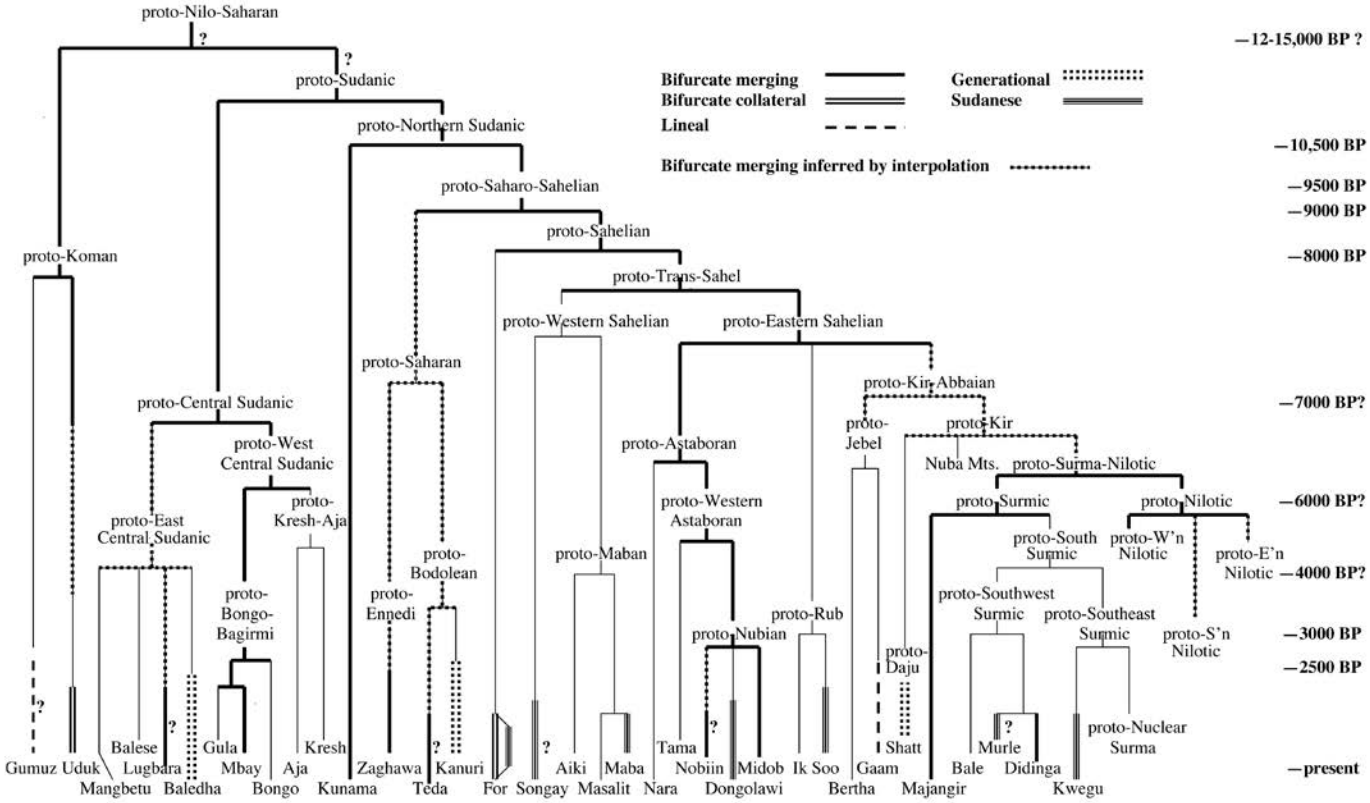


FIGURE 5.6a. Sibling's children terminology in Nilo-Saharan history.

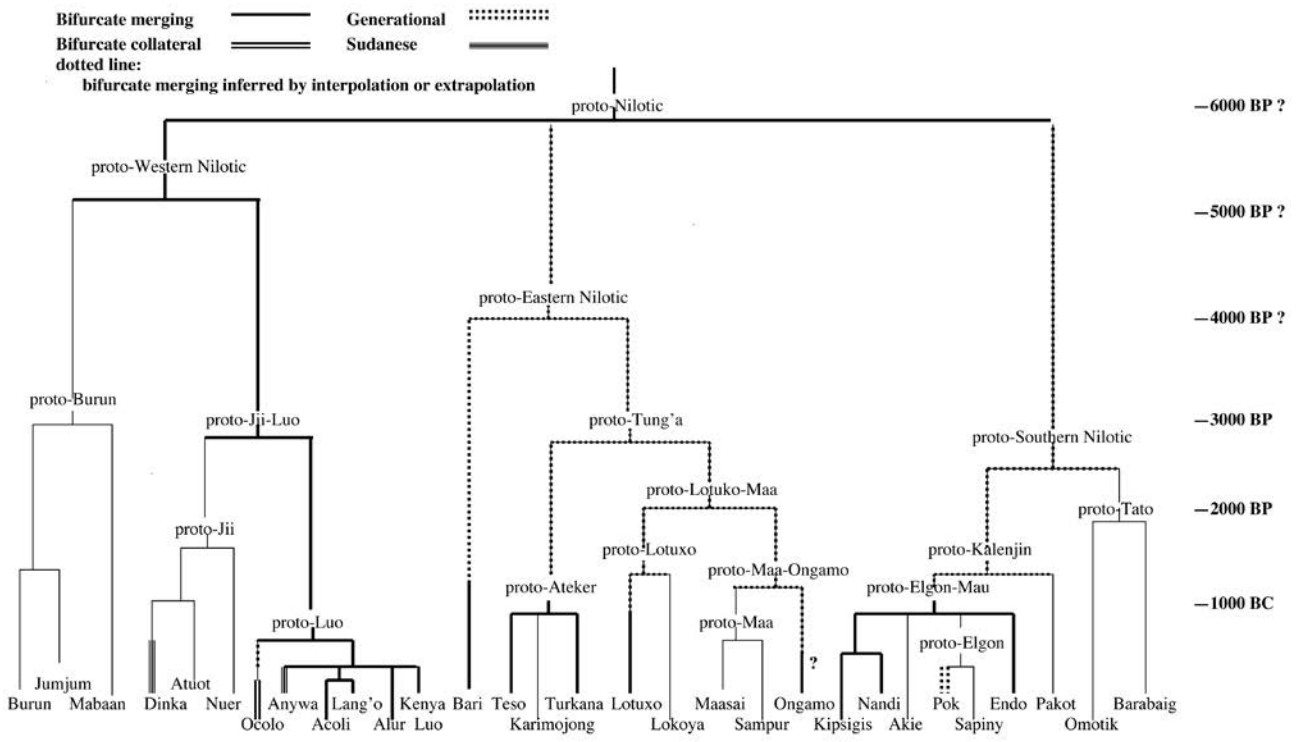


FIGURE 5.6b. Sibling's children terminology in Nilotic history.

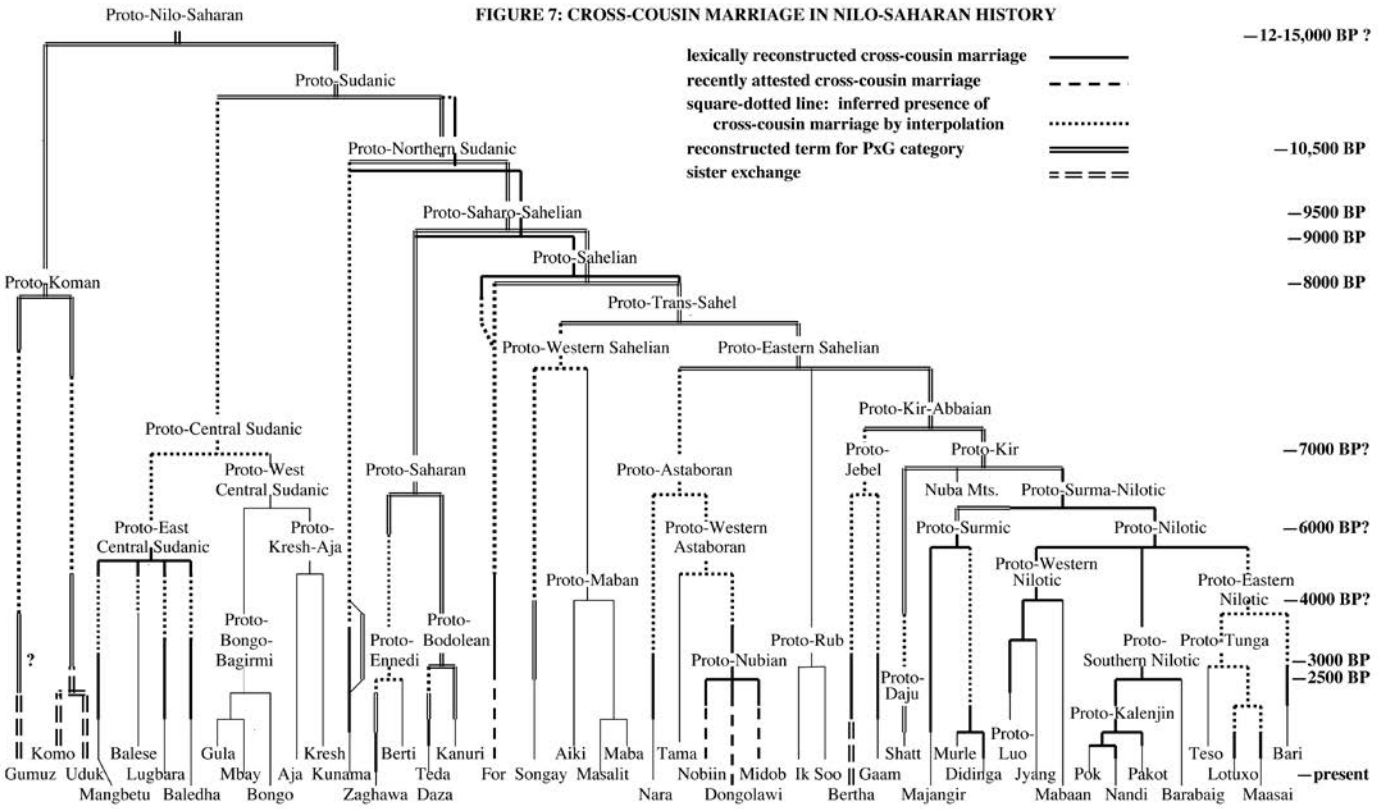


FIGURE 5.7. Marriage patterns in Nilo-Saharan history.

as indirect Bertha lexical testimony (Appendix 5.2, Section F, root 3), implies that once upon a time, cross-cousin marriage existed in all three of these divisions of the family as well.

Finally, if the reconstruction of the meaning PxG for PNS *k'wes (Appendix 5.2, Section A, root 11) is correct, then the existence of cross-cousin marriage not only was formerly prevalent across the family, but reconstructs specifically back to Proto-Nilo-Saharan.

Unilineal Descent in Nilo-Saharan History

The developments in Nilo-Saharan kin terminology comport with the comparative ethnographic evidence in suggesting the ancient prevalence of another notable feature among Nilo-Saharan peoples: matrilineal descent.

Matrilineal institutions and descent reckoning persist in relict occurrences in each of the deeper branches of the family. The Uduk and other peoples of the Western sub-branch of the Koman primary branch of the family are matrilineal in descent and inheritance. The Gumuz of the other Koman sub-branch, though apparently patrilineal today, were recorded as matrilineal in the earlier twentieth century (Hilke and Plester 1955). Matrilineal descent persists also in a considerable variety of populations whose languages belong to distant subgroups of the Northern Sudanic branch. The Kunama, whose language constitutes one of the two primary divisions of Northern Sudanic, are matrilineal. In the Astaboran subgroup of Eastern Sahelian, the evidence of the previous prevalence of matriliny is pervasive. The Nara, who form one primary branch of Astaboran, are to this day matrilineal, and the presence of matriliny among at least one modern-day Nubian people, the Midob, along with the historical indications of earlier matrilineal institutions among the Nile Nubians, favors the reconstruction of this kind of descent in the Proto-Nubian society of the second or first millennium BC. In the Kir-Abbaian subgroup of Eastern Sahelian, matrilineal descent and inheritance were present until recent times, and may still be current, among the Bertha and at least certain of the Daju group.

A second widespread indicator of former matriliny among Nilo-Saharans is the presence today or the existence in former times of Crow systems in languages belonging again to several deep branches of the family, including Gumuz of the Koman branch and the Kunama and Saharo-Sahelian primary branches of Northern Sudanic (see Figure 5.5a and Appendix 5.1). At least one subgroup of Eastern Sahelian peoples, the Murle, and

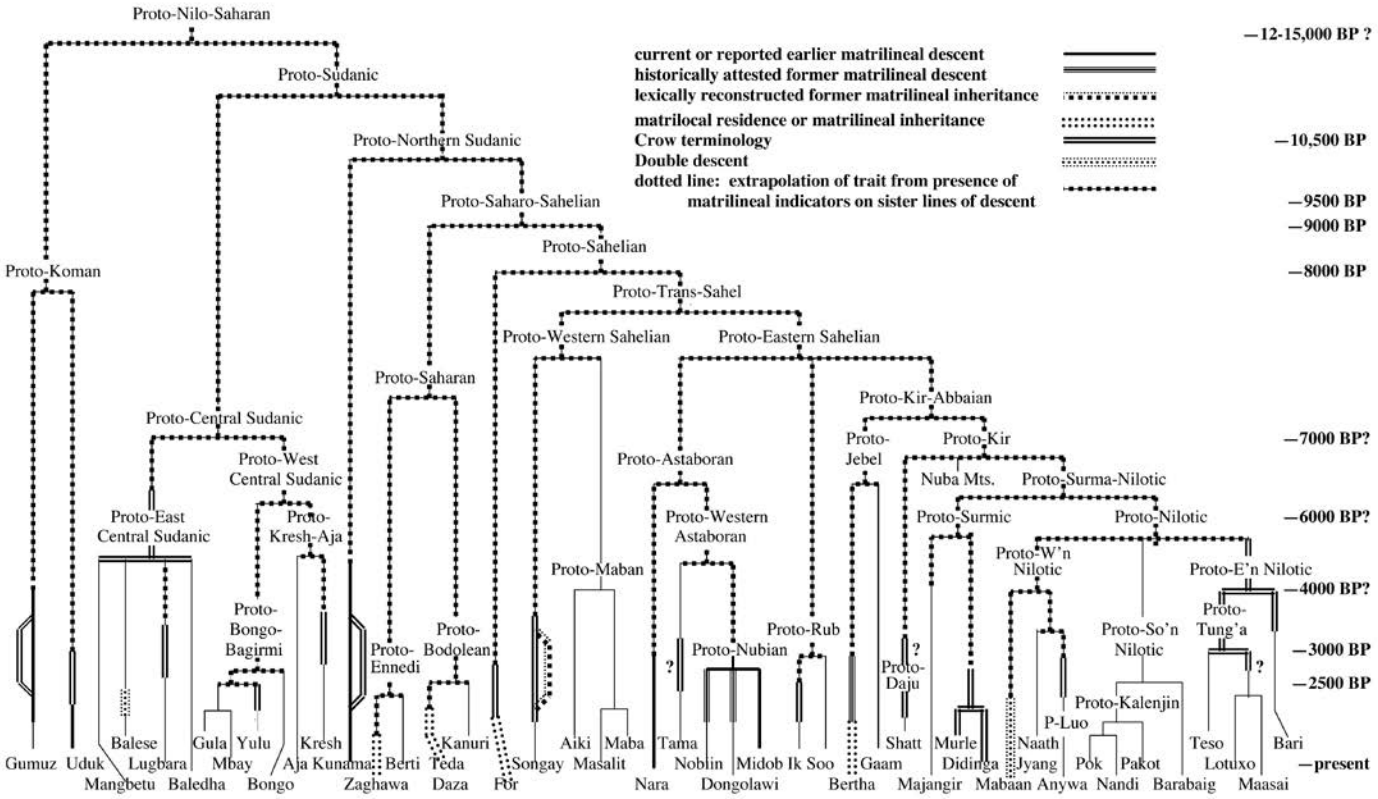


FIGURE 5.8. Matrilineal descent in Nilo-Saharan history.

probably the closely related Didinga, follow Crow reckoning today and have done so probably for centuries (Appendix 5.2, Section I, root 2), and another people, the Ik of the Rub subgroup of Eastern Sahelian, maintain a partial Crow terminology. This terminology is characteristic of matriliny, and when it persists in a patrilineal society, it implies the former presence of matrilineal descent (Murdock 1949, 1959a). Songay, for which the naming evidence indicates a former Crow system (Appendix 5.2, section A, root 12), also contains a different kind of lexical datum directly revelatory of former matrilineal descent: its noun for "male ego's sister's child," *túbéy*, derives from the verb *túbú* 'to inherit,' overtly showing that the Songay people in earlier times followed a matrilineal rule of inheritance, MB to ZC.

Other Nilo-Saharan societies maintain indirect indications of possible former matrilineal descent. The For pattern of settlement in matrilocal extended families suggests, as in other such instances, the relatively recent existence of matrilineal principles there (Murdock 1959a, 143). Among the Teda and some Zaghawa-related people of the Saharan sub-branch of Saharo-Sahelian, the custom of an initial period of matrilocal residence after the marriage, Murdock (1959a, 130) suggests, also makes sense as a feature left over from an earlier matrilineal era. Double descent, another social indicator of prior matriliny, occurs among the Mabaan of the Western branch of the Nilotic branch of Kir-Abbaian (James 1988, 160). Although historically recent influences from the nearby matrilineal Koman might be suspected in this case, the existence of a unique Mabaan lexeme for "matrilineage" favors an older provenance for this custom.

Figure 5.8 depicts the combined distributions in the various branches of Nilo-Saharan of modern-day matriliny and of features indicative of former matriliny. Every successive diverging line of descent from Proto–Northern Sudanic down to Proto-Nilotic leads down to one or more societies in which those indicators are present or can be reconstructed to a previous historical stage. The consistency of this evidence builds a strong foundation for extrapolating matrilineal descent back to at least the Proto–Northern Sudanic society. The continuity of this progression back in time is broken only at the intervening Proto-Sudanic node between the Proto–Northern Sudanic and Proto-Nilo-Saharan periods by the lack of any indicators as yet of former matrilineal descent among the

today universally patrilineal peoples of the Central Sudanic branch.

Did unilineal kinship of a matrilineal kind already exist among the Proto-Nilo-Saharans and simply get replaced by patriliny in Proto–Central Sudanic, or did it develop separately in Koman and Proto–Northern Sudanic? In deference to Ockham's razor, one should not unduly multiply such events. The presence of matriliny in both the deep branches of Nilo-Saharan, as shown in Figure 5.8, and the recurrent evidence of former matriliny in Nilo-Saharan societies no longer so organized are most parsimoniously accounted for by simply tracing matriliny back to the original society. An alternative, but less parsimonious, possibility is that bilateral descent existed down to the second stratum in Nilo-Saharan linguistic history, Proto-Sudanic. If so, three separate creations of unilineal institutions must be postulated: of matrilineal descent separately in the Proto-Koman and in the Proto–Northern Sudanic societies, and of patrilineal descent by the Proto–Central Sudanic people.

This alternative proposal, with a separate development of matriliny at the Proto–Northern Sudanic period, although less economical, intriguingly would situate the development in a period of major change in the material circumstances of life. According the lexical and correlative archaeological evidence (Figure 5.1), the Proto–Northern Sudanic people, beginning around 10,500 BP, set in motion the shift from foraging to food production. By greatly increasing the amount of food that can be extracted from the same amount of land, food production tends to lead to both growth of population overall and growth in the sizes of local communities—and thus to the need for more formal institutions of cooperation and cohesion. In this situation the reconstitution of obligations to small-scale, personally known kin into the relations of unilineal descent would create persistent integrative institutions out of what would otherwise be continually dispersing and dissolving kin links as population grew and expanded with the adoption of the new economy.

The most parsimonious explanation—that unilineal matriclan organization goes back to Proto-Nilo-Saharan—cannot, on the other hand, be ruled out. Two classic accompaniments of matrilineal descent—cross-cousin marriage and Iroquois kin systems—favor that possibility, because both appear likely to have been present in Nilo-Saharan culture back to the Proto-Nilo-Saharan society. Hunter-gatherer societies of more recent millennia, especially those in more productive foraging environments, have not all been bilateral. The Dahalo of the Kenya coast, who were organized in patrlineal clans, come immediately to mind (Ehret, unpublished fieldwork), as do a variety of matrilineal and patrilineal California Native American societies. If the Proto-Nilo-Saharan society, in existence significantly before 11,000 BP, was already matrilineal in descent, its people would likely have exploited a relatively productive set of environments, able to support a denser population than most parts of Africa, despite the Terminal Pleistocene having been a period of very dry environments and low productivity in many parts of the African continent. Reliance on the aquatic food resources of the Nile and its tributaries in what is today the southern and eastern Sudan may have been that adaptation.

If the core social component in the local communities of the pre-unilineal foraging stages of Nilo-Saharan history was a group of women closely related on the maternal side, mothers and their adult daughters—as the Grandmother Hypothesis supposes—the emergence of unilineal descent of a matrilineal kind would be a natural outgrowth of the expansion of formerly smaller and more localized societies. A challenging task would be to seek out linguistic "signatures" of the former presence of such "sororal groups," to use Christine Saidi's (2010) term. The most direct evidence, of course, would be a reconstructed old root word specifically denoting such an institution. If we look outside the Nilo-Saharan family, the ethnographic descriptions of twentieth-century observers reveal that among the matrilineal, Bantu-speaking Sabi (Bemba-related) peoples of Zambia, just such a sororal group typically constituted the core social unit of the local farming village. As Saidi's (2010) investigations show, a reconstructed older Bantu term for the sororal group traces its formal existence and its social authority far back in time in the linguistic history of the region.

If sororal coalitions persisted in any of the more recent Nilo-Saharan societies, it is not immediately apparent from the anthropological literature. One bit of indirect evidence, however, already considered in the discussion of parents' siblings terminology, suggests the possibility that groups of this kind may have been recognized social actors in the earliest periods in Nilo-Saharan history, even if everywhere lost today. The PNS root word *bɛɛs 'mother's sister,' it has been argued (Appendix 5.2, Section A, root 12), took on its kin meaning via a logically prior metaphorical extension of its tangible meaning "blood" to the social category comprised of "ego's mother" and

"ego's mother's sisters," a core element of the maternal kin unit as envisioned in the Grandmother Hypothesis. If the arguments as to the history of PNS *bɛɛs are correct, they would imply the presence of maternal female coalitions in the immediate pre-Proto-Nilo-Saharan and perhaps Proto-Nilo-Saharan eras.

Two other old roots words dating to at least the Proto–Northern Sudanic and Proto-Trans-Sahel nodes, respectively (Appendix 5.2, Section C, root 8, and Section F, root 3), appear also, from their range of meanings in modern-day languages, to have connoted women of the category of closely related, female matrilineal kin. Were these simply familiar terms of address for women of those sorts of relationship to ego, or did they originally denote the specific existence of a more formally constituted social category, the sororal group, of close female maternal kin with social authority in early Nilo-Saharan eras? Are there other kin-connected terms and terminologies still to be identified that might aid and inform in exploring such issues? Definitive answers will not be easy to come by, but the questions are worthy of addressing, not just for Nilo-Saharan, but for other language families as well.

Implications and Conclusions

From a variety of angles, then, the study of the Nilo-Saharan language family affords new vistas into the potential contributions of linguistic historical reconstruction in uncovering kin relations and kin institutions far back into the past. The Proto-Nilo-Saharan society, dating well before 11,000 BP, had bifurcate, at least partially collateral, terminology for parents' siblings. Very early in Nilo-Saharan history, unilineal descent of a matrilineal type took hold: either as two separate developments, one in the Koman branch and the other in the Proto–Northern Sudanic society, or already at the Proto-Nilo-Saharan period. Iroquois cousin terminology reconstructs equally far back in Nilo-Saharan history. Cross-cousin marriage seems especially likely to have been a Proto-Nilo-Saharan feature. These institutions and structures persisted for thousands of years, in some cases lasting down to the present day.

The long-term trends in different branches of the family have led separately to the adoption of patrilineal descent in more recent ages in many of the Nilo-Saharan societies, with only some scattered preservations of full matriliny. Among Nilotic-speaking peoples, the shift from matriliny to patriliny is general today, except for the apparently remnant occurrence of double descent among the Mabaan of the Burun subgroup. One might attribute the patrilineal changeover to the Proto-Nilotic period of 6,000–5,000 years ago were it not for the Mabaan case and for the inferential evidence of earlier Crow kinship in the line of descent leading to Bari of Eastern Nilotic. Together, these indicators suggest that matrilineal descent and inheritance lasted beyond the Proto-Nilotic era and separately gave way to patriliny at different, still undetermined times in the three branches of Nilotic.

Outside the Nilotic subgroup, the shift to patriliny has often been relatively recent in a historical sense. The Songay and the Didinga-Murle, because of the strong relict indications of matriliny in their languages, may be examples of changeover during the past 1,000–1,500 years, as apparently were the Nubian speakers of the Nile. A visitor traversing the Nilo-Saharan-speaking areas of the Sahara and Sudan 3,000 years ago, from the Blue Nile to the great Bend of the Niger, would likely have encountered more matrilineal than patrilineal societies, although today the situation would be quite the reverse.

Subsequent to the various shifts to patriliny, Hawaiian, Sudanese, and—among some of the southeasterly Nilo-Saharan-speaking peoples—Omaha cousin naming systems separately developed in a large number of cases. The histories of these terminologies are in accord with the other indications of relatively shallow time spans for patriliny in many Nilo-Saharan areas. Sudanese terminologies occur only with patrilineal descent, and Omaha specifically with strong patriliny. Hawaiian terminology co-occurs in the world normally with bilateral or patrilineal descent. In the Gaam language it accompanies bilateral descent, but in the rest of its current-day Nilo-Saharan occurrences it goes with patriliny. Except possibly for the East branch of Central Sudanic and the Jii group of Western Nilotic, these patriliny-associated cousin terminologies characteristically appear as separate developments along shallow linguistic descent lines in particular languages, or particular subgroups of closely related languages, probably extending back no deeper than the past 1,500 years. Among the Luo of Western Nilotic, whose histories are relatively well known (Crazzolara 1950–54, Ogot 1967, and Atkinson 1994, among others), the separate developments by different daughter societies, variously, of Sudanese, Hawaiian, and Omaha systems, replacing an original Proto-Luo Iroquois terminology specifically date to the period 1400–1800 AD (Figure 5.5b).

The history of matriliny in the Nilo-Saharan family, covering a far longer time span than the usual testimony available for theory building, raises significant issues for debates on unilineal descent—and on matrilineal de-

scent in particular. Matriliny appears from the evidence to have persisted not only for thousands years in most Nilo-Saharan lines of deep linguistic descent, but to have prevailed despite widely differing histories of social and economic change among the speakers of the languages involved. The archaeology of the period of the incipient shift to a pastoral economy, identified with the Proto–Northern Sudanic period in the linguistic record, indicates that the economy of that era may well have included extended male absence, a trait argued by Hage and Marck (2002) to favor matriliny, with men away tending their animals in distant pasturing areas. But the archaeology of the immediately succeeding period, with its evidence of settlement in complex homesteads, implies a shift away from that pattern already as early as the late eighth millennium BC (Figure 5.1). Nilo-Saharan history provides examples, in addition, of matriliny coupled with the expansion of peoples over wide swaths of land (cf. the ideas of Divale [1984]), notably during the 1500-year era of pastoral expansion across the southern Sahara and the Sahel beginning around or after 6000 BC. But matrilineal descent thereafter proved to be an equally resilient long-term feature in the sedentary mixed-farming and herding societies of the succeeding ages.

Holden and Mace's (2003) thesis, relating to Bantu peoples in eastern and southern Africa—that the adoption of cattle raising impels a shift toward patriliny—does not seem well supported by the Nilo-Saharan cases. Cattle raising, on a considerable scale in some instances, coexisted for thousands of years with matrilineal inheritance among the peoples of the Northern Sudanic branch of the family. The Nubians, whose ancestral society of the second or first millennium BC was apparently strongly pastoral (Thelwall 1982, Adams 1982), nonetheless maintained matrilineal descent. Even the Proto-Nilotes, whom the linguistic evidence suggests were strongly cattle focused in their economy (Ehret 1983), appear probably to have been still matrilineal in inheritance. There are also indicators (that matriliny may have long persisted among highly pastoral peoples of the Sahara, such as the Teda, Daza, and Zaghawa (Figure 5.8), as it still does among the Afroasiatic-speaking neighbors of the Teda and Daza, the Tuareg. On the other hand, none of the Central Sudanic peoples, who may have adopted patriliny relatively early on, seem likely to have been major raisers of livestock until significantly later in their history (Ehret 1998). There may indeed be social-historical circumstances in which the ownership of large numbers of cattle or other large stock, such as camels, precipitates a shift from matriliny to patriliny, as Holden and Mace (2003) propose, but if so, the Nilo-Saharan kin histories show that much more remains to be learned about just what those circumstances might be.

Holden and Mace's proposition faces a problem even among Bantu-speaking societies. If the shifts to patriliny among Bantu of southern and several eastern African areas were a consequence of the adoption of cattle raising, we need then to explain why the same pattern of social shift, matrilineal to patrilineal, proceeded at a similar pace in the past 2,000 years across the equatorial rainforest areas of Bantu speech (Ehret 1998, Klieman 2003). The peoples of these regions had no cattle and raised at most a few goats and sometimes a few sheep or pigs, and most of them did not belong to states or highly stratified societies. Yet their histories followed similar trajectories of shift from matrilineal to patrilineal descent over roughly the same span of time. An explanation that relates one set of cases to cattle raising needs to explain why other peoples of the same subgroup of the Niger-Congo language family with no cattle display the same history.

The long-term resilience of matriliny along different lines of Nilo-Saharan descent among peoples of widely varying histories raises two questions. First, what if matriliny were the unmarked variety of unilineal descent, tending to persist in default of strong opposing factors? To consider patriliny the marked alternative would switch many of our perceptions around. Explaining in nuanced ways why patriliny should have come to prevail in so many parts of the world would then become the greater challenge.

Second, might initial conditions be the best predictor of which kind of unilineal descent is historically primary? Three reconstructed old Nilo-Saharan kin lexemes (Appendix 5.2, Section A, root 12; Section C, root 8; and Section F, root 3) suggest at least the possibility that in the earliest Nilo-Saharan periods there existed a particular ancient initial condition favoring matriliny—namely, recognized sororal groups of maternally closely related women, forming the core element in the kin nexus of local communities.

In revisiting these issues, and also in probing the deep origins of human kinship, the very long-term perspectives of deep-time reconstruction of kin lexicons and their histories, as pursued here for the Nilo-Saharan family, are likely to be essential critical tools.

Appendix 5.1
Nilo-Saharan Kinship Features

TABLE 5.1. Nilo-Saharan kinship features

Society	Cousin Terminology	Parents' Siblings Terminology	Cross-cousin Marriage
Uduk (Koman)	Iroquois	bifurcate collateral, except that MZ (voc.) = M; from earlier bifurcate merging, with FZ = MB	implied: former presence of PxG category term (PNS root 11); also FZ > PxG > MB (PNS root 9)
Saysay Gumuz (Koman)	Iroquois; implied earlier Crow (FZ > FZC > PxGC: PNS root 11)	bifurcate collateral; earlier bifurcate merging with FZ = MB	implied: former PxG category term (PNS root 10?)
Mbay, Bagiro (Sara: West Central Sudanic)	Sudanese (all terms descriptive?); Iroquois variant 2 crossness in GC and PG terms	bifurcate merging	
Lugbara, Madi (East Central Sudanic)	Hawaiian, with Iroquois variant 2 crossness in PG and GC terminology	bifurcate collateral but bifurcate merging terms of address	implied: FZ > EM (PS root 3)
Mangbetu (East CSud)	Iroquois variant 2 crossness in PG and GC terminology	bifurcate merging	implied: MB > EF (PS root 6)
Baledha (East CSud)	Hawaiian (all terminology generational)	bifurcate merging	implied: Proto-ECS *aja MB > EP > Balendru EM
Proto-Northern Sudanic	Iroquois? (bifurcate merging GC?)	bifurcate collateral?	implied: Z > FZ > WM (PNoS root 6)
Kunama	Iroquois; possible earlier Crow (via FZ > FZC > DH(♀): PNS root 7)	bifurcate collateral (FB ≠ F ≠ MB)/bifurcate merging (MZ = M)	implied: MB > PxG > FZ (PNS root 7); MB > HF (PS root 6)
Proto-Saharo-Sahelian	Iroquois (PSS root 5)	bifurcate collateral, except probably FB = F	implied: inferred PxG root (PNS root 11); also FZ > PxG > MB (PNS root 8)?
Kanuri (Saharan)	Hawaiian	bifurcate merging, except for FZ = FB	implied: PxG > EP (PNS root 11)
Teda and Daza Saharan)	Iroquois; also alternate set of descriptive terms	bifurcate collateral; from earlier partial bifurcate collateral, except for MZ = M	implied: PxGD > W (PSS root 5); former presence of PxG category term (PSS root 4)
Zaghawa (Saharan)	Iroquois	bifurcate collateral, except for MZ = M	implied: (FZ? >) PxG > WF, DH (PNS root 11)
Proto-Sahelian	Iroquois (PNS root 5, PSS root 5)	bifurcate collateral, except for FB = B	implied: inferred PxG root (PNS root 11)
For (Sahelian)	Hawaiian	bifurcate collateral (FB = compound term 'father's brother')	implied: FZ > EM (PSah root 3); PxGS > WZ, BW (PNS root 5); also For SW = ZD
Songay (W. Sahelian)	Iroquois; FZC/MBC via FZC < earlier FZ implies prior Crow system (PNS root 13)	bifurcate merging	implied: MB > PxG > FZ (PTSah root 2)

TABLE 5.1. Continued

Society	Cousin Terminology	Parents' Siblings Terminology	Cross-cousin Marriage
Maba (W. Sahelian)	Sudanese (recorded terms descriptive)	mixed bifurcate collateral (FB ≠ F)/generational? (M = MZ = FZ?)	
Proto-Eastern Sahelian	Iroquois (PNS root 5, PSS root 5)	bifurcate merging?	implied: inferred PxG root (PNS root 11)
Proto-Nubian (E. Sah: Astaboran)	Sudanese (descriptive)?	bifurcate collateral	implied: PxGS = EG, CE (PNS root 5)
Dongolawi (Astaboran)	Sudanese (descriptive, except for FBC); simplex FBC term indicates possible earlier Iroquois system	bifurcate collateral (all terms descriptive except MB); bifurcate merging in terms of address	
Midob (Astaboran)	FBC = descriptive; but rest not recorded	bifurcate collateral, except MZ descriptive	
Nara (Astaboran)	(not recorded)	bifurcate collateral, except FB descriptive	implied: PxGD > HG (PSS root 5)
Gaam (E. Sah: K-A: Jebel)	Hawaiian, but implied earlier Omaha (earlier MB > MBC: see fourth column)	bifurcate merging, except for MZ = MB	implied: MB > MBC > H (No. Middle Nile Basin root 1)
Bertha (E.Sah: K-A: Jebel)	(not recorded)	bifurcate collateral, but FB and MZ are descriptive compounds, literally FG, MG, implying that terms of address are bifurcate merging	implied: MBD > W (PTSah root 3)
Shatt (E.Sah: K-A: Daju)	earlier Iroquois > nondescriptive udanese, except with MBC = MZC	bifurcate merging, except for FZ = MZ	implied: FZ > PxG > MB (PKir root 2)
Proto-Surmic (E.Sah: K-A)	Iroquois?	bifurcate collateral (PSah root 3)	implied: FZ > PxG > MB (PSah root 3)
Majangir (E.Sah: K-A: Surmic)	Eskimo (MGC); Hawaiian (FBC)	bifurcate collateral, except for FB = F	implied: PxGS > HG (PNS root 5)
Didinga (E.Sah: K-A: Surmic)	either Crow or Iroquois (current terms for FZC are not certain)	bifurcate merging (MZ < M plus singular/plural suffixes	implied: FZC > HB (PKir root 2)
Murle (Surmic)	Crow	bifurcate merging	
Proto-Jii-Luo (E.Sah: K-A: W'n Nilotic)		bifurcate collateral/merging (FB); earlier pre-PJL lineal for PZ (PSah root 4)	implied: FZ > FZ *and* EM (before FZ > PZ) (PSah root 4)
Nuer (W'n Nilotic)	Sudanese (all terms descriptive)	identical to Jyang pattern	
Jyang (Dinka) (W'n Nilotic)	Sudanese (all terms descriptive)	bifurcate collateral; but FB, MZ = compounds, father + -len, mother + -len, implying bifurcate merging address terms)	
Ocolo (W'n Nilotic)	Sudanese (all terms derived from PG terms) (but bifurcate merging GC)	bifurcate merging	implied: FZ = BW(♀) = HZ (descriptive FZC terms from FZ word)
Anywa (W'n Nilotic)	Sudanese (all terms derived from PG terms; this fact explains column 4 evidence without requiring intermediate Crow stage)	bifurcate collateral, except for FB = F	implied: FZ = HZ (explanation as for Ocolo)
Lang'o (W'n Nilotic)	Sudanese MGC (derived)/ Iroquois FGC	bifurcate merging	implied: Proto-Luo FZC > BW

TABLE 5.1. Continued

Society	Cousin Terminology	Parents' Siblings Terminology	Cross-cousin Marriage
Acholi (W'n Nilotic)	Omaha; distinct FZC term = ZC(♂): possible earlier Iroquois	bifurcate collateral, but FB, MZ descriptive implying merging terms of address	
Kenya Luo (W'n Nilotic)	Hawaiian	bifurcate merging	
Nandi (E.Sah: K-A: So'n Nilotic)	Omaha	bifurcate merging	
Kipsigis (So'n Nilotic)	Iroquois	bifurcate merging	
Endo (So'n Nilotic)	Omaha (from earlier Iroquois)	bifurcate merging	
Pok (So'n Nilotic)	Hawaiian	bifurcate collateral, except for FB = F	
Pakot (So'n Nilotic)	Iroquois	bifurcate merging	implied: PxGC = EG (PNS root 5, PSS root 5)
Barabaig (So'n Nilotic)	Omaha	bifurcate merging	
Bari (E.Sah: K-A: E'n Nilotic)	Omaha; Crow at an undetermined earlier period (FZ > FZD > HZ: PSS root 4)	bifurcate merging	implied: FZ (via Crow shift: FZ > FZD) > HZ; also MBD (via Omaha shift: MB/ MBC > MBD) = EF
Lotuxo (E'n Nilotic)	Iroquois	lineal (from earlier bifurcate merging)	
Proto-Ateker	Iroquois (GC crossness retained in modern-day languages)	lineal FZ = MZ (< earlier FZ = MZ = M); bifurcate merging BF = F vs. distinct MB	
Turkana (E'n Nilotic: Ateker)	Sudanese (all stems derived from PG terms)	(same as Proto-Ateker)	
Teso (Ateker)	Hawaiian	(same as Proto-Ateker)	
Maasai (E'n Nilotic)	probable earlier Omaha, except that MBC/MZC = FZC (possible Kalenjin calque); FBC = G	generational, except for distinct MB	implied: EP term derived from MB term
Ik (E. Sah: Rub)	Mixed: Crow (FZC = FZ); Omaha (MBC = MB); also MZC = MZ, FBS = B, FBD = Z; implies earlier Crow or Iroquois system (PS root 4), probably Crow	bifurcate collateral, except for FB = F	
Soo (E. Sah: Rub)	Sudanese; FBS = B, FBD = Z (all terms except FBS/D are descriptive), suggestive of earlier Crow or Iroquois system	lineal (FZ = MZ)/bifurcate merging (FB = F)	

Appendix 5.2
Nilo-Saharan Kin Lexeme Reconstructions and Semantic Histories

A. Kinship Terms Reconstruc ted to the Pro to-Nil o-Saharan (PNS) Period

1. PNS *ɛɛya 'father': Uduk FB, BC(♂) (recipr.); Kunama F; Kanuri PPP, CCC (recipr.); For 'male (human).'
   Semantic note: derivation of Uduk FB from original F indicates an earlier pre-Uduk bifurcate merging pattern, still present in Uduk M and MZ terms of address.
2. PNS *baab 'father'; var. *baaba 'father (vocative)': 2nd element in Uduk compound for PF (literally 'old father'); Central Sudanic (CSud): Baledha F, Yulu F, Lugbara PF; Kunama F, PF (voc.); Kanuri F, FG, FBW; For F, FB; Songay F, FB; Nobiin, Dongolawi F; Nara PF; Gaam F; Surmic: Majangir F (own), FB; Murle F, FB, Didinga F (voc.); Nilotic: Bari F, FB; [Maa-Ongamo: Maasai, Ongamo F, FB: loan from Kalenjin]; [Ateker: Teso, Turkana F: loan from Rub]; [Turkana SC(♂): borrowing of Rub (Ik) PF (as recipr. address)]; Ik PF (sound change regular); [Ik F (voc.): loan from undetermined source].
3. PNS *ya 'mother'; var. *aya 'mother (voc.)' (Ehret 2001b, root 1469).
4. PNS *dɔ 'child'; Saysay (Gumuz) dua 'child'; CSud: East Central Sudanic *a-dɔ ' child.'
5. PNS *wɛɛd 'boy': Saysay (Gumuz) *wəda* in *wəda-ci* MZC (compounded with reduced form of Saysay *cici* MZ); Sah: [Berti WZ: For loanword]; For *kora* WZ, BW; Nubian *ort- CE (stem plus *-t n. suff.): Nubian: Midob CE, Nobiin DH, Dongolawi EF, EB; Surmic: Majangir HG; Nilotic: Ocolo WG, WP, Acholi EP, WB, DH, Lang'o WB, DH, WF, ZH(♂), Kenya Luo DH, EF (recipr.); Pakot PxGS, WG; [Proto-Kalenjin *we:ri 'boy': loanword from unidentified language].
   Semantic notes: (a) the Pakot and the borrowed Kalenjin reflexes, together with the evidence of complementary PSS root 5 for "female cross cousin," indicate that this root originally had a male reference; (b) the morphology identifies separate derivations of the affinal terms in For (addition of the PNS *k^h- definite prefix) and in Proto-Nubian (addition of the PNS *t^h attributive/ associative suffix), implying the earlier presence of the unmodified root with the source meaning "cross cousin" separately in both pre-For and pre-Proto-Nubian; the common historical node for all these language groups was the Proto-Sahelian stage, thus tracing the underlying meaning PxGS back to at least this period on the Nilo-Saharan family tree (see Figure 5.2), and separately the custom of cross-cousin marriage back, separately, along the For line of descent and to before the Proto-Nubian node; (c) shift in For to female meanings, WZ and BW, implies the original For meanings to have been ZH and HB, which gave rise to reciprocal usages, ZH/WZ and HB/BW, followed by later narrowing to just WZ and BW.
6. PNS mwey 'sister, girl': Uduk ZC(♂); CSud (le-mwi) 'sister'; Gumuz MB, FB; Teda, Daza S; Maba 'sister' (*muk*, *mu- plus Maba *-k sing.); Gaam CC, PF (recipr); Didinga MBS, Murle MBC; WNil: Dinka S; Proto-Luo C; ENil: Itesyo BW (not recorded but probably also HZ), Turkana HG, BW(♀), ZH(♀?); WNil: [Lang'o HB, WZ, BW(♂), ZH(♀): Ateker loanword]; Rub: Ik 'child,' Soo 'daughter'; [Ik HZ: Ateker loanword].
   Semantic notes: (a) prefix *a- in Uduk *amwi* ZC imparts the meaning "something/someone associated with / characterized by [root word]"—i.e., a relation associated with one's sister, hence ZC; (b) Gumuz meaning also implies earlier ZC(♂), applied as a mutual term of address for the reciprocal relationship MB/ZC(♂), with subsequent extension to include the FB relationship (this lineal term exists in Gumuz alongside a separate bifurcate collateral naming of FB and MB); (c) the Maba and Ateker meanings imply retention of the application to Z; (d) if the initial meaning extension to siblings-in-law in pre-Proto-Ateker was from Z to BW(♀) and from B to ZH(♂), as indicated by the Turkana and Itesyo reflexes, this would imply that a former same-sex sibling meaning, Z(♀), lies behind this outcome—i.e., Z(♀) > ssG in general, at least in the line of descent leading to Ateker; (d) the remainder of the Saharo-Sahelian attestations imply the retention of the comeaning "girl," with several separate shifts to "child" in later periods; (e) Teda-Daza: prior generalization to "child" allows for meaning S as a semantic renarrowing; (d) pre-Proto-Didinga-Murle meaning shift, C to PxGC, with specialization to just MBC in the reconstructed Proto-Didinga-Murle Crow system (see

Appendix 5.2); (f) Dinka C > S; (g) Rub: Proto-Rub C > D in Soo, or 'girl' > Proto-Rub D > Ik C.

Morphological note: The Didinga-Murle and Dinka reflexes share the addition of an old Nilo-Saharan *t n. suff., also seen in Gaam reflex, implying a shared Kir-Abbaian innovated shape *mweyt; the reflexes of this shape all require an underlying Proto-Kir-Abbaian application to "child."

7. PNS *nam 'mother's brother; sister's child (♂)': Uduk ZC(♂); CSud: Mbay, Bagiro MB, ZC(♂), Gula MB; Kunama FZ, DH(♀); Maban: Aiki MB.

   Semantic notes: (a) ZC(♂) is reciprocal relation to MB; thus Uduk ZC(♂) implies former presence of meaning MB for this term in pre-Uduk; (b) Mbay and Bagiro show same extension of meaning, MB, ZC(♂); (c) Kunama FZ implies pre-Kunama extension of root to both "cross siblings of one's parents," MB and FZ, with subsequent narrowing to just FZ; (d) Kunama DH(♀) = BS(♀) in a context of customary cross-cousin marriage; this explanation would indicate the former presence in Kunama of the proposed PNS reciprocal meaning ZC(♂), seen in the Uduk and Central Sudanic reflexes, later extended in pre-Kunama to cover both ZC(♂) and BC(♀) and then narrowed to just BC(♀); (e) alternatively, the Kunama meaning DH(♀) can be explained by cross-cousin marriage and an earlier period of Crow cousin terminology in Kunama—i.e., Kunama FZ > FZC = CE, narrowed to DH(♀).

8. PNS *maama 'father's sister': Gumuz FZ; CSud: ECS *mama 'parent's mother'; Saharan: Zaghawa, Berti MB; For MB; Maban: [Masalit MB: loan from For; F and all PG terms borrowed by Masalit from For]; Gaam FZ; Bertha FZ; Surmic: Majangir MZ, FBW, Murle MB, Didinga MB (voc.); Nandi, Endo MB, MBS, FZC, ZC(♂), Pakot, Pok MB, [Pok MZ: loan from Rub language]; Proto-Ateker MB; Ongamo ZC(♂); Ik MB, MBC; [Soo MB: loan from Ateker language].

   Semantic notes: (a) the occurrence of the meaning "father's sister" in the reflexes of this root in the earliest diverging branches—directly in Gumuz of the Koman primary branch and implied in the Central Sudanic sub-branch of the Sudanic primary branch—supports reconstructing this meaning as original; (b) East Central Sudanic meaning PM implies earlier FZ; FZ > PM is a recurrent link in Nilo-Saharan languages, separately attested for West-Central Sudanic (PNS root 9 following), Sila (PNS root 10), and Uduk (PSS root 4); (c) reconstructing FZ as the original meaning of this root requires a semantic shift, FZ > PxG in general, in the line of descent leading to Proto-Saharo-Sahelian (PSS), implying cross-cousin marriage during that span, followed by a renarrowing to MB in Proto-Saharo-Sahelian, explaining the prevalence of that meaning in the descendant languages of PSS; (d) the meaning FZ recurs in a limited areal distribution in two Saharo-Sahelian languages, Gaam and Bertha, spoken adjacent to the Gumuz territories, making these two occurrences suspect as an areal influence from Gumuz; (e) Majangir MZ implies a different generalization, Proto-Surmic MB > both MG, with subsequent renarrowing to just MZ in Majangir; (f) the Ongamo term is the reciprocal of MB, implying a pre-Ongamo meaning MB; (g) the phonological evidence shows that the borrowed reflex in Pok came from an extinct Rub language in which the same shifts as in Majangir, MB > MG > MZ, took place.

9. PNS *tayt^{h}a 'father's sister (voc.?)'; possibly also 'brother's child (♀)': Uduk MB; CSud: Kresh, Baka PM; [Kunama FZ: loan, probably from Nara, before pre-Kunama *e > a]; Nara FZ; Rub: Ik FZ, Soo FZ.

   Semantic notes: (a) Uduk meaning requires a pre-Uduk generalization of FZ to both opposite-sex siblings of one's parents, i.e., FZ > PxG (FZ and MB), creating anew a bifurcate collateral naming, followed by a later loss of the meaning FZ and retention of only the meaning MB; this series of changes would have followed the semantic widening of PNS root 1, above, which produced bifurcate merging for F and FB; (b) CSud: extension, FZ > PM, a link separately attested in Uduk (PSS root 4) and in other CSud languages (PNS roots 8 and 16 and PS root 3).

10. PNS *bɔgw 'father's sister' or 'parent's opposite-sex sibling in general' (father's sister *and* mother's brother): Saysay (Gumuz) PxGC; Zaghawa WF, DH; Daju: Sila FM.

    Semantic note: An original meaning FZ would explain the attested semantic outcomes: (a) Gumuz extension FZ > FZC (Crow system) with further generalization to both sets of PxGC, yielding present-day Iroquois system in Gumuz; (b) pre-Zaghawa FZ generalized to PxG and later narrowed to MB, with a further shift of meaning to WF (and reciprocal DH) arising in a social context of preferential cross-cousin marriage; (c) Daju shift FZ > FM, a semantic link attested also in Uduk (PSS root 4) and in Central Sudanic (see PNS roots 10 and 16 and PS root 3); (d) an opposite direction of se-

mantic shift, from PM to PZ and from PP > MB, appears in the Sungor reflexes of PS root 7, PNoS root 5). Alternatively, the original meaning could have been PxG in general, with a narrowing in pre-Zaghawa to MB and with separate narrowings in Gumuz and pre-Proto-Daju to FZ.

11. PNS *k'wes 'mother's brother and father's sister (PxG)': Uduk: combining form changing term for 'sibling' into term for FZC, MBC; Kanuri EP, CE (recip.); Zaghawa FB; pre-Proto-Daju 'father's sister' (implied by loan in Bari); [Bari *waso* FZ: loanword from Daju-related language (k' > Ø /#_ and *e > *a in the Bari reflex are specifically Daju sound changes)].
    Semantic notes: Contra Ehret (2008), who proposed this as the original root term for FB, it is argued here that this root word originally designated the category of potential parents-in-law, i.e., PxG, in a society with customary cross-cousin marriage; this meaning would explain more economically than Ehret 2008 the attested semantic outcomes: (a) an Uduk compounding this root with the Uduk term for "sibling, parallel cousin" to express "cross cousin," PxGC; (b) a Kanuri actualization of the implied marriage connection, PxG > EP; and (c) a simple narrowing in pre-Proto-Daju, PxG > FZ; (d) with just the Zaghawa outcome, FB, requiring a more complex sequence of shifts: PxG > MB > PB in general, producing a linear naming of uncles, with a subsequent shift to a bifurcate collateral system via the narrowing of the term to just FB; (e) the Kanuri and Zaghawa meanings require the root and the meaning PxG in Proto-Saharan and in the Bodelean line of descent leading to Kanuri; the inferred Daju reflex requires its persistence in the descent line leading through Proto-Kir to Daju.
12. PNS *bɛɛs 'mother's sister': Uduk *abas* 'maternal relative'; Kunama *kebesa* 'matriclan, matrilineage'; Teda, Daza *baha FZ (PNS #s > TD *h); Songay *baase* FZC, MBC.
    Semantic note: (a) Uduk: stem plus NS *a- attributive prefix, generalizing the term to all maternal relatives; (b) Kunama: meaning extension as in Uduk, but with addition of the PNS *k^{h} definite prefix to specify a more formally constituted kin grouping; (c) the Teda-Daza and Songay reflexes imply a Proto-Saharo-Sahelian extension of this term to PZ in general, followed by a narrowing of meaning specifically to FZ; (d) a further meaning shift, FZ > FZ *and* FZC (Crow terminology), explains the Songay outcome and implies a pre-Songay Crow cousin system; a subsequent generalization to all cross cousins, FZC > PxGC, in Songay, along with the loss of the meaning FZ, instituted the current Iroquois reckoning of Songay.
13. PNS *at^{h}i 'grandparent': Uduk PM; For CC.
14. PNS *maaɵeh 'spouse': Uduk GE, WG; Maba H; Didinga H; Nandi HB, BW(♀).
15. PNS *mɛd 'father-in-law': Uduk EP; Daza 'co-wife'; Gaam EF; Surmic: Majangir BW(♂); Bari PF.
    Semantic note: Proposed derivation of Daza meaning: EF extended to EG, GE > 'co-wife' via an intermediate narrowing to BW(♀); a similar trajectory of semantic shift is indicated for Majangir BW(♂).
16. PNS *daada 'older female relation (elder sister?)': Gumuz Z; CSud: PCS *dada, *da FZ (Yulu PM; Mangbetu FZ); For eZ; Bertha M; [Luo, Acholi PM: loanword (from CSud?)]; [Lango'o PM, HM: Ateker loan]; [Ateker: Teso, Turkana PM: loan from Rub]; Ik, Soo PM.
    Semantic note: (a) the Gumuz and For meanings make it possible that this term had a more specific application to "elder sister," along with a more general reference to "a close older female kinperson"; (b) the linkage of "father's sister" and "grandmother" seen in the CSud reflexes recurred widely in Nilo-Saharan history; the more usual direction of shift was FZ > PM (see PNS roots 8 and 9 above), making it probable that this root named FZ in Proto–Central Sudanic.

B. Kinship Terms Reconstructed to the Proto-Sudanic (PS) Stratum

1. PS *ɖa 'girl, daughter': CSud: Baledha 'daughter'; Saharan: Zaghawa 'child'; Sahelian 'heifer' (Songay 'heifer'; Proto-Nilotic 'heifer').
    Semantic note: specialized shift of meaning in Proto-Sahelian to denote "the female child of a cow."
2. PS *ɗuur or *duur 'brother (female speaking?)': CSud: Mangbetu B(♀), Madi-Madi B, PGS (also Lugbara MB, ZC), Gula S, Kresh 'male' in compound term for S; Kunama BW; Saharan: Kanuri 'kindred'; Masalit FeB; Nuer B (classificatory).
    Semantic note: This root is tentatively proposed as the male opposite-sex equivalent of root 3; the 'brother' part of the meaning is strongly indicated, but only Mangbetu attests the specific sense B(♀).
3. PS *dal or *ɗal or * ḍ̤al 'sister (male speaking)': CSud: Mangbetu Z(♂), Lugbara EM, Madi PM; For ZC(♂).
    Semantic notes: (a) the meanings in Lugbara and Madi imply an intermediate shift Z(♂) to FZ (i.e, 'sister of a

male, of same generation' > 'sister of a male, of the ascending generation') in the Moru-Madi subgroup of East Central Sudanic, to which these closely related sister languages belong; Lugbara EM, Madi PM < FZ implies a former context of prescriptive cross-cousin marriage; for other attestations of semantic linkage of FZ to PM, see PNS roots 8, 9, and 16; PS root 3; and PNoS root 5; (b) For ZC(♂) > earlier Z(♂).

4. PS *'weɖ 'brother (male speaking?)': East Central Sudanic (Balendru, Moru-Madi) *a'we FZ; Kunama *awada* FB; Barabaig B, MZS; Soo B, FBS.
   Derivational and *semantic notes*: (a) complementary to the proposal that PS roots 2 and 3 applied to cross siblings, B(♀) and Z(♂), it is proposed that this root originally applied to male parallel sibling, B(♂); the generalization to any brother in Eastern Sahelian reflexes would be in accord with the expectations of markedness; (b) the identical morphology of the East Central Sudanic and Kunama reflexes—PNS *a- attributive noun prefix plus the stem—and parallel reapplication of the term to a PG category are most parsimoniously accounted for if this were a single development in the common Proto-Sudanic ancestor of Central Sudanic and Kunama, producing a second, coexisting root shape *a'weɖ FB (see PNoS root 6 for the proposed parallel derivation of a comparably early term for FZ); (c) the East Central Sudanic meaning FZ is then economically explained by a two-step semantic shift in pre-Proto-East Central Sudanic, first FB > FG in general, and then FG > FZ; (d) the application to "brother" and to "male parallel cousins" in both Barabaig of the Kir-Abbaian and Soo of the Rub branch of Eastern Sahelian favors tracing this meaning extension back to the Proto-Eastern Sahelian language; (e) Barabaig B, MZS is consistent with either an earlier Hawaiian or an earlier Iroquois system, but in view of the reconstruction of a retained Iroquois system down to Pakot in the sister Kalenjin branch of Southern Nilotic, an earlier Iroquois system would be the preferred solution; (f) Soo B, FBS is the probable remnant of a former Iroquois or Crow system in Western Rub; a relict element of Crow terminology in Ik, the sister language of Soo (see PS root 3), favors the latter solution.
5. PS *yeen 'elder (?) sibling': CSud: PCS 'sibling' or 'spouse's sibling'; Kunama eG, PssGeC, ZeC(♀); For G; Nubian: Midob B; Nil: Acholi HZ, BW(♀), ZH(♂).
6. PS *yɛmb 'mother's brother': CSud: Mangbetu EF, EB; [Mamvu EB: loan from Mangbetu]; Kunama HF; [Kunama MB: early loan from Nara]; Sah: Berti MZ; Nara MB, Nobiin *embes-* MZ (< *emb- + Nobiin –es-Z, literally MB-Z).
   Semantic notes: (a) Mangbetu: MB > EF, indicative of former customary cross-cousin marriage, with a secondary meaning extension EF > EB, seen also in the Mamvu borrowing; (b) Kunama HF(♀) < MB also implies earlier preferential cross-cousin marriage; (c) Berti: MB > MG > MZ.
7. PS *k^{h}aak' 'grandparent': CSud: PCS *ka(ka) PM; Kanuri PP, CC; Teda PM; Songay 'ancestor; PP'; Taman: Sungor MB; Surmic: Majangir PM, CC(♀), Kwegu PF.
   Semantic note: Sungor MB is the male-gendered parallel meaning shift to that of Sungor FZ, PNS root 10: PP > PF > MB.
8. PS *t^{h}eyk 'sibling's (brother's?) spouse; spouse's (husband's?) sibling': CSud: Lugbara WB; Kanuri EG, GE, Teda GE, Daza HyB; Majangir HG, BW; Dinka W.
   Semantic notes: The Dinka application of this term to "wife," if it is a valid reflex and not a chance resemblance, is not yet satisfactorily explained; two possibilities are: (a) the original PNS meaning of the term was W, extended in pre-Proto-Sudanic to include BW, with subsequent extensions to spouse's siblings; (b) the original meaning was "cross cousin," giving rise by two separate semantic trajectories to the sibling-in-law meanings found in most cases and to the meaning "wife" solely in Dinka. The difficulty with solution (a) is that it requires an original meaning "wife" to have survived only in Dinka of all the Nilo-Saharan languages; the difficulty with solution (b) is that the meaning "cross cousin" is unattested in any of the available Nilo-Saharan kin lexicons. Deriving the meaning "wife" from a "sister-in-law" term would be an extraordinarily improbable violation of the normative directions of shift, from primary to secondary kin meaning; i.e., W can be extended to include BW, but the opposite shift, BW > W, does not take place.
9. PS *kççkç 'female maternal relative of earlier generation (voc.)': Kunama M; Dinka MBW.

C. Kinship Terms Reconstructed to the Proto–Northern Sudanic (PNoS) Stratum

1. PNoS *yeeṭ^{h} or *'yeeṭ^{h} > 'younger (?) sibling': Kunama yG, PssGyC, ZyC(♀); Nub: Proto-Nubian *Z; Rub: Soo ZH.

2. PNoS *atayt^{h}a 'brother's child (female speaking); sister's child (male speaking)': Kunama BC(♀), ZC(♂), FZC, MBC; E'rn Sahelian: Midob ZS(♂?).
   Semantic notes: This root derives from PNS root 9, 'father's sister,' by addition of the PNS *a- attributive prefix; (a) the most economical explanation is that it arose as a reciprocal usage, BC(♀), of PNS root 9; conceivably PNS root 9 was used this way already in PNS, in complementary distribution to PNS root 7, which was proposed above to have covered both MB and ZC(♂), but direct testimony of this possibility is lacking; the addition of the attributive *a- prefix to the stem would then make sense as extending the meaning in PNoS to cover both BC(♀) and ZC(♂); (b) Midob narrowing of the term to just ZS (Midob ZD is not recorded, so it may be an additional meaning).
3. PNoS *tawp' 'son, daughter; same-sex-sibling's child': Kunama CC; Saharan: Teda, Daza D; E'rn Sahelian: Gaam GC.
   Semantic note: (a) Kunama meaning CC can be understood as an example of the same semantic equation GC = CC, seen in Italian *nipote*, Spanish *nieto*, and elsewhere in Indo-European; (b) Teda, Daza: S/D > D, with loss of niece/nephew reference; (c) Gaam: generalization, ssGC > all GC, in response to broader shift to generational kin reckoning in modern-day Gaam.
4. PNoS *wabo 'grandfather': Kunama PF; Zaghawa PM; [For PF: loan from early Nubian]; Masalit PF (also loan?); Dongolawi, Nobiin, Midob PF; Nara F; Daju: Shatt PP; Nilotic: Pakot WF (term of respect).
5. PNoS *ap'o 'grandmother': Kunama PM; Berti PM (redup.); For PM; [Nara *afo* PM: loan from Kunama]; Dongolawi, Nobiin, Midob PM; Taman: Sungor FZ; Surmic: Majangir PF, CC(♂), Kwegu PM, Murle PM, MBW.
   Semantic note: Sungor meaning: for the same semantic linkage, but opposite direction of meaning extension, see Daju entry, PNS root 10, West Central Sudanic (Kresh, Baka) entries, PNS root 9, and Uduk entry, PSS root 4.
6. PNoS *amwey 'father's sister; wife's mother': Kunama WM; For FBW; Maba WM; SNil: Pakot HP, SW.
   Semantic notes: (a) This root derives from PNS root 6, 'sister, girl,' by addition of the PNS *a- attributive prefix, i.e., implying "relationship with attributes of being a sister"; the most parsimonious semantic history would have FZ as the original derived meaning, coined prior to the Proto–Northern Sudanic period (see PS root 4 for parallel semantic and morphological derivation of a similarly early FB term), after which FZ > FZ and WM in Proto–Northern Sudanic, a shift implying the presence of cross-cousin marriage at that historical stage; (b) FZ > FBW, as in For, is a commonly found equivalency in kin reckoning; implication is that the meaning FZ lasted down to the divergence of the For line of linguistic descent out of Proto-Sahelian; (c) Pakot: a prior generalization, WM > EM > EP, would have preceded a renarrowing to HP and its reciprocal SW.
7. PNoS *ṭ^{h}aŋgaṭ 'daughter's husband': Kunama DH(♀); Maba DH.
8. PNoS *kɔɔkɔ 'female maternal relative of earlier generation (voc.)': Kunama M; Dinka MBW; Southern Nilotic: Proto-Kalenjin PM; Eastern Nilotic: Lotuxo PF; [Massai PM: loan from Kalenjin].

D. Kinship Terms Reconstructed to the Proto-Saharo-Sahelian (PSS) Stratum

1. PSS *ṭ ɛyn 'daughter': Zaghawa D, BD(♂?); Surmic: Kwegu G; Didinga D, [Didinga ZC(♂): Ateker loanword]; Proto-Ateker ZC(♂), BD(♀).
2. PSS *baar 'same-sex sibling' [Afroasiatic loanword]: Zaghawa 2nd element in compound word for B(♂), Z(♀); For B(♂); Bertha ssG (in compound words for "parent's same-sex siblings," FB, MZ).
3. PSS *ayda'y 'child'; Zaghawa PxGC (cross cousin); Daza yG; Midob eB; Daju: Shatt FBC; Maasai C; Ik B, FBS.
   Semantic notes: (a) Shatt FBC is remnant of Iroquois system; (b) Rub: Ik B, FBS is probably similarly left over from an earlier Crow or Iroquois system (see PS root 3 for arguments favoring former Crow terminology in Proto-Rub).
4. PSS *disih or *ɗsih or *ḍisih 'father's sister': [Uduk dit^{h}i' FZ, BC(♀), FM: loan from unidentified Nilotic language (shows Nilotic sound change, PNS *s > *t^{h}]; Teda, Daza *dihi MB (PNS *s > Teda-Daza *h); Nilotic: Bari ɗitanit HZ.
   Semantic notes: (a) probable original meaning FZ (see Figure 5.3), implying generalization to FZ *and* MB (PxG) and then narrowing to MB in pre-Proto-Teda-Daza; (b) Nilotic loan in Uduk indicates original Nilotic meaning FZ, with extension in Uduk to FM; see PNS roots 8, 9, and 16, PS root 3, and PNoS root 5 for further attestations of this semantic linkage; (c) deri-

vation of Bari meaning HZ from FZ requires intermediate shift FZ > FZD (Crow terminology) in context of cross-cousin marriage.

5. PSS *haat 'female cross cousin': Daza W; Nara HG; SNil: Pakot PxGD, HG; Nandi W.
   Semantic notes: (a) "female cross cousin" is attested in only one subgroup today, but that meaning is the one commonality capable of explaining the range of outcomes; in addition, normative directions of semantic shift, blood relative to affine, back up that solution; (b) Daza W requires a single meaning extension, from "female cross cousin" to "wife," in a cultural context of cross cousin marriage; (c) Nara HG similarly implies former cross-cousin marriage, with a prior generalization, HZ > HG; (c) Nandi separately derived the meaning "wife" from this root by addition of the PNS *k^{h}- noun-definite prefix, i.e., "a wife" is a particular "cross cousin"; (d) Pakot application of this term to both female cross cousin and HG overtly attests cross-cousin marriage.
6. PSS *tot^{h}o 'mother': Teda MZ; [Lang'o (W. Nilotic) M, MZ: Teso loanword]; [Ateker (E. Nilotic) *toto: Teso M, MeZ, Turkana M, SC(♀): Rub loanword (expected *doto)]; Ik MZ, MZC.
   Semantic notes: Normative direction of semantic shift from primary to secondary relationship implies original meaning "mother," preserved today only in the borrowed Ateker form; (a) Teda M > M, MZ (bifurcate merging) > MZ only (bifurcate collateral); (b) borrowing into Ateker from an early Rub language in which both meanings M and MZ were present; Turkana SC(♀) is reciprocal of MZ; subsequently borrowed by Lang'o ca. the eighteenth century from Teso; (c) early Rub M and MZ (bifurcate merging), implied in Ateker borrowing, > Ik MZ only (term dropped entirely in modern-day Soo language).
7. PSS *k'ɛyr or *k'aayr 'parent': Zaghawa M, MZ; Songay P.
8. PSS *maŋk^{h}aḷ or maŋk'aḷ 'parent': For *magal* EF, DH; [Maba *mangar* HF: loan from Saharan language (*ḷ > r /_# is Saharan sound change)]; Gaam *maaɬ* M.
   Semantic notes: (a) root is not attested in available Saharan group data, but Maba form requires an earlier Saharan source; (b) For P > EP > EF; (c) Maba borrowed term shows that a parallel meaning shift, P > EP > HF, took place in at least one as yet unidentified language of Saharan subgroup: this borrowing is another attestation of the old central Saharan areal contact zone evidenced in section J below.
9. PSS *ɛlt^{h}a'y or *hɛlt^{h}a'y> 'wife's sibling': Zaghawa WG, ZH, Teda, Daza EM; Gaam EG.
10. PSS *k^{h}am 'woman': Kanuri 'wife, woman'; Nandi M, MZ, MBD.

E. Kinship Terms Reconstruc ted to the Pro to-Saheli an (PSah) Stra tum

1. PSah *aŋah 'mother': Zaghawa, Berti FZ (probable loans from For); For FZ; [Masalit FZ: loan from For, like all Masalit PG terms]; Songay M; Nobiin FZ (loan from pre-For into Proto-Nubian?).
   Semantic notes: Meaning FZ forms an east-central Sahel areal spread, innovated a single time from M via M > MZ > PZ (lineal PG system) > FZ in either pre-For or pre-Proto-Nubian; if For borrowed from Nubian, then the first presence of this root should be moved to the Proto-Trans-Sahel period (see section J, East Central Sahara areal root 3).
2. PSah *wɛy or *'wɛy 'child': For C; Dinka C (grown), Anywa, Ocolo, Luo, Lang'o S; Ik C (pl.).
3. PSah *maareh 'father's sister': For EM; Surmic: Majangir, Didinga MB; ENil: [Bari, Lotuko MB: loan from Surmic language]; WNil: Anywa MZ, Kenya Luo EM, Acholi EM and derived term for MBC, Lang'o EM and derived term for MZC.
   Semantic notes: (a) EM in For makes sense as a meaning shift, FZ > EM, in a situation of preferential cross-cousin marriage; this implies that the pre-For meaning was FZ; (b) Proto-Surmic MB implies an intermediate generalization of term to "parents' cross-siblings," FZ > FZ/MB (PxG), with later renarrowing, FZ/MB > just MB in Proto-Surmic; (c) Anywa and implied pre-Lang'o MZ (seen in derived form for MZC): from earlier shift to lineal reckoning of aunts, FZ > PZ, with subsequent narrowing, PZ > MZ; narrowing probably took place early in the Western Nilotic line of descent leading down the Jii-Luo branch, to which Anywa and Lang'o belong, because a replacement term *way- for FZ had come into use already in Proto-Jii-Luo; (d) the meaning extension FZ > EM attested Kenya Luo and Lang'o took place, of course, before the loss of the meaning FZ, therefore implying a custom of cross-cousin marriage at that stage in history, among Proto-Jii-Luo speakers or earlier.
4. PSah *mawnih 'spouse's sibling': For HZH; Taman: Sungor DH, EF; Surmic: Didinga HZ; [Didinga DH, WB, WF; ENil: Bari DH: areally diffused term]; Lotuko CE, EP; WNil: Acholi W.
   Semantic notes: (a) an original meaning "cross cousin"

before the PSah period in a context of customary cross-cousin marriage would explain the separate semantic history trajectories leading to the "sibling-in-law" meanings and to the meaning "wife" in Acholi; the difficulty with this solution is the lack of attestation of the meaning "cross cousin" in any of available evidence; (b) the application of this root with reciprocal CE, EP meanings involves a morphological addition (NSah *k^{h}- noun definite prefix) in Lotuko but not in Sungor, suggesting that these meaning shifts arose separately in the two languages.

5. PSah *ba'y 'elder male relation': For eB; Maba HB, WZ; Soo F, FB.

F. Kinship Terms Reconstructed to the Proto-Trans-Sahel (PTSah) Stratum

1. PTSah *hay, *k^{h}ay 'child': Aiki D, C (stem with *k^{h}- prefix); Nara B, Z (each without *k^{h}- prefix, but with different suffixes); Bertha (dial.) Z (without prefix); Proto-Western Nilotic *kay C (with *k^{h}- pref.): Dinka *-kai* 'sibling' (in compound *nyan-kai* Z (*nyan* 'girl, female'), Proto-Luo FZC, MBC, ZC(♀) BC(♀) (root with *k^{h}- prefix); Eastern Nilotic: Turkana *na-kain* HBW, 'co-wife' (with *k^{h}- prefix); [Turkana FZC, FZD: Luo loanword], Maasai S, BS (root shape without *k^{h}- prefix).

   Semantic notes: Two coexisting alternate shapes, one with and one without the NSah *k^{h}- noun-definite prefix, must be reconstructed in this case; (b) the Proto-Luo application of the prefixed form of the root to FZC cross cousins implies an earlier Iroquois system in Proto-Luo or pre-Proto-Luo; apparent skewing also to both descending generation xGC; (c) the meanings of the non-borrowed Turkana reflex are most economically explained by earlier shifts: 'child' > 'girl' > 'sister,' with the latter extended to include HBW and 'co-wife.'

2. PTSah <*haɓa'y> 'mother's brother': Songay FZ; Gaam MZ, MB.

   Semantic notes: the most economical accounting of semantic outcomes is that (a) in Songay original MB generalized into the PxG category term (MB and FZ), with subsequent renarrowing to just FZ; (b) Gaam: MB > MG.

3. PTSah *has 'female maternal relative': [Uduk aš W: loan because initial PNS *h > ø; probably from Bertha-related language in particular (PNS *s > š is a uniquely Bertha sound change)]; Songay MB; Sungor Z; Nubian: Nobiin, Midob D; Surmic: Didinga FZ, Murle FZ, FZC (Crow), FZH.

   Semantic notes: The variety of meanings attested here are most simply explained if the original application was to "female member of one's matrilineal kin group," either same or previous generation; (a) borrowed Uduk term: MBD > W in context of cross-cousin marriage, presumably in the earlier Bertha-related society from which the term was borrowed; (b) Songay: MZ > MG > MB; (c) Proto-Nubian D(♀) > D in general; (c) Surmic: MZ > PZ in general, with subsequent narrowing to FZ.

4. PTSah *musaŋ > 'female (?)': Maba múšǒŋ > W; Bertha mušaŋ 'girl.'

G. Kinship Terms Reconstructed to the Proto–Eastern Saheli an (PES) Stratum

1. PES *Too or *Tooh 'child': Dongolawi C; Surmic: Majangir C; Nilotic: Turkana B (with masc. pref.), Z (with fem. pref.); Nandi (Kalenjin) *C.
2. PES *ɖaat 'son': Nubian: Midob S; Bertha S, C; Nuer C
3. PES *k^{h}uuk^{h} or *k^{h}uuk or *kuuk^{h} or *kuuk 'grandfather': Daju: Nyala PP; Nil: PSNil PF; Rub: Soo PF, CC.
4. PES *yogw 'spouse's sister; sister's spouse': Dongolawi EM, EZ, ZH; Gaam EM; Ik WG, Soo BW.
5. PES *kek or *k^{h}ek^{h} or *k^{h}ek or *kek^{h} 'female relation': Proto-Nubian *kek- in *een-kek* MZ (een- M) (Dongolawi *ɛɛn-kɛg-id*, Midob *een-gecc-i*); Ik W.
6. PES *yɔkw 'husband': Ik H; Daju H.

H. Kinship Terms Reconstructed to the Proto-Kir-Abbaian (PKA) Stratum

1. PKA *tɔk' 'female': Bertha *dɔk'çN* 'girl'; Maasai W.
2. PKA *ned 'mother's brother': Taman: [Sungor MB: Daju loanword]; [Bertha MB: loanword from Gaam subgroup language]; Proto–Western Nilotic MB.

I. Kinship Terms Reconstructed to the Proto-Kir Stratum

1. PKir *t'ɔwn 'sister's child (male speaking)'; 'cross cousin (?)': Daju: Shatt MGC; Majangir ZC(♂); [Lotuko PxGC: loan from uncertain source]; Alur ZC(♂).
2. PKir *ŋwel> 'father's sister'; Daju: Shatt MB; Didinga HB; [Bari FZC, ZC(♂), Lotuko ZC (♂?): loan from Surmic language].

   Semantic note: (a) Shatt: FZ > PxG > MB; (b) the meaning FZC of the borrowed form in Bari implies an earlier Surmic meaning FZ, with an intervening period of Crow terminology, presumably in the

Surmic source language (as is in fact present in Murle of Surmic today), although the change may possibly have taken place in Bari after borrowing (see PSS root 4 for an indicator of a one-time Crow terminology in Bari); (c) Didinga HB, explainable as coming from FZ via intermediate FZC, indicates both an earlier period of Crow terminology and a former cross-cousin marriage preference, in which one's HB is one's FZS or MBS.

J. East Central Sahara Areall y Diffused Kinship Terms

1. *aba 'father' (loanword from Afroasiatic): Kanuri, Zaghawa, Teda, Daza; For; Midob; also in Bertha (separate Afroasiatic loan).
2. *bur 'child': Zaghawa C; Dongolawi, Nobiin (Nubian) D.
3. *khitan 'sibling': Zaghawa B(♀), Z(♂); For *dítàn*, pl. *kínnà G*.
4. *baR 'parent-in-law' (loanword from Afroasiatic?): Zaghawa WM; For SWP.

K. Northern Middle Nile Basin Areal Term

1. *ɠi 'male relative': Gaam H; Dongolawi MB.
   Semantic notes: Original meaning in Gaam was probably also MB: an earlier meaning extension MB > MB, MBC (Omaha pattern) would allow for the meaning change MBC > H to take place in a situation of preferential cross-cousin marriage.

L. Southea stern Sudan Areal Term

1. *ŋwaa 'adult woman': Rub M; Surmic: Majangir M, Murle W, Didinga W, M (+ suff.); ENil: Bari M.

6

Proto-Bantu Descent Groups

Per Hage and Jeff Marck

In *Paths in the Rainforest* (1990), Vansina argues on the basis of historical linguistic evidence that Proto–Western Bantu and Proto-Bantu society had cognatic ("undifferentiated") descent groups. Cognatic descent provided a convenient ideology for "Houses" established by local "Big Men," and it proved adaptive during the early Bantu expansion into the equatorial rainforest (Vansina 1990).[1] Unilineal descent was a later eighteenth- and nineteenth-century development suited to the altered material and political circumstances of many Bantu societies—wealth and disorder—and hence corporate descent groups. We propose, on the basis of historical linguistic, cross-cultural, and comparative ethnographic evidence that Proto-Bantu and Proto–Western Bantu society had unilineal descent groups, and we suggest that the mixed agricultural and hunting economy of early Bantu society would have favored matrilineal descent groups in particular.

