
Kinship: The Conceptual Hole in Psychological Studies of Social Cognition and Close Relationships

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Kinship has been the central construct in evolutionary biological analyses of social phenomena since Hamilton (1964) extended the concept of Darwinian fitness (personal reproductive success) to encompass the actor's effects on the expected reproduction of collateral as well as descendant kin ("inclusive fitness"). Hamilton's theory replaced the classical Darwinian conception of organisms as evolved "reproductive strategists" with the more subtle notion that they have evolved to be "nepotistic strategists," instead. If each of a behaving animal's genes is just as likely to be duplicated in a sister as in a daughter, for example, then the evolution of sororal beneficence is not, in principle, more paradoxical than the evolution of maternal beneficence. No development in this century has more pervasively and fundamentally affected biologists' understandings of social influence and interaction.

Kinship has attained a central position in anthropological analyses of social phenomena as well. Here, the centrality of kinship emerged much earlier, not for theoretical reasons but because of its inescapable centrality in the lives and minds of human subjects. In the words of Edmund Leach (1966), "Human beings, wherever we meet them, display an almost obsessional interest in matters of sex and kinship" (p. 41). Of course, we grant that one may reasonably question whether the "kinship" to which Leach refers is quite the same thing as evolutionary biology's central construct of genetic relatedness. But they are, at the very least, sibling constructs, grounded in sexual reproduction and

genealogical descent. Just how anthropology's and biology's kinship concepts are related to one another is another topic that we consider further.

Because kinship is so important both theoretically and phenomenologically, one might suppose that it would have attained a central position in social psychology, too. Remarkably, it has been virtually ignored. Human social life is dominated by interactions with relatives and acquaintances, but textbooks of social psychology are almost exclusively concerned with studies of stranger interactions. This seems a scandalous situation, especially when we consider that neither the textbook writers nor the experimentalists have offered any particular justification for this narrow focus. (But see Moghaddam, Taylor & Wright, 1993, who have lodged complaints that partly parallel our own.) We suspect that this narrow focus has arisen primarily as a result of the convenience of a captive subject pool of freshman psychology students who are strangers to one another, and secondarily because real social relationships are messy sources of just the sorts of complex "noise" that good experimental psychologists strive to eliminate. In any event, whatever the reason, the social psychology of even North American kinship has received more attention from anthropologists (e.g. Schneider and Homans, 1955) and, especially, from sociologists (e.g. Adams, 1968; Harris, 1970; Parsons, 1943) than from social psychologists themselves.

Since about 1980, social psychology's restrictive focus on stranger interactions has been somewhat alleviated, as the study of close relationships has become a significant subfield. However, research under this rubric has hitherto been largely confined to dating and marital relationships, with a secondary emphasis on friendships. (See, for example, Berscheid's, 1994, review of almost 300 recent references on the psychology of interpersonal relationships, in which familial relationships are conspicuous by their absence.) It is only very recently that social psychology journals have begun to include research, explicitly inspired by Hamilton's inclusive fitness theory, demonstrating the relevance of genealogical relatedness to human cooperation and altruism (Burnstein, Crandall & Kitayama, 1994; Petrinovich, O'Neill, & Jorgensen, 1993).

In this chapter, we introduce Hamilton's theory in a little more detail and address some common misconceptions about it. We then argue for the existence of a relationship-specific kinship psychology, in which specialized motivational and information processing devices cope with the peculiar demands of being a mother, a father, an offspring, a sibling, a grandparent, or a mate. Although human kinship systems exhibit interesting cross-cultural diversity, they share many universal features, several of which we proceed to discuss in light of evolutionary models such as Hamilton's.

What has yet to be fully appreciated by most psychologists who lack an evolutionary perspective is that sexual partnership, friendship, parenthood, and so forth, are qualitatively distinct kinds of close relationships that differ in many specific ways other than just in their degrees of intimacy. The attributes of an ideal mate, for example, are quite different from those of an ideal sibling or

friend, and it is clear that the human mind processes information about these different sorts of intimates in different, specialized ways (Kenrick, Sadalla, & Keefe, in press; Krebs & Denton, chapter 2, this volume; Symons, 1995).

Even the several fundamental sorts of close genetic relationships require distinct analyses. Before addressing their differences, however, we must first consider what these kin relationships share that distinguishes them from other close relationships. Why and how is it that "blood is thicker than water"?