Proto-Bantu Kin Terms and Descent Groups

In Vansina's (1990) reconstruction of Bantu history, Proto-Bantu society originated in the Benue Valley region of Nigeria some time before 3000 BC. On the basis of glottochronology and archaeology, Vansina (1990, 52–53) dates the split into Western and Eastern Bantu languages around 3000 BC. The Bantu expansion eastward into the equatorial rainforest and southward began a millennium later. The early Bantu economy was based primarily on yam cultivation and hunting; cereals and iron tools came later. The dates and the status of Western and Eastern Bantu languages are open to question. Ehret (1998) reconstructs a gradual differentiation of the Bantu languages consistent with an unfolding agricultural expansion from Cameroon into favorable parts of the rainforest, reaching the western fringe of the woodland savanna (Proto-Savanna-Bantu) in the second millennium BC and the western border of the Western Rift (Proto-Mashariki) before 1000 BC. But there is general agreement on the location of the Bantu homeland (Greenberg 1963), the direction of the Bantu expansion, and the nature of the early Bantu economy. According to Vansina (1990), Proto–Western Bantu and, by extension, Proto-Bantu society was organized on the basis of "Houses" established by competing "Big Men" supported by their relatives, friends, clients, and dependents. Houses were units of production varying in size from ten to forty individuals, and in longevity, sometimes dissolving upon the death of a big man and sometimes continuing into the next generation under new leadership. Houses were united by an ideology or fiction of cognatic ("undifferentiated") descent.[2] As evidence for cognatic descent, Vansina (1990, 75) cites a cluster of Proto-Bantu (PB) lexical reconstructions from Guthrie (1967–71):[3]

> The strongest evidence for undifferentiated descent are terms derived from the verb "to give birth to" (CS 208) and other derivations such as "relative" (CS 210,5) and "seed" (CS 211). These include "House" (ps 50 [3,67]) and many more reflexes not noted by Guthrie which prove that this derived term is Proto–Western Bantu. People did not think or act in terms of unilineal descent.... Consequently, free men had a wide choice as to the establishment they cared to join.

According to Vansina (1990, 319), etymologies for terms for "House" in Proto–Western Bantu (PWB) is neutral with respect to gender, and hence descent was neither male (patrilineal) nor female (matrilineal):

TABLE 6.1. The relationship between bifurcate merging kinship terminology and descent groups

Type of Kinship Terminology	Descent Groups		
	Unilineal	Cognatic	Absent
Bifurcate merging (F = FB ≠ MB)	47	0	8
Other	63	10	47

Sources: Murdock 1967, 1970; Murdock and White 1969.

TABLE 6.2. The relationship between bifurcate merging kinship terminology and residence rules

Type of Kinship Terminology	Residence	
	Unilocal	Non-unilocal
Bbifurcate merging (F = FB ≠ MB)	49	5
Other	103	17

Sources: Murdock 1967, 1970; Murdock and White 1969.

> The etymology of terms for "House" does not usually refer to gender as one would expect in unilineal descent situations. The etymologies found refer to "house," "bed," "hearth," "hearthstones," "plaza of authority," "offspring of," "grandchild of," "species," "root," "shield" and "communal shed."

Vansina is skeptical that kinship terminology can be used to infer the structure of descent groups. He classifies PWB and PB kinship terminology as "bifurcating Hawaiian," with separate terms for cross-relatives in the parents' generation (MB and FZ) and a single term for all relatives in ego's generation, including siblings and cousins. Vansina observes that the bifurcating feature fits with unilineal descent, but the Hawaiian feature fits with undifferentiated (cognatic) descent.[4]

Contrary to the assumption made by Vansina, to establish whether Proto-Bantu and Proto–Western Bantu society had unilineal descent groups, much can be learned through knowledge of the parents' generation kin terms.[5] In her dissertation on Bantu kinship, Laumanns (1941) gives the following PB terms, which according to Vansina apply to PWB as well:

-vava, *ta*: F, FB
-ma, *nina*: M, MZ
-ma –luma: MB, lit. 'male mother'
-ta –kalî, *-nali*, *nkali*: FZ, lit. 'female father'
-ana, *yana*: C
'*-ipwa*, *-ipua* ZCms, BCws

Laumanns states explicitly that the terms for F and M are extended to FB and MZ, respectively: "In the classificatory sense, the parallel relatives on the father's side [FB] and mother's side [MZ] belong to the parents' class" (Laumanns 1941, 13).[6] In the classification of Lowie (1948), PB and PWB kinship terminology is bifurcate merging in type: F = FB ≠ MB, M = MZ ≠ FZ. (It is not necessary for our purpose, but terms in the child's generation are also bifurcate merging: C = BCms = ZCws ≠ ZCms = BCws.) Intuitively, bifurcate merging terminology reflects a rule of unilineal descent since it separates patrilateral from matrilateral relatives. Cross-culturally, as shown in Table 6.1, bifurcate merging terminology is strongly associated with unilineal (patrilineal or matrilineal) descent. The few exceptions in Table 6.1 are best interpreted as survivals of earlier unilineal systems given the lag between changes in descent rules and changes in kinship terminology (Murdock 1949).

The absence of cross-cousin terms in the reconstruction of PB kinship terminology (the Hawaiian feature) can be interpreted as a marking effect. In Greenberg's ([1980] 1990) theory of kinship universals, the parents' generation is unmarked as against ego's (and all other) generations. It is an implicational universal that the presence of cross-cousin terms implies the presence of cross-uncle/aunt terms, but not the converse. Diachronically interpreted, cross-cousin terms are lost before cross-uncle/aunt terms and hence are more difficult to reconstruct (Hage 2001a). We assume[7] that PB or an ancestor of PB had cross-cousin terms to fit with the cross-uncle/aunt terms in the parents' generation and with the cross-nephew/niece terms in the child's generation.

As shown in Table 6.2 bifurcate merging terminology is also highly correlated with unilocal residence, either patrilocal or matri-avunculocal. Proto-Bantu and Proto–Western Bantu society, with or without "Houses," probably had unilineal descent and unilocal residence, contrary to Vansina's reconstruction.

Matrilineal Descent in Early Bantu Society

Vansina (1980, 151) argues that cognatic ("bilateral") descent would have been adaptive in early Bantu society given its joint dependence on agriculture (yam cultivation) and hunting. The first settlers in the rainforest lived:

> in the forest where the environment lent itself best to their double preoccupation with hunting and agriculture. They probably lived in an oasis and general demographic pressure remained very low. When it increased at the center of the oasis emigrants had to adapt to more distant, less favorable environments. Hunting required collective and individual mobility.... The kinship model which corresponds best to this state of affairs is bilaterality since it leaves a wide choice [of residence] to the individual male: he can join any of the villages of his four grandparents or even that of his father-in-law.

But as we have established, early Bantu society seems to have been unilineal, not cognatic (bilateral). Male absence due to the continued reliance on hunting favors the presence of matrilineal institutions. In Harris's (1980, 1985) model the development of matrilocal residence and matrilineal descent is favored under conditions of prolonged male absence for purposes of trade, warfare, and resource exploitation. In contrast to patrilocal residence and patrilineal descent, in which absent husbands must rely on wives "whose alien descent group loyalties override any obligation to [their] husband[s]" (Harris 1980, 97), in matrilocal residence and matrilineal descent absent brothers can rely on their sisters to look after their common lineage interests.

Ethnographic examples of this model include the Iroquois of the Northeastern Woodlands, the Huron of Ontario (Harris 1980), the Haida of the Northwest Coast of North America (Hayden 1993), and among colonizing societies, the Lapita peoples of the Pacific (Hage and Marck 2003). In Micronesia male mobility in interisland voyaging for purposes of trade and warfare was highly correlated with matrilineal institutions (Hage and Marck 2002). African examples would include the Yao of Malawi, a matrilineal, matrilocal society with prolonged male absence due to trading and slave-raiding expeditions (Mitchell 1956). The Iroquois case is especially pertinent because the development of matrilineal institutions has been linked to the limited adoption of horticulture due to a short growing season and a continued reliance on hunting, fishing, raiding, and warfare, which entailed prolonged male absence (Trigger 1978). As for the broad choice of descent group affiliation, mobile males are more easily assimilated to matrilineal groups. As Mary Douglas (1969, 127) has written with respect to African societies, matrilineal as opposed to patrilineal descent groups have "an open recruitment of talent and manpower."

Concl usion

We conclude on the basis of historical linguistic and cross-cultural evidence that early Proto-Bantu and Proto–Western Bantu society had unilineal, probably matrilineal descent groups. Contrary to Vansina, unilineal descent was not a late—eighteenth- and nineteenth-century—development. Comparative ethnographic evidence suggests the presence of matrilocal residence in early Bantu society as an adaptation to a mixed agricultural and hunting economy. Our interpretation is consistent with that of Ehret (1998), who has argued, on the basis of PB house and descent group terms and derivations, that PB **-ganda* 'anciently identified a matriclan' rather than a 'house,' as Vansina believed. According to Ehret there is a contrasting "strongly reconstructable PB term" for 'house,' **-júbò*.

Ehret also contests Vansina's interpretation of PB **-kumu* (CS 1265) as meaning "big man," a leader whose position is achieved rather than inherited (non-chiefly). According to Ehret **-kumu* is derived from the PB verb meaning "to be honored" and meant "'honored person'—most probably a hereditary ritual head of a narrower, lineage grouping of households within the wider kin... [who] continued to have a leadership role in society" (Ehret 1998, 149). Ehret's reconstruction suggests the presence of probably low level, matrilineal chiefdoms in early Bantu society. The early Bantu expansion may have been led not by "young and ambitious" sons of big men, as Vansina (1990, 55) proposes, but by emigrating junior collaterals of chiefly successors. Oceanic parallels have been posited by Bellwood (1996), Kirch (1997), and Hage (1999d).

Notes

Before his death, Hage and I had only corresponded and conversed about this chapter. Presented here is the first draft I saw, found in Hage's papers after his death. I left the work unaltered but for the addition of notes 1, 6, and 8. Two developments since Hage's death should be mentioned. The first is that in both Hage's Proto-Bantu and Proto-Oceanic works, details of the distributional arguments for matrilineality were left to another day. Hage was first occupied with linguistic and lifeway observations (Hage 1998, 1999d, 2001a; Hage and Marck 2001, 2002, 2003, this chapter; Marck, Hage, Bostoen, and Kamba Muzenga,

this volume). I have since emphasized the distributional evidence in favor of Proto-Oceanic society matrilineality (Marck 2008) and in favor of Proto–East Bantu matrilineality (Marck and Bostoen, this volume). The second development since Hage's death is my growing respect for Divale's (1974, 1984) thesis of recurring shifts in human societies to uxorilocality and thence matrilocality upon migration (and the common devolvement thence, over one, two, and three thousand years, of the matrifocal institutions). I assign a central significance to this in both the Oceanic (Marck, 2008) and East Bantu (Marck and Bostoen, this volume) situations. Hage (1998, 374), in a paper on Proto-Oceanic society, mentioned Divale 1974 and may have been aware of Divale 1984. In suggesting a "why" for Proto-Bantu matrilineality, we mention, in the present posthumous chapter, only absence of males due to hunting and not Divale's "uxorilocality upon migration" theme.

1. Neither Hage nor I had seen Vansina 1995 prior to Hage's death. But Vansina (1995) does not speak to the "house" versus "lines" arguments, which was Hage's main purpose in mentioning Vansina 1990. —J. Marck
2. "Undifferentiated" descent (from Lévi-Strauss 1969) and "bilateral" descent in Vansina (1990) are synonyms for "cognatic" descent.
3. In Guthrie's *Comparative Bantu* a C.S. (comparative series) "is a list of items with two distinguishing features: (a) each item has the same assignable meaning, which acts as a connector of the C.S.; (b) the shapes of the items display sets of patterns that recur in other C.S." (Guthrie 1967–71, 17). "P.S." refers to "partial series."
4. Vansina limits his remarks on bifurcation to Crow and Omaha type terminologies—i.e., terminologies which have intergenerational skewing. Many unilineal societies have neither Crow nor Omaha terminologies. The great majority of unilineal societies in the *Ethnographic Atlas* (Murdock 1967a) have Iroquois terminologies.
5. Here I have changed Hage's wording in which the sentence originally ended with "…it is only necessary to know the terminology of the parents' generation." This is the only change I made to the manuscript with the exception of adding this note and notes 1 and 7. —J. Marck
6. "Väter in diesem weiteren Sinne sind Vaterbrüder.… Mütter sind Mutterschwestern.…" (Laumanns 1941, 13).
7. "[A]ssume" is perhaps too strong a word. —J. Marck.

7

Kin Terms in the East Bantu Protolanguages

Initial Findings

Jeff Marck, Per Hage, Koen Bostoen, and Jean-Georges Kamba Muzenga

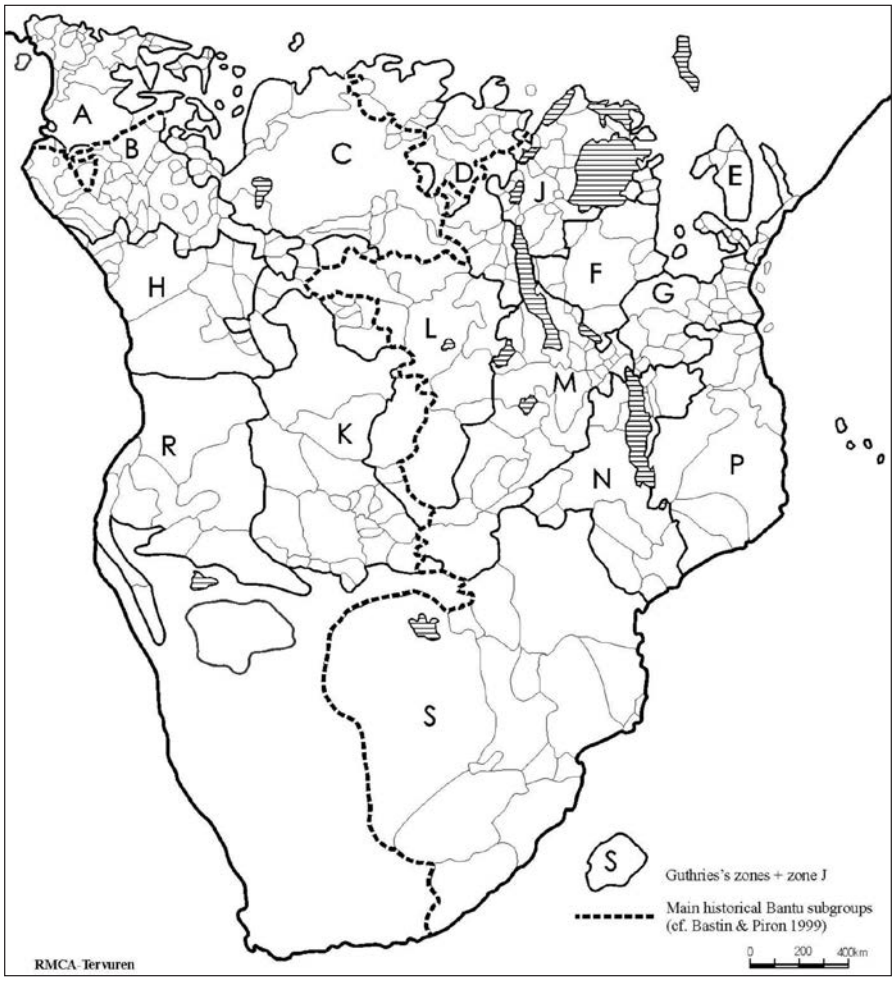
The only possible way of answering the question why a particular society has the social system that it does have is by a detailed study of its history over a sufficient period, generally several centuries.

— Radcliffe-Brown 1941, 16

The approximately 500 present-day Bantu languages extend from Cameroon in the northwest to southern Somalia in the northeast, and into Southern Africa and the limits of the African continent in the south (Map 7.1). The Bantu group is a branch of Benue-Congo, which is, in its turn, a subgroup of the Niger-Congo phylum (Williamson and Blench 2000, 30–36). The Proto-Benue-Congo homeland has been tentatively located in the neighborhood of the Niger-Benue confluence in Nigeria (Williamson 1989, 269–72), and Proto Bantu is believed to have been spoken in the vicinity of the Cameroon Grassfields, close to the modern Nigerian border. From there, Bantu-speaking peoples are posited to have begun their dispersal some five millennia ago (Nurse and Philippson 2003, 164). Proto–East Bantu was spoken ca. 500 BC, a date offered on the basis of certain antecedent archaeological traditions first arriving in the East Africa Highlands at about 1000 BC and the apparent spread of descended peoples by 500 BC (cf. Nurse 1999).

Guthrie (1967, 1970a, 1970b, 1971) subdivided the Bantu languages into fifteen distinct zones on the basis of a set of typological and geographical criteria. Given the large number of Bantu languages and the vast area they occupy, such a coding system is very useful for comparative purposes since it allows one to situate a Bantu language according to the zone in which it was grouped. This widely used referential tool has, however, only limited historical value and can not be considered a demonstrated phylogenetic classification of the Bantu languages. Later studies have therefore tried to revise it to match more with historical linguistic reality. One such revision is Zone J, which is a regrouping of part of Guthrie's Zones D and E (see Bastin 1978). It is one of the few revisions that is largely, though not universally, accepted.

Dialect areas appear to have spread, overlapped, and variously merged or balkanized as the languages' speakers spread. Description is scant for most of the languages and several of Guthrie's zones, especially in the western part of the Bantu area. Historically speaking, more than a century of comparative linguistic research has led to a better understanding of the Bantu language dispersal, but many questions remain unanswered. As yet, no internal classification of the Bantu languages has reached unanimity (Schadeberg 2003), but Map 7.1 shows Bastin and Piron's (1999) widely respected estimation of the main groups. A major issue of debate is the position of East Bantu in the genealogical tree—that is, is it a primary branch or a lower-level offshoot? In any event, it is widely believed that part of Zone D, Zones J and E, and the zones to their south (F, G, M, N, P, S, and possibly parts of L and K) form a genetic unity and that "during the last half of the first millennium BC, Bantu-speaking communities spread slowly east and south from the rainforests, gradually becoming the predominant linguistic population of most of subequatorial Africa" (Nurse 1999, 2). Accordingly, the reconstruction of kinship terms to



MAP 7.1. Guthrie's zones and Bastin and Piron's (1999) current estimation of the main subgroups.

their hypothetical common parent language, Proto–East Bantu, provides evidence of social organization in East Africa some 2,500 years ago.

Three of the Guthrie zones in Bastin and Piron's (1999) East Bantu have rather more social organization description than the others, and they were the subject, by default, of special study in the present work, although kin terms from all Bantu zones were examined where available. These three zones—J, G and S—show agreements with each other and to external evidence, which have allowed the reconstructions of the Proto–East Bantu parental generation and cross-cousin terminologies shown in Table 7.1. We refer to "common" Zone J, G, and S forms to escape the obligation of arguing that J, G, and S are closed subgroups, although they may be. The "common" reconstructions receive the standard single star when external cognates are known, and double stars (for less reliability) when no external cognates can currently be demonstrated.

The Proto–East Bantu term for "cross cousin" has been discussed in various ways by Murdock (1959a, 383–84), Bastin (1971, 36), Schoenbrun (1997, 70–71; 1998, 96–97), and Fourshey (2002, 146–47). Table 7.2 gives typical cognates from some Zone J, G, and S languages, and one from Zone M.

As can be seen in Table 7.1, a bifurcate merging parental generation terminological system (F = FB, MB; M = MZ, FZ)[1] is reconstructed for Proto–East Bantu, as are terms for "cross cousin" and "parent-in-law," which are, literally, "cross cousin's father" and "cross cousin's mother." Table 7.2 shows typical agreements for the reconstructed "spouse's parent" terms. Bifurcate merging parental generation terminologies are most often associated with lineal societies, and terms equating a consanguine with an affine are essentially diagnostic of cousin marriage.

As Proto–East Bantu, the interstages considered, and most of the daughter societies have this same system, we

TABLE 7.1. Proto–East Bantu reconstructions

	Proto–East Bantu	'Common' Zone J	'Common' Zone G[1]	'Common' Zone S
F, FB (1s)	*tààtá[2]	*tààtá[2]	*tààtá[2]	*tààtá[2]
M, MZ (1s)	*mààmá[2]	*mààmá[2]	*mààmá[2]	*mààmá[2]
MB (1s) ('M-')	*máá-dʊmè[3]	*máá-dʊmè[3]	**tʊmba[4]	*máá-dʊmè[3]
FZ (3s) ('F-')	*i-cé-n-kádí[3]	*i-cé-n-kádí[3]	*ca-n-kádí[5]	*F-kádí[3]
Cross cousin	*bíádá[6]	*bíádá[6]	*bíádá[6]	*bíádá[6]
Parent-in-law	*F/M-*bíádá[6]	*F/M-*bíádá[6]	*F/M-*bíádá[6]	*F/M-*bíádá[6]

Notes: See Marck and Bostoen, this volume, and Table 7.2 for supporting data for the reconstructions.

[1] * proto form; ** form common among some languages of the zone.

[2] Bastin et al. 2003.

[3] J. G. Kamba Muzenga, from work in progress on suppletive possessives in Bantu kin terms.

[4] Kwere, Ngulu, Shambala *tumba*.

[5] Possible vowel change: **cé-n-kádí* > **ca-n-kádí*. Several of the zones show change where others retain all the old morphemes, suppletive 'father' morphemes or innovative 'father' morphemes: Non-East Bantu: (H) Ovimbundu *tate-kai*, (R) Umbundu *tatekã*, Ambo *usin-kasi*; East Bantu: (F) Nilamba *shangáázi*, Nyamwezi, Sukuma *sengi*, (G) Gogo *nyina-henga*, Kagulu *mai sangasi*, Kwere *mama sangazi*, Luguru *shangazi*, Ngulu *mame sangazi*, Shambala *naa ngazi*, (J) Nyoro *isen-kati*, Chiga *cwen-kazi*, Ganda *senga*, *sengawe*, Soga *songa*, Nyambo *cwen-kazi*, Haya *ishénghâzi*, *ishengkazi*, (M) Lamba *kashi*, (S) Ronga *rara-kati*, Venda *ma-khadzi*, Zulu *ubabe-kazi*.

[6] Bastin 1971, 36–37, and Schoenbrun 1997, 70.

TABLE 7.2. East Bantu terms for cross cousins and spouse's parents

Language	Cross Cousin	Spouse's Father	Spouse's Mother
J11 Nyoro		ise-zara	nyina-zara
J13 Kiga	mu-zara	ice-zara	nyina-zara
J15 Ganda		se-zala	nya-zala
J61 Rwanda	mu-byara		
G12 Kagulu		baba fiala	
G34 Ngulu		tate vyalu	mame vyalu
G63 Bena		nya-fiyara	nya-fiyara
M51-2 Ambo	mu-fyala	usi-fyala	nyina-fyala
S21 Venda	mu-zala		
S21 Basuto	mo-tsoala		
S32 Lovedu	mo-tswala		mma-tswale
S41 Pondo	m-zala		
S42 Zulu	um-zala	u-babe-zala	u-mame-zala
S44 Ndebele	um-za	u-baba-zala	u-mama-zala

conclude that the last 2,500 years of Proto–East Bantu descended social organization was dominated by unilineal clan-based societies practicing "preferential" cross-cousin marriage, as are most of the daughter societies today.

If Radcliffe-Brown (1941, 3) defined our task as one of arriving at valid abstractions, we wish to point out that there is nothing abstract about this central core of reconstructions. These have simply and demonstrably been at the core of some of the most stable kin terms in these East Bantu systems for two or three thousand years.[2]

With respect to how to define the Zulu parental generation terminologies, Kuper (1979, 373) noted that "A number of modern kinship specialists would argue that such

a question is inevitably arid, since the categories are too crude, and because kinship terminologies are not simply definable entities." He did not, however, take that position himself and shed light on a puzzle of the general system of kin and its nomenclature for Southern Africa. Here we hope we have shed some light on the general system of kin and its nomenclature through Southern and East Africa over the last 2,500–3,000 years. We have done so, rather exclusively, by discovering the general stability of a bifurcate merging parental generation terminology coupled with a similarly stable system of special terms for cross cousins and the naming of parents-in-law as "father of cross cousin" and "mother of cross cousin."

Our study of the "prescriptive" marriage terms does not indicate what sort of symmetry or asymmetry is reconstructable for East Bantu cross-cousin marriage systems through time and space, and such determinations are, in any event, often beyond linguistic methods. We have surveyed the alliance literature and feel it is presently best to simply note the confusion we encounter[3] when trying to make sense of how fluid and competing social organization principles play out through time and space when contrasted with the central linguistic observation that alliance ("spouse's parent") has, through 2,500 or 3,000 years of East Bantu prehistory, typically been defined as "cross cousin's parent." Through time and space, and into many or most of the living societies considered, it has done so whether the society was matrilineal or patrilineal. This may have marched through time, as with Krige's (1975)[4] example involving Lovedu (Zone S) circulation of bridewealth cattle, as strongly preferential. But we cannot know, through linguistic methods, the commonness of this preference in the past. Such matters are little reported in the ethnographic literatures for East Bantu or Bantu in general. Casting about for ethnographic data on this matter elsewhere, the Dravidian region of India with its prescriptive marriage systems has, variously through the region, as few as 10 percent and only as many as about 50 percent of marriages following the cross-cousin pattern (Dumont 1993, Trautmann 1993a, 1993b).

We have shed little light on the sorts of questions Hage (2006) addressed for the East Bantu Yao (Zone P) with its Dravidian system. Our study shows that there is little ancient about the Yao kin terms concerned, and that those terms seem to be what Hage said they were: a local development.[5] We have, however, completed the beginnings of work toward understanding and elucidating the Proto–East Bantu system. We posit elsewhere (Hage and Marck, this volume; Marck and Bostoen, this volume) a matrilineal Proto–East Bantu society, as are most of today's East Bantu societies and Bantu societies in general. By this model it is the patrilineal East Bantu societies of Zones J and S that have (independently of one another) changed. It would seem that lineality was maintained through a period of double descent, or that there was a cognatic (non-unilineal) period short enough that it did not disturb the parental generation kin term distinctions which commonly become generational (F = FB = MB, M = MZ = FZ) given enough time in a cognatic society.

Notes

Marck began this work as a project of the Health Transition Centre, National Centre for Epidemiology and Population Health, Australian National University in 1997 and was joined by Hage in 1999. Collection of data and initial analysis proceeded until Hage's death in 2004. This chapter was completed in December 2005 and January 2006 when Bostoen joined the project, and Kamba generously supplied much unpublished data. Marck received institutional support from the Service of Linguistics, Royal Museum for Central Africa, Tervuren, Belgium, in 1997, 1998, 2005, and 2006, and received institutional and financial support for this project from the Centre for Research and Documentation on Oceania, School for Advanced Studies in Social Sciences, Marseille, France (CREDO-EHESS), in 2004. The work was finalized by Marck and Bostoen in Tervuren in January 2006, at which time they began work on Marck and Bostoen (this volume).

1. F = father; B = brother; M = mother, Z = sister.
2. Terms for "grandparent," Proto–East Bantu *-kùùkù, and "grandchild, Proto–East Bantu *jíjùkùdù, have been similarly stable but are not of great moment in social organization studies and are not, therefore, given or expanded in Table 7.1. Further work on these and other terms is reported in Marck and Bostoen (this volume).
3. "We" refers to "the linguist coauthors" (Marck, Bostoen, and Kamba), this portion of the chapter having been drafted after Hage's death.
4. The title of Krige's paper reads as if Lovedu is matrilineal, but refers to comment's Krige offers on another author's work, not to Lovedu, which is patrilineal.
5. Or that, perhaps, of Yao and its immediate relatives. It is a Zone P language and there is little ethnographic or linguistic description for this group.

8

Proto-Oceanic Society (Austronesian) and Proto–East Bantu Society (Niger-Congo) Residence, Descent, and Kin Terms, ca. 1000 BC

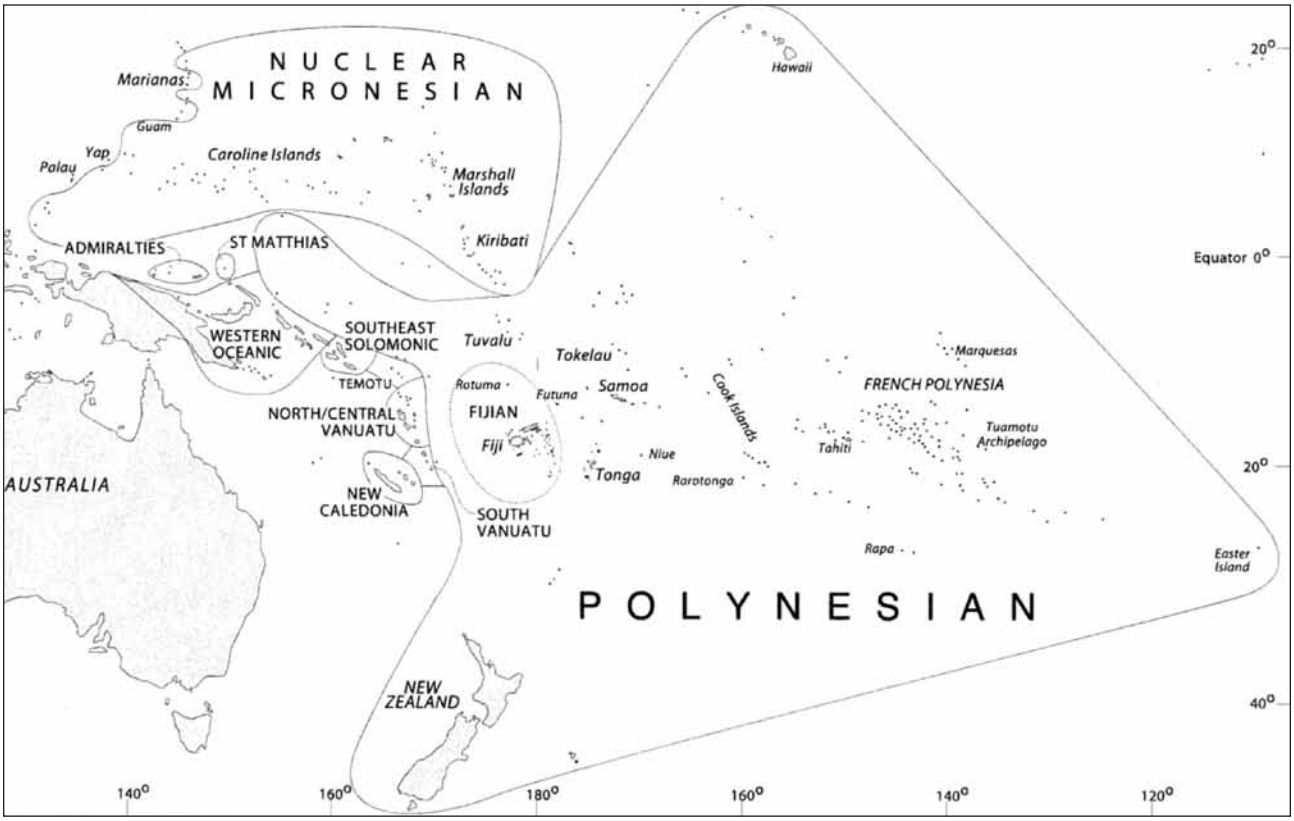
Jeff Marck and Koen Bostoen

The Proto-Oceanic language was a Proto-Austronesian and Proto-Eastern-Malayo-Polynesian daughter spoken around the Bismarck Archipelago at about 1000 BC. Descendants of its speakers ultimately spread through much of Island Melanesia, onto the northeast and southeast coasts of New Guinea, through all of Polynesia and through all of Micronesia but for two of its westernmost island groups (Map 8.1). The settlement of Polynesia was under way by about 950 BC (cf. Burley et al. 1999) and constitutes a convenient time to mark the last possible "moment" of highly unified Oceanic speech (cf. Green 2002, 2003; Pawley 2003, 2008). The Proto–East Bantu language was a Proto-Niger-Congo and Proto-Bantu daughter that was spoken around the Great Lakes of East Africa. Descendants of its speakers ultimately spread through much of Eastern and Southern Africa (Map 8.2). Proto–East Bantu was spoken ca. 500 BC, a date offered on the basis of certain antecedent archaeological traditions first arriving in the East African Highlands at about 1000 BC and the apparent spread of some of these peoples by 500 BC (cf. Nurse 1999).

This chapter compares and contrasts Proto-Oceanic and Proto–East Bantu residence, descent, and kin terms. The kin term systems, which are treated first, were fully bifurcate merging[1] in their parental generation terminologies (discussed further below; also see Marck et al., this volume). Proto–East Bantu had cross-cousin and prescriptive alliance terminologies. Proto-Oceanic did not. Following Hage (Hage 1998, Hage and Marck 2003), Kayser et al. (2006), and Marck (2008), we believe Proto-Oceanic society was matrilineal and matrilocal. We also hold the view that Proto-Bantu society was matrilineal and matrilocal (Ehret 2001a; Hage and Marck, this volume) as, we here add, was Proto–East Bantu society. In Proto-Oceanic, Proto-Bantu and Proto–East Bantu societies, we hold that residence (matrilocal), descent (matrilineal), and kin terms (bifurcate merging in the parental generation) were concordant[2] and in archetypically perfect alignment—and were probably so due to migration (Divale 1984) in their recent pasts (500–1,000 years).

We posit that both the Proto-Oceanic and Proto–East Bantu societies were matrilineal and matrilocal because they had, at some time in their past, become uxorilocal[3] then matrilocal[4] due to migration, as observed by Divale (1984) for many other migrant human societies. For Proto-Oceanic society there was additional matrifocal residential pressure from extended absences of males due to long-distance seafaring (Hage and Marck 2002, 2003; Marck 2008), a factor that has continued in some areas up to the present; it is observed that most Oceanic societies that are still matri-/avunculocal are still seafaring to greater or lesser degrees. For Proto-Bantu society and Proto–East Bantu society there may have been additional matrifocal residential pressure from regular absences of males due to hunting (Hage and Marck, this volume). Divale's migration model revolves around the redirection of warfare from feuding and other intragroup rivalries and violence toward the "others" displaced upon migration. We expand upon this presently. Hage's "male absence" model for Oceanic (Hage and Marck 2003) and Proto-Bantu (Hage and Marck, this volume) continues Harris's (1980, 1985) thesis that frequently absent males find their sisters better custodians of their property than their wives, and that matrilocality easily accommodates this.

The Divale and Harris models give us reasons to believe that Proto-Bantu society and Proto-Oceanic society



MAP 8.1. The Oceanic subgroups.

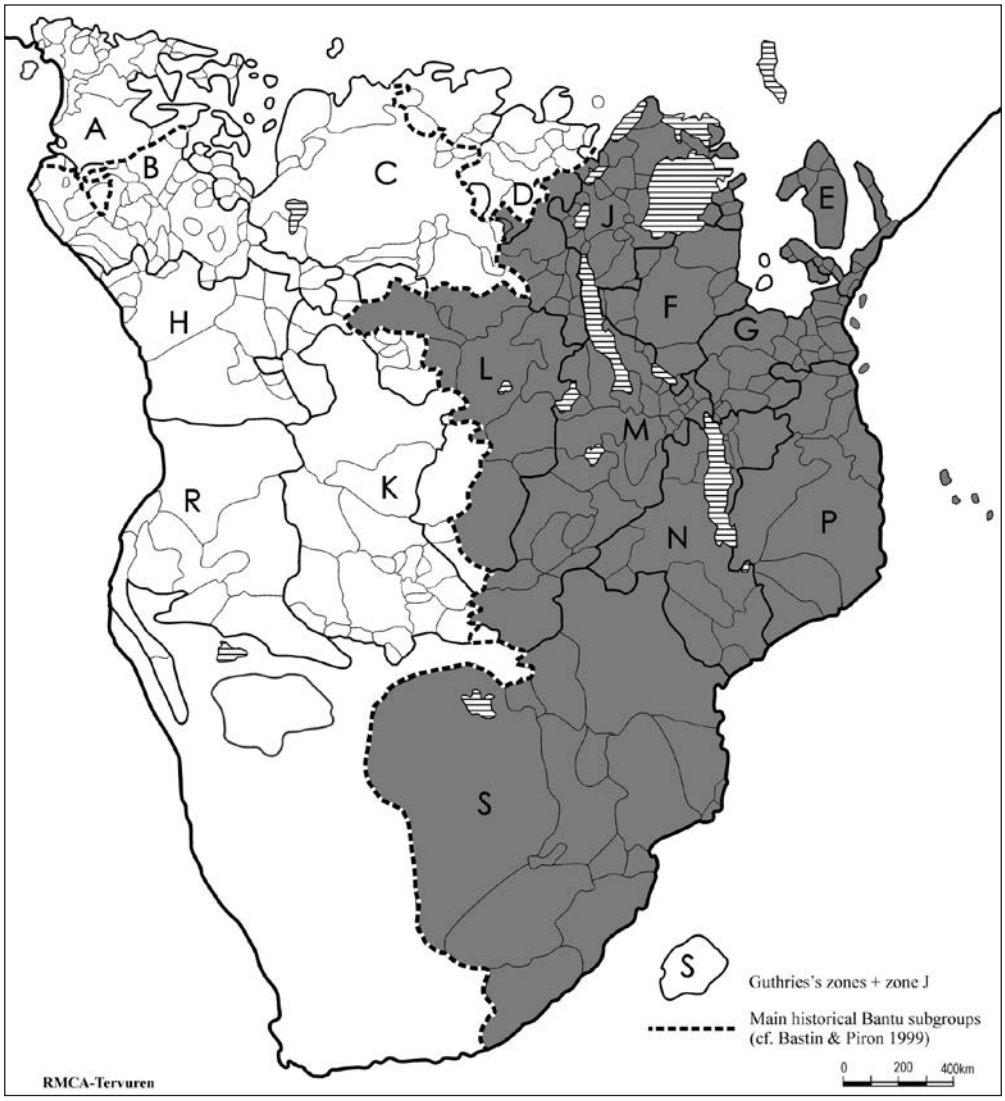
were doubly motivated to be matrilocal. Here we emphasize for East Bantu, as Marck (2008) recently has for Oceanic, that the modern ethnographic distributions of matrilineality are better evidence than any other (apart from the evidence of human genetics) for showing that those double motives, migration and regular male absences, had actually resulted in matrilocality in Proto–East Bantu society and Proto-Oceanic society.

In the main, historic East Bantu societies remain at least nominally matrilineal except in the extreme northwest and the extreme south (Guthrie zones J and S [Map 8.2]). Historic Oceanic subgroups, with their less continuous island group geographies, followed more varied paths to the present.

The following sections consider the kin terms (the linguistic evidence for lineality), the modern distributional situations with respect to descent, and, finally, an old question about mother's brothers.

The Kin Terms

Studies of social organization intersect with linguistics at the level of kinship terminologies, and here we set out where the Proto-Oceanic and Proto–East Bantu kin term situations stood. This section is a linguists' report to the social organization specialists. Comparison of kin term systems can shed light on past stages of social organization and help inform theories of change from various anthropological perspectives. Here we inventory the reconstructed kin terms of Proto-Oceanic and expand reconstructions of Proto–East Bantu kin terms (Table 8.1, Appendix 8.1) beyond those of Marck et al. (this volume). Both languages were spoken by expanding farming communities. Both languages spawned hundreds of daughters, which provide excellent opportunities for terminological reconstructions (to the extent that they have published descriptions). Both were fully bifurcate merging in their parental generation terminologies. Both spawned various systems among their offspring: more minimal systems in some instances, more complex in others. Both have at least one Dravidian society among their daughters (Hage 2001a, 2006). For both languages there are, perhaps, some kin terms that existed that will remain unreconstructable due to the propensity of terms of certain categories to experience more replacement than others, and also to lack of description. For both languages the current report is exhaustive in terms of extant



MAP 8.2. Guthrie's (1967, 1970a, 1970b, 1971) Bantu "zones." The shaded area is Bastin and Piron's (1999) present estimation of what groups should be included in East Bantu.

data, and further knowledge of these ancient kin term systems would require targeted work in the field among their daughter languages.

As can be seen in the reconstructed kin terms of both (Table 8.1), there is a difference between the two where Proto–East Bantu had prescriptive alliance terminologies ("spouse's F/M = cross-cousin's M/F") (Marck et al., this volume), whereas Proto-Oceanic seems to have had no reconstructable cousin terms or prescriptive alliance terminologies of any kind (Hage, this volume; Marck 2008).

Lineality devolved in some Oceanic instances, most famously in the mainly cognatic systems of the Polynesians. Possibly it would not have so often devolved if the lines were tied together in the prescriptive alliance systems of the East Bantu. Most East Bantu speech communities today seem still to be lineal, although in the far south (zone S) and the far northwest (zone J) whole Guthrie zones have become patrilineal rather than matrilineal.

As can be seen in Table 8.1, the parental generation systems are of the same form with bifurcate merging terms. The outstanding difference from a social anthropological perspective involved the previously mentioned prescriptive alliance formula of Proto–East Bantu ("cross-cousin's[5] F/M" = "spouse's F/M"). Proto-Oceanic had neither that nor any other prescriptive alliance equation. If Proto-Oceanic society had cousin marriage of any sort, there is no trace of it in the kin terms (Hage, this volume; Marck, forthcoming). It is common for extant Oceanic

TABLE 8.1. Proto-Oceanic and Proto–East Bantu kin term reconstructions

	Proto-Oceanic	Proto–East Bantu
grandparent	**tubu*	
grandfather		**céé-kú dú*
grandmother		**máá- kú dú*
father	**tama*	**cé*
mother	**tina*	**nìnà*
mother's brother	**matuqa*	**máá-dúmè*
father's sister	**aia*	**cé-n-kádí*
elder same-sex sibling	**tuqa(ka)*	**kú dú*
younger same-sex sibling	**taci*	***mununguna*
woman's brother	**mwaqane*	
man's sister	**papine*	
cross cousin		**bíádá*
child	**natu*	**jánà*
man's sister's child	**(q)alawa*	**mwipwa*
woman's brother's child	***kadea*	
grandchild	**makubu*	**jíjò kò dò*
spouse's parent	**rawa*	**kwe*
spouse's father		**tààtá-bíádá*
spouse's mother		**mààmá-bíádá*
spouse	**(q)asawa*	
husband		**dúmè*
wife		**ké, *kádí*
sibling-in-law		**dámú*
spouse's cross-sex sibling	**(q)ipaR*	
spouse's same-sex sibling		
child's spouse	**rawa*	**kwe*

Source: Marck, forthcoming, Appendix 1.
Note: Double asterisks (**) indicate a reconstruction whose level of proto-language or precise semantic reconstruction is problematic.

societies to proscribe first- and second-cousin marriage, although we have not approached that problem systematically and can offer no synthetic statements here.

The Proto–East Bantu term for "cross cousin" has been discussed in various ways by Murdock (1959a, 383–84), Bastin (1971, 36), Schoenbrun (1997, 70–71; 1998, 96–97), Fourshey (2002, 146–47), Bastin et al. (2003), and Marck et al. (this volume). It is formed of the verb "to bear, procreate." Linguistically, we can be quite certain that the "cross cousin's F/M = spouse's F/M" equation existed at the Proto–East Bantu level, and one therefore posits that society at that time practiced cross (first)–cousin marriage.

Both Proto-Oceanic and Proto–East Bantu saw their first-order daughter languages develop in the first millennium BC. Reconstruction of these first-order daughters commonly results in systems not so very different from Proto-Oceanic or Proto–East Bantu themselves, and they often resemble Proto-Oceanic or Proto–East Bantu more than they resemble many of their living daughters. The present report considers only Proto–East Bantu and Proto-Oceanic themselves, for in doing so we presently

posit that we capture the general nature of most of the daughters for most of the first millennium BC.

The Proto–East Bantu society pattern of matrilineality with cross (first)–cousin marriage enjoyed great stability as it emerged onto the savanna. Later, communities in the extreme north and south of the East Bantu domain (Zones J and S, respectively) shifted to patrilineality but did not, at the level of the Zones J and S protolanguages, abandon the "cross cousin's F/M = spouse's F/M" equation or their bifurcate merging parental generation kin terms. Bifurcate merging is associated with lineality of every type (matrilineality, patrilineality, and double descent). Exceptions in Oceanic seem mainly to involve cases of small populations that dropped bifurcate merging terms and became generational (F = FB = MB, M = MZ = FZ) (e.g., Proto-[Nuclear]-Micronesian [Hage and Marck 2002]). We are currently aware of no exceptions in East Bantu. In neither the Bantu shifts to patrilineality nor the Oceanic shifts to patrilineality or double descent is there evidence from the kin terms marking these shifts. The same bifurcate merging parental generation terms continued in most instances to be present in the societies so transformed.

Divale (1984) and the Distributional Social Organization Evidence

With the reconstruction and comparison of kin terms, the linguists' work is done, but here we also review and expand upon the literature concerning questions of Proto-Oceanic and Proto–East Bantu residence and descent. It was mainly Hage who had been doing so for Oceanic (Hage 1998, 1999d; Hage and Marck 2002, 2003) and Bantu (Hage and Marck, this volume), but he died before developing the distributional arguments for Proto-Oceanic, Proto-Bantu, and Proto–East Bantu matrilineality and matrilocality.

Distributional arguments are a powerful complement to the other lines of inference Hage pursued, and here we summarize Marck's (2008) distributional argument for Proto-Oceanic matrilineality and matrilocality. We then turn to an examination of the distributional argument that can be made for Proto–East Bantu matrilineality and matrilocality, expanding upon Ehret's (2001a, 33) notion that "corporate matrilineal kin groups of some kind are likely to go back to proto-Bantu," a view held by Hage at the time of his death (Hage and Marck, this volume).

We assert that one can most conveniently claim that the Proto-Oceanic and Proto–East Bantu societies were matrilineal because so many of their historical daughters are. Such a distributional argument must have a model of most likely changes, and Divale (1984) has been our guide as to how matrilineal societies would be expected to develop and then change over time. The general thesis continues Murdock's (1967a, 1970) observation that residence tends to seek a concordant descent system, and that descent creates certain regular patterns of kin terms (bifurcate merging parental generation kin terms being typical of lineal societies). Divale (1974, 1984) observed that societies sometimes become uxorilocal[6] and then matrilocal[7] when they migrate. His 1984 work showed just how common this is cross-culturally. Divale's theory of the formation dynamic is considered presently. In reference to Proto-Oceanic society, for the moment we are concerned with the dynamic of what transpires after the migrant, matrilocal societies begin passing some centuries and then millennia in their new homes. In a process Divale found to average 1,800 years, the matrilocal societies eventually become avunculocal,[8] then virilocal,[9] then drop matrilineality or briefly have double descent,[10] finishing off as virilocal cognatic societies or as patrilocal[11] societies where formally reckoned patrilines have emerged.

Marck (2008) argues that the Oceanic subgroups show retentions and abandonments of matrilineality along the cline outlined by Divale, the cline skewed to some extent by unpredicted[12] retention of matrilocality involving groups that continued long-distance seafaring (cf. Hage and Marck 2002) and unpredicted retention of matrilineality in societies that developed age-grade institutions (cf. Allen 1984)—the distributional evidence therefore supporting Hage's (1998) suggestion of Proto-Oceanic matrilineality. Lineality in Hage's model emerged in two major parts: in his initial defense of Proto-Oceanic society lineality (Hage 1999d)[13] and *then* his defense of a specific matrilineality component (Hage 1998). Hage's (1998) "Was Proto-Oceanic society matrilineal?" was soon supported by studies of Polynesian mitochondrial DNA and Y chromosomes showing a pattern typical of matrifocal residence from their centuries in the Proto-Oceanic homeland (Hage and Marck 2003, Kayser et al. 2006, Marck 2008).

The distributional argument is more obvious for East Bantu, for which most historical societies remain matrilineal. Only two East Bantu subgroups were patrilineal upon earliest Western contact: Zones J[14] and S (Map 8.2). The rest are matrilineal, as are East Bantu's immediate

Bantu neighbors to the west. Clearly it is Zones J and S which have changed.

Diffusion would be a poor explanation for the discontinuous geographies of Oceanic matrilineality (Marck 2008). Diffusion would also be a poor explanation in the East Bantu instance, where we observe that East Bantu matrilineality is more easily explained as a continuation of Proto-Bantu matrilineality. Abandonment is mainly outward from the Proto-Bantu homeland far to East Bantu's northwest. This is just as Divale's model predicts (i.e., abandonment among formerly migrant societies which have been in situ longest). Diffusion of matrilineality over almost the entirety of Bantu's distribution is a hopelessly complex suggestion compared to the simple notion that Proto-Bantu society was matrilineal to begin with. Diffusion of matrilineality is unattested ethnohistorically in Bantu-speaking areas, and Marck (2008) identified only one possible Oceanic language case (between two or more Oceanic-speaking groups[15]). Diffusion of matrilineality over the vast reaches of Bantu speech ends up being a very ad hoc suggestion. In any event, there have been no recent opinions published suggesting subequatorial Africa's "Matrilineal Belt" arose through diffusion.

Following Divale's model, Proto-Bantu matrilocality was motivated most anciently by external conflict following their ancestors' migration from closer to the Proto-Niger-Congo homeland. They may have arrived in what became the Proto-Bantu homeland (the Cameroon Grasslands) already matrilocal (from previous migration) or they may have become matrilocal in situ in the Grasslands. No opinion on that matter seems ever to have been published, and we offer none here.

With reference to the formation of matrilineal societies (out of patrilineal, cognatic, etc.), Divale showed that in many instances societies became uxorilocal as part of a general migrant process. Finely segmented patrilineal institutions, which organize internal conflict (blood revenge, feuding, units of warriors, etc.), are abandoned as migrants' conflicts become collectively directed toward "others." Every male becomes equally attached to the missions of aggression and defense with respect to aborigines of the land intruded upon. They become less attached to residing with agnatic kin and might, the present authors suspect, be inclined as migrants to find their wives happiest with their wives' own uterine kin. Divale (1984, 24) suggests decisions at this level would be under natural pressure from prospective parents-in-law, who could insist on uxorilocal residence for a daughter courted by a warrior, a status held by most able-bodied males. Divale's model is a conflict model, and he gives examples of historical societies that quickly became uxorilocal when external conflict emerged: a kind of ranging warfare among the previously patrilineal Osage of North America (Divale 1984, 26), warfare upon migration among the Tupi of South America (Divale 1984, 93–94), and many others.

Divale's general thesis of what then transpires in the centuries and millennia after migration is one of men incrementally taking back control of residence and descent in the progression summarized previously. More specifically (Divale 1984, 26–28), a common first step involves a shift of residence to male control through avunculocality.[16] Then, as time passes, men become more concerned with passing land on to their own sons rather than their sister's sons, and virilocal residence becomes an option. These societies are still matrilineal, but, given enough time, matrilineality eventually determines little more than exogamy in increasingly virilocal contexts. These changes may happen earlier among the highest-ranking families than among more average families, or, alternately, it can be the average families that innovate while people of rank continue the old pattern (Marck 2008).

Turning now to the details of historical East Bantu societies, we have done what we believe is an exhaustive search for sources and have found few descriptions of matrilineality in East Bantu societies that go beyond simple assertions that the societies should be classed as matrilineal.[17] Most of those sources are for Guthrie's Bantu Zone M (Map 8.2). One source is Colson (1951, 1958, 1961), who describes the matrilineal Plateau Tonga of what is now Zambia:

> Clans are not corporate bodies. They own no property, have no ritual centers or leaders, and never on any occasion assemble as a group. At first glance they appear to be functionless.…
>
> …Inheritance, succession, provision and sharing of bridewealth, vengeance and a common ritual responsibility are functions of the group. A group does not hold a common estate in land or in movable property.…
>
> …Residence is usually virilocal but it is not otherwise determined by any rule which associates the husband residentially with a given body of kin. (Colson 1961, 40, 41, 42)

The Bemba (Zone M) (Richards 1950, 1951) are described as matrilocal but little concerned with the avunculate. At least one Zone M group is patrilineal. The Nyakyusa, closely related to the Bemba, reside in herding groups organized around male age-mates (Wilson 1950, 1951), and residence is perhaps patrilocal. Wilson seems to describe actual patriclans and mentions no matriclans. He does describe strong mother's brother—man's sister's child relationships for the Nyakyusa.

For the Ila, another Zone M cousin of Bemba, Wilson (1950, 236) relates that "It is a system which is described as matrilineal since clan membership is reckoned through the mother, and the avunculate is strong, but there is some evidence that the individual belongs to double descent groups, one patrilineal and the other matrilineal; succession and inheritance may take place from the father as well as the mother's brother and in the ancestral cult the patrilineal ancestors have precedence."

Fourshey (2002) reconstructs Proto-Rukwa (Zone M) (the ancestor of Wungu, Ndali, Nyakyusa, Malila, Nyiha, Lambya, Safwa, Mambwe, Lungu, Fipa, Nyamwanga, Pimbwe, Rungwa, and Nyika) positing a matrilineal ancestral society.

Beyond Zone M, we have very little information about matrilineal East Bantu societies, but there is the case of the Yao (east of Lake Malawi, Guthrie Zone P, Map 8.2) (Richards 1950; Mitchell 1951, 1956), who are matrilocal and among whom chiefly succession is through the matrilineage and the avunculate.

Looking beyond East Bantu for some impression of life among matrilineal Bantu who have been in situ longer than any East Bantu group, we encounter Douglas's (1952, 1954) description of the Lele of Kasai (Zone C, Map 8.2) in what is now the Democratic Republic of the Congo. As expected, we find that she captures a matrilineal society that we maintain to be at a relatively late stage of matrilineality (Douglas 1952, 60):

> Lele kinship organization is weak and unstable, suffering competition from other forms of social grouping. The village is the political and ritual unit, but its population is fluctuating and, from a kinship point of view, heterogeneous. The most compact groups within the village are the cult societies and the men's age-sets, whose solidarity contrasts with the weakness of the matrilineal clans. The later are scattered by patrilocal marriage,[18] and their very dispersal contributes to the fluidity of residential ties. The main functions of clan membership are exercised by very small groups, sometimes only three or four adult men living in one village. They pay compensation for blood debts incurred by fellow members by transferring rights over clanswomen, and they exact blood compensation for the murder of members, allocating amongst themselves the wives so obtained from other clans. It is hard to judge whether this prime function of clan organization is a source of solidarity or disruption. All clan and kinship loyalties are weakened constantly by jealousy and sorcery accusations.

The arrival of Bantu-speaking people in Zone C began earlier than the 1000 BC of the East African Highlands. And still the Lele are matrilineal, but in a minimal and moribund way that would not surprise Divale. The best explanation for the Lele's matrilineal institutions is that they are residual, left over from a matrilineal past that had more reason to be matrilineal. Certainly the Lele did not borrow this limited collection of matrilineal practices in some wave of sub-equatorial diffusion. Indeed, we might wonder why they remain matrilineal at all. Our first answer would be "because their neighbors still are" and that such societies may be collectively reluctant to restructure exogamy individually.

Our second answer comes from Divale's long (an average 1,800-year) timeline for complete abandonment of matrilineality and is simply "cultural conservatism." By this model, tens of thousands of village palavers over Bantu-speaking Africa in the last four millennia saw one and, incrementally, another matricentric practice abandoned. These customs are matters of law as understood by literate societies and are argued endlessly in village gatherings in preliterate societies. Precedents are upheld in matters of land inheritance and other practices of moment, and the rights a child is born with are defended into the generations that follow. A third factor would have been the Bantu's Niger-Congo warrior schools,[19] their age sets, their rites of initiation, and the consequent individual male opportunities for advancement in the society independent of one's matriline. Male rank and status may no longer follow the matrilines, but matrilineal exogamy continues to be practiced. Loss of matrilineality is also posited to have been slowed in Oceanic societies that developed male age-grades (Allen 1984). Those Oceanic societies seem to have developed age-grades locally and did not inherit them from their Proto-Oceanic society past (Marck 2008). No one has ever suggested

that Proto-Oceanic society had male age-grade societies, and the position taken here is that Proto-Oceanic society had none.

The Mother's Brother

Here we revisit the matter of "the mother's brother" as that topic exists in the works of Junod (1912) and Radcliffe-Brown (1924). We wish to recall that Junod wondered if the strong mother's brother institutions of the patrilineal Thonga in South Africa were due to a previous period of matrilineality. Radcliffe-Brown then held up the example of Tongan mother's brother institutions in Polynesia and noted that they were essentially the same as those of the Thonga and that there was no reason to believe Polynesians had ever been matrilineal. We leave off here with the knowledge that both the Thonga and Tongans had been matrilineal up to perhaps 2000 BP. So if the Thonga and Tongans can no longer be seen as possible examples of strong mother's brother institutions developing in the absence of past matrilineality, they can at least be held up as examples of societies in which strong mother's brother institutions persisted for as much as two millennia after matrilineality was abandoned.

Conclusion

We began by emphasizing the central difference between the Proto–East Bantu and the Proto-Oceanic kin terms: Proto–East Bantu had cross-cousin terms and terminologies of prescriptive alliance (Marck et al., this volume), whereas Proto-Oceanic did not (Hage, this volume; Marck, forthcoming). But it seems quite certain that both of these expanding farming peoples were matrilineal, with bifurcate merging parental generation kin terms, and the human genetic evidence (Marck 2008) now persistently suggests that Proto-Oceanic society was specifically matrilocal. Residence, descent, and kin terms were perfectly concordant.

Divale (1974, 1984) is vindicated at every turn examined. He supplies us with a reason for matrilocality developing in migrant societies (a collective response to "external conflict" [conflict with their new home's aborigines]). We find it a natural model for both the Proto-Oceanic and Proto–East Bantu cases: it doesn't try to make water flow upstream as diffusionist and perhaps other models would require. Divale gives us a progression of how matrilineality then devolves (residence changes and then descent), and we see those processes at work in Oceanic-speaking societies (Marck 2008) and (above) in our examples from Zone M among East Bantu speakers. Divale (1984) also gives us a timeline (an average of 1,800 years between when a society becomes matrilocal and when that society has completely shed matrilineality), and we note that East Bantu and Oceanic societies are not far off that age, some still matrilineal, others transformed perhaps long ago. Even the small difference in the age of Proto-Oceanic (ca. 1000 BC) and Proto–East Bantu (ca. 500 BC) seems to matter from Divale's model's perspective: it is the younger East Bantu group which still has more matrilineality than the older Oceanic group, and, as our Bantu Zone M examples show, matrilineality is certainly devolving in that zone rather than intensifying. Perhaps East Bantu societies would show something more like Oceanic society variability if they too had the extra 500 years for matrilineality to devolve.

In addition to the possible conservative effects of male age-grade societies in all of East Bantu and here and there in Oceanic, regular extended absences of males are implicated in conserving/preserving matrilocality. In the East Bantu instance (regular male absences due to hunting), present ethnographic sources are inadequate to pursue the question systematically, but in the Oceanic instance (regular male absences due to seafaring) it is clear (Hage and Marck 2002) that this has skewed Divale's cline quite systematically in Micronesia at least (only societies that have abandoned regular seafaring have abandoned matrilocality).

Proto–East Bantu and especially Proto-Oceanic provide convenient tests of Divale's (1974, 1984) migration and matrilocality model and affirm his main hypotheses. But our method has run its course and cannot be further applied. No further data exists for either East Bantu societies or, in most instances, Oceanic societies that would allow the present sort of comparative study to expand.

Sources

A23:Kpe (Ardener 1956); A24:Duala (Ardener 1956); D41:Konzo (Taylor 1962); F21:Sukuma (Cory 1953); F22:Nyamwezi (Abrahams 1967); G11:Gogo (Rigby 1969); G12:Kagulu (Beidelman 1967); G23:Shambala (Winans 1962); G30:Kwere (Beidelman 1967); G34:Ngulu (Beidelman 1967); G35:Ruguru (Luguru) (Beidelman 1967); G63:Bena (Culwick and Culwick 1935);

J11:Nyoro (Roscoe 1923); J13:Ciga (Edel 1957); J15:Ganda (Fallers 1960); J15:Ganda (Roscoe 1965); J16:Soga (Fallers 1960); J21:Nyambo (Edel 1957); J22:Haya (Dauer 1977); J61:Rwanda (Maquet 1961); M54:Lamba (Doke 1931); N12:Nsenga (Colson 1951); R11:Umbundu (Childs 1949); R11:Ovimbundu (McCulloch 1952); M51-52:Ambo (Stefaniszyn 1964); S10:Shona (Holleman 1952); S21:Venda (Kuper 1982, Stayt 1931); S21:Basuto (Ashton 1967); S32:Lovedu (Kuper 1982); S41:Pondo (Hunter 1936); S42:Zulu (Krige 1936); S44:Ndebele (Hughes and Van Velsen 1955).

Notes

This work began as a project of Marck at the Health Transition Centre, National Centre for Epidemiology and Population Health, Australian National University in 1997 and continued there for two years. Institutional support to Marck for this project was provided by the Service of Linguistics, Royal Museum for Central Africa, Tervuren, Belgium in 1997, 1998, 2005 and 2006. Institutional and financial support to Marck for this project was provided by the Centre for Research and Documentation on Oceania, School for Advanced Studies in Social Sciences, France (CREDO-EHESS) in 2004.

Bostoen, of the Service of Linguistics, Royal Museum for Central Africa, Tervuren, Belgium, joined the project in 2006 and collaborated through 2007–2008, taking the main responsibility for the Proto–East Bantu reconstructions and directing Marck to a variety of Bantu culture history sources that enriched the work.

1. Bifurcate merging: F = FB ≠ MB, M = MZ ≠ FZ.
2. "Harmonized" in Lévi-Strauss's (1969a) parlance.
3. Matrifocal residence in the absence of formal matrilines.
4. Matrifocal residence in the presence of formal matrilines.
5. The level of cousin is established through comparative ethnography rather than linguistics. Linguistics can establish that a special term existed, not the degree of cross cousin (first, second, third) who is marriageable.
6. Matrifocal residence in the absence of matrilines.
7. Matrifocal residence in the presence of matrilines.
8. Marital residence is with a groom's maternal uncles (classed as a kind of matrilocality).
9. Patrifocal residence in the absence of patrilines.
10. Formally reckoning both patrilines and matrilines.
11. Patrifocal residence in the presence of patrilines.
12. Not predicted by Divale's model but noted previously for Oceanic-speaking Micronesia by Hage and Marck (2002).
13. There was some kind of publication delay in the instance of Hage 1999d. It was obviously written before Hage 1998.
14. And at least one member of the nearby Zone E, the Kikuyu (Kenyatta 1938), abandoned matrilineality in the historical period. It is noteworthy that the Kikuyu-Kamba are in Bantu Zone E, an isolate in what is otherwise Nilo-Saharan territory; there was no contiguity with other matrilineal Bantu.
15. The story of Oceanic/Papuan (non-Austronesian) contacts is more complex and was not reviewed.
16. Residence with a groom's mother's brothers on their matriland.
17. The best-described East Bantu–speaking peoples are the idiosyncratically patrilineal peoples of Zones J and S.
18. "Virilocal" in contemporary parlance.
19. Marck (1997) argues that these warrior schools were a feature of Proto-Bantu (and thus Proto–East Bantu) society.
20. The work presented in Appendix 8.1 benefited from unpublished materials supplied by Jean-George Kamba Muzenga from his collection of possessive paradigms for certain Bantu kin terms.

Appendix 8.1
Proto-East-Bantu Reconstructions[20]

Consanguines

**cé-kú dú* 'grandfather (3s)': D41:Konzo *sokulu* 'PF(2s)'; G35:Ruguru *kaka sekulu* 'PF'; J11:Nyoro *isenkulu*; J13K:Kiga *icenkuru* 'PF', *icenkuruza* 'male ancestors'; M54:Lamba *shikulu*; R11:Ovimbundu *sekulu* 'PF, PFB'; S10:Shona *sekuru* 'PF(voc.)'.
*From Proto Bantu *cé 'F(3s)' and *kú dú 'adult, elder, senior'. See 'father' terms for 1s and 2s.*

**nìnà-kú dú* 'grandmother (3s)': J11:Nyoro *nyina-nkulu* 'PM'; J13:Kiga *nyinenkuru* 'PM, PPZ'; R11:Umbundu *maikulu* (*nyokulu*) 'PM, PPZ'; S21:Venda *makhulu* 'PP, PPG, EPP, EPPG, PPGE'; S41:Pondo *makhulu* 'PP, EPP'; S42:Zulu *umakhulu*, *umamekhulu* 'PM, PPZ'.
*From Proto Bantu * máá 'M' and *kú dú 'adult, elder, senior'. See 'mother' terms for 1s and 2s.*
F21:Sukuma *mama* 'PM'; F22:Nyamwezi *mama* 'PM, PPZ etc.'; G11:Gogo *mama* 'PM'; G12:Kagulu *mama* 'female +2 relative'; G35:Ruguru *mama* 'PM'. G23:Shambala *wao* 'PP, PPZ'; G34:Ngulu *wao*; G35: Ruguru *wao* 'PM'.
N12: Nsenga *ambuya* 'PP'; S10:Shona *ambuya* 'PM'.

**cé* 'father (3s)': F21:Sukuma *ise* 'F(3s)'; F22:Nyamwezi *ise* '+1 male consanguines (3s)'; G11:Gogo *sewo* '+1 male relatives (3s)'; J11:Nyoro *ise*; J13:Kiga, J21 Nyambo *ice* 'F'; J22:Haya *ishe* 'F(ms)'; M54:Lamba *wishi*; M51-52:Ambo *usi*; S41:Pondo, S44:Ndebele *uyise* 'F(3s)'. Cf. Guthrie (1970a:89).
Proto Bantu and Proto East Bantu had suppletive possessives. The other singular forms were tàátá for first person (Guthrie 1970b:95) *and* có *for second person* (1970a:106).

**nìnà* 'mother (3s)': F21:Sukuma *nina*; F22:Nyamwezi *nina*; G11:Gogo, J11:Nyoro, J13:Kiga, J21:Nyambo, J22:Haya, M54:Lamba, M51-52:Ambo *nyina*; S41:Pondo, S42: Zulu, S44 Ndebele *unina* 'M(3s)'. Cf. Guthrie (1970b:30).
Proto Bantu and Proto East Bantu had suppletive possessives. The other singular forms were máá *for first person* (Guthrie 1970b:7) *and* nyòkò *for second person* (Guthrie 1970b:31).

**máá-dómè* 'mother's brother (1s) (lit.: "mother-male")': D41:Konzo *nyokulume* (2s); D61:Rwanda *marume*; F21:Venda *malume*; J11:Nyoro *nyinarumi* (3s); J13: Kiga, J21:Nyambo *nyinarume* (3s); N12:Nsenga *malume*; S21:Venda *malume*; S21:Basuto *malome*; S32: Lovedu, S41:Pondo *malume*; S42:Zulu, S44:Ndebele *umalume* 'MB'. Cf. Guthrie (1970a:188), Schoenbrun (1997:97).
See "mother" terms for second and third person singular. Curiously, where the first person singular is the common citation form for the MB term, the third person singular is the common citation form for the FZ term. Possibly there has been some difference in the frequency of use as terms of address.

**cé-n-kádí* '(3s) father's sister (lit.: "father-female")': F21:Sukuma *sengi*; F31:Nilamba *shangáázi* 'FZ'; G12:Kagulu *mai sangasi* 'woman of first ascending generation, of father's clan'; G23:Shambala *mnaa ngazi* 'FZ'; G34:Ngulu *mame sangazi* 'woman of father's clan, first ascending generation'; G35: Ruguru *shangazi*, *mai shangazi*, *mama shangazi*; R11:Ovimbundu *tatekai*; J11:Nyoro *isenkati*; J13:Kiga *cwenkazi*; J15:Ganda *senga*; J15:Ganda *sengawe*; J16:Soga *songa*; M54:Lamba *wisonkashi*; R11:Umbundu *tatekã*; M51-52:Ambo *usinkasi*; S21:Basuto *rakhali*; S32:Lovedu *rrakgadi*; S42:Zulu *ubabekazi*; S44:Ndebele *ubabakazi* 'FZ'. Cf. Schoenbrun (1997:99–100).
*See "father" terms for first and second person singular. This reconstruction is provisional. It attempts to account for the several forms that reflect *sengi or something of the sort.*

**kú dú* 'elder same-sex sibling': F21:Sukuma *nkulu* 'eB'; F22:Nyamwezi *nkulu* 'e//G'; G12:Kagulu, G34:Ngulu *mkulu*; G35:Ruguru kulu; J11:Nyoro *mukuru* 'e//G'; J13:Kiga *mukuru* 'eG'; J15:Ganda *muganda omukulu* 'e//G'; J15:Ganda *muganda mukulu* 'eB(ms)'; J16:Soga *muganda omukulu* 'e//G'; J21:Nyambo *mukuru* 'eG'; J61:Rwanda *mu-kuru* 'eZ'; M54:Lamba *umukulu* 'e//G'; S10:Shona *mukuru* 'elder'; S32:Lovedu *moholo* 'eG'; S41:Pondo *mkhuluwe* 'eB(ms)'. Cf. Guthrie (1970a:308–309).

***mununguna* 'younger same-sex sibling': F31:Nilamba *mununa* 'y//G'; G63: Bena *mununguna* 'yB(ms)'; S10: Shona *mununguna* 'y//G'.

Given here with double asterisks as the above distribution does not allow assertion that the form occurred in Proto East Bantu.

Other sibling term reconstructions were not accomplished. One might expect such terms as: 'cross-sex sibling', 'woman's brother' and 'man's sister'. Indeed such are found in many of the daughters but we found none to be cognate beyond a single Zone (in the small sample that extant descriptive data constitutes). Also, we observe the following cognate set:

A23:Kpe *ndome* 'xG'; A24:Duala: *ndome* 'B(ws)'; M54:Lamba *indume* 'xG'; M51-52:Ambo *ndume* 'B', *nkasi* 'Z'.

*Distributions such as this need not compel us to reconstruct Proto East Bantu as having "brother" from the word "male" and "sister" from the word "female"(PEB**dómè *and PEB* *kádí*). Similar distributions are found if asking what Zones "husband" and "wife" are found with the "male" and "female" names as well. But one does not observe both meanings current at once in any living language. The "sibling" meanings are, perhaps, the more rare. Incidence is low and agreement local within Zones. One might expect such terms as: 'cross-sex sibling', 'woman's brother' and 'man's sister'. Indeed such are found in many of the daughters but we found none to be cognate beyond a single or adjacent Guthrie Zones amongst the few languages beyond Zones J and S for which there is description. We observe, e.g., the following cognate sets:*

F22:Nyamwezi *ilumbu* 'xG'; G11:Gogo, G12:Kagulu *lumbu*, G34 Ngu:Ngulu, G35:Ruguru *lumbu* 'xG'.

J11:Nyoro *munyanya* 'xG'; J13:Kiga *munyanya*; J21:Nyambo *munyanya* 'xG'.

J15:Ganda *mwanyina*; J16:Soga *mwanhina* 'xG'.

**bíádá* 'x-cousin': F22: Nyamwezi *myala*; J13:Kiga; J21: Nyambo *muzara*; J61:Rwanda *mubyara*; M54:Lamba *umufyala*; M51-52:Ambo *mufyala*; S21:Venda *muswala*; S21:Basuto *motsoala*; S32:Lovedu *motswala*; S42:Zulu *umzala*; S44:Ndebele *umza* 'x-cousin'. Cf. Murdock (1959:383–4), Bastin (1971:36), Schoenbrun (1997:70–71).

**jánà* 'child': A23:Kpe *mwana*; F21:Sukuma *ng'wana*; F22:Nyamwezi, G11:Gogo, G12:Kagulu, G34:Ngulu, G63:Bena, J11:Nyoro *mwana*; J13K:Kiga *omwana*; J15:Ganda *mwana*; J21c:Nyambo *omwana*; M54: Lamba *umwana*; N12:Nsenga, M51-52:Ambo, S10: Shona, S21:Venda *mwana*; S42:Zulu *umtwana* 'C'. Cf. Guthrie (1970:147).

**jìpú á* 'man's sister's child': G11:Gogo *mwihwa*, G12:Kagulu *mwihwa*, G30:Kwere *mwihwa*; G34:Ngulu *mhwa*; G35:Ruguru *mhwewe*, *mpwawe*; G63:Bena *mwipwa*; J13:Kiga *omwihwa* 'ZS(ms)'; J15:Ganda *mujwa*; J16:Soga *mwiwa* 'ZC'; J21:Nyambo *omwihwa* 'ZS(ms)'; M51-52:Ambo *mwipwa* 'ZC'; M54:Lamba *umwipwa* 'BS(ws)'. Cf. Guthrie (1970b:188), Schoenbrun (1997:86–87).

**jíjù kù dù* 'grandchild':F22:Nyamwezi, G11:Gogo *mwizukulu*; G23:Shambala *nwezuku*; G30:Kwere, G34:Ngulu *mzukulu*; G35Ruguru *mjukulu*; J13K:Kiga *omuijukuru*; J15:Ganda *muzukulu*; J16:Soga *mwidhukulu*; J21:Nyambo *omuijukuru*; J22:Haya *mwíjukulu*; M54:Lamba *umwinshikulu*; N12:Nsenga *mzukulu*; M51-52:Ambo *musikulu*; S10:Shona *muzukuru*; S21:Venda *muduhulu*; S42:Zulu *umzukulu* 'CC'. Cf. Guthrie (1970b:178).

Affines

*'father'-*bíádá* 'father-in-law (lit.: "cross-cousin's father")':D41:Konzo *tatabyala*, G34:Ngulu *tate vyalu*, J13:Kiga, J21:Nyambo *icezara*, J11:Nyoro *isezara*, J15:Ganda *sezala*, M51-52:Ambo *usifyala*, S32:Lovedu *ratswale*, S42:Zula *ubabezala*, S44: Ndebele *ubabazala* 'EF'. Cf. Bastin (1971:36), Schoenbrun (1997:70–71).

*'mother'-*bíádá* 'mother-in-law (lit.: "cross-cousin's mother")': D41:Konzo *mabyala*, G34:Ngulu *mame vyalu*, J13:Kiga, J11:Nyoro, J21:Nyambo *nyinazara*, J15:Ganda *nyazala*, M51-52:Ambo *nyinafyala*, S32:Lovedu *mmatswale*, S42:Zulu *umamezala*, S44:Ndebele *umamazala* 'EM'. Cf. Bastin (1971:36), Schoenbrun (1997:70–71).

**kóì* 'in-law': D41:Konzo *mukwe* 'DH'; J61:Rwanda *kwe* 'EP, CE'; F21:Sukuma *nkwela* 'EG, GE'; G11:Gogo *mukwe* 'EP', *mukwemulima* 'CE'; G12:Kagulu, G34: Ngulu *mukwe* 'affine not of one's own generation'; G35:Ruguru *mkwe* 'EP'; J11:Nyoro *mukoi*; J13K:Kiga *mukwe* 'DH'; M54:Lamba *wukwe* HG'; M51-52:Ambo *mukweni* 'DH'; S42:Zulu *umkhwe-*, S44:Ndebele *umkwe-* 'in-law'.

This form meant "child's spouse" and less certainly "spouse's parent". Schoenbrun (1997:91–92) gives **kó* for 'in-law' citing Vansina (1990) and evidence of living languages. Cf. Guthrie (1970a:287) **kó* 'relative by marriage', Bastin et al. (2003) *kóì*.

**kái* 'wife': E63:Old Moshi *mka*; F21:Sukuma *nke*; F22: Nyamwezi *nke*; G12:Kagulu *muke*; G33:Kwere, G34: Ngulu, G35:Ruguru *mke*; J15:Ganda *muka* 'W'; M54: Lamba *muka-* 'W of'. Cf Guthrie (1970a:257, 270) *ká*, *ké*, Schoenbrun (1997:91) *ke*, Bastin et al. (2003) *kái*.

**dámú* 'sibling-in-law': G11:Gogo *mulamu* 'WB, ZH (ms), ZH (ws), HZ, BW (ws), wife's male cousins'; G12: Kagulu *mulamu* 'affine, usually of ego's generation'; G30:Kwere, G34:Ngulu, G35:Ruguru *mlamu*, G63: Bena *mulamu*, J11:Nyoro, J13:Kiga *muramu* 'EG, GE'; J15:Ganda *mulamu* 'WZ, HG'; J61:Rwanda *muramu*, M51-52 Ambo *mulamu* 'EG, GE'; S21:Venda *mulamu* 'WB'; S21:Basuto *molamo* 'HZ, BW'; S42:Zulu *umlamu* 'in-law; S44:Ndebele *umlamu* 'WB, WBW, WBC, WZ'. Cf. Guthrie (1970a:135), Schoenbrun (1997:73–74).

Sources

A23:Kpe (Ardener 1956); A24:Duala (Ardener 1956); D41:Konzo (Taylor 1962); F21:Sukuma (Cory 1953); F22:Nyamwezi (Abrahams 1967); G11:Gogo (Rigby 1969); G12:Kagulu (Beidelman 1967); G23:Shambala (Winans 1962); G30:Kwere (Beidelman 1967); G34:Ngulu (Beidelman 1967); G35:Ruguru (Luguru) (Beidelman 1967); G63:Bena (Culwick and Culwick 1935); J11:Nyoro (Roscoe 1923); J13:Ciga (Edel 1957); J15:Ganda (Fallers 1960); J15:Ganda (Roscoe 1965); J16:Soga (Fallers 1960); J21:Nyambo (Edel 1957); J22:Haya (Dauer 1977); J61:Rwanda (Maquet 1961); M54:Lamba (Doke 1931); N12:Nsenga (Colson 1951); R11:Umbundu (Childs 1949); R11:Ovimbundu (McCulloch 1952); M51-52:Ambo (Stefaniszyn 1964); S10:Shona (Holleman 1952); S21: Venda (Kuper 1982, Stayt 1931); S21:Basuto (Ashton 1967); S32:Lovedu (Kuper 1982); S41:Pondo (Hunter 1936); S42:Zulu (Krige 1936); S44:Ndebele (Hughes and Van Velsen 1955).

9

Oceanic Cousin Terms and Marriage Alliance

Per Hage

In the Proto-Oceanic (POc) kinship system, terms can be reconstructed for cross uncle (mother's brother) **matuqa*, cross aunt (father's sister) **aya*, and cross nephew/niece (man's sister's child) **(qa)-lawa*, but not for cross cousin (mother's brother's child, father's sister's child) (Milke 1958, Pawley 1981, Chowning 1991). Cross-cousin terms, however, are present in many Oceanic (Oc) kinship systems in Melanesia and eastern Micronesia (Kiste and Rynkiewich 1976). These terms are alike in their classification of first cousins (parents' siblings' children) but not in their classification of second cousins (parents' parents' siblings' children's children). As recent research has shown, a semantically accurate and sociologically informative analysis may depend on the latter (Tjon Sie Fat 1998, Trautman and Barnes 1998, Viveiros de Castro 1998). The purpose of this chapter is to distinguish three different types of Oceanic cross-cousin classification, each of which implies a different form of marriage alliance. The Oceanic evidence illustrates the flexibility of Oceanic kinship systems in adapting to new or altered demographic conditions, and it supports the hypothesis that "all types of crossness can be shown to be compatible with some regime of matrimonial exchange" (Viveiros de Castro 1998, 354).

Cross-Cousin Classification

On the basis of first-cousin classification, Iroquois type terminologies are those which merge siblings (G) and parallel cousins (MZC, FBC) and distinguish cross cousins (MBC, FZC). On the basis of second-cousin classification, Iroquois is one of sixteen logically possible and five empirically attested cross-cousin terminologies: Dravidian, Iroquois, Kuma, Yafar, and Ngawbe (Tjon Sie Fat 1998, Viveiros de Castro 1998). The first three terminologies are found in Oceanic kinship systems.

The polar contrast is between Dravidian and Iroquois (Lounsbury 1964). In Dravidian terminologies children of opposite-sex cross cousins are parallel classified with siblings, and children of same-sex cross cousins are cross. Intuitively, opposite-sex cross cousins are potential spouses, and their children are classified as siblings; same-sex cross cousins are potential in-laws, and their children are classified as cross cousins and potential spouses. Dravidian terminologies are associated with cross-cousin marriage.

In Iroquois terminologies children of opposite-sex cross cousins are cross, and children of same-sex cross cousins are parallel and classified with siblings. Iroquois terminologies are not compatible with cross-cousin marriage, but they may be associated with other forms of marriage alliance (Tjon Sie Fat 1998, Viveiros de Castro 1998). Dravidian and Iroquois classifications of second cousins are shown in Table 9.1 (from Tjon Sie Fat 1998).

In Kuma terminologies, named after a Papuan society in Highland New Guinea (Reay 1959), children of all cross

TABLE 9.1. Cross-parallel classification of second cousins in Dravidian and Iroquois systems

		IROQUOIS	
		Parallel	Cross
DRAVIDIAN	Parallel	MMZDC MFBDC FMZSC FFBSC	MMBSC MFZSC FMBDC FFZDC
	Cross	MMBDC MFZDC FMBSC FFZSC	MMZSC MFBSC FMZDC FFBDC

Source: Tjon Sie Fat 1998.

	Iroquois	Dravidian	Kuma
G^{+2}	0 0 1 1	0 0 1 1	0 0 1 1
G^{+1}	0 1 0 1	0 1 0 1	0 1 0 1
G^{0}	0 1 0 1	0 1 1 0	0 1 1 1

FIGURE 9.1. Crossness in cross-cousin terms (from Viveros de Castro 1998).

cousins are cross cousins. In Table 9.1 Kuma cross cousins are the union of Iroquois and Dravidian cross cousins. In Kuma society marriage is prohibited between first cross cousins but permitted between second cross cousins and children of second cross cousins.

A formal definition of Dravidian, Iroquois, and Kuma cross-cousin terminologies using Viveiros de Castro's (1998) adaptation of Scheffler's (1971) calculus is shown in Figure 9.1. G^{+2}, G^{+1}, G^{0} refer to generational levels; 1 and 0 refer to relative sex, opposite, or same, respectively, of two siblings in G^{+2}, of their children in G^{+1}, and the cross or parallel status of cousins in G^{0}.

Dravidian and Iroquois distinguish cross/parallel relatives in all three medial generations. In addition to a distinctive pattern of crossness, Dravidian terminologies usually have affinal-consanguineal equations reflecting a rule of cross-cousin marriage; e.g., MB = FZH = EF, FZ = MBW = EM, MBD = FZD = BW, MBS = FXS = H = HB = ZH, xGD = SW, xGS = DH.

Oceanic Cousin Terminologies

Consistent with POc sibling terms **tuqaka* 'elder same-sex sibling,' **taci* 'younger same-sex sibling,' **m^{w}aqane* 'woman's brother,' **papine* 'man's sister' (Milke 1938, Blust 1980, Chowning 1991), Oc cross-cousin terms usually distinguish same- from opposite-sex cross cousins. In some terminologies cross-cousin terms are improvisations of Proto-Polynesian (PPn) sibling terms or sibling-in-law terms (Marck 1996). Oc cross-cousin terms may be reducible or metaphorical, indicating more recent development, or irreducible and opaque, indicating greater antiquity. Cognate forms are often lacking, implying numerous lexical innovations. Dravidian kinship terminologies and cross-cousin marriage are well known from Fiji.[1] In Tokatoka, Tailevu Province (Nayacakalou 1955, 1957), the cross-parallel classification is Dravidian, as shown in Table 9.1. The terms for cross cousins are:

tavale: man's male cross cousin, WB, ZH

raiva: woman's female cross cousin < POc **ipaR* BW, HZ + prefix *ra-*

davola: opposite-sex cross cousin

According to P. Geraghty (pers. comm.), Fijian *tavale* may be related to Mota (Vanuatu) *tavale/imwa* 'members of the other exogamous *vewve* or moiety'; Raga (Vanuatu) *tarabe* 'brother-in-law'; Arosi and Sa'a (Solomon Islands) *aharo* 'relative by marriage' (Hage 2001b).

Dravidian terminology and cross-cousin marriage are also found in West Futuna-Aniwa, two Polynesian outliers in Melanesia (Hage 2001b). The terms for cross cousins, from Dougherty (1983), are:

fakau mangoro opposite-sex cross cousin and spouse; *fakau* 'people,' *mangoro* 'person, sweet, fresh, clean,' possibly 'sweetheart' (J. Dougherty, pers. comm.)

maa woman's female cross cousin < PPn **maqa* WB, HZ

safe man's male cross cousin

West Futuna-Aniwa apparently adopted the structure of a Dravidian terminology from the neighboring islands of Tanna and Aneityum in South Vanuatu, using the lexical resources of its own language (Hage 2001b). The ethnographies of Tanna and Aneityum Islands do not give the classification of second cousins, but the presence of Dravidian affinal-consanguineal equations (in all three medial generations in both places) implies Dravidian crossness.[2] Tanna cross-cousin terms from Humphreys (1926), J. Lynch (pers. comm.), R. Clark (pers. comm.), and Hage (2001a) are:

nevin: man's male cross cousin, WB, ZH

newun: woman's female cross cousin, BW, HZ

rahnpetan: man's female cross cousin, W, WZ; possessive prefix *raha* + *n* '3s' + prefix *p-* + POc **tau-*(*pa*)*pine* 'woman.'

rahiaruman: woman's male cross cousin, H, ZH, HB; *raha* + *n* +

G^{+2}	0	0	1	1
G^{+1}	0	1	0	1
G^{+1}	father	uncle	cousin	cousin
	mother	aunt		

FIGURE 9.2. The Kuma classification of relatives in the first ascending generation (adapted from Scheffler 1971).

naruman: 'man, male' < POc **na* + *tau-m^{w}aqane* 'man'

Aneityum cross-cousin terms from Rivers (1914), J. Lynch (pers. comm.), and Hage (2001b) are:

enga: man's female cross cousin, W, WZ, BW

natamng: woman's male cross cousin, H, HB, ZH < POc **tau-m^{w}aqane* 'male'

Kuma cross-cousin classification is found in the kinship system of Bellona, a Polynesian outlier in the Solomon Islands (Monberg 1976). The effect of a Kuma terminology is to expand the pool of potential spouses vertically as well as horizontally by classifying the children of all cross cousins as cross cousins. The children of opposite-sex siblings in higher and lower generations are also cross cousins. The rule is "once cross—always cross" (Scheffler 1971, 248). Thus, in Bellona, cross cousins include certain "uncles" and "aunts" and "nephews" and "nieces," as well as cousins (e.g., MMBC and MMBDDC as well as MMBDC). Figure 9.2, adapted from Scheffler (1971, 248), shows the Kuma classification of relatives in the +1 generation.

Bellona and its close neighbor, Rennell, were isolated islands lacking regular contact with any other island communities. The Bellonese introduced a Kuma terminology as a demographic remedy.

> According the Bellonese traditions, marriage of cross cousins was taboo until about 11 generations ago when the population of Bellona thinned out due to excessive interlineage fighting, and intermarriage of close kinsmen became necessary for the further survival of the population. Cross cousins who were previously label *tuahine* 'real and classificatory sister' (< PPn **tua-fafine*) were now labelled *ha'anga* and thus became marriageable. (Monberg 1976, 249)

Both Dravidian and Kuma cross-cousin terms were present in the otherwise Iroquois-like kinship systems of the Marshall Islands in eastern Micronesia.[3] In Marshallese terminologies (Spoehr 1949) parallel cousins and same-sex cross cousins are classified with siblings: *jeo* 'older sibling,' *jato* 'younger sibling.' But a special term, *reliko*, was coined for opposite-sex cross-cousins. In Arno and Majuro atolls, cross-cousin marriage is reflected in Dravidian cousin terms: "individuals are 'cross-cousins' when they are children of siblings, i.e. *jimjim*, *jimjato* of the opposite sex. The children of 'cross-cousins' are not cross-cousins, rather, they are considered siblings and refer to one another as such" (Kiste and Rynkiewich 1976, 217). "Even though a man and a woman who stand in the cross-cousin relation do not marry each other, their children are considered classificatory siblings" (Spoehr 1949, 196).

In Bikini, a tiny, relatively isolated atoll at the northern end of the Ralik chain, cross-cousin marriage was preferred but cross-cousin terms were Kuma in type: "the children of cross-cousins as well as the offspring of siblings of the opposite sex, i.e. any male or female who can trace a cross-sex tie through their kinsmen of the parental generation are cross-cousins" (Kiste and Rynkiewich 1976, 217). As in Bellona, a Kuma classification was introduced as a demographic remedy: "the Bikinians have responded to the fact that appropriate sexual partners are severely limited in number by enlarging the category of kinsmen with which sexual intercourse and marriage may occur" (Kiste and Rynkiewich 1976, 217–18).

An Iroquois cross-cousin classification is implicit in the kinship system of Busama, an Oc (Kawa')-speaking society on the Huon Gulf in coastal New Guinea (Hogbin 1963). In Busama *tengga* is MBS, FZS, and *tiwi* is MBD, FZD. Hogbin does not give the classification of second cousins, but an Iroquois classification can be deduced from the classification of "child," "nephew," and "niece." In Iroquois same-sex cross cousins' children are parallel

classified with children (but cross in Dravidian and Kuma); opposite-sex cross cousins' children are cross classified with nephew and niece (cross in Kuma but parallel in Dravidian) (Scheffler 1971). Busama terms (Hogbin 1963, 42–50) are:

bali: S; (♂)BS, (♂)FZSS, (♂)MBSS; (♀)ZS, (♀)FZDS, (♀)MBDS

bawi: D; (♂)BD, (♂)FZSD, (♂)MBSD; (♀)ZD, (♀)FZDD, (♀)MBDD

nisip: (♂)ZS, (♂)FZDS, (♂)MBDS; (♀)BS, (♀)FZSS, (♀)MBSS

nisipawa: (♂)ZD, (♂)FZDD, (♂)MBDD; (♀)BD, (♀)FZSD, (♀)MBSD

Iroquois cross-cousin terms and kinship terminologies are, as noted, not associated with cross-cousin marriage. They may, however, be associated with "exclusive straight sister exchange" (an exchange of sisters which is not repeated in the following generation) and the periodic renewal of marriage alliances (Tjon Sie Fat 1998, Viveiros de Castro 1998).[4] In Busama, first cross-cousin marriage is prohibited, straight sister exchange is preferred, and marriage with (unspecified) more distant cousins is permitted (Hogbin 1946, 1963).

Concl usion

The classification of Oceanic kinship systems on the basis of first cousins alone masks significant differences in semantic structure and marriage alliance. In the *Ethnographic Atlas* (Murdock 1967a) the kinship systems of Fiji, (West Futuna)-Aniwa, Busama, and the Marshalls are all classified as Iroquois in type. Bellona would also be classified as Iroquois. But in terms of second-cousin classification, Fiji and West Futuna-Aniwa are Dravidian, with a rule of cross-cousin marriage; Bellona is Kuma, with an expanded rule of cross-cousin marriage; Busama is Iroquois, with a preference for straight sister exchange; and the Marshalls are Dravidian (without affinal-consanguineal equations) and Kuma, with preferences for restricted and unrestricted cross-cousin marriage, respectively. The different types of cross-cousin classification reflect the variety of marriage systems that developed in the course of the Oceanic expansion.[5]

Notes

Jeff Marck found this chapter in draft form among Hage's papers after his death. Here Marck presents the work with a single annotation (note 5).

1. Variations of cross-cousin marriage have developed in the Dravidian systems of Fiji, including preferences for matrilateral or patrilateral cross cousins, and for first or classificatory cross cousins (Capell and Lester 1945, Sahlins 1962).
2. There are reports in the kinship literature of terminologies with Dravidian crossness but separate affinal terms (Viveiros de Castro 1998, 354), but not of terminologies with affinal-consanguineal equations in all three medial generations and non-Dravidian crossness.
3. In Marshallese there are terms for 'mother's brother,' *wulebo*, and 'man's sister,' *mangoro* (Spoehr 1949). In Bikini the terms are *rikona* and *mangörö* (Kiste 1974).
4. The term "straight sister exchange" is from Müller (1980).
5. This final sentence was part of an additional paragraph that ended the manuscript. In Hage's editing of the draft materials, the first part of the paragraph is marked for deletion and the remaining sentence marked for placement at the end of the preceding paragraph, as I have done above. The deleted sentences of the abandoned final paragraph are: "Given the basic symmetry of kinship systems, we suppose that the POc kinship system '*may have* [Hage inserted the italicized words 'in pencil] had cross-cousin terms. In Greenberg's ([1980] 1990) theory of kinship universals the presence of cross-cousin terms (marked) implies the presence of cross uncle/aunt terms (unmarked) but not conversely. Diachronically interpreted, cross-cousin terms are lost before cross uncle/aunt terms (Hage 2001b) and therefore more difficult to reconstruct. Marked cross-cousin terms may also be lexically more unstable than unmarked cross-uncle/aunt terms." I am familiar with the markedness issues and wonder why he marked those materials for deletion as they are consistent with my general understanding of those issues. However, I am quite relieved that he went from (Proto-Oceanic) "had cross-cousin terms" to "may have had cross-cousin terms" to deleting any such assertion. The linguist, at this point, begs the anthropologists to accept that there are, at least, no such Proto-Oceanic terms reconstructable and that such will probably never be accomplished. The linguist is perhaps inclined to imagine that this is because Proto-Oceanic had none, the matter of such terms being "lexically more unstable" notwithstanding. —J. Marck

| 10 |

The Transition from Kariera to an Asymmetrical System

Cape York Peninsula to North-East Arnhemland

Patrick McConvell and Ian Keen

The essential point is not so much that kinship terminologies and systems evolve… but above all that these transformations are irreversible, and do not head in a single direction.

— Godelier 2004, 533

…the Dravidian type seems to constitute the point of departure for several lines of evolution, while continuing to coexist with systems derived from it.

— Godelier 2004, 538

The basis of Australian kinship before the invention of sections must probably have been Dravidian.

— Godelier 2004, 524

Godelier is one of a line of anthropologists who have speculated that the Dravidian kinship system was the earliest in Australia, but others have diverged from this pattern. The evidence for or against this hypothesis has never been mustered to provide a rigorous test. In this chapter we hope to begin this task by looking at two regions in Australia that appear to provide an example of what might have been an early Kariera (Dravidian symmetrical) system (eastern Cape York Peninsula) and what might have been a later development of this system, a Karadjeri (asymmetrical matrilateral) system among the Yolngu people of North-East Arnhem Land.

The evidence we use draws both on the structure of the systems and how one might be transformed into the other, and on linguistic evidence about the forms of kinship terminology. Because a good proportion of the terms used in Cape York Peninsula (CYP) and North-East Arnhem Land (NEAL) are cognate, it is possible to trace the early history and change in meaning of the terms, and to assess what this evidence tells us about a transformation between them. We also detail further structural changes in the Yolngu system and some of their linguistic consequences.

The languages of CYP and NEAL form two separate subgroups (Paman and Yolngu, respectively) within the Pama-Nyungan language family, which covers most of the Australian continent. It is beyond the scope of this chapter to make any definitive statement as to whether the Pama-Nyungan protolanguage had a Kariera (Dravidian) type of kinship system, but we consider briefly where the results of our more limited investigation point us in pursuing this deeper reconstruction.

The late Per Hage and his group have drawn heavily on comparative linguistics and the study of specific forms of kinship terms for insights into the kinship systems of protolanguages and the developments that lead from one protolanguage to another and to the present day. In particular they have reported that many protolanguages of families around the world display Dravidian/Kariera characteristics involving symmetrical cross-cousin marriage and the equation of spouses with cross cousins in the terminology, although the daughter languages today do not. This is in tune with the hypothesis about the evolution of kinship systems proposed by Allen (1989b, 1998b), in which an early stage of systems worldwide was Dravidian. However the strong form of the hypothesis, whereby

the change from Dravidian to other systems is unidirectional, has been disputed by Hage (2001a) on the basis of cases where Dravidian systems are claimed to have emerged at later stages. Pending further work, we cannot be sure at this stage whether the Kariera systems of CYP are relics of a primordial Dravidian system or a later, emergent system.

The CYP-NEAL case is important in its own right, but is also potentially important as a detailed case of the change from symmetrical to asymmetrical systems of a kind that is found elsewhere in the world, and which Lévi-Strauss and others have invested with great significance as the key element in the transformation from restricted to generalized exchange. For Australianist anthropology this difference may also correlate with other significant differences, such as degree of polygyny and type of economy (Keen 2004), although we do not have time to explore these facets here.

In the CYP-NEAL case, linguistic evidence points to changes in the meaning of terms in the transition. These changes are not necessarily those predicted as central in structural models of transformations, which do not give attention to the etymology of terms. Among key changes has been a switch based on a type of polysemy known as "Omaha skewing," found in some parts of Cape York Peninsula, in which, for instance, mother's brother's daughter is referred to as "mother" and, conversely, father's sister's daughter may be referred to by the term used for man's sister's child. The "skewing" type of polysemy is seen by Kronenfeld (1996, 2009) as a secondary layer in many systems subject to pragmatic conditioning, so the conditions under which a categorical switch to the marked meaning has occurred in the CYP-NEAL case, and whether they relate to other changes, need attention.

Charting Kinship Transformations

The Structural Approach

The most common approach to change in kinship systems in anthropology has been a structural one. The key issue is the pattern of equations between kin types in the terminology (or the pattern of polysemy of the terms, as a linguist might put it). What matters is which kin types get the same term, not the terms themselves or their history.

Obviously there are likely to be transformations between different systems. The structural approach, insofar as it has taken diachrony on board at all, has tended to take an abstract perspective, working out which systems could logically turn into which other systems, and which transformations seem logically unlikely or even impossible. Once such deductions are made, it is possible to propose unidirectional or irreversible changes in kinship evolution.

One of the problems is establishing principles whereby such possible or likely transformations can be distinguished from the impossible or unlikely ones. Frequently there seem to be assumptions lying behind the arguments that are not openly discussed or justified. One such is the idea that systems always, or predominantly, go from simpler (with more equations) to more complex (with less). This has lain behind the misreading of the history of sibling terms in Oceanic for instance (Blust 1993) and perhaps also the primacy of the idea of "rupturing equations" in the work of Allen discussed below.

There is a need to put such abstract theorizing to the test, empirically. This requires some kind of independent evidence of the history of systems. Such evidence is generally of two kinds: one is the detection of such changes in historical documentary records, which generally is only possible in societies with a long record of literacy, and even then poses a lot of problems. The other approach is to use the methods of comparative linguistics to reconstruct kinship terms at various eras with their probable meanings by the use of contemporary and recent records of languages, and from there to build up a picture of kinship systems through time. This can tell us what kinds of transformations actually occurred and enable us to compare them with the abstract structural models. It is, of course, harder to establish the validity of claims that a certain kind of transformation is impossible, but once large amounts of kinship reconstruction work have accumulated without finding any examples, then the probability of such negative predictions increases.

Anthropologists' Use of Linguistic Evidence

Unlike some other anthropologists who have dealt with schemes for transformations between systems, Hage advocated use of linguistic evidence about change in the actual form and meaning of terms in understanding how the changes came about. Hage's "linguistic turn" in diachronic kinship studies was particularly spurred on by Clark's (1975) Proto-Polynesian reconstructions, which showed developments to be different from what anthropologists had proposed about sibling terminology. Hage commented, "Comparative linguistic evidence is obviously crucial for an evaluation of Allen's theory (Allen 1989b, 1998b) or for similar theories of irreversibility in the evolution of kinship systems" (Hage 2001a), and "The

separation of [anthropology and comparative linguistics] has been…much to the detriment of progress with diachronic issues in ethnology" (Hage 2001a, citing Blust 1993).

Allen has used linguistic arguments to reconstruct earlier stages of a particular family (Allen 1976). He lists the concrete means by which an equation can be "ruptured" (Allen 1989b, 181):

> It is of course only by abstraction that one can talk of a language rupturing a certain kind of equation: the semantic events take place at the level of particular equations, say between kin-type X and Y. One can imagine various processes leading to a new signifier for one type e.g.
>
> - Morphological modification either of the term which originally made the equation or
> - Of some other term in the terminology;
> - Transference of a term into the kinship terminology from some other semantic domain;
> - A loan from another language;
> - The extension of the meaning of another term from specification Z to take over Y, in which case the rupture of X = Y is accompanied by the appearance of the new equation Z = Y.
>
> That the rupture of various equations takes place according to a fairly regular sequence is suggested by Aberle (1967) and Witkowski (1972).

We will be reviewing linguistic evidence for such processes in an Australian case study.

Evolutionary Theories: Primordial Dravidian?

"Dravidian" is the name given to a type of kinship and marriage system in which there is bilateral cross-cousin marriage and the kinship terminology reflects this marriage system in its equations. Most notably, in classic Dravidian systems the terms for cross cousin and spouse are the same. The effects of a Dravidian system can also be seen in other terminological equations (see discussion of Kariera A below). Several authors have suggested that Dravidian is an early form in particular language families, with transformations departing from that (e.g., Allen, as part of his broader tetradic theory; Ives (1998) for parts of North America; Hage 2001a, 2003, 2004, 2006; Hage et al. 2004). The idea that transformations away from Dravidian are irreversible is also found (e.g., Fox 1988d).

In Australia, Elkin (1970) has suggested that the "Kariera" type is primordial (Kariera A, the term used by McConvell [2006] to label the Australianist definition, not Kariera B, which we are using to designate "Kariera" as defined by Hage, to include alternate generation equations). Kariera in Australianist terms does not have alternate generation equivalence as a criterial feature but is a type with Dravidian prescriptive equations extended to the grandparental generation so that MM = FFZ = MFW, and so on.

In Dravidian systems, mother's brother is equivalent to father's sister's husband and spouse's father. If these equations are extended to linking relatives in the grandparent generation, it follows that:

MMB = MFZH = MHF = FF
FMB = FFZH = FWF = MF

And if father's sister is equivalent to mother's brother's wife and spouse's mother, then:

MFZ = MMBW = MHM = FM
FFZ = FMBW = FHM = MM

Dravidian to Matrilateral

One of the main types of transitions following Dravidian is to a matrilateral form usually associated with matrilateral cross-cousin marriage. As Hage writes:

> In Allen's theory symmetric prescriptive (i.e. Dravidian) terminologies based on bilateral cross-cousin marriage can be transformed into asymmetric prescriptive terminologies based on unilateral cross-cousin marriage. In this transformation symmetric equations are broken down to distinguish wife-givers from wife-takers. Thus
>
> MB = WF / FZH
> FZ / WM = MBW
> MBD / FZD
> MBS = WB / FZS = ZH
> ♂ZS = DH / ♀BS
>
> and so forth. (Hage 2001a, 503)

In seeking evidence for this transition in linguistic prehistory, we are looking for relics of the previous state before the ruptures, and of the innovations that were called upon to provide the extra terms, having regard to mechanisms such as those outlined by Hage (2001) above.

Irreversible Drift from Dravidian?

Another hypothesis that forms part of Allen's tetradic theory is that there is no turning back after a system has changed away from Dravidian. Allen admits that there are exceptions, such as the well-known adoption of Dravidian systems by Indo-European language speakers when they entered India. Hage (1997) cites a similar case of Polynesian outliers in Vanuatu adopting a Dravidian system from the "substrate" in southern Vanuatu. These are cases of substrate adoption, it is argued, and do not therefore constitute a true counter-example to the irreversibility hypothesis. Hage argues that there are some true cases of independent and later development of Dravidian systems in the Pacific from "post-Dravidian" systems (see below).

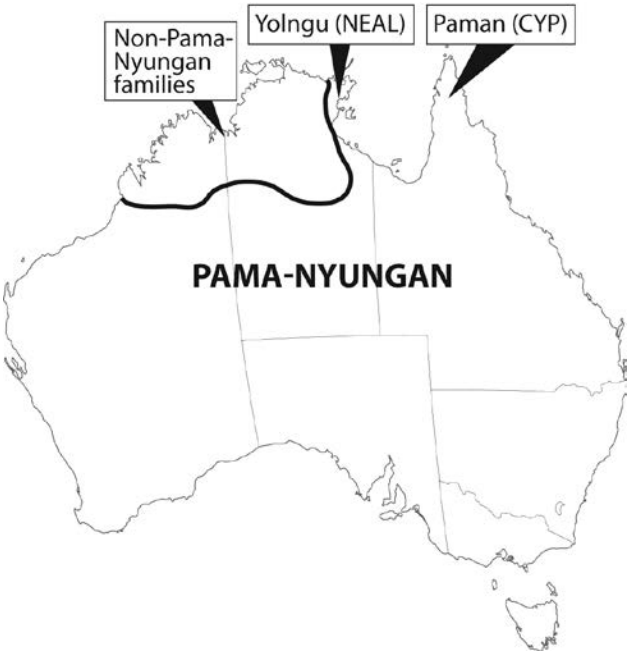
Needham (1984, 229) discusses cases of symmetric systems becoming asymmetric, but says there are no instances of the opposite. In the Pacific, in southern Vanuatu and some other groups in Fiji, however, Hage analyzes the shift to Dravidian as a true counter-example to the irreversibility principle since the protolanguage would have been matrilateral in type.

One might extend the idea that 'Dravidian' or Dravidianate systems like Kariera were primordial to the whole of Asia, Oceania, and the Americas. That there were widespread Dravidian systems in early South and East Asia is quite well accepted, and it has been suggested that these represent an earlier stage of Austronesian also. Dravidian systems have been identified by anthropologists and linguists, including Hage, in early and protosystems in a number of regions of North, Central, and South America. In Australia a number of scholars (e.g., Elkin [1970], as mentioned) have proposed that Kariera is the earliest system from which others have diverged, although virtually no linguistic evidence has been brought to bear on this question so far. A bold hypothesis (which Hage comes close to stating) would be that the entire Pacific Rim was populated initially by people with Dravidian systems—all perhaps originating in Southeast Asia. We are not supporting such a hypothesis here, but it is worth bearing in mind.

Australia

Pama-Nyungan

Pama-Nyungan is the largest language family in Australia, covering seven-eighths of the continent, but not the central north, where at least ten Non-Pama-Nyungan language families are found (Map 10.1). The main example we will look at involves a discontinuity in the Pama-Nyungan family (henceforth abbreviated as PNy). The Yolngu languages in North-East Arnhem Land represent a close-knit subgroup surrounded by Non-Pama-Nyungan languages (NPNy); the nearest PNy neighbor, Yanyuwa, on the southern Gulf of Carpentaria, is also discontinuous from the other Warluwarric languages.



MAP 10.1. Pama-Nyungan and non–Paman-Nyungan languages.

Directly across the gulf are the languages of Cape York Peninsula, all PNy, known as the Paman subgroup. Their closest relation linguistically is thought to be the Maric languages of the bulk of interior Queensland to the south of CYP, and this higher-level grouping is known as Pama-Maric.

No particularly close connection has yet been shown to exist between Yolngu and Paman or Pama-Maric languages, but further research is required on this question. Certainly in some areas of vocabulary there appears to be a frequency of related forms that is higher than the average in Pama-Nyungan as a whole, and kinship is an example of one such domain. This may be due to common inheritance from a joint ancestor later than Proto-Pama-Nyungan and/or from high levels of borrowing in certain areas. Further research may be able to determine which of these is the prime mechanism, and also the relative contribution of each if both are involved.

Either of the above scenarios (common inheritance or

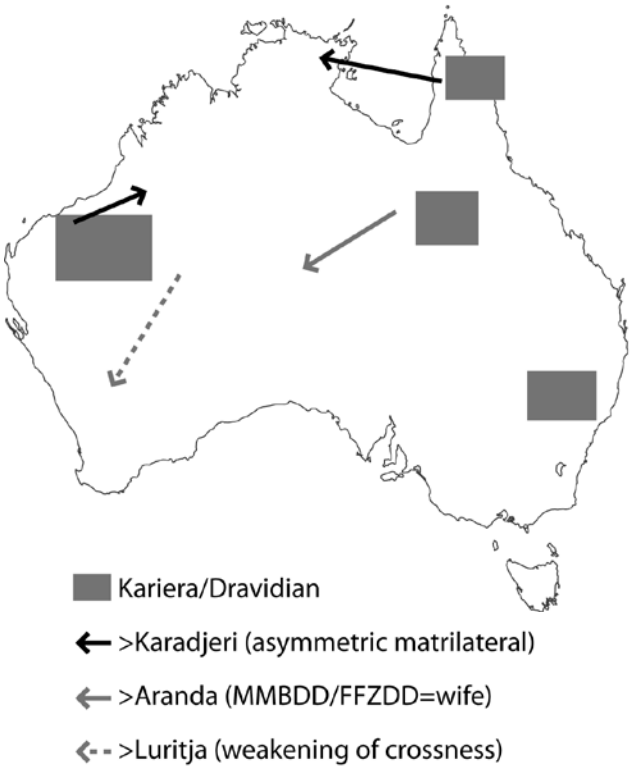
borrowing) implies that speakers of ancestors of present Yolngu and Paman (or at least some Paman languages) were once living together in the same area or in closer contact than they are today or have been in the recent past. Some evidence suggests that there is a strong genetic link between people in western CYP and NEAL Yolngu (White 1997) that could support either of these scenarios (common origin or contact and intermarriage).

The issue then remains of when and where this common origin or contact took place since the two groups are, and have been, separated by a stretch of sea of 500–600 kilometers, and there is no evidence that either Yolngu or CYP people undertook sea journeys of this length at all, let alone regularly enough to affect the genetics of the populations or their respective kinship terminologies. According to oceanographers, the last time there was dry land between the two areas would have been at least 8,000 years ago, which is probably too long to explain the similarities in the kinship systems and terms presented here. (Generally linguists assume that at this kind of time depth common elements between languages are so eroded as to be almost completely disappearing from view, which is far from the case between Yolngu and CYP.) Intriguing hints in the kinship data indicate that borrowing may have occurred between Yolngu and languages to the south and southeast apart from immediate neighbors, which may support a "trek round the gulf" hypothesis, with Yolngu migrating from a position closer to Cape York Peninsula well after the gulf was inundated. This remains a mystery, and it is not one that we will attempt to unravel at this point; however, the data presented here are an important piece of the puzzle.

Conjectural History Starting with Dravidian/Kariera

We take as a hypothesis to be tested the notion that Dravidian/Kariera A is the earliest type of kinship system in the Pama-Nyungan family, with others innovating away from that. The pattern of change was no doubt complex, but to simplify, there are three major types of change which we would want to examine:

1. Dravidian/Kariera to asymmetrical (known as Karadjeri in the Australianist literature);
2. Dravidian/Kariera to Aluridja (partially generational, although Dousset (2003) argues it retains Dravidian features);
3. Dravidian/Kariera to Aranda (second-cousin marriage and four grandparents distinguished).

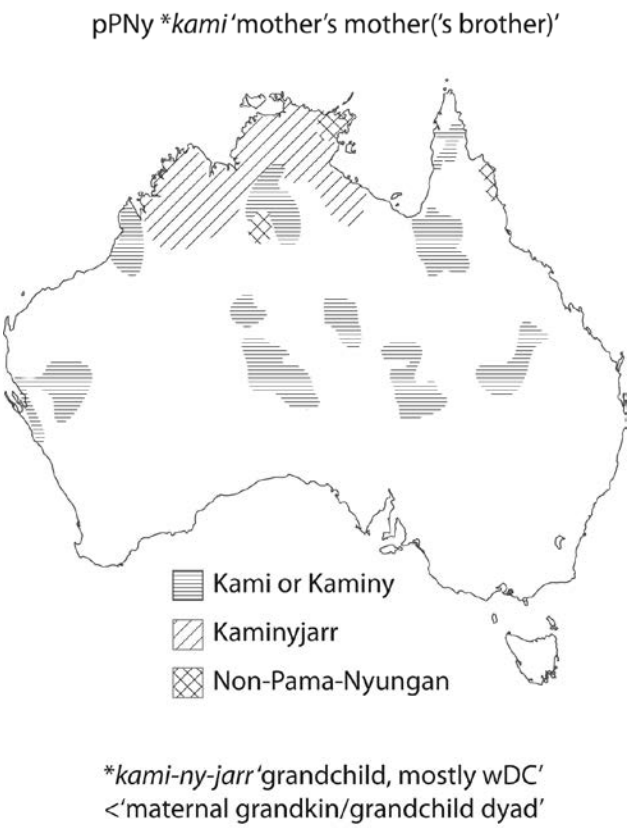


MAP 10.2. Some possible transitions in Pama-Nyungan.

In this chapter we will look only at the first type of change (see Map 10.2). There are also interesting potential correlations of the asymmetrical system with polygyny (Keen 2004, 2006) and possibly expansionism (McConvell and Alpher 2002), but here we confine ourselves to linguistic evidence. Some linguistic evidence that Proto-Pama-Nyungan could have been of the Dravidian/Kariera type is touched on briefly in the next section. In a fuller treatment the alternative hypotheses about PPNy would be compared and assessed.

Proto-Pama-Nyungan Kinship

Yolngu and Paman are two subgroups of the Pama-Nyungan family of languages. The reconstruction of the Pama-Nyungan kinship system is a related project currently underway. This is being done by collecting all the kin terms in Pama-Nyungan and other languages where relevant, together with other vocabulary items that appear to be related to kin terms. Each root is then reconstructed with a form and probable meaning (including its probable polysemy or equations). Eventually—a stage not reached yet—a hypothesis about the full terminology of Proto-Pama-Nyungan (PPNy) will be produced. As an illustration, take the proposed PPNy term **kami*. Reflexes



MAP 10.3. Proto–Pama-Nyungan **kami* 'mother's mother.' (from Peterson et al. 2005, 90).

of this form are found in many languages across the Pama-Nyungan area, as shown in Map 10.3.

Reflexes of this root are found in many CYP (Paman) languages with the meaning "mother's mother" or a closely related meaning. Interestingly, in a number of widely scattered languages, including Yolngu, only reflexes of the complex form **kami-ny-jarr* are found, usually as a reciprocal "grandchild" form.[1]

As with many roots, there are extensions and changes of meaning from the original. While this poses a problem of finding the correct original meaning and paths of change, once a supportable hypothesis has been arrived at, it provides us with a great deal of evidence about continental changes in systems.

We cannot describe findings about the entire PPNy kinship system here, but a hypothesis about the grandparent terms is briefly laid out below. This is a structure of equations that is compatible with a Kariera A/Dravidian system, in which the major difference is between parallel (MM/FF and siblings) and cross (MF/FM and siblings). Different terms are used for male and female referents.

**kami*: mother's mother = FFZ
**ngatyi*: mother's father = FMB
**papi*: father's mother = MFZ
**mayi-ri/li*: father's father = MMB

The hypothesis implies that these roots are then commonly subject to semantic change; for example, terms may be extended to siblings of the opposite sex.

Reflexes of all these roots occur in various places in CYP, and. in general terms, what is emerging is that CYP languages are somewhat closer to PPNy in kinship roots, at least than other subgroups. Yolngu has one of these roots directly preserved in *ngathi* < **ngaji*, and **mayi-ri* is reflected as *ma:ri*, which has shifted its central meaning to MMB while retaining the FF meaning in some contexts. As already noted, the root **kami* is only reflected in a complex "grandchild" form, *gaminyarr*, and **papi* is apparently not reflected in the Yolngu terminology.

Kariera to Karadjeri: Cape York Peninsula to North-East Arnhem Land

There are two major examples of Kariera and Karadjeri systems in which the latter may have developed from the former: the groups after which the systems are named and some neighbors in the eastern Pilbara, and CYP and NEAL (Yolngu). In this chapter we are concerned only with the latter. All Yolngu groups have 'Karadjeri' kinship, with matrilateral cross-cousin marriage and patterns of kin terminology to match. In CYP there are a number of variations, including Dravidian/Kariera and Karadjeri.

A number of kin terms are cognate between CYP and NEAL, but not all with the same meanings. Our aim here is to establish whether a transition within CYP and to NEAL could have happened, and what the likely steps were in the light of evidence of linguistic reconstruction.

North-Ea st Arnhem Land: Yolngu

Since we are mainly concerned with a proposed endpoint of the transition in Yolngu, we shall look at the Yolngu system first. In this section we use a structural approach to look at the way such a system could have evolved from a Kariera system through a sequence of changes, taking into account linguistic changes that are evident internally in Yolngu languages. Then we review the situation in CYP in which the Kariera systems are mainly located in the east. In the west—closest geographically to North-East Arnhem Land—there are matrilateral systems. (Some of

the changes seen in the Yolngu system could well have occurred in western CYP.) We then focus on the Yolngu kin terms that have cognates (or related forms) in Cape York Peninsula, especially those where there has been a change in meaning. The linguistic evidence suggests a suite of changes that is broadly the same as that suggested by the structural approach and internal Yolngu evidence, but adds some interesting additional facets.

Yolngu Kinship and Marriage

The "Karadjeri" form of the Yolngu terminology combines some features of Kariera and Aranda terminologies.[2] Like the Kariera terminologies, Yolngu kin classification classifies FM and MFZ together, and MF with FMB, but it distinguishes MM/MMB from FF/FFZ. Parallel cousins are merged with siblings but, important for marriage, matrilateral cross cousins (*galay*) differ from those on the father's side (*dhuway*). A man can only legitimately marry his *galay*, while a woman had to marry her *dhuway*. The matrilateral cross cousin of one's matrilateral cross cousins, "sibling" in Kariera terminologies, is MM/MMB (*ma:ri*).

Yolngu kin classification arranges terms into five, or in some regions seven, "lines" traced through men. Terms for women in line 1, on the right of the conventional diagram, were ideally the wives of males of the same generation, to whom ego applied the terms in line 2; terms for women in line 2 were ideally applied to wives of males of line 3, and so on. Each woman's "husband" in the diagram is her patrilateral cross cousin (FZS, MFZDS), and each man's "wife" is his matrilateral cross cousin (MBD, MMBDD, to his right on the conventional diagram). (Wife and wife's mother categories are also found two generations below ego.)

People trace three sequences of terms through women, cutting across the patrilineal "lines" of terms (Shapiro 1981). These name the relatives involved in marriage negotiations and exchange. Certain kin terms are repeated in alternate generations in the male line (the "alternate generations agnates," or AGA feature). This widens the field of a man's potential marriage partners to cross cousins two generations down. For example, a man's *galay* includes MBSSD, and *ma:ri* includes MMBSC as well as MM/MMB.

Yolngu preferred marriage between genealogically close cross cousins. They belonged, by implication, to patri-groups whose countries were geographically close and of opposite patri-moieties. A marriage contract (*wawun.guma*, 'promise a wife') could involve negotiations among relatives across several generations and between several lineages, implying a long span of time between the contract being made and brought to fruition. Exchange obligations, particularly on the part of the potential husband, lasted many years. A man could arrange for the bestowal of a sister's daughter's daughter on his *ngathiwalkur* (MMMBS), whose sister's daughter's daughter he had married, closing the circle between two groups (Shapiro 1981). Yolngu had one of the highest levels of polygyny recorded for Australian Aborigines, up to twenty-six concurrent wives.

Kariera to Yolngu

The difference between Kariera and Karadjeri or Yolngu crucially involves bilateral marriage in the Kariera case and matrilateral marriage in the Karadjeri (Yolngu) case. In the kin terminology, we find differentiation in the Yolngu terminology which does not exist in the Kariera one. Central is the use of two separate terms for patrilateral and matrilateral cross cousins in Yolngu that correspond to their different affinal positions as woman's husband and man's wife, respectively. Related to this terminological difference there is a suite of other "ruptures" as compared to Kariera. This involves different terms for father's sister and wife's mother, which are usually referred to as the same term in Kariera, and between mother's mother's brother and father's father, which also fall together in Kariera A systems. In the case of Yolngu, as we shall see, these secondary changes in the +1 and +2 generations are somewhat superficial in that they are effected by adding qualifying words or a suffix to the older Kariera terms; in the grandparent case, the term can still be used as a superclass term for parallel grandparents alongside the differentiated usage (Scheffler 1978).

The transformations leading from a Kariera system to the Yolngu Karadjeri system are set out in some detail in Appendix 10.1, where successive pages show sequential changes. A starting point in a Kariera system is modeled with existing Yolngu terms.

The Order of Transformations: Later Phase

The model of the transformation of a Kariera-like terminology into the Yolngu Karadjeri-like terminology suggests the following series of differentiations, or

"ruptures." The following summary list of changes omits most spouse equations and specification of relations of patrifiliation in collateral lines. The ordering of transitions from a historical linguistic point of view is discussed below and set out in Table 10.1. In the listing immediately below, it is likely that the differentiation of cross cousins (item 1) is a relatively early change; it is therefore not included in Table 10.1 but is included instead in the following table, which deals with the linguistic changes that belong to the earlier phase of the transition.

Spouses and spouses' parents

1. Differentiation of cross cousins: MBC/MMBDC (*galay*) ≠ FZD/MFZDC (*dhuway*).
2. Differentiation of wife's mother from FZ and the reciprocals:
   (a) WM (*mukul rumaru*) FZ (*mukul ba:pa*) and reciprocally:
   (b) WMB (*maralkur*) ≠ F/FB (*ba:pa*)
   (c) wDH/FZDC (*gurrung*) ≠ mSC (*ga:thu*).

Spouses' parents siblings and parents (1)

3. Differentiation of WMF from FF/FFZ and the reciprocals:
   (a) WMF = MMB, WMFZ = MM (*ma:ri*) ≠ FF/FFZ (*mari'mu*) and reciprocally:
   (b) mDDH/BDDH = wDC/ZDC (*gutharra*) ≠ mSC (*marratja*).

Alternate generation extensions

4. Extension of M/MZ, MB, MBC terms extended to alternate generations agnates descending and reciprocal extensions:
   (a) MBSD = M/MZ (*nga:rn̲di*), MBSS = MB (*ngapipi*, *gawal*) ≠ ♀C/ZC (*waku*) MBSSC = MBC (*galay*) ≠ ♀SC/ZSC/♂DC/BDC (*gaminyarr*) and reciprocally:
   (b) FFFZC ⇒ FZC ≠ FM/FMZ (*momu*) and MF/FMB (*ngathi*); FFZC = wC/ZC (*waku*) ≠ M (*nga:rn̲di*) and MB (*ngapipi*).
5. Extension of MM/MMB(WMF/WMFZ) term to alternate generation descending (agnatic) and reciprocal extensions:
   (a) MMBSC = MM/MMB (WMF/WMFZ) (*ma:ri*) ≠ eB (*wa:wa*), eZ (*yapa*), ySb (*yokuyuku*, *gutha*), and reciprocally:
   (b) FFZDC (*gutharra*) ≠ eB (*wa:wa*), eZ (*yapa*), ySb (*yokuyuku*, *gutha*).
   And extension of MMBD/WM and MMBS terms to alternate generation descending (agnatic) and reciprocal extensions:
   (c) MMBSSD = MMBD/WM (*mukul rumaru*) and MMBSSS = MMBS/WMB (*maralkur*) ≠ mC/BC (*ga:thu*) and reciprocally:
   (d) FFFZDC = FZDC/wDH/wDHZ (*gurrung*) ≠ F/FB (*ba:pa*) and FZ (*mukul ba:pa*).

Spouse's parents' parents (2)

6. Differentiation of WMM and WMMB from FM/MFZ and MF/FMB, and reciprocals:
   (a) WMM = MMMBD (*mumalkur*) ≠ FM/MFZ (*momu*),
   (b) WMMB ≠ MF/FMB (*ngathi*) = MMMBS (*ngathi-walkur*), and reciprocally
   (c) FZDDC ≠ SC/ZDC (*gaminyarr*) = ♀DDH/ZDDH (*dhumun.gur*).

Specification of terms at the periphery

7. Terms for FMM/FMMB (MMF and MMFZ), MMM/MMMB, ♀DDC/ZDDC, mSDC and wDSC are specified, reproducing the Kariera-type terms, and instantiating AGA and AGU extensions.

Recursion of spouse's matrisequence

8. Extension of MMBD/WM and MMBS/WMB to FZDDD and FZDDS (with the corollary of specifying *dhumun.gur* as 'WMM/WMMB'):
   (a) FZDDDD = MMBD/WM (*mukul rumaru*) and
   (b) FZDDDS = MMBS/WMB (*maralkur*) ≠ wDSD (*mukul ba:pa*, 'FZ') and wDSS (*ba:pa*, 'F/FB').

In Table 10.1, the numbers in the left column refer to the changes in the list above. The second column specifies the proposed original term and its etymology. This refers to the current Yolngu term, but it may be that at an earlier stage a different term was used; the main point here is that the original term covers a particular range of kin types before the relevant change and diversification of terminology has taken place. This original, broader meaning is listed in the third column. The fourth column specifies one of the new terms after the change and split (labeled "I"), and the fifth column, the mechanism or type of process whereby this term has been created. The sixth and seventh columns provide parallel information for the second of the new terms (II). If there is nothing in the seventh (last) column, this simply means that the original term is retained with a more restricted meaning.

TABLE 10.1. Summary of transitions from Kariera-type to Karadjeri-type Yolngu terminology

Number	Original Term & Etymology	Original Meaning	New Term & Meaning 1	Mechanism & Etymology	New Term & Meaning 2	Mechanism & Etymology
2a	*Mukul* (PNy/CYP)	WM (MBW) +FZ	*Mukul rumaru* WM	Qualifier added *rumaru* old PNy 'avoidance relation'	*Mukul ba:pa* FZ	Qualifier added *ba:pa* 'father' NPNy loan (Wandarang)
2b	*Ba:pa* (NPNy loan)	F/FB+WMB	*Maralkur* WMB	*Ma:ri* 'MM/FF' + *walkur* 'patri-filial'	*Ba:pa* F	
2c	*Ga:thu* (PNy not CYP)	♀DH/♂C/BC	*Gurrung* fDH	NPNy loan (Wandarang)	*Ga:thu* mC/BC	
3a	*Ma:ri* (PNy)	MM(B)+FF(Z)	*Ma:ri'mu* FF(Z)	Suffix *–mu* added	*Ma:ri* MM(B)	
3b	*Gutharra* (probably PNy)	♀DC+♂SC	*Marratja* mSC	Perhaps related to *marra* 'hair'	*Gutharra* wDC	
6a	*Ngathi* (PNy incl. CYP)	MF(B)/FM(B)+ WMMB (MMMBS)	*Ngathi-walkur* WMMB (MMMBS)	*Ngathi* 'MF' + *walkur* 'patri-filial'	*Ngathi* MF(B)/FM(B)	
6b	*Momu* (NPNy loan)	FM(Z), MFZ+ WMM (MMBD)	*Mumalkur* WMM	*Momu* 'FM'		
6c	*Gaminyarr* (PNy *kami 'MM' + suffix)	♀SC/♂DC+ ♀DDH(Z)/ZDDH(Z) (FZDDC)	*Dhumun .gur*+ ♀DDH(Z)/ ZDDH(Z) (FZDDC)	Etymology obscure	*Gaminyarr*	

Implications of the Model of Yolngu Transformations

The model of the transformation of Yolngu terminology from a Kariera base has implications for the linguistic resources necessary to make these posited changes, which are discussed below. Some required drawing on external sources—either vocabulary in domains outside kinship or drawing on kin terminology (or related vocabulary) from neighboring languages. Other transformations drew on resources internal to the terminology—for example, through extending terms to agnates in alternate generations. This is in addition to the changes in meaning of inherited items, which is discussed in the next section, after the introduction to Cape York Peninsula.

***mukul rumaru* (MMBD, WM) ≠ *mukul ba:pa* (FZ)**

According to Zorc (1986), *rumaru* has the sense 'avoidance relationship,' as in *rumaru'manydji*, ('in an avoidance relationship'). The term *rumaru* is possibly cognate with the Western Desert term *yumari* 'mother-in-law/avoidance relation'; if so, it would be reconstructable to PPNy and would imply the existence of in-law avoidance in Proto-Pama-Nyungan society. *Ba:pa* is the term for 'father/father's brother,' itself perhaps borrowed from non-PNy (cf. Wandarang *baba*, Ndjebbana *babba* 'father'). Zorc's suggestion that it is borrowed from Makassarese seems less likely, and Zorc (1986, 13) notes that others such as Warner also argued against this.

The reciprocal *gurrung* is probably borrowed from a neighboring non-PNy term: Ngandi MMBD/WM *gurrung*; Wandarang *wurrung* (*gurrung* in some contexts). While borrowing from Yolngu might be proposed, the presence of probable other cognates in neighboring NPNy languages supports the idea of borrowing *into* Yolngu (e.g., Burarra *gorrnga* 'spouse').

***galay* (MBD, MMBDC) ≠ *dhuway* (FZC, MFZDC, FFZSC)**

Galay derives from an older term for MB (perhaps MyB), probably through Omaha skewing (see below).

***ma:ri* (MM/MMZ/MMB) ≠ *mari'mu* (FF/FFB/FFZ)**

Ma:ri may be related to terms for FF elsewhere in PNy, such as *mayili* in the Pilbara, and could be reconstructable to PPNy as "parallel grandparent" (MM/FF), especially if the protolanguage had a Kariera system.[3]

The source of the suffix *-mu* (*-mungu* in some dialects: see Heath 1980, 1982) differentiating these terms is unclear. There are cognate suffixes in CYP, however: in Umpila *ngaci* (*mu*) 'mother's father,' reciprocal *ngaci:cu* 'daughter's son,' *ngacamu* 'husband's mother,' HF, SW, 'son-in-law' (Thomson 1972; Bruce Rigsby, pers. com.).[4]

***maralkur* (MMBS, WMB) ≠ *ba:pa* (F/FB)**

Maralkur appears to be a contraction of *ma:ri-walkur*. The term *walkur*, which Zorc glosses as "descendant from the male line," appears as an alter-centric term "your *ga:thu* (♂C/BC') (Zorc 1986:249), and *walkur-ma:rrama* = "procreate." It also seems to be a noun of some kind meaning "patriline" or similar. It appears as a suffix, probably originally the second element of a compound, in three of the terms that we have identified as providing additional terms in the transition from Kariera to Karadjeri. In all cases the suffix has the effect of shifting the primary reference of the term to an affinal sense. In each case there is a conventional equation of the affinal term with a consanguineal kin type. In the case of *maralkur* the affinal sense is WMB, which is most centrally a MMBS, so the import of *walkur* appears to be "son of a male *ma:ri*," conforming to the "patrifilial" sense of *walkur* identified. In the other terms with this suffix (*ngathiwalkur*, *momalkur*) the effect of the suffix is also to produce an affinal sense that is conventionally identified as a consanguineal relative also—WMMB/MMMBS and WMM/ MMMBD, respectively. The roots are respectively MF/FMB and FM/MFZ centrally.[5]

gutharra* ≠ *marratja

The term *gutharra* could be a loanword from Alawa or a closely related NPNy language where the stem *wujarra* is found alternating with *gujarra* following a consonant final prefix in the same meaning as the Yolngu term "woman's daughter's child" (Sharpe 2001, 171, 173). Alawa is a considerable distance southwest of Yolngu, so one would have to posit change in language territories since the time of the borrowing, perhaps movement north of the Yolngu.

Some evidence, however, suggests that this may be a Pama-Nyungan root. According to Alpher (2006) it descends from a root **kucarra*, but there are few cognates and they are not persuasive, and there are apparently none in CYP. If it were a retention of the meaning "parallel grandchild," that might explain why *gaminyarr* (see below) has shifted from parallel to cross grandchild.

The term *gutha* in Yolngu means "younger sibling" and is given by Alpher as related to **kucarra*. Since sibling terms are commonly used for parallel grandparents and especially younger sibling terms for grandchildren, a derivation from this source is a possibility, although the "suffix" *-rra* required to make this etymology work is not attested or explicable in Yolngu.

There are, however, other probable cognates in PNy with a *kutha* root, and a suffix in the meaning "woman's daughter's child" in the Warluwarric subgroup of the west-central Gulf of Carpentaria and Barkly Tablelands (e.g., Bularnu *kuthaninyu* '♀DC').

The term *marratja* may be derived from *marra*, 'hair.'

***nga:rndi* (MBSD, etc.), *ngapipi* (MBSC) ≠ *waku* (wC/ZC)**

The term *nga:rndi* is not the most common of PNy roots for "mother," and the more common root *ngama* is used in both CYP and Yolngu. Cognates of *nga:rndi* are not found in CYP but seem restricted to the Karnic subgroup of the Eyre Basin and surrounds—Proto-Karnic *nganti (Alpher 2006). Alpher also comments that the form *ngaarndi* is not likely to be a PNy inheritance as it does not undergo the Yolngu regular sound change of nasal-oral consonant cluster to nasal, illustrated from the kinship term *kaminytyarr > *gaminyarr*. Another possibility is that it is related to *ngayarnda-thu* 'MBD' (< "mother" by Omaha skewing) found in Kayardild (Evans 1995, 554), a language of Tangkic, an NPNy family in the central-eastern Gulf of Carpentaria phylogenetically close to PNy.

The terms *nga:ndi* (MBSD, etc.) and *ngapipi* (MBSC) are extended to generations –2 (agnatic) from M/MZ and MB, displacing *waku*, which retains the sense wC/ZC (and FZSC, etc.).

Ngapipi (centrally MB) is undoubtedly an NPNy loan, although exactly this form and meaning are not found combined in current NPNy languages. Alawa has *bibi-nga* 'my mother's brother' with the syllables/morphemes in the reverse position from the Yolngu form, but bearing in mind that *nga-* is commonly the first-person prefix of NPNy languages of the region and that "my" affixes most commonly become bleached of meaning in kin terms (McConvell 2008, 318).[6] The old roots for MB found in CYP (junior and senior), cognates of *galay* and *mukul*, both ended up with different meanings in Yolngu, as we shall see below, and a new MB term was needed.

***waku* (FFZC) ≠ *nga:rndi* (M/MZ), *ngapipi* (MB)**

The term *waku* is extended to generations +2 (agnatic) to denote FFZC, displacing *nga:ndi* and *ngapipi*, which retain the senses M/MZ and MB. The etymology of *waku* is

obscure: there are no obvious PNy cognates or NPNy loan sources.

***gaminyarr* (mDC, wSC) ≠ *galay* (MBSSC, MMBSSDC, etc.)**

The term *galay* is extended to generation −2 (agnatic) from MBC/MMBDC, displacing *gaminyarr*, which retains the sense mDC/wSC, etc. As noted, *gaminyarr* descends from PPNy **kami-nytyarr*, a morphologically complex form. In a number of languages in CYP, forms descended from **kami* are retained for MM, but in some cases in CYP and elsewhere the grandparent term has been replaced by another root, but the grandchild term is formed from a reflex of **kami*. In Umbithamu, for instance (Verstraete, unpublished notes), the terms *ami-than* and *ami-thunu* (from **kami*+suffix) mean ♀SC and ♀DC, respectively, but the reciprocal grandparent terms are the unrelated *angkutha* and *tyangkutha*.

***dhuway* (FFFZC) ≠ *momu* (FM/FMZ/MFZ) or *ngathi* (MF/MFB/FMB)**

The term *dhuway* is extended to generation +2 (agnatic) to denote FFZC, displacing *nga:ndi* and *ngapipi*, which retain the senses M/MZ and MB.

***ma:ri* (MMBSC) ≠ *wa:wa* (eB), etc.**

The term *ma:ri* is extended to generation −2 (agnatic) to denote MMBSC, displacing the sibling terms *wa:wa* (B), etc. To differentiate FF/FFB/FFZ (a criterial rupture for Karadjeric systems), a suffix (*-mu*) can be added (see discussion above). The term *wa:wa* is possibly a PNy inheritance as the forms *wawa*, *wawi(n)* are found widely in Victoria for "elder brother" and related kin.

***mukul rumaru* (MMBSSD) and *maralkur* (MMBSSS) ≠ *ga:thu* (♂C, MBDC)**

The terms *mukul rumaru* (MMBSSD) and *maralkur* (MMBSSS) are extended down two generations (agnatic) to displace *ga:thu*, which retains the senses ♂C, MBDC, etc.

***mumalkur* (MMMBD, WMM/WMMZ) ≠ *mumu* (FM/FMZ/MFZ), *ngathiwalkur* (MMMBS, WMMB) ≠ *ngathi* (MF/MFB/FMB)**

These terms are differentiated with the addition of the suffix *-walkur* (contracted in *mumalkur*), which here seems to imply greater distance rather than "child of" (cf. *maralkur* above). The term *momu* (*muumuu*) (FM/MFZ) does not appear as a Pama-Nyungan root closely related to this meaning in CYP or elsewhere, and thus is suspected of being a non-PNy loanword. There is a near-exact match in Nunggubuyu *mumu* 'FM,' and while this could be a loan from Yolngu, it seems more likely that it is into Yolngu. The other current neighboring languages have somewhat similar terms for FM: Ngandi, *memem*; Wandarang, *mimi*; Ndjebbana, *mamam*, meaning MF(B/Z), but the variation in vowels lacks an explanation in our current state of knowledge.

***dhumun.gur* (FZDDC, ♀DDH) ≠ *gaminyarr* (♀SC, ♂DC)**

Dhumun.gur, along with *waku*, is the only Yolngu kinship term for which we have no prospective etymology either by inheritance or borrowing. Although a morpheme *-kur* may be present, leading to proposal of a root *dhumun*, neither the root nor the suffix has any meaning in Yolngu today. O'Grady (1990, 88) regards this term as "possibly" related to the PPNy root *tyaami 'MF,' but the change in vowels and the semantic shift are unexplained, and at this stage this etymology must be rejected. Zorc records *ga:la* as a synonym.

Summing up:

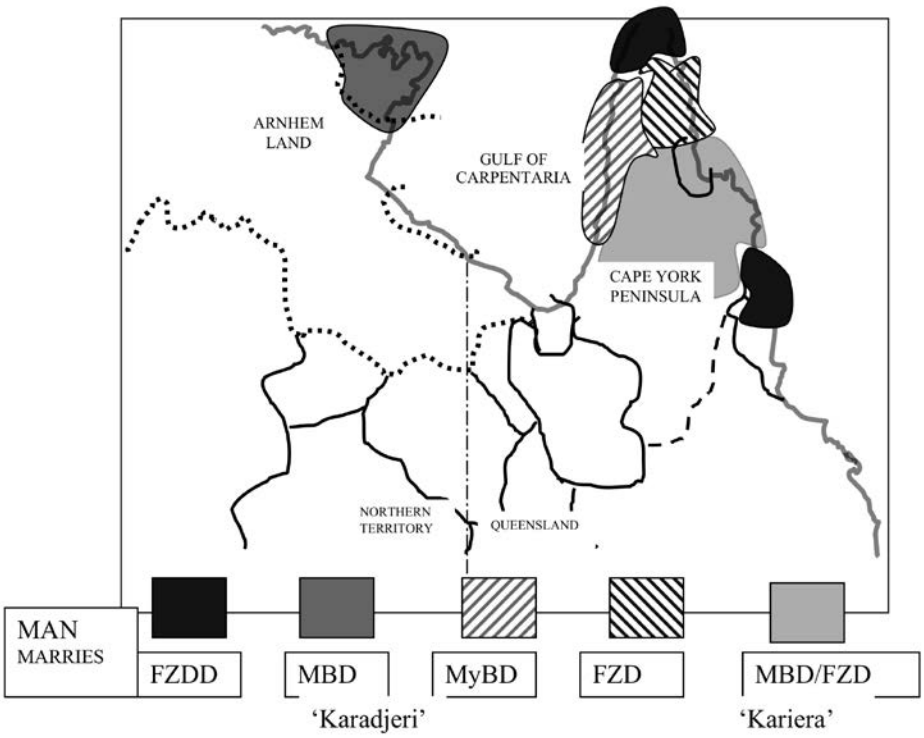
- A number of terms have been extended from other terms through alternate generation agnatic extension (*nga:ndi*, *ngapipi*, *waku*, *galay*, *dhuway*, *ma:ri*, *maralkur*, *mukul rumaru*);
- Some terms derive from preexisting kin terms by the addition of suffixes (*mari'mu*, *gutharra*, *maralkur*, *mumalkur*, *ngathiwalkur*, *dhumun.gur* perhaps), or by combination (*mukul ba:pa*);
- At least one term derives from kin-related vocabulary (possibly from earlier affinal terms) (*mukul rumaru*);
- Some terms may derive from other vocabulary (*marratja* from *marra* 'facial hair').
- A number of terms may derive from external sources, particularly neighboring Arnhem Land non-PNy languages (*gurrung*, *ngapipi*, *momu*, *baapa*).

The next section examines cognates of Yolngu kin terms in the terminology of other regions, principally Cape York Peninsula.

Cape York Peninsula

Distribution of Different Kinship Systems

In the southern and southeastern parts of CYP there was classic Dravidian symmetrical cross-cousin marriage (see Map 10.4).[7] On the west coast of CYP and to some extent in other areas, however, a form known as "junior



MAP 10.4. Kinship and marriage systems in Cape York Peninsula and North-East Arnhem Land.

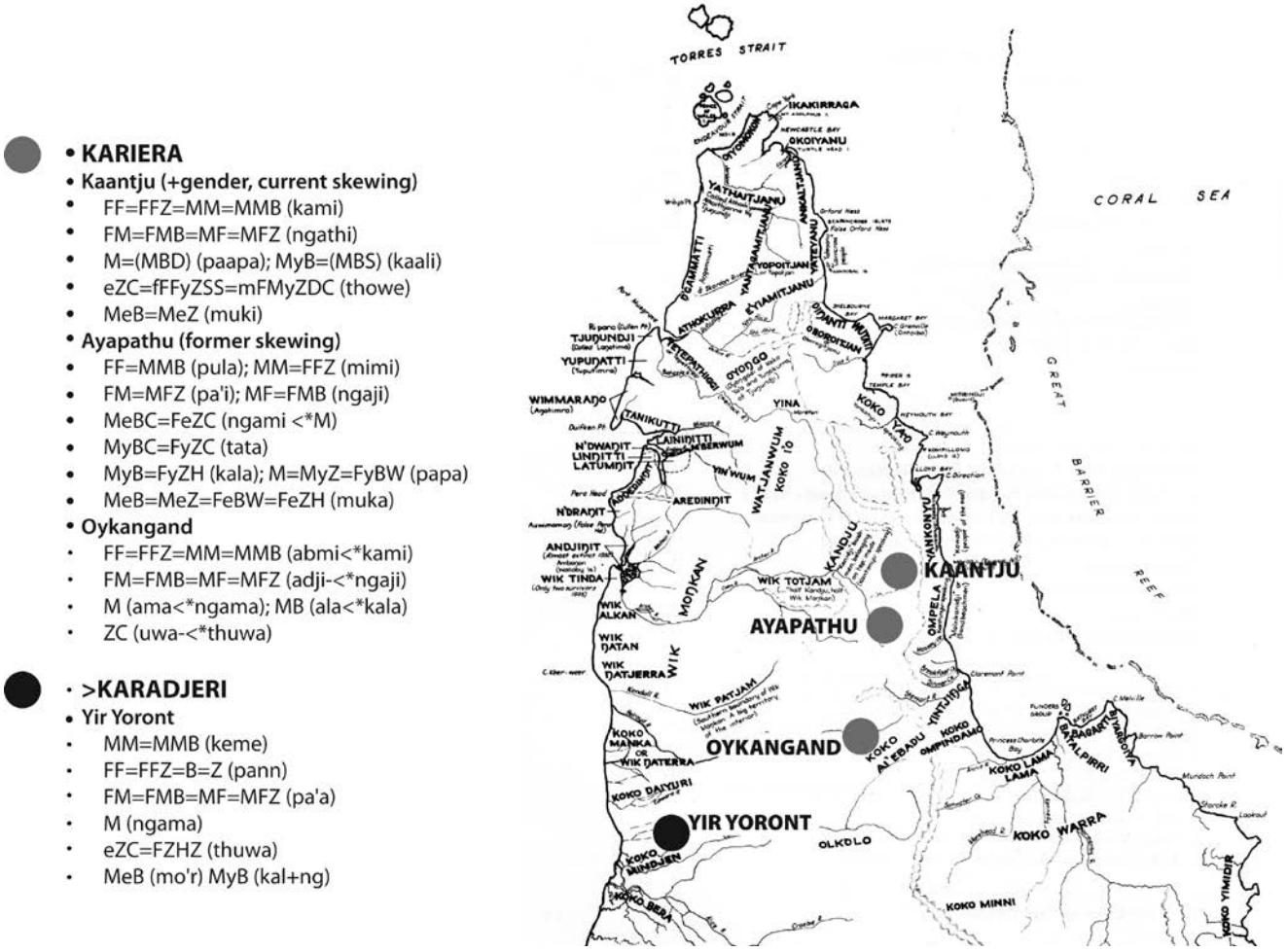
marriage" existed. It came in both matrilateral and patrilateral forms in different areas, but the matrilateral was most common: in "junior marriage" a man married the daughter of the junior sibling in the set of relevant parents-in-law (MyBD for the matrilateral form; FyZD for the patrilateral form). There is significant elaboration of the seniority/juniority dimension in most CYP systems, which seems to be intimately related to this form of marriage. Most systems in Australia distinguish between senior and junior siblings, but CYP typically distinguishes senior and junior siblings of parents, their children, and other kin. While Yolngu pay a great deal of attention to seniority of siblings in their cultural practice, this does not figure in their kin terminology or marriage systems in the same way.[8]

Ursula McConnell (1950, 107) noted: "The Wikmunkan system differs from MBD marriages elsewhere in Australia in its restriction of a man's marriage to the daughter of a KA.LA (MyB), the daughter of a MUKA (MeB) being tabooed." McConnell also believed this system to be older than some of the other marriage systems in CYP, and seems to have seen matrilateral marriage as the older form also, although she does not discuss the sequential relation between plain Dravidian/Kariera and matrilateral: "The Wikmungkan system (MBD marriage being a primitive character in kinship and basic in Australian kinship) with its junior sororate, levirate and marriage triumvirate, would appear to be the norm from which the more complicated Peninsular systems have developed, complications in the latter probably arising from the change to FZD marriage with its taboo on MBD." To the east there is a tendency toward patrilateral marriage in several groups, and in the north the cousin's child marriage, already mentioned.

It is probably significant that the matrilateral area is on the west side, closest to North-East Arnhem Land. Juniority is absent in the kinship system and marriage patterns of the Yolngu, but there is evidence in the terms (discussed below) that a junior system might have preceded the Yolngu system.

Kariera and Karadjeri Systems in CYP

Map 10.5 shows some representative samples of Kariera systems, and a Karadjeri system in the west (Yir Yoront). The central-eastern CYP systems (e.g., Kaandju/Umpila) have a set of grandparent terms that differentiate parallel vs. cross and gender of referent as reconstructed for PPNy above. Also in the area—for example, Ayapathu, to the south—there is Omaha skewing, which played a role in the development of the Yolngu terminology in setting



MAP 10.5. Kariera and Karadjeri systems in Cape York Peninsula (from Thomson 1972).

the stage for the change in meaning of the terms **thuwa* and **kaala*.

Linguistic Details of Early Changes

This section examines changes in meaning in the Yolngu kin terminology away from its CYP roots.

Cousins and Spouses from Uncles and Niblings

Perhaps the most striking change in the meaning of kin terms between CYP and Yolngu is found in the origin of the two cross-cousin/spouse terms. The way these terms have changed exactly complements each other and is a joint effect of a change entirely parallel to that of the extension known as Omaha skewing. Why Omaha skewing should be involved in the transition from a Dravidian to a matrilateral system is not immediately obvious, and we return to that question below.

Dhuway in Yolngu means "father's sister's child, husband/husband's sibling." This again reflects a matrilateral prescriptive equation, in accordance with Yolngu marriage practice.

The meaning of the proposed protoform **dhuwa* for *dhuway* (PNy **cuwa* [Alpher 2006]) and most of the reflexes in CYP is "woman's child; man's sister's child." This is also the reciprocal of *kaala*, so the reciprocal relationship between the two terms is maintained by a complementary change in meaning. The strict reciprocal would be ♂eZC, and a cognate term is used in this way in Wik Mungkan but extending also to ♀eZC. Related roots (with suffixes *-na*, etc.) are found also in other Queensland languages and with shifts in meaning far west in the Pilbara.

The cognate term is *tyuwai* in the Gugu Yimidhirr terminology of southeast CYP (Terwiel-Powell 1976, Haviland 1973 *dyuway*). It is centrally eZS but is extended to FZS (senior or junior sister), and indeed to the next generation in the patriline up to FFZS (Terwiel-Powell 1976, 149,

171; Powell 2002). Skewing of this term one generation up is quite common in southern CYP. In Gugu-Yimidhirr *mugur*, centrally MB, is subject to the converse downward Omaha skewing to MBS (and others in the patriline, in the Gugu-Yimidhirr multigenerational fashion).

Galay is the reciprocal of *dhuway*, and is the Yolngu term for mother's brother's child and wife('s brother), a straightforward matrilateral prescriptive equation. The cognate term in CYP, generally *gaala* (or *kaala*), and reconstructable to PPNy in that form, consistently has the meaning "mother's younger brother." In the junior marriage systems of that region (discussed above), a relation of this type (and not the MeB) is the prescribed wife's father. Meanings at the southern periphery of CYP for the **kaala* root include MB (without juniority) in Oykangand and Olkolo.

To the south, throughout the Maric and other Queensland PN languages, there is a root *kalnga* which is probably related to *kaala*, most likely through *-nga* being an old suffix. This root is mostly simply MB. There is no senior/junior distinction in parental generation siblings in this region, nor is there any marriage rule referring to such distinctions. This raises the question of the original meaning of the *kaala-* root: was it simply MB or MyB in PNy? The existence of a separate root reconstructed as MeB (*mukul*, discussed below) would tend to argue for the MyB meaning; however, the latter does have meanings along the lines of "old," which could be the original meaning, and might point to *kaala* being MB early in PNy.

There is usually an association between Omaha skewing and patrilineal institutions; both CYP and Yolngu are quite strongly patrilineal in ideology and clan organization. Thomson, however, in his discussion of the function of Omaha skewing as it occurs in parts of CYP, states that the use of the term "mother" for a female cross cousin emphasizes the unmarriageability of the cousin (McConvell and Alpher 2002). This was even more obvious in Sharp's (1934) description of the use of the skewed term *thuwayrr* in Koko-Bera, centrally "woman's or man's sister's child," as precisely an "unmarriageable cousin" for a man. These two usages of skewed mother terms on the one hand and skewed woman's child terms on the other appear different but they are reciprocals.

The idea that Omaha skewing of a mother term marks unmarriageable cross cousins for males does not work very well for our historical reconstruction: both the CYP meaning in the matrilateral marriage areas is "parent's sibling of a marriageable cousin" (MBD), and the Yolngu meaning is "a marriageable cousin" (MBD) within the matrilateral system (a problem noted by McConvell and Alpher [2002, 163]).[9] However, the other scenario of the ♀C/♂ZC (**thuwa-/dhuway*) term being skewed to describe an unmarriageable cousin (FZD) for a man is much more compatible with areas of CYP that have matrilateral marriage (where it is found) and with the Yolngu system.[10]

The usage described by Sharp (1934)—in which people block one side or the other for marriage, often alternately—is typical of the contextual and flexible uses of skewing emphasized by Kronenfeld (1996, 2009) and discussed in McConvell et al. 2002 and McConvell and Alpher 2002. The conversion of the term **thuwa* 'FZC' to a cross-cousin term may have started from such a context, when the matrilateral option became fixed, and different terms for the patrilateral and matrilateral cousins were required.

The original meaning of **kaala* reflexes was "mother's classificatory younger brother" who is the wife's father in a junior system such as found in CYP. In applying Omaha skewing to this term, the result—an MyBD—is a marriageable woman in the junior system, so Thomson's explanation of the Omaha extension of the M term to mark unmarriageability does not apply. As the juniority dimension of marriage was lost, and matrilaterality alone dominated, *kaala/galay*, the term for marriageable cousin for men, was applied to MBD generally.

Uncles to Aunts

In the transition from CYP **muka/mukur*, 'MeB,' to Yolngu *mukul*, FZ, WM, MBW, there are two major changes: the change from the meaning MeB to WM/FZ, which took place early on, and the addition of second elements to the root to distinguish the FZ and WM meanings in Yolngu, which was later (see discussion above). Here there is a differentiation between FZ and WM, and MB and HF, reflecting a matrilateral system. *Mukur-muka* is a widespread root in western PN in the meaning FZ and WM and is probably reconstructable to some high-level subgroup protolanguage within PNy—probably PNy itself. As well as in the western languages, the term *mukimuki* (for FZ) is found in Muruwari, far to the south. If this is cognate, then it begins to look as if the CYP forms are closest to PNy in meaning, and all other branches have changed to FZ. The presence of a distinct form **pimur* for FZ in CYP, and also found outside CYP (discussed below), supports this view.

The meaning of the root *mukur* ~ *muka* in CYP is MeB in just about all cases. In junior marriage systems this is

the "wife-taker," HF. As *mukur* (*mukul*) takes over the position of FZ, it "bumps out" the previous occupant of this role, the root **pimur*. The affinal role has been dominant in the change.

This shift in meaning leaves a "hole" in the early Yolngu system for the kin type "mother's brother." It is filled by two terms, *gawal* and *ngapipi*. The first may be a variant of *kaala, and the second is a non-PNy loanword, as discussed above.

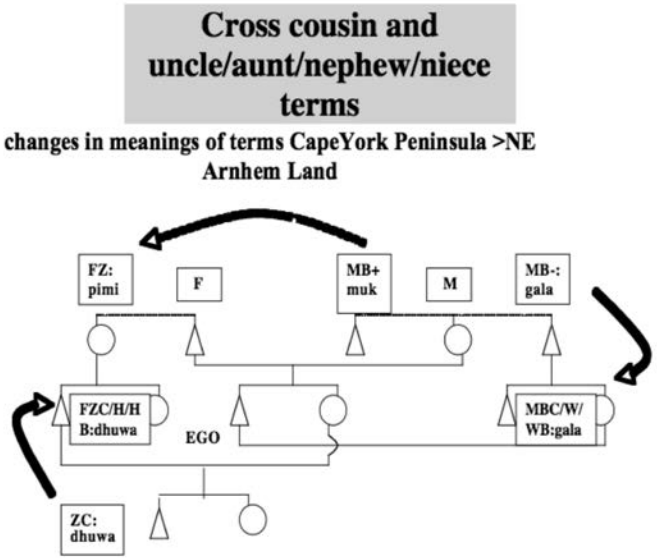


FIGURE 10.1. Cross-cousin and uncle/aunt/nephew/niece terms: changes in the meanings of terms, Cape York Peninsula > North-East Arnhem Land.

Grandparents and Grandchildren

In the transition between Kariera and Karadjeri, because of the flow-on effect of the change in marriage rules and terminology the parallel-grandparental equations are ruptured, while the other equations (the cross grandparents) are retained:

MMB ≠ MFZH ≠ MHF ≠ FF
FMB = FFZH = FWF = MF
MFZ = MMBW = MHM = FM
FFZ ≠ FMBW ≠ FWM ≠ MM

The relevant terms (*ma:ri*, *gutharra*, *momu*, *ngathi*, *gaminyarr*) have been discussed.

Table 10.2 summarizes the early changes between CYP and Yolngu. What is odd about *gaminyarr* in Yolngu is that it denotes a cross relative, not a parallel one. Possibly the prior occupation of the parallel grandchild term by *gutharra* may have played a role in the change, but a more solid explanation is needed for it.

Bolutju is another term for cross grandparent/grandchild. If this is related to CYP *pula* 'FF,' parallel grandparent, then this is another switch of this dimension. Zorc (1986), however, records this as meaning "facial hair."

The term *gaminhdharr* in Gugu-Yimidhirr, cognate with Yolngu *gaminyarr*, retains the old sense of reciprocal of MM (♀DC) for older speakers, but middle-aged speakers have extended it to mean SC, the reciprocal of FF and MF (Terwiel-Powell 1976, Haviland 1979), thus incorporating cross as well as parallel meanings.

Ordering of Changes: Historical Linguistic Considerations

It seems clear that, usually, not all elements in a type transformation happen simultaneously. In fact, it has been proposed that the component changes in other cases may happen in a regular order. As far as we know there is no general hypothesis about the ordering of changes of the above kind, nor does Hage suggest one. In the Australian case of "Kariera" changing to "Karadjeri" there are further "ruptures" in the grandkin terms, so that for instance FF is no longer equivalent to MMB, as shown earlier.

Taking first the rupture FZ/WM = MBW, here there has been only a partial rupture in the Yolngu terminology as the term *mukul* retains both meanings, FZ and WM, but added morphemes can optionally be used to distinguish: *ba:pa* 'father' > FZ, and *rumaru* 'avoidance' > WM. What has occurred, however, is a change in meaning of *mukul* from MeB to FZ, replacing an earlier FZ root. The connection that allows this change is most probably the "junior marriage system" of parts of CYP in which MeB, unlike MyB, is *not* a possible father-in-law for a man. As the daughter of the senior uncle is not a possible spouse in this system, the daughter of an FZ is not a possible spouse in the new matrilateral system.

In the case of the ruptured MBD/FZD, the change is effected by the complementary importation of the Omaha-skewed meanings terms for ♀C > FZC, H (*dhuway*); and for MyB > MBC, W (*galay*). Omaha skewing is reported from several areas of CYP, but the function seems to be to block a possible marriage to a normally allowed spouse because of contingent reasons (e.g., too many marriages in that direction). This works well for the first change, since this very root, with what is probably a cognate suffix (*thuwayrr*), is known to have the specific function of

TABLE 10.2. Early Yolngu changes

Number	Original Term & Etymology	Original Meaning	New Term and Meaning 1	Mechanism & Etymology	New Term & Meaning 2	Mechanism & Etymology
1	**thuwa* (PNy, CYP)	♀C, ZC	*Dhuway* FZC (H)	Omaha skewing >FZC, H in matrilateral, loss of original meaning		Suffix –y may have played a role
2	**kaala* (PNy, CYP)	MyB (WF)	*Galay* MBC (W)	Reciprocal Omaha skewing related to 1	*Gawal* retained as MB; *Ngapipi* NPNy loan for MB	Suffix –y may have played a role
3	**mukur* (PNy, CYP)	MeB (HF)	*mukul* FZ/WM	Bridging context of change 'parent-in-law'		Old PNy/CYP FZ term **pimur* lost in Yolngu
4	**papi* (PNy, CYP)	FM/MFZ	*Muumuu* FM/MFZ	Replacement by NPNy loan		**papi* lost in Yolngu
5a	**kami* (PNy, CYP)	MM/FFZ	*Maari* MM/FFZ+ FF/MMB	Extension of FF≠MMB to all parallel grandkin		**kami* MM lost in Yolngu but retained in reciprocal—6 below
5b	**mayiri* (PNy, CYP)	FF/MMB				
6	**kami-nytyarr* (PNy, CYP)	♀DC **kami* + suffix	*Gaminyarr* ♀SC/♂DC	Shift from parallel to cross grandchild		*Gutharra* took over parallel grandchild

marking "unmarriageable for males," as is FZD. On the other hand, the original meaning of the term *galay* is "prescribed spouse," as is the final meaning in the Yolngu languages.