EVOLVED NEPOTISTS

According to Hamilton's (1964) analysis of "the genetical evolution of social behaviour," the ultimate arbiter of the evolutionary fate of a potentially heritable novel trait is its impact on the inclusive fitness of individuals who possess the trait. This inclusive fitness effect is the sum of the trait's effects, by any and all causal chains, on the survival and reproduction of the focal individual (its "direct" fitness effects, in Brown's 1975 terminology) plus whatever effects it may have on the survival and reproduction of the focal individual's relatives, weighted by the closeness of relationship ("indirect" fitness effects). Personal reproduction is, in a sense, just one form of kin-directed altruism—one of the ways in which an individual can contribute to the relative proliferation of her relatives and her genes within the interbreeding population to which she belongs.

Nepotism originally referred to the bestowal of patronage on the bastard sons, euphemistically called nephews, of popes and other high Vatican officials. It has come to mean the (usually illicit) use of one's social position to bestow benefits on relatives, both genetic and marital. Our meaning here is a little different again: Evolutionary biologists now refer to any sort of social discrimination on behalf of genetic relatives as nepotism, with no implication that such discrimination is reprehensible. It is simply what the evolved attributes of living creatures have been "designed" by the natural selective process to achieve. In the words of Richard Alexander (1979) living creatures "should have evolved to be exceedingly effective nepotists, and we should have evolved to be nothing else at all" (p. 46).

According to Hamilton's (1964) original formulation, "the social behaviour of a species evolves in such a way that in each distinct behaviour-evoking situation the individual will seem to value his neighbours' fitness against his own according to the coefficients of relationship appropriate to that situation" (p. 23). What are these "coefficients of relationship"? The elementary Hamiltonian analysis that has proven adequate in accounting for much of social evolution ignores such complications as sex chromosomes and mitochondrial DNA, and relies on Sewall Wright's (1922) coefficient of relatedness r : the probability that a particular autosomal allele in one individual will be identical

of his personal survival chances. Suppose . . . that virtually the entire population are universal altruists and a tiny minority of mutants or immigrants are kin altruists. Superficially, the U gene appears to be caring for copies of itself, since the beneficiaries of the indiscriminate altruism are almost bound to contain the same gene. But is it evolutionarily stable against invasion by initially rare K genes? No, it is not. Every time a rare K individual behaves altruistically, it is especially likely to benefit another K individual *rather than* a U individual. U individuals, on the other hand, give out altruism to K individuals and U individuals indiscriminately, since the defining characteristic of U behavior is that it is indiscriminate. Therefore K genes are bound to spread through the population at the expense of U genes. . . .

[Now] assume that kin altruism has become common and ask whether mutant universal altruist genes will invade. The answer is no, for the same reason as before. The rare universal altruists care for the rival K allele indiscriminately with copies of their own U allele. The K allele, on the contrary, is especially unlikely to care for copies of its rival. We have shown, therefore, that kin altruism is stable against invasion by universal altruism, but universal altruism is not stable against invasion by kin altruism (pp. 191–192).

In other words, nepotism is an evolutionarily stable state in competition with less discriminative social behavior, and this does not cease to be true when a nepotistic gene has become so prevalent that unrelated individuals are virtually as likely to share it as related ones.

There is a riposte available to the defender of “genetic similarity theory,” but it is a riposte that restricts the theory to a domain so narrow as to be possibly nonexistent. A game theory argument like the one Dawkins uses to debunk Washburn’s fallacy requires a complete specification of the “strategy set,” and Dawkins’ argument allows for only two alternatives, U and K. What about others? Would a population of either U or K individuals be evolutionarily stable against a mutant that neither bestowed altruism indiscriminately nor relied on kinship as an imperfect indicator of the likelihood that another individual carried the same mutant, but somehow detected copies of itself more directly and bestowed altruism accordingly?

Such a hypothetical mutant has been called a “green beard” gene (Dawkins, 1976), and it is probably obvious that it could indeed spread rapidly in a population of universal altruists or even in a population of kin altruists. But do such things exist? The requirements are formidable: The phenotypic effects of the mutant would have to include the unlikely combination of both self-recognition and some kind of discriminative impact on social interactions. A few candidate cases have been proposed, of which perhaps the most interesting is that of certain genes expressed in maternal endometrial tissue that effectuate the selective implantation of blastocysts carrying copies of themselves in preference

to that in another by virtue of their being direct descendants of the same allele in a recent common ancestor. In a sexually reproducing diploid species such as *Homo sapiens*, Wright’s $r = .5$ for (outbred) parent and offspring, $.5$ for full siblings, $.25$ for half siblings, $.25$ for aunt/uncle and nephew/niece, $.125$ for first cousins, and so forth. According to Hamilton, “altruistic” behavior in which the altruist incurs an average cost c (in units of expected future reproduction) and a beneficiary acquires an average benefit b (in the same currency) can proliferate under natural selection as long as $r > c/b$.