We have already suggested that in the case of **kaala/galay* the "marriageable" element was transferred from the junior cross cousin to the matrilateral cross cousin. A further reason could be found in sequencing of the changes. If the change in **cuwa/dhuway* came first, this would lead to the change in *galay* as a reciprocal of it, not because it is necessarily strongly independently motivated as skewing. Once this change occurs, there is a need for a term for an MB who is a man's WF. An older term in Yolngu is *gawal*, which is possibly related to the term **kaala* and to variants of it: *galnga*, and *gawa* farther south in Queensland. This would probably mean that a suffixed form with -y was used for the skewed variant, the cross cousins. A more frequent form today for MB in Yolngu is *ngapipi*, a loanword.

It is not clear what the ordering of the changes involving *mukul* and *pimu+* would have been relative to the skewing changes discussed above. As there is no trace of a reflex of **pimu* in Yolngu languages, the shift in meaning of *mukul* to FZ/WM must have occurred early—at Proto-Yolngu, possibly before. Most likely, there was ambiguity in the meaning of *muk- terms from early times between a parent's (elder) sibling and a wife's parent. If the "wife's parent" element is dominant, this could shift along with changes in marriage and the relative power of the parents-in-law. This is speculative, however, and requires more research.[11]

Below is summarized the ordering needed for the changes above, which are the key ones in the early transformation between the CYP type and Yolngu type of system. After these follow the later changes, described above. The changes involving Omaha skewing that yielded the Yolngu cross-cousin/spouse terms occur as 1 and 2 here, but also at the start of the list of later changes, with emphasis, in the latter case, on how these interacted with other terms.

1. **dhuway* C>skewing>FZC, H/HB/HZ (cf. Koko-Bera *thuwayrr* 'unmarriageable cross cousin for man'); FOLLOWED BY
2. **galay* MyB>MBC, W/WB/WZ RECIPROCAL OF ABOVE;
3. **mukur* change from MeB to FZ/WM;
4. loss of **pimu-* FZ in Yolngu (could precede above changes).

Concl usions

Hage stressed that evidence of linguistic forms and how they changed, and not just system types, is crucial to discovering the actual transitions. We have focussed in this chapter on the transition between Dravidian and matrilateral systems, which has been of great import in anthropology, especially since Lévi-Strauss (1969a) located the change from restricted to generalized exchange in this transformation. There is a prima facie case that such transitions have occurred in Australia, and we have examined the case of the probable transition from Cape York Peninsula "Kariera" ("Dravidian") with its variations to the matrilateral system of the Yolngu of North-East Arnhem Land.

The hypothesis that the Yolngu terminology developed out of a Kariera-type system receives strong support from evidence brought together in this chapter. First is the Kariera form of kin terms at the periphery of the Yolngu system (notably in generations +3 and –3). Second is the relatively straightforward and ordered series of differentiations needed to convert a Kariera-like form into the Karadjeri form of the Yolngu terminology. Third is the distribution across CYP of Kariera- and Karadjeri-type terminologies that share cognates of many Yolngu terms. Fourth, Omaha skewing in early Kariera terminologies may explain the change of meaning (from +1 and –1 generation cross terms to 0 generation cross-cousin terms) of derivatives of **kaala* and **thuwayrr* in the Yolngu terminology. The model of Yolngu differentiations shows that following initial differentiations of cross cousins and wife's mother from FZ, they may have drawn on internal resources, as well as borrowing from nonkinship semantic domains and from non-PNy neighbors.

The geographical implications of the posited connections between NEAL and CYP are problematic, however, given the long history of the Gulf of Carpentaria, which separates the two regions. The most plausible hypothesis at the moment seems to be migration of Yolngu forbears, followed by encapsulation within non-PNy speakers. The expansionary character of the Yolngu kinship system, linked as it is to high levels of polygyny and rapid growth of some patri-groups (Keen 2006), may explain the current distribution of Yolngu "dialect groups" in NEAL. Hypotheses about the dynamics of populations related to their kinship systems in general (e.g., Hammel 2005) as well as for the Australian indigenous situation specifically (White and Denham 2009) are receiving vigorous attention, and the kind of evidence presented here from anthropology and linguistics pointing to changes and spreads feeds into this enterprise.

In conclusion, research on kinship evolution in anthropology has relied mainly on typology of systems. Modeling of structural transformations from synchronic data is a useful heuristic for investigating possible historical change. The reconstruction of linguistic forms and meanings can give different answers and also a more complex and stratified picture of transformations. Investigation of the case of Dravidian becoming matrilateral from Cape York Peninsula to North-East Arnhem Land shows the importance of a type of Omaha skewing used in the initial changes. The subsequent rupturing of former Kariera equations in Yolngu is ordered and uses various resources in the innovations, including adding of qualifying elements (some suffixed) and loanwords from neighboring languages.

Notes

1. The form *gaminyarr* in Yolngu results from a regular sound change in the subgroup whereby nasal-stop clusters are reduced to nasals (Heath 1981, McConvell 1997). There is also a meaning change from "maternal parallel grandchild" to "cross grandchild ♂DC/♀SC," which requires explanation.
2. Heath (1981, 364) cites Shapiro (1977) as analyzing the Yolngu system as a kind of hybrid between Kariera and the Aranda system found among some neighbors of Yolngu. Heath cites some examples showing that "borrowings in the area of kinship terminology often involve significant semantic restructurings." One of these is the adoption of the term *mudi* for FF in the southern dialect of Yolngu Ritharrngu, strongly differentiating this kin type from MM(B) as opposed to other dialects in which MM and FF fall together (*maari*) or FF is optionally distinguished by a suffix *–mu*(*ngu*). In the approach followed in this chapter, changes in the kinship system are not significantly shaped by the influence of Yolngu neighbors, although some terms have been borrowed from that source during later changes.
3. Alpher (2006) lists **ma:ri* as a separate root from **mayili*, with the meaning "cousin," although some of the reflexes in Central Queensland are MMB, perhaps more closely related to the Yolngu forms.
4. The suffix *–mu* is said by Zorc (1986) to be Makassarese, meaning "your." He says also that in Ritharrngu the suffix can be used to mean "your true blood relation." It is

plausible that a suffix of this kind may be used to emphasize a direct patrilineal connection when patrilineal clans, etc., are locally important and the pronominal possessive sense is lost. Most historians believe that contact between Yolngu and Makassarese seafarers only began around 1700, so this would give a relatively recent date for the introduction of the device for making this distinction, thought to be a key one in Karadjeri systems. In this respect, however, the Yolngu system is only half a step away from Kariera A, as *ma:ri* can still refer to FF(Z) in some contexts, so a shallow time depth for this rupture is perhaps not too surprising. It is also possible that Austronesian-speaking seafarers (e.g., the so-called Bayini) were in intimate contact with the Yolngu some time before the Macassans, and this suffix is found in many Austronesian languages, so the time-depth could be greater.

5. MF = MMH = MMMBS in a Kariera Dravidian system, so in such a system, proposed as the original one here, there would be no differentiation of these kin types. Unlike with *maralkur* there is no meaning of "patrifiliate of" the relative designated by the root here. Rather they are second cousin to the relative designated by the central meaning of the root: *mumalkur* and *ngathiwalkur* are the MMBSD and MMBSS, respectively, of *momu* and *ngathi*. The *walkur* element still seems to relate to the patriline since the relatives are in the patriline of the maternal grandmother's brother, as is *maralkur*.
6. In Wandarang, *bibi* is "mother." In the Yolngu outlier language Djinang-Djinba the term for FZ is *bapipi*, possibly related to *papa* 'F.' Hosokawa (2003, 116) gives *yungapipi* as an alternative form in Yolngu for MB: the source of this other apparent prefix with the root *pipi* is unclear but indicates non-PNy origin since the PNy Yolngu languages do not have prefixes. *Pipi* is a root for "father" in CYP and, more generally, in PNy and is found in non-PNy to the west (e.g., Wardaman *biwi* < **bibi*). The change F > MB seems poorly motivated in this case. *Pupi* is MB in Kalkatungu, in west-central Queensland, but this is geographically distant and probably coincidental. Another term for MB in Yolngu recorded by Warner (1937) is *gawal*, which may be descended from PPNy **kaal(a)* 'MB.'
7. In the Dyirbal system to the southeast of CYP, marriage was with the cross cousin's child (Dixon 1989). This is similar to the type of marriage described for the northern tip of CYP. Its occurrence at these extreme points may not be a coincidence, but we cannot at this point attempt an explanation.
8. This raises the question of whether juniority systems existed at an earlier stage, even in PPNy. The fact that both **muka* MeB and **kala* MyB are reconstructed here tends to favor its presence; however, we are not pursuing this question further here.
9. The areas where former skewing is in evidence in reflexes of "mother" to mean "mother's brother's daughter" may have practiced patrilateral cousin marriage at the time of the change in meaning of the term. In areas of CYP (the north currently, with possible pockets in the south) there are also MBDD and FZDD marriage rules (McConnell 1950—from male viewpoint). Assuming this to be a later development, probably from junior marriage, the role of wife giver is taken on by MBD and her brother MBS, no longer M(y)B. If this role is central, the shift of meaning of **kaala* MeB to *galay* MBC is plausible. This type of generation-shifted marriage is not, however, found in Yolngu, although some terminology (e.g., *ma:ri*) indicates an extension of matrilateral terms in Omaha fashion to adjacent generations of the patriline/clan.
10. The meaning of the suffix *-y* found in the western terminologies that have this type of skewing, and in Yolngu, may be significant here, although it is not clear exactly how (see McConvell 2008 on interpretation of old Pama-Nyungan kinship suffixes). This is why we are proposing that this change is the first of the skewing changes to derive a new asymmetric cross-cousin/spouse term.
11. There are attestations of the root with the meaning FZ in the northeast and southwest of CYP.

Appendix 10.1
Transformation Tables

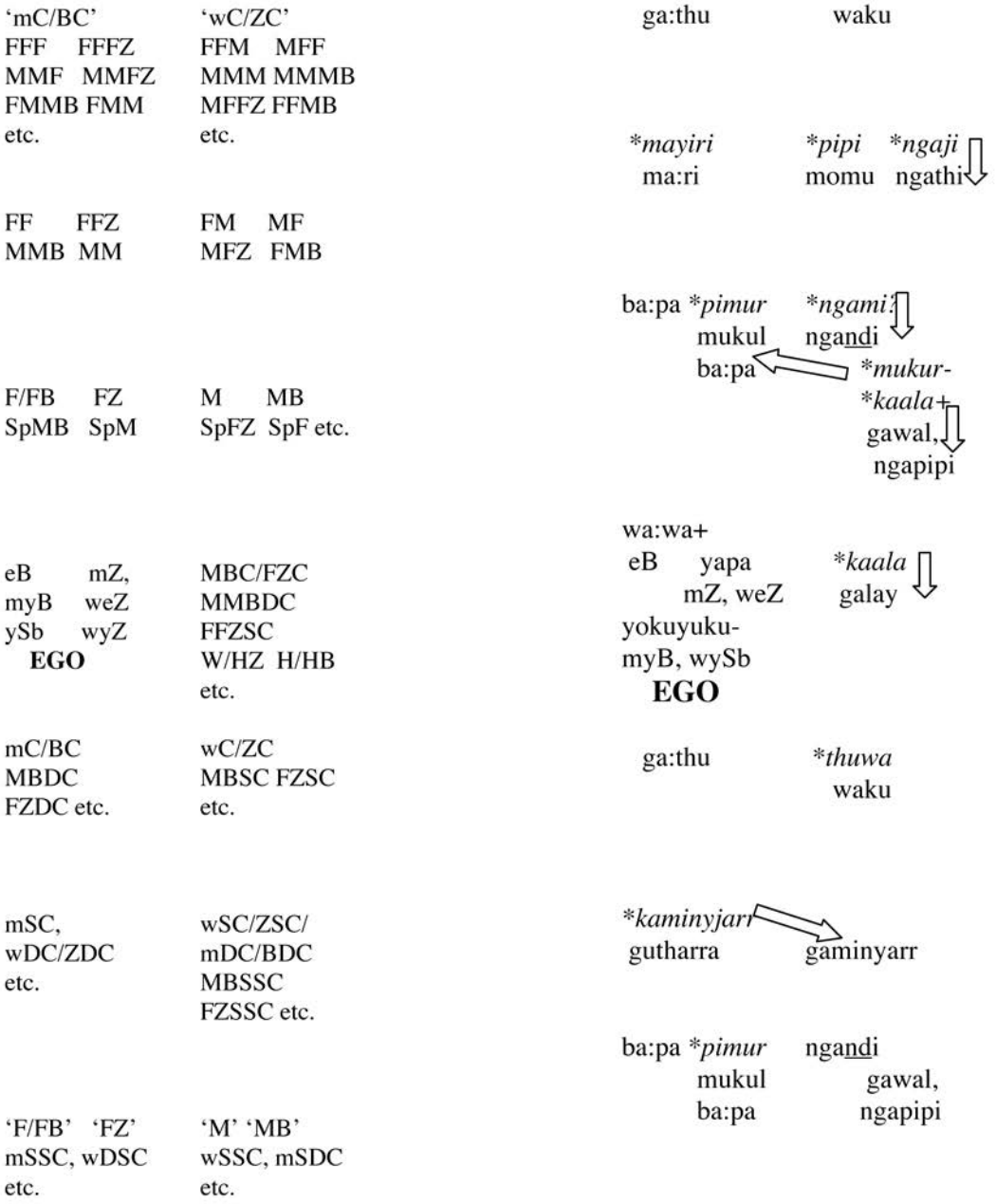


FIGURE 10.2. Basic Kariera (Dravidian) terminology. Basic Kariera categories set out in two "patrilines." Opposite-sex categories in horizontally adjacent squares are prescribed spouses. Relations of patrifiliation obtain between categories in vertical alignment; relations of matrifiliation obtain between categories in diagonal alignment. Same-sex sibling equivalence (FB = F, MZ = M, etc.) and cross-parallel neutralization (BC = ♂C, ZC = ♀C) are assumed, as is spouse equation between cross-cousin categories (horizontally adjacent squares). The terminology in the parents' generation is bifurcate merging.

FIGURE 10.3. Yolngu terminology as Kariera-type. Basic Kariera-like terminology drawing on modern Yolngu terms with posited Proto-Pama-Nyungan CYP terms (in italics). Arrows show the possible derivation of certain Yolngu terms from the PPN terms.

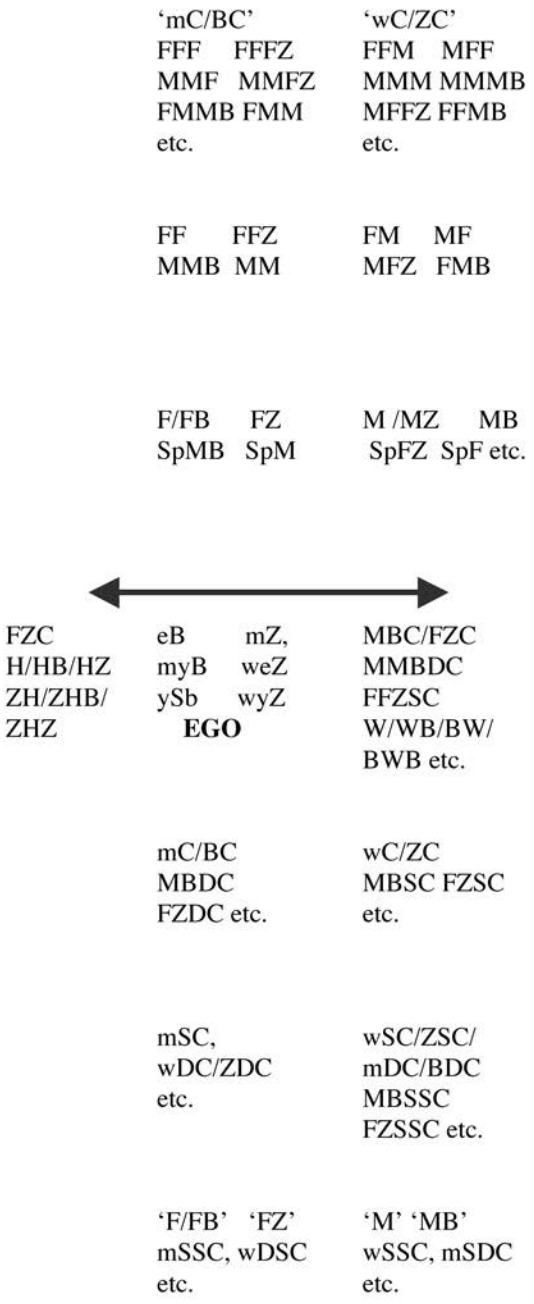


FIGURE 10.4. First differentiation: matrilateral and patrilateral cross cousins distinguished. Patrilateral cross cousins are distinguished from matrilateral ones; the prescribed wife category is MBD, and husband is FZS, perhaps as a preference at this stage:

MBC (W/WB) ≠ FZC (H/HZ).

The double arrow shows the differentiation of terms.

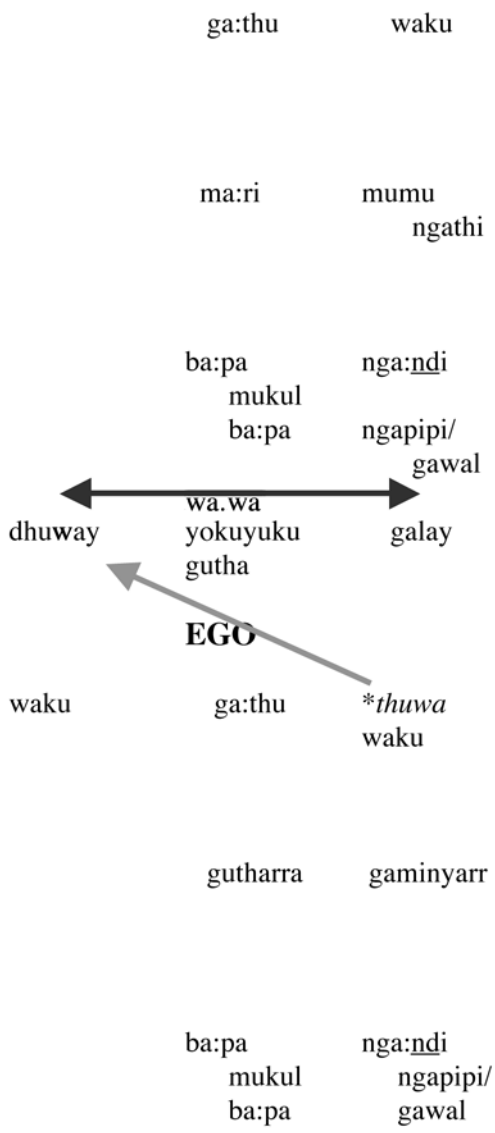


FIGURE 10.5. First differentiation: changes to the terminology. Assuming the skewing equation ♀C = FZC (for the reciprocal of MeBC) in the original terminology, **thuwa* is adopted to distinguish FZC from MBC (*galay*), drawing on the ECYP skewing rule; ♀C/FZSC is designated *waku*.

MBC ⇒ M/MB

FZC ⇒ wC/ZC

The designation of wC/FZSC remains *waku*.

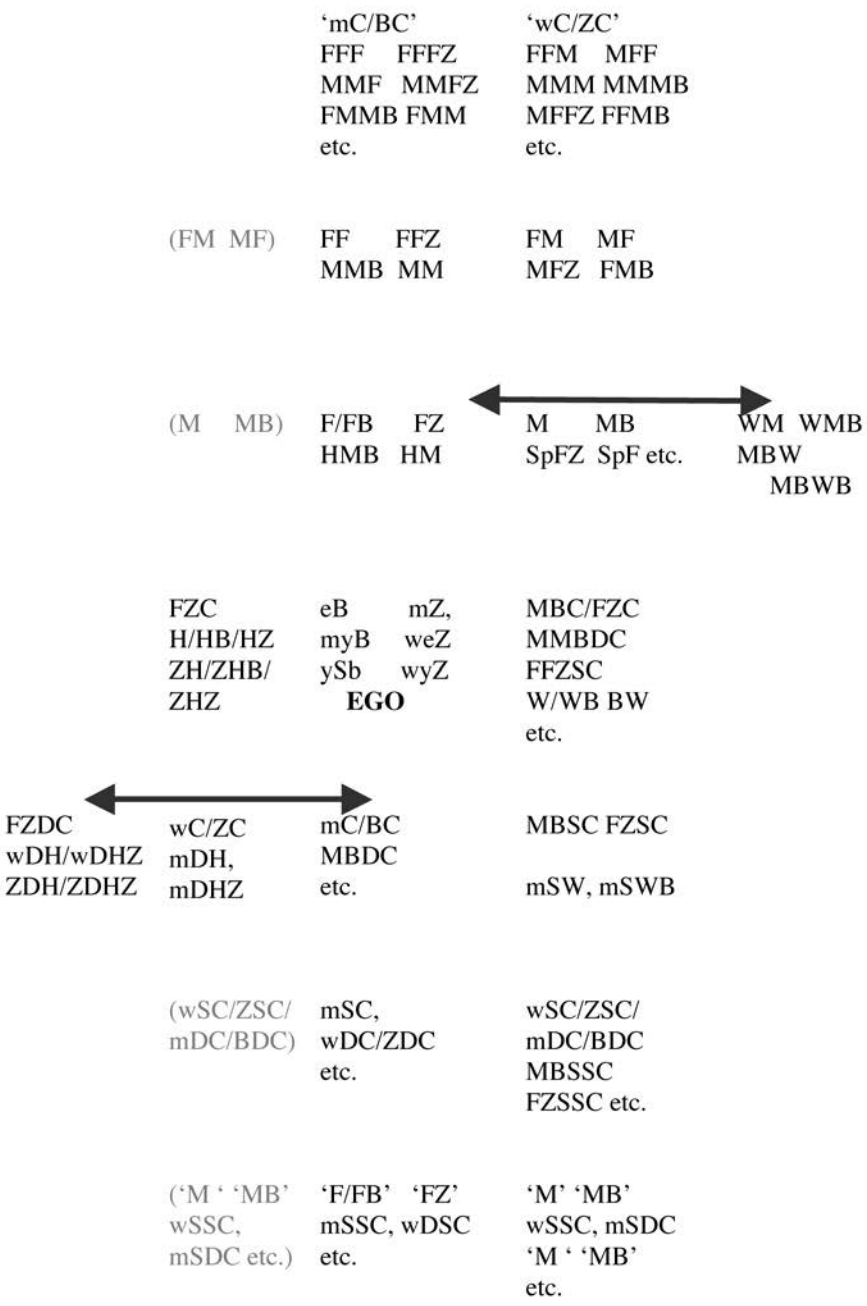


FIGURE 10.6. Second differentiation. WM is no longer identified as FZ, and WMB is no longer identified as F/FB:

WM ≠ FZ, WMB ≠ F/FB

Reciprocally, ♀DH/DHZ/ZDH/ZDHZ is differentiated from ♂C/BC:

♀DH/FZDC ≠ ♂C/BC

♀DH/DHZ is identified as FZDC and not MBDC, because the F/FZ of *waku* (♀C/ZC) is *dhuway*, FZC. The default terms in the patriline of the FZC are those of the FM/MF patriline (shown in gray). Both husband's and wife's father and father's sister remain classified as M and MB. It follows as corollaries of the first and second differentiations that WM, the wife of MB (WF), is his MBD and not FZD, hence:

WM = MMBD ≠ MFZD, WMB = MMBS ≠ MFZS

WMF = MMB (≠ FF/FFB), ♂DDH = ♀DC (≠ ♂SS)

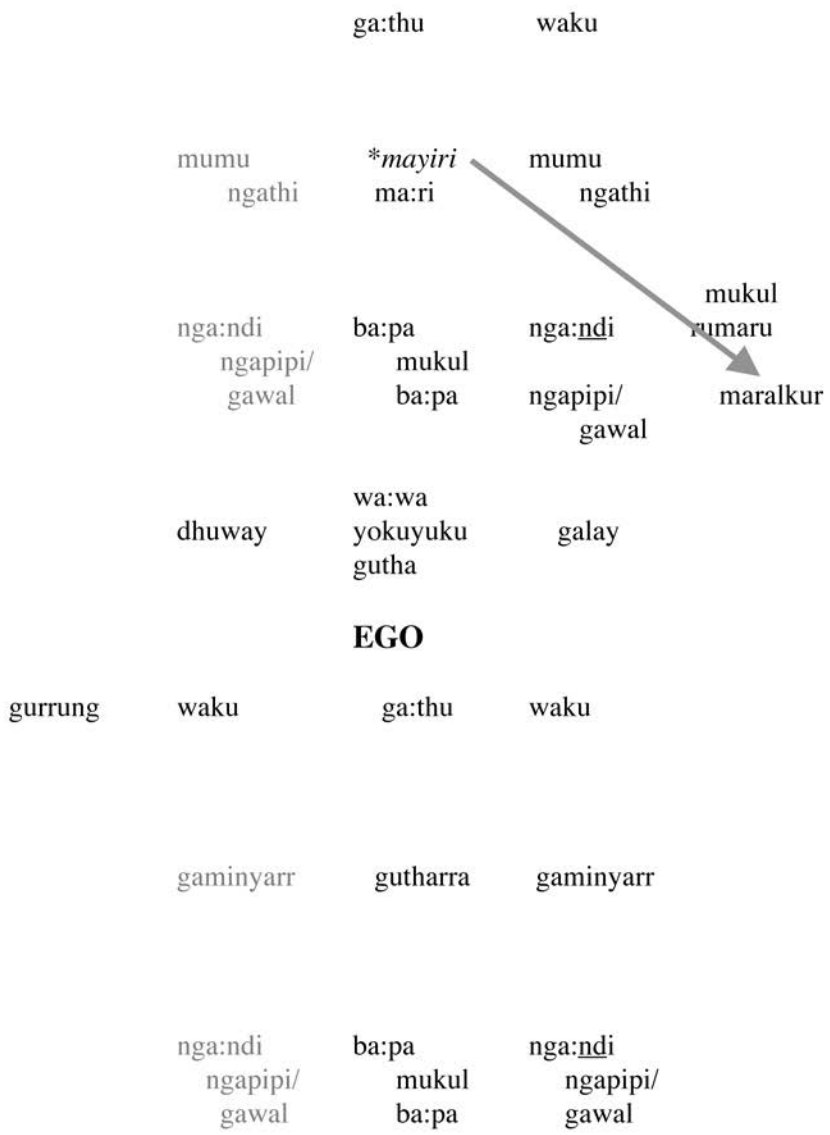


FIGURE 10.7. Second differentiation: changes to the terminology. In the WM term, *mukul* is posited as deriving from *mukur* (see first differentiation above), and *rumaru* is posited as an old PNy avoidance relation; *gurrung* (♀DH/♀DHZ) may be a loan from a non-PNy term (e.g., *Burarra gorrng*). The WMB term *maralkur* may derive from *mayiri (modern form *ma:ri*), and *walkur*. Default terms in the patriline of FZC are shown in gray.

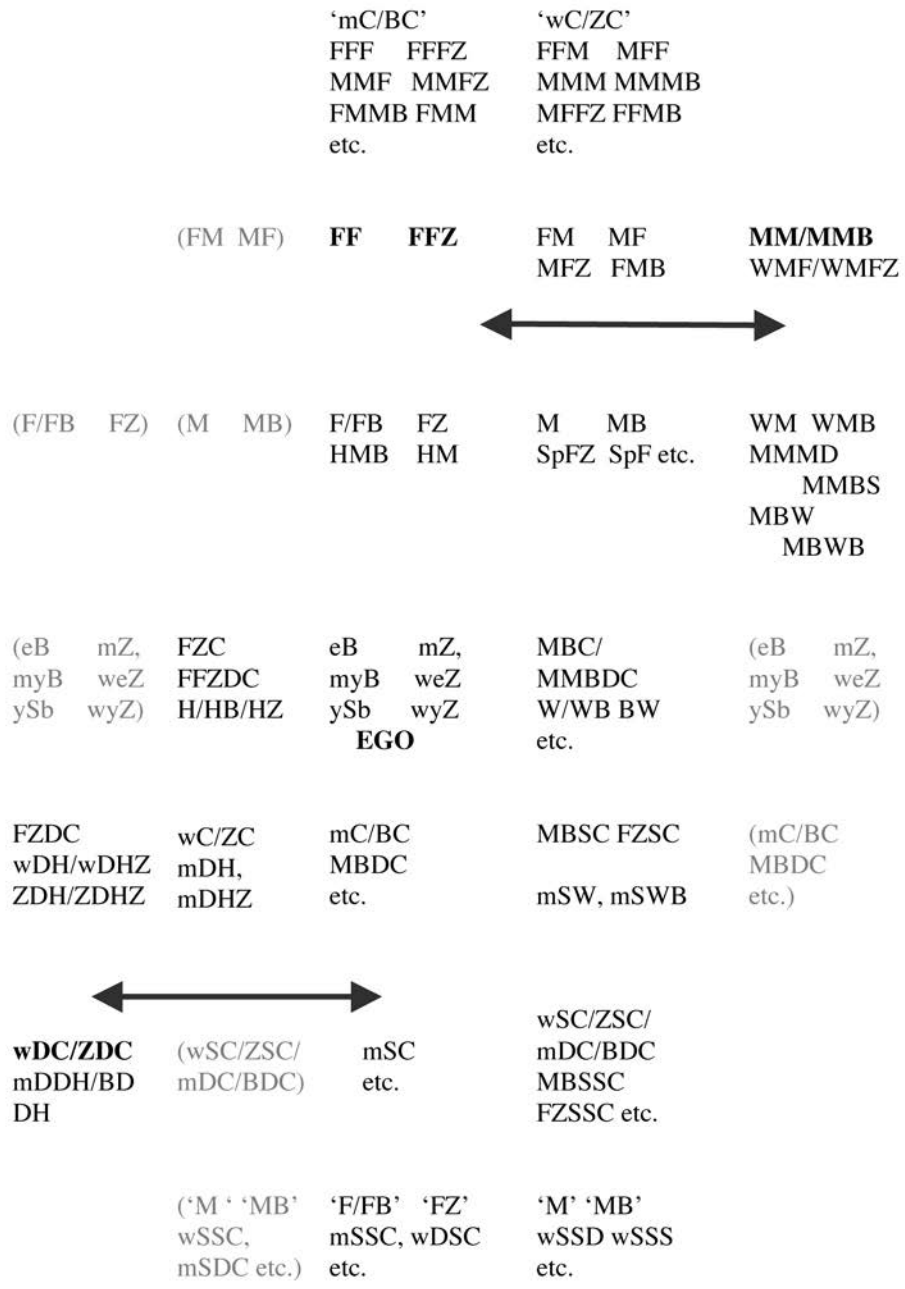


FIGURE 10.8. Third differentiation. MM/MMB (WMF/WMFZ) are differentiated from FF/FFZ:
WMF = MMB, WMFZ = MM (ma:ri) ≠ FF/FFZ (mari'mu) and reciprocally:
♂DDH/BDDH = ♀DC/ZDC (gutharra) ≠ ♂SC (marratja).
As a corollary, WM and WMB are identified as MMBD and MMBS.
The default terms for the F/FB, FZ, FF/FFB and FFZ of FZDC, and S, D, SS and SD of WMB (MMBS) are shown in gray. FFZDC has become equated with 'FZC' and not 'MBC.'

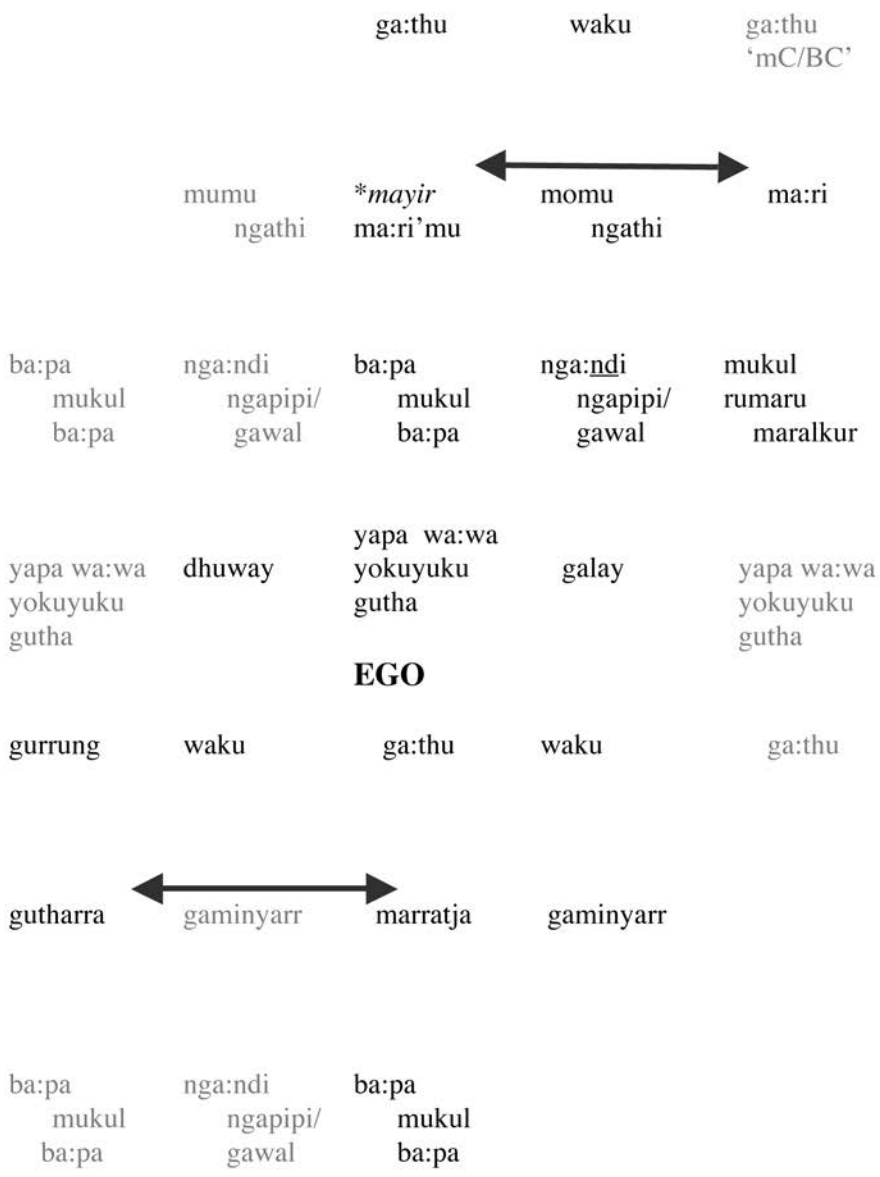


FIGURE 10.9. Third differentiation: changes to the terminology. *Mari'mu* (FF/FFB/FFZ) is distinguished from *ma:ri* (MM/MMB), both deriving from *mayiri; *marratja* (♂SC/BSC) is distinguished from *gutharra* (♀DC/ZDC), the former perhaps coined from *marra*, 'hair.' Default categories in the patrilines of these additional categories are added in gray type.

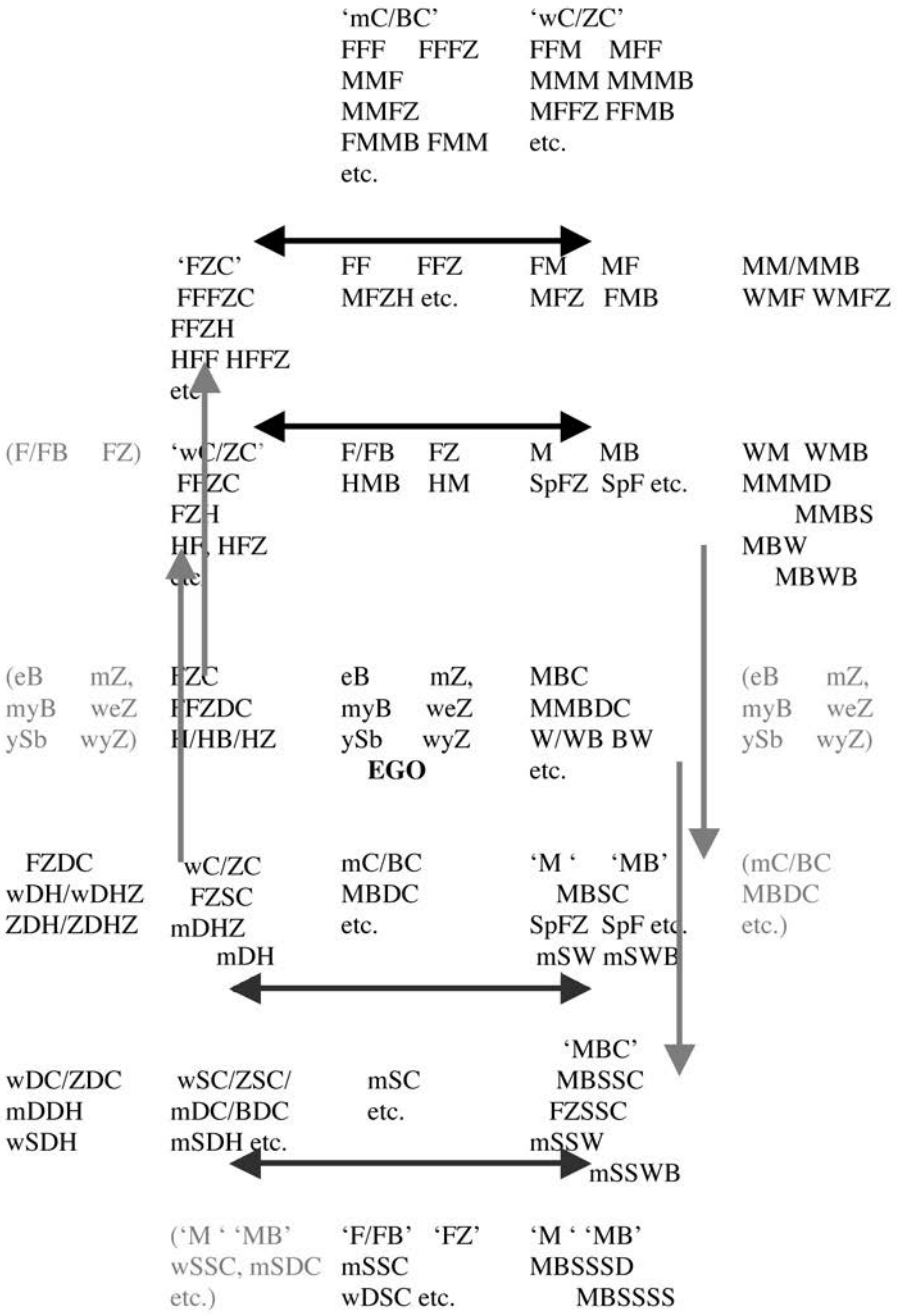


FIGURE 10.10. Fourth differentiation: alternate generation agnates extension. M, MB, MBC terms extended to alternate generations agnates descending: MBSC ('M,' 'MB') differentiated from ♀C/ZC; and MBSSC ('MBC') from ♂SC:

MBSD ⇒ M, MBSS ⇒ MB ≠ ♀C/ZC

MBSSC ⇒ MBC ≠ ♀SC/ZSC/♂DC/BDC

Reciprocally: ♀C and FZC terms are extended two generations up to designate FFZC/FFZH/HF/HFZ and FFFZC/FFZH/HFF, etc., respectively, so that:

FFFZC ⇒ FZC ≠ FM and MF

FFZC ⇒ ♀C/ZC ≠ M and MB

The vertical arrows indicate the AGA extensiions; the solid horizontal arrows indicate differentiations.

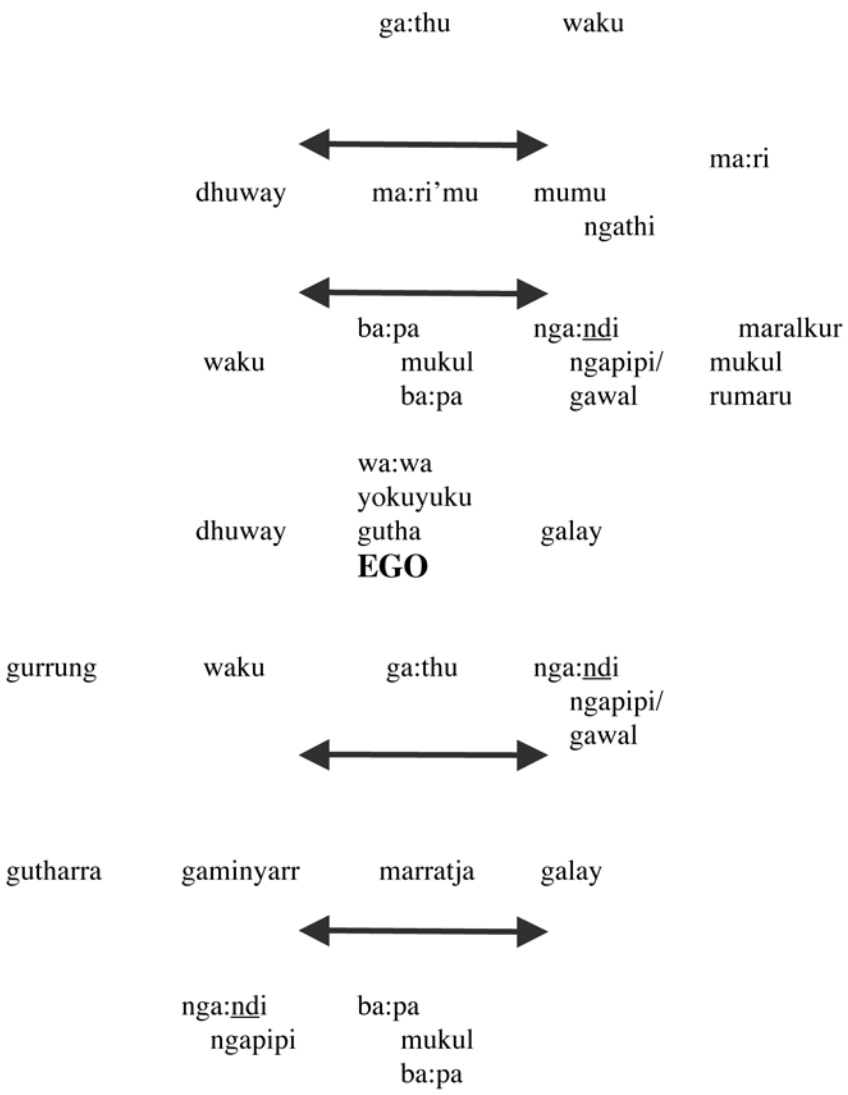


FIGURE 10.11. Fourth differentiation: changes to the terminology. FFFZC/FFZH (etc.) (*dhuway*) is differentiated from FM/MFZ/MF/FMB (*mumu* and *ngathi*), FFZC/FZH, etc. (*waku*) from M and MB (*ngandi* and *ngapipi/gawal*); MBSS and MBSD (*ngandi* and *ngapipi/gawal*) are differentiated from ♀C/ZC (*waku*), and MBSSC (*galay*) from ♂DC/♀SC (*gaminyarr*).

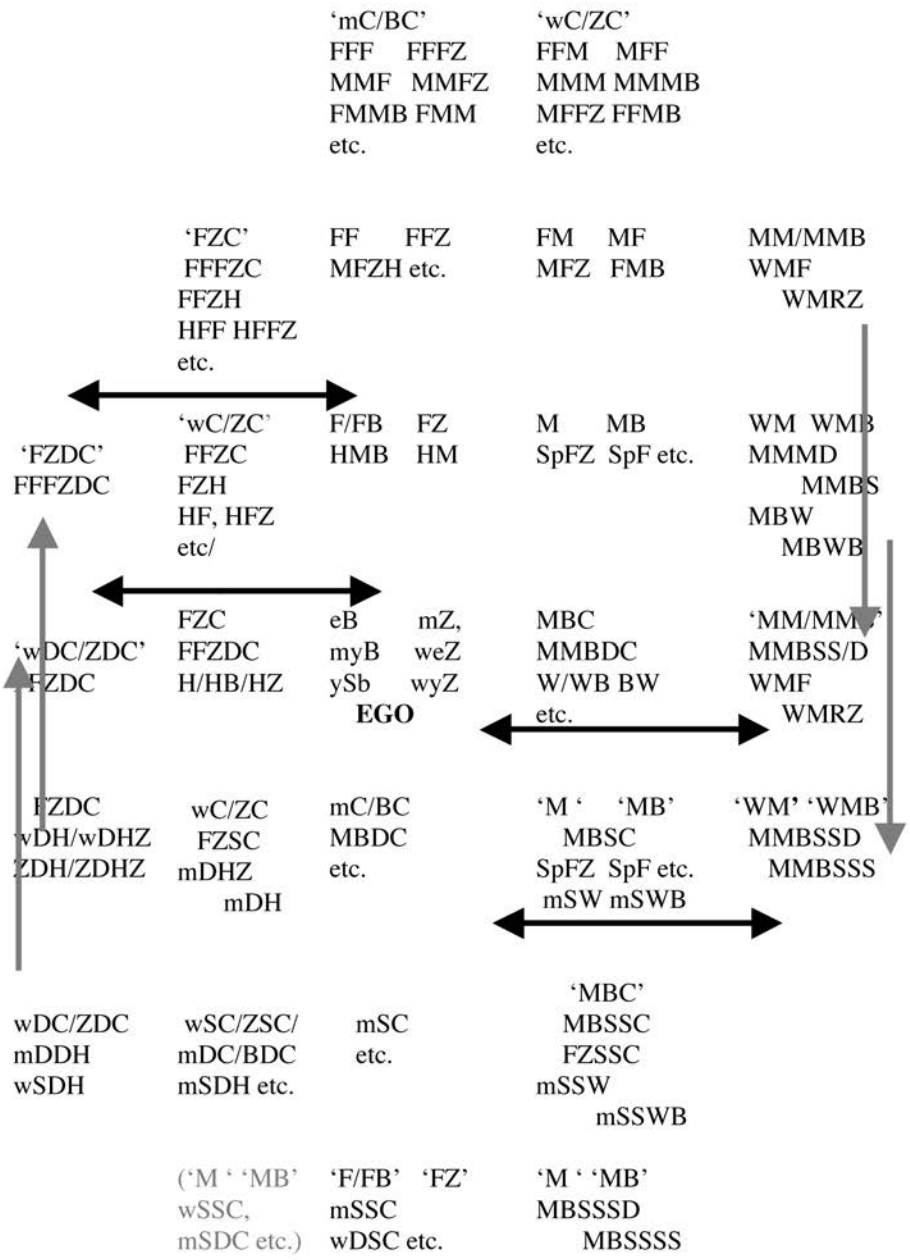


FIGURE 10.12. Fifth differentiation. MM/MMB, MMBD and MMBS terms are extended to alternate generations agnates descending:

MM/MMB ⇒ MMBSS/D ≠ eB, Z, yB, etc.

Reciprocally, the ♀DC/ZDC term is extended to FFZDC, and FZDC extended to FFFZDC:

♀DC/ZDC ⇒ FZDC ≠ eB, Z, yB, etc.

FZDC ⇒ FFZDC ≠ F/FB, FZ

MMBSS and MMBSD are differentiated from siblings, and MMBSSS and MMBSSD are distinguished from ♂C/BC; FFZDC is differentiated from siblings, and FFFZDC from F/FB and FZ.

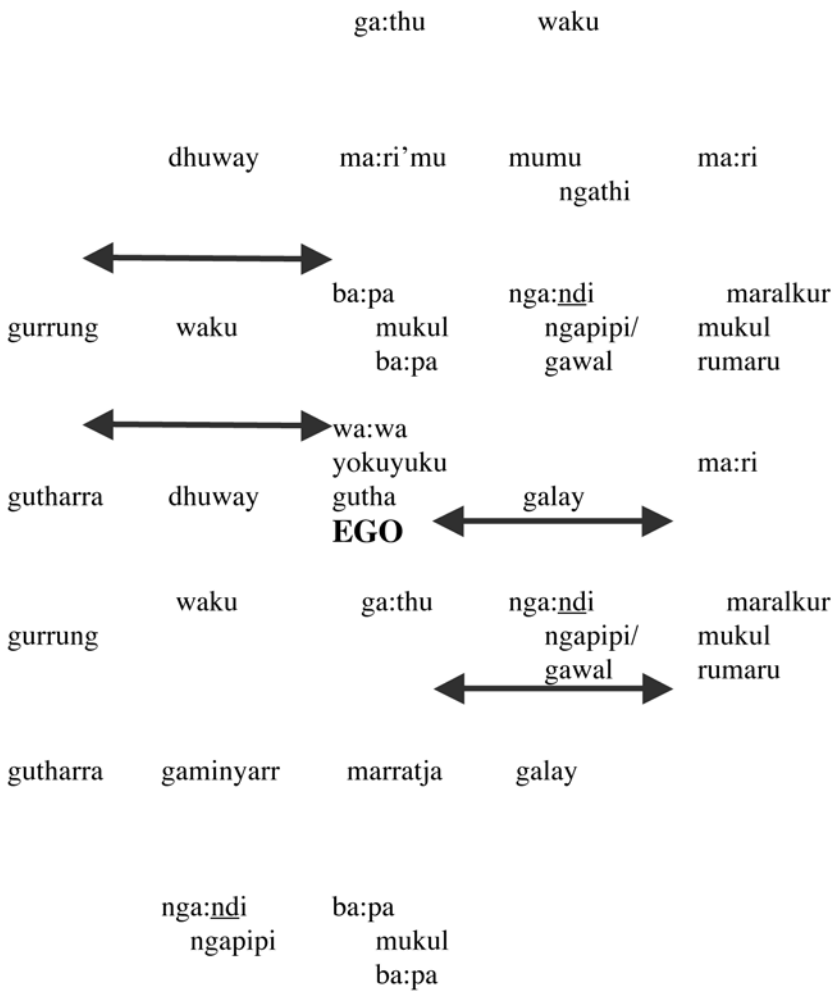


FIGURE 10.13. Fifth differentiation: changes to the terminology.
MMBSC is *ma:ri* and not categories of sibling;
MMBSSS is *maralkur* and not *ga:thu* (♂C/BC);
FFZDC is *gutharra* and not categories of sibling;
FFFZDC is *gurrung* and not F/FB (*ba:pa*) or FZ (*mukul ba:pa*).

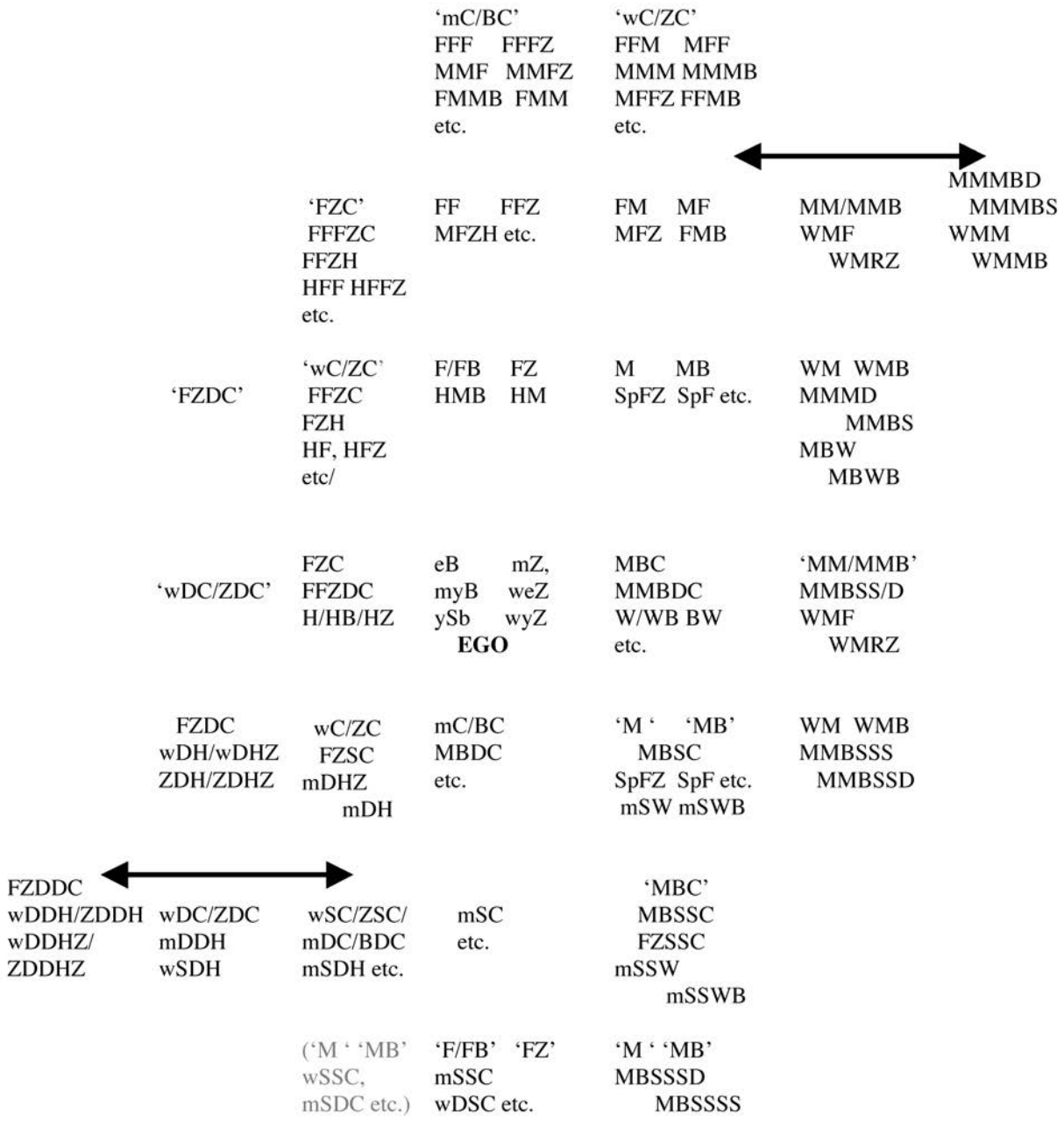


FIGURE 10.14. Sixth differentiation. The mother and mother's brother of WM and WMB are differentiated from FM/MFZ and MF/FMB:

WMM ≠ FM/MFZ, WMMB ≠ MF/FMB

Reciprocally:

FZDDC ≠ wSC/ZDC

The W of MMB becomes 'WMM' (MMMBD), and H of ♀DC becomes FZDDS.

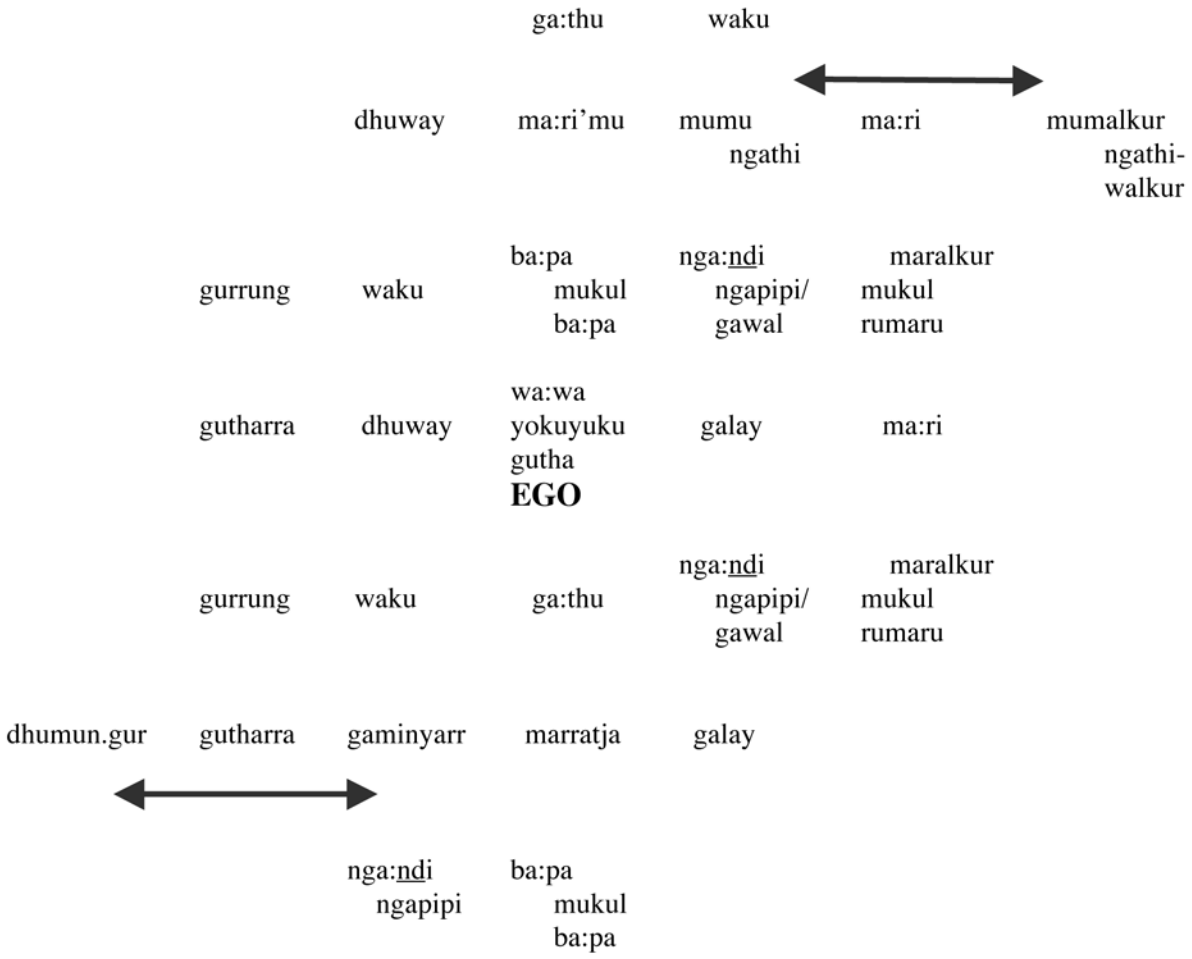


FIGURE 10.15. Sixth differentiation: changes to the terminology. MMMBD (*mumalkur*) and MMMBS (*ngathiwalkur*) distinguished from FM/MFZ (*momu*) and MF/FMB (*ngathi*); FZDDC (*dhumun.gur*) distinguished from ZDC (*gaminyarr*).

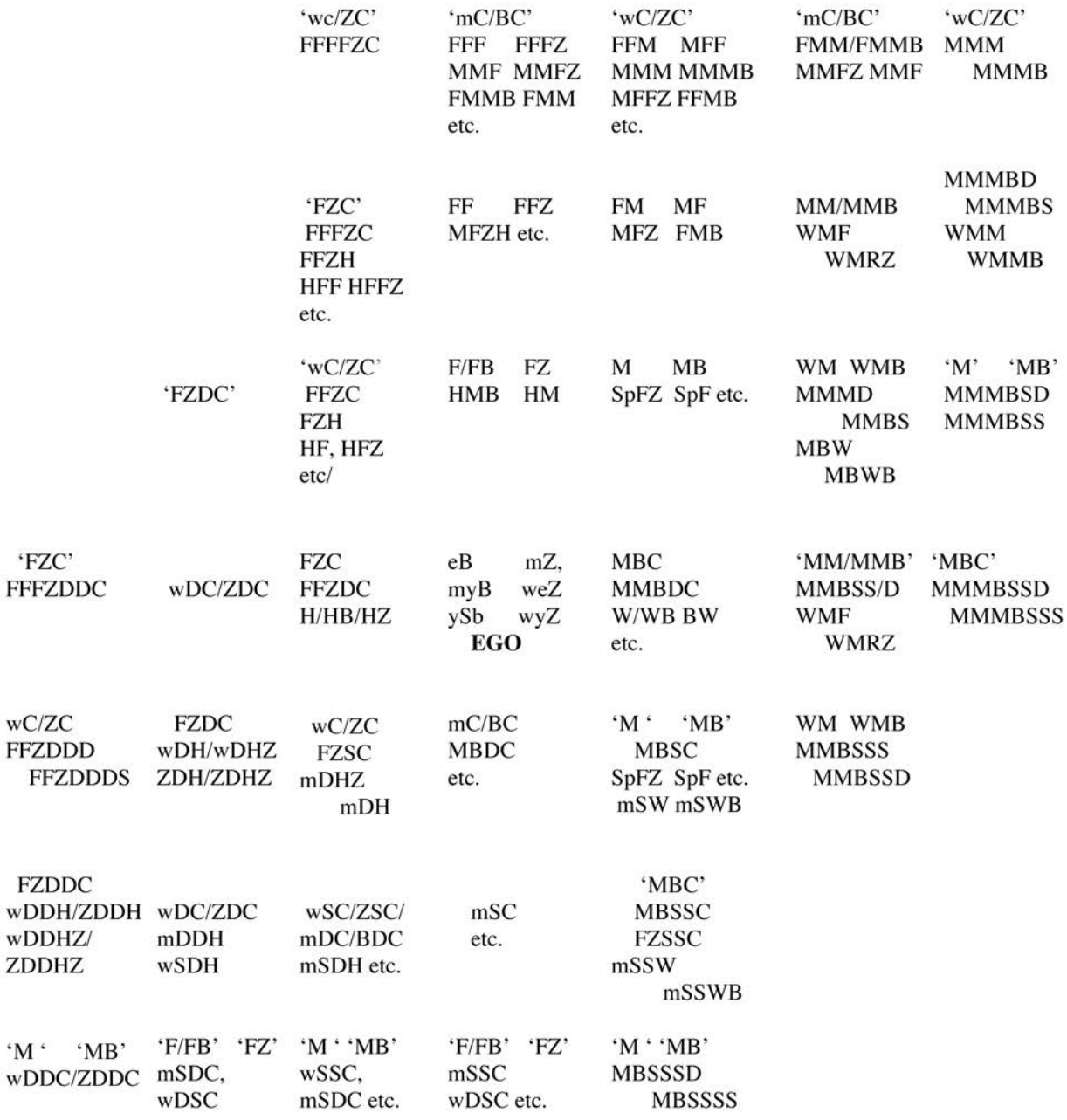


FIGURE 10.16. Specification of terms at the periphery. Terms for FMM/FMMB (MMF and MMFZ), MMM/MMMB, ♀DDC/ZDDC, ♂SDC and ♀DSC are specified, reproducing the Kariera-type terms and instantiating AGA and AGU extensions.

FIGURE 10.17. Changes to the Yolngu terminology. Specification of terms in the PPP and CCC generations reproduce the Kariera-type forms.

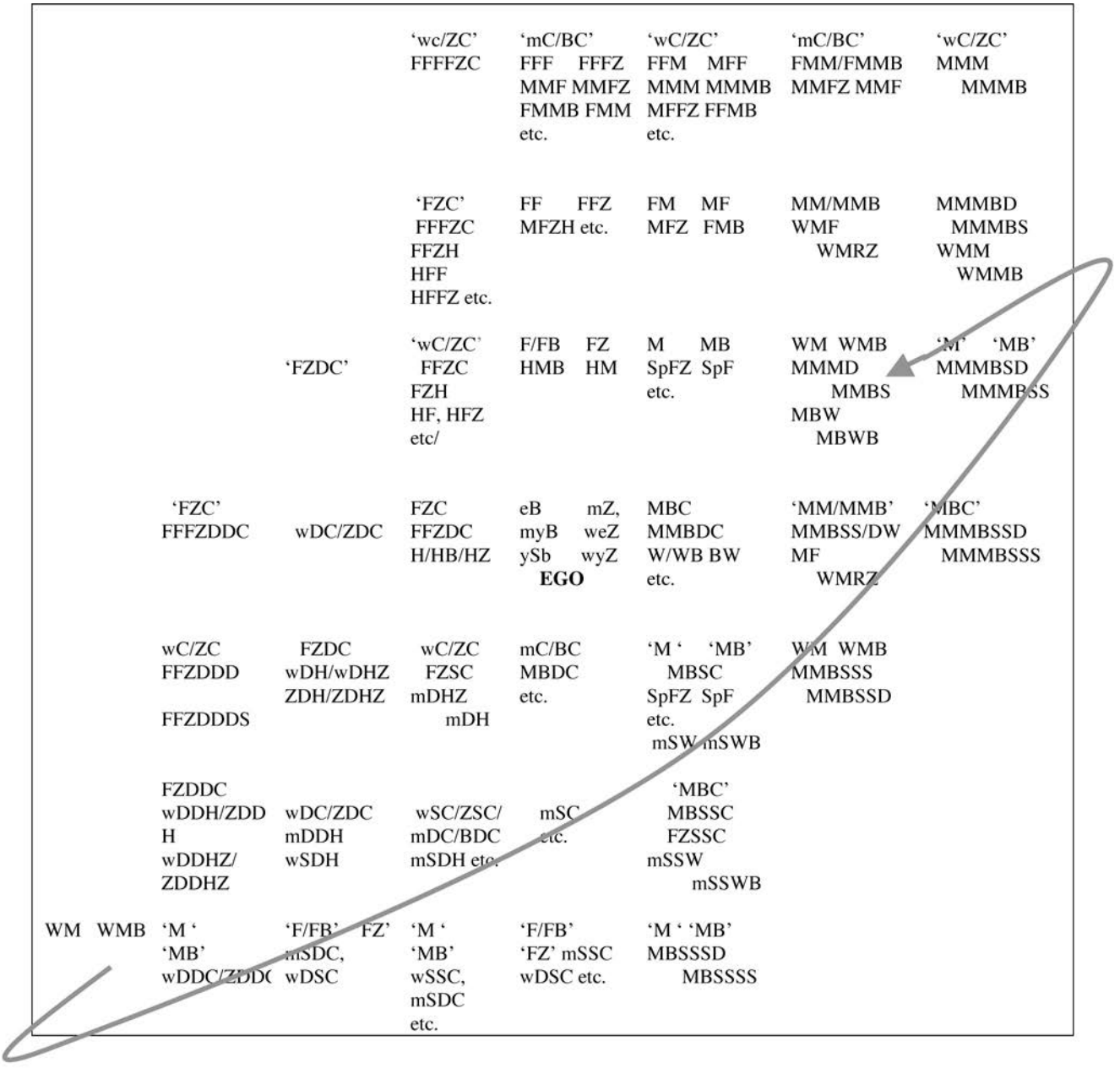


FIGURE 10.18. Closing the circle: the specification of FZDDDD and FZDDDS. FZDDDD and FZDDDS are specified as 'WM' and 'WMB,' so equating FZDDC with MMMBD (WMM) and MMMBS (WMMB). This specificaton enables the exchange of sisters' daughters' daughters by male ego and his MMMBS (*ngathiwalkur*).

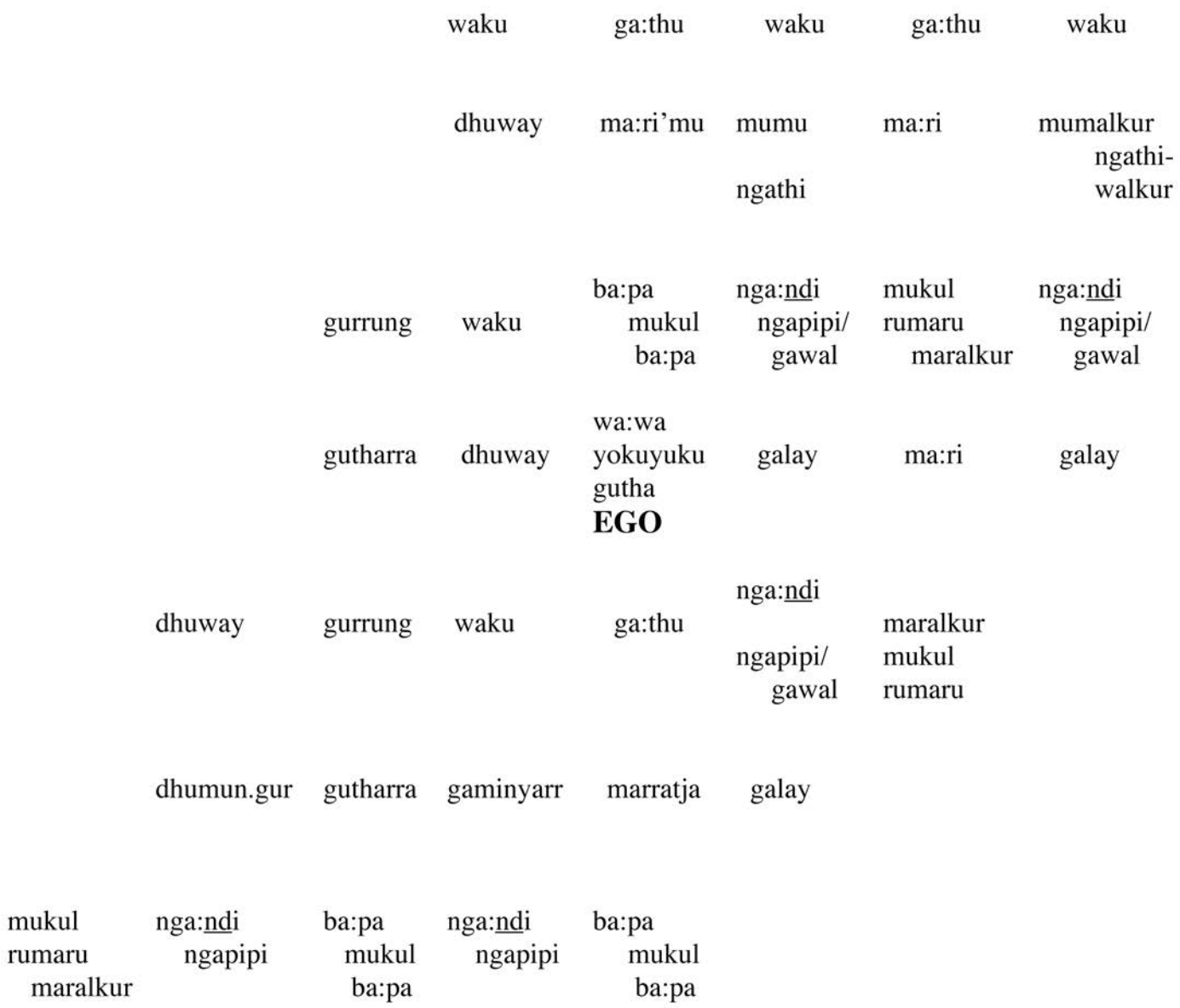


FIGURE 10.19. Changes to the Yolngu terminology. The D and S of FZDDD are specified as *mukul rumaru* (WM) and *maralkur* (WMB).

11

Proto–Central Amerind *Pa

"Father's Sister" = "Mother-in-Law"

Per Hage

The historical reconstruction of kinship systems often depends on the reconstruction of a few key terms or even a single key term. The key term may be semantically fragmented, with different components of meaning retained in different languages. For example, Friedrich's (1966) reconstruction of the Proto-Indo-European (PIE) kinship system as "Omaha" in type depends on the "keystone term" *awyos. In some PIE stocks, reflexes of *awyos mean MS (e.g., Lycian *xuga*); in other stocks the reflexes mean MB (e.g., Lithuanian *avynas*), and in still other stocks the reflexes mean both MF and MB (e.g., Old English *e:am*). In Latin *avus* means PF (usually MF), while *avunculus* means "little grandfather" (MB). Friedrich concluded from this pattern that PIE 2 *awyos meant "MB, MF, a set of older men in the mother's patrigroup," a term diagnostic of an Omaha Type III kinship system (Lounsbury 1964). My purpose is to suggest that the Proto–Central Amerind kinship system can be reconstructed as Dravidian in type on the basis of a key term, *pa, meaning FZ, MBW, EM. My reconstruction accounts for a common semantic shift in the breakdown of Dravidian systems, and, together with other kin term reconstructions, it identifies ancient Mesoamerica as a region of Dravidian-type kinship systems.

Dravidian Kinship Systems

In a Dravidian (or prescriptive) system of bilateral cross-cousin marriage, two exogamous groups (lineages, clans, houses) exchange sisters (equivalently brothers or siblings) in successive generations. A Dravidian system has two types of kin term equations: classificatory equations, which merge parallel relations, and prescriptive equations, which merge affinal and consanguineal relations. These equations include:

In the +1 level:
MB = FZH = EF ≠ F = FB = MZH
FZ = MBW = EM ≠ M = MZ = FBW

In the 0 (ego's level):
MBS = FZS = H = HB = ZH + B = FBS = MZS
MBD = FZD = W = WZ = BW ≠ Z = FBD = MZD
(♂)Z = (♂) SWM = (♂) DHM
(♀)B = (♀) SWF = (♀) DHF

In the –1 level:
osGD = SW ≠ ssGD = D
osGS = DH ≠ ssGS = G

In the breakdown of Dravidian systems, prescriptive equations are lost, and classificatory equations are replaced by terms that merge parallel and cross relations (e.g., F = FB = MB), or by terms that distinguish parallel relations (e.g., F ≠ FB ≠ MB) (Allen 1998, Kryukov 1998). Many Central Amerind kinship terminologies have lost some or all classificatory and prescriptive equations, as can be seen in Shimkin's (1941) comparative study of Uto-Aztecan terminologies and Romney's (1967) survey of Mesoamerican terminologies.

Central Amerind Kinship Systems

In *Language in the Americas*, Greenberg (1987a) classifies all American Indian languages into three macrofamilies: Eskimo-Aleut, Na Dene, and Amerind. Amerind has three branches, one of which is Central Amerind (CA). CA consists of three families: Uto-Aztecan (UA), Tanoan, and Oto-Manguean (OM). Greenberg's support for CA is based on Whorf and Trayer's (1937) grouping of UA and

TABLE 11.1. Classification (abbreviated) of Central Amerind

A	TANOAN	Kiowa, Towa, Tewa, Taos, Sandia
B	UTO-AZTECAN	Numic: Northern Paiute, Mono, Shoshone, Comanche, Kawaiisu, Southern Paiute Tübatulabal: Tübatulabal Takic: Serrano, Luiseño, Cahuilla, Cupeño Hopi: Hopi Pimic: Pima Bajo, Southern Tepehuan Taracahitic: Tarahumara, Guarijío Corachol: Cora, Huichol Aztecan: Pipil, Nahuatl (= Aztec)
C	OTO-MANGUEAN	Amuzgo: Amuzgo Otomian: Chichimeca, Pame, Mazahua, Otomi, Matlatzinca, Ocuiltec Mixtean: Trique, Mixtec, Cuicatec Popolocan: Mazatec, Ixcatec, Chocho, Popoloc Chinantecan: Chinantec Zapotecan: Chatino, Zapotec Manguean: Mangue

Source: Ruhlen 1987.

Tanoan into a single family, Miller's (1967) UA cognate sets, and Rensch's (1976) comparative phonology of the OM languages. An abbreviated version of Ruhlen's (1987) classification of the CA languages is shown in Table 11.1.

Greenberg's Amerind classification is controversial, but in this chapter I will follow Ruhlen and treat CA as a valid subgroup.[1] The distribution of CA languages is shown in Map 11.1.

The only Central Amerind societies known to have practiced cross-cousin marriage are a handful of Numic societies in the Great Basin (Steward 1938). In Elko Shoshone kinship terminology (Steward 1938, 284–306), prescriptive equations are found in all three medial (+1, 0, −1) generations (Table 11.2). In the +1 generation cross uncles and aunts are equated with parents-in-law. In ego's generation opposite-sex siblings are equated with children's parents-in-law; for a male ego, male cross cousins are equated with male siblings-in-law and children's spouses' fathers; for a female ego, female siblings in-law are equated with children's spouses' mothers. In the –1 generation a man's sister's children are equated with his children's spouses, and a woman's brother's son is equated with her daughter's husband.

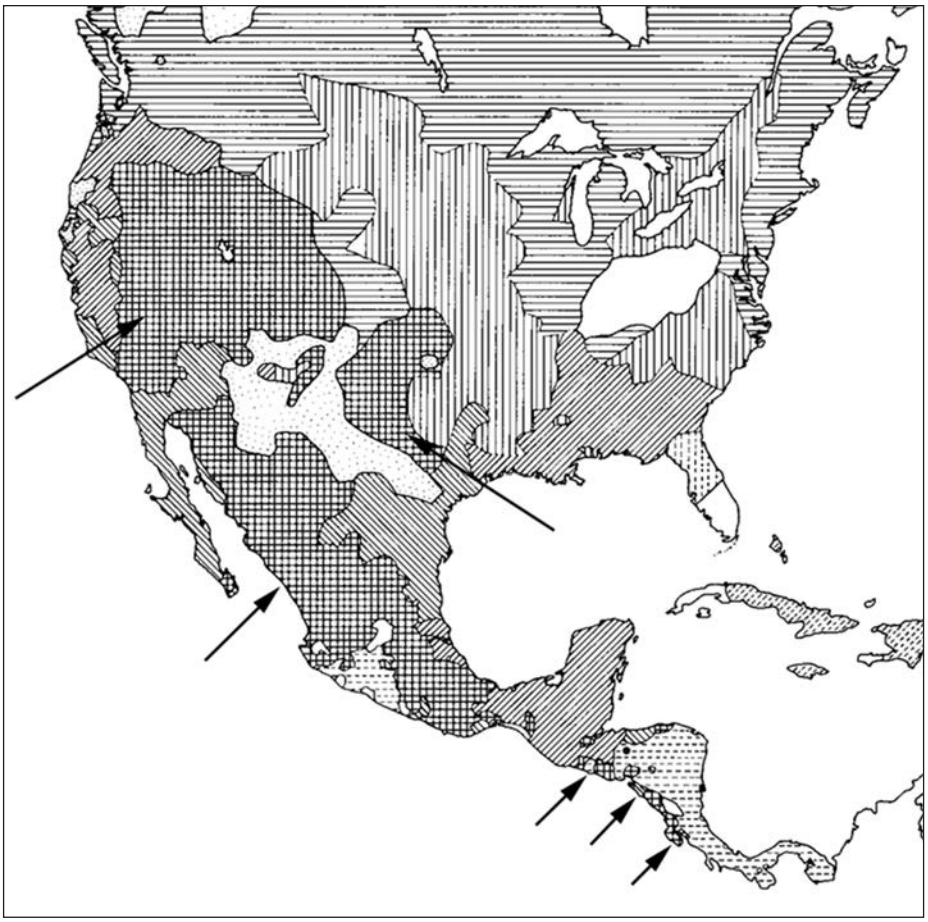
The key term in the Numic systems is *baha*: FZ, MBW, EM. In his monograph on UA cognates Miller (1967) gives a number of kin term reconstructions, including a term *pa, meaning "aunt," or more specifically, "paternal aunt" (FZ), as implied by the reflexes of *pa and by a separate set of cognate terms meaning "maternal and paternal aunt."[2] Using the orthography in K. C. Hill's revised and expanded list of Miller's UA cognate sets (Miller [1988] 2003), the terms are: Mono *pawwa*, Southern Paiute *pa(h_a*, Luiseno *pá-may* (may dim. suff.) FZ; Cahuila *né-pa* 'my FZ'; Southern Tepehuan *?in-pásul* eFZ, eMZ (Miller 1967, 67).