THE “GENETIC SIMILARITY” FALLACY

Hamilton’s proviso that the relevant index of relationship is the probability of allelic identity “by descent” has been the object of some considerable confusion. Shared alleles are shared alleles whatever their origin. So should we not expect the extent to which natural selection favors altruistic behavior to depend simply on the beneficiary’s genetic commonality with the altruist, regardless of “descent”?

This line of reasoning has been called “genetic similarity theory,” and has been touted as a more general theory that encompasses Hamilton’s inclusive fitness theory as a special case (Rushton, Russell & Wells, 1984; Russell, 1987). But it is no such thing. It is an instance of what Richard Dawkins (1979) has called “Washburn’s fallacy,” in honor of an earlier version of this attractive but flawed argument.

“This whole calculus upon which sociobiology is based is grossly misleading,” anthropologist Sherwood Washburn (1978, p. 415) maintained, because most genes are identical regardless of descent. Parent and offspring are identical at 50% of their genetic loci by virtue of copying of an allele in that very parent, but they are sure to be alike at many other loci, too. If the alleles that two parties have in common were really the basis for altruism, we would have evolved to cherish all other humans as our close kin, and perhaps the great apes as well. By the same reasoning, selection should have favored our being nicer to monkeys than to other mammals, or, for that matter, being nicer to mosquitos than to marigolds. *Reductio ad absurdum*.

Obviously, something is wrong here. But it is not Hamilton’s reliance on Wright’s coefficient of relatedness. The proportion of genes that two individuals have in common may sound as if it captures what we mean when we refer to relatedness, but it is a red herring. The real issue is the evolutionary stability of trait states in competition with one another. As Dawkins (1979) explained:

Let there be two strategies, Universal Altruist U, and Kin Altruist K. U individuals care for any member of the species indiscriminately. K individuals care for close kin only. In both cases, the caring behaviour costs the altruist something in terms

to those carrying the mother's other allele (Haig, in press). But there is no reason to suppose that "green beard" genes are numerous, and in any event, they could not even in theory produce what Rushton et al.'s (1984) genetic similarity theory proclaimed: an evolved psychology that adjusts altruism in relation to an inferred degree of across-the-genome similarity rather than in relation to an inferred degree of genealogical relatedness. This is because no matter how many loci one uses in assessing overall genetic similarity, one is none the wiser about the probability of similarity at some other locus (such as a mutant gene affecting the rules for allocating altruism) except by virtue of what the similarity assessment implies about genealogical relatedness. Thus, if psyches that regulate altruism in response to gross similarity assessments do indeed exist, they have evolved because genetic similarity can be used as a cue indicative of genealogical relatedness, not the reverse. Discriminative altruism that is contingent on such an assessment is favoured by selection only to the degree that it constitutes discriminative nepotism.

A variant of Washburn's fallacy (or, if you like, a close relative) is the suggestion that it only makes sense to discriminate in favor of kin if there is significant genetic variability. Why should a "selfish gene" bother to engender nepotistic discrimination if nonrelatives were as likely to carry it as relatives? But to even ask this question is to take the metaphor of genes as replicative "strategists" too literally. One and the same gene cannot "change its mind" about its phenotypic expression. Genes that engender discriminative nepotism go to fixation and are stable against invasion by alternatives, and that is all there is to it. It is true that selection often favors phenotypes and hence genotypes that respond facultatively to environmental variations, but the entities that engage in flexible "strategizing," contingent on social and contextual variations, are entities at the level of whole organisms or complex subsystems thereof, not entities at the level of the "selfish gene."

More generally, there is an oddly prevalent misconception, even among biologists (e.g., Hrdy & Hausfater, 1984; Lewontin, 1979; Plomin, DeFries & McClearn, 1980), to the effect that any hypothesis that some phenotypic attribute is an adaptation requires that there be demonstrable variability at relevant genetic loci. If it is an evolved adaptation, goes the argument, then there must be genes "for" it, so show me that the trait is "genetic" first, and only then will I entertain the hypothesis that it might have been selected for. The trouble with this argument is that selection tends to eliminate heritability, with the effect that the attributes with the most direct and important effects on reproductive success are precisely the ones with the lowest heritabilities, not the highest (Falconer, 1960). The most highly heritable of the variable aspects of our eyes, for example, is the color of the iris, and this is because iris color and the genes affecting it are neutral (inconsequential) with respect to visual function. It follows that demonstrable, appreciable heritability should be considered *prima facie* evidence (though by no means conclusive evidence) against

the hypothesis that the trait under consideration represents an adaptation (Daly, 1995). Nepotistic adaptations usually take the form of species-typical contingent decision rules: Sound the alarm when your neighbors are kin, for example, and stay mum when they are not (Sherman, 1977). It is therefore environmental rather than genetic sources of behavioral variation that usually provide the crucial tests of adaptationist hypotheses (Crawford & Anderson, 1989).

Oddly, arguments such as Washburn's have been advanced, not only as supposed critiques of Hamilton's theory, but as supposed validations of it. Consider, for example, Segal's (1984) claim that Hamilton's theory entitles us to expect a greater solidarity in monozygotic than in dizygotic twins. As it happens, Segal has convincingly demonstrated just such a difference, but this was never a straightforward prediction from inclusive fitness theory. Nepotistic inclinations are psychological adaptations, "designed" by the process of natural selection to promote inclusive fitness in the particular social environments in which they evolved. People living in circumstances like those of our ancestors probably seldom bore twins and were unlikely to rear both when they did (see Granzberg, 1973), so there appears to be little chance that we possess complex psychological adaptations whose specific function is to discriminate between our identical and fraternal twins and adjust our cooperativeness/competitiveness accordingly. A much more plausible hypothesis is that children possess psychological adaptations whose function is to assess whether a junior sibling has the same paternity as oneself, and to adjust the intensity of sibling competition accordingly. It is also possible that similarity to oneself is used more generally as one cue of relatedness, as Segal herself recognized. The exceptional solidarity of identical twins might then reflect a "supernormal" activation of psychological mechanisms whose normal function is to discriminate between lower values of r . Such solidarity can only be "predicted," however, from some such specific hypothesis about the nature of an evolved Hamiltonian adaptation. Rather than directly assessing Hamilton's analysis of the selective process, evolutionary psychology can progress by testing alternative specifications of the predictable "design" features of the psychological mechanisms of nepotistic discrimination under one versus another specific hypothesis about their primary functional contexts.

RELATIONSHIP-SPECIFIC PSYCHOLOGICAL ADAPTATIONS

According to Haslam (1994b), "The study of social relationships lies at the heart of the social sciences, but psychologists' understanding of the cognitive structures that support them remains in the hinterlands" (p. 575). It is becoming clear, however, that those cognitive structures do not merely locate relation-

ships in a space defined by a couple of dimensions such as "intimacy." They distinguish relationship categories. Haslam's (1994b) study of mental representations of relationships left both kin relationships and distinctions by sex out of consideration, yet he was still led to conclude, following Fiske (1991) and Fiske, Haslam, & Fiske, (1991), that "implicit knowledge of social relationships is modeled better by a small number of local, discontinuous representations, or categories, than by global laws and dimensions" (Haslam, 1994b, p. 582; see also Haslam 1994a).

When we include kinship (and gender), the categorical distinctions among relationships become inescapable. Genealogical kinship is not just one discrete category of relationship but several. The challenges that have faced human mothers, for example, are different from those confronting fathers or offspring or siblings or more distant relatives. It is certain that we possess distinct sets of evolved psychological adaptations for dealing with the peculiar demands of motherhood and offspringhood, and virtually as certain that we possess psychological adaptations for dealing with the challenges of being fathers and siblings as well. Specific psychological adaptations for grandparenthood and perhaps for other distal relationships remain plausible, too.

Motherhood

Consider first the psychology of motherhood. The most intimate of mammalian social relationships is that between mother and young. It is also the one with the largest inventory of special-purpose anatomical, physiological, and psychological machinery. But the task demands of motherhood are a good deal more complex than even a consideration of the component demands of conceiving, gestating, and raising a baby would imply. Because offspring are not all equally capable of translating parental nurture into increments in the long-term survival of parental genetic materials, there has been intense selection for subtle discriminations in the allocation of maternal effort. The result is that the evolved motivational mechanisms regulating maternal investment decisions are complexly contingent on variable attributes of the young, of the material and social situation, and of the mother herself including lifespan developmental changes from youth to menopause in the possibly exceptional case of *Homo sapiens* (Daly & Wilson, 1995a).

The problem of adaptive allocation of maternal investments is an especially subtle one because of the active intervention of other parties with conflicting interests, namely the offspring themselves. Parent-offspring conflict (Trivers, 1974) is endemic to sexually reproducing species because of a certain asymmetry of relationship: A mother is equally related to any two of her offspring, but each offspring is more closely related to self than to sib. It follows that mother and offspring are selected to see the relative fitness values of broodmates, and hence the optimal allocation of maternal investments, somewhat differently. Each

offspring is selected to covet a little more from the mother than would be optimal for her own fitness. This conflict accounts for the otherwise puzzling existence of seemingly maladaptive aspects of mother-young interaction, including weaning conflict (Trivers, 1974), tantrums (Trivers, 1985), and the dangerously high levels of allochrine substances of fetal origin in the blood of pregnant women, including human chorionic gonadotropin, which interferes with the mother's capacity to terminate pregnancies that are suboptimal from her perspective, and human placental lactogen, which upregulates the fetus's access to maternal glucose stores (Haig, 1993).