TABLE 11.2. Prescriptive kin terms in Elko Shoshone

baha:	FZ, MBW, EM; (♀) BS, (♀) DH
ada:	MB, FZH, EF
dete:	(♂) MBS, (♂) FZS, WB, (♂) ZH, (♂) SWF, (♂) DHF
bahambia:	HZ, (♀) BW, (♀) SWM, (♀) DHM
bavi, dami:	(♀) B, (♀) SWF, (♀) DHF; (♂) Z, (♂) SWM, (♂) DHM
ada'a, ada:	(♂) ZS, (♂) DH, (♂) ZD, (♂) SW

Source: Steward 1938.

Ethnographic evidence (Gifford 1917, 1922; Kroeber 1917; Steward 1938; Hoebel 1939) reveals that reflexes of



MAP 11.1. The Central Amerind Family (adapted from Greenberg 1987a).

PUA *pa mean FZ, MBW in Southern Paiute, Luiseno, and Cahuila, and also in Tubatulabal (*paiwa*) and Comanche (*baha*). In Mono *pawwa* is FZ, MB, HM, and in Elko and other Shoshone dialects, reflexes of *pa mean FZ, MBW, EM.

PUA *pa meaning FZ, MBW, EM occurs in terminologies belonging to two of the three branches of Numic: Western (e.g., Mono Bannock) and Central (Shoshone), and *pa meaning FZ, MBW occurs in three (neighboring) branches of UA: Numic, Tubatulabal (an isolate) and Takic, implying that the Proto-Numic and possibly the Proto-Uto-Aztecan kinship system was Dravidian in type. Evidence for a Dravidian system in Central Amerind comes from Oto-Manguean.

According to Greenberg, Rensch's (1976) Oto-Manguean (OM) *kw corresponds to UA and Kiowa-Tamoan p.[3] As an example of this correspondence, Greenberg cites a number of Rensch's Proto-Oto-Manguean (POM) lexical reconstructions, one of which is *kwah(n), meaning "grandmother," "aunt," "mother-in-law": "grandmother" *nkwa'n in Proto-Mixtecan, "aunt" kwah(n) in Proto-Popolucan, and "woman," "mother-in-law" *ka in Proto-Otopamean. Rensch's reconstructions are intended only as phonological illustrations, but only "paternal aunt" would be consistent with "mother-in-law" (assuming that marriage was not prescribed with the mother's sister's daughter, a cross-culturally nonexistent practice). It is not obvious how reflexes of *kw(H)(n) came to mean "grandmother," although the same thing happened in the devolution of the Proto-Algonquian system, which was based on a rule of cross-cousin marriage (Hockett 1964). The semantic fragmentation of POM *kw(H)(n) into FZ and EM is similar to the fragmentation of PIE *awyos into MB and MF, or, to use a marriage example, the fragmentation of Proto-Malayo-Polynesian *ma(n)tuqa into MB and WF (Blust 19980).

*Pa meaning FZ, EM occurs in two of the three branches of Central Amerind, implying that the Proto–Central Amerind kinship system was Dravidian in type. The available evidence for the kin term equation

MB = FZH = EF is consistent with a Dravidian hypothesis. Miller (1967, 66–67) gives three UA cognate sets for "uncle," one of which has a starred (reconstructed) form:

> uncle *pu: Mono *pu?* (maternal); Serrano *puyu|'* 'cousin' (probably either paternal or parallel); 'friend.' uncle: Serrano *-ta:|r* (sg.) *taham* (pl.), Papago *tátal*, Northern Tepehuan *tatáli* 'maternal, younger'; Hopi *-taha* 'maternal'; Southern Tepehuan *tata:|'* 'my elder uncle'; Varahio *tá?atai* 'paternal'; Yaqui *taáta* 'paternal'.
>
> The third set is:
>
> uncle *kamu. Cahuilla –kum 'my paternal uncle'; Serrano *-ku:mu|?* (sg.), *kumua* (pl.) 'older, maternal'; cf. *–ku?* 'older, paternal uncle'; Northern Tepehuan *kumúli* 'older, maternal'; Tarahumara *kumúci* KV 'older'; Yaqui *kumui* 'paternal.' In Serrano *ta:|r*, *-ham* mean FZH as well as MB, as do cognate terms in Cahuilla (*tas*) and Luiseno *tá:?as* (Gifford 1922).

The category MB, FZH, EF is found in Central and Northern Numic terminologies; for example, in Elko Shoshone, as already shown, and in Northern Paiute (Mono Bannock) *ats* MB, FZH *atsi* (*tsi*, dim.), *yahi* HF. Unfortunately, Rensch does not offer any terms for "uncle" in his Pom reconstructions.

Circumstantial evidence in favor of a Dravidian hypothesis of Central Amerind kinship includes the presence of alternate generation equations in UA terminologies. Many kinship theorists—including Granet (1939), Hocart (1928), Lévi-Strauss (1969), Trautmann (1981), and Allen (1989)—have noted the association between grandparent-grandchild kin term equations and cross-cousin marriage. In the Kariera version of a Dravidian system, defined by four marriage classes, the equations are:

FF = (♂) SC
MM = (♀) DC
FM = (♀) SC
MF = (♂) DC

The parallel grandparents and grandchildren fall into ego's class, while the cross grandparents and grandchildren fall into ego's cross-cousins class. All four of these equations are universal in Numic kinship systems where there is direct evidence of cross-cousin marriage (Steward 1938), and they are present in other Uto-Aztecan systems as well: Tubatulabal, Pima, and Tarahumara (Shimkin 1941).

Miller (1967, 67) reconstructs four PUA "grandparent" terms:

*kwa: grandfather
*to: grandfather
*ka: grandmother
*su: grandmother

Most of the reflexes of these terms are self-reciprocal with grandchild terms; e.g., Mono *togo'* (*toqo'o*), *toqoh* "maternal grandfather, daughter's child (of a man)." The reflexes show some variation due in part to the loss of one or more terms. Our hypothesis is that the PUA +2/−2 terms were Kariera in type. Unless one appeals to archetypal properties of the human mind (Needham 1983), there is no satisfactory explanation of alternate generation terms other than their association with cross-cousin marriage, specifically with marriage classes (Allen 1989).

Discussion

The foregoing analysis raises theoretical and ethnological questions concerning (1) the probative value of individual kin term equations, (2) semantic shifts in the devolution of Dravidian terminologies, and (3) ancient Mesoamerica as a kinship region.

1. Kin term equations. Dravidian kinship terminologies have often been conflated with Iroquois terminologies. Both have classificatory equations with separate terms for cross aunts/uncles, cross cousins, and cross nephews/nieces, but Iroquois terminologies lack prescriptive equations and are not associated with cross-cousin marriage (Godelier et al. 1998). Trautmann and Barnes (1998, 34) have cautioned that the equations FZ = MBW and MB = FZH "have all too often been taken as evidence of cross-cousin marriage and a Dravidian pattern when they would also be compatible with the absence of cross-cousin marriage and an Iroquois pattern." This stricture might apply to PUA terminology—although the motivation for the equation FZ = MBW is not obvious (it is not found in Seneca, for example [Morgan (1871) 1997])—but not to PCA terminology, in which *pa means EM as well as FZ (and MBW).

2. Semantic shifts. A Dravidian hypothesis of Central Amerind kinship would account for a common semantic shift in kin term application. In giving up the practice of cross-cousin marriage, the retention of the equation FZ = FBW would not present a problem since it only

merges cross aunts, but the retention of FZ = EM would merge two relatives who are no longer identical. The same holds for the equation MB = FZH = EF. One solution would be that of teknonymy: by adopting the child's point of view, the mother-in-law comes to be called "grandmother." This is apparently what happened in some Shoshone dialects: "In the region of the Great Salt Lake, Shoshoni designated some or all parents-in-law by modified grandparent terms which trace the relationship through the child" (Steward 1938, 290). For example, South Lauhi Shoshone who no longer practiced cross-cousin marriage retained the equation FZ = MBW but used *unduNgogo* "their MF" for WF, *uduNgago* "their MM" for WM, *unduNguno* for "their FF" for HF, and *uduhutsi* "their FM" for HM (Steward 1938, 290). Hockett (1964, 245) describes a similar practice in his reconstruction of cross-cousin marriage in the Proto–Central Algonquian kinship system: "The Fox use of *nemes(o.ma* ['grandfather'] for 'fa-in-law' is surely an innovation. A different fa-in-law term [which also meant 'cross uncle'] can be reconstructed for PCA." This innovation came about when a woman, adopting her child's point of view, began to call her father-in-law "their grandfather" instead of "my father-in-law," and similarly for the substitution of "their grandmother" for "my mother-in-law."

3. Mesoamerican kinship systems. The Proto-Uto-Aztecan kinship system that may have originated in Central America (Bellwood 1997, Hill 2001) and the Proto-Oto-Manguean system may be part of a larger Mesoamerican complex. Although Romney (1967) found no instances of cross-cousin marriage in his survey of Mesoamerican kinship systems, Boremause (1979) subsequently discovered an intact Dravidian system in Northern Lacandon, a remote Maya group living in the rainforest of southern Mexico. The Lacandon once inhabited a large area in Peten (Guatemala), Belize, and Chiapas. Eggan (1934) reconstructed a Dravidian system for "ancient Maya" society, and Hage (2003) reconstructed a Kariera system for Proto- and archaic Maya society. Isomorphic to the quadripartite Maya kinship system was an elaborate cosmological scheme in which the four cardinal directions were associated with colors, gods, and celestial and metaphysical concepts similar to the cosmology of the Aztecs (Soustelle 1941). In a comparative study of Mixe-Zoquen (Northern Amerind) Sierra Popoluca kinship systems, Foster (1949) emphasized that aboriginal marriage practices in the region and, by implication, in much of Central America, had undergone radical change as a result of the Catholic prohibition on marriage with relatives. On the basis of kin terms collected in 1672 by Gonzales (1898), Foster reconstructed a rule of cross-cousin marriage in precontact Zoque society. Foster's reconstruction rests on a single pair of self-reciprocal terms: sep (♀) MBW, HM; sep han (♀) SW, HZD.

Concl usion

OCS *pa > PUA *pa, POM *kw(H)(n) can be reconstructed to mean FZ, MBW, EM, an equation which is diagnostic of a Dravidian system of cross-cousin marriage. *Pa is a short kin term, but one whose reflexes are widely distributed and highly consistent in meaning. The fragmentation of the denotations of *pa is consistent with a general evolutionary trend away from Dravidian toward non-Dravidian kinship systems (Godelier et al. 1998, Allen 1998, Kryukov 1998). A Dravidian hypothesis for Central Amerind is consistent with the meaning of UA "uncle" terms. The hypothesis accounts for a semantic shift following the disappearance of cross-cousin marriage. Together with other kin term reconstructions, it identifies ancient Mesoamerica as a region of Dravidian-type kinship systems.

Notes

1. In support of Greenberg see Ruhlen 1987 and Taylor 1982, as well as Greenberg's introduction to *Language in the Americas* (1987a). For a stock-taking article on Greenberg, see Newman 1993.
2. In Miller's UA reconstructions, "as much of the root morpheme or stem is included as can be accounted for realistically. In many cases one or more proto phonemes at the end are left out of the starred form because of various phonological, morphophonemic, or grammatical problems that have yet to be solved" (Miller 1967, 6).
3. "In Oto-Mangue itself, p actually occurs in Zapotec, Chiapanec-Mangue, and Oto-Pame, and Longacre (1967, 133) notes that "*p could be reconstructed rather than *kw. Second, Rensch's *|s corresponds to Uto-Aztecan k and kw" (Greenberg 1987b, 124).

Part II

Kinship, Language, and Mind

12

What is Malay Kinship a ll a bout? Or, the New Kinship Studies and the Fabrication of Ethnographic Fantasy

Warren Shapiro

Lewis Henry Morgan, the generally acknowledged founder of kinship studies, referred to the Malay system of kin classification as "the most archaic yet discovered" (Morgan 1877, 402). I argue later that this is not an innocent historical conjecture. My main concern in the body of this chapter, however, is with a much more recent analysis of Malay kinship by Janet Carsten (1991a, 1991b, 1992, 1995a, 1995b, 1995c, 1997). This latter effort is widely held to be exemplary of what is sometimes called a "performative" approach to kinship (e.g., Bamford 2007, 57; Bretell 2001, 59; Galvin 2001, 117–18) and, perforce, of "the new kinship studies," an expression apparently coined by Carsten herself (2000, 3). I shall demonstrate that Carsten's analysis is not only wrong but, as well, revealing of certain biases in current scholarship that are antithetical to serious empirical inquiry. My main title is of course a play on that of an article which can reasonably be construed as foundational to those biases (Schneider 1972). My subtitle, by contrast, points to the urgent need to call into question—to "deconstruct," as one says these days—the grand claims of the new kinship studies.

Cars ten on Mal ay Egocentric Kinship

The key points in Carsten's analysis are that Malay kinship—or "relatedness," as she prefers to call it—is idiomized in terms of the sharing of blood, and that procreation is only one of the ways by which blood is construed to be shared. Others include nursing, whereby the milk ingested is held to be transformed into blood within the body, and consuming rice together, for the rice taken in is also said eventually to become blood in the metabolic process. Thus she concludes that, in "the cultural construction of kinship among Malays," "ideas surrounding co-eating and sharing are as fundamental . . . as are ideas about procreation" (1991b, 425). It is not entirely clear what "sharing" refers to here: nurturing, I shall guess, is included, as is sharing a rice meal. In any case, Carsten's assertion implies that these two latter actions generate as much consubstantiality as procreation does. But this is not at all the case. Carsten repeatedly asserts or implies that, in Malay theory, the strongest blood ties are those established through procreation. Here is one of her more explicit statements on the matter:

> Just as *relatedness is thought of in terms of a continuum—one is more or less distantly related* . . . we find a parallel in terms of substance. . . . Mothers and their offspring and full siblings are most closely related. . . . More distant than full siblings but still close enough for marriage to be incestuous are those, such as foster-siblings, who have drunk the same milk. [Others] brought up in one house who have shared meals in common could technically marry. In fact they are very unlikely to, because to do so would carry connotations of incest. (Carsten 1992, 38; emphasis added)[1]

All this being so, it is patently misleading, if key to Carsten's thesis, to argue that "[f]or these Malays kinship itself is a process of becoming" (Carsten 1992, 21), since this suggests that all modes of Malay kinship entail the same degree of consubstantiality, and that nurturance and/or "sharing" are somehow even more crucial to local conceptions than procreation is. And it is quite false to insist that "the process of transforming social ties of neighborhood into those of blood is central to Malay kinship" (Carsten 2004, 142). The only justification for this usage

is that "central" here is meant to have rhetorical effect. If taken literally—that is, to describe the way in which Malays structure a portion of their world—the only reasonable conclusion is that what is central to Malay kinship is procreation.

Related to this are Malay notions of siblingship, which, as Carsten rightly points out, are of great social and symbolic significance. But it is just not true that sibling/sibling is "a relation from which all others may be said to derive" (Carsten 1995c, 226), or that "siblingship is logically prior to…descent" (Carsten 1995b, 326)—that is, to filiation. Here again, I suspect, expressions that have unequivocal significance in semantic theory—in this instance derivation and logical priority—are used in more cavalier fashion. In any case, Carsten (1997, 85–87) reports a set of "birth-order" terms that distinguish siblings: these terms, as we shall see, figure significantly in Malay kin classification. Here it needs to be noted that such terms express nothing if not procreative notions, which perforce in Malaysia, as everywhere else, derive siblingship from filiation; that is, from parent/child relationships.

For this reason, the statement that "[t]he closest of kin are siblings, and mothers and their children" (Carsten 1997, 4) is unacceptable. Although Carsten tells us that Malay conception ideology allows for a number of possibilities, as is typical of such ideologies (Loizos and Heady 1999), at least one of them posits that "[c]hildren are created from the seed…of their father and the blood…of their mother" (Carsten 1997, 113). This being so, it would seem unfaithful to native theory not to include the father/child dyad as among "the closest of kin," but this is just what Carsten does. Indeed, by giving, as we have seen, undue emphasis to breast feeding and meal sharing in generating consubstantiality—rice, the symbolically richest food, is associated with women (Carsten 1997, 135)—Carsten misrepresents men as peripheral to Malay kinship. This is not, I think, an innocent ethnographic error, and I shall return to it.

One of the arguments Carsten makes for the "centrality" of the sibling relationship in Malay thought is that "[m]any spirits appear in…myths as siblings, and in these cases their parentage is always unknown" (Carsten 1995c, 126). But this has nothing to do with any denial of parental connection among real human beings—an idea which, as we shall see, seems to hold a special attraction for Carsten. It is a recurrent theme in fantasy that heroic figures are parentless, or have unusual or attenuated relationships with parents, often being raised by foster parents. One has only to think of (say) Batman, Superman, Wonder Woman, Moses, or Jesus (Dundes 1981). Why this should be so I am not prepared to say, but it has by my lights absolutely no bearing on local notions of kinship that pertain to the unheroic majority.

In any case, Carsten (1997, 102) points out that "the term for 'relatives' and for kinship in general" is a derived form of one of the "sibling" terms. But she fails to see that this too implies the semantic centrality—the *focality*—of procreative kinship in Malay ideas of "relatedness." Thus she seems to take literally a proverb about village ties which she translates as "[W]e are all kin here, there are no strangers" (Carsten 1991b, 437). But surely this is an axiom at least roughly comparable to the Judeo-Christian idea that, as children of God, and/or descendants of one or another of Noah's three sons, all human beings are brothers and sisters—and approximately as challengeable.

In connection with her emphasis on nurturance in Malay kinship, Carsten pays considerable attention to the various forms of fostering she encountered. At one point she tells us that "foster kin…are undifferentiated from conception kin" (Carsten 1991b, 433). But this is not at all the case, for in the very same article we learn that an adopted child is referred to as a "raised child" or a "lifted child" (Carsten 1991b, 440)—that is, by a linguistically marked[2] and hence derived form of the "child" term. This is cross-culturally true of fostering and adoption, as is the fact, reported by Carsten (1991b, 431), that the distinction is often elided (see, e.g., Guemple 1972, 68; Howard et al. 1970, 43; Modell 1994, 4–5). But Carsten apparently takes this tactical elision to mean that in some sense no real distinction is made, but, as we shall see, this is very far from the case.

Carsten is so committed to a depiction of Malay society as one involving "undivided kinship" (Carsten 1995a, 115) that, by stressing its negotiability,[3] she calls attention as well to the fact that it can be, as it were, un-negotiated. Thus she notes that Malay kinship notions are indefinitely extendable, such that "kin are not sharply defined in opposition to non-kin" (Carsten 1995b, 329), but she fails to see that this is a very general feature of human kin reckoning. Thus elsewhere (Shapiro 2005b) I have shown that in populations which have what have been called "universal kin categorization"—in which kin terms are applied to everyone in one's social universe—there is nonetheless a kin/nonkin distinction, and that this distinction is a flexible one, dependent on tactical considerations. There

is no indication here of "undivided kinship." Nor is Malaysia exceptional in this regard. Thus Carsten notes that kin/nonkin distinctions are "blurred or ignored *except in disputes when it is always possible to assert them*" (Carsten 1995a, 115, emphases added), but this is presented as a Malay datum sui generis—and one with no bearing on her argument.

In view of all this, it should be plain that Carsten's insistence that Malay thought does not posit a distinction between "biological kinship" and "social kinship" (1997, 291) is untenable. It is fine to argue that "the acquisition of substance" (Carsten 1995c, 235) occurs outside of procreation, but, as we have seen, such acquisition, when nonprocreative, creates a substantially diminished and semantically derived form of "relatedness," and I see no good reason not to call this form "social kinship."

My conclusion so far is that Carsten's claim that her analysis of Malay egocentric kinship is carried out "in indigenous terms" (1997, 291–92) is contradicted by her own data. I argue later that the "terms" she employs in this analysis are in fact of foreign provenience. Supporting evidence for this verdict is supplied by her treatment of Malay fosterage and the Malay house, to which, in that order, I now turn.

Carsten on Malay Fosterage

It is necessary to repeat here that the Malay term for a foster child is a derived form of the "child" term, and that the latter term *simpliciter* is often applied to such a child, presumably to downplay its adoptive status. But the derived term is only one of the ways by which fostering can be distinguished from procreative parenthood in Malay life and thought. Thus Carsten (1991b, 432) tells us that "[t]he rights of parents to their own children have priority over any other claim," and that it is only after a couple has "three or four children" that the claims of potential fosterers are considered—and then only if they are close kin. Even so, parents say they are . . . embarrassed . . . to give a child away" (ibid.)—so much so that even residence with their own parents, the child's grandparents, is said to be "not fixed" (Carsten 1997, 248), as if the only appropriate abode for small children is that of their biological parents. This is so much the case that "[t]here is a general reluctance to put children under the care of a step-mother, who is regarded as potentially malevolent" (Carsten 1991b, 432).

All of this, it seems, goes against Carsten's own summary of the situation, for she says that Malay fosterage is not to be regarded as "an exemplar of the primacy of [procreative] kinship, as suggested in the classic anthropological accounts. Adoptive kinship . . . does not simply serve as an arena in which 'fictive' kinship can be distinguished from a backdrop of 'real'—that is, [procreatively] based ties and hence reinforce the latter's primacy" (Carsten 2004, 140–41). My own conclusion here is that, quite to the contrary, adoptive kinship in Malaysia is indeed founded on a "backdrop" of procreative kinship, from whose semantic and normative "primacy" it derives its significance.

Carsten on the Malay Village as a "House Society"

Originally put forward by Lévi-Strauss (1982), the concept of a "house society" has undergone development in what seems to be two different directions. The first of these, and by my lights the more productive, is symbolic/cosmological, and is illustrated by Rivière's analysis of social space among various ethnic groups in the Guianas (Rivière 1995). Rivière's conclusion is that indigenous architecture in this area exemplifies "an almost Pan-amazonian pattern of concentric dualism whereby the centre is opposed to the periphery" (Rivière 1995, 194). The most illustrious example of this pattern is of course the village plan of the Bororo of Central Brazil, made famous by Lévi-Strauss and other scholars (Crocker 1985, 30–33; Fabian 1992, 37–63; Lévi-Strauss 1963a, 126–29). But the Bororo example makes especially clear that the "house society" notion needs to be dereified, for here the pattern is made manifest by not one but several edifices, each of which is necessary to the overall structure.

From this standpoint Carsten's approach to her Malay materials, though not indifferent to symbolism, has another emphasis, for she views the house as an isolable and largely independent unit of everyday sociality in Malaysia. She tells us that "a house never has more than one hearth," and that "co-residence necessarily implies the sharing of one hearth" (Carsten 1995a, 110). The question then is the nature of the communal group. Much of Carsten's analysis suggests that it is superfamilial, as when she notes that guests are received "by men" at the periphery of the house, "while women of the household remain in the [interior]" (Carsten 1995a, 113).

But this conclusion would seem to be justified only ambiguously at best. Thus Carsten tells us that within a house "[c]o-resident nuclear families never have a separate annex or room . . . for their own use" (1995a, 113), but

in the very next sentence she notes that partitions are erected "when more than one married couple co-reside in one house" (ibid.). There is, it would seem, not only a contradiction here but, as well, a suggestion that the contingency noted is relatively unusual. This latter interpretation is supported rather directly by Carsten's own words: "As different members of a sibling group marry and have children, they establish new houses" (1995a, 117). Elsewhere she states plainly that "residence up to the birth of the first child is generally mainly uxorilocal and thereafter, if possible, it is neolocal" (1991a, 117), that "couples try to establish independent households as soon as they can afford to" (1991a, 119), and that "married siblings never co-reside" (1995a, 116). From all this it would seem relatively clear that the preferred and statistically most common residence group among Malays is the nuclear family, living adjacent to but nonetheless distinct from related nuclear families (Carsten 1995a, 117). The collective association with a particular house is thus mostly a matter of symbolism, something Carsten herself notes (1997, 82). All this being so, it is misleading in the extreme to label Malay communities "house-based societies" (Carsten 1995a, 125). Their basis is the nuclear family.

My chief conclusions so far are that a fresh examination of Carsten's ethnographic materials shows (1) that Malay ideas about kinship are grounded in parent/child bonds and not, as Carsten maintains, in the sharing of food, or coresidence; and (2) that, related to this, it is the nuclear family and not, as Carsten holds, the house that is the elemental social unit among Malays. I turn now to other presentations of Malay kinship to see to what extent these conclusions hold for Malaysia in general.

Other Malaysianists: Egocentric Kinship

It is necessary to state at the outset that I am not a Malaysianist and therefore lack an exhaustive acquaintance with the pertinent literature. Even so, it is clear to me that the Malay area as a whole is by no means ethnographically uniform. Still, it seems well worth examining Carsten's analysis, and my own reanalysis of her materials, in a wider Malay context, insofar as this context can be appreciated through a handful of anthropological sources.

I begin with Malay procreation ideology. The best of my sources here is Banks (1972, 1257), who notes two words for "the hereditary 'seeds' of the male and female sexes respectively.... [M]ilk is also a powerful symbol of relationship as is semen.... There is a cover concept... which subsumes all of the kinds of genetic, substantial relationship stuff. Being of one ['substance'][4] is the closest biological relationship possible between people." It would be helpful to know more about the significance of semen as "a powerful symbol of relationship." Still, the fact that it is presented as such suggests that Malay kinship is considerably more balanced and less gynocentric than Carsten would have it. Moreover, Banks's last sentence intimates that "the cultural construction of kinship among Malays" is not very different from Western ideas, a point Banks expressly makes elsewhere (1983, 54). Here he tells us that "the closest 'blood' relatives are assumed to transmit the most similar hereditary...features to offspring" (ibid.). Banks also provides a particularly cogent summary of the matter: "Malays recognize degrees of collaterality through males and through females equally, implying a branching model of relatedness through gradually weakening, thinning ties of relationship substance. Each individual transmits the substance of both his mother and his father" (Banks 1983, 60).

The separation of lineal and collateral kin in Malay kinship ideology has also been treated by Wilder (1991, 129) and Djamour (1959, 23). The latter proffers native expressions which she translates as "father's side" and "mother's side" (ibid.). Banks (1983, 55–56) notes another expression translatable as "layer," but which in a kinship context means "degree of collaterality." Still another term means "collateral relative," and this is oppositionally paired with yet another expression which Banks (1983, 59) tells us means "real." This last datum is of the highest order of importance for my argument, implying as it does that collateral kin are deemed lesser kin than lineals, something we have already encountered in considering Malay notions of substance sharing.

This emphasis on the lineal/collateral distinction is apparently so strong that half-siblings are not always considered lineal kin. McKinley (1983, 354) tells us that "individuals with a common father but different mothers are [called] 'step-siblings,' while half-siblings who have the same mother but different fathers are [called] 'dog siblings.'" Djamour (1959, 26) reports this as well. It is unclear whether this last appellation is pejorative (Leach 1964). It is, I think, nonetheless significant that half-siblings, like collateral kin, are allowed to marry (McKinley 1983, 355).

There is thus good reason to question Carsten's claim of "undivided kinship" in Malay thought. Additional support for this contention is provided by a consideration of

native notions of the wider sphere of kin connectedness. Banks (1983, 92–93), Djamour (1959, 4), McKinley (1983, 336), Peletz (1988, 49), and Wilder (1991, 129) all confirm Carsten's finding, noted above, that one of the "sibling" terms is extended so as to apply to all those considered kin, which, as I have already observed, underscores the focal status of close kin. Banks (1983, 80) reports another expression used "to refer to a group of all one's blood kinsmen," and Wilder (1982, 97) notes yet another, which he translates as "near kin" and which, he notes elsewhere (1991, 132), are distinguished from "kinsmen a little distant" and "distant kinsmen" (see also Djamour 1959, 24). People outside this sphere are likely to be labeled by a term which Djamour (1959, 24), Massard (1991, 141), and McKinley (1983, 336) translate as "unrelated" or "stranger."

To be sure, there are idioms of inclusion. Massard (1991, 141) notes an expression pertaining to a whole village, which she translates as "[T]he people here are all relatives." But in the very same paragraph she tells us that "neighbors are perceived as irrevocably different from blood kin" (ibid.), and she proffers an expression in which neighbors are rendered as "like brothers and sisters" (ibid.). Such likenings are common in my sources (Banks 1983, 48; Djamour 1959, 32; Peletz 1988, 46; Wilder 1982, 57). It bears stressing that *they appeal to a model of procreative kinship* (Shapiro 2005a), *from which they are perforce logically derived*.

Massard (1991, 141) goes on to describe how, in this guise, neighbors share food. They do so, she tells us, on the basis of "balanced reciprocity," not the unrestricted giving that, in Malaysia and elsewhere, pertains to real kin (see below and Peterson 1997). Banks (1983, 164), by contrast, presents us with something more like Carsten's conclusions, but with a significant caution: "Malays think of kinship sentiments in terms of kinshi dyads [like] father-son. They also think of them in terms of the likely conditions that would create them: blood relationship and co-residence.... *Co-residence is thought to make kinship sentiments extremely likely but not necessary*" (emphases added)."

I would stress here the distinction between membership in a kin class and the sentiments and behaviors associated with that class, which are both logically distinct (Scheffler 1973, 768–769) and, very generally, empirically connected only contingently (see, e.g., Goodenough 1965, Keesing 1969, Shapiro 1997)—as indeed they are in Malaysia. What else is implied by regarding neighbors "like brothers and sisters," and, by these means, "likely but not necessarily" extending kinship sentiments to them? This is as close to support for Carsten's thesis as my sources provide.

Finally, there is evidence for the manipulation of genealogies (Banks 1983, 63). The key point here is that such manipulation makes sense only in a situation in which procreative links are meaningful.

Other Malaysianists: Fosterage and related Matters

Like Carsten, my other sources call attention to the importance of fostering in Malaysia. McKinley (1983, 384) notes, however, that adoptive siblings are said to be "siblings by transfer," in contrast to birth siblings, who are "siblings of the womb." This is not necessarily a statement of focality. But Wilder (1982, 54) tells us that, from the parental perspective, only the latter are said to be one's "true" children, and, a page later, that both adoptive and step relationships may be marked by a suffix meaning "synthetic" (1982, 55). The implication is that blood relationships are "real," and that they provide a model for those created by fosterage. Hence Wilder (ibid.) proffers the additional glosses "surrogate" and "imitation" for this suffix. Related to this is Banks's report than an adoptive father can be said to be "like a real father" (1983, 136). Similarly, Djamour (1959, 23) tells us that adoptive relationships are sometimes designated by consanguineal terms followed by a free morphemic marker (see also Wilder 1982, 96). This too, like the English expressions "godfather" and "male nurse," indicates nonfocality. Banks (1974, 52) observes that this marker may be applied to any "supergenealogical kinsman," which carries the suggestion that others so labeled have nonfocal status. This conclusion is supported by Banks elsewhere (1983, 143), where he notes that a class of terms designated by a label which is obviously cognate to one of the "adoption" markers is "said to originate in the consanguineal domain." It is therefore not surprising to learn that this selfsame marker figures in Malay ritual kinship, which, according to Banks (ibid.), "resembles the Mediterranean godparent relationship." Nor should we be surprised to learn that alternative designations for ritual parents are provided by the "father" and "mother" terms to which a suffix meaning "old" is attached (ibid.). The same marker that is applied to adoptive kin is also used to speak of those labeled "friends," who are likened to kin by an expression which McKinley (1983, 349) translates as "relatives in spirit but not technically

so." Quite contrary to Carsten, a procreative model is so pervasive in Malay thought that even "children nursed by the same woman are known as…'milk siblings'" (McKinley 1983, 355; see also Peletz 1988, 56)—that is, they are nonfocal members of the "sibling" kin classes. Even a passing familiarity with the growing literature on "milk kinship" reveals that this nonfocality applies generally in instances of the phenomenon in question (see, e.g., Khatib-Chahidi 1992, 109; Parkes 2001, 11, 2004, 347).

But this is not all. Banks (1983, 64) tells us that in cases of foster parentage "in which the child knows the identity of its biological parents, the child will always have an interest in their mutual relationship that transcends possible inheritance of property from them, for their behavior and reputation reflect upon the child's own." The child will visit them occasionally and exhibit any gifts from them proudly, even though the child receives more intense parental interaction from its foster parents.

Moreover, in cases where the biological parents are unmarried, the child may be assigned to foster parents so that he or she "will not have to bear the stigma of being called…a child born out of wedlock" (Banks 1983, 128–29). Banks (1983, 129) goes on to say that "such adopted children should not be told who their biological parents are…because they will entertain self-doubts after being told. They may think that they are doomed to repeat the sin…of their biological parents. They may also try to vindicate their biological parents by searching for them."

This feeling for birth parents on the part of adopted children in Malaysia is remarkably similar to what has been reported for such children in the United States (Modell 1994, 143–68). Furthermore, the fact that parental "behavior and reputation reflect upon the child's own"—especially the idea that adopted children "are doomed to repeat the sin…of their biological parents"—suggests some notion of mystical linkage between parents and children. This suggestion is supported by the magical qualities associated with those anatomical parts that link mother and child. Here is McKinley (1983, 371) on the matter:

> First, divination is carried out with the umbilical cord of the firstborn child to determine how many siblings will eventually complete the group initiated by this child. Second, the placenta is ritually buried and is personified as the mystical elder sibling of the baby. In spirit form, this…'older sister placenta' or 'older brother placenta' is believed to interact with its human younger sibling. It is also thought to be able to return to the uterus where it can supervise the development of successive younger siblings. Third, there is the custom of saving the dried navel scabs of babies.… [T]his is done to protect the…health of [a] child.…

McKinley's argument here is that these usages reflect ideas of sibling unity, and, as such, it echoes Carsten. What I would stress, however, is that all of these materials—the umbilicus, the placenta, and the navel scabs—are liminal with respect to mother/child and therefore, *pace* Douglas (1966), can be expected to be endowed with ritual value that associates the two (see also Peletz 1988, 50–51). Also pertinent here is Banks's report of "ritual exorcisms of evil bodily 'humors'…which affected all…blood kin" (1972, 1264), as well as his remark that "Malays…speak frequently about the influence of 'bad seed'" (Banks 1972, 1258).

It is clear that adoption in Malaysia in no way nullifies the tie between natural parents and their children. According to Banks (1972, 1259):

> Children who suddenly find that they have been raised by other than their biological parents are said to be likely to become distant and search for them, leaving their social kinsmen behind. Fathers and mothers are expected to want to "look after their seed," and this phrase implies also that they will want to care for and raise their natural offspring. Mothers want to raise "their" children, to nurse and care for them. This truth is a fact of simple observation.

As for fathers, "there is a moral injunction that men should care for and love their children.… A man has special responsibilities for his own children that he does not have for the children of others" (ibid.).

Finally, there is Swift's (1965, 109) report of "a…general theme in Malay culture expressed in stories, songs, and now films, which sees having a stepmother as the cruelest fate which could befall anyone. It is said that…a stepmother will favor her own children, and that most of them will be actually cruel."

Most of these materials corroborate Carsten's data, already noted, and those that do not support them indirectly. But none validates her conclusion that Malay fosterage is not "an exemplar of the primacy of [procreative] kinship." This conclusion, I submit, is entirely at odds with reality.

Other Malaysianists: the Nuclear Family

Carsten is the only scholar among my sources who has attempted to apply the "house society" notion to Malaysia and perforce the only one to downplay the nuclear family. Swift (1965, 102) tells us that, in the village in which he carried out fieldwork, "[t]he nuclear family of husband, wife, and dependent children is the most common form of domestic grouping, and also the major social unit in day-to-day living." And his next paragraph begins as follows: "Husbands attempt to build their own house as soon as possible after the birth of their first child (which ideally will occur within a year of marriage), and to establish their own family of procreation as an independent unit" (ibid.). Banks (1972, 1264) proffers corroborative data. "Ideally," he notes, a newly married couple "would have a separate house of their own because of the Malay belief that a young couple should have privacy at the start of an important relationship to them both." Stivens (1991, 83) notes that in the village she studied "[i]n terms of day-to-day household organization the husband and wife are the preeminent unit," and she observes more generally that "[a]ll accounts of Malay kinship agree that the elementary family has been a dominant residential grouping" (ibid.).

To be sure, matters are not so simple. Thus Stivens, continuing, tells us that "many other household forms are created through developmental cycles of the household and through specific historic and economic conjunctures" (ibid.)—a point corroborated by Peletz (1988, 43), Wilder (1982, 40–44), and Wong (1991, 193–96). Perhaps the most systematic of these modifications is noted by Peletz in his statement that "postmarital residence eventually resulted in the creation of a new household adjacent to the wife's [natal] home but still within the compound…controlled by her mother.… [W]e are dealing with postmarital residence involving settlement in the wife's village *and* the establishment of a separate household in the wife's mother's compound" (Peletz 1988, 43, emphasis in original). This is the closest approximation in my sources, other than Carsten, to a "house society."

But there is more. I have already noted some of the behavioral norms pertaining to the parent/child relationship in Malaysia. Here it needs to be added that, correspondingly, more distant kin can be largely ignored. Thus Banks (1983, 79) assures us that "one can hardly live in a Malay village…long without hearing…discussions of the thinness of recognition and the general lack of worth of blood ties beyond the limited range of primary filial bonds and bonds of common parentage." And consider this: "It is said that one should provide support and hospitality to all one's blood kinsmen, but this injunction…is only rarely recognized in practice.… Only parents, children, and siblings actualize the ideal" (Banks 1983, 63). Finally, there is this from Djamour (1959, 48):

> [A] man who had any means usually helped kinsmen who were hungry or infirm with food or money. This was particularly the case where his closest [kin] were concerned: married children, parents, siblings, grandparents, grandchildren, parent's sibling, sibling's child, and first cousin, generally in that order. Whenever practicable he invited a destitute close relation to live in his home at least temporarily. More distant kinsmen had a lesser claim on one's generosity.

I have argued so far that, on the three grounds adduced by Carsten, there is no good evidence for the state of "undivided kinship" she claims, and that Malay kinship is decidedly "divided." I turn now to yet a fourth area, which, though she barely deals with it, is of the utmost importance in assessing claims of "centrality."

Other Malaysianists: Kin Classification

The key point is this: "Malayan [kin] terms tend to be appended by…marker-affixes indicating that the individual in question is 'like a…' but not a definite representation of the Malayan category" (Banks 1974, 47). One set of affixes has to do with the birth order of siblings, which, as we have seen, Carsten notes, and indeed is one of the most frequently described data in my sources (Banks 1974, 53–54; Djamour 1959, 27–28; McKinley 1983, 365–69; Peletz 1988, 50; Wilder 1982, 81–88). These markers are especially used in reference to kin of the parental generation: such kin are classed as "father" or "mother," followed by a birth order term; for example, "father first-born," "mother last-born," and so on. *But one's biological parents are not so classed*: they are members of their kin classes ipso facto *and thus serve as the foci for the classification of their generation*. In a structural semantic sense it is they who are "central." The conclusion, then, is that *Malay kin classification is based on procreative ties and is extended on the basis of procreative concepts*.

This is supported by a number of considerations. First, there is a special term for lineal relatives en masse, whereas collateral relatives are designated by lineal kin terms and either the affixes just noted or other affixes

which indicate collateral distance, rather like English "second cousin" (Banks 1974, 51–52; see also Wilder 1982, 93). Malays, Banks (1974, 51) tells us, "thus distinguish degrees of cousinship much as American English informants do," except that "the concept of collateral distance . . . is applied . . . in all generations and not simply in ego's own."

Second, there is considerable evidence in my sources that kin classification is not effected sui generis—"Brother, can you spare a dime?"—but on the basis of parental links. Thus Wilder (1982, 86) reports Malay expressions which he translates as "father's side" and "mother's side" in kin classification. Banks (1974, 51; 1983, 57, 60) and McKinley (1983, 345) provide examples of kin reckoning, all of which involve parent/child and sibling/sibling links, both genealogical and terminological, between Ego and Alter. These illustrate *native* kin class extension rules and are entirely comparable to what we have for other areas (see, e.g., Basso 1973, 75; Mayer 1965; Sahlins 1962, 154; Scheffler 1972; Shapiro 1981, 34–37). They are therefore not to be dismissed, *pace* Schneider (1989), as "virtuoso manipulations." Moreover, Djamour (1959, 33) tells us that in cases where principles of kin classification permit two choices, "the [genealogically] closest link takes precedence": this too squares with data from outside Malaysia (see, e.g., Barnard 1978; Burch 1975, 56; Falkenberg 1962, 41, 218–20; Feinberg 2004, 76; Myers 1986, 208–9). Further ethnogenealogical distinctions are noted by Banks (1983, 159), Peletz (1988, 44), and Wilder (1982, 82).

Third, the emphasis on procreative ties is so strong that other kinds of relationship are idiomized as derived versions of them. We have already seen this with regard to adoptive kinship, ritual kinship, "milk" siblingship, and friendship. But it is also true in cases of polygyny. Djamour (1959, 30) tells us that "[t]he children of the newer wife refer to the father's older wife as . . . [']stepmother[']', whereas those of the older wife refer to their father's newer wife as . . . [']young mother[']. The wives themselves refer to each other's children by the common husband as . . . [']stepchildren[']. . . ."

Still another area of Malay sociality that is rendered as a secondary form of procreative kinship is affinity. Thus we learn from Djamour (1959, 23–24) that affines as a class can be referred to by the general term for "kin"—which, as we have seen, is an extension of a "sibling" term—followed by yet another specializing affix, which seems quite comparable to the English "-in-law." But, she assures us, these are no more than "courtesy terms—for as soon as the union is dissolved by divorce (and sometimes even by death) the persons become ['strangers'] again. . . ." (Djamour 1959, 30). Banks (1983, 102) notes that within the sphere of affinal kin "one should use the same kinship terms one's spouse uses," modifiable in reference by the affinal affix. Note, incidentally, that this is a statement of an extension rule.

None of the foregoing should be taken as a denial of the negotiability—the tactical flexibility—of Malay kinship. Thus the affinal marker just noted is omitted in address because it implies social distance and fabrication (Banks 1974, 59)—which is to say, making plain that the relationship in question is, by native criteria, not 'real.' This is also true of other affixes, perhaps most commonly the ones signaling adoptive status (Banks 1983, 145). But this flexibility is founded on a procreative base and thus *in no sense* deserves the emphasis given it by Carsten: it is peripheral, not "central," to Malay kinship. Here is Banks (1983, 144) on the matter:

> [T]he usual framework within which sentiments should grow is the [nuclear family] household. . . . The household is the grouping of individuals that is created by men in fulfillment of their . . . obligation to marry and procreate within marriage. The terms for parents and children, siblings, and the parents of these parents are the basic terms, and the usual circumstances . . . surrounding the roles they symbolize provide the models for [other] relationships.

And elsewhere Banks (1972, 1259), taking account of wider notions of "relatedness" in Malaysia, has this to say:

> Beyond their primary . . . lineal relations there is a hazier and almost mystical sense binding men of the same general stream of heredity. These are called one's ['collateral kin'], and all social relationships of a very close and personal kind which transcend ties of blood are called "like ties between ['collateral kin']. . . ." [I]t was unusual for Malays to be able to trace genealogical relationship between individuals separated by "two layers" [i.e., two collateral removes]. . . . Relationship beyond that point is "very light," moving off into the area in which people are simply . . . non-relatives [or strangers]. The next symbol of blood unity outside the ring of ['collateral rela-

> tives'] is that of the Malay people, who are assumed… to share a common heredity which has expressed itself in both a general similarity in physical appearance and a common history and tradition.… Malays view [these last] ties as much weaker than the primary relations between parents and children, grandparents and grandchildren, and between siblings.

Hence my overall conclusions: (1) Procreative notions are central to Malay kinship, even when it comes to idiomizations of ethnic unity. (2) These notions are in native theory grounded in the nuclear family. (3) Malay kinship ideology is thus closely comparable not only to other such ideologies in the developing world but, as well, to its Western counterpart. All this being so, it is misleading in the extreme to posit that we need a special term—"relatedness"—to deal with the Malay materials, implying as it does that these materials suggest, in "postmodern" fashion, "radical alterity" to the West; that what is fundamental to these materials is the notion of a "house society" and not the nuclear family; and that these materials seriously suggest "undivided kinship."

Discussion

Carsten is thus quite mistaken in her depiction of Malay kinship. But this is not, I suggest, just another set of ethnographic errors. Although her model is not at all consistent with the data, hers and others', it is in remarkable conformity with a set of exogenous paradigms, to which I now turn.

Let me go back to the source, for both the old kinship studies and the new—that is, to Lewis Henry Morgan, particularly to his "evolutionary" scheme in *Ancient Society* (Morgan 1877). Here Morgan put to use the solid ethnographic data compiled in his earlier *Systems* (Morgan [1871] 1997), not in the service of particular historical reconstructions but, instead, for the grounding of a metaphorical history through which known cultural development is seen primarily as a set of instantiations of a metahistorical plan. This is surely best expressed in his assertion that human "institutions" "have been developed from a few primary germs of thought" (Morgan 1877, 4).[5] These "germs," Morgan argued, were so minimally developed in their "earliest" manifestations that these could be effectively contrasted with their "latest," which, in view of his interpretation of the kinship data, meant that the Rest could be set against the West as an inferior version of it. Hence the "community of husbands and wives" (Morgan 1877, 49) he read into the Malay data he got from his associates was viewed, in his blatantly progressivist millennial scheme,[6] as a less morally "evolved," a less perfect exemplar, of the same plan made more boldly manifest in the Victorian nuclear family.

Carsten's analysis of the Malay materials employs an almost exact inversion of Morgan's scheme. The (Malay) Rest/West opposition remains, as does "the community of husbands and wives"/nuclear family one, but now the arrow of "moral evolution" (Morgan's expression) is reversed, and the West is construed, in fine primitivist millennial fashion, as a retrograde counterpart to the Rest. The midwives are Engels (1972) and "the left-wing bohemianism" of Carsten's own girlhood (Carsten 2004, 31).[7]

My sources are not silent on this link to Morgan. Thus Banks (1983, 55) says: "To describe Malay kinship terminology as recognizing only sex and generation without regard to…modifiers [i.e., to markers, to affixes], as Morgan did…, is to present a highly misleading picture of the ways Malays use their terminological system to describe blood relationships.…" And elsewhere (Banks 1983, 19): "The Malay kinship terminology, contrary to Morgan's assumption, makes the lineal versus collateral distinction just as clearly [as English kin classification], by means of modifiers.…" Carsten's treatment of Malay kinship is as inadequate as Morgan's, and in much the same way. Furthermore, it ignores, as Morgan could not have, a half-century of scholarship, from Malinowski to Scheffler, as well as a large literature on focality outside kinship (see, e.g., D'Andrade 1995, 115–21; Gardner 1985, 344–50; Kronenfeld 1996; Lakoff 1987; MacLaury 1991), in the fabrication of a world in which, in effect, a Roman Catholic priest is really my father, my Cub Scout den mother is really my mother, and a panhandler who requests spare change is really my brother. Her notion of "centrality" in Malay kinship has nothing at all to do with rigorous semantic or behavioral analysis but is instead entirely intuitive.

But this is not all—and much of the rest derives not from Morgan but from Engels's co-option of him, wherein the advent of capitalism is said to bring about not only the nuclear family but, as well, "the *world historical defeat* of the female sex" (Engels [1884] 1972, 120, emphases in original). Hence the proposition that in the "pre-capitalist world"—that is, the Rest—the materials of the nuclear family are dissolved in a larger network, the position of men in social life is all but nonexistent (there being no

assured way of establishing paternal connection because of "the community of husbands and wives"), and the situation of women is thereby elevated. And hence Carsten's "finding" in Malaysia "undivided kinship," her resurrection elsewhere (Carsten 2000, 8) of the antiquated "ignorance of paternity" claims for the Trobrianders and the Yapese, and her allegation that women in Malaysia are "central to the political process" (Carsten 1997, 18).

I have assessed the first of these claims in the body of this essay. As to "ignorance of paternity" in the Trobriands and on Yap, there is now more recent research that challenges these allegations (Campbell 2002, 181–82; Labby 1976, 28; Weiner 1988, 57).[8] Here is the gist of Carsten's argument for the "centrality" of women in Malay politics:

> The everyday tasks in which women engage: cooking a meal, looking after children, running the house, visiting neighbors and affines, calling on the sick and the dying, cultivating rice, organizing rotating credit associations, arranging marriages, attending communal feasts, do not simply reflect their engagement in the domestic organization. Because men's activities are associated with the external…world, women come to have a centrality that is not purely domestic. It is true that the tasks mentioned above are all associated with domestic reproduction and with the house. However, the house itself is not simply a domestic unit.… [T]he house has a communal…significance which goes beyond what anthropologists conventionally label '"the domestic."' One representation of the community is in fact that of an enlarged house, a group of people who are all related to each other.… When women carry out their everyday activities they reproduce the wider community as much as the domestic hearth.… Feeding, fostering, marriage, and having children are all processes in which women dominate. (Carsten 1997, 18)

This last sentence—which, by my lights, would be true for conservative sectors of this country as well as Malaysia—shows better than anything else how tortuous this argument is. Women "dominate" in domestic activities, but these activities are not "really" domestic, because domestic life is a microcosm of the wider community. But this community, as we have seen, is "communal" only in a very limited sense, a sense which involves modeling on the nuclear family. The proposition that women "dominate" in a society in which virtually all extra-community activities are monopolized by men (Carsten 1997, 135–41) is sustainable only by a leap of "radical" feminist faith.

In this connection, Carsten's treatment of the "sexual division of space" in Malaysia is highly pertinent. We have already seen that she attaches great importance to the house. But

> houses might be opposed to [fishing] boats, mosque, and coffee-shop. The division not only reflects the [gender] segregation of labour but also of [other] activities. The coffee-shop is the main forum for informal political discussion. Women very rarely go to coffee-shops, nor do they participate more than minimally in formal political activity in the village. They rarely attend meetings; when they do so, they do not engage in public discussion. (Carsten 1997, 136)

More, a few pages later there is a reproduction of a photograph captioned "Men vote at a village meeting." An inspection of the photograph reveals, accurately enough, not a single woman (Carsten 1997, 141). How all this can reasonably be construed as evidence for the "centrality" of women in Malay politics is entirely beyond me.

There is, as I have intimated, a great deal in Malay kinship that jibes with what we know about kinship elsewhere. There was a time, not at all long ago, when this conclusion would have been regarded as philosophically humanizing and indicative of the fact that all people, no matter how far distant, share with us a single species heritage (Jones, Milicic, and Read, this volume). What the new kinship studies offers us instead is a millennial melodrama in which the people of the developing world are cast, with no real regard for their own life choices, as Pure Good (Pure Communal, Pure Feminist) and the West as Pure Evil, governed by narrow familial interests and "patriarchal" men. These studies, then, constitute an empirically based subdiscipline only in a very loose and entirely secondary sense: as I have suggested here and elsewhere (Shapiro 2008, 2009, in press), their main goal is moralizing. That they should be rendered as "cutting edge" in kinship studies is a reflection of how far Enlightenment standards of skepticism and evidence have fallen in today's academy.

Notes

For their comments on earlier versions of this article I am indebted to Tom Gregor, Tom Parides, Peter Parkes, and Hal Scheffler. Responsibility for its arguments, however, rests solely with me.

1. Much of this and other portions of Carsten's text noted here are repeated in other publications of hers. For the sake of brevity I supply no cross-references.
2. On marking in semantic theory, see Greenberg 1980, 317–19 and Scheffler 1987.
3. I borrow this handy expression from Guemple (1972), an early exemplification of Schneider's influence.
4. Single quotes here and later are meant to gloss Malay expressions, which, to spare the reader, are not used.
5. I bypass here the materialist claim that Morgan took particularly seriously: the techno-economic determination of cultural forms. I think it reasonably fair to say, with Leslie White, one of his most ardent materialist admirers, "that Morgan had two theories of social evolution: one in which technology was the determinant; the other in which ideas inherent in man's mind just grew and expressed themselves in social institutions" (White 1966, 112–13), though by my lights the latter is by far the more pervasive theme in *Ancient Society*. It is, however, not necessary to argue the point in the present context. The metaphorical quality of Morgan's scheme was long ago appreciated by Goldenweiser (1937, 507–526) and, somewhat more recently, Nisbet (1969, 159–208). This is not to say that Morgan and other Victorian thinkers were not motivated by a concern with specific histories: indeed, the opening sentence of *Ancient Society* was probably influenced by the first Neanderthal fossil findings (Gruber 1965). My point is only that, in confronting these findings, Morgan and the others appealed to a prescientific metaphysics (Lovejoy 1936).
6. I borrow the expression "progressivist millennialism" from recent scholarship in comparative religion (Wessinger 1997, 50–51). The millennial character of primitivist projects, to which I refer below and in Shapiro 2005b, seems usually to be taken for granted, though it is explicitly grasped by the following formula: "Primitivism and millennialism are opposite sides of the same coin of human aspiration for a way of life dramatically opposite [to] the present" (Berkhofer 1978, 72). In work currently in progress I try to show that most millennial ideologies are relatively simple logical transformations of primitivist visions.
7. The millennial character of Marxist theory has been treated by several scholars, most notably Campion (1994, 425–53).
8. See also Helmig 1997, 3 on the analytical muddles involved in the claim of such ignorance for the Yapese. Carsten does not mention similar claims for Aboriginal Australia, but these too have been challenged (Shapiro 1996 and references therein).

13

The Logic and Structure of Kinship Terminologies

Implications for Theory and Historical Reconstructions

Dwight Read

"Kinship" does not refer to a single, specific aspect of a human society. The term is used to refer to the range of concepts, ideas, and behavior that, to one degree or another, reflect or relate to the relations individuals have with one another as a consequence of the cultural construction of relations and meanings built over, in a nondeterministic manner, the biological facts of reproduction. Whether known or not, those biological facts universally link each person to a unique biological male and a unique biological female, yet culturally differentiated importance and meaning (or even denial) is placed on those reproductive facts. These culturally differentiated meanings are expressed through the structural relations among the kin terms in kinship terminologies, as well as the properties and meanings associated with the content of the categories of kin relations determined through a kinship terminology system such as "real" versus "nonreal" kin and notions of shared substance (Shapiro, pers. comm., 2009). For this reason terminologies are central to understanding the differentiations involved in the social organization of societies, including the conceptually grounded means by which a newborn becomes a social, and not just a biological, offspring. A kinship terminology expresses linguistically, through kinship terms, the cultural constructions and meanings that overlie the inherent facts of reproduction and, computationally, through the structural form of a terminology, the logic by which users of a terminology are able to express kin relations in a mutually understood manner. Mutual understanding requires, at a minimum, shared concepts, but to say that concepts are shared does not go far enough because a key aspect of a kinship terminology is the computational means it provides for recasting kin relations expressed from the viewpoint of one actor into kin relations from the viewpoint of another actor when the first actor has a kin relation with the second actor. What is shared is not merely the kin terms making up the terminology as a list of vocabulary items, but the underlying structural knowledge and its generative logic. That logic makes a terminology a conceptual system through which it is possible to conceptually transform kin relations from the perspective of one person to the perspective of another person.

The generative logic of kinship terminologies does not reside in the genealogical relations assumed to be the basis of kinship systems since the time of Lewis Henry Morgan, but in the way kin terms form a systematic, structured system of concepts (Read 2007a). Though kin terms provide categorizations of genealogical relations, those categorizations are derivative from, not defining for, the structural logic of kinship terminologies. The assumption of genealogical primacy for kinship system concepts leaves unanswered the causal basis for structural differences between and within terminologies (D'Andrade 2003; Kronenfeld 2009, 295) and ignores the way kin term semantics includes both meaning through reference and through the structural relations among kin terms. The English term "uncle" does not have just the referential meaning given by the genealogical relation—mother's brother, father's brother, mother's sister's husband or father's sister's husband—but also has meaning through its conceptual relation to other kin terms *qua* kin terms and not as categories of genealogical relations. The kin term "uncle" is linked to other kin terms through computations that may be made using kin terms: I refer to him as "grandfather," he refers to that person as "daughter," and I refer to her as "aunt," so we have the kin term product *daughter of uncle*, and the kin term equation *daughter of grandparent is aunt*, that do not depend on whether the

individuals involved know their respective genealogical links. These are valid even in the absence of genealogical links, as may occur through adoption. Elsewhere (Read 2007a; see also Leaf and Read n.d.) I have given the rationale for considering kinship viewed through the logic of kinship terminology structures to be a new paradigm. In this chapter I examine how this paradigm relates to the work by Per Hage on kinship terminologies and explore its implications for the Proto-Polynesian terminology worked out by Jeff Marck (1996) that appears in several of Per Hage's papers on kinship (e.g., Hage 2001a, 2001b; Hage and Marck 2001).

Kinship Terminology Constraints

In his work on kinship terminologies, Per Hage brought to the foreground a fundamental issue about the structural organization of kinship terminologies that reflects on our understanding not just of terminologies, but more broadly on the organization of cultural idea systems in general: What are the constraints that affect the structural organization of kinship terminologies? As discussed in the chapter by David Jenkins, Hage addressed this question by examining the systematicity of kinship terminologies through linguistic factors, as suggested by Kroeber (1909). Hage considered that kin terms are individually constrained through a preference for conjunctive over disjunctive definitions, and are pairwise connected through linguistic marking in the manner laid out by the anthropological linguist Joseph Greenberg, with the constraint that "these dimensions are not free to combine in any arbitrary way" (Hage 1997, 664). From this he concluded (1999c, 424) that Greenberg's theory on marked and unmarked terms consequently has direct implications for the pattern of evolutionary changes in kinship terminologies.

Greenberg's marking theory gave him a way to reconstruct evolutionary changes in kinship terminologies by assuming that structural differences between parent and offspring terminologies would arise through changes in kin terms consistent with that theory. In so doing, Hage was following the framework used by most kinship theorists in which it is assumed that the structure as a whole does not constrain changes at the level of individual terms. For example, Nerlove and Romney's (1967) argument about the number of possible sibling terminologies in comparison to the number of actual sibling terminologies (also discussed in the chapter by Douglas Jones; see also Kronenfeld 2009, Chap. 12) starts with the assumption that each of the logically possible 4,140 partitions of the set of eight ways in which sibling relations can be genealogically constructed (sex of referent x, sex of speaker x, relative age of speaker, and referent) could be the set of sibling terms in a terminology. From this they concluded that the actual, restricted range for sets of sibling terms is due to constraints on the properties of terms, such as non-use of disjunctive definitions. In their argument, the statistical pattern for sibling terms isolated from terminologies was used inductively to arrive at allegedly causal factors. This approach, though, does not consider whether a vast number of what they considered to be logically possible sets of sibling terms are, in fact, inadmissible due to being inconsistent with the generative logic of kinship terminology structures discussed by Bennardo and Read (2005, 2007) and Leaf and Read (n.d., Chap. 6).

In a similar manner, Greenberg's marking theory focuses on local properties of kin terms and mainly provides descriptive accounts about pairs of kin terms considered in isolation without reference to the overall logic of a kinship terminology structure. For example, the fact that sibling terms in English are sex-marked but cousin terms are not is said to be an instance of syncretization (distinctions present in the unmarked term, in this case sibling terms, are absent in the marked term, in this case cousin terms) (Hage 1999c). But this is just a descriptive statement about the English terminology and does not answer why the English term "cousin" is not sex-marked in the first place. In the reverse direction, although syncretization would predict that we would not find a terminology with sex-marked "cousin" terms and non-sex-marked "sibling" terms, it is still a descriptive and not a causal argument as it fails to identify the generative basis for the observed regularity. As an alternative, we can express sex marking of kin terms in the English terminology through a simple causal rule. To do so, we first need to introduce the fundamental concept upon which the underlying conceptual and generative logic for the structure of a kinship terminology is based. This generative logic has been demonstrated exhaustively for a wide variety of terminologies, including the American/English terminology (Read and Behrens 1990 along with implementation of that structural logic in the software program KAES [Read 2006]), the Shipibo terminology (Read and Behrens 1990; structural logic demonstrated through KAES), the Trobriand terminology (Read and Behrens 1990; structural logic demonstrated through KAES); the Punjabi terminology (structural logic demonstrated through KAES), the Tongan terminology (Bennardo and Read 2005, 2007), the

Kariera terminology (Leaf and Read n.d.), the !Kung San terminology (Read 2007a), the Polish terminology (Lee and Read n.d.), and the Agta terminology (Read, Headland, Leaf and Fischer n.d.) and constitutes a new paradigm discussed in Read 2007a for framing how we perceive of kin relations expressed through kin terms.

The New Paradigm: Structural Logic of Kinship Terminologies

The Kin Term Product

The key to modeling the structural logic of a kinship terminology with structural form expressed either through a kinship map (which graphically identifies the relations among kin terms in the manner by which they are elicited experimentally [Leaf 1971, 2006]) or a kin term map (which shows the structural relations among the kin terms based on the generating terms for the terminology [Read 1984]; see Figure 13.2 below for an example of a kin term map) is the notion of a kin term product: If ego (properly) refers to alter 1 by the kin term L and alter 1 (properly) refers to alter 2 by the kin term K, then the kin term M used (properly) by ego to refer to alter 2 is the *kin term product* between K and L, written "K of L is M."[1] For example, users of the American terminology would say that if ego refers to alter 1 by "uncle," and alter 1 refers to alter 2 by "child," then ego refers to alter 2 by "cousin," and so "child of uncle" is "cousin," with this expression interpreted as stating how the kin terms "uncle," "child," and "cousin" are structurally linked. The kin term product may be elicited and expressed without reference to genealogical relations among ego, alter 1, and alter 2.

The kin term product formally recognizes how folks on the ground compute kin relations without reference to, and even without knowledge of, genealogical relations. The ethnographic literature is replete with ethnographic examples showing how kin relations are computed using kin term products (see references in Read 2007a). For example, Levinson (2002) makes the computation explicit for Rossel Island:

> Kinship reckoning on Rossel does not rely on knowledge of kin-type strings.... What is essential in order to apply a kin term to an individual X, is to know how someone else, of a determinate kinship type to oneself, refers to X. From that knowledge alone, a correct appellation can be deduced. For example, suppose someone I call a tîdê "sister" calls X a tp:ee "my child," then I can call X a chênê "my nephew," without having the faintest idea of my genealogical connection to X. (Levinson 2002, 18)

Kin Term Products and Structural Logic

By using the kin term product, we can formulate a simple rule for English sex marking of kin terms: For any kin term K, if the kin term product *spouse of K* is a non-affinal kin term or *spouse of* K^r is a non-affinal kin term (where K^r is the reciprocal term for K) then, and only then, K will be sex-marked. (In this rule "spouse" is the kin term used by a married ego to refer to the person to whom ego is married.) According to this rule, "parent" is sex-marked as "father" or "mother" since *spouse* of *parent* is *parent*, and so *spouse* of *parent* is a kin term. Similarly, there are sex-marked terms "aunt" and "uncle" (and reciprocally, "niece" and "nephew") since *spouse* of *aunt* is *uncle* and *spouse* of *uncle* is *aunt*. The rule also applies to "spouse" via *spouse* of *spouse* is *self*, where "self" is included in the product computations of kin terms due to the centrality of the "self" concept for any kinship terminology.[2] It follows from the rule that "spouse" is sex-marked, namely as "husband" or "wife." Finally, according to this rule, "cousin" is not sex-marked since "spouse of cousin" is not a kin term in the set of English/American kin terms. The rule accounts precisely for all terms that are sex-marked and all terms that lack sex marking. Now we need to consider why "spouse of cousin" is not a kin term.

The absence of "cousin-in-law" as a term derives from the fact that *parent* of *parent* of *spouse* = 0, where the 0 indicates that this kin term product does not lead to a kin term. To see this, I will show that the reciprocal of the kin term product *spouse* of *cousin* is not a kin term when *parent* of *parent* of *spouse* = 0, hence "spouse of cousin" cannot be a kin term due to closure of terminologies under reciprocality of kin terms. To show this, first note that the kin term "cousin" is generated by the kin term product *child* of *child* of *parent* of *parent*, so we have the equation *spouse* of *cousin* = *spouse* of *child* of *child* of *parent* of *parent*. Next, the reciprocal for *spouse* of *cousin* is therefore given by the reciprocal of the kin term product *spouse* of *child* of *child* of *parent* of *parent* and the latter is *child* of *child* of *parent* of *parent* of *spouse*. Lastly, since *parent* of *parent* of *spouse* = 0, it follows that *child* of *child* of *parent* of *parent* of *spouse* = *child* of *child* of 0 = 0, hence the reciprocal for "spouse of cousin" is not a kin term, thus "spouse of cousin" is not a kin term. Logically, then, the term "cousin-in-law" cannot be introduced into the ter-

minology without violating consistency in the structural logic of the American terminology expressed through kin term products. Observe that in this argument no reference to genealogy has been made. This is not accidental, but a consequence of the fact that the conceptual basis for the structure of kinship terminologies is distinct from properties that are part of the genealogical domain.

Relationship of Genealogy to the Structure of Kinship Terminologies

The common assumption in kinship theories has been that the genealogical domain provides the conceptual foundation for the structural properties of kinship terminologies. Greenberg makes this assumption explicit in applying his marking theory to kinship terminologies when he assumes all terminology properties are reducible to genealogical distinctions, even though he comments, without elaboration, that this could be done only by "[l]eaving aside some difficulties and complications" ([1980] 1990, 313). The unstated difficulties and complications are the Achilles heel of the presumption of a genealogical space as the reference domain for delineating the structure of terminologies and the meaning of kin terms. Numerous ethnographic examples run counter to this genealogical claim (see examples and references in Read 2007a). Nonetheless, kinship theorists, especially those characterized by Parkin (2009) as extensionists (e.g., Floyd Lounsbury and Harold Scheffler, among others; see also the discussion of kin term extensions in the chapter by Christopher Ehret), have assumed that genealogy is prior, in an ontological sense, to a terminology, and therefore a kinship terminology should be analyzed by reference to genealogical criteria with consequence that "genealogical reckoning be elevated to the status of an analytical technique" (Parkin 2009, 163). Explicit claims for the primacy of genealogy as the basis for defining kinship and kinship terms go back at least to W. H. R. Rivers's (1924) assertion: "A third mode of definition which has been suggested [for defining kinship] is by means of terms of relationship, but *since these are determined by genealogical relationship*…this is quite unsuitable" (Rivers 1924, 53, emphasis added). Subsequent theorists have sometimes made this assumption explicit, as in the claim that "a system of kin classification is a system of classification of ego-centric, genealogical relationships" (Scheffler 1987, 217). Formal methods for analyzing kinship terminologies—such as componential analysis and rewrite rule analysis, derived from assuming the primacy of genealogy in the meaning of kin terms—would just be exercises in the formal manipulation of a symbolic notational system for the representation of genealogically defined kin terms without this assumption (Scheffler and Lounsbury 1971, Read 2000).

Rivers's claim about genealogical determination of kin terms is contradicted empirically, though, by the fact that genealogical definitions of kin terms may be derived with complete accuracy from the structural properties of a kinship terminology in conjunction with the genealogical instantiation[3] of just the generating terms. For example, in the American kinship terminology (but not necessarily in other terminologies), the primary, generating terms are "parent" (along with its reciprocal term, "child") and the self-reciprocal kin term "spouse," with the latter being the generating term for the affinal portion of the American kinship terminology structure (see the right side of Fig. 13.1). All of the kin terms of the American kinship terminology can be generated systematically from these two primary terms.

From this generated structure, along with the genealogical instantiation of "parent" by {genealogical father, genealogical mother} and "spouse" by {genealogical husband, genealogical wife}, may be deduced, for example, the genealogical definition of "aunt" as the set of genealogical relations given by {father's brother, mother's brother, father's sister's husband, mother's sister's husband}. Similar deductions may be made for all other kin terms (see Read 2001, 2007 for details). Other terminologies will likely have different primary terms (e.g., "father" rather than the neutral "parent") and different structural equations, thereby leading to different structural forms across the corpus of kinship terminologies.

The fact that genealogical definitions of kin terms can be deduced without error from the structure of a kinship terminology using the genealogical instantiation of the generation kin terms cannot, in any plausible manner, be accounted for within the extensionist framework that considers genealogical relations (however defined) to be the basis for kinship relations, and kin terms to be just linguistic labels for categories of genealogical relations determined for reasons extrinsic to the terminology. It would be truly extraordinary if by chance the kin terms for the American/English terminology were determined by, say, functional or pragmatic aspects of kinship terms arising through kin term usage, linguistic constraints such as marked/not marked, historically contingent events that led to the introduction of certain kin terms, and so on, yet somehow all of this coincidentally ended up

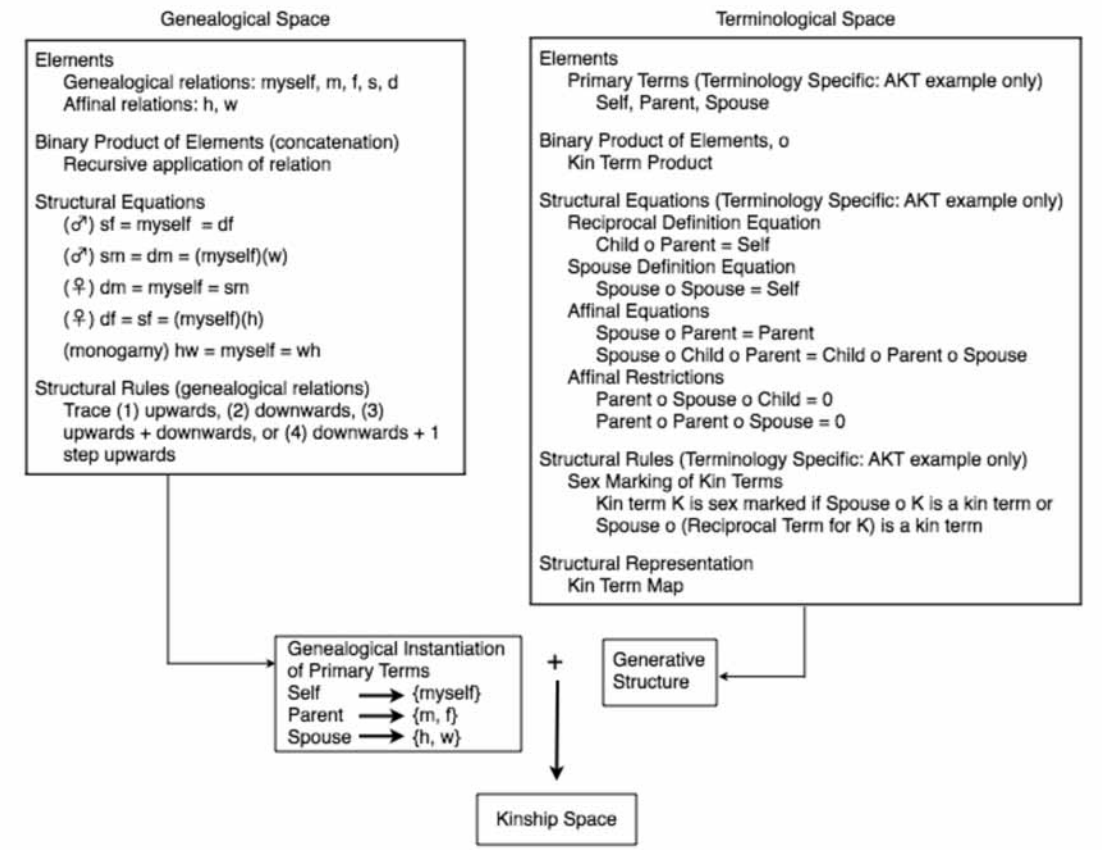


FIGURE 13.1. Two conceptual systems that are the foundation for kinship space.

with a configuration of kin terms that has a clear and specific generative logic that also enables precise duplication of the genealogical categorization associated with kin terms. That one terminology should have this remarkable coincidence is highly improbable; that a diverse range of terminologies such as that of American/English, Shipibo, Trobriand, Tongan, Kariera, !Kung San, Punjabi, Polish, and Agta (the terminologies analyzed to date) should all converge on structures that only coincidentally have a generative logic enabling deduction of the genealogical definitions of kin terms is simply not possible.

In summary, terminological features are not, in general, reducible to derivations based on properties of a genealogical space. This does not mean that genealogical properties—or properties derived from genealogical properties, such as marking theory—are irrelevant, but rather that these are not adequate as a singular foundation for explicating the structural properties of kinship terminologies. Hage correctly noted the relevance of marking theory based on genealogical properties as another dimension that adds to our understanding of changes in terminologies, but, by itself, this is not a sufficient theory for explicating kinship terminology structures and their transformations. As Robert Parkin has noted: "category and genealogy represent different forms of knowledge about kinship…I[I]f there is any universal here…all speech communities use *both* category and genealogy… in explaining kinship to themselves and to others, depending on the context" (2009, 164, 165, emphasis added; see also Parkin 1996). Instead of viewing kinship as genealogically founded, kinship theorizing requires a new paradigm that incorporates both genealogy and category, and demonstrates the relationship between them. This paradigm, presented in a series of publications (Read 1984, Read and Behrens 1990, Read 2001, Read 2007a, Leaf and Read n.d.), begins by identifying the conceptual basis of what we refer to as "kinship" as being composed of one conceptual system having to do with the logic and properties of a kinship term space generated through products of kin terms, and the other conceptual system having to do with the logic and properties of a genealogical space generated through genealogical tracing. Neither space can be reduced to the other, and neither can be derived from the other. The two conceptual systems are linked through the

instantiation of the generating terms of the terminological structure using genealogical concepts, and this gives rise to what we can call "kinship space" (see Fig. 13.1), the conceptual system of kinship relations determined through both the structural logic of kinship terminologies and the cultural instantiation of that structure through (but not limited to) relations in the genealogical space identified through the process of genealogical tracing.

Kinship Space: A Dual Conceptual System

Genealogical Tracing

Consider first the notion of genealogical tracing, which is based on the concept of *myself* structurally linked via a *genealogical mother relation* (denoted by *m* in the genealogical space box in Fig. 13.1) to a *genealogical mother* position and by a *genealogical father relation* (denoted by *f* in the genealogical space box in Fig. 13.1) to a *genealogical father* position. Genealogical tracing begins by instantiating *myself* to be the reference person from whom the tracing is being done. Next, the position *genealogical mother* is linked conceptually (hence structurally) to *myself* by the *m* relation through a culturally specified criterion (or criteria) for instantiating the *genealogical mother* position with a unique female person (that is, the person who is the "genealogical mother of myself"). Similarly, the *genealogical father* position is instantiated with a unique male person. The precise criterion for the assignment has been left unspecified here, as there is substantial ethnographic evidence indicating that no single criterion is used universally for this instantiation. Instead, what may be universal is the concept of genealogical tracing as a structure preserving, but not content preserving, abstraction based on (but not reducible to) the empirical, biological facts of reproduction (Lehman 2001, Read 2001). Next, the concept of marriage determines a *husband* affinal relation (denoted by *h* in Fig. 13.1) and a *wife* affinal relation (denoted by *w* in Fig. 13.1) and correspondingly introduces a *wife* position and a *husband* position into genealogical tracing when affinal relations are included. These latter positions are generally instantiated by a female person and a male person, respectively, but there are exceptions, such as female husbands documented in more than thirty African societies (O'Brien 1977) and gay and lesbian marriages in the United States and elsewhere.

Genealogical tracing proceeds recursively. First the *myself* position is instantiated, and then a genealogical position is instantiated by a person having the specified genealogical relation to the person instantiated as *myself*. Second, and recursively, the first step is repeated by using a person identified in the first step as the new instantiation for the *myself* position. Thus a person, call him John, is initially instantiated as "myself" and then *genealogical mother* (or *genealogical father*) is instantiated with a female named, say, Susan, whom John considers to be his genealogical mother. The process continues recursively by instantiating *myself* with Susan and then instantiating the *genealogical mother* position (or the *genealogical father* position) through reference to Susan.

From an algebraic viewpoint, recursion provides the basis for defining a binary product over the relations used in genealogical tracing. That is, we can define the kin type product relation *fm* (read "genealogical father's genealogical mother") to mean that the person instantiated as genealogical father with respect to the person initially instantiated as *myself* is then used as the person instantiating *myself* and then the person identified as that person's genealogical mother has the relation given by the kin type product *fm* to the person initially instantiated as *myself*.

The binary kin type product is constrained to make it consistent with the practice of genealogical tracing. In particular, for a male speaker the genealogical father of his genealogical son (or daughter) is himself, so $fs = myself = fd$ for a male speaker, and similarly, for a female speaker, $ms = myself = md$. For the affinal relations, $hw = myself = wh$ is structurally consistent with monogamous marriage, $wh = myself$ is structurally consistent with polygynous marriages, and $hw = myself$ is structurally consistent with polyandrous marriages.

The structural rules identify restrictions placed on whether the outcome of genealogical tracing identifies persons considered to be genealogically connected. The first three rules restrict genealogical tracing to pathways whereby two persons, A and B, are considered to be genealogically connected only if there is a third person, C, such that one can trace upward from A to C and upward from B to C. This ensures that a genealogical structure constructed consistently with these rules will be an abstraction of the empirical structure for genetically connected individuals. More precisely, the first rule indicates that lineal genealogical relations are included in genealogical tracing; the second rule ensures the reciprocal of lineal relations are included in genealogical tracing; and the third rule indicates that collateral genealogical relations are included within genealogical tracing. The fourth rule identifies where genealogical relations and affinal relations come together in genealogical tracing; for

example, "son's mother" for a male speaker is (conceptually at least) "male speaker's wife." The received view of kinship presumes that kin terms relate to the genealogical relations engendered through genealogical tracing by means of classification and are constrained just by linguistic properties such as marked/nonmarked and/or avoidance of disjunction definitions for classification. As mentioned above, the shortcoming of the received view is that it does not account for the generative logic of kinship terminologies.