Of course, long before Trivers laid bare the logic of parent-offspring conflict, it was apparent to all who looked that the maternal relationship was special. Throughout human history, most women have devoted the majority of their waking hours to foraging for, educating, guarding, and otherwise nurturing their children. But try to find even a paragraph concerning this central domain of human social behavior in a textbook of social psychology, and you are likely to be disappointed. The sources of variability in maternal feeling and action have also been virtually ignored in scientific psychology's consideration of "motivation," apparently because theorists lacking an evolutionary perspective have had no framework for making sense of the vicissitudes of maternal inclinations (Daly & Wilson, 1988a). It is only developmental psychologists who have paid some attention to maternal behavior, but the interest here has been primarily in alleged impacts on the developing child (e.g. Cranley, 1993; Howes, Matheson, & Hamilton, 1994) and secondarily in maternal style as a personality attribute (e.g. Belsky, Fish, & Isabella, 1991) rather than as an adaptively contingent response. The neglect of motherhood is perhaps the single most telling indictment of a social psychology devoid of the concept of qualitatively distinct fundamental relationships.

Fatherhood

Now consider fatherhood. There are some obvious parallels with the maternal case, but also some crucial differences. In both mothers and fathers, parental solicitude evolves to vary adaptively in relation to phenotypic and situational cues affording information about the expected impact of any parental investments on the offspring's reproductive value (expected future fitness), so mother and father alike are selected to assess offspring quality and offspring need. However, a father cannot necessarily exploit the same information as a mother in making his parallel assessment, mainly because of the special avenues of communication (and manipulation) between a mother and her fetus or nursing (Haig, 1993). It is also the case that both maternal and paternal solicitude evolve responsiveness to cues of the fitness value of the available alternatives to present parental investment, but here it is even clearer that the specifics are different. In particular, the chronic possibility that extrapair mating effort might

enhance male fitness lures effort away from parental investment. Finally, both mother and father are selected to discriminate with respect to available cues that the offspring is indeed the parent's own, but the relevant information sources are again distinct. Female mammals generally identify their own babies on the basis of initial circumstantial cues soon after birth, and subsequent learning of their young's distinguishing features, and there is no reason to doubt that this applies to women (Daly & Wilson, 1995a). But the mere fact that a particular baby emerged from a particular woman's birth canal has never been conclusive evidence of paternity, so a putative father must rely on additional sources of information about the woman's probable fidelity, the baby's phenotypic resemblance to his relatives or himself, or both.

An evolutionary psychological hypothesis derived from these considerations is that the affection felt by fathers is likely to be influenced by their children's resemblance to themselves, whereas little or no such effect would be expected in mothers. As far as we know, this hypothesis has not been tested directly. However, there is evidence that all interested parties pay a great deal more attention to a baby's phenotypic resemblances on the paternal than on the maternal side, and that mothers and their kin actively promote perceptions of paternal resemblance (Daly & Wilson, 1982, 1988a; Regalski & Gaulin, 1993).

The issue that we are discussing has been referred to as one of the "uncertainty" of paternity, or variable paternity "confidence," especially in studies of nonhuman animals in which males invest in their ostensible offspring. The same terms have also been used in anthropological discussions of the *avunculate*, a social practice whereby men transmit titles and resources primarily to their sisters' sons rather than their own. Following a suggestion by Alexander (1974), evolution-minded anthropologists have discussed the incidence of extrapair paternity that would be necessary for putative fathers to actually be more closely related, on average, to their sisters' sons than to their wives' sons (Kurland, 1979). Avuncular inheritance is indeed cross-culturally associated with conditions conducive to low levels of paternity confidence (Flinn, 1981; Gaulin & Schlegel, 1980), and if those levels are seldom or never quite low enough to make the sisters' sons closer kinsmen than wives' sons, we should remember that these inheritance decisions are not the man's alone and that his parents can always be surer of their relationship to his sister's children than to his own children (Flinn, 1981; Hartung, 1985).

The use of the terms *uncertainty* and *confidence* has been unfortunate, however, because of their misleading psychological implications. Both terms seem to refer to a subjective degree of confidence or doubt of which the putative father is aware. But that is not the way these concepts are actually used. In practice, they have been synonymous ways of referring to a population parameter: the proportion of offspring actually sired by their ostensible fathers (or, if you like, 1.0 minus the incidence of "cuckoldry"). One problem with this usage is that it can mislead readers (and occasionally even the writer!) into imagining

that the writer is actually speaking about men's beliefs. Another is that present terminology leaves no room for consideration of variations in confidence among the fathers within a population. Some men have children who resemble them and wives in whose fidelity they have every reason to believe; others do not. Thus, *confidence of paternity* is surely a variable whose determinants and consequences can be studied. In certain songbirds, for example, males attain a significant, albeit imperfect, match between actual paternity and the effort expended in feeding young by making their paternal efforts proportionate to how thoroughly they were able to monitor their mates during the fertile egg-laying period (e.g., Davies, 1992). Human males may be capable of comparable cognitive feats.

This points up yet another problem with the prevalent terminology of *uncertainty* and *confidence*, however: the implication of awareness is superfluous. A male songbird need not doubt his paternity, nor indeed have a concept of paternity at all, in order to adjust paternal investment adaptively. And neither need a man. It is perfectly possible that at least some of the mental mechanisms that instantiate paternity confidence adaptations are activated automatically in isolation from articulatable beliefs. We hypothesize, for example, that the affection of adoptive fathers may very well be more strongly affected by the adoptee's resemblance to self than is the affection of adoptive mothers, simply because such resemblance is a cue that the paternal psyche has evolved to respond to. This need not imply that the emotional aspects of parental feeling and commitment are utterly isolated from that stream of cognition of which we are aware, nor even from the influence of rational deliberation; indeed, there is anecdotal evidence that paternal affection can be shattered by a verbal revelation of nonpaternity (Daly & Wilson, 1988a). Here, as in other domains of kinship psychology, there is much to learn about the ways in which emotional responses can and cannot make contact with articulatable beliefs and knowledge.

Sibship

Sibling relations also warrant scrutiny from a selectionist perspective (Mock & Parker, 1996). Sisterhood is, of course, at the heart of Hamilton's (1964) analysis of the evolution of exceptional sociality and altruism in haplodiploid bees, ants, and wasps, but sibling relations are prominent in the sociality of diploid creatures, too. Such phenomena as cooperative courtship displays by pairs of male turkeys (Watts & Stokes, 1971) or delaying personal reproduction to help at the parental nest (Moehlman, 1986; Stacey & Koenig, 1990) are testimony to the relevance of sib relations to social evolution. But if siblings are major social allies by virtue of relatedness, they are even more surely major competitors, especially for crucial maternal resources. It is little wonder, then, that sibling relationships are so often ambivalent.

The siblings into which we are born are crucial social environments, with associated opportunities, costs and "niches," and it would be remarkable if our evolved social psyches did not contain features adapted to the peculiarities of sibling relationship. Sulloway (1995, 1997) has developed the idea of niche differentiation in an evolutionary psychological perspective, with principal reference to the ways in which one deals with one's ordinal position in a sibship. Evolutionary considerations suggest that parents would favor their eldest offspring, and in tough choices there is evidence that they do just that (Daly & Wilson, 1995a), so it is not surprising that firstborn children tend to be conservative supporters of the status quo (Sulloway, 1997). There is some theoretical and empirical support for the notion of parental indulgence of lastborns, too, which suggests that it may be the middle birth positions that derive the least benefit from nepotistic solidarity. In support of this conjecture, Salmon (1997) has found that both first- and lastborn Canadians differ from middleborns in measures of familial solidarity and identity: Middleborns are substantially less likely than either first- or lastborns to name a close genetic relative as the person to whom they feel closest, and are also significantly less likely than either first- or lastborns to assume the role of family genealogist.

Sibling conflict is the other side of the coin of parent-offspring conflict. Children are selected to try to manipulate mother to extend the interval before the next birth (Blurton Jones & daCosta, 1987; Trivers, 1974), but mother has her counterplays, and the next sibling often arrives too soon from the perspective of the toddler (Dunn & Kendrick, 1982). The costs that the toddler is willing to impose on its infant sibling in competition for maternal investment may vary adaptively in relation to nutritional status, the birth interval, the social situation, and perhaps even the phenotypic quality of each youngster.

Uncertainty of paternity engenders a problem for siblings as well as for fathers: Given common maternity, do we share a father ($r = .5$) or have different ones ($r = .25$)? A particularly interesting example of such discrimination comes from the study of nepotistic discrimination in ground squirrels. Because females often mate with more than one male in a single estrous period, even littermates might be only half siblings. Males disperse at maturity, but females do not, with the result that if two female littermates both live to adulthood, they may occupy adjacent territories. Such littermate sisters vary in the extent to which they cooperate in mutual defense of young or are mutually hostile, and it turns out that a significant determinant of that variability is relatedness, with full sisters the more cooperative neighbors (Holmes & Sherman, 1982). This is a remarkable finding because there is apparently no circumstantial cue that would enable females to make this discrimination. However, if individual aspects of odor are genetically based (as they surely are) and if the squirrels habituate to their own odors, then there is a simple heuristic that they might use to make this and other discriminations: Be most hostile to those who smell strongest.