Generative Logic of Kinship Terminology Structures

The generative logic is sketched out in the Terminological Space box in Figure 13.1 for the American kinship terminology (AKT). Other terminologies will follow the same steps, but with different content. (The underlying theory is given in Read 1984, 2007; Read and Behrens 1990; Bennardo and Read 2005, 2007; and Leaf and Read n.d.) Briefly, all terminologies include the concept of "self," whether or not it is identified through a kin term. The "self" concept acts as an identity element for the kin term product.[4] The terminology structure is generated by first identifying the ascending generating kin term (or terms). All terminologies will have some variant of "parent," "mother," and/or "father" as an ascending generating term. Some terminologies—the so-called classificatory terminologies—also have a sibling-generating term such as "brother," or "elder same sex sibling," and it is the fact of a sibling-generating term that leads to the structure of classificatory terminologies (see Read and Behrens 1990; Bennardo and Read 2005, 2007; Leaf and Read n.d., Chap. 4). All the ways of characterizing classificatory terminologies through genealogical equations such as $f = fb \neq mb$ are a logical consequence of a sibling term as a generating term and hence are derivative, not defining, structural properties.

Next, an ascending structure is generated from the ascending generating term(s). In the case of the AKT, this will consist of the lineal sequence of kin terms "self," "parent," "grandparent," and so on, but may, and often does, take a different structural form for other terminologies.

The descending structure is then constructed through making an isomorphic copy of the ascending structure; that is, generating kin terms for the descending structure are introduced along with equations that correspond to structural equations for the ascending structure, if any. For the AKT, the term "child" is introduced as a generating term for the descending structure. Reciprocity between terms in the ascending structure and the descending structure (such as "parent" and "child" in the AKT) are determined through a structural equation of the form *ascending term* o *descending term* = *self* (read "ascending term of descending term is self"). For the AKT, the structural equation that defines "parent" and "child" as reciprocal terms is *parent* of *child* = *self*, where *parent* of *child* is the kin term product between these two kin terms. The rationale for this equation can be seen as follows. For English speakers making use of kin terms just in the structure of ascending and descending terms (that is, without incorporating affinal relations), if ego refers to alter 1 as "child," and alter 1 refers to alter 2 as "parent," then absent affinal relations, alter 2 must be ego for there to be a non-affinal relation between ego and alter 2. In this case, since ego refers to her/himself as "self," it follows that "parent of child" is "self" as a kin term product, hence the equation, *parent* o *child* = *self* as an equation defining reciprocity between the kin terms *parent* and *child*.

Sex marking of kin terms is introduced in some terminologies, including the AKT, via sex marking elements. In other terminologies it is introduced through making an isomorphic copy of the ascending + descending structure; that is, there will be one structure consisting of male marked terms and a second structure consisting of female marked terms. This is the manner in which sex marking is introduced in the classificatory terminologies and in the "pure descriptive" terminologies, such as the Polish terminology. An example of this form of sex marking is given in the next section with the Proto-Polynesian terminology.

Next an affinal structure is introduced, often through inclusion of a "spouse" or a "husband" or "wife" generating term. The AKT introduces affinal relations through a spouse-generating term along with appropriate structural equations, as indicated in Figure 13.1 for the AKT. Other terminologies, such as the Kariera terminology from Australia, introduce an affinal structure through a marriage rule. In the case of the Kariera terminology, the marriage rule is logically inseparable from the terminology structure (Leaf and Read n.d., Chap. 7).

Next, terminology-specific rules introduce local structural properties, such as the nomenclature for the "cousin" terms in the AKT and skewing rules in a terminology such as the Trobriand terminology (Lounsbury 1965) or the Fanti terminology (Kronenfeld 2009).

Finally, some terminologies will have term-specific properties that relate to the intersection between the terminology as a conceptual system and other cultur-

ally salient conceptual systems. For example, an "elder brother"/"younger brother" distinction for the term 'brother' of 'mother' in the Tongan terminology relates to the way inheritance is conceptualized in Tongan culture (Bennardo and Read 2007).

As indicated in Figure 13.1, the elements (genealogical mother, genealogical father, and their reciprocals) used in genealogical tracing are included in the cultural instantiation of the primary generating terms for the terminological structure. These generating terms, initially abstract concepts, are instantiated as sets (or categories) of genealogical relations; for example, the generating kin term "parent" for the AKT is instantiated as the set whose members are the genealogical mother and genealogical father. This instantiation of the primary terms, in conjunction with the generative logic of the terminology (which can be visually presented in the form of a kin term map, as discussed in the next section), suffices to deduce the genealogical instantiations of all other kin terms through kin term products of the generating terms. For example, the generative logic of the AKT indicates that *grandparent = parent of parent*. The instantiation of "parent" as {m, f} implies that the instantiation of "grandparent" will be {m, f} x {m, f} = {mm, mf, fm, ff}, and similarly for all the other kin terms expressed as kin term products of the generating terms. Hence the genealogical definitions of kin terms (other than the primary terms) are derived from the structural properties of the kinship terminology and thus are not primary defining properties for those terms.

Instantiation of kin terms as sets of genealogical relations appears to be universal, though the importance placed on this instantiation varies culturally; for example, "among the Agta [former hunter-gatherer group in eastern Luzon, Philippines], memory of grandparents is memory of a person, not of a genealogy" (Headland 1987, 262). Cultural instantiation of primary terms is not limited to genealogical relations and can include other relations such as adoption parent. We can illustrate these ideas with the Proto-Polynesian terminology as reconstructed by Jeff Marck (1996).

Structural Properties of the Proto-Polynesian Kinship Terminology

The generative logic outlined above is neither isolated from, nor irrelevant to, other ways that terminologies may be characterized, but instead it provides a basis for better understanding what are primary terminological properties and what are derivative properties. For example, as discussed above, the generative logic makes it evident why some, but not all, affinal terms are marked with an -in-law suffix in the AKT, why kin term products such as *spouse of cousin* do not yield a kin term in the AKT, and so on. Another example of this kind of cross-referencing between different ways of characterizing the properties of a kinship space like that characterized in Figure 13.1 can be seen in Jeff Marck's (1996) reconstruction of the Proto-Polynesian (PPN) terminology.

Marck's reconstruction is based on the morphological forms of kin terms from all the Polynesian kinship terminologies reported on ethnographically, and it represents what appears to be a set of kin terms from which all Polynesian kin terms have been linguistically derived. The generative logic for the classificatory terminologies discussed above relates directly to his argument. It both adds confirmation to parts of his argument while making it evident that the transformation of terminology structures is more complex than indicated through linguistic transformations alone. Structures do not change merely by adding or removing equations or by "neutralizing" or removing distinctions. Instead, change is constrained in so doing by the terminology's generative logic as to the kinds of equations that might be added or deleted, or when neutralization can take place. As McConvell and Keen note in their chapter: "One of the problems is establishing principles whereby such possible or likely transformations can be distinguished from the impossible or unlikely ones" (p. 3). The argument being advanced here is that the linguistic transformations are constrained by the generative logic of a terminology.

The Proto-Polynesian terminology reconstructed by Marck and further analyzed by Hage and Marck (2001) is presented in Table 13.1. The right column gives the closest English transliteration for a PPN kin term and is included in single quotation marks to signal that the meaning of the PPN kin term is not the same as the meaning of the corresponding English kin term. This differs from Hage and Marck's presentation of the PPN kin terms as they give the focal genealogical relation for each kin term (see chapter by Warren Shapiro for a discussion of focality as it applies to kin term categories) since the goal here is to present the structural logic of the PPN kin terms expressed through kin term products with primary (i.e., generating) kin terms. Thus in Table 13.1 the transliteration for **tama(na)* is (a) 'father' or (b) 'brother' of 'father' since **tuaka(na)* of **tama(na)* = **tama(na)* = **tahina* of **tama(na)* (read 'elder same sex sibling' of 'father' = 'father' = 'younger same sex sibling' of 'father'). From previous work with the Tongan terminology (see Bennardo and Read 2005, 2007),

TABLE 13.1. Proto-Polynesian kin terms

*tupuna	'grandparent'
*tama(na)	'father,' 'brother' of 'father'
*tina(na)	'mother,' 'sister' of 'mother'
*tuʔa-tina	'brother' of 'mother'
*masaki-tanga	'sister' of 'father'
*tuaka(na)	'elder same sex sibling'
*tahina	'younger same sex sibling'
*tua-ŋaʔane	♀'brother'
*tua-fafine	♂'sister'
*tama	♀'son'
**fosa	♂'son'
*tama-ʔa-fine	♀'daughter'
*ʔo-fafine	♂'daughter'
**faka-fotu	♀'child' of 'brother'
*ʔilamutu	♂'child' of 'sister'
*makupuna	'grandchild'

Notes: Data from Hage and Marck 2001, Marck 1996a; affinal terms not included. Sex symbols indicate the sex of speaker for a kin term.
* Reconstructed Proto-Polynesian linguistic form.
** Uncertain if the linguistic form is Proto-Polynesian (Marck 1996a).

we know that the generating kin terms will be **tama(na)* and its reciprocal term ***fosa*, **tina(na)* and its reciprocal term **tama-ʔa-fine*, and **tuaka(na)* and its reciprocal term **tahina*. In addition, rather than the structure having a single node for the "self" concept (as is the case with the AKT), the PPN terminology will include both a "male self" concept and a "female self" concept; that is, the male-female distinction is a fundamental property of the PPN terminology and is expressed through the terminology having both a male self whose instantiation will be a male reference person, and a female self position whose instantiation will be a female reference person.

Kin Term Map for the PPN Terminol ogy

We form the kin term map for the PPN terminology (see Fig. 13.2) by constructing a graph in which each node is a kin term and an arrow is drawn from a kin term, call it K, to the kin term, call it L, that is the product of K with a generating kin term. Different arrow forms (shape of arrow head; solid, dashed, or dotted shaft [see box at bottom of Fig. 13.2]) are used to indicate which generating kin term is being used in a kin term product. Thus the dashed arrow with a solid arrow head from **tupuna* to **tama(na)* (left side of Fig. 13.2) indicates that the kin product ***fosa* of **tupuna* yields the kin term **tama(na)*. For comparison, the kin term map for the American terminology is shown in Fig. 13.3. Just by comparing these two maps, it is apparent that each is based on very different generative properties. The American terminology is built around an indefinitely extending "ladder" of pairs of sex-marked kin terms, with a series of collateral lines of kin terms. The PPN terminology, in contrast, separates the male terms from the female terms in two isomorphic structures, each of which is vertically and horizontally symmetric. Other structural differences can easily be identified when comparing these two kin term maps.

The shape of the kin term map is based on whatever layout most clearly shows the structural relations among the kin terms. For the PPN terminology, we would ideally use a three-dimensional graph since the terminology has a vertical dimension (see ascending/descending terms vertically aligned in Fig. 13.2), a horizontal dimension (see the location of the sibling terms in Fig. 13.2), and a third dimension for opposing the male-marked with the female-marked terms. In two dimensions, these two sets of terms can be drawn side-by-side (see Fig. 13.2). For purposes of identifying male and female kin term substructures, the neutral 'sibling,' 'grandparent,' and 'grandchild' kin terms have been included twice: once implicitly as male terms with the male-marked terms, and another time implicitly as female terms with the female-marked kin terms. Some arrows—such as the 'mother' arrow from **masaki-taŋa* ('sister of father') to **tupuna* ('grandparent')—have not been drawn for purposes of visual clarity. The missing arrows and the terms they connect are evident and can easily be added to the diagram if need be.

The terms **tua-ŋaʔane* and **tua-fafine* (prefaced with a female and a male symbol, respectively) and the two long arrows (with shadows) in the center of Figure 13.2 connecting these terms to each other need special mention. The structural analysis of the Tongan terminology makes it evident that the complete kin term map is formed from two embedded structures: a structure for male kin terms and a structure for female kin terms. These two embedded structures are shown in Figure 13.4 and obtained from Figure 13.2 by just including kin term products with either male terms or neutral terms for the terms in the left side of Figure 13.2, and similarly for the female

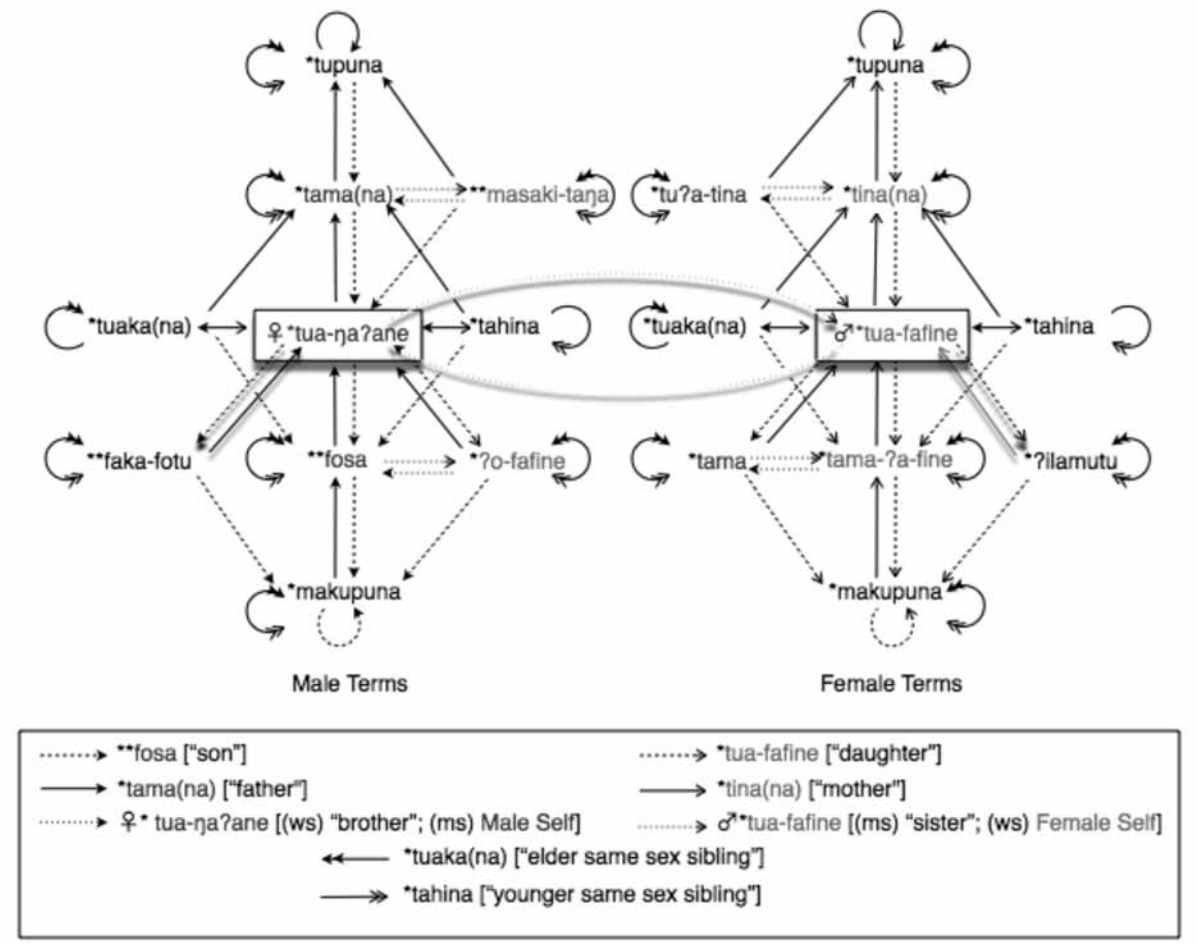


FIGURE 13.2. Kin term map for the Proto-Polynesian terminology.

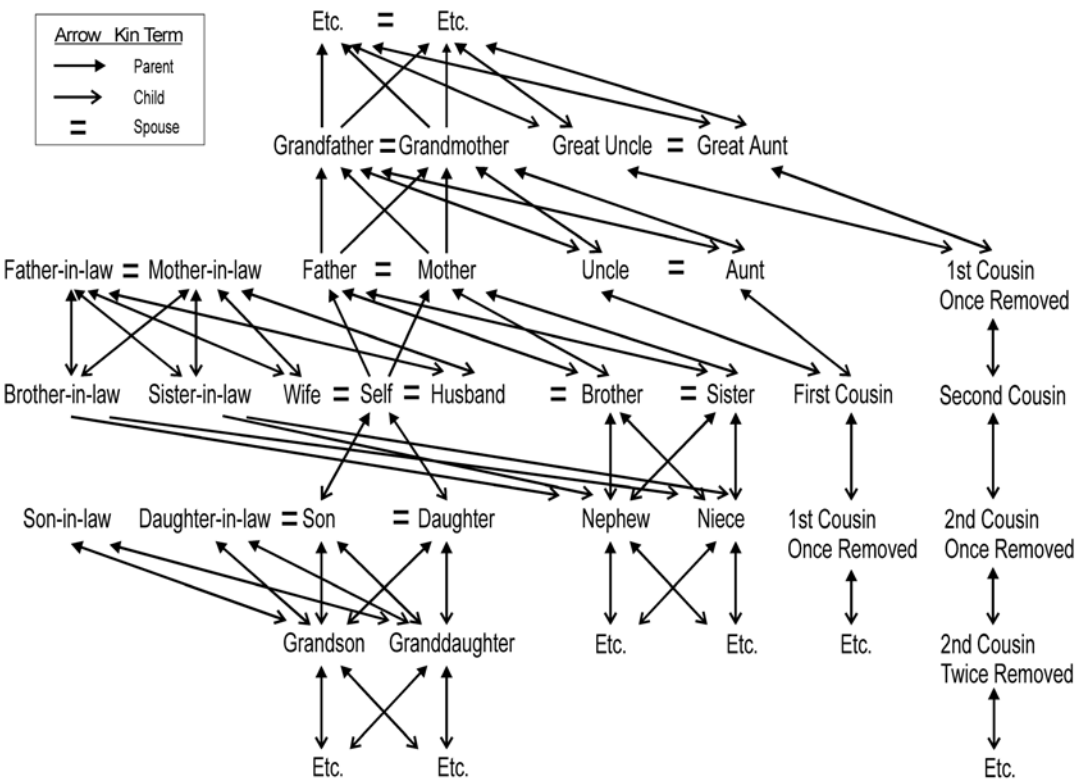


FIGURE 13.3. Kin term map of the American kinship terminology, based on the generating kin terms "parent," "child," and "spouse."

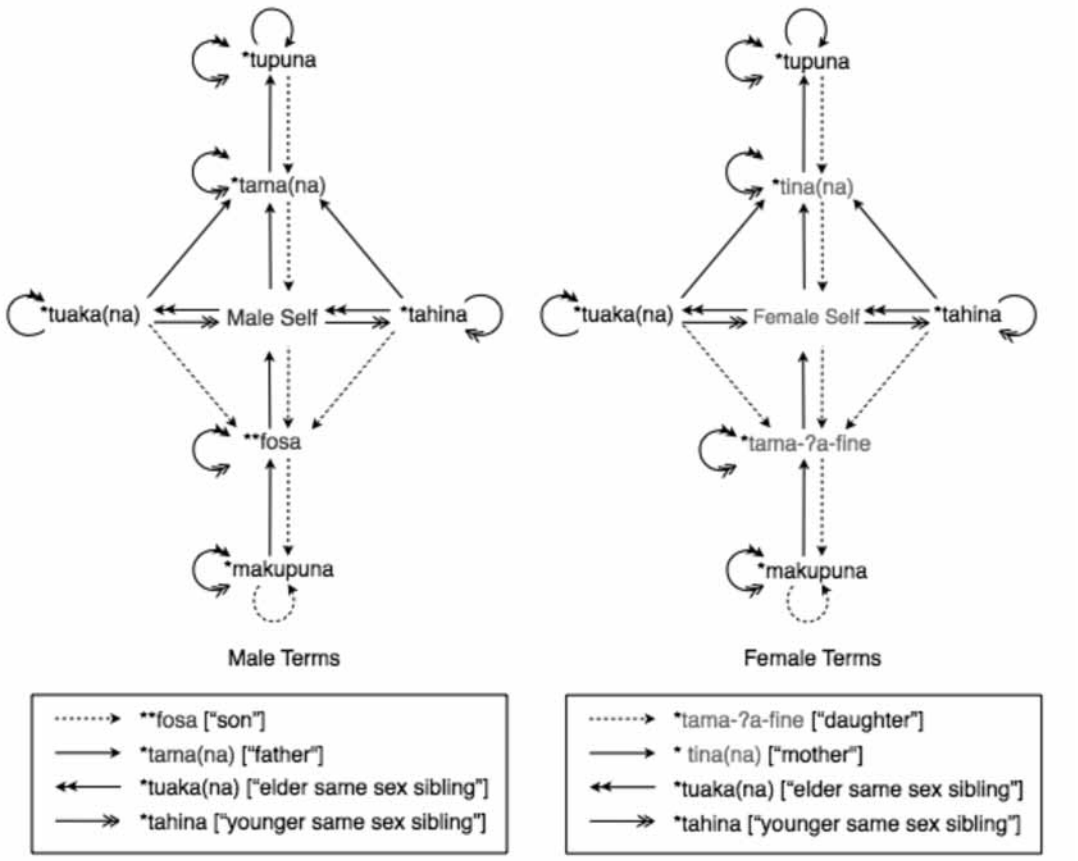


FIGURE 13.4. Structure of male terms (left side) and structure of female terms (right side) derived from Figure 13.2.

terms in the right side of Figure 13.2. In these two structures, male self is an identity element for kin term products with male-marked (or neutral) kin terms, and female self is an identity element for female-marked (or neutral) kin terms. This means that each of the two plays an analogous role to self in the AKT, but for terms of the same sex as these self terms. The instantiation of male self would be the reference male person for the male terms, and a similar comment applies to the "female self" term.

Embedded Male Structure and Female Structure

The isomorphism between these two structures is self-evident from Figure 13.4. The two structures are conceptually linked through a cultural construction that constrains the instantiation of male self and female self to relations that are genealogical brother or genealogical sister to the reference person, according to the latter's sex. That is, if A is a male person who is the instantiation of male self, then from A's perspective the instantiation of female self will be A's genealogical sister, and similarly for the instantiation of female self. Consequently, from the perspective of a male reference person, since female self is instantiated with his genealogical sister, it follows that the label for the female self position will be a term with transliteration 'sister of a male person,' which is precisely the PPN kin term, **tua-fafine*. Similarly, the male self position will be instantiated, from the perspective of a female reference person, by a male who is her genealogical brother; hence the label for the male self position will be a term with transliteration 'brother of a female person,' which is precisely the PPN kin term, **tua-ŋaʔane*. This implies that in the PPN terminology, a male person will have terms for "older genealogical brother," "younger genealogical brother," and "genealogical sister" as a consequence of the logic of how these two structures are connected. (A similar statement applies to a female person and her genealogical sisters and brothers.) Whereas the linguistic reconstruction only identifies that there are terms for "older/younger same sex sibling" and for

"opposite-sex sibling" in PPN, the structural analysis accounts for why the difference between same-sex and opposite-sex sibling terms with regard to "older"/"younger." (Compare the structural argument for the sibling terms in the PPN terminology with the linguistic argument for this pattern of sibling terms in the chapter by Douglas Jones.)

As a result, the central position in the substructure on the left side of Figure 13.2 is either male self when the reference person is a male (hence not labeled with a kin term; thus, the upward 'father' arrow from each of ***fosa* and **ʔo-fafine* is to unlabeled male self), or is labeled **tua-ŋaʔane* when the position is instantiated with genealogical brother from the perspective of a female reference person. This can be seen with the downward arrow (with a shadow) from **tua-ŋaʔane* to ***faka-fotu* ('child of brother' for a female reference person) and the reciprocal upward 'father' arrow (with a shadow) from ***faka-fotu* back to **tua-ŋaʔane*.

Further, since male self is only an identity element for male-marked (and neutral) kin terms, and similarly, female self is only an identity element for female-marked (and neutral) kin terms, it follows that kin term products such as female self of K, where K is a male-marked kin term, will be a new node in the structure and hence correspond to a different kin term. Thus **tua-ŋaʔane* ('brother' of female) of **tina(na)* ('mother') = **tuʔa-tina* ('brother of mother') (see arrow from **tina(na)* to **tuʔa-tina* in Figure 13.2 using the arrow type corresponding to the term **tua-ŋaʔane*). Since **tina(na)* is instantiated as a female person, the product **tua-ŋaʔane* of **tina(na)* is a kin term product consistent with **tua-ŋaʔane*, only being used by a female speaker.

What appears to be a complicated structure in Figure 13.2 is due primarily to cross products of terms from the simple male structure and the simple female structure shown in Figure 13.4 that are necessary for logical completeness. Each simple structure consists of a bounded, lineal sequence of terms for the ascending/descending directions and a pair of reciprocal "sibling" kin terms for a second, horizontal dimension. Because the "sibling" terms are generating terms and not compound terms, as is the case for the AKT where *son of parent = brother*, *daughter of parent = sister* are the kin term products giving rise to the kin terms "brother" and "sister," respectively; **fosa* of **tama(na)* is male self, not a "sibling" term. Thus there are no collateral positions in this terminological structure, as noted by Morgan for classificatory terminologies.

Comparison of Classificatory Terminologies: Proto-Polynesian, Tongan, Trobriand, and Kariera

Not surprisingly, the two structures shown in Figure 13.4 (and derived from the PPN terminology kin term map shown in Figure 13.2) are also isomorphic to the male term and female term structures for the Tongan terminology derived in a similar manner from a kin term map (see Bennardo and Read 2007, Fig. 13.6). Less obviously, the Trobriand terminology, a non-Polynesian, Oceanic terminology, has precisely the same structure for male and female terms, though differing (a) by using a single, neutral term in place of the pair of sex-marked terms, **tua-ŋaʔane* and **tua-fafine* for the male self and female self nodes (but note that the neutral term for these nodes differs from the reconstruction of Proto-Oceanic, Table 8.1 in the chapter by Marck and Bostoen) and (b) repeating the +2 generation term as the −2 generation term (see Read and Behrens 1990, Fig. 8b). In addition, the Trobriand terminology, without its skewing rule, structurally matches the structure for the PPN terminology shown in Figure 13.2. Even more surprising, perhaps, is the fact that the Kariera terminology, a Dravidian type, has exactly the same pair of structures for the male and female terms, but with the exception that the neutral terms in these structures for PPN are replaced by sex-marked terms in the Kariera terminology, and the +2 generation terms are repeated as −2 generation terms (see Fig. 13.5A). Unlike the PPN terminology, though, the Kariera terminology has both sex-marked 'older cross-sex sibling' and 'younger cross-sex sibling' terms. This difference between the PPN and Kariera terminologies arises from a different logic for connecting the pair of unconnected, sex-marked structures into a single structure for the terminology as a whole. Rather than connecting the two structures through the male self and the female self nodes as shown in Figure 13.2, the two structures are linked through the sex-marked "older same-sex sibling" and "younger same-sex sibling" terms in the Kariera terminology. The difference in the two ways the structures may be joined are shown in Figure 13.5A for the Kariera terminology and Figure 13.5B for the PPN terminology (see Leaf and Read n.d., Chap. 7, for details). From that logic for the Kariera terminology also arises the so-called Kariera cross-cousin marriage rule as logically necessary for the terminology to have a globally consistent structural form (ibid.).

There is also a subtle, but very real difference between the Tongan terminology as it is used in practice and the

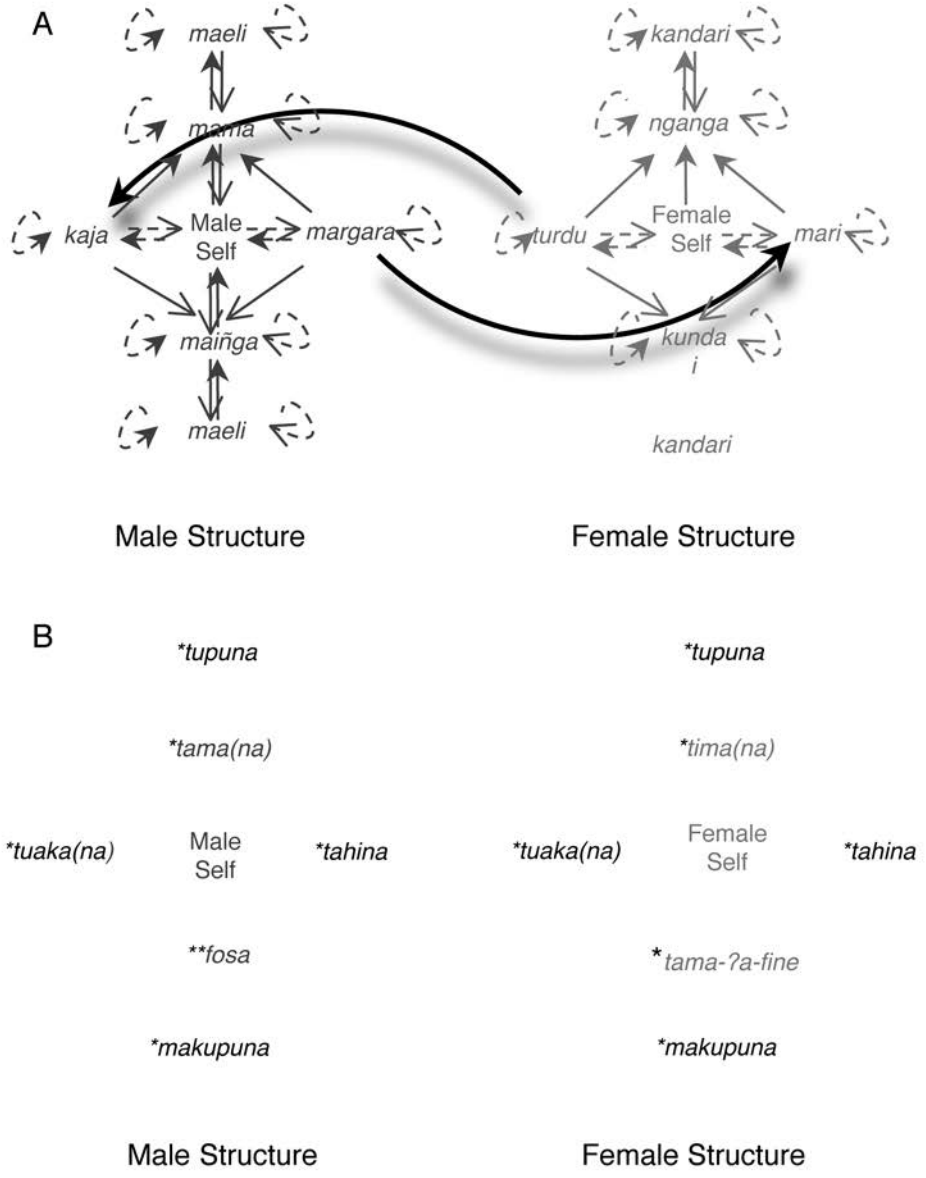


FIGURE 13.5. (A) Kariera terminology. The disjoint structures are linked through the *kaja/turdu* and the *margara/mari* positions. For a reference person located at Male Self or Female Self, the sibling positions become *kaja*, *margara*, *turdu*, and *mari* (glossed as "older brother," "younger brother," "older sister," and "younger sister," respectively). (B) The PPN terminology links the disjoint structures through the Male Self and Female Self positions labeled as sibling terms. For a male reference person located at Male Self, the Female Self position is labeled "sister," and for a female reference person located at Female Self, the Male Self position is labeled "brother" (see Figure 13.2).

Trobriand terminology that arises from the way the ascending and descending structures are generated. The usage difference relates to the fact that a person's behavior toward genealogical parallel cousins is differentiated from behavior toward genealogical cross cousins, even though the two kinds of "cousins" are not terminologically differentiated (Biersack 1982). The difference between Tongan and Trobriand kin term usage can be accounted for by two different ways the structure shown in Figure 13.2 may be generated. To see the difference, begin with the male ascending structure generated with the terms 'male self,' *tamai* ('father'), and *tokoua* ('same-sex sibling') for the Tongan terminology (Bennardo and Read 2005, 2007), and the terms 'male self,' *tama* ('father') and *tuwa* ('older same-sex sibling') for the Trobriand terminology (Read and Behrens 1990). After the ascending

structure is generated, the descending structure is generated through making an isomorphic copy of the ascending structure. There are two ways this may be done: (1) Both of the generators (other than male self) for the descending structure are different from their counterparts in the ascending structure—the procedure used for the Trobriand terminology. Thus for the Trobriand terminology the generators for the ascending structure are 'male self,' *tama* ('father') and *tuwa* ('older same-sex sibling'), and the generating terms for the descending structure are 'male self,' *latu* ('son') and *bwada* ('younger same-sex sibling'). In this construction the reciprocal of the ascending sibling-generating term, *tuwa*, is introduced into the descending structure via an isomorphic copy of the ascending structure through the use of a term distinct from *tuwa*, namely *bwada*. (2) Only the descending generator (i.e., *foha*) is different from its counterpart in the ascending structure (i.e., *tamai*)—the procedure used for the Tongan terminology. Thus for the Tongan terminology the generators for the ascending structure are 'male self,' *tamai*, and *tokoua*, and the generators for the descending structure are 'male self,' *foha* and *tokoua*. These two patterns for the sibling generators, along with two other patterns, are given in Table 13.2 (Appendix 13.1), showing the sibling term structure for Polynesian terminologies.

For both the Trobriand and Tongan terminologies, the final structure that is generated using these male terms is isomorphic to the structure for the male-marked terms shown on the left side of Figure 13.4. However, the structural route to this final structure is not the same for both terminologies. For the Trobriand terminology, the term *bwada* is included in the descending structure as the reciprocal for the term *tuwa* while forming the generating terms for the descending structure. For the Tongan terminology, however, the 'same-sex sibling' term *tokoua* is initially used for both the ascending and the descending structure, and then is necessarily bifurcated into the reciprocal sibling terms *ta'okete* ('older same-sex sibling') and *tehina* ('younger same-sex sibling') for logical consistency as the kin term structure is generated (see Bennardo and Read 2005 for details). As part of this construction, the kin term product equations *son* of *older brother* of *father* = *older brother* = *son* of *older sister* of *mother* are part of the Tongan terminology (but not the Trobriand terminology). These equations are not modified even after the kin term product 'older brother' of 'father' necessarily becomes 'father,' and similarly 'older sister' of 'mother' necessarily becomes 'mother' (see Bennardo and Read 2005, 2007 for details). Hence in the usage of the Tongan terminology (but not the Trobriand terminology), the genealogical relation—a man's father's older brother's son (or mother's older sister's son)—is conceptually 'older brother' and acted toward accordingly, regardless of his actual age (Biersack 1982). (A similar comment applies to the 'younger same-sex sibling' term for the female sibling terms.) As a consequence, 'son' of 'sister' of 'father' is the same as 'son' of 'father' is the same as 'son' of 'brother' of 'mother,' but differs from 'son' of 'sister' of 'father' and 'son' of 'brother' of 'mother'; that is, male genealogical parallel cousin is structurally differentiated from male genealogical cross cousin by the above equations (the basis for the behavior difference), even though genealogical parallel cousin and genealogical cross cousin are not terminologically distinguished. (Similar comments apply to female genealogical parallel cousin and female genealogical cross cousin.) For the Trobriand terminology, this structural differentiation does not occur; consequently, there is no distinction in one's behavior with respect to genealogical parallel versus genealogical cross cousins (or at least no such behavior difference has been reported in the ethnographies on the Trobriand). These structural results also have important implications for evolutionary changes in terminologies.

Evolutionary and Structural Transformations

As discussed above, the "older"/"younger" distinction for all sibling terms in the Kariera terminology arises through a culturally different procedure for the generation of a kin term structure from the two disjoint, sex-marked structures. For differences of this kind between terminologies, transformation from one terminology, such as Kariera, to another terminology, such as Tongan, would require changes in the generative logic of the terminology. This cannot be accomplished merely by adding, deleting, or neutralizing attributes associated with kin terms. The Kariera terminology has both "same-sex" and "cross-sex" sibling terms differentiated by an "older"/"younger" distinction that cannot be transformed into, say, the PPN terminology simply by somehow neutralizing the "older"/"younger" distinction for "opposite-sex sibling" terms in an unspecified manner. The neutralization, if it were to occur, would require transforming the generative logic from one in which the two disjoint structures are linked through the sibling generators (see Fig. 13.5A) into another generative logic in which the linkage

is introduced through the male self and female self terms (see Fig. 13.5B). Thus the PPN terminology, contrary to Allen's claims (2004), does not derive from a supposedly more general terminology, such as his hypothesized tetradic structure terminology—the best example of a tetradic structure is the Kariera terminology with its four-section systems (Hage 2001a)—by merely neutralizing an "older"/"younger" difference in cross-sex sibling terms. The structural route for such a transformation is much more complex—if it exists at all.

The difference in how the two disjoint, sex-marked structures are connected has implications for the "sibling" kin terms. This makes it evident as to which of these two structural pathways is relevant for the PPN terminology; however, the same is not true for the differences in behaviors associated with the Tongan and Trobriand terminologies. The *tokoua* term for the Tongan terminology—a generating "sibling" term—does not have a counterpart in Marck's (1996) PPN terminology reconstruction, as there is no 'same-sex sibling' term in PPN. If so, the structural analysis presented here shows that PPN has a terminological form generated from the two sex-marked structures in a manner similar to the Trobriand and the Kariera terminologies, and dissimilar from the way the Tongan terminology is generated. (If the absence of the "same-sex sibling" term is, however, accidental, then the structural analysis has made evident an omission in the terms for the PPN terminology that otherwise is not evident from a purely linguistic viewpoint.) Comparison of the Tongan terminology with terminologies of other Polynesian groups shows that the Kapingamarangi have a terminology with the equivalent of the Tongan *tokoua* term (see Appendix 13.1, Table 13.2). Beyond discovering structural similarity between terminologies, comparisons of this kind can also identify instances where structural properties due to the structural logic of the terminology have counterparts in other cultural conceptual systems (see the discussion of radiality in the chapter by Bennardo and Read).

As discussed by Read (2007), the centrality of sibling generators—initially identified in the Tongan terminology and now shown to also be part of the PPN terminology—have their counterpart in the central importance placed on sibling relations in Polynesian societies (Marshall 1981; see additional references in Read 2007a). In particular, the notion of a man's sister (or a woman's brother) as alter egos (Lambert 1981) is virtually a direct mapping of the structural argument for joining the male and the female structures shown in Figure 13.2 through the male self and the female self positions as diagrammed in Figures 13.2 and 13.5B. The structural argument indicates that there are two, sex-differentiated ego positions, thereby leading to the instantiation of one as male self and the other as female self. The structural argument identifies that, culturally, the relation between these two ego positions is that of genealogical brother for a female speaker and genealogical sister for a male speaker. Hence a man's genealogical sister is also the instantiation for the female self in the structure of female terms; that is, she is female ego from his perspective, and he is male ego from her perspective; that is, they are alter egos. Altogether then, the behavior pattern of genealogical brother and genealogical sister being conceptualized as alter egos to each other through behavior is literally a behavioral instantiation of the structural properties of a kinship terminology.

Concl usions

These results only make sense if kin terms are not vocabulary items for already-formed categorizations of genealogical positions. This observation is supported by the experiment discussed in the chapter by Bennardo and Read. They experimentally demonstrated that for users of the Tongan and American terminologies, the respective structural differences of those terminologies have clear and unmistakable consequences for the accuracy and speed of computational performance by Tongans and Americans regarding kin terms determined through kin term products. They argue that the experimental results are predictable from the structural logic of the two terminologies since the Tongan terminology is centered on sibling generators, and the American terminology is centered on parent as an ascending generator. Their results are also in accord with the observations discussed in the chapter by Bojka Milicic on the way children learn kinship terminologies in a manner consistent with the ideas of Piaget regarding children's cognitive development (see also Leaf and Read n.d., Chap. 3). All of these data point in the same direction: terminologies are culturally constructed conceptual systems with meanings engendered through the generative logic for a structure. Terminologies must be constructed, as opposed to natural, systems due to substantive differences in the structural logic of terminologies that has no counterpart either in the genealogical space or in the empirical structures produced through biological reproduction. (Compare the structural

logic for American terminology in Figs. 13.1 and 13.3, and the structural logic for Tongan and PPN terminologies discussed above.) In this sense, kinship terminologies are akin to languages in that performance depends upon "grammatical rules" for what constitutes expressions that are meaningful to, and seen as properly constructed, by others sharing the same conceptual system. The kinship terminology "grammar" differs from language grammar, if only because one of the functionalities of kinship conceptual systems (without a language counterpart) is being able to transform the kin term space constructed around a self position (hence conceptually the terminology is "ego centric" from the viewpoint of the user as the instantiation of the self position), into an equivalent kin term space that is "alter centric" when there is a known kin relation between ego and alter. The latter becomes the basis for kinship as also constructing the conceptual boundary in small-scale societies, such as the !Kung San self-identification of themselves as the *ǂhun/twasi* ("we, the real people"; other spellings are also used), with the latter defined through kin relations. The "real people" are mutually kin to one another, and one knows if one is kin to another either through already having a kin term of reference for that person or being able to compute a kin term of reference through the kin term product and the structural logic of the !Kung San terminology. (See Read's [2009] discussion of Marshall's [1976] example of how a person named Gao determined his kin relation to other !Kung San that he had not previously met.)

At an even deeper level, we can ask what is common across kinship terminologies. The answer is: only general properties, and not specific structural features. All terminologies, it appears, have as generators an ascending term such as parent (neutral), father (male-marked) or mother (female-marked), and their reciprocals: child, son, or daughter, respectively. Morgan's division between descriptive and classificatory terminologies hinges on whether a sibling term (which may or may not be sex-marked) is a generating term—as in the Kariera, PPN, Tongan, Trobriand, and other so-called classificatory terminologies—or is a compound term, as in the American terminology, with "sibling" constructed from the kin term product *child* of *parent* or its equivalent for the terminology in question. All terminologies have an ascending structure and, I hypothesize, an isomorphic descending structure. All terminologies have some means by which kin terms are sex-marked, and two structural variants for so doing are (1) terms are sex-marked, in effect, by implicit sex-marking elements, or (2) the distinction between male terms and female terms is constructed through an isomorphic copy of the ascending/descending structure. All terminologies incorporate marriage relations, either through additional generating terms, such as "spouse" in the American/English terminology, or through marriage rules, as in the Kariera. All terminologies may have additional rules that locally modify the structural form of the terminology (such as the sex-marking rule given in Fig. 13.1 for the American terminology), and finally, terminologies may have term specific modifications to accommodate intersection between the kinship conceptual system and other cultural idea systems. As mentioned above, one such example is provided by the presence of 'older brother' of 'mother' and 'younger brother' of 'mother' terms in the Tongan terminology (Bennardo and Read 2005, 2007).

As can be seen from this characterization of what is universal with regard to kinship terminology structures, there is nothing that resembles the tetradic structure with four kin terms based on two bifurcations: sex (male/female) and generation (odd/even) that Allen (2004) has proposed as a root terminology for all other kinship terminologies. The only terminology examined to date that has something like a tetradic structure is a portion of the !Kung San terminology (see discussion in Read 2007a). Though the terminology has four terms that are essentially a bifurcation by sex and by generation (where generation is with respect to the name giver of a newborn child, not with respect to the newborn child, and the terms are also linked horizontally by a marriage relation), it simultaneously has terms that identify family relations ('mother,' 'father,' 'elder brother,' 'elder sister,' 'younger sibling,' 'son,' 'daughter'), but kin term products of these terms do not yield new kin terms. These two structures are disjoint and are then linked through a name giver–name receiver relation (see Marshall 1976 for details on the name giver–name receiver relation, and Read 2007a for the structural logic that incorporates this relationship in the kinship terminology structure). In this case, precisely a structural feature that makes it resemble a tetradic structure (that is, four sex x generation terms that are not generated from the terms for family relations) is simultaneously a feature (namely, absence of terms generated from kin term products of the terms with reference family members) that differentiates the !Kung San terminology from other descriptive and classificatory terminologies, suggesting the !Kung San terminology has

origins distinct from the origins of descriptive and classificatory terminologies. This would fit in with the observation made in the chapter by Pierre Bancel, Alain Matthey de l'Etang, and John Bengtson regarding the early divergence of the African languages, including the !Kung San Khoisan language, from all other language families.

Rather than something like a tetradic structure serving as a common structural basis for all kinship terminologies, we have to move outside of terminology structures to the genealogical space to find commonality in kinship conceptualizations. As suggested by Figure 13.1, what may be common across terminologies is just a genealogical space based on the logic of genealogical tracing which, in and of itself, does not give rise to the genealogical grid denigrated by Schneider (1984), as the latter depends upon additional structural equations for its construction (D'Andrade 1970). This implies that we should find convergence between, on the one hand, a plausible evolutionary pathway from the biologically based and individually learned social relations found in nonhuman primates societies, and, on the other hand, genealogical tracing as a conceptual system that is part of what we mean by "kinship" in human societies. This is precisely the case. Read (2010, in press) has laid out how that evolutionary pathway would have arisen through the development, first, of the cognitive ability to categorize on the basis of relations between individuals (rather than on the basis of the attributes of individuals), and second (and critically), the ability to cognize the concept of a new relation (e.g., the "mother's mother" relation formed recursively from an already cognized relation such as "mother"). While the macaques possibly have the ability to conceptualize (in some manner) a "mother relation," (Dasser 1988a, 1988b), the ability to conceptualize a relation of a relation is beyond the cognitive capacity of the nonhuman primates. Cognizing a relation of a relation as a new relation depends on recursive reasoning, and the nonhuman primates do not have the working memory capacity needed for recursive reasoning (Read 2008). Consequently, the transition from biologically and individually learned social relations to social relations based on genealogical tracing is not simply one of elaborating on existing capacities in the nonhuman primates, as argued by Chapais (2008); instead it involves a qualitative change made possible through expansion of working memory during hominid evolution (see Read and van der Leeuw 2008 for the concordance between working memory expansion, changes in conceptualizations involved in stone tool manufacture, and brain encephalization in the hominid lineage leading to *Homo sapiens*).[5] Leaf and Read (n.d., Chap. 3) have elaborated on the more recent part of this evolutionary development and argued that it is the development of the cognitive capacities that underlie (but are not limited to) the kinship reasoning capacities of modern *Homo sapiens* that signal the major change of our evolving lineage from just another hominid (such as the Neanderthals) to what makes us modern *Homo sapiens*—and not just *Homo sapiens*.

Notes

1. Read (1984) introduced the expression "kin term product" and gave it a formal definition rather than using the ambiguous expression "relative product" that occurs in the anthropological literature. "Relative product" is sometimes used to refer to genealogical relations: "relative product denotes an English 'kin-type'" (Wallace and Atkins 1960, 58; see also Scheffler 1987), and other times is used in a manner comparable to the kin term product defined by Read (e.g., Kronenfeld [1980] 2009, Tables 3-1–3-3, though elsewhere Kronenfeld [1996, 155] uses kin term products in the sense of products of kin types). To add to the confusion, "relative product" also has a mathematical definition as the product of (dyadic) relations defined over a set, a concept that has been illustrated using kin terms: "words for kinship, such as 'brother', 'cousin', 'father', 'ancestor', 'spouse', 'child' etc., likewise express dyadic relations—of course between persons, not terms…[and can be] expressed formally by placing the symbol R between the symbols for the two individuals which serve as arguments of the relation…'x is R of y', e.g. 'x is father of y'. The relative product of the relations R and S…holds between the arguments x and z, if there is a y such that x is an R of y and y is an S of z" (Patzig 1963, 52). Wallace (1970) used this mathematical notion of the product of relations as a way to express English kin terms through relative products of the primary relations "parent of," "child of," and "spouse of." None of these variants on what is meant by a "relative product" fully captures the idea central to the definition of a kin term product as being a (binary) product defined over a set of kin terms in accordance with cultural knowledge about computation with kin terms. Kronenfeld ([1980] 2009) comes closest, though, as he recognizes: "Read's system is particularly attractive to me because it closely parallels (though in a much more mathematically elegant and complete way) the kind of system I came up with when I attempted to produce a formalized version of the kinds of statements which my Fanti informants

used to calculate, explain, and justify their own assignment of relatives or kintypes to kinterms" (2006, 429). The kin term product enables the formation of an algebraic model for a kinship terminology consistent with cultural knowledge expressed through computations made with kin terms, as noted by Kronenfeld for his Fanti informants.

2. Despite the centrality of "self" as a concept in systems of kinship, the morpheme "self" (or its equivalent in non-English languages) is not included among kin terms (Greenberg 1949). However, as Bojka Milicic notes in her chapter, the children of her study spontaneously included the term *nokay* ('I,' 'myself') in their kinship diagrams.
3. By "instantiation of a kin term," or, more precisely, "cultural instantiation" (Read 2002), I mean the cultural knowledge involved in the assignment of meaning to kin terms under the ontological sequence: kin term (concept)—kin term (category)—kin term (category with content). The sequence is the reverse of the order assumed under the presumption that kin terms begin with genealogical relations founded on genitor and genetrix, and end with kin terms being labels for already established categories of genealogical (or kin type) relations. The reason for the reversal of the ontological order will become apparent below with introduction of a new paradigm for kin relation systems based on both a genealogical system and a terminological system (see Fig. 13.1). As an example of what is implied by this reversal of the ontological order, consider the American kin term "mother." The proposed ontological sequence begins with a "mother" concept (which may include a variety of meanings, such as "the woman who gave birth to me," "the woman who suckled me," "the woman who provided for my well-being and support," and so on, as well as how that concept is related to other kin concepts such as "father," "husband," "child," and so on). Next, the lexeme "mother" becomes less abstract by interpreting it as a category determined by the concept involved; that is, the concept "mother" is used to define a category whose content will be a person or persons deemed to personify the "mother" concept. Finally, the specific content of the category is assigned by cultural criteria; for Americans this may include "genetic mother" and "adoptive mother" (or, more recently, "gestational mother" and "intentional mother"), or to put it more simply, the content will be "genealogical mother" with the latter determined through cultural criteria. This ontological sequence provides a straightforward way to resolve current, oppositional viewpoints on kinship—such as the structuralist, constructionist, and extensionist positions discussed by Parkin (2009)—by relegating the structural aspect of kinship terminological systems to the way kin terms are conceptually structured (the first part of the ontological sequence, discussed below in detail). The extensionist position is then given structural foundation through genealogical instantiation of that conceptual structure (details discussed below; this appears to be universal). The constructionist arguments identify other, culturally specific and culturally salient instantiations of the conceptual system of kin terms. None of these instantiations is "right" or "wrong," and each depends on ethnographic validation for its inclusion. Which instantiation is deemed relevant by the users of a terminology is context-dependent and relates to the information content being invoked, exchanges being made among the individuals involved, aspects of the kinship system that are being identified or manipulated, and the like.
4. This may be seen by noting that if ego refers to alter 1 as self, and alter 1 refers to alter 2 by the kin term K, then alter 1 is ego; thus ego refers to alter 2 by the kin term K, hence the product of self and K is just K. That the product of K and self is K follows from noting that if ego refers to alter 1 by the kin term K, and alter 1 refers to alter 2 as self, then alter 1 is alter 2, and so ego refers to alter 2 by the kin term K.
5. The argument made here converges with the data and conclusions presented in the chapter by Bancel et al. for the antiquity of the *mama/nana* terms for "mother" and *papa/tata* terms for "father" if we consider these as terms initially used to identify the basic relations involved in genealogical tracing. Genealogical tracing must be a precursor to the development of the terminological conceptual systems we refer to as kinship terminologies; therefore, the use of these terms for genealogical tracing would account for their widespread distribution in kinship terminologies, even though, as argued here, there is no single protokinship terminology that provides an origin point for all extant terminologies. Interesting is the fact that for African languages, *kaka* has the meaning "grandfather," which would have as its precursor, using genealogical tracing, *papa's papa*. Thus all three forms discussed by them are consistent with being part of genealogical tracing. If so, these may be terms whose origins predate the origin of kinship terminology systems. In this regard, it is intriguing that the !Kung San terminology does not include relative products of kin terms, which is consistent with the absence of a term that is a reflex of *kaka*, except possibly *//ko* ('elder brother'). As mentioned above, the !Kung San terminology does have four terms that are in agreement with Allen's tetradic argument; thus even though his tetradic argument does not work as a proto-terminology for all kinship terminologies, it does appear to play a role in at least one Khoisan kinship terminology, and conceivably represents a structural solution to incorporating individuals outside of the family into the sphere of kin relations other than through a structure built from kin term products of primary kin terms.

Appendix 13.1

While writing this chapter, correspondence between Dwight Read and Jeff Marck regarding the PPN terminology reconstruction led to Read's categorization of the Polynesian terminologies according to the pattern of distinctions made among the sibling terms (see Table 13.2). This led to a third pattern for the sibling terms based on an opposition between "same-sex sibling" and "cross-sex sibling" with two variants: (A) "cross-sex sibling" is sex-marked (Tokelau and Pukapuka) and (B) "cross-sex sibling" is not sex-marked (all other groups with the "same-sex sibling" and "cross-sex sibling" opposition). A fourth pattern also occurs in which there is a single "sibling" term. Of these patterns, Patterns 1, 3A, 3B, and 4 correspond to the four patterns identified by Clark (1975) based on linguistic comparative reconstruction. Clark did not identify Pattern 2 as a distinct pattern. The two additional patterns for the sibling terms raise the question of what constitutes their generative basis. The answer lies in the structural ways the reciprocal term for the "sibling" generating term used in the ascending structure can be constructed.

To see how the patterns are generated, it will be easier to use symbols rather than actual kin terms. For the ascending generators, let I represent the male-marked identity element corresponding to male self. Let F represent the ascending generating element, and B the sibling element in the ascending structure. Then, by virtue of what is meant by a sibling term, BB = B, whereby "BB" is meant the kin term product of the kin term B with B.

When the descending structure is constructed isomorphically to the ascending structure, one possibility is that a new symbol, call it b, is used in the set of generating symbols for the descending structure (along with a symbol S isomorphic to F that will also become the reciprocal of F through the structural equation FS = I). Then one way B and b become reciprocal elements is via the equations Bb = I = bB. This gives rise to Pattern 1 in Table 13.2 and includes the PPN terminology, where B = **tuaka(na)* and b = **tahina*, along with most other Polynesian terminologies.

A second way to form the descending structure and reciprocity of the sibling term is to use the symbol B (at least initially) as an element in the set of generators for the descending structure. In this case B is not made to be self-reciprocal via an equation of the form (ancestral term)(descendant term) = self, but by bifurcating B into B+ and B− and then making B+ and B− reciprocal terms via the equations B+B− = I = B−B+. As a result, B becomes a cover term (analogous to "parent" in the American kinship terminology) for B+ and B−. This procedure accounts for Pattern 2, which includes the Tongan terminology. For the Tongan terminology, B = *tokoua*, B+ = *tao-kete*, and B− = *tehina*. The same pattern occurs in East Uvea with B = *toko-loua* (clearly a cognate of *tokoua*), B+ = *tao-kete*, and B− = *tehina*. The Tokelau society follows the same pattern but with the modification that the "elder/younger same-sex sibling" terms have become "eldest/youngest same-sex sibling" terms.

A third way to form the descending structure and the reciprocity of the generating sibling terms is through the equation BB = I. This equation—in conjunction with the equation BB = B—implies B = BB = I. As a consequence, the structure for the male-marked terms will be a single line of terms in which the symbol I plays a dual role: its instantiation identifies both the focal male person and (for a male speaker) those who are "brother" to a male focal person. Thus the symbol I = B has disjunctive meaning since it can be instantiated as the focal person or as the "same-sex sibling" of the focal person. When a female structure is formed isomorphic to this structure, and the two structures are joined through male self having interpretation as "cross-sex sibling" for a female focal person, and female self having interpretation as "cross-sex sibling" for a male focal person, the structure will have precisely two sibling nodes, one of which corresponds to "same-sex sibling" and the other to "cross-sex sibling," exactly as for the Polynesian groups listed under Pattern 3A. Pattern 3B has a single society, PukaPuka, and is listed separately because it has a sex-differentiated cross-sex sibling term. (Clark [1975] considered PukaPuka and Tokelau to have the same pattern, but this ignores the "oldest/youngest same-sex sibling" terms in the Tokelau terminology.) The latter may be a culture-specific modification of a "cross-sex sibling" term that does not have differentiation by sex of the referent person.

The fourth pattern arises by using "self" rather than "male self" or "female self," "parent" (P) rather than "father" as the ascending generating term, along with

TABLE 13.2. Sibling terms among Polynesian societies

Group	Elder Same-sex Sibling	Younger Same-sex Sibling	Same-sex Sibling	♂ Sister	♀ Brother	Cross-sex Sibling	Sibling
Pattern 1: "elder same-sex sibling" generator							
PPN	*tuaka(na)	*tahina		*tua-fafine	*tua-ŋaʔane		
Hawai'i	kai-kua-'ana	kai-kaina		kai-kua-hine	kai-kunaane		
Mangareva	tuakana	teina		tue'ine	tugane		
Manihiki & Rakahanga	tua-kana	teina		tua-hine	tua-ngane		
Maori	tuakana	teina		tuahine	tungane		
Marquesas	tua'ana	teina		tuehine	tunane		
Niue	taokete	tehina		mahakitaga	tugane		
Rapa	tu-aana	teina		tuahine	tu'aane		
Ranigiroa	tua-'ana	teina		tua-hine	tu'ane		
Rapanui	tua-kana	taina (same sex??)		tua-hine	??		
Rarotonga	tua-kana	teina		tua-'ine	tu-ngane		
Rennell	tau-kete	taina		tua-hine	tua-nga'ane		
Tahiti	tua'ana	teina		tua-hine	tua'ane		
Taumako	tokana	teina		tahini	tungane		
Tongareva	tua-kana	teina		tua-hine	tua-ngane		
Tubal	tua-ana	teina		tua-hine	tuane	tae'ae	
Pattern 2: "same-sex sibling" generator							
Tonga	tao-kete	tehina	tokoua	tuo-fefine	tuongaane		
East Uvea	tao-kete	tehina	toko-lua	tua-fafine	tua-ngaane ??	tua-ngaane ??	
Tokelau	kimaua, faka-mua (oldest)	kimuli (youngest)	taina	tua-fafine	tua-gane		
Pattern 3: "same-sex sibling" generator, "sibling" of "sibling" = self A							
Anuta			taina			kave	
Luangiua			hangau, kainga			'ave	
Tikopia			taina			kave	
West Futunan			Soa(‖) ♀maa(X) ♂safe(X)			kave(‖) fakau magaro(X)	
East Futuna	♂ta'o-kete (oldest)		taina			tua-nga'ane	
Nanumea			taina, takete			tua-gane	
Tuvalu			taina			tua-ngane	
B							
Pukapuka			taina	tua -wawine	tua-tane	kainga	
Pattern 4: "sibling" generator, "child" of "parent" = "sibling" equation							
Kapinga-marangi							tuahin(a)
Uncertain Pattern							
Bellona	??	??		tu-hahine	tu-nga'ane		
Aniwa		ta kawe (sister, ws)	tuku so (brother)	tuku kawe	tuku so		
Samoa	tua-'aa (older??)	tei (same sex??)	uso	tua-fafine	tua-gane	tau-soga (recent??)	

Notes: Kin terms compiled from Marck 1996b. ?? Denotes either an uncertain kin term or an uncertain attribute for a kin term.
‖ = Parallel cousin X = Cross cousin

"child" (C) as its reciprocal, and then constructing the reciprocal of "sibling" (G) through including the equation CP = G (read 'child' of 'parent' is 'sibling'). This kin term product equation is similar to the pattern for the American kinship terminology, where the terms "brother" and "sister" are compounds constructed via the kin term product "child of parent." Here, though, G is not a compound term, as it is a generating term (and must be one for this to be a classificatory terminology). The equation implies that the reciprocal of G can be computed from the reciprocal of the kin term product CP as follows. The kin term product CP has reciprocal $(CP)^r = P^rC^r = CP = G$, and so G becomes self-reciprocal since the equation G = CP implies that the reciprocal of G is G. Altogether, there will just be a "sibling" term and not "same-sex sibling" and "cross-sex sibling" terms under this construction due to the absence of "male self" and "female self" terms.

This is precisely the kin term pattern for Kapingamarangi, the only society with a Pattern 4 terminology. First, unlike all of the other Polynesian terminologies, the Kapingamarangi has the neutral generating term *matua* ('parent') with reciprocal term *tama* ('child'), and the term *matumatua* ('grandparent') with reciprocal *tamatama* ('grandchild'). Sex distinctions only apply to *matua*, which is bifurcated into *taman(a)* ('father') and *tinan(a)* ('mother'). ('Grandmother' is expressed via the kin term product *tina-na matua*, and 'grandfather' via the kin term product *tamana matua*.) Secondly, it has a single sibling term, *tuahin(a)*. Finally, as explained by Marck (1996b, 35), the term *taman(a)* "[m]ay be extended to parents' brothers and husbands of parent's sisters," which simply expresses the classificatory aspect of the terminology, namely GP = P, "but commonly the relationship is simply described 'brother of my father' *tuahin toku tamana*." The latter reflects the way that the equation CP = G implies CPP = GP; that is, the "sibling" of "parent" kin term follows from CP = G, and so "sibling" of "parent" is appropriate as a distinct relation under the logic of the equation CP = G. Hence the genealogical construct "father's brother" comes under both the kin term *taman(a)* (according to the classificatory equation GP = P, derived from "sibling" as a generating term) and under the kin term given by the product *tuahin toku tamana* (according to the equation CP = G, introduced as a means to structurally make the sibling generator into a self-reciprocal term). Similar comments apply to the kin term *tinan(a)*. What otherwise might be seen as just an oddity of the Kapingamarangi terminology in fact reflects the generative logic giving rise to the structure of this terminology.

Lastly, the Aniwa, Bellona, and Samoa terminologies are unclear as to which pattern they exhibit due to uncertainty regarding the kinship data for these three groups.

14

Salience of Verticality and Horizontality in American and Tongan Kinship Terminologies

Giovanni Bennardo and Dwight Read

In Bennardo and Read 2005 and 2007, we presented an algebraic analysis of the Tongan kinship terminology. The results are strikingly different from what characterizes the structure of the American kinship terminology (AKT) (described in Read 1984, Read and Behrens 1990). In the latter, the foundational, generative relationship is the conceptual relation between self and parent. From this relation, coupled with the reciprocity of kin terms in kinship terminologies, all other terms are derived as products following a theory of kinship terminology structures developed by Read (Read 1984, 2001, 2007a; Bennardo and Read 2005, 2007; Leaf and Read n.d., Chap. 4). For example, from the kin term "parent" and reciprocity of kin terms, we have the kin term "child" in the AKT. The kin terms "father" and "mother" (and, reciprocally, "son" and "daughter") are determined through products with male and female sex markers. The kin term "brother" arises from the (conceptual) kin term product equation "brother is son of parent" (or, more formally, *brother* = *son* o *parent*, where "o" stands for the kin term product used to calculate kin term relationships [Read 1984, 2001; Leaf and Read n.d., Chap. 4]). By this equation we are referring to the concepts represented by the kin terms "brother," "parent," and "son," not to genealogical pathways. However, it is the relationship between self and a sibling kin term that is generative and foundational for the structure of the Tongan kinship terminology (TKT). In TKT, 'son' of 'father' is 'self,' not 'brother,' and instead of being a compound term, the term 'brother' is an irreducible concept from which other kin term computations are made, such as 'brother' of 'father' is 'father.' (For easier readability, by X is meant the Tongan kin term whose closest transliteration would be the American kin term X. There is, for example, no single Tongan kin term that is the equivalent of the American term "brother." For male speakers, the two terms closest to the American kin term "brother" are 'older brother' or 'younger brother.' For female speakers there is a single term whose transliteration would be 'brother.')

The results of the two algebraic analyses gave rise to a two-part hypothesis. First, when confronted with a kinship problem that requires an individual to conceptually take the self-to-parent route vs. the self-to-sibling route, an American would cognitively find the former easier, while a Tongan would find the latter easier. In other words, when confronted with a question for the kin terms X and Y—such as: "If you refer to somebody as X, and that person refers to someone else as Y, how do you refer to that third person?"—if Y is the kin term "father," then an American would find the solution to the problem for the kin term X rapidly and almost error-free. Secondly, if Y is a sibling kin term, then a Tongan would find the solution to the problem rapidly and almost error-free. The opposite would happen to both individuals in the reversed situation. If supported, this hypothesis would confirm the results of the algebraic analyses by providing an empirical verification of the differences in the cognitive and logical organization of the two terminologies, made evident through the algebraic analyses of their respective terminology structures.

In this chapter, we first illustrate the fundamental differences between the American and the Tongan kinship terminologies. Second, we describe the genesis of the methodological tools employed to investigate the hypothesis mentioned above through experimental data, and what are the Tongan and American population samples used in the experiments. Third, we present the results of the experiments and discuss their implications.

Fundamentally, we found that Americans and Tongans differ substantially in speed and precision in solving the proposed kinship problems exactly in the way we predicted.

Verticality and Horizontality in American and Tongan Kinship Terminologies

By a "kinship terminology" we mean the terms that culture bearers use in reference to kin. Kin terms are both a way to identify that someone is one's kin, and a way to refer to those already known to be one's kin. The former typically involves computing that the person in question is one's kin through reference to a third person, and the kin terms that the speaker and the person in question use to refer to that third person. For example, among the !Kung San, Lorna Marshall (1976) discusses a situation where a person named Gao determines that he is kin to a group of persons otherwise strangers to him through determining that he has a name relationship to the brother of one of the members of the group, and thereby is kin to that person. A name relationship—established when the name of a close relative of the parents is given to a newborn child—is central to the !Kung San terminology (Marshall 1976, Read 2007b). Since Gao has now established a kin relation to that brother, and since each person in the group has a kin relation to the brother, they can each now compute her/his kin relation to Gao, and reciprocally Gao has a kin relation to each of them. Underlying kin term computation is the logic by which kinship terminologies are structured as a system of interconnected kinship concepts.

A kinship terminology contains a generative logic for its kinship concepts rooted in the generative term (or terms) and the kin terms derived from the generating term (see chapter by Dwight Read for a more detailed discussion). In the American terminology it is the self-parent relation that plays the generative role, while in the Tongan terminology it is the self-sibling relation that plays a primary generative role (Bennardo and Read 2005, 2007). By this we do not mean that a self-parent relation is not relevant to the Tongan terminology. All kinship terminologies include a self-parent relation as part of the relations within a family, sometimes indicated in the form of a kin term without sex marking, as occurs with the kin term "parent" in the AKT, or with a sex-marked "parent" term, as occurs with the kin terms *tamai* and *fa'e* in the TKT. What we find is that the structure of the AKT is derived from kin term products based on the self-parent relation alone, whereas the structure of the TKT is centered around the kin term products based on the self-sibling relation, with the Tongan sibling kin term a structurally irreducible concept.

By a kin term product is meant the following. If ego refers properly to alter 1 by the kin term K, and alter 1 refers properly to alter 2 by the kin term L, then the kin term M that may be used properly by ego for alter 2 is the kin term product of K and L. The product is computed not by reference to other criteria—such as genealogical relations among ego, alter 1, and alter 2—but by reference to cultural knowledge about one's kinship terminology, just as we compute the addition of two numbers such as $2 + 4 = 6$ by reference to our knowledge of an addition table for the natural numbers. Just as the addition table is based on the way in which the natural numbers are constructed as a system of interconnected number concepts, such as one, two, three…, a culture-specific product table for kin terms is based on the way kin terms are a constructed system of kinship concepts. Just as the natural numbers have a beginning concept—that of the number 1—from which other natural numbers may be constructed through repeated use of addition (e.g., $2 = 1 + 1$, $3 = 2 + 1 = 1 + 1 + 1$, and so on), other kin terms may be constructed through repeated kin term products starting with a beginning concept, or concepts, for a system of kin terms.

We may also use the kin term product to express structural properties for a system of kin terms connected through the kin term product. One property that expresses a fundamental kin concept for all cultures is that of ancestry expressed through terms determining an ascending direction for the terminology. Although, empirically speaking, ancestry derives from reproduction, it is not the *fact* of ancestry through reproduction but the *concept* of ancestry as determining an ascending direction that is incorporated into a kinship terminology. In the AKT, the concept of an ascending direction is embodied in the kin term "Parent" or, alternatively, the sex-marked kin terms "Father" and "Mother."

Note that we are using capitalized English kin terms here. We do this to distinguish between the two meanings associated with the English words "father," "mother," and "parent." One meaning is that of a genealogical relation, and the other is that of a (relational) concept. Consider the expression "That woman is my mother." One meaning of the sentence is genealogical for English speakers when the female in question is the person who begat the

speaker. But the sentence can also mean that the female in question is a person to whom the speaker may properly refer by the kin term "mother," as occurs when the speaker is an adopted child. Technically, a distinction can be made between these two meanings through distinguishing whether the woman in question is the *genetrix* for speaker or is the speaker's *mater*, or for males, the distinction between *genitor* and *pater*. But even the meaning of the *genitor/genetrix* versus *pater/mater* distinction is not self-evident when we consider that, in some cultures, a male may be recognized as the *genitor* for a reason other than his sexual role in reproduction. We may avoid what otherwise would require cultural-specific definitions to keep clear the intended meaning of, say *genetrix*, by distinguishing between the two usages as the difference between (1) identifying the female in question as the genealogical mother, and so she is the female through whom genealogical tracing may be carried out by the speaker—leaving unstated the culture-specific criterion by which a woman is identified as the genealogical mother, versus (2) the kin relation "Mother," which is one kin term concept in a system concepts making up what we recognize as a kinship terminology. To keep clear which meaning is meant, henceforth we will use capitalized English words when we are using an American word in its kin term sense.

In the AKT, the kin term "Parent" is not decomposable into more basic kin terms according to the logic of the AKT, whereas "Father" and "Mother" may be decomposed into "Male Parent" and "Female Parent"; that is, via the product of the sex markers "Male" and "Female" with the kin term "Parent" (see Read and Behrens 1990 for the details of this argument). Other terminologies do not have a term equivalent to "Parent." The Tongan terminology does have the term *motu'a*, which can be transliterated as 'Parent,' but its conceptual linkage to the terms *fa'e* ('Mother') and *tamai* ('Father') is that of a covering term for the latter two, not as a primary concept from which *fa'e* and *tamai* are derived through products with sex-marking elements (Bennardo and Read 2005, 2007). For the AKT, we may construct a series of neutral ascending kin terms by taking repeated products using the kin term "Parent," beginning with the concept of "Self": "Self, Parent, Parent of Parent = Grandparent, Parent of Parent of Parent = Parent of Grandparent = Great-Grandparent," and so on. This sequence of products generates the concept of an ascending direction in the AKT.

For the Tongan terminology we construct two sex-marked ascending sequences: one based on *fa'e*, and the other on *tamai*. The former sequence consists of the terms 'Female Self,' *fa'e*, *fa'e* of *fa'e* = *kui*, *fa'e* of *fa'e* of *fa'e* = *fa'e* of *kui* = *kui*, and further products generate only the term *kui*. The latter sequence consists of the terms 'Male Self,' *tamai*, *tamai* of *tamai* = *kui*, *tamai* of *tamai* of *tamai* = *tamai* of *kui* = *kui*, and further products generate only the term *kui* (see Bennardo and Read 2005, 2007, for an analysis of the structural relations among the terms *fa'e*, *tamai*, and *kui*).

Through reciprocity of kin terms we also have a descending sequence. For the AKT, the reciprocal term for "Parent" is "Child," and this yields the descending sequence "Self, Child, Child of Child = Grandchild, Child of Child of Child = Child of Grandchild = Great-Grandchild," and so on. For the TKT, the reciprocal term for *fa'e* is *tama* (♀'Child'), and the reciprocal term for *tamai* is *foha* (♂'Son'). These two terms produce the two descending sequences: (1) 'Female Self,' *tama*, *tama* of *tama* = *mokopuna*, *tama* of *tama* of *tama* = *tama* of *mokopuna* = *mokopuna* and (2) 'Male Self,' *foha*, *foha* of *foha* = *mokopuna*, *foha* of *foha* of *foha* = *foha* of *mokopuna* = *mokopuna* (see Bennardo and Read 2005, 2007, for the complete logic underlying the non-sex-marked term *tama* and the sex-marked term *foha*, including a term for ♂'daughter').

For both terminologies we also have the kin term product of the ascending terms and the reciprocal descending terms. In the AKT this leads to "Child of Parent = Brother or Sister." However, in the TKT the product of the ascending generating term with the reciprocal term leads to *tama* of *fa'e* is 'Female Self,' and *foha* of *tamai* is 'Male Self.' In the AKT, the sibling terms "Brother" and "Sister" are generated from the terms "Parent" and "Child," but not in the TKT. For the TKT, sibling terms are primary and hence are not part of the structure generated from the ascending generators and the reciprocal descending generators. Instead, the sibling terms are themselves generating terms. The generating term is *ta'okete* (♂'Older Brother,' ♀'Older Sister') with reciprocal term *tehina* (♂'Younger Brother,' ♀'Younger Sister'). For male speakers the term *ta'okete* generates the sequence 'Male Self,' *ta'okete*, *ta'okete* of *ta'okete* = t*a'okete*, and the reciprocal term *tehina* generates the sequence 'Male Self,' *tehina*, *tehina* of *tehina* = *tehina*. As reciprocal terms, *ta'okete* and *tehina* satisfy the products *ta'okete* of *tehina* = *tehina* of *ta'okete* = 'Male Self' (for a male speaker) or 'Female Self' (for a female speaker). With respect to the ascending generators, the following equations follow logically from the sibling

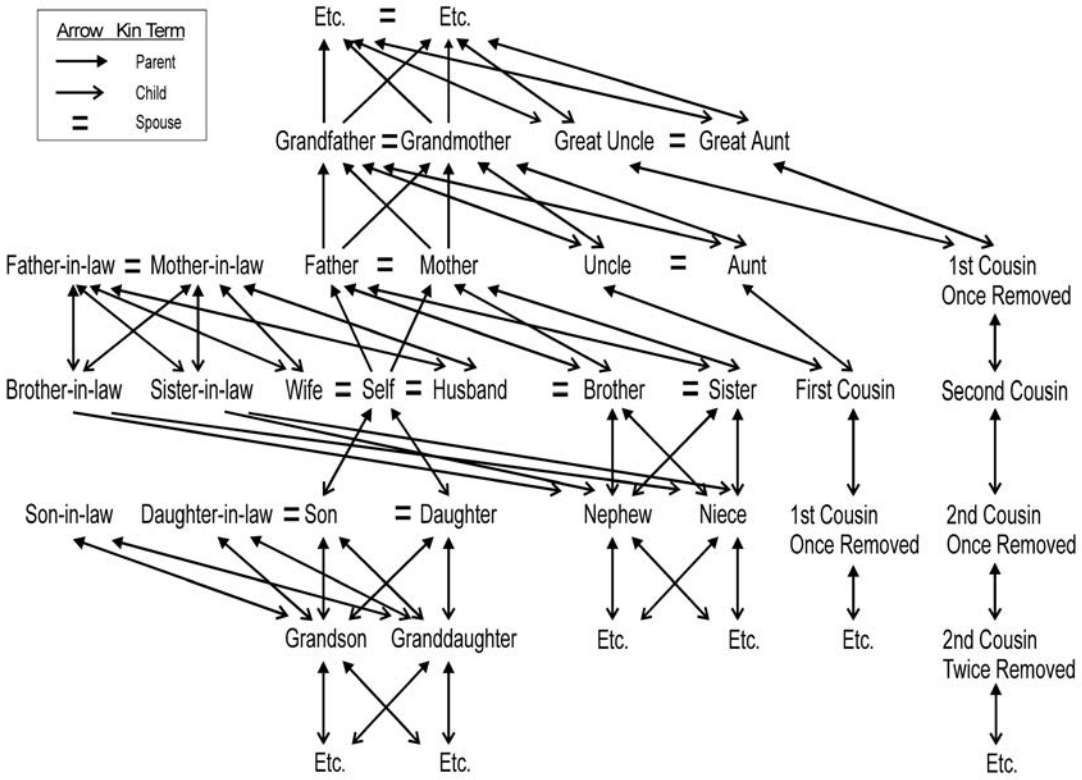


FIGURE 14.1. Kin term map showing the structure of the AKT based on the generating term "Parent" (and its reciprocal term, "Child") and the self-reciprocal term "Spouse."

generators and the structural logic of TKT (see Bennardo and Read 2005, 2007; Leaf and Read n.d., Chap. 7): *ta'okete* of *tama* = *tehina* of *tama* = *tama* and *ta'okete* of *foha* = *tehina* of *foha* = *foha* (these are sometimes referred to as *classificatory* equations).

The structure generated by "Parent" and "Spouse" for the AKT is shown in Figure 14.1, and the structure for the male terms generated by *tamai* and *ta'okete* for the TKT is shown in Figure 14.2 (see also Fig. 13.2 in the chapter by Dwight Read). For both figures, the result of taking kin term products with the generating terms are shown by arrows with a style (solid or broken shaft) specific to a generating term (as shown in the key for the figures). The arrow in the structure points to the kin term that is the product of the term at the beginning of the arrow, with the generating term represented by the arrow. Thus a solid arrow corresponding to the TKT generating term *tamai* points from *tamai* to *kui* since *tamai* of *tamai* = *kui*.

These two figures make evident structural differences in the two terminologies. In the AKT there is a line of kin terms connected by the ascending kin term "Parent" and the descending kin term "Child." Since *Child of Parent* = *Brother* or *Sister*, the structure also has collateral kin terms branching off the main line of kin terms. In contrast, the TKT has a central line of kin terms connected vertically by the ascending kin terms *tamai* and *foha* that connect to 'Male Self' in both an upward and downward vertical direction. As a consequence, there are no collateral kin terms, since *foha* of *tamai* = 'Male Self.' Rather than having collateral kin terms, the diagram has two generating sibling terms, *ta'okete* ('Older Same-sex Sibling') and *tehina* ('Younger Same-sex Sibling'), connected horizontally to the side of the main vertical line.