Could there be analogous discrimination in human beings? It is certainly plausible that the distinction between full and half sibs was selectively significant in our evolution. Studies of contemporary foraging peoples suggest that a succession of more or less monogamous mateships may have been common among our ancestors. Children fare better when they have the benevolent attention of both genetic parents (Daly & Wilson, 1988a; Hurtado & Hill, 1992; Volland, 1988), and this fact provides a strong disincentive against taking divorce lightly, but nevertheless both marital breakups and (perhaps more importantly) untimely deaths probably assured that half sibship was common. It could well be the case that in human prehistory it was virtually a toss-up whether successive children of the same woman were full or half-siblings, and the distinction between ($r = .5$) and ($r = .25$) is by no means trivial when the decision to cooperate or to compete is a close call. It therefore seems to us very plausible that the psychology of toddlers has evolved to adjust the intensity of competitive tactics toward newborn siblings in relation to either phenotypic cues or direct evidence of male turnover.

Grandparenthood

Is grandparenthood, too, a relationship status for which we possess specific adaptations? This question is harder to settle. The very fact that women experience menopause has seemed to many writers to suggest that our female ancestors may have attained with some regularity a life stage in they could serve their fitness interests better by prolonged investment in their extant young and perhaps in their grandchildren than by further reproduction. However, an evaluation of this hypothesis in light of the known demographic and life history characteristics of contemporary foragers led Hill and Hurtado (1991) to question whether women in such populations could really attain greater fitness from helping kin in old age than from continuing to reproduce (see also Rogers, 1991). But even if menopause is not itself a grandmaternal adaptation, it is a cross-culturally general fact that postmenopausal women contribute significantly to their grandchildren's welfare (Lancaster & King, 1985), and it is therefore at least plausible that mental processes specific to the task of adaptive allocation of grandparental investment have been targets of natural selection (see also Turke, in press; Smith, 1988).

Mateship

Although mates are not typically close genetic relatives, kinship is often conceived of as encompassing this relationship, too. There is a certain logic to this conflation of genealogical and mating relationships: In both cases, the two

parties have a commonality of interest grounded in the fact that the fitness of both is promoted by the reproductive success of their common kin. A longstanding mateship becomes increasingly like a genetic relationship because as children are produced and mature, it is more and more the case that the exigencies and resource allocations that would be ideal for promoting the fitness of one party are optimal for the other too. Indeed, as Alexander (1987) noted, if mating partners are faithfully monogamous and their efforts are channeled predominantly into reproduction rather than collateral nepotism, their commonality of interest, and hence of perspective, may become nearly total. This would seem to explain why established couples may become more solitary in their approach to the world around them than even the closest genetic kin.

There is an important difference between mateship and genetic kinship, however: The former can be more readily and irredeemably betrayed (Wilson & Daly, 1992). Whatever failures of reciprocity and other provocations may strain blood-kin relations, shared interests in the welfare of common relatives have provided a countervailing force selecting for a kin-specific readiness to forgive and reconcile. The correlation between the fitness interests of husband and wife, by contrast, can be abolished if one or both parties engage in extrapair mating effort. Moreover, if a husband is cuckolded and unwittingly invests his parental efforts in a rival's young, then the very acts that promote the wife's fitness are positively damaging to the husband's. These considerations would seem to account for the fact that suspected or actual infidelity is a uniquely potent source of severe marital conflict and violence (Daly & Wilson, 1988b; Wilson & Daly, 1993).

Steprelationship resembles cuckoldry in that a child raised by a couple is a potential vehicle of fitness for one party but not the other. It is different, however, in that this asymmetry is out in the open and has ideally entered into the negotiation of entitlements and reciprocities in the remarriage. Nevertheless, the presence of stepchildren is an important risk factor for marital disruption and violence (Daly & Wilson, 1996), and the stepchildren themselves incur greatly elevated risk of severe assault (Daly & Wilson, 1988a, 1988b, 1995b). It is apparently stepparenthood itself that is the relevant risk factor and not some correlate or "confound" (Daly & Wilson, 1996), reinforcing the point that the motivational mechanisms of parental feeling are designed to channel affection and investment preferentially toward one's own offspring. Stepparenthood is one of several forms of "fictive" or nominal kinship in which people find themselves placed, not always altogether willingly, in interpersonal statuses that are artificial analogues of kinship statuses. It would be very surprising if the appropriate relationship-specific psychology were fully activated by such experiences, because the interests of our interactants are seldom identical with our own and selection has presumably acted to buffer us against being the manipulators of others' social agendas (a subject to which we return). It is not at all surprising, on the other hand, that the genetic parent in a stepfamily should do

what she or he can to induce stepparent and stepchildren to feel and act more like genetic relatives than their inclinations might dictate.