These two structures are the basis for the hypothesis regarding our experimental study of the amount of time it takes users of the AKT versus users of the TKT to answer questions involving products of kin terms. For the AKT, we expect that questions based directly on the generating terms "Parent" and "Child" can be answered more rapidly and more correctly than questions based on the sibling terms since the latter computationally require both the representation of the sibling term as a composite of the "Parent" and the "Child" terms as well as the computation involved in answering the question posed regarding the structural relation among the AKT kin terms. For the Tongan speakers, we expect that questions based on

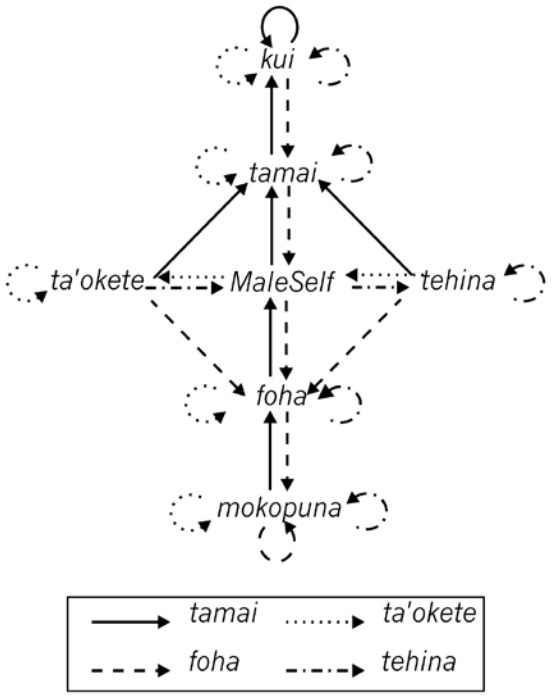


FIGURE 14.2. Kin term map showing the structure of the TKT for male terms based on the ascending generating term *tamai* (and its reciprocal term, *foha*) and the sibling generating term *ta'okete* (and its reciprocal term, *tehina*).

the sibling terms will be answered more quickly and more correctly since they are generating terms and represent central relations in the life of individuals in Tonga. The questions we posed to Tongans and to Americans are designed to determine if there are differences in speed and accuracy in answering questions about kin term products according to whether one is enculturated with the American or the Tongan kinship terminology.

Methodol ogy

In order to collect empirical data about the performance consequences of this fundamental conceptual difference in kin term computations in the two terminologies, we prepared a questionnaire designed to elicit differences in performance, if any, by Tongans and Americans according to our hypothesis. Our hypothesis is that American subjects would perform faster (less response time) and better (fewer mistakes) when reasoning about kin terms that enable them to focus on the self/parent relation, whereas Tongan subjects would perform faster and better when reasoning about kin terms that enable them to focus on the self/sibling relation.

The questionnaire we prepared is divided into six parts: two contain questions that require the interviewee to focus on the self/parent relation (henceforth referred to as a focus on self), and four parts contain questions that require the interviewee to focus on self/sibling relation (henceforth referred to as a focus on sibling). A typical question of the first type is: (a) If you call somebody "father," and father calls someone "son," what term/s do you use for "son"? A typical question of the second type is: (b) If your brother/sister calls somebody "father," and father calls someone "son," what term/s does your brother/sister use for "son"? Both questions require the interviewee to mentally walk one generation up and one generation down through the terminology. Other parts of the questionnaire require the interviewee to "walk" a variety of generations either up or down: for example, two generations up and one down, same generation and one down, and so on. Each of the six parts includes two to eight questions about both male and female kin terms, for a total of twenty-six questions for the American questionnaire and thirty-three for the Tongan questionnaire (see Appendices 14.1 and 14.2). This difference in number of questions is due to different numbers of generating kin terms in the two terminologies.

To avoid any sex-priming effect, we alternated questions about males (e.g., Son, Uncle) with questions about females (e.g., Daughter, Aunt). Similarly, we alternated questions focused on self with those focused on sibling. Altogether, we developed four questionnaires for English subjects and eight for Tongan subjects (see examples in Appendices 14.1 and 14.2). Twice the number of questionnaires were required for Tongan because the gender of the interviewee calls for the use of a different set of kinship terms; thus it was necessary to prepare two sets of four questionnaires for the Tongans, one for male subjects and one for female subjects.

In administering the questionnaires, we implemented two different protocols. One was used with subjects at Northern Illinois University (NIU) and in Tonga, and the other used both at NIU and at the University of California, Los Angeles (UCLA). In the first protocol the first author interviewed subjects face-to-face and on a one-to-one basis, both at NIU and in Tonga. The interviews were digitally recorded to allow analysis (response time and correctness of response) subsequent to the interview. The NIU interviewees included 16 males and 13 females, ranging in age from 18 to 69 (average age = 25.4). Two Tongan subjects (one male, 52 years old, and one female, 50 years old) were interviewed on the phone from the United

States in fall 2006 (not included in the analyses), and 48 more subjects were interviewed face-to-face and on a one-to-one basis in Tonga during summer 2007. These latter Tongan subjects include 24 males and 24 females ranging in age from 23 to 71 (average age = 37.9).

For the second protocol, we queried a group of 65 subjects at NIU (spring 2009) and two groups at UCLA (46 in winter 2008 and 35 in fall 2008) with a questionnaire. We used Microsoft's software program PowerPoint™ to present each question on a screen for just 12 seconds. To avoid priming effects, we randomized the questions. The decision to allow 12 seconds was reached after we found that the American subjects interviewed on a face-to-face basis ranged in response time from 1 to 16 seconds. Thus, allowing 12 seconds (¾ of the longest response time) would eliminate as much as possible test anxiety due to a time constraint, yet require subjects to respond without going through detailed calculations. Subjects were given an answer sheet (see Appendix 14.3) and asked to write their answers in the appropriate spaces.

This protocol allowed quick access to more subjects, thereby allowing us to increase the sample size used for statistical analysis. These data, however, provided only responses that could be marked as correct or incorrect, while giving no insight into response time. Some of the subjects answered all of the questions (with no or few incorrect answers), so the allowed time was sufficient to answer all of questions if the answer was determined quickly. Other subjects left some of the questions blank. For our purposes we considered answers left blank as incorrect since a blank meant that the person was not able to do the calculation in the allotted time of 12 seconds before a new question was flashed on the screen. A blank answer indicates directly the increased difficulty in mental processing for the corresponding question.

Both protocols allowed for easy detection of correct or incorrect answers. The former was done by listening to the recordings, and the latter by checking the answer sheets. For the first protocol we had to make a decision regarding how to measure response time. Since we had recorded the interviews digitally, it was possible to determine time elapsed between the end of a question and the beginning of an answer. We decided that the onset time for the response time would be the time at which the interviewer had finished formulating the question, and the length of the response would be the time that had passed between the onset time and the beginning of the answer.

The program we used allowed time discrimination accurate to a tenth of a second, but for ease of processing and analysis, we decided to consider only the full- or half-second value. In addition, some of the subjects asked to have a question repeated; for these cases we had to decide how to calculate the response time. We decided to simply double the response time from the repetition of the question. We did that consistently for the data obtained through face-to-face interviewing (including the two phone interviews).

Results

Tongan Data

The simplest way to test our hypothesis is through comparison of the response times for the questions that trace vertically from self versus the questions that trace horizontally using the sibling terms. For the Tongan data, we computed the average time it took to respond to the seven self questions and the twenty-six sibling questions, regardless of whether the interviewee's answer was correct or incorrect. We are not concerned with the absolute kinship knowledge of an interviewee, but the amount of time it takes the interviewee to decide on an answer to the question as a measure of the computation complexity involved in mentally formulating it.

A scattergram plot of sibling question response time versus self question response time is shown in Figure 14.3. The diagonal line shows equal response time for the two sets of questions. One pattern is immediately apparent—namely, the division of the interviewees into two distinct groups: Group 1, open circles ($n = 30$), bunched together to the left in Figure 14.3, and Group 2, open squares ($n = 18$), widely dispersed. Group 1 is characterized by statistically equal mean time for responding to the two kinds of questions ($\bar{x}_{Self} = 2.95$, $s_{Self} = 1.08$, $n_{Self} = 30$, ($\bar{x}_{Sibling} = 2.66$, $s_{Sibling} = 1.18$, $n_{Sibling} = 30$; $t = 1.05$, $df = 29$, $p = 0.15$; paired two-sample *t*-test). Group 2 is characterized by substantially longer times for responding to the self questions in comparison to the sibling questions since the Group 2 data points are consistently below the solid, diagonal line. The longer response times for the self questions by the interviewees making up Group 2 unequivocally support our hypothesis.

The statistical division into two groups is paralleled by differences in the attributes of the Tongans in each of the two groups. Group 1 differs from Group 2 by age and by residence location. The mean age of the interviewees in Group 1 is 33.7 years (mean age for females = 30.4 and for males = 37.0), whereas the average age in Group 2 is

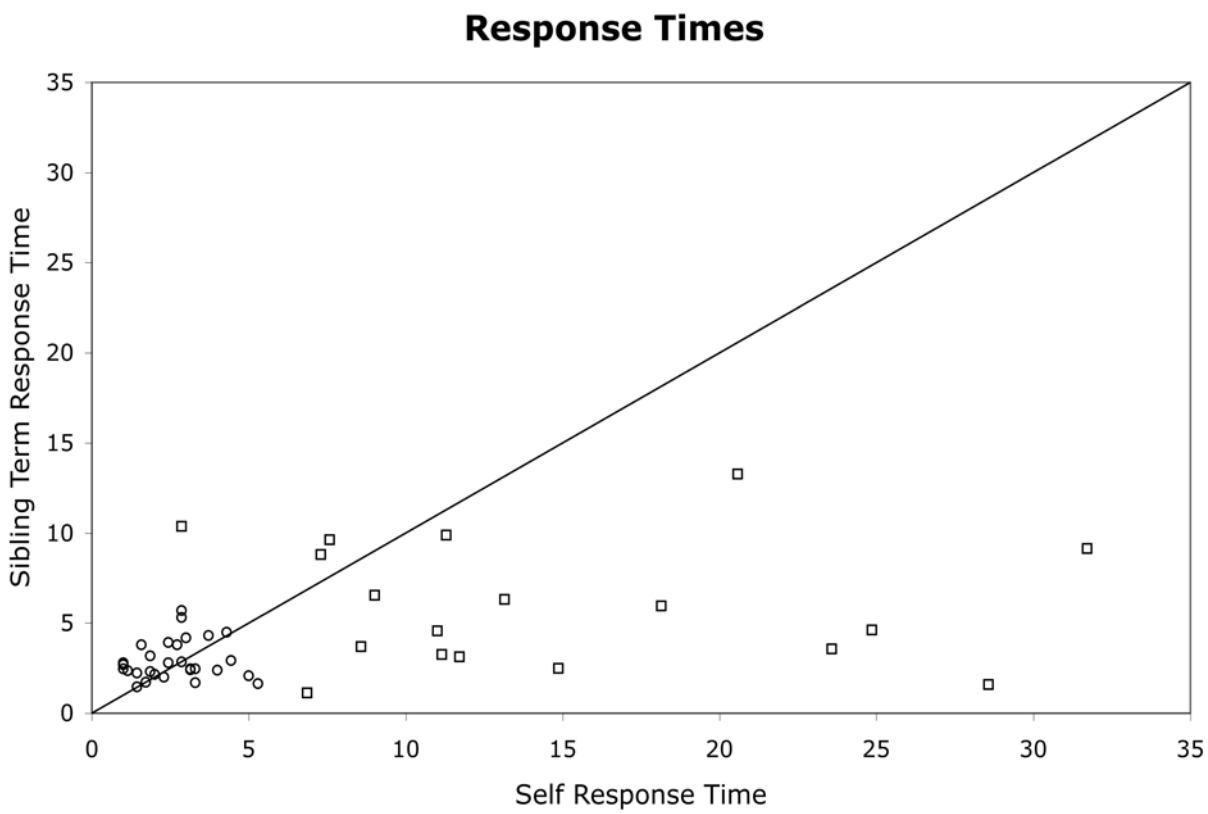


FIGURE 14.3. Response time for self questions (horizontal axis) versus response time for sibling questions (vertical axis). The solid line represents equal response time for self and sibling questions. Open circles and squares are two response patterns that emerge from the scattergram plot of response times: short response times for both questions (open circles) and longer response times for self in comparison to sibling questions (open squares). Here, and in the following graphs, some data points include more than one interviewee.

45.5 (mean age for females = 44.1 and for males = 46.9). The interviewees from Group 1 are from town or non-isolated villages (21 out of 30 respondents), whereas the interviewees from Group 2 are almost all from isolated villages (16 out of 18 respondents). The interviewees from Group 1 are also more educated than those from Group 2. It appears that interviewees who are older, less educated, and from more isolated village are in clear agreement with our hypothesis that Tongans will have greater difficulty with self questions. The younger, more educated interviewees from town have also had substantial exposure to English, hence to the American/English kinship terminology, which could account for their more rapid answering of questions based on self. Nonetheless, as we will now see, while they may respond equally rapidly for both kinds of questions, their error rates are much higher with the self questions.

The equal response times for the two sets of questions by the 30 interviewees in Group 1 can be examined further by comparing the proportion of correctly answered questions for the two sets of questions. Our hypothesis also implies that more errors would be made even with equal response times on the grounds that the equal "search time" would be less effective for computing the correct kin relation with the self questions than with the sibling questions. This prediction is also clearly supported by the data. Figure 14.4 compares the proportion of correct answers for the self questions in comparison to the sibling questions. Almost all of the interviewees (25 out of 30) are above the line for equal proportion of correct answers for the two sets of questions. Thus, while these interviewees answer the questions equally rapidly for the two kinds of questions, they consistently make more errors with the self questions, as we predicted.

Another way to compare the two groups is through the proportion of correct answers for each group for the two sets of questions (see Table 14.1). For the sibling questions the proportion correct in Table 14.1 is not

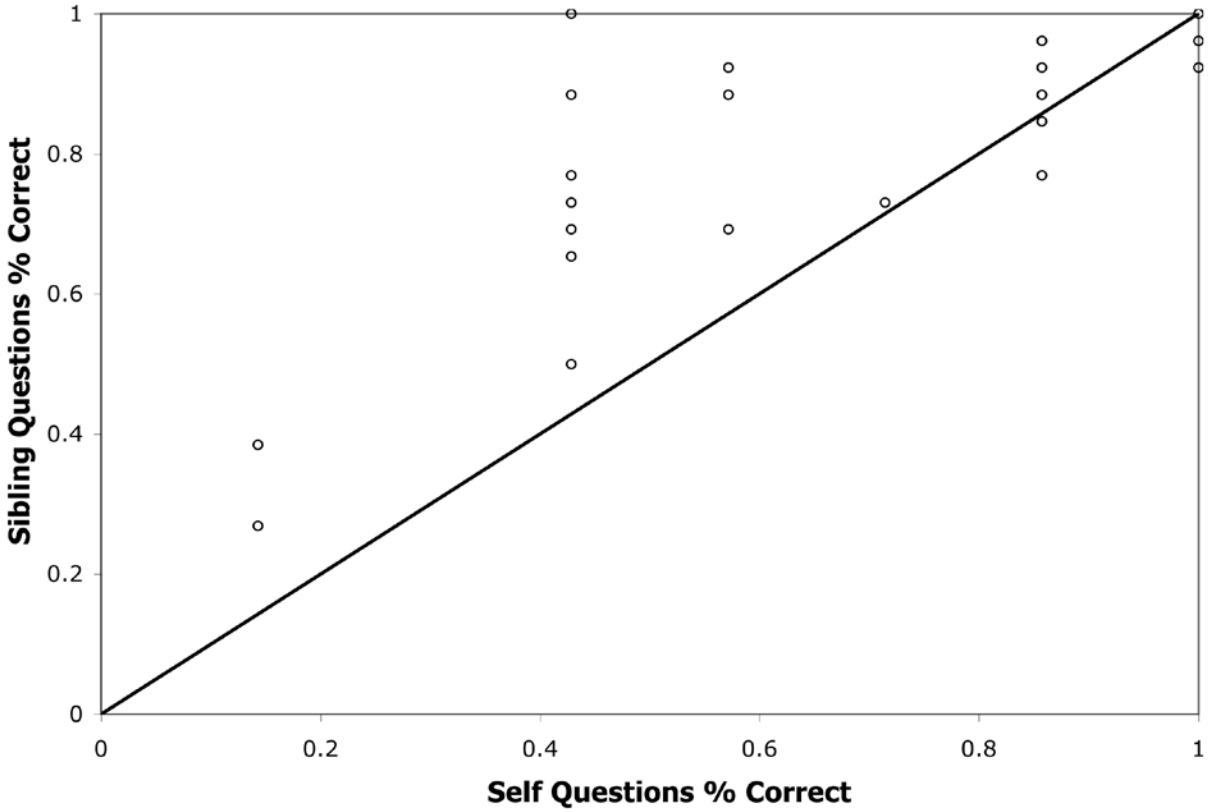


FIGURE 14.4. Percentage correct for self questions (horizontal axis) versus sibling questions (vertical axis). Data are for the Group 1 interviewees identified in Figure 14.3. The solid line represents equal percentage correct for self and sibling questions. Data points are consistently above the solid line, indicating fewer errors with sibling, in comparison to self, questions.

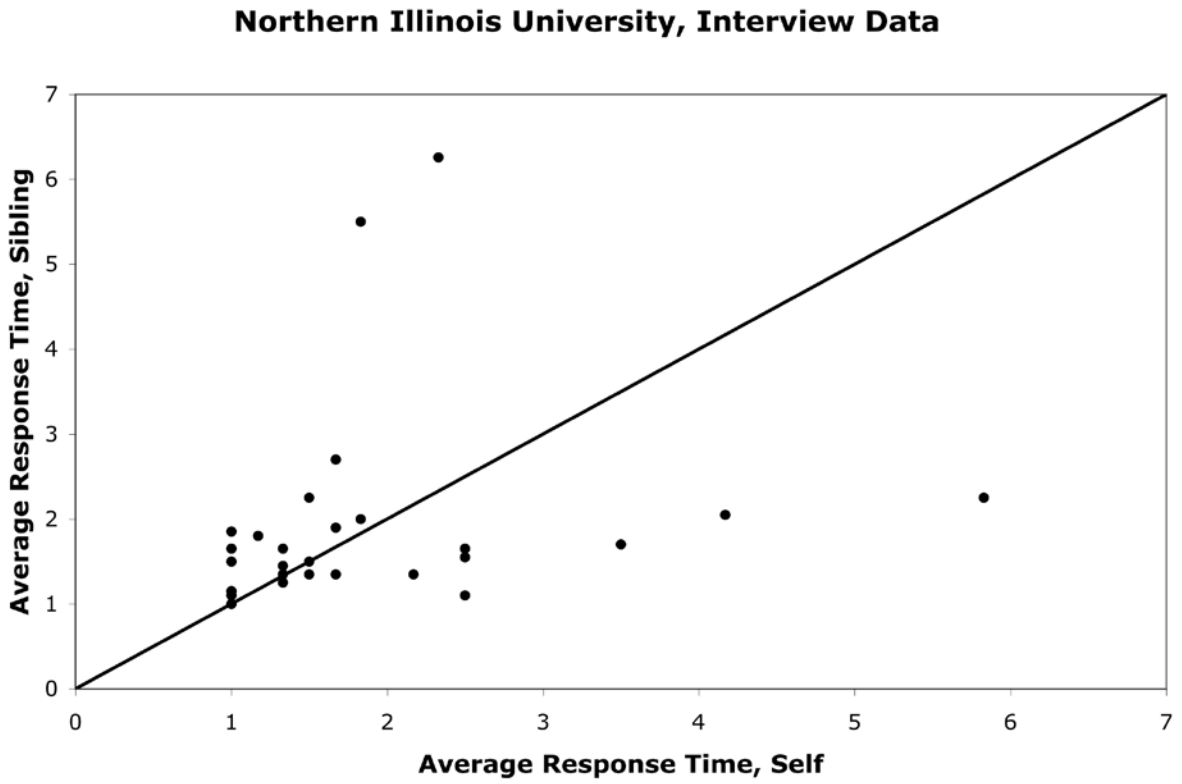


FIGURE 14.5. Response time for self questions (horizontal axis) versus response time for sibling questions (vertical axis). The solid line represents equal response time for self and sibling questions.

TABLE 14.1. Percentage of questions answered correctly

	Sample Size	Self Questions	Sibling Questions
Group 1	30	0.63	0.81
Group 2	18	0.59	0.72

statistically different between the two groups ($t = 1.52$, df = 46, $p = 0.13$; equal variance t-test) and clearly the proportion correct for the self questions is not different between the two groups. This implies that while Group 1 and Group 2 differ on the amount of time taken to answer the self questions (with Group 2 taking substantially more time), the extra time does not translate into different performance levels between the two groups within a question set. However, between the question sets there is a highly significant difference for proportion correct on self questions versus sibling questions for Group 1 ($t = 5.39$, df = 29, $p = 0.000$; paired two sample t-test). The same pattern holds for Group 2 as there is a significant difference for proportion correct on self questions versus sibling questions ($t = 2.41$, df = 17, $p = 0.03$; paired two sample t-test). So while Group 1 answers all questions equally rapidly, the error rates are much higher for the self questions.

Finally, we used linear regression to determine the relationship between proportion correct answers and amount of time spent answering the questions. The proportion correct when answering questions is either (1) independent of the amount of time spent answering the questions, as shown by nonsignificant p-values when testing the null hypothesis that the slopes are 0 in the linear regression analyses of time versus proportion correct for Group 2 (sibling questions: $p = 0.33$; self questions: $p = 0.26$), or (2) decreases with more time spent answering questions as measured by the significant, estimated slope, b, in the regression analyses for Group 1 (sibling questions: $b = -0.1$, $p = 0.000$, $r = 0.62$; self questions: $b = -0.1$, $p = 0.008$, $r = 0.48$). For Group 2, the higher rate of errors in answering the self questions in comparison to the sibling questions, and the lack of any correlation in the error rate with the time spent responding are consistent with our hypothesis about the greater cognitive difficulty in conceptualizing questions based on self rather than sibling for users of the Tongan terminology. However, the decrease in proportion correct with increased response time implies that the differences in speed with which the questions were answered by individuals in Group 1 involve factors other than just those stated in our hypothesis since the self questions are not only relatively, but absolutely more difficult for these interviewees, who were unable to provide correct answers even when more time was taken to respond.

American Data

For the American kinship terminology, we collected data in two ways. First, a sample of American students (n = 29) was interviewed at NIU in a manner comparable to the interviews of the Tongan respondents. Second, in order to obtain larger samples, we decreased the time it takes for conducting individual interviews by reducing the interview questions to 26 written questions (6 based on self and 20 based on sibling; see Appendix 14.1) projected onto a screen using PowerPoint™. The respondents wrote their answers on standard answer sheets. By keeping the amount of time a question was projected onto the screen constant and short (12 seconds), we could determine, through error rates, whether an interviewee had more problems with self or with sibling kin term questions.

Interview Data

The results for the student interviewee response time data are quite similar to those for the Tongan Group 1; namely, a cluster of points centered around the line showing equal response times (see Figure 14.5). In Figure 14.5 there are three interviewees with much longer response times for the self questions, and two interviewees with much longer time for the sibling questions, though the overall pattern is roughly symmetric with respect to the equal time line. As with the Tongan Group 1 data, we next considered the number of correct questions for the student interviewees. Here we find the reverse of the Tongan Group 1 data shown in Figure 14.4. In sharp contrast to the Tongan interviewees, student interviewees clearly make a greater proportion of incorrect answers with the sibling questions (see Fig. 14.6). American student interviewees are correct 80 percent of the time for the self questions, and 73 percent of the time for the sibling questions. (One case with 0 correct self questions and 20 correct sibling questions appears to be an outlier. Excluding this case, the percentages are 83 percent and 72 percent, respectively.) The mean proportion of correct answers per interviewee for the self questions is significantly different (the outlier excluded) from the mean proportion for the sibling questions ($\bar{x}_{Self} = 0.83$, $s_{Self} = 0.24$, $n_{Self} = 28$; $\bar{x}_{Sibling} = 0.73$, $s_{Sibling} = 0.24$, $n_{Sibling} = 28$; $t = 2.53$, df = 27, $p = 0.02$; paired two-sample t-test).

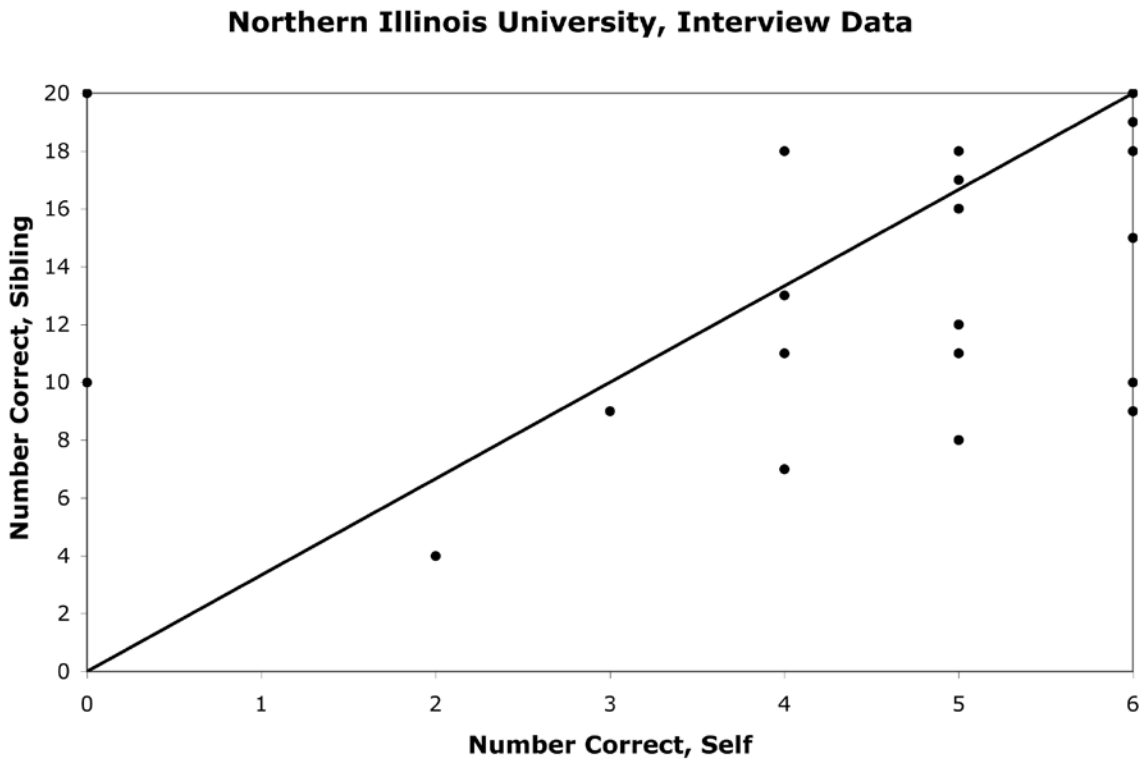


FIGURE 14.6. Number of correct self questions (horizontal axis) versus sibling questions (vertical axis). The solid line represents equal proportion of correct self and sibling questions. Data points are consistently below the solid line, indicating proportionally fewer errors with self, in comparison to sibling, questions.

Fixed Response Time Data

Experiments with error rates using a protocol of fixed response time per question were conducted at UCLA with two groups of student subjects (winter and fall 2008) and at NIU with one set of student subjects (spring 2009). The students were asked to indicate on their answer sheets whether English was one's native language. Students' whose native language was not English were excluded from the statistical analysis. Also excluded were a few answer sheets in which more than 50 percent of the questions were left blank. Most of the students left some of the questions blank as the 12 seconds for reading and answering a question required quick determination. The group sizes for the experiments after removing non–English speakers and those whose answer sheets had more than 50 percent blank responses were $n = 46$ and $n = 35$ for the two UCLA groups, and $n = 59$ for the NIU group.

The two UCLA groups have similar average number of correct answers for the self ($\bar{x}_1 = 4.52$, $s_1 = 1.54$, $n_1 = 46$; $\bar{x}_2 = 4.40$, $s_2 = 1.75$, $n_2 = 35$; $t = 0.33$, $df = 79$, $p = 0.74$; equal variances for both groups) and the sibling questions ($\bar{x}_1 = 12.63$, $s_1 = 4.52$, $n_1 = 46$; $\bar{x}_2 = 12.66$, $s_2 = 5.35$, $n_2 = 35$; $t = 0.02$, $df = 79$, $p = 0.98$; equal variances for both groups). The pattern for the rate of correct answers is comparable for both groups, and both have the same pattern that occurred with the student interview data—namely, more errors with the sibling questions than the self questions (see combined UCLA sample, left side of Figure 14.7).

The data for the NIU sample (right side, Figure 14.7) is very similar to the UCLA data. The UCLA and the NIU groups show no difference in mean number of correct answers for the self questions ($\bar{x}_{UCLA} = 4.47$, $s_{UCLA} = 1.63$, $n_{UCLA} = 81$; $\bar{x}_{NIU} = 4.36$, $s_{NIU} = 1.44$, $n_{NIU} = 59$; $t = 0.43$, $df = 138$, $p = 0.67$; equal variances for both groups) and the sibling questions ($\bar{x}_{UCLA} = 12.64$, $s_{UCLA} = 4.86$, $n_{UCLA} = 81$; $\bar{x}_{NIU} = 12.22$, $s_{NIU} = 4.48$, $n_{NIU} = 59$; $t = 0.52$, $df = 138$, $p = 0.60$; equal variances for both groups), and both display similar patterns overall (compare left and right sides, Figure 14.7). For the combined UCLA and NIU samples, respondents were correct 74 percent of the time for the self questions, and 62 percent of the time for the sibling questions. The 12 percent difference in percentage between

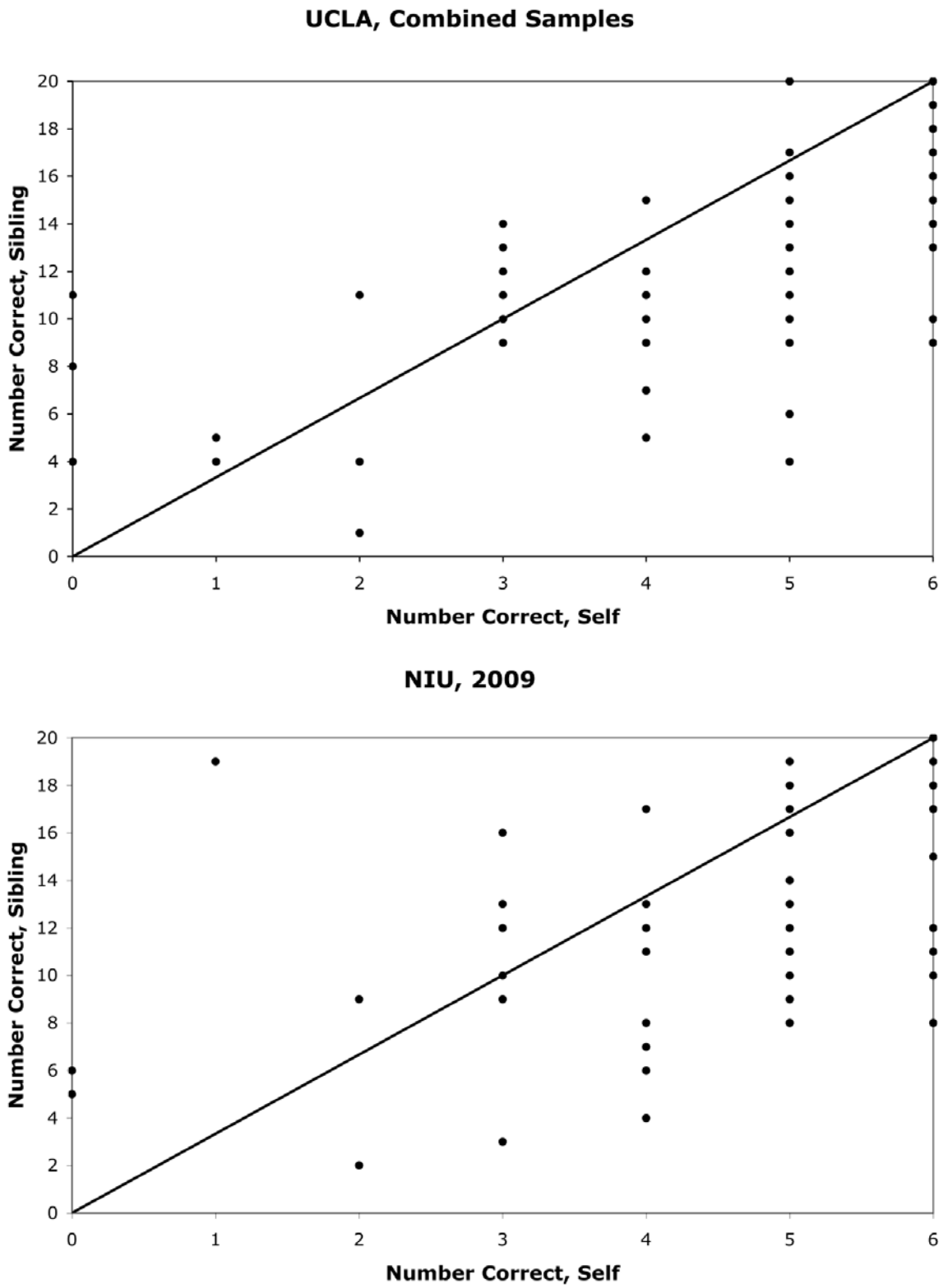


FIGURE 14.7. Number of correct self questions (horizontal axis) versus sibling questions (vertical axis). Data (*top*) are for the combined two groups of subjects at UCLA and (*bottom*) for the group of subjects at NIU. The solid line represents equal proportion correct answers for the self and sibling questions. Data points are consistently below the solid line, indicating a lower percentage of errors with self, in comparison to sibling, questions, for both the UCLA and NIU samples.

the self and sibling questions for the fixed time response format is about the same as the 10 percent difference in correct answers for the interview questions of NIU students. That the students do absolutely less well in the fixed time response format is not surprising since the limit of 12 seconds for a response, unlike the interview questions, does not always provide time to think through the kin relations involved, whereas the interviewees are able to take extra time to determine an answer.

Discussion

The experimental results are unequivocal: Tongan respondents consistently do better on the sibling questions than the self questions, and the American respondents consistently do better on the self questions than on the sibling questions. This is true whether measured by the amount of time it takes to respond to self versus sibling questions, or by the accuracy of the answers to questions with a time constraint for answers. This is surprising for the interview data: one might expect that, if interviewees are given adequate time to answer, error rates should not be different for the two kinds of questions as both draw upon one's cultural knowledge of kinship terminologies. We have assumed that individuals would answer the questions by using their already internalized knowledge of kin term products expressed through the structure of the kinship terminology (hence determine solutions to the questions without reverting to genealogical calculations), and so differences in performance, it would seem, should be reflected just in the amount of time needed to answer the questions. This, however, is not the case. The Tongan interviewees both found it harder to answer the self questions and made more mistakes with the self questions; whereas the American interviewees both found it harder to answer the sibling questions and made more mistakes with the sibling questions. We did not anticipate that even when the subject had as much time as he or she wanted (as in the interview data), errors for one kind of question would still dominate the other kind, thereby adding additional support to our hypothesis.

Interestingly, the more urbanized Tongans answered all questions relatively quickly, suggesting that the interviewee considered her/his answer to be correct for both the self and the sibling questions, yet even so, significantly more errors were made with the self questions than with the sibling questions. The more ruralized Tongans took longer to respond to the self questions but still made more errors with the self questions than the sibling questions. The American interviewees all responded rapidly and took the same amount of time for both the self and the sibling questions, yet, in reversal of the pattern for the Tongan interviewees, they consistently had much higher error rates with the sibling questions.

The "mirror image" relationship between Tongan interviewee performance (Fig. 14.4) and American interviewee performance (Fig. 14.6) is striking. It is difficult to account for this pattern other than by the implication of our posited hypothesis that the neural processes involved in computing an answer to a kinship question are in fact channeled in a manner reflecting the underlying structure of the Tongan and the American kinship terminologies identified through the algebraic analysis (see also discussion of kinship and possible mental modules in the chapter by Bojka Milicic).

The fixed time questionnaire complements and reinforces the results obtained from the interview data. When designing the protocol for the questionnaire data—due to our assumption that, with enough time, subjects would be able to answer all of the kinship questions correctly—we selected a short time interval to ensure that responses could use only minimal, or no, detailed calculation of the kin term that satisfies the conditions of the question. The time for each question was short enough to ensure that not all subjects would be able to answer all of the questions.

The pattern for the blank answers thus provides another point of interest here. Subjects divide bimodally (histogram not shown) into those with few blank answers (number of blanks ≤ 4) and all others. The results for those with few blank answers are given in Table 14.2. Clearly, those who answered almost all of the questions have extensive knowledge of their kinship terminology and can cognitively retrieve correct answers to the questions directly from kin term products without reverting to genealogical calculations, as we expected.

The experimental data not only confirm the results of our algebraic analyses of both the American (Read and Behrens 1990) and the Tongan (Bennardo and Read 2007) kinship terminologies, but also provide further support for the proposed Tongan foundational cultural model called "radiality" (Bennardo 2009). What is radiality? In its most abstract form, it is a structural organization in which a number of vectors share a common origin that may also function as an ending point for these vectors. In

spatial relationships, radiality is the relationship between two points where one of them functions as either the origin or goal of the vector that signals the relationship. This origin/goal remains constant over a number of relationships and with any number of points. The origin/goal can be ego (i.e., cognizer, viewer) and/or speaker, or a point in the field of ego. We label this latter case "radiality"; that is, a point in the field of ego (i.e., other-than-ego) is chosen to function as the source/goal of a number of relationships with other points in the same field, including ego. Essentially, this type of radiality stands for a foregrounding of other-than-ego, while at the same time ego is relegated to the background.

When (preference for) radiality is present in one's cognition, processing of kinship information centered on one's sibling (other-than-ego) is expected to be faster and more accurate—at a minimum because of habituation. If radiality is not present in the organization of one's knowledge (in our case, a kinship terminology), then the opposite is true. So, one's preferred structural organization of mental knowledge (i.e., radial, in the Tongan case) is expected to affect the quality of processing (speed and correctness of output) of incoming data—namely, terms from a kinship terminology. The results of the tasks we administered, presented, and discussed above provide substantial and clear support for the presence of radiality, a Tongan foundational cultural model, in Tongan cognition acting on kin terms. In fact, Tongans do answer faster and more correctly questions involving computations with and within their kinship terminology focused on one's sibling; that is, other-than-ego.

TABLE 14.2. Percentage of questions answered correctly by NIU subjects, with at most four blank response lines

Number of Blanks	Number of Subjects	Proportion Correct	
		Self Questions	Sibling Questions
0	6	0.97	0.96
1	5	0.83 (0.94)	0.71 (0.92)
2	7	0.95	0.84
3	7	0.80 (0.87)	0.72 (0.83)
4	8	0.85 (0.88)	0.64 (0.69)

Note: Numbers in parentheses exclude five subjects who had less than 50 percent correct answers.

Concl usion

The results obtained here run counter to the long-standing assumption, from the time of Lewis Henry Morgan, that kinship first and foremost has to do with genealogical relations, which in turn are presumed to be based on *genitor* and *genetrix* (Kroeber 1917, Rivers 1924, Fortes 1969, Scheffler and Lounsbury 1971, Keesing 1975, among others). If kinship relations were universally framed around genealogical relations computed through *genitor* and *genetrix* determined with respect to ego, we would not expect such striking differences in performance. Under the genealogical rubric, kin terms differ only according to the boundary of the category of genealogical positions identified by the kin term, not through structural relations among the kin terms; thus, from a cognitive/computational perspective, the questions we posed to our subjects would be answered on the basis of computing relevant genealogical pathways identified by the kin terms.

Presumably a kin term would cognitively activate what Lounsbury ([1964] 1968) refers to as the kernel, or prototype, kin type for a kin term, and the cognitive calculation would be made on the basis of category prototypes or focal relations (see discussion of focality in the chapter by Warren Shapiro). If so, then there should be no difference in performance between Americans and Tongans since the kin terms used in the questionnaires and/or interviews are presumed to have the same prototype kin terms; e.g., the prototype for the Tongan kin term *tamai* is the kin type "father" (= *genitor*), and the prototype for the American kin term "Father" is also the kin type "father" (= *genitor*). Consequently, under the genealogical assumption, systematic differences in performance should be based on differences in the kin type calculations involved for each of the kin term questions, and the time to respond, along with error rates, should vary with the complexity of the alleged, underlying kin type product calculation for a particular kin term question and not according to the structure of the terminology.

We find no evidence supporting the genealogical claim; instead we find congruence between performance and the algebraically demonstrated structural differences in the respective kinship terminologies. This empirically confirms our hypothesis that cognitive performance is related to differences in the conceptual structure involved in one kinship terminology compared to another, and identified through the algebraic representation of kinship terminology structure.

Appendix 14.1
Questionnaire in English

Task 1 (1 generation up and down)

Q1a: if your sister calls somebody father, and her father calls someone son, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO son?

Q2a: if your sister calls somebody father, and her father calls someone daughter, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO daughter?

Q3a: if your sister calls somebody mother, and her mother calls someone son, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO son?

Q4a: if your sister calls somebody mother, and her mother calls someone daughter, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO daughter?

Q1b: if your brother calls somebody father, and his father calls someone son, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO son?

Q2b: if your brother calls somebody father, and his father calls someone daughter, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO daughter?

Q3b: if your brother calls somebody mother, and his mother calls someone son, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO son?

Q4b: if your brother calls somebody mother, and his mother calls someone daughter, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO daughter?

Task 2 (1 generation up and down)

Q1: if your sister calls somebody uncle, and her uncle calls someone child, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO child?

Q2: if your brother calls somebody uncle, and his uncle calls someone child, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO child?

Q3: if your sister calls somebody aunt, and her aunt calls someone child, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO child?

Q4: if your brother calls somebody aunt, and his aunt calls someone child, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO child?

Task 3 (2 generation up and down)

Q1: if your sister calls somebody grandparent, and her grandparent calls someone grandchild, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO grandchild?

Q2: if your brother calls somebody grandparent, and his grandparent calls someone grandchild, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO grandchild?

Q3: if your sister calls somebody grandparent, and her grandparent calls someone child, IF YOUR SISTER CANNOT USE THE TERM/S PARENT, MOTHER or FATHER FOR child, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO child?

Q4: if your brother calls somebody grandparent, and his grandparent calls someone child, IF YOUR BROTHER CANNOT USE THE TERM/S PARENT, MOTHER or FATHER FOR child, what TERM/S COULD YOUR BROTHER USE TO REFER TO child?

Task 4 (same generation and 1 generation down)

Q1: if your sister calls somebody brother, and her brother calls someone child, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO child?

Q2: if your sister calls somebody sister, and her sister calls someone child, WHAT TERM/S COULD YOUR SISTER USE TO REFER TO child?

Q3: if your brother calls somebody brother, and his brother calls someone child, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO child?

Q4: if your brother calls somebody sister, and his sister call someone child, WHAT TERM/S COULD YOUR BROTHER USE TO REFER TO child?

Task 5 (1 generation up and down)

Q1: if you call somebody father, and your father calls someone daughter, WHAT TERM/S COULD YOU USE TO REFER TO daughter?

Q2: if you call somebody father, and your father calls someone son, WHAT TERM/S COULD YOU USE TO REFER TO son?

Q3: if you call somebody mother, and your mother calls someone daughter, WHAT TERM/S COULD YOU USE TO REFER TO daughter?

Q4: if you call somebody mother, and your mother calls someone son, WHAT TERM/S COULD YOU USE TO REFER TO son?

Task 6 (2 generation up and down)

Q1: if you call somebody grandparent, and your grandparent calls someone grandchild, WHAT TERM/S COULD YOU USE TO REFER TO grandchild?

Q2: if you call somebody grandparent, and your grandparent calls someone child, IF YOU CANNOT USE THE TERM/S PARENT, MOTHER or FATHER FOR child WHAT TERM/S COULD YOU USE TO REFER TO child?

Appendix 14.2
Questionnaire in Tongan

Task 1 (1 generation up and down)

Q1: if your sister (tokoua) calls X father, and X calls Y son, WHAT TERM/S WOULD YOUR SISTER USE TO REFER TO Y?

Q1: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe tamai, pea ko e tamai ui e taha, foha, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e foha ko é? **tuonga’ane**

Q2: if your sister (tokoua) calls X father, and X calls Y daughter, WHAT TERM/S WOULD YOUR SISTER USE TO REFER TO Y?

Q2: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe tamai, pea ko e tamai ui e taha, ‘ofefine, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e ‘ofefine ko é? **tokoua**

Q3: if your sister (tokoua) calls X mother, and X calls Y child, WHAT TERM/S WOULD YOUR SISTER USE TO REFER TO Y?

Q3: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe fa’e, pea ko e fa’é ui e taha, tama, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokua ‘o ui’aki ‘a e tama ko é? **tokoua/tuonga’ane**

Q1a: if your brother (tuonga’ane) calls X father, and X call Y son, WHAT TERM/S WOULD YOUR BROTHER USE TO REFER TO Y?

Q1a: kapau ‘e hanga ho’o tuonga’ané ‘o ui ‘a taha koe tamai, pea ko e tamai ui e taha, foha, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e foha ko é? **tokoua**

Q2a: if your brother (tuonga’ane) calls X father, and X calls Y daughter, WHAT TERM/S WOULD YOUR BROTHER USE TO REFER TO Y?

Q2a: kapau ‘e hanga ho’o tuonga’ané ‘o ui ‘a taha koe tamai, pea ko e tamai ui e taha, ‘ofefine, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e ‘ofefine ko é? **tuofefine**

Q3a: if your brother (tuonga’ane) calls X mother, and X calls Y child, WHAT TERM/S WOULD YOUR BROTHER USE TO REFER TO Y?

Q3a: kapau ‘e hanga ho’o tuonga’ané ‘o ui ‘a taha koe fa’e, pea ko e fa’é ui e taha, tama, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e tama ko é? **tokoua/tuonga’ane**

Task 2 (1 generation up and down)

Q1: if your sister (tokoua) calls X uncle (in Tongan = not your real *tamai*), and X calls Y son/daughter, WHAT TERM/S WOULD YOUR SISTER USE TO REFER TO Y?

Q1a: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe fa’etangata, pea ko e fa’etangatá ui e taha, foha, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e foha ko é? **tuonga’ane**

Q1b: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe fa’etangata, pea ko e fa’etangatá ui e taha, ‘ofefine, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e ‘ofefine ko é? **tokoua**

Q1c: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe tamai (not real tamai), pea ko e tamaí ui e taha, foha, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e foha ko é? **tuonga’ane**

Q1d: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe tamai (not real tamai), pea ko e tamaí ui e taha, ‘ofefine, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e ‘ofefine ko é? **tokoua**

Q2: if your brother (tuonga’ane) calls X uncle (in Tongan = not your real *tamai*), and X calls Y son/daughter, WHAT TERM/S WOULD YOUR BROTHER USE TO REFER TO Y?

Q2a: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe fa’etangata, pea ko e fa’etangatá ui e taha, foha, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e foha ko é? **tokoua**

Q2b: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe fa’etangata, pea ko e fa’etangatá ui e taha, ‘ofefine, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e ‘ofefine ko é? **tuofefine**

Q2c: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe tamai (not real tamai), pea ko e tamaí ui e taha, foha, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e foha ko é? **tokoua**

Q2d: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe tamai (not real tamai), pea ko e tamaí ui e taha, ‘ofefine, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e ‘ofefine ko é? **tuofefine**

Q3: if your sister (tokoua) calls X aunt, and X calls Y child, WHAT TERM/S WOULD YOUR SISTER USE TO REFER TO Y?

Q3a: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe fa’e (not real mother), pea ko e fa’é ui e taha, tama, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e tama ko é? **tokoua/tuonga’ane**

Q3b: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe mehikitanga, pea ko e mehikitanga ui e taha, tama, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e tama ko é? **tokoua/tuonga’ane**

Q4: if your brother (tuonga’ane) calls X aunt, and X calls Y child, WHAT TERM/S WOULD YOUR BROTHER USE TO REFER TO Y?

Q4a: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe fa’e (not real mother), pea ko e fa’é ui e taha, tama, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e tama ko é? **tokoua/tuofefine**

Q4b: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe mehikitanga, pea ko e mehikitanga ui e taha, tama, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e tama ko é? **tokoua/tuofefine**

Task 3 (2 generation up and down)

Q1: if your sister (tokoua) calls X grandparent, and X calls Y grandchild, WHAT TERM/S WOULD YOUR SISTER USE TO REFER TO Y?

Q1: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe kui, pea ko e kuí ui e taha, mokopuna, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e mokopuna ko é? **tokoua/tuonga’ane**

Q2: if your brother (tuonga’ane) calls X grandparent, and X calls Y grandchild, WHAT TERM/S WOULD YOUR BROTHER USE TO REFER TO Y?

Q2: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe kui, pea ko e kuí ui e taha, mokopuna, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e mokopuna ko é?
tokoua/tuofefine

Q3: if your sister (tokoua) calls X grandparent, and X calls Y child, WHAT TERM/S (NOT A PARENT) WOULD YOUR SISTER USE TO REFER TO Y?

Q3: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe kui, pea ko e kuí ui e taha, tama, ko e há leva ‘ae fo’i lea (‘ikai tamai mo fa’é) ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e tama ko é?
fa’e tangata/mehikitanga

Q4: if your brother (tuonga’ane) calls X grandparent, and X calls Y child, WHAT TERM/S (NOT A PARENT) WOULD YOUR BROTHER USE TO REFER TO Y?

Q4: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe kui, pea ko e kuí ui e taha, tama, ko e há leva ‘ae fo’i lea (‘ikai tamai mo fa’é) ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e tama ko é?
fa’e tangata/mehikitanga

Task 4 (same generation and 1 generation down)

Q1: if your sister (tokoua) calls X brother, and X calls Y son, WHAT TERM/S WOULD YOUR SISTER USE TO REFER TO Y?

Q1: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe tuonga’ane, pea ko e tuonga’ane ui e taha, foha, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e foha ko é?
fakafotu

Q2: if your sister (tokoua) calls X sister, and X calls Y child, WHAT TERM/S WOULD YOUR SISTER USE TO REFER TO Y?

Q2: kapau ‘e hanga ho’o tokoua ‘o ui ‘a taha koe tokoua, pea ko e tokoua ui e taha, tama, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tokoua ‘o ui’aki ‘a e tama ko é?
tama

Q3: if your brother (tuonga’ane) calls X brother, and X calls Y son, WHAT TERM/S WOULD YOUR BROTHER USE TO REFER TO Y?

Q3: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe tokoua, pea ko e tokoua ui e taha, foha, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e foha ko é?
foha

Q4: if your brother (tuonga’ane) calls X sister, and X calls Y child, WHAT TERM/S WOULD YOUR BROTHER USE TO REFER TO Y?

Q4: kapau ‘e hanga ho’o tuonga’ane ‘o ui ‘a taha koe tuofefine, pea ko e tuofefine ui e taha, tama, ko e há leva ‘ae fo’i lea ‘e ngaue’aki ho’o tuonga’ane ‘o ui’aki ‘a e tama ko é?
‘ilamutu

Task 5 (1 generation up and down)

Q1: if you call somebody mother, and your mother calls someone child, WHAT TERM/S COULD YOU USE TO REFER TO child?

Q1: kapau te ke ui ha taha ko ho fa'é, pea ko ho fa'é ui e taha, tama, ko e há leva 'ae fo'i lea 'e te ke ngaue'aki 'o ui'aki 'a e tama ko é?
tokoua/tuonga'ane

Q2: if you call somebody father, and your father calls someone daughter, WHAT TERM/S COULD YOU USE TO REFER TO daughter?

Q2: kapau te ke ui ha taha ko ho tamai, pea ko ho tamai ui e taha, 'ofefine, ko e há leva 'ae fo'i lea 'e te ke ngaue'aki 'o ui'aki 'a e 'ofefine ko é?
tokoua

Q3: if you call somebody father, and your father calls someone son, WHAT TERM/S COULD YOU USE TO REFER TO son?

Q3: kapau te ke ui ha taha ko ho tamai, pea ko ho tamai ui e taha, foha, ko e há leva 'ae fo'i lea 'e te ke ngaue'aki 'o ui'aki 'a e foha ko é?
tuonga'ane

Task 6 (2 generations up and down)

Q1: if you call somebody grandparent, and your grandparent calls someone grandchild, WHAT TERM/S COULD YOU USE TO REFER TO grandchild?

Q1: kapau te ke ui ha taha ko ho kui, pea ko ho kui ui e taha, mokopuna, ko e há leva 'ae fo'i lea 'e te ke ngaue'aki 'o ui'aki 'a e mokopuna ko é?
tokoua/tuonga'ane

Q2a: if you call somebody grandparent, and your grandparent calls someone child, IF YOU CANNOT USE THE TERM/S PARENT, MOTHER or FATHER FOR child WHAT TERM/S COULD YOU USE TO REFER TO child?

Q2a: kapau te ke ui ha taha ko ho kui, pea ko ho kui ui e taha, tama, kapau 'ikai ke lava ngaue'aki 'ae le'a tamai pé fa'é, ko e há leva 'ae fo'i lea 'e te ke ngaue'aki 'o ui'aki 'a e tama ko é?
fa'é tangata/ mehikitanga

Q2b: if you call somebody grandparent, and your grandparent calls someone child, IF YOU CANNOT USE THE TERM/S PARENT, MOTHER or FATHER FOR child WHAT TERM/S COULD YOU USE TO REFER TO child?

Q2b: kapau te ke ui ha taha ko ho kui, pea ko ho kui ui e taha, 'ofefine, kapau 'ikai ke lava ngaue'aki 'ae le'a fa'é, ko e há leva 'ae fo'i lea 'e te ke ngaue'aki 'o ui'aki 'a e 'ofefine ko é?
mehikitanga

Q2c: if you call somebody grandparent, and your grandparent calls someone child, IF YOU CANNOT USE THE TERM/S PARENT, MOTHER or FATHER FOR child WHAT TERM/S COULD YOU USE TO REFER TO child?

Q2c: kapau te ke ui ha taha ko ho kui, pea ko ho kui ui e taha, foha, kapau 'ikai ke lava ngaue'aki 'ae le'a tamai, ko e há leva 'ae fo'i lea 'e te ke ngaue'aki 'o ui'aki 'a e foha ko é?
fa'é tangata

Appendix 14.3

Answer Sheet for Protocol 2

	Native Speaker of English: Yes ___ No ___	Sex: F___ M ___ Age: ___
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26.		

15

Marking and Language Change

David Kronenfeld

In this chapter I first quickly characterize my understanding of marking, including how this understanding derives from the classic sources. I then discuss three variants of marking phenomena that occur in the semantics of words, and show how each contributes to people's use of their existing linguistic resources to adapt to changing cultural and communicative situations. I also show how this adaptive process often embodies diachronic change and, in doing so, can leave behind evidence that can contribute to our understanding of language change and to our use of linguistic data relating to marking, allowing us to unravel some of the history of the communities of speakers of the languages in question.

"Marking" refers to an asymmetric opposition in which one item is more basic than the other. The unmarked category represents a kind of default which is presumed in the absence of further information and which often can stand as a cover term for both members of the opposition.

Trubetzkoy ([1939] 1969) developed the concept of marking in his work on phonology. He noticed that some phoneme oppositions ("privative" ones) were between items that shared all of their distinctive features except for the one on which they were opposed, and that feature distinguished between the presence and absence of an added articulation. The phoneme lacking the added articulation, the "unmarked" member of the opposition, was thus more "basic" since the set of articulations that the pair shared was sufficient to define it but, while necessary, was not sufficient to define the more derivative marked member. More or less "basic" was defined in terms of distinctive features because those were the substance on which the functioning of phonemes was based. Phonemes distinguish meaningful entities from one another, and it is only through differences in their distinctive features that phonemes do so within the system of a language.

First Jakobson (e.g., 1939) and then Greenberg (see 1966, 1968, and 1978) extended the idea of looking for marking phenomena in other areas of language. While some initial attempts appeared to rely analogously on added substance, as in "cat" vs. "cats," it soon became clear, at least to Greenberg, that the presence or absence of such inflectional (or derivational) additions could not define basic vs. less basic in the way they did for phonology. First, in passing, one notes that logically (and behaviorally) equivalent oppositions, such as "man" vs. "men," lack it. Then it becomes clear that presence of inflectional affixes is not what makes the derived form more basic, but, instead, is itself a result of a regular pattern for signaling such relations. Greenberg examined and enumerated (1966) all of the attributes that appeared to characterize what appeared to be nonphonological cases of marking, and decided that the attribute which made one member of such oppositions more basic than the other was frequency of use. He did not explicitly spell out his reasons for this choice, but—based on my experience in courses he taught, my close reading of his work, and my own experience with marking phenomena—I have suggested that the reasoning was as follows: We learn the items that make up language (words, sentence forms, etc.) through exposure to them in everyday usage. We have greater exposure to more frequent items than to less frequent ones, and thus learn them sooner. In terms of any particular morphological, syntactic, or semantic opposition, this means that we learn that more frequent item as a relative "stand-alone" without thinking of it in reference to its eventual opposition. On the other hand, the less frequent item is learned as an item opposed to the more frequent one—that is, as a derivative, variant, or modified form of it. It is in this sense that we can, when the conditions justify it, speak of a more or less "basic" language form outside of phonology.

What makes an opposition neutralizable in one or another context while making one member of the opposition significantly more frequently used than the other seems, in semantics at least, to depend on pragmatic aspects of the terms' referents. In some cases, such as *long* vs. *short* or *deep* vs. *shallow*, the pragmatic issue seems one of underlying logic (here the logic of measurement); in other cases, such as *cow* vs. *bull*, *nurse* vs. *male nurse*, or *doctor* vs. *woman doctor*, it seems to depend on relative frequency with which referents are encountered (joined perhaps with the differential nature of their cultural or economic importance). In yet other cases, such as *dog* vs. *bitch*, it seems to depend on the cultural associations of the category (here, dogs in general—where cultural associations include aspects of both location and behavior). There may be other cases as well. I discuss these and other examples at some length in *Plastic Glasses and Church Fathers* (Kronenfeld 1996).

Relating the presence or absence of one attribute to the presence or absence of another, the occurrence of a zero cell (that is, where one of the table's four cells contains a zero) in a table with a large enough number of cases to make the absence significant indicates an empirical implicational relationship between the two attributes. One can then investigate what the basis of the implicational relationship might be. With related attributes, a marking relationship (i.e., marked vs. unmarked opposition) is often found.

Marking importantly transcends the speech-language opposition, while the implicational relations that it entails transcend the synchrony-diachrony opposition. Greenberg has shown that languages can have unmarked items without their marked opponents, but not vice versa. It follows that unmarked items appear diachronically before their marked oppositions. It was this diachronic concomitant of marking that Per Hage exploited so well in his historical work.

A "marking hierarchy" is the chaining together of a series of overlapping marking relations. Such chaining can produce empirically validated diachronic sequences, as Greenberg has shown. The sequences can, in the abstract, involve either the loss or the addition of attributes—or some mixture of loss and addition.

In the semantics of words, at least three marking loci occur. One locus involves the "external to language" referents of words. This amounts to a question of the default sense in which a term is to be understood in the absence of further evidence. Thus, in English kinship, the native's primary, hence unmarked, sense of "uncle" is something like "parent's brother," while "aunt's husband," though clearly a correct member of the uncle category, is felt to be a secondary variant. Secondary defaults can emerge in specific contexts—for instance, in expressions such as "Say uncle!"—which mostly means "Give up!" but can be used to refer to addressing some uncle. Relative frequency here depends on a combination of frequency with which referents are encountered and the relative centrality of alternative referents to the functional situation that leads to the existence of the given terminological category.

Brent Berlin (e.g., 1972) has shown how, in the domain of ethnobotany, such marking relations enable old terms to be spread to encompass new referents. For example, a local culture's initially monomial term, such as *oak*, is used for the single kind of oak its people know, and then gets used for the other kinds of oak encountered as they move and spread, when necessary, by adding an hoc descriptor, such as "red *oak*." In Berlin's examples, this is the beginning of a sequence in which marked referents can subsequently acquire standard paraphrastic descriptive labels, such as *live oak* (regularities of speech), which in turn can become words (or lexemes) in the language—that is, new words.

In Kronenfeld 2004 I offer the example of historical shifts in the unmarked default referent of "pen." That discussion includes both the material forces that drove the change and the way in which changing usage in successive members of the relevant speech communities produced the change.

Gabriella Rundblad (see Kronenfeld and Rundblad 2003) has shown how one can sometimes pull changing default senses out of historical corpuses and then use this kind of linguistic marking data to throw light on semantic change in language—and thus on the changing cultural conditions which it tracks.

A second marking locus has to do with interword relations, as for "cow" vs. "bull," where "cow" can also serve as a cover term for the set—that is, with the default term when an opposition is neutralized. As Greenberg (1975) has noted, the unmarked term has substantially greater text frequency than does the marked. The greater text frequency of the unmarked term means that it typically is learned before the marked term, and thus that the unmarked term is learned without the context of the opposition, while the marked one is only learned as a differentiated variant of the unmarked. Diachronically this means that the unmarked term will enter a language

before the marked, and that the marked will be lost (if at all) before the unmarked. Per Hage applied these insights very effectively to the study of some specific historical changes in selected kinship terminologies[1] (see, for example, Hage 1999c, 2001a, 2001b, and Hage and Marck 2001). This is the kind of situation that characterizes the *long/short*, *cow/bull*, and *dog/bitch* examples discussed above.

As Berlin (1972) shows, this second locus of marking can arise out of the first; however, cases such as that of *man/woman* show that it also is possible for an initially balanced opposition without a marking default (here, *wæpman* vs. *wifman* as types of *man* in Old English) to change into an asymmetric opposition with a marking default (as in the *man* vs. *woman* as types of *man* in recent English) when, for example, the relevant social conditions exist (Rundblad and Kronenfeld 2000). Berlin (1972) shows (in ways similar to classic examples such as those in Sapir 1936) how the specific nature of lexemes, particularly binomial expressions, can sometimes allow us to reconstruct something of the actual history of the referential and contrastive history of the terms in question.

A third locus has to do with alternative patterns of semantic relations involving a single domain or set of terms. In Fanti the basic set of kin terms is extended out from a set of focal referents in three alternative patterns: one informally based loosely on relative age, sex, and lineage/inheritance; a more marked one which adds genealogical specification to the preceding; and a most marked one that adds generational skewing. The marking shows up in the usual ways. The informal one is the most frequently used, with the unskewed genealogical one next most frequent. As with our cow/*bull* opposition, where the most specified sense of *cow* (female bovine) is considered the technically most correct, the skewed pattern is described as being the most correct; the informal pattern gets the same "not really, but…" response to probes about correctness that our English equivalent gets; both the skewed and nonskewed genealogical variants are described as correct. In *Fanti Kinship and the Analysis of Kinship Terminologies* I provide extensive discussions of this kinship example (Kronenfeld 2009, 16–20, 32, 42–50, and 58–60) as well as, *inter alia*, a rich discussion of multiple aspects of Fanti kinship terminology and behavior from a variety of perspectives and via a variety of approaches (see, for example, McConvell and Keen, this volume).

Something similar (though different in ways that reflect the differences between the two domains) occurs with our domain of fruits and vegetables. What has been initially a distinction between parts of a plant—roots and tubers, stems, leaves, flowers, fruit, seeds—gets somewhat focused as different parts of different plants are selected and selected for as food. In our basic English history, stems (maybe with leaves) got coded as the plants' vegetative matter—hence *vegetables*, leaves as *greens* or *salad greens*, and fruit as *fruit*, while seeds got coded as either *grains* (if ground into flour) or *nuts* (if eaten individually). Roots and tubers and flowers seem not to have made it into our basic American picture, although they have in other cultures, and certainly now we eat lots of roots and tubers. Then our basic meal structure was constructed out of these—perhaps initially as *grain*, *vegetables*, and *meat*—but at some point into *bread* (based on grain); a salad (based on greens); a main plate consisting of a starchy staple (based on grain or roots), a vegetable, and a meat; and a sweet dessert (fruit or some sweetened baked grain). Nuts have become mainly a snack or hors d'oeuvre item. I lay out this only rough and approximate history as a background to what has happened to some particular items and oppositions as a basic set of terms got applied in a marked way to a new context. Thus avocados and tomatoes, though they are both fruits on the plant, are not normally spoken of as *fruit* on the table and are not normally eaten as *fruit*. Instead, tomatoes typically go into some version of the vegetable category, either raw as part of a *salad* or cooked as *vegetables*. Avocados go into the *salad* category or a separate condiment category. In a similar way, corn (maize), though clearly a grain, is commonly spoken of and eaten as a *vegetable* when fresh and sweet, and peanuts, though a tuber-like item, are talked of and eaten as *nuts*. In sum, then, our meal slot structure has been derived from our parts-of-the-plant structure, and foodstuffs whose use is inconsistent with their plant-part classification are reassigned according to the meal slot they fall into. And food types that did not initially get slots in our early meal structure, such as roots and tubers, are now classified according to their meal slot. In addition, between our part-of-the-plant structure and our meal-slot-structure lies a fruit-and-produce-section/store structure. The three structures seem now, synchronically, each independent and distinctive; however, it seems to me that the fruit/produce-store and meal-slot structures cannot be fully understood or accounted for without a consideration of their diachronic derivation from the plant-parts one. This means, to my mind, that the connections among the three structures are still synchronically alive enough

to shade our current thinking (what Wallace Chafe [2000] has characterized as a "shadow meaning").

Shifts such as those we have seen in the kinship and food examples represent one way in which language is adapted by its users to their changing and developing communicative needs. These shifts involve changes in both the shape of paradigmatic structures of opposition and the specific distinctive features that distinguish terminological categories from one another within the structures. Such shifts illustrate a third way in which marking can function as a tool for the adaptation by users of language to new and changing communicative needs. They also show how a consideration of such related structures, including a consideration of the nature and direction of their apparent interdependencies, can aid in our understanding of culture history.[2]

Notes

1. See Shapiro, this volume, for relevant issues.
2. Read's criticism (this volume) notwithstanding. The question is not whether marking solves all problems, but only whether or not it solves some.

16

Grammars of Kinship and Color

Cognitive Universals and Optimal Communication

Doug Jones

Introduction: Grammars for Everything!

Linguistics has sometimes been heralded as a potential master discipline in the human sciences: a fountainhead of theories and methods that might be exported to anthropology, history, sociology, and other fields to create an integrated science of humanity. (Its main rivals for this position have been economics and, from the natural sciences, evolutionary biology.) In the nineteenth century, historical linguistics seemed to offer an unmatched source of insight into both the general evolution and the particular deep histories of human societies. In the twentieth century, the excitement shifted to structural linguistics, which seemed to offer even deeper insight into the patterning of communication, culture, and mind.

Structural linguists from Saussure to Jakobson and the Prague school, to Bloomfield and Greenberg (reviewed in Foley 1997), discovered that a great deal of linguistic patterning is unconscious, abstract, and universal. First, language patterns are largely *unconscious*. For example, English speakers are not generally aware that in the paired phonemes /b/ and /p/, or /d/ and /t/, or /z/ and /s/, the key difference is the presence or absence of a single *distinctive feature*, voicing, in the first member of each pair. Yet a whole range of evidence—systematic changes in speech production, allowed and disallowed syllables, historical changes in phonology—shows that, without being aware of it, speakers process speech into bundles of distinctive features. Also, much of the patterning of language is *abstract*. Distinctive features are not independent entities in their own right, but relational features—hence the example above where voicing resides in the difference between pairs of phonemes. Finally, *universals* are part of the patterning of language. Some of these are simple substantive universals; all languages have consonants and vowels, nouns and verbs. But a larger category of universals are *implicational* or if-then universals: *if* B is present, *then* A is present, but not conversely. These imply that some features of language (like A) are more prototypical or basic and take precedence over other, more atypical *marked* forms (like B). Implicational universals are present in a number of linguistic domains, from phonology, to syntax, to semantics (Comrie 1981; Greenberg 1966; Kronenfeld, this volume).

These discoveries went far beyond simple stamp collecting or inventories of variation to create a genuine theoretical science. Grammar went from a collection of schoolbook rules for proper speaking and writing, comparable to rules for spelling, to a tightly articulated structure with its own logic. Starting around the same time as Freud, but working on a firmer scientific footing, structural linguists developed a real science of the unconscious knowledge embedded in linguistic forms.

These successes naturally inspired the question how far the principles of structuralism in linguistics might carry over to other fields. If there are grammars for speech sounds, are there similar grammars for kinship systems? For myths and folktales? For meals and clothing? For all thought and social life? The greatest exponent of linguistics' structuralizing mission to the social sciences was Lévi-Strauss, who sought to rebuild kinship theory from the ground up by combining and recombining "elementary structures" of kinship (Lévi-Strauss 1969a), and to uncover a structure of "mythemes" in the mythologies of the Americas and elsewhere. His work inspired a generation of structuralist theorizing in Anglo-American anthropology in the 1960s and 1970s. The early work of Hage and Harary (1983b), with its marriage of structuralist analysis

with graph theory and network analysis, has roots here. In France, the structuralist tradition has remained strong up to the present. Meanwhile, componential analysis and later schools of cognitive anthropology—less high-flying than structuralism and more concerned with hypothesis testing—developed as another offshoot of structural linguistics.

Yet developments within linguistics itself were undermining these early efforts to find "grammars for everything." One development was a shift to a more psychological understanding of rules of language. According to structural linguistics, grammar might be relatively abstract, but it is also public: a set of rules relating different public expressions to one another. But from the 1950s onward, strong theoretical arguments increasingly pushed linguists to treat grammar as a system of mental representations. In the new mentalistic conception of grammar, public expressions were generated as transformations of underlying mental representations—representations that in some cases were never overtly expressed. The cognitive turn made linguistics a more powerful science, but it also weakened the credibility of linguistics as the basis for a general theory of society and culture.

An even more damaging development was the rise of generative grammar associated with Chomsky and his students. Although Chomsky and Lévi-Strauss were sometimes lumped together as structuralists, their approaches were very different. Chomsky (1972) argued that the acquisition of language, especially syntax, is the product not of communicative intentions or general learning abilities, but of a biological specialization, which he sometimes called the Language Acquisition Device (LAD). Chomsky compared the LAD to an organ, like the eye or the kidney. Eventually cognitive and evolutionary psychologists would carry this analogy even further, arguing for a whole range of *mental organs* or *modules*: innate information processing systems specialized for tasks such as navigating through space; recognizing, quantifying, and manipulating physical objects; avoiding contaminants; classifying living things into kinds; assessing the intentions of other creatures; dividing the social world into friend and foe, dominant and subordinate, kin and non-kin (Jones 1999). While these developments assigned language an important status as a major human adaptation, they offered little hope that the study of language was the key to understanding the mind or communication in general.

Other researchers in anthropology and cognitive science have pointed out additional pitfalls of hunting for grammars everywhere in culture. In his analyses of symbolism and communication, Sperber (1985), partly in collaboration with Wilson (Sperber and Wilson [1986] 1995), drew a sharp distinction between two modes of communication. One mode involves the rule-based encoding and decoding of messages, and is the domain of grammar proper, understood in modular terms. The other mode involves a more open-ended process of expressing and inferring intentions, and is the domain of symbolism and linguistic pragmatics. Between them, the two modes left little room for the structuralist's broader conception of grammar. Sperber (1985, 90) summarized the implications:

> In the 1940s and '50s, many scholars set great store by the development of a unified science of communication.... This science would bring together the study of language, culture, and society with that of the human brain and mind. Common concepts, and a common method, would lead to a new scientific takeoff. Lévi-Strauss's early methodological papers were meant as a methodological contribution to this new science.... Thirty years later it has become clear that such expectations were largely unjustified.

Up to this point I have recounted a story of the rise and fall of an ambitious theoretical project resting on overdrawn linguistic analogies. In the rest of this chapter, however, I argue for a final twist in the tale, as recent innovations in linguistics have put some old ideas back into play. One innovation is an influential new approach to rules of language called Optimality Theory (OT) (Prince and Smolensky [1993] 2004, McCarthy 2002). Before OT, there seemed to be a split between the old-fashioned, informal cross-cultural generalizations about distinctive features and markedness of structural linguists such as Greenberg, and the high-powered formal machinery of generative grammar. With OT, however, the old generalizations turn out to be part of the generative machinery itself. And not only does the theory incorporate specific findings of structural linguistics, it may also have a similarly wide range of application. OT was developed as a theory of phonology, where it has largely swept aside or assimilated other approaches; however, it may apply to syntax and pragmatics as well. And in this chapter, I show how the theory applies to two semantic domains: kin terms and color terms. The last section of the chapter

considers the likely scope and limits of OT and raises questions about possible broader implications.

Grammar for Sibling Terms

Close parallels between kin terminology and other areas of language have long been recognized. Kroeber (1909) noted that variation in kin terms across cultures is organized around a modest set of distinctive features. Greenberg (1975, [1980] 1990) went a step further, demonstrating consistent markedness relationships, including implicational universals, among kin terms—with one pole rather than the other of each distinctive feature being prototypical, or unmarked. In a series of papers (Jones 2003a, 2003b, 2004) I showed how the machinery of OT could be used to turn these generalizations into a generative theory of kin terminology. In this earlier work, I looked at data on cross-cultural variation in terms for aunts, uncles, and cousins. A major theoretical objective was to use the "grammar" of kin terms as a window on the evolutionary psychology of kinship. Here I turn to data on sibling terms. The major objective—apart from understanding sibling terminologies in their own right, and their interdependencies with other areas of kin terminology—is to understand what the grammar of kin terms tells us about the place of grammar in human communication.

Sibling terminologies afford a classic demonstration of just how highly structured kin terms are (Nerlove and Romney 1967). Each terminology is defined by the way it merges and separates types of siblings. A familiar example is the Brother-Sister ('B'-'Z') terminology, which equates all male siblings under one term, and all female siblings under a separate term. This terminology—usually with words other than *brother* and *sister*, of course—is fairly common among the world's languages, but there are many other possibilities. Three major binary distinctions—sex of sibling, relative age (older/younger than Ego), and sex of Ego—are active among the world's sibling terminologies, and these yield eight elementary sibling types: Man's Older Sister (♂eZ), Woman's Younger Brother (♀yB), and so on. (This chapter uses standard abbreviations or initial capitals for kin types, and single quotes around abbreviations or English glosses for kin terms.) These eight types can, in turn, be split or merged in many ways to generate any of 4,140 possible sibling terminologies. Yet the vast majority of possible terminologies are found nowhere in the world. In fact, in a sample of terminologies from 245 languages, Nerlove and Romney show

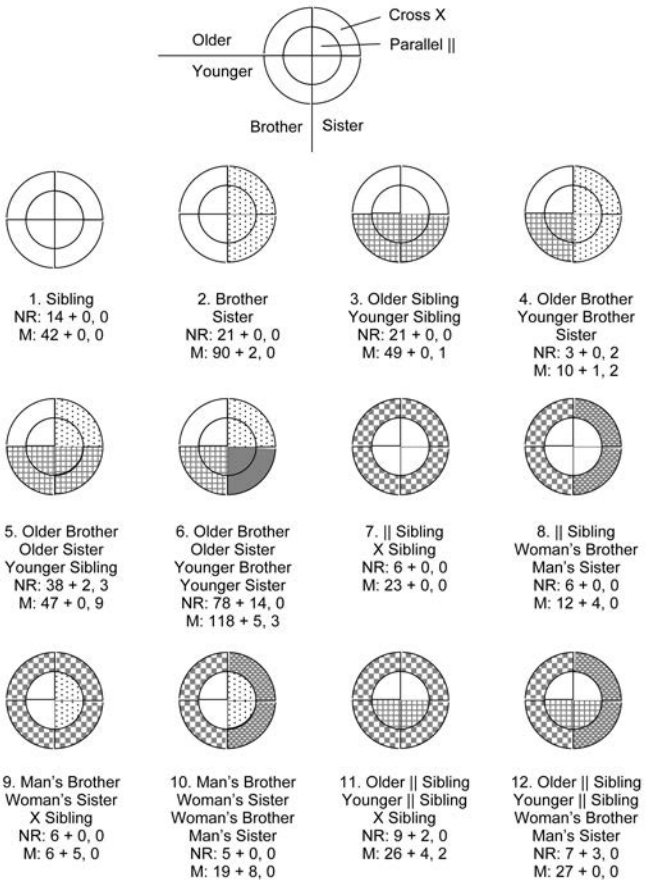

FIGURE 16.1. Twelve basic sibling terminologies. Twelve major types of sibling terminology, along with the number of cases of basic + derivative terminologies, and reversals, from Nerlove and Romney (1967) and Murdock (1970). The figure at the top is a key to the diagrams. Siblings called by the same term get the same shading, so in a Type 2 terminology (Brother Sister), all types of Brother are white and all types of Sister are stippled.

that just twelve major types account for all but ten cases. The true number of exceptions is probably fewer than ten, according to a later review of the original sources by Kronenfeld (1974). An even larger sample (561 cases) comes from Murdock's (1970) summary of kin terminologies; as we will see below, these are highly consistent with the earlier results.

Nerlove and Romney's twelve basic types of sibling terminology are shown in Figure 16.1. Note that when the sex-of-speaker distinction is active, it is normally combined with the sex (i.e., sex-of-sibling) distinction to yield a distinction between parallel siblings (same sex; man's brother or woman's sister) and cross siblings (opposite sex; woman's brother or man's sister). Nerlove and Romney define each of their basic types by *primary* and *sec-*

ondary distinctions: primary distinctions are those that divide the whole set of sibling types into halves; secondary distinctions subdivide just one half into quarters. The 'B' 'Z' terminology (Type 2) has one primary distinction (sex) and no secondary distinctions. The three-term 'eB' 'eZ' 'yG' terminology (Type 5; yG = younger sibling) has one primary distinction (relative age), and one secondary distinction (sex, applied only to older siblings). The most common sibling terminology—'eB' 'eZ' 'yB' 'yZ' (Type 6)—has two primary distinctions (sex and relative age) and no secondary. In addition to the basic terminologies shown in Figure 16.1, there are also *derivative* terminologies, with tertiary distinctions that subdivide single quarters into eighths. The Komba of southeast New Guinea, for example, have a derivative version of 'eB' 'eZ' 'yB' 'yZ' terminology that further distinguishes man's and woman's eB (Murdock 1970, 194). There is a further category of *reversals*. The Yuki of central California distinguish the sex of younger siblings but not that of older siblings (Murdock 1970, 200); this counts as a reversal of the much commoner 'eB' 'eZ' 'yG' terminology (Type 5).

Figure 16.1 summarizes data from Nerlove and Romney (NR) and Murdock (M) on the number of cases of different terminologies. In addition, Nerlove and Romney record four disjunctive terminologies containing terms that cannot be defined as conjunctions of sex of sibling, relative age, and parallel/cross, and one unique case. Murdock's categories are slightly different. Apart from the twelve types defined by Nerlove and Romney, he notes sixteen cases of a thirteenth type (six terms: '♂eB' '♂yB' '♀B' '♀eZ' '♀yZ' '♂Z'), as well as nine disjunctive terminologies, and a miscellany of twenty terminologies with six, seven, or eight terms not spelled out in detail. In total Nerlove and Romney count 214 basic, 21 derived, 5 reversed, and 4 disjunctive cases, and 1 unique case; Murdock's data yield 502 basic (including Type 13), 32 derived, 17 reversed, 9 disjunctive, and 20 miscellaneous cases.

Two principles are at work here constraining variation in terminology (Greenberg 1966, Nerlove and Romney 1967). First, when terminologies combine distinctive features, they almost always do so by conjunction (logical *and*), not disjunction (logical *or*). For example, the category Older Brother is a conjunction of male *and* older sibling. By contrast, a sibling category consisting of eB and yZ—logically possible, but empirically nonexistent—could only be defined disjunctively (with an *or*)—for example, as "Older Brother *or* Younger Sister." There is no conjunction of features that eB and yZ have in common that they do not also share with other types. The rarity of disjunctive sibling categories is consistent with evidence from cognitive psychology that disjunctive categories are difficult to learn and remember (Feldman 2000).

The second major principle is *markedness*, a linguistic reflection of the fact that some categories are more prototypical, or cognitively focal, than others. The former are said to be *unmarked* relative to the latter (i.e., "marked" is the opposite of "prototypical"). Consider the common 'eB' 'eZ' 'yG' terminology (Type 5). Here speakers are making a sex distinction among older siblings that they don't bother with for younger siblings. The much greater frequency of Type 5 terminology compared to the Type 5 reverse ('eG' 'yB' 'yZ', with younger but not older siblings distinguished by sex) shows that older siblings are generally more cognitively focal than younger siblings, with more communicational resources devoted to talking about them. Similarly, male siblings are marked relative to female siblings (see Type 4), and parallel relative to cross (discussed below).

In the rest of this section, I will turn these generalizations about distinctive features and markedness into a formal input-output account of sibling terms using Optimality Theory (Prince and Smolensky [1993] 2004, McCarthy 2002). (The application of OT to kin terms is discussed at greater length in Jones 2003a, 2003b, 2004.)

The building blocks of OT are *constraints*. Here are five constraints (including abbreviations) that generate the first six major terminologies in Figure 16.1. (The remaining terminologies, involving sex-of-speaker distinctions, are treated later in this section).

Distinguish Senior and Junior (within generations) [DAGE]
Minimize Younger Sibling Terms [*YSIB]
Distinguish Male and Female [DSEX]
Minimize Sister Terms [*SIS]
Minimize Sibling Terms [*SIB]

There are two major classes of constraint in OT. The first class, so-called faithfulness (or descriptive) constraints, requires that information about some distinctive feature be faithfully preserved. The first constraint above, DAGE, is a faithfulness constraint, requiring that a kin terminology preserve information about whether a sibling is older or younger than Ego (or other linking relative; see below.) The 'B' 'Z' terminology (Type 2), for example, violates this constraint. Markedness (or classificatory) constraints comprise the second class. These

work in the opposite direction from faithfulness constraints, requiring that terms for marked, non-prototypical categories be avoided. The second constraint above, *YSIB, is a markedness constraint. It is violated by any terminology with separate terms for younger siblings: the more younger sibling terms, the worse the violation. The next constraint, DSEX, is another faithfulness constraint, which is violated by any terminology that ignores sex distinctions. The next two constraints are markedness constraints. One of these, *SIS, is violated by any terminology with sister terms. The last, *SIB, is violated by a terminology with any sibling terms at all. In summary, two of the constraints above are concerned with relative age and sex distinctions, and three are charged with keeping terms to a minimum: terms for siblings in general, and for the two marked categories of younger sibling and sister more particularly.

Clearly there is no way a single sibling terminology can obey all of these constraints. There must be some procedure for assigning priorities when they conflict. In OT this is accomplished by putting constraints in rank order, with each constraint strictly dominating all lower-ranking constraints: no number of violations of lower-ranking constraints outweighs one violation of a higher-ranking constraint. In the simplest formulations of OT, every language uses the same set of constraints, but differences in constraint rankings account for differences in grammar between languages.

An example, illustrated in Figure 16.2, shows how this works: how the constraints on sibling terms, ranked in the order given above, generate an 'eB' 'eZ' 'yG' (Type 5) sibling terminology. The figure presents four *tableaus* that show how ranked constraints select the correct or *optimal* output for a given input. Inputs are kin types; outputs are kin categories. For a Type 5 terminology, the correct output for Older Sister is 'older sister,' the correct output for Younger Sister is 'younger sibling,' and so on.

In each tableau, the upper left cell is the input cell. Thus, in the first tableau the input is Older Sister. The rest of the leftmost column shows a number of candidate outputs. These include all nine conjunctive combinations of relative age and sex. (In one tableau we consider a tenth candidate, a disjunctive category consisting of Older Brother and Younger Sister.) The rest of the top row in each tableau gives the constraints listed above, in order. The rest of each tableau shows the process of evaluation, with candidates running through a gauntlet of constraints. In OT, constraints do not actively transform inputs. Instead they act as filters on randomly generated variation; each constraint in succession deletes prohibited variants until a single *optimal* candidate survives. In other words, OT posits a process of random variation and selection, a process analogous to natural selection or trial-and-error learning, but carried out on mental representations rather than genes or overt behaviors.

Consider the first tableau: When the candidates face the first constraint, DAGE, seven of them are eliminated immediately, because DAGE won't allow information about relative age to be disregarded or falsified. The DAGE column indicates these constraint violations with asterisks in the corresponding cells. The violations are fatal—shown by exclamation marks after the asterisks—and these candidates are eliminated from further consideration. The next constraint, *YSIB, disallows younger sibling terms; the more it hears about younger siblings, the less happy it is. 'Younger sibling' violates this constraint once. The more elaborated 'younger brother' and 'younger sister' each violate it twice, because they supply even more information than 'younger sibling.' (The disjunctive candidate also violates the constraint twice, because it must be defined using an elaborated younger sibling type, Younger Sister.) The three survivors from the first round pass the second constraint unscathed. But the third constraint, DSEX, eliminates 'older brother' and 'older sibling,' because DSEX rules out a male or neuter output for a female input. This leaves 'older sister' as the only surviving candidate. Thus 'older sister' is the correct, or *optimal*, output for the input Older Sister, as indicated by the checkmark. It is not a perfect candidate because it violates the next two constraints, *SIS and *SIB. In fact, it violates *SIS twice and *SIB three times, by supplying extra information about the respective sibling types. But in OT the violation of a higher-ranking constraint outweighs any number of violations of lower-ranking constraints, so 'older sister' survives as the candidate with the least serious violations.

In the second tableau, with Older Brother as input, the optimal output is an 'older brother' term. However, in the last two tableaus, with younger sibling inputs, something different happens. The first constraint, DAGE, ensures that there will be at least one separate term for younger siblings, but the next constraint, *YSIB, ensures that there will be no more than one. The optimal output for both Younger Sister and Younger Brother is 'younger sibling.'

Input	RANKED CONSTRAINTS
'candidate outputs'	EVALUATION

Older Sister (eZ) is 'older sister' ('eZ')…

Older Sister	DAGE	*YSIB	DSEX	*SIS	*SIB
'older brother'			*!		***
'older sibling'			*!		**
'older sister' ✓				**	***
'brother'	*!		*		**
'sibling'	*!		*		*
'sister'	*!			*	**
'younger brother'	*!	**	*		***
'younger sibling'	*!	*	*		**
'younger sister'	*!	**		**	***
Disjunctive Type: Older Brother + Younger Sister	*!	**	*	**	**

and Older Brother (eB) is 'older brother' ('eB')…

Older Brother	DAGE	*YSIB	DSEX	*SIS	*SIB
'older brother' ✓					***
'older sibling'			*!		**
'older sister'			*!	**	***
'brother'	*!*	**			**
'sibling'	*!*	**	*		*
'sister'	*!*	*	*	*	**
'younger brother'	*!	**			***
'younger sibling'	*!	**	*		**
'younger sister'	*!	*	*	**	***

but Younger Sister (yZ) is 'younger sibling' ('yG')…

Younger Sister	DAGE	*YSIB	DSEX	*SIS	*SIB
'older brother'	*!		*		***
'older sibling'	*!		*		**
'older sister'	*!			**	***
'brother'	*!		*		**
'sibling'	*!		*		*
'sister'	*!			*	**
'younger brother'		**!	*		***
'younger sibling' ✓		*	*		**
'younger sister'		**!		**	***

and Younger Brother (yB) is 'younger sibling' ('yG') too.

Younger Brother	DAGE	*YSIB	DSEX	*SIS	*SIB
'older brother'	*!				***
'older sibling'	*!		*		**
'older sister'	*!		*	**	***
'brother'	*!				**
'sibling'	*!		*		*
'sister'	*!		*	*	**
'younger brother'		**!			***
'younger sibling' ✓		*	*		**
'younger sister'		**!	*	**	***

FIGURE 16.2. Generating a Type 5 sibling terminology ('eB' 'eZ' 'yG'): four tableaus. To find the optimal output for a given input: Place a kin type as input in the upper left cell of a tableau. Generate a random collection of potential kin terms that might be used to label that input (left column). Use the constraints in the top row in succession to evaluate these terms, marking constraint violations (*). Eliminate unsuitable candidates (!) until the optimal candidate (✓) is selected. See text for more details.

The outcome of the constraint ranking is a terminology with separate terms for older brother and older sister, but a single term for younger sibling.

Now suppose we take the constraints above and put them in a different rank order. In this case the evaluation process will generate a different set of outputs for the given inputs, and a different sibling terminology. In fact, each of the first six sibling terminologies in Figure 16.1 is generated by one or more possible rankings of the constraints. This is shown in Table 16.1.

In Table 16.1, a 'G' terminology (Type 1), with just one term for sibling, is associated with the constraint ranking *Sib » (DSex DAge). The symbol » indicates ranking, while parentheses indicate clusters of constraints, or constraint *strata*, within which rank order is unimportant. (To reduce clutter, two constraints, *ySib and *Sis, are omitted where they rank below other constraints and have no influence on the evaluation of candidates.)

Conversely, switching the ranking around so that (DSex DAge) » *Sib generates a Type 6 terminology in which four terms provide complete information about sex and relative age. In addition, assigning top rank to the sex distinction and bottom rank to the relative age distinction, DSex » *Sib » DAge, yields a two-term 'B' 'Z' terminology (Type 2), while the reverse gives an 'eG' 'yG' terminology (Type 3). Finally, the markedness constraints *Sis and *ySib come into play in generating Type 4 and Type 5 terminologies.

The constraints not only generate six major terminologies, they also do not overgenerate rare or nonexistent terminologies. Two faithfulness constraints, and one generic and two specific markedness constraints cover the great majority of variation with respect to sex and relative age distinctions.

The third major distinction active in sibling terminologies is the sex-of-speaker distinction, as in Man's Sister versus Woman's Sister. This distinction is unusual in several respects. First, unlike sex and relative age distinctions, sex-of-speaker distinctions are not normally active on their own. Instead they work in conjunction with sex (i.e., sex-of-referent) distinctions, in the form of parallel/cross distinctions, where parallel siblings are of the same sex, and cross siblings are of opposite sex. Second, there seem to be two different parallel/cross distinctions: symmetrical and asymmetrical. Third, cross sibling (opposite sex) is not just marked, but super-marked compared to the other marked categories of younger sibling and sister. Below we consider how all these facts can be accommodated in an OT framework and integrated with other areas of kin terminology.

TABLE 16.1. Generating sibling terminologies: constraints and rankings. The types of terminology in the first column correspond to those in Figure 16.1. These terminologies can be generated by the constraint rankings in the second column, following the principles of Optimality Theory. See the key for a list of constraints and a markedness scale.

Type of Terminology	Constraint Ranking
1. G	*Sib » (DSex DAge)
2. B Z	DSex » *Sib » DAge
3. eG yG	DAge » *Sib » DSex
4. eB yB Z	DSex » *Sis » DAge » (*ySib, *Sib)
5. eB eZ yG	DAge » *ySib » DSex » (*Sis, *Sib)
6. eB eZ yB yZ	(DSex DAge) » *Sib
7. ||G xG	DBifS » *Sib » (DSex DAge)
8. ||G ♀B ♂Z	DBifA » *Sib » (DSex DAge)
9. ♂B ♀Z xG	DBifS » *xSib » DSex » *Sib » DAge
10. ♂B ♀Z ♀B ♂Z	(DBifS DSex)» *Sib » DAge or DBifA » *xSib » DSex » *Sib » DAge
11. ||eG ||yG xG	DBifS » *xSib » DAge » *Sib » DSex
12. ||eG ||yG ♀B ♂Z	DBifA » *xSib » DAge » *Sib » DSex
13. ♂eB ♂yB ♀eZ ♀yZ ♀B ♂Z	(DBifS DSex) » *xSib » DAge » *Sib or DBifA » *xSib » (DAge DSex) » DSex

Key:

Faithfulness or descriptive constraints

DSex	Distinguish Male and Female
DAge	Distinguish Senior and Junior (within generations)
DBifS	Distinguish Parallel and Cross, Symmetrically
DBifA	Distinguish Parallel and Cross, Asymmetrically

Markedness or classificatory constraints

*Sib	Minimize Sibling Terms
*Sis	Minimize Sister Terms
*ySib	Minimize Younger Sibling Terms
*xSib	Minimize Cross Sibling Terms

Markedness scale

*xSib > (*Sis *ySib)

Cross Sibling is more marked than Sister or Younger Sibling.

The parallel/cross distinction among siblings is closely related to parallel/cross distinctions among uncles, aunts, and cousins (Jones 2003b). Consider so-called bifurcate merging terminologies for parent's siblings (aunts and uncles): in these terminologies, Mother's

Sister is subsumed under 'mother,' and Father's Brother under 'father,' while there are separate 'father's sister' and 'mother's brother' terms. In the framework of OT, this reflects the constraint ranking DBIF » *PARSIB. A faithfulness constraint, DBIF (which requires that parallel and cross kin be distinguished from one another) outranks a markedness constraint, Minimize Parent's Sibling Terms (*PARSIB), which requires that terms for parent's siblings be kept to a minimum. The first constraint keeps Father's Sister (cross) from merging with 'mother' or 'mother's sister' (parallel). The second constraint forces a merger of Mother's Sister and Mother. With the constraints in reverse order, both Father's Sister and Mother's Sister are subsumed under 'mother'—a so-called generational terminology.[1]

Parallel/cross distinctions in sibling terminology work much the same as bifurcate distinctions in aunt and uncle terminology, with the same faithfulness constraint, DBIF, and with a Minmize Cross Sibling Terms markedness constraint (*XSIB) taking the place of *PARSIB. The constraint ranking DBIF » *XSIB results in cross and parallel siblings being distinguished, while the opposite ranking, *XSIB » DBIF, leads to them being merged. There is another way to get these results: think of a man's sister as a brother's sister ('BZ'), and a woman's sister as a sister's sister ('ZZ'), and replace *XSIB with a *SIBSIB constraint that bars such sibling's sibling terms. This makes the parallel with bifurcate aunt and uncle terms even clearer. (It may be closer in spirit to Bennardo and Read's analysis of sibling terms in this volume as well.)

To get the full range of sibling terminologies, we add the other constraints introduced above. Thus, with the sex distinction, DSEX, ranking high, we can get a four-term Type 10 terminology ('♂B' '♀Z' '♀B' '♂Z'), while with DSEX ranking low, we can get a two-term Type 7 terminology ('||G' 'xG').

Several other features of parallel/cross sibling distinctions remain to be accounted for. First, a single bifurcate constraint will not cover the data. We need two bifurcate constraints: one acting symmetrically, one asymmetrically. Compare terminologies Type 7 and 8 in Figure 16.1. Type 7 is symmetrical: the two types of cross sibling are equated. Type 8 is asymmetrical: the two types of cross sibling are distinguished, even though no sex difference is observed in parallel sibling terms. To handle the two kinds of bifurcation, we can split DBIF into two faithfulness constraints, DBIFS and DBIFA. The first of these allows the reciprocal cross siblings, Man's Sister and Woman's Brother, to be equated; the second enforces a distinction between them. Using two different bifurcate constraints is not just a "patch" introduced to handle sibling terms; in some form or other, two constraints are needed for cousin terms as well, because the two reciprocal cross cousins—Mother's Brother's Child and Father's Sister's Child—are sometimes distinguished and sometimes not. (The difference is sometimes, but not always, associated with symmetrical and asymmetrical cousin marriage rules [Lévi-Strauss 1969, Fox 1967]).[2]

Finally, there is one further complication. The parallel/cross distinction, unlike sex and relative age distinctions, almost always appears as a primary rather than a secondary distinction when it is active at all. For example, it is common to find terminologies that make a sex distinction among older but not younger siblings ('eB' 'eZ' 'yG'; Type 5), but difficult or impossible to find terminologies making parallel/cross distinctions only among older siblings (e.g., '||eG' 'xeG' 'yG'). The latter, nonexistent terminology would be generated by the ranking DAGE » *YSIB » DBIF » *XSIB. The nonexistence of this and related terminologies implies that *YSIB (and *SIS) virtually never outrank *XSIB. In other words, cross sibling terms are not just marked, but exceptionally marked. In the framework of OT, we can rule out secondary parallel/cross distinctions with a *markedness gradient* or *scale* which stipulates that XSIB always outranks *YSIB and *SIS. This is written *XSIB > (*YSIB, *SIS). Note the difference between two signs, with > designating a universal markedness gradient, and » designating a particular constraint ranking. A generally high rank for *XSIB is consistent with the low frequency of parallel/cross distinctions. Counting only primary and secondary distinctions, and ignoring disjunctive terminologies, 18 percent of cultures in Nerlove and Romney, and 30 percent in Murdock make a parallel/cross distinction, versus 72 percent (NR) and 63 percent (M) that make sex distinctions, and 76 percent (NR) and 60 percent (M) that make age distinctions.

Thus the three new constraints relating to parallel and cross siblings are:

Distinguish Parallel and Cross, Symmetrically [DBIFS]
Distinguish Parallel and Cross, Asymmetrically [DBIFA]
Minimize Cross Sibling Terms [XSIB]

Table 16.1 shows how the expanded set of constraints, plus the markedness gradient *XSIB > (*YSIB, *SIS), generates the full set of major sibling terminologies.[3]

All of the faithfulness constraints active in sibling terms are active in other areas of kin terminology as well. In principle, we hope to find that in each culture a single ranking of constraints governs all kin terms: if DAGE outranks DBIFS for sibling terms, then it should do so for aunt and uncle terms as well. We can apply this principle to predict how these terms covary across cultures. Consider the markedness constraint, *YSIB, which bars younger sibling terms. This constraint also bars elaborated versions of younger sibling such as 'parent's younger sibling.' This implies that the constraint ranking *YSIB » DAGE, which generates a terminology with no terms for 'younger sibling,' will also generate a terminology with no terms for 'parent's younger sibling.' The converse, however, is not the case, because other constraints may eliminate relative age distinctions among aunts and uncles, but not among siblings. For example, one of the markedness constraints active in aunt and uncle terms is simply Minimize Parent's Sibling Terms (*PARSIB), which is violated by parent's sibling terms, and multiply violated by elaborated terms like 'parent's younger sibling.' Thus the constraint ranking *PARSIB » DAGE » *YSIB suppresses relative age distinctions for parent's siblings, while requiring them for siblings. This leads to a prediction: if a culture makes relative age distinctions in its sibling terms, it should also make them in its uncle and aunt terms, but not conversely. Here are the numbers from Murdock (1970):

		Primary age distinctions for aunts, uncles?	
		No	Yes
Age distinctions for siblings?	No	189, 190	3, 3
	Yes	334, 334	32, 31

Patterns in kin terminology seem to result from the joint operation of two cognitive systems: one concerned with kinship and social cognition generally, and one with rule-governed grammatical communication. The next section follows the grammatical part of the mind to another semantic domain, color.

Grammar for Color Terms

Color terminology is one of the most studied and celebrated topics in cognitive anthropology. It demonstrates especially clearly that cross-cultural variation is not random, but structured by psychological universals. Color categorization and terminology have been extensively studied in psychology and anthropology. Here we consider what linguistics—specifically Optimality Theory—can contribute.

Color terminology presents fewer combinatorial possibilities than kin terminology. There are eight basic types of siblings alone, and many tens of other kin types, compared with just six primary colors and five or so basic secondary colors terms in the world's languages. There are also fewer plausible distinctive features in color terminology. On the other hand, with color terminology there is more agreement on first principles. Thus I make a special effort here to derive constraints from perceptual psychology. The present analysis is concerned with focal colors rather than color boundaries, which show less cultural standardization and more individual variation. (For other formal models of color terminologies see MacLaury 1997, Jameson and D'Andrade 1987, Kay and Maffi 1999, Kay and Regier 2003).

To begin at the very beginning (Wooton and Miller 1997), the human retina contains rod cells, which are sensitive to overall levels of illumination, and cone cells, responsible for color vision, which are fine-tuned to different wavelengths of light. The three classes of cone cells in humans (other than the colorblind) are maximally sensitive to long (560 nanometer), medium (540 nm), and short (420 nm) wavelengths. However, the outputs of cone cells are not delivered directly to perception. Instead, neural processes upstream of the retina combine cone cell outputs to deliver the experience of color, which is built around three opposing pairs of primary colors: White-Black, Red-Green, and Yellow-Blue. The position of a color along the White-Black axis depends on L + M, the sum of the outputs of long- and medium-type cones. When this sum is high for some area of the visual field relative to other portions of the field, its color is perceived as white or light. When it is low, the color is perceived as black or dark. For the Red-Green axis, the relevant quantity is L − M, the difference in outputs of long- and medium-type cones. An area of the visual field with lots of light at long wavelengths and little at medium is perceived as red. The opposite is perceived as green. Finally, the Yellow-Blue axis depends on (L + M) − S, the difference between summed long- and medium-type outputs, and short-type output. A high value for this quantity is perceived as yellow, a low value as blue; a side-effect is that yellow, with high L + M, is perceived as light. This scheme allows combinations of non-opposing colors: a patch of color may be reddish blue (purple) or reddish yellow (orange). It also allows intermediate colors between opposites, such as

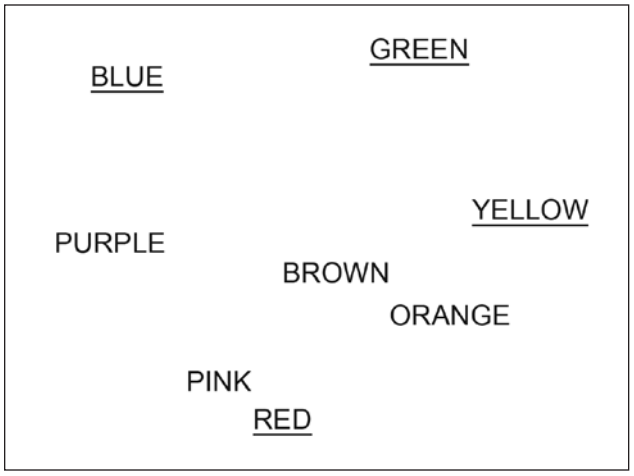

FIGURE 16.3. Colors in similarity space. Based on data from Moore and Romney (2000) on judgments of color similarity with U.S. and Chinese subjects, combining data for color terms and color samples. Closer colors are rated as more similar. Units on scale are arbitrary. Primary colors are underlined.

gray, which is intermediate between black and white. But a combination of opposing colors—reddish green—is not possible.

That perceived colors are mixtures of three opponent pairs of primary colors is the first principle of color perception relevant to color terminology. This principle, at least for the chromatic colors (not including White, Black, or Gray), is demonstrated in Figure 16.3. The figure (based on Moore, Romney, and Hsia 2000) shows perceived similarity among a number of color terms. Raters were asked to give numerical ratings of similarity between pairs of color terms, and the results were subjected to multidimensional scaling to give a two-dimensional representation of the results: the closer together two terms are in Figure 16.3, the more similar they are judged to be. Virtually identical results were obtained for Chinese and American raters, and for color words and physical samples of each color. Consistent with the opponent process principle, Red and Green stand diagonally opposite, as do Yellow and Blue. The figure also demonstrates a second principle: along the sides of the Red-Yellow-Green-Blue quadrilateral, Red and Blue are the most distant from one another, and Yellow and Green the closest.

A third principle, however, is harder to discern in Figure 16.3. This principle aligns the three pairs with one another: White, Red, and Yellow line up at one pole as light or warm colors; Black, Green, and Blue line up at the opposite pole as dark or cool colors. Light-warm and dark-cool colors do not form two clusters in the raw perceptual similarity space of Figure 16.3. Also, as the awkward double labels imply, there is no one distinctive feature that unites all light-warm colors in opposition to all dark-cool colors. We seem to be straddling the line between perceptual psychology and linguistics here, with an echo perhaps of the structuralist maxim that the mind, at least in communication, strives to impose binary divisions on the stuff of thought and experience. More exactly, a phenomenon called *harmonic alignment* in Optimality Theory seems to be at work (McCarthy 2002). For present purposes we can summarize harmonic alignment as follows: Sometimes linguistic forms vary along two or more independent dimensions, and along each dimension one pole is preferred or more prominent than the other. Suppose we have two axes, running from a_1 to a_2 and from b_1 to b_2, with a_1 and b_1 being the more prominent ends of each axis. In such cases, the preferred, harmonic, unmarked configuration is one that aligns a_1 with b_1, and a_2 with b_2. A configuration that aligns a_1 with b_2, and a_2 with b_1, is dispreferred, disharmonic, and marked. Applied to colors, with three opponent pairs, harmonic alignment dictates that the more prominent members in each pair should line up together, as should the less prominent. If bright and warm are more prominent than dark and cool, as independent evidence suggests (Hardin 1988), the result is a light-warm/dark-cool split.

Adding the binary division imposed by harmonic alignment, adding the maximally salient White and Black pair, and translating the quantitative information on color distances in Figure 16.2 into a two-dimensional ranking gets things into the right format for the machinery of grammar to work on.

Figure 16.4 shows two gradients of increasing markedness, from top to bottom and left to right. (The dots represent the secondary basic colors, except Brown; see below.) The top vs. bottom gradient—the light-warm/dark-cool division—is usually overridingly important. It implies, for example, that the distinction between White and Red in the top row counts for more than the parallel distinction between Black and Blue in the bottom row. The other markedness gradient runs from left to right. It implies that the distinction between White and Black in the first column counts for more than that between Red and Blue in the middle column, which counts for more than that between Yellow and Green in the right column.

The chart, with its markedness gradients, can be translated into a collection of faithfulness and markedness constraints and scales to generate the major empirically

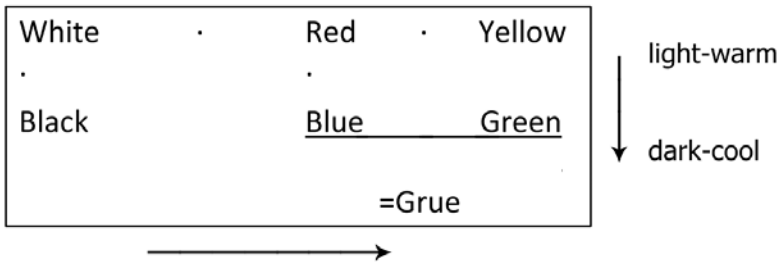

FIGURE 16.4. Colors in semantic space: distinctions and markedness.

observed patterns of color terminology, as shown in Table 16.2. The numbers in the third column represent the number of cases of each terminology in the World Color Survey (WCS). Below I consider first how one faithfulness constraint and several markedness constraints and scales account for most variation in color terminology, and then how to handle some further complications, including secondary colors, Yellow-Green terms, and varieties of markedness.

We begin with a single faithfulness constraint, DCOLOR (abbreviated D in Table 16.2). This constraint is violated by any terminology equating colors across the light-warm/dark-cool divide—strongly on the left-hand end of the divide (Black ⇔ White), moderately on the right (Green ⇔ Yellow). DCOLOR is also violated when adjacent colors within each row are equated, moderately at the top left (Red ⇔ White), weakly at the bottom right (Green ⇔ Blue). Diagonal and other distant equations violate DCOLOR more strongly.[4]

Now we add several markedness constraints, *GREEN, *BLUE, *GRUE, *YELLOW, and *RED, and two markedness scales, (*GREEN, *BLUE) > *YELLOW > *RED and *GRUE > *RED (abbreviated in the table). These constraints and scales follow the chart in Figure 16.4, above, with two provisos covering its least- and most-marked regions. First, note that no markedness constraints bar White or Black, following Berlin and Kay's dictum that White and Black are universally distinguished. Second, note the presence of a *GRUE constraint. If *BLUE were strongly marked relative to *GREEN (proposed by Berlin and Kay ([1967] 1991), but subsequently withdrawn) or vice versa, this could be encoded in a corresponding markedness scale. What the evidence shows instead is, in effect, a flattening of the markedness gradient in the lower right end of the chart—a tendency to merge Blue and Green, but with neither color consistently marked relative to the other. *GRUE, and the associated markedness scales, accommodate this pattern. (For further support for the current analysis, including a special position for Grue, see the cluster analysis of cross-cultural variation in color terms by Lindsey and Brown [2006].)

Secondary Colors

In addition to the six primary colors, some or all of the secondary colors Gray, Purple, Pink, Orange, and Brown are lexicalized in many languages, usually after most or all primary colors. These secondary colors are almost all binary admixtures of White, Black, or Red with each other or other primary colors. Brown, the one possible exception, may be a mixture of Black and Yellow (Wooton and Miller 1997). Missing from the list of widely lexicalized basic colors are combinations of other primary colors, such as Turquoise, between Blue and Green, or Chartreuse, between Green and Yellow. In Figure 16.4, all the secondary basic colors except Brown fit into the interstices in the top row and left and middle columns.

This less-marked region of the chart is where DCOLOR is most sensitive. Suppose DCOLOR registers a violation when Orange is equated with Red or Yellow rather than given its own color term. In this case the constraint ranking DCOLOR » *ORANGE will generate a terminology with a term for Orange. But suppose that in the marked regions of the scale DCOLOR is too insensitive to register any violation when Turquoise is equated with Blue or Green. Then no ranking of the constraints DCOLOR and *TURQUOISE will generate a terminology including Turquoise. Brown is a special case. It may result from what Figures 16.3 and 16.4 don't show: the perceived lightness of Yellow and Orange, meaning that Yellow-Orange and Black are so perceptually distant from one another that the intermediate Brown cannot be equated with either of them without violating DCOLOR. Finally, if we further suppose the scales *ORANGE > (*YELLOW, *RED), *PURPLE > (*BLUE, *RED), and similarly for other secondaries and their component primaries, we can account for the broad patterns of secondary color terms.

TABLE 16.2. Generating color terminologies: constraints and rankings. The first column gives Kay and Maffi (1999) stages in Roman numerals, and [in brackets] the number of color terms in each stage. The second column shows how color terms are combined or separated in each terminology; there may be more than one terminology per stage. The third column lists the number of cultures found at each stage + the number of transitional cases, according to the World Color Survey (WCS). Thus a stage III color terminology has four color terms. There are five stage III terminologies; the first has terms for White, Red, Yellow, and Green/Blue/Black. There are 0 clear-cut cases + 5 transitional cases of this terminology in the WCS. The constraint ranking (*Bu, *G, *Grue) » D » (*Y, *R) generates this terminology. Data from Kay and Maffi 1999. See the key for a list of constraints and markedness scales.

Stage [No. of Terms]	Color Terms	No. of Cases + Transitional in WCS	Constraint Ranking	Note
I [2]	W/R/Y G/Bu/Bk	0	(*Bu, *G, *Y, *Grue, *R) » D	1
II [3]	W R/Y G/Bu/Bk	6+4	(*Bu, *G, *Y, *Grue) » D » *R	1
III [4]	W R Y G/Bu/Bk	0+5	(*Bu, *G, *Grue) » D » (*Y, *R)	1
	W R/Y G/Bu Bk	3+4	(*Bu, *G, *Y) » D » (*Grue, *R)	1
	W/Y R G/Bu Bk		(*Bu, *G, *Y, *Y&R) » D » *R	
	W R Y/G/Bu Bk	2	(*Bu, *G, *Y) » D2 » (*Grue, *R) or ? (*Bu, *G, *Grue) » D2 » (*Y, *R) see next	
	W R Y/G Bu/Bk	?	(*Bu, *G, *Grue) » D2 » (*Y, *R)	2
IV [5]	W R Y G/Bu Bk	41+11	(*Bu, *G) » D » (*Grue, *Y, *R)	1
	W R Y G Bu/Bk	3+1	(*Bu, *Grue) » D » (*G, *Y, *R)	
	W R Y/G Bu Bk	1	(*G, *Grue) » D2 » (*Bu, *Y, *R)	
V [6]	W R Y Bk G Bu	23	D » (*Bu, *G, *Y, *Grue, *R)	1

Notes:

1. Also found in Berlin and Kay 1969.
2. This pattern may or may not be empirically attested.

Key:

Color abbreviations

W White Bk Black R Red Y Yellow G Green Bu Blue

"Grue" is Green plus Blue.

Faithfulness constraints:

D Distinguish Colors (including light-warm/dark-cool)

D2 Distinguish Color Distance (ignoring light-warm/dark-cool)

Markedness constraints:

*Bu Minimize Blue Terms *G Minimize Green Terms *Grue Minimize Grue Terms

*Y Minimize Yellow Terms *R Minimize Red Terms

Markedness scales: (*G, *Bu) > *Y > *R; *Grue > *R

Input = X	*X ROOT	*X WORD	*X-ANY	D
'X'	*	*	*	
'Y' + Mark			*	*
'Y'			*	**
Ø (Null output)				***

FIGURE 16.5. Varieties of markedness. A given input, X, may be labeled with an unmarked expression of its own: "X." Or it can be labeled with a marked version of another form: "Y" + Mark. Or it can be labeled with an unmarked version of another form: "Y." Or it may receive no label at all: Ø or Null output. These possibilities can be handled in the framework of Optimality Theory if we go beyond a simple *X constraint, to allow the markedness constraints shown here.

Yellow-Green Terms

In a scattering of terminologies, color similarity (see Fig. 16.3) partially overrides the light-warm/dark-cool division: Yellow and Green, and sometimes Blue, end up covered under one color term (MacLaury 1997, Kay and Maffi 1999). Only at the marked end of the scale does the light-warm/dark-cool distinction break down; no language merges Red and Blue or White and Black. This pattern can be accommodated by a rare second faithfulness constraint, DCOLOR2, similar to the standard DCOLOR, but not reacting as strongly against light-warm/dark-cool mergers.[5]

Varieties of Markedness

So far our analyses of kin and color terms have considered only a single variety of linguistic markedness: the merging of marked terms, or *syncretization*; however, markedness can take other forms. Returning for a moment to kin terms, consider this sequence of kin types and English terms:

Wife ⇒ wife,
Brother's Wife ⇒ sister-in-law,
Parent's Brother's Wife ⇒ aunt, and
Parent's Sibling's Son's Wife ⇒ Ø (null expression).

These fall along a scale, with less effort made to supply distinctive terms for more genealogically distant affines. Wife gets a term of her own. Brother's Wife gets a term borrowed from someone else but altered to fit her. (This is *markedness* sensu stricto: the added *-in-law* is a mark.) Uncle's Wife gets a borrowed term not altered to fit her (*syncretization*). Cousin's Wife gets no term (*defectivation*).

To see how OT can handle these varieties of markedness, consider the following sequence:

*__ ROOT
*__ WORD
*__-ANY

These items are constraint schemas rather than constraints. They can be turned into constraints by filling in the blank spaces with some category, such as a kin type or color. For example, suppose we fill in the blank and create the constraint *BROTHER'S WIFE ROOT. This constraint bars any monomorphemic root referring specifically to Brother's Wife. But the constraint is narrowly focused, and doesn't bar a marked form such as *sister-in-law*. The next schema is more general. It bars any word, whether root or compound, focused on the selected category. For example, *PARENT'S BROTHER'S WIFE WORD bars not only a root specifically for this kin type, but also the compound *aunt-in-law*. However, it still allows Uncle's Wife to borrow the term *aunt*. Finally, the last constraint bars *any* lexical item referring even indirectly to a specified category. Thus *COUSIN'S WIFE-ANY bars any term for the corresponding kin type, allowing only *cousin's wife*.

Figure 16.5 shows how these schemas govern varieties of markedness in conjunction with a faithfulness constraint, D., which assigns extra violations to terms the farther they are from the item in question with respect to some distinctive feature. With the constraints in the order given, the output is Ø, and there is no term in the language for the specified category. A higher rank for D would generate less marked output, including all the varieties of markedness listed above.

The varieties of markedness have some bearing on current controversies about color terminologies. Consider the Yélî Dnye speakers of Rossel Island (Melanesia). They have what looks like a Type II color terminology, with conventional terms for White, Black, and Red. In Table 16.2, Type II is associated with the constraint ranking

(*Blue, *Green, *Yellow, *Grue)
» DColor
» *Red.

However, Levinson (2001) shows that rather than merging Yellow with Red, and Green and Blue with Black, Yélî Dnye simply lacks conventional terms for the extra colors. Speakers improvise descriptive expressions as needed. According to the discussion of varieties of markedness above, this is a variation on, rather than a radical departure from, the standard Type II ranking, with defectivation rather than syncretism for marked terms. The appropriate constraint ranking is a slight variation on the standard one,

(*Blue-Any, *Green-Any, *Yellow-Any, *Grue-Any)
» DColor
» *Red Word.

But Levinson's argument goes beyond this. He points to further anomalies, and argues that color terms in Yélî Dnye, and probably some other languages too, are so closely tied to terms from outside the domain of color that speakers can scarcely be said to have a color terminology at all (see also Lyons 1995). On the other hand, Kay and Maffi make a case for fitting these cases into the early stages of the Berlin and Kay evolutionary sequence. Without attempting to resolve all the issues here, I note that the present analysis may shed light on this controversy. According to this analysis, universals in color terminology reflect the joint operation of two underlying psychological systems: one governing color perception, the other governing the elaboration of shared communicational codes. In discussions of color terminology, the first of these commonly receives far more attention than the second. But color terminologies are not a direct readout from the perceptual system; rather, they reflect the output of the perceptual system as filtered through principles of optimal communication. When the two systems work together, they have predictable consequences for color terminology. But even if each system is part of a universal human endowment, there is no requirement that they interact to govern color terms in every culture: where communication about color is not important, color may barely exist as a semantic field.

Conclusion: The Scope of Grammar

Kin and color terms are lexical items, but they act like grammatical forms. Like common regular plurals and verb conjugations, kin and color terms are probably memorized and not generated on the fly most of the time. But apparently an OT-style process of evaluation happens often enough in the lives of speakers to keep these linguistic forms highly regular. The parallels are close enough, I propose, that the word *grammar*, with no apologetic quotation marks, is appropriate in both cases.

OT works as well as it does for kinship and color because these domains share several characteristics that make them especially grammar-friendly. In both cases there is a space of possibilities: kin types defined by genealogical and other links, and basic colors related by variations in brightness, hue, and saturation. And in both cases, universals of perception or cognition ensure that there is a modest set of distinctive features and markedness scales obvious to both speakers and hearers that partition this space. Obviousness matters. While the human brain is perfectly capable of learning to carve up the world in less-than-obvious ways, language learners tend to approach the task of learning a language as a coordination game in which any mutually obvious distinctive features are especially likely to be relevant.

What other semantic domains, apart from kinship and color, are good candidates for analysis in the framework of OT? Consider the language of spatial relations and motion. In English, the former are encoded by prepositions like *on*, *over*, *under*, *between*, or *into*, the latter by verbs like *come* or *go*. Cross-cultural variation in this domain is less studied than variation in kin and color terms. However, a recent collection with a promising title, *Grammars of Space* (Levinson and Wilkins 2006b), reports encouraging initial findings, suggesting that cross-cultural variation is structured around markedness and distinctive features. For example, one possible universal of spatial cognition is a basic unmarked scene involving "a relatively small, manipulable, inanimate, movable and independent figure object…in close contiguity with a relatively large, relatively stationary…ground object—for example a cup on a table" (Levinson and Wilkins 2006a, 515). In English,

the spatial relationship in this scene is encoded with *on*. Varying the distinctive features in the scene sometimes changes the appropriate preposition—"The apple is *in* the bowl"—and sometimes doesn't—"The stamp is *on* the envelope." Different languages use different locutions to encode the basic scene, and also differ in how they extend or vary these locutions for other, marked scenes. The variation is not random. There seem to be cross-linguistic implicational hierarchies at work, and "[o]ne can imagine a feature-optimizing account along Optimality Theory lines, which will increase the chances of coding in the basic locative construction in accord with the optimal collection of features" (Levinson and Wilkins 2006a, 515–16).

Other semantic domains, however, are not such promising candidates for OT-style analysis. Consider ethnobiology. The space of possibilities—of all possible living forms—is astronomical, and existing species fill only a minuscule fraction of this space. The features relevant to categorization differ widely from one group of organisms to another, and are discovered post hoc, not picked off a limited menu of perceptual or cognitive universals. Phonology and kin terminologies have many pairs of items differing by a single distinctive feature, like [b] and [p], or Brother and Sister. But no single feature distinguishes elk from deer, or felines from canines. Instead, members of these groups are distinguished on the basis of a whole list of features, which are assigned variable weights, rather than ranked OT-style. Thus, even though a rich cognitive structure, probably including innate schemas of living kinds, organizes biological categorization (Keil 1994, Berlin 1992, Gelman 2003), folk biological taxonomies do not look much like grammars.

The analysis here suggests something about what grammars are and what domains of language they operate in. Grammars are regular input-output relationships in language governed by the principles of Optimality Theory. These principles include violable faithfulness and markedness constraints derived from perceptual and cognitive universals that are arranged in strict hierarchies which filter random variations in inputs to select optimal (not necessarily perfect) outputs. Permutations in constraint rankings generate cross-linguistic variation in grammar, with relationships of salience and harmonic alignment placing limits on permitted permutations. Grammars operate in the domain of phonology, where OT was first developed, and in several semantic domains, including kin terms and color terms. They probably operate in other areas of language as well, including other semantic domains, such as spatial relationships, and perhaps syntax and part of pragmatics. But some semantic domains, like ethnobiology, although highly structured, don't seem to be so grammar-friendly. Also—structuralist enthusiasm notwithstanding—it is doubtful that such cultural domains as clothing, food preparation, and mythology are suitable for OT-style analysis.

The results in this chapter thus fall in-between the maximalist, grammars-for-everything approach of classic structuralism, and the barebones grammar-equals-syntax approach of much current linguistics. The wide scope of grammar—working right across traditional linguistic domains such as phonology, syntax, and semantics—obviously raises broader questions about its place in human cognition and communication. Do the principles of OT derive from general laws of thought, or from the demands of communication? Are these principles rediscovered by language learners in each generation, or are they the product of a biological adaptation—an evolved "grammar faculty"? These questions will go unanswered here; I hope to address them in the future.

Notes

1. The same argument works, *mutatis mutandis*, for uncle terms. Not relevant here are some other terminologies, such as the English lineal terminology in which Mother's Sister and Father's Sister merge, but are distinguished from Mother. An additional faithfulness constraint is needed for these. Also irrelevant here is evidence from generationally skewed terminologies that DBIF comes in matrilineal and patrilineal versions.
2. Are two bifurcate constraints really necessary? In principle, a single DBIF together with the DSEX constraint could do the job, but only at the cost of introducing two new markedness constraints: one barring cross siblings, the other barring parallel siblings. Sometimes one constraint and sometimes the other would have higher rank. This would clash with considerable evidence from other areas of sibling terminology that cross siblings are strongly marked relative to parallel, but not vice versa. Furthermore, there is independent motivation from cousin terminologies for the two bifurcate constraints.
3. The constraints and markedness gradient in Table 16.1 also allow terminologies with age distinctions among cross siblings. A stronger version of the markedness scale, *XSIB >

(DAGE, DSEX), would rule these out. None of Nerlove and Romney's basic types distinguish older and younger cross siblings, but Murdock finds a modest number of miscellaneous exceptions.

4. What this two-dimensional representation can't show is that Yellow is lighter than Red. A tiny number of terminologies merge Yellow, but not Red, with White, while none do the reverse. See also the discussion of Brown.
5. One way to think of it: Imagine two faithfulness constraints, one calling for light-warm and dark-cool colors to be kept separate, and one calling for dissimilar colors to be kept separate; the more perceptually distant two colors, the more the second constraint is violated. Normally the first constraint outranks the second, but on rare occasions the second outranks the first, and Yellow-Green color equations may result. (Note that for this to work, the distance from Red to Blue must be greater than from Red to White.)

17

Is There a Kinship Module?

Evidence from Children's Acquisition of Kinship Terms in Pitumarca, Peru

Bojka Milicic

Kinship terminologies are anthropology's treasure.

—P. Hage

In *Systems of Consanguinity and Affinity of the Human Family* ([1871] 1997), Lewis Henry Morgan wrote: "A formal arrangement of the more immediate blood kindred into lines of descent, with the adoption of some method to distinguish one relative from another, and to express the value of the relationships would be one of the earliest acts of human intelligence. . . ." (10). Morgan's point is significant for the contemporary anthropological discourse on human cognition. In this chapter I attempt to answer two questions inspired by Morgan's claim: what type of cognitive faculties and principles are needed to recognize and label kin, and what is the nature of such a hypothetical faculty? One way to answer these questions is through studying how children acquire kinship terms.

Kinship terminology is a human universal. Kinship terminologies map the social world through the classification of kin and non-kin, and regulate marriage and formation of alliances and coalitions through their constituent parts of incest avoidance and exogamy. The intertwining of kinship with religion and economic and political structures speaks of its sometimes overarching, at times underlying, but nevertheless universal presence. Schneider's (1984) critical position that kinship is not genealogically and biologically grounded, and that it is entirely culturally constructed cannot deny the universal existence of kinship terminologies in ethnographically described societies. Shapiro's (this volume) reexamination of Carsten's (1997, 2000) data shows that the critique in the vein of Schneider's extreme relativism is often not corroborated even by the data these researchers collect themselves. Whether genealogically grounded, entirely culturally constructed, or both, these findings support the claim that kinship is a human universal rather than just a product of anthropologists' minds.

Given the universality of kinship terminologies, it is important to ask: Is there something special about kinship and kinship terminology that might indicate the existence of a specialized cognitive domain—or even a module? Kinship calculus had been described and analyzed by anthropologists as a system of limited variations (Morgan [1897] 1997, Kroeber 1909, Murdock 1949, Lévi-Strauss 1949) and governed by a small number of universally found principles, regardless of the seemingly great ethnographic cross-cultural variation of kinship systems. Lévi-Strauss (1949) wrote that marriage rules and kinship systems are a sort of language, a set of operations designed to ensure a certain type of communication between individuals and groups. In particular, children's thinking has some sort of a "common denominator" of all thinking and all cultures that he called the "polymorphism" of infantile thinking (Lévi-Strauss 1965).

Chomsky's (1972, 1986) "Poverty of Stimulus" argument about the innateness of language directed some researchers toward the theory of modularity, proposing that the human mind contains a number of distinct cognitive specializations, or modules (see, for example, Fodor 1983, 2000; Cosmides and Tooby 1992, 1994; Sperber 2002; Carruthers et al. 2005; Carruthers 2006). In an attempt to

answer questions about the possible innateness of kinship terminology and modularity, I examine here data about the acquisition of kinship terms from a study conducted with bilingual Quechua- and Spanish-speaking children in the town of Pitumarca, Peru,[1] as well as some evidence from Croatian-speaking children on the island of Hvar, Croatia.[2] The results confirm Hirschfeld's (1986, 199) suggestions about children's intuitive understanding and use of kinship terminology, as well as Chomsky's claim about the poverty of stimulus in the acquisition of these terms. I propose that studies of children's acquisition of kinship terms may confirm the existence of a kinship module in the weak form as a part of language (see Jones, this volume), but also with its own unique rules and parameters (Read 1984, this volume; Bennardo and Read, this volume). The results of this study offer a contribution to Chomsky's claim.

Kinship Terminol ogies as Linguistic Phenomena

Kinship terminologies are a part of language. Greenberg highlighted the relevance of kinship terminology as "linguistic phenomena because it constitutes what is perhaps the most highly organized part of the lexicon" ([1980] 1990, 310). He enumerates three factors that determine kinship terminologies: cognitive, the nature of thought; linguistic, the nature of language; and sociological, the nature of social organization. These factors would account for the limited number of variations in the systems of kinship terminologies, and also for its universal presence. Hage (1997, 2001a) pointed out that Greenberg's ([1980] 1990) theory leads to a synthesis between cognitive and social determinants of kinship, and he considered the avoidance of disjunctive categories and the effects of marking as simple yet powerful ideas fundamental for the evolution of human kinship systems and their reconstruction. Hage considered Allen's (1986, 1989b) elegant tetradic model as the best depiction of both the human protokinship terminology and social organization (see Read, this volume, for a critique of Allen's tetradic model).

Kinship terms are among the first words children use to relate to their social group. It has been proposed recently that kinship terms for "mother," "father," and "mother's brother" formed the core of the vocabulary of the human protolanguage (Bancel and Matthey de L'Etang 2002; Bancel, Matthey de L'Etang, and Bengtson, this volume; Bancel, Matthey de L'Etang, and Ruhlen, this volume). These findings point to the semantic domain of kinship terms as the very origin of language. It is reasonable to assume that this form of classification was one of the necessary prerequisites for the organization of social life in humans at the time of the great dispersal, about 100,000 to 40,000 years ago.

Kinship and kinship terminology, therefore, are an area of human life that should be of fundamental interest to a wide range of researchers. Its qualities make kinship terminologies a powerful tool for studying human cognition, prehistory, and social organization. Given its significance and the evidence of its importance in many ethnographically described societies, it is remarkable that kinship terminology is referred to only sporadically in the literature on modularity.

Children' s Acquisition of Kinship Terms

Acquisition and transmission of knowledge is essential for understanding culture as well as for understanding the human mind, which is still largely uncharted territory. There is a great need for empirical studies that might confirm or disprove the theoretical stance on innateness. Hirschfeld (2002), an advocate of the innateness argument, describes the woeful lack of children's studies in anthropology: "The marginalization of children and childhood…has obscured our understanding of how cultural forms emerge and why they are sustained" (2002, 611). Developmental psychologists have studied children's acquisition of kinship terms as an indicator of children's cognitive development, but these studies are limited in their scope, focusing mostly on Western societies, nuclear families, and biased methodology.

The goal of this research was to test Chomsky's hypothesis of the poverty of stimulus in children's acquisition of a special segment of language: kinship terminology. The study was conducted in a non-Western culture with a pattern of kinship terminology radically different from English, focused on extended family, and the research involved a novel method of interacting with children. The results show that the question of the ability to define "kin term" as a relative products (see Read, this volume, on kin types as relative products) is significant: perhaps the fact that children acquire the terms early, with the majority of intervention consisting of corrections rather than instruction and explanations, and yet are able to clearly define them relatively late, speaks of the innateness of the cognitive faculty necessary to use complex kinship terms correctly.

Piagetan studies used kinship terms to assess the development of children's relational concepts and their ability to take another's point of view. The major result of these studies was recognition of the four stages of definitions of kin terms, the related factor of increased semantic complexity, and the type of individual personal experience a child needs to acquire kinship terms. The results were fairly uniform, but, with few exceptions (LeVine and Price-Williams 1974, Greenfield and Childs 1977, Bavin and Shopen 1985, Carter 1985, Ragnasdottir 1999), they were limited to English speakers, and the great majority focused on the set of nuclear family kinship terms. Only Bavin and Shopen (1985), Canter (1985), LeVine et al. (1977), and Greenfield and Childs (1977) had been concerned with non-Western terminologies, but with the exception of Bavin and Shopen, they were all limited to nuclear family kinship terms. Moreover, they focused on children's performance, rather than the input from the environment. Children's acquisition of kin terms as learned in their immediate environment is not uniformly supported in the cited literature.[3]

Hirschfeld (1989) challenged these psychological studies as inadequate to account for children's intuitive acquisition of kinship terms by focusing on adult-like definitions rather than the intuitive correct usage, and argued instead for domain specific "innate endowments." There is still a great need for empirical studies to describe the process of acquiring consanguineal and affinal terms from societies whose kin terminologies are radically different from the Western pattern—and with different, less biased research strategy. I examine here the data from my fieldwork on the acquisition of kinship terms with bilingual Quechua- and Spanish-speaking children in the town of Pitumarca, Peru. Some additional evidence was provided from work with Croatian-speaking children on the island of Hvar, Croatia. The results confirm Hirschfeld's suggestions about children's intuitive understanding and use of kinship terminology, as well as Chomsky's claim about the poverty of stimulus in the acquisition of these terms.

If, as Chomsky asserts, it is true that a child's learning really is about choosing the right parameter to apply to lexical labels (1986), rather than about reinforcement through excessive instructions, then one can expect that the complex non-Western kin terms should be grasped by children with relative ease without systematic reinforcement, which would point to the innateness of these rules and parameters.

The Method

The aforementioned researchers tested children's ability to use kinship terms "correctly" by having them provide a definition. The investigators tested the usage of kin terms for the members of their nuclear families or dolls' "families." Besides focusing on nuclear family only, there were some serious problems with this method, including disadvantages of using Western testing methods in non-Western settings, cultural prohibition on certain kinship terms, and an emphasis on performance that placed an inappropriate pressure on children involved in the studies. Data obtained in this way can often be skewed because children feel that they have to provide "correct" answers. The method of this project, in contrast, emphasized the active role of children as teachers rather than test subjects. The study also offered incentives and rewards that were deemed appropriate for the children as well as for this particular culture.[4] The research was conducted over the period of eight weeks.

The first incentive was an exchange of lessons, English for Quechua, between the researcher and a group of twenty-five children, a random sample from one neighborhood of the town of Pitumarca, in the Andean region of Peru. The researcher taught the children English for a couple of hours every afternoon and included the entire group; in exchange, the researcher asked the children to teach her Quechua, specifically the kin terms for their family members.

A small group of four to five children assembled in the mornings. The children formed their own groups, which included children of various ages and both sexes. Small gifts of crayons and paper were provided for each child for these sessions. The researcher asked each child to draw the family members living in the household as well as others living in the same *ayllu* (one of the "neighborhoods"; the four-part division in Pitumarca follows the classic four-fold *suyu* structure of the Inca administration) or in the same community, or who had perhaps migrated elsewhere. This method allowed for the inclusion of other relatives besides the nuclear family since many children live in extended-family households or maintain contact with other members of the bilaterally extended family.

The researcher asked each child to teach her the Quechua kinship term for each family member in his or her drawing. In the course of this work the researcher asked questions about each term; for example, "Please explain to me WHY is this your *tataɣ* (father)? I don't know this because I am learning Quechua language." Other kinship

terms were examined using the same question. Many uninhibited discussions among children resulted from this procedure when the children felt free to express themselves as teachers rather than research subjects, without any pressure about expected "correct" answers. Because the groups were small (four to five children), mixed in age, and chosen by the children themselves, the researcher was able to observe their interactions, including the help with kinship terms that older children offered to the younger ones, often their siblings.

Findings

In Pitumarca, a mostly bilingual community of Quechua (Runasimi) and Spanish speakers, Castillanization is evident in kinship terminology, as it is in other areas of Runasimi language. This change is taking place both on the lexical and the organizational level—namely, the pattern of splitting and lumping of kinship terms has become Castillanized. In the Pitumarca kinship terminology the feature of bifurcate merging,[5] common in Quechua terminologies (Webster 1977, Zuidema 1990), is lost in the parental generation. The Quechua terms for parents' siblings were replaced by Spanish *tía(-y)*, and *tío(-y)*, reorganizing the original bifurcate merging pattern by terminologically equating all father's and mother's siblings while distinguishing them from "father" and "mother," respectively. But the Spanish terms are also Quechuanized with the suffix *-y* ('my'). Older informants were able to identify the term *ipa* ('father's sister,' 'sister-in-law,' here also extended to all parents' female siblings), but very few could identify *kaka* ('mother's brother,' 'wife's brother,' 'husband's brother'). The children were not familiar with either term. Accordingly, in the ego's generation the cross/parallel cousin distinction is lost as well.[6] Terms *turay pawawan* ('father's brother's children') and *ñañay pawawan* ('mother's sister's children') terminologically equating parallel cousins and siblings are also known only to older informants. The Spanish terms *primo* (masc.) and *prima* (fem.) are now used for all cousins, while distinguishing them from terms for siblings that are preserved in their Quechua form.

In Pitumarca the best-preserved Quechua kin terms are four sibling terms that differentiate siblings of the same and opposite sex in relation to the sex of the speaker—a feature of Quechua terminology that is radically different from Western classification and often difficult for Western students to grasp. In addition to this, Quechua terms also have a prefixes to differentiate between older and younger siblings. These were the terms that all children knew and used without difficulty, including the younger ones in the group, who made few mistakes while using them. Nerlove and Romney (1967) suggest that sex-of-speaker terms are more difficult to learn because they take ego as the distinguishing feature. Pitumarca children, however, had no difficulty using these kinship terms even at the age of five or six, but they could not define them until they were eleven or twelve. Finally, almost all children included themselves and the term *nokay* ('I,' 'myself') in their drawings without being asked to do so.

The second finding refers to the process of acquiring kinship terms. The presence of Chomsky's four criteria of imitation, explanation, correction, and social interaction (1972, 1986) were clearly exhibited in this group. Children are not explicitly taught kinship terms; rather, they are simply corrected by their older siblings or playmates when they make mistakes.[7] It is the same process as in the acquisition of other areas of language, such as gender in Spanish.

The criterion of explanation—such as the one offered by a twelve-year-old who said, "I am your sister because we have the same mother"—actually was the least present, while the other three were amply used. A seven-year-old used the "older brother" term for a younger one and was immediately corrected without explanation by an older child. Social interaction was clearly important as most of the children had siblings and lived in extended families or in close proximity of non-nuclear family relatives. Their awareness of kin relationships was clearly present, as evident from their drawings and the discussions prompted by the drawings. As predicted in Piagetan studies, children between the ages of eleven and twelve were able to provide the relational definitions of kinship terms.

Fieldwork with Croatian-Speaking Children

Most kinship studies with children have assumed that the test of children's acquisition and use of kinship terms is their ability to define or explain correctly the relational properties of a kin term. However, a four-year-old Quechua- (or English- or Croatian-) speaking child is in full command of his/her language without the ability to define any, or very few, concepts—including kinship terms. An example comes from my work with a Croatian-speaking child of four and half and her three-year-old

cousin. In an interesting cognitive twist, she effortlessly assumed another child's point of view by using the term *barba* ('mother's brother,' 'father's brother,' 'mother's sister's husband,' 'father's sister's husband') to refer to her own father. She quickly explained the switch without being able to define the relational properties of each kin type: the girl's three-year-old cousin, her mother's sister's son, was spending some time with her family. Apparently missing his father, the little cousin began addressing his uncle with the term for father. His older cousin explained that she began calling her own father *barba* ('uncle') because she wanted to change her cousin's use of the term "father" to "uncle," for him the appropriate term. When asked to define "father," "uncle," and "cousin," however, she was unable to do so.

The importance of this finding is that the girl was fully capable of assuming another child's point of view, but unable to provide a definition for these terms; nevertheless, she was able to use these kinship terms without any mistakes, not only egocentrically but also from another child's perspective, as illustrated by this, admittedly solitary, example. This example, however unique, points at an innate use of kinship terms that has nothing to do with the ability to provide a definition. It reinforces Read's argument (this volume) that we do not learn the generative logic of our terminology through explanation and definition.

Finally, another important result that emerged concerns the research method. Most of the aforementioned studies with children used structured interviews and focused on children's ability to define the terms—a method that is not suitable for testing acquisition of kinship terms. A four-year-old is a competent speaker of Spanish, Quechua, or Croatian, and can use the kinship terms without making many mistakes, but he or she cannot define relational terms such as kinship, or any of the concepts in either language. By the age of twelve, however, children were able to provide relational definitions, as predicted by the Piagetan studies. Unlike previous researchers who asked children to define a particular kin term, in this study I avoided definitions. Instead of asking "WHAT is a sister?"—which is confusing, I would ask, "WHY is someone your sister?"—a question they found much more manageable. One Quechua four-year-old' answered the question this way: "Because I love her; because she brings me toys." Another finding is evidence of a cognitive leap between ages eight and nine. Answering the WHY question, nine-year-olds were able to describe accurately the relation of "aunt" and "cousin" (while looking at their drawings), while eight-year-olds were not. When asked to tell me the Quechua term for "cousin," the answer of a child of eight and a half was "No se puede!" (You can't do that!) because the Spanish terms *primo* and *prima* had replaced Quechua terms. Nevertheless, the Piagetan phases of cognitive development are confirmed in my sample.

The question of the ability to define kin terms as relative products or kin term products (see Read, this volume, on the ambiguity of the term "relative product") is significant: perhaps the fact that children acquire the terms early, with the majority of intervention consisting of corrections rather than instruction and explanations, and yet are able to clearly define them relatively late, speaks of the innateness of the faculty necessary to use kinship terms correctly. The above example of the four-year-old Croatian-speaking girl is the case in point: she knew clearly that her father was the other child's uncle, that her cousin was not her brother, and that it was therefore incorrect for him to refer to HER father as "father," and she was able to effortlessly restructure the usage of the terms by taking her cousin's point of view. However, when asked to define any of these kin terms, she was unable to answer.

Is There a Kinship Module?

Calvin and Bickerton (2000) have placed the emergence of complex thought at some 50,000 years ago, when "the development of thought from simple to complex implied long-term planning, logical train of reference, games with made-up rules, and the discovery of hidden patterns" (2000, 65). They were presaged by Lévi-Strauss (1965), who almost forty years earlier wrote that in ethnographically described societies, kinship calculus contains all of the characteristics enumerated by Calvin and Bickerton, requiring remarkable cognitive abilities. It is thus reasonable to hypothesize that kinship terminology, like language itself (Deacon 1997), emerged as a cognitive response to the demands of social life.

The domain of kinship, or of relatives, appears to be a computational theory that enables the formations of coalitions through marriage and therefore has to accommodate classes of marriageable and non-marriageable relatives. The great ancestors of kinship studies have already pointed out the nature of kinship as a computational system. Morgan ([1871] 1997, 11) wrote that kinship terminology, "a natural system, numerical in its character, will be found underlying any form which man may contrive and which, resting upon an ordinance of nature,

is both universal and unchangeable." Morgan recognized that kinship calculus requires an inherent cognitive capacity. Kroeber (1909) discovered that all kinship terminologies are based on a limited number of "principles and categories." Lévi-Strauss (1965) expanded Morgan's claim: kinship terminologies are not a surface expression of unconscious processes as the end result of trial-and-error primitive thinking, but rather elegant solutions to real-life problems, carefully thought out by native thinkers. The solutions include "cross-cousin marriage for small stable groups" (the "Paleolithic model") and that of extended prohibited degrees better suited for larger or more fluid ones (the "Neolithic model")." Such a protohuman society had to be equipped with the cognitive skills needed for the simplest social organization based on kinship. Allen's (1986, 1989b) tetradic model, which may explain the "big bang" of kinship terminology, represents such an elegant solution to forging affinal ties that enable a higher population density (see Read, this volume, for a critique of the tetradic theory).

In the recent volume *Primeval Kinship* (2008) primatologist Bernard Chapais reconciles the evolutionary perspective and the structuralist theory of human kinship proposed by Lévi-Strauss, arguing convincingly for the structural unity of human kinship organization. Supported by recent data on nonhuman primates, Chapais reexamines Lévi-Strauss's (1949) claim about symmetrical exchange of women, the pivotal element of structuralist kinship theory. Chapais translates structuralist marriage alliance as the "exogamy configuration," concluding that it is indeed the cornerstone of protohuman social organization. Chapais points out that recognition of close relatives and inbreeding avoidance are found among nonhuman primates as well, and therefore are a continuation of our primate legacy. However, among many nonhuman primates, residential kin groups are based on females' uterine links, and only lineal kin are recognized consistently (Chapais 2008, 39).

Chapais argues that kinship systems originated in the facts of biological reproduction—however loose, culturally altered, or even nonexistent this connection might appear in the ethnographic record. He shows that Lévi-Strauss's exogamy rule and marriage alliance theory converge with nonhuman primate data and "rest on some of the theory's most basic principles" (2008, 13). Chapais's "exogamy configuration" includes a limited set of traits: stable kin groups, enduring breeding bonds, a dual system of residence (pre- and postmarital), incest avoidance among coresident close kin based on the recognition of both matrilateral and patrilateral kin, wider kinship networks that exceed local groups, opposite-sex sibling bonds, and recognition of affinal relationships. These traits are ordered on an evolutionary continuum from early primate traits to the ones that are distinctly human. The last one, tied to exogamy and the consistent principle of the symmetrical exchange of spouses between kin groups, is unique to our species, and it is directly related to the recognition of affines, or in-laws. What is special about human societies is that they integrate *all* of these features, while other primates possess only some of them (Chapais 2008, 12).

I contend here that kinship terminologies—particularly with references to members of the wife-givers group, such as "mother's brother," that require not only the use of symbolic reference (Deacon 1997), but also a peculiarly human ability to conceptualize relation of a relation—could have been the decisive next step, a cognitive leap, that distinguished nonhuman primate societies from protohuman social organization (see also Read, in press).

The first verbal articulations acquired by babies make kinship terms the first words in the acquisition of language, as well as the meanings assigned to them. In addition, "physiological and behavioral factors determining them have far-reaching consequences for our understanding of the ultimate origin of articulate language" (Bancel et al., this volume). Ruhlen's (1994) discovery about the distribution of the term *kaka* ('brother,' 'uncle') and Bancel's and Matthey de l'Etang's expansion of this finding worldwide ('mother's brother,' 'grandfather,' and '(elder) brother' [Bancel and Matthey de l'Etang 2002]) points to these terms as a substratum of human protolanguage rather than onomatopoeic words, as Jakobson (1960) and Murdock (1959b) initially suggested. Bancel et al. (this volume) show that nursery kinship terms are taught to babies, which also implies that the caretakers, by teaching the connection between these first syllables and their meaning to the infants, also teach the principles of symbolic representation, a fundamental cognitive operation. In addition, Matthey de l'Etang and Bancel (Matthey de l'Etang and Bancel 2002, Matthey de l'Etang et al., this volume) suggest that the global semantic and anthropological study of these terms shows that sex, age status, and filiation were recognized in the first *Homo sapiens'* kinship system. Leaf and Read (n.d.) argue that what a child learns through kinship concepts is a precursor for understanding concepts such as social roles in general.

If the resemblances in human languages reflect their common basis in the structure of the mind, a narrower scope and specialization of kinship terminologies (which can be reduced to their own small number of unique principles and parameters of limited variation) surely must be meaningful for both the broader goals of studying human cognition and the anthropological studies of kinship terminology as social charts. Chomsky (1972, 1986) argued that, given "the poverty of stimulus," or the lack of explicit instructions in early childhood in a normal environment, the speed of children's acquisition of language could be explained only if that faculty is innate. Basic principles and parameters existent in all languages would support the claim that language is indeed such a universal human property. Chomsky's proposition triggered a range of work on the modular nature of language. Strongly convinced that language is, in fact, a modular faculty, Pinker (1994) enumerated three main criteria that support that claim: language is acquired early and effortlessly during a child's cognitive development; children make few or no mistakes; it is a faculty universally shared. According to Pinker, the mind is organized into modules, mental organs, each with a specialized design that is responsible for interaction with the world. Modules are defined by the *special things they do* with the information available to them, not necessarily by the *kind of information* they have available (Pinker 1994, 30–31). Finally, Pinker adds, "[A]ll cultures have a system of formal kinship rules.... Law, arithmetic, folk science, and social conventions are other rules; the grammar of a language is yet another" (1994, 127). Thus Pinker makes a distinction between kinship, with its own set of special rules, and rules of grammar.

Studies of the kinship domain have already contributed the general assertion that there is a cognitive domain for kinship. Hirschfeld (1986, 1994) conjectured that kinship is based on "shared commonality" and the intuitive understanding of residence group required for children to acquire local kinship categories. Using quantitative data, Romney et al. (1996) have shown that the English speakers in their sample "share virtually identical cognitive representations of the semantic structure of kinship terms." They propose that the results should be generalized to all semantic domains, and suggest that these domains are perhaps localized in the "functional units" of the brain (1996, 4704).

While neuropsychologists have confirmed in their practice cases of patients with head trauma who had affected various semantic domains, it seems that there is also empirical neurological evidence that kinship is a neurally located semantic domain. A few studies of aphasic patients showed that lesions in an area of the left cortical hemisphere result in grammatico-logical disabilities affecting the relational expressions, specifically "mother's brother" (Luria 1976, 181; Benson and Ardila 1996). Perhaps it is significant that such a disability affects a term often crucial for kinship terminologies. Garman (1990, 438) described the "conduction aphasia" syndrome that affects "particularly closely structured semantic fields such as kinship terms, color names and numerals." Comprehension of the impaired word is "frequently revealed in the form of some appropriate circumlocution." Therefore there is evidence from clinical practice that kinship terms indeed belong to a special semantic domain.

Kronenfeld (1996, 149) points out the uniqueness of kinship, in that "[given] the relative product mechanism by which semantic extensions take place in kinship, it seems at least insofar as we are aware, have no obvious parallel in any other domain." Trautmann (2000, 154) suggests evidence for kinship terminology as a primitive system "because kinship terminology, like language itself, is both lodged in unconscious knowledge and yet fully available to consciousness for articulation in speech...it takes a special effort to call into consciousness the relations of reciprocity among the terms." Dwight Read (this volume) proposes that kinship terminologies possess their own generative logic, and Bennardo and Read (this volume) then apply this "theoretical shift" to their comparative study of Tongan and American usage of kinship terminologies. They show that the generative principles are modified by cultural concerns as the Tongan and American speakers calculate the distance between ego and other kin types via different routes, ego/self-to-parent route vs. the ego/self-to-sibling route, respectively.

Given the fact that some parameters such as the cross/parallel distinction and sex of the speaker/sex of the relative are unique to the semantic domain of kinship, one intriguing question is whether kinship terminology is a special module or a submodule within the language module itself.

The concept of modularity raises many as yet unanswered questions about the clear definition, nature, scope, and independence of various domains. The massive modularity view advanced in evolutionary psychology (see Carruthers 2006) defines modules as innate computational systems naturally selected and designed

to solve problems of survival. They provide access to specific cognitive domains, such as intuitive biology, psychology, physics, and so on (Cosmides and Tooby 1994). For example, the neuropsychologist Butterworth (1999) has suggested that infants are born with a core ability to grasp numeracity, situated in "the number module." The linguistic labels, the number names, are provided by the culture and found in number slots provided by the brain architecture. According to evolutionary studies, language, object recognition, tool use, mother/child eye contact, social exchange, kin orientation, friendship, incest avoidance, coalition formation and cooperation, and so on are modular faculties (Cosmides and Tooby 1994). However, this massive modularity theory does not specify exactly how these modules are implemented in the neural structure of the brain. Evolutionary theorists postulate that domain-specific mechanisms evolved under selective pressures in our ancestral environments; modules are necessary to explain the complexity of human cognitive performance against the existence of only a general purpose learning program. Some researchers suggest that they are spatially localized in the brain, while others point out that at least some modules may be widely distributed within the brain structures (Segal 1996, Carruthers and Chamberlain 2000).

Fodor (2000) criticized the "strong modularity" position as "modularity gone mad," arguing that modular computation must be, among others, informationally encapsulated, fast, shallow, neurally localized, and mostly inaccessible to other processes. Karmiloff-Smith's softer argument (1991) reconciles learning and modularity: intuitive knowledge is just a kick-start for the development of cognitive domains, and soon after modularization has occurred, the modules begin to work together. According to this view, transfers that occur between modules and domains account for creativity, which takes place in development after age three. Mithen (1997) proposed a similar model for prehistory, using the cathedral metaphor, with individual chapels as various types of specialized intelligence. At one point the walls between the chapels were "vandalized" by modern language.

The main assumption in modularity theories proposed within evolutionary psychology is that modules evolved as a response to the problems encountered in our ancestral environment. What purpose and adaptive value would an ability to intuitively and quickly grasp and use kinship terminology have in such an environment? Such a module would serve a number of important functions in the organization of social structure, which, in turn, would directly affect reproduction and, consequently, survival. It would require a computational mechanism(s) to negotiate reciprocal social exchanges that would ensure reproduction and protection (Cosmides and Tooby 1992). Based on our knowledge of ethnographically described hunter-gatherer societies, we can conjecture that it is precisely kinship organization that supplies a chart of a small-scale society, and that a quick computational procedure and application of kinship terms enables individuals to classify all members in a small number of categories and quickly situate all individuals upon encounter within the social coordinates (see Read, this volume, on the !Kung kinship calculus).

To summarize the preceding arguments about kinship terminology: kinship terms represent a special semantic domain marked by the characteristic of the relative product; they possess a set of special rules, separate from grammar; they are deposited in the unconscious, and articulation of the definitions of kinship terms requires a special cognitive effort; they are an important adaptive response to pressures in the environment; they are based on some intuitive sense for a shared substance. These characteristics of kinship terms make them a good candidate for a module with its own internal logic (see also Read and Bennardo and Read, this volume), a specialized type of knowledge rather than a part of general intelligence.

Jackendoff (1992) has proposed that the mind encodes information in some finite number of distinct representational forms, or languages. These "languages" are representational modules or faculties: language, music, visual, motoric, and so on. Each has a set of primitives and principles of combinations. What is innate is a combinatorial system of interface modules: translation between different levels of information. Jackendoff reconciles Chomsky and Piaget: the choice should not be between learning and innateness, but rather how we can account for learning at all, and determine how much of it relies on an innate base. Jackendoff also adds that social concepts constitute a separate module: they are relational. Thus a social cognition module, probably a subspecialty of the conceptual structure, answers the questions "Who is it?" and "How is this person related to others and to me?" This is unique to humans: membership in one descent group determines the other group or groups into which one may or may not marry, and kinship terms are relational parameters that answer these questions.

Concl usion

It appears that modularity studies are a robust body of theory with relatively few anthropological contributions on the nature of kinship calculus, and on children's acquisition of kinship terms in cross-cultural settings. I believe that children's correct usage of kinship terms without the ability to explicitly define them supports the assertion about at least partial innateness of rules and parameters that are used in kinship terminology. It suggests that at least some measure of language-independent calculus is found in kinship terminologies. Moreover, the relational nature of kinship terminology alone attests to the importance of kinship terms when it comes to "reciprocal social exchanges," so important to the modularity theorists in the area of evolutionary psychology (Cosmides and Tooby 1992).

Kinship calculus, however, cannot be modular in the "strong" theory sense because it uses much of the same cognitive apparatus as language. For example, markedness, a language universal, is one of the features of kinship terminologies (Greenberg [1980] 1990; Hage 1999c; Kronenfeld, this volume), and Optimality Theory is another that also structures other semantic domains (Jones, this volume), but current definitions of kinship as domain-specific are too week. Following Greenberg's ([1980] 1990) position that primarily the cognitive, but also the social template determine kinship, I propose that kinship terminology is a historical product based on the same cognitive tools found in language, but using some specific cognitive heuristics. Perhaps kinship terminologies constitute one of the "languages of the mind." There is clearly a need for many more studies of children's acquisition of kinship terms to test the theory.

I have argued here that the conceptualization of kinship types and use of kinship terms were crucial in the transition from nonhuman primate to human social organization based on kinship. Kinship terms possibly represent evidence of an evolutionary new cognitive domain, associated not only with face recognition, but also with language that allows for the calculation of kinship ties and, eventually, the cultural construction of kinship terms (see Read and Bennardo and Read, this volume). Although kinship calculus is a part of language—and subject to the constraints of rules such as markedness, conjunctivity, and Optimality Theory—it has its own set of rules and principles that might be indicative of its modular nature.

Are kinship terms the original nucleus of human language, as proposed by Bancel et al. (this volume)? Had the need for social rules prompted the development of language itself via kinship terminologies? Could the cognitive heuristics used for kinship terms have been the trigger that provided the essential tools for organizing and expanding social relationships? Was the kinship module, in the weak sense, the decisive cognitive leap between nonhuman primates and modern *Homo sapiens*? A lot of evidence suggests that this may be a plausible scenario.

Notes

1. The Andean village of Pitumarca is situated at an altitude of about 13,000 feet, in the *sierra* above the Urubamba River valley in the Department of Cuzco. My fieldwork was carried out in 2003, supported by a University of Utah research and teaching grant.
2. My fieldwork in Croatia was carried out in 2004 and 2005 as part of long-term research that began in 1987 as fieldwork for my dissertation on gender, social stratification, ethnohistory, and economy in a Mediterranean agricultural community (Milicic 1992).
3. Piaget noted as remarkable that an only child is equally capable of defining sibling terms as a non-single child (Haviland and Clark 1974). Haviland and Clark concluded that experience, or lack of it, in no way affected the children's performance with different kin terms, while other researchers (Price-Williams et al. 1977) showed no difference in performance between children who live in nuclear families and those who live in non-nuclear ones. Bavin and Shopen (1985) noticed that some children below age five produced correct or partially correct "skin names," which presupposes the intersection of generation, moiety, and sex in the system of Australian aborigines. These studies pose intriguing questions about the process of learning systems of kin terminology much more complex than ours. In many non-Western societies kin types are classified on the remarkably different non-Western criteria of cross and parallel. None of the aforementioned studies targeted this feature. It has been only sporadically mentioned in ethnographic literature, such as the description of an Ojibwa child who "soon learns" the bifurcate collateral terminology distinction between cross and parallel cousins, or "nonsiblings" and "siblings" of the same and opposite sex (Hallowell Human Relations Area Files). This stands out sharply from the Piagetan assertions that young children's ability is limited to grasping only sex

and generation (Danziger 1957, 213; Burling 1965), but it fails to say when these features become part of children's vocabulary.

4. The enthusiasm and emotional investment of the children who participated in this study constituted a reward for me, and established a symmetrical exchange relationship between us. The last session was devoted to a competition in composing and telling a short story in Quechua. The children voted for the best story, and I gave all participants a certificate. This was an important incentive for the children to participate and to feel the importance of preserving their language.
5. The bifurcate merging system terminologically equates, or "lumps," "father" and "father's brother" under one term, and "mother" and "mother's sister" under another, but has separate terms for "mother's brother" and "father's sister."
6. The cross/parallel distinction refers to cross cousins (children of siblings of the opposite sex) and parallel cousins (children of siblings of the same sex). It is common in many non-Western terminologies and is associated with bifurcate merging in the parental generation.
7. It should be noted that these "mistakes" were really not mistakes but an application of rules rather than exceptions (Pinker 1994): a four-year-old in this group applied the rule of the suffix *–a* as a mark of feminine gender in Spanish—"la puma" instead of the correct masculine form "el puma." The child was corrected and taught the exception by his adult sister.
8. An Italian study (Bernardini and Egerland 2006) of Italian children's use of definitive articles with kinship terms led the authors to conclude that "the semantic categories underlying the morphosyntactic ones are pre-existing, presumably innate. Since a correlation between morphological definiteness and functional features such as *person* and *number* is encountered in many Italian varieties, as well as in the child data, this correlation should have an innate basis too."

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