The solidarity even of faithful couples is apt to wane if children are not forthcoming (Rasmussen, 1981). A mated pair's separate interests in their separate kindreds is a potential source of conflict for any couple, but these "in-law problems" may be more acutely felt when there are no children to cement the marital relationship itself and the broader alliance between the two parties' families of origin that the marriage represents. For marriage is indeed an alliance between kin groups, as many anthropologists have stressed. Marriage is a cross-culturally ubiquitous feature of human societies, notwithstanding variations in social and cultural details of the marital relationship (Flinn & Low, 1986; Murdock, 1967; van den Berghe, 1979): Women and men everywhere enter into publicly acknowledged one-on-one reproductive alliances, with mutual obligation to invest biparentally in the union's joint progeny, and this reproductive purpose appears to be felt at least as acutely by interested kin as by the marriage partners themselves. Many writers have tried to argue that the economic and/or political aspect of marriage is fundamental, yet all interested parties, including the kin groups allied by the union, understand the first purpose of marital union to be reproductive.

SOME UNIVERSAL ASPECTS OF HUMAN KINSHIP

The human brain/mind contains an as yet unspecified large number of special-purpose modules. The notion that some general-purpose cognitive device does all our information processing has been shown to be unworkable (Miller & Todd, 1990; Pinker & Prince, 1988). Consider language: There is no longer a reasonable doubt that human language is a complex functional aspect of our evolved human nature (Pinker, 1994). The hallmarks of evolutionary adaptation are apparent in the large number of analytically separable but functionally integrated elements of neuroanatomy, of the peripheral speech apparatus, and of the elements of natural languages themselves, which perform astonishingly efficient encoding and decoding of linguistic materials and of nothing else. Some considerable fraction of our human nature, and especially of our mind/brain, is designed specifically to generate and comprehend speech.

Can anything comparable be claimed about human kinship cognition? We think it can, but study of the evolutionary psychology of the family is not nearly so advanced as psycholinguistics in identifying the constituent adaptations. Human kinship systems are dauntingly diverse, so much so that social anthropologists have devoted more attention to their variations than to any other aspect of human society (Fox, 1967). Clan (or lineage or moiety) memberships may be single or multiple, and they may have pervasive social consequences or

virtually none. Kin relationships may dictate scarcely any limitation on potential marriage partners, or they may proscribe thousands of complete strangers. Descent reckoning may be strictly patrilineal (47% of 857 societies according to Murdock, 1967), or matrilineal (14%), or "bilateral" (36%, for which a better label would be "multilineal"), or even a "double descent" system (3%; these are genuinely bilineal in that each person is considered to be descended from a female line extending back from the mother and a male line from the father). Most notably, the domains of kin terms are cross-culturally variable. The Yanomamö studied by Chagnon (1974), for example, employ an Iroquois terminology, such that a man would address not only his brother as *Abawä* but also his patrilineal parallel cousin (his father's brother's son) and even, at least in principle, more distant same-generation male kin related through strictly patrilineal links. To some anthropologists, these facts have seemed to imply that kinship is "cultural rather than biological."

To evolutionists, of course, there can be no such antithesis: "culture" is produced by a living species. Moreover, cross-cultural diversity is not arbitrary, and its orderliness has provided evolutionists with opportunities for statistical tests of adaptationist hypotheses about what kinship means and how it is used by self-interested actors. Matrilineal descent reckoning and inheritance, for example, are systematically associated with residential and subsistence practices that threaten paternity confidence (Flinn, 1981). Patriliney is associated with concentrated bride price, blood feud, and severe penalties for adultery (Daly & Wilson, 1988b). These and other correlations are readily interpreted as the compromise outcomes of reproductive and nepotistic struggles under different socio-ecological conditions (Alexander 1974, 1977, 1979; Flinn & Low, 1986; Gaulin and Boster, 1990; Hartung 1985).

If we wish to identify the core adaptations underlying human kin classification, we will need to burrow under this diversity and identify that which is cross-culturally universal (Brown, 1991). When the French say "chien" where we say "dog," we can infer that it is not these lexical specifics that are the general features of language; better candidates for linguistic universals are more abstract attributes such as the existence of discrete words and their assemblage out of a short list of language-specific phonemes, or the existence of nouns and the fact that such entities as animal species are among their referents (Pinker, 1994). Can we identify any comparably abstract but well-specified universal features of human kinship?

We propose the following list, without imagining that it is anywhere near complete. The first few principles are well established, but farther along the list are attributes of kinship that have been demonstrated in only a few societies. Their universality is an hypothesis. As far as we know, there are no known counterexamples to any of them, and although one or more may yet be overturned, we won't be holding our breath.

10. KINSHIP PSYCHOLOGY

1. *Ego-centered kindred terminologies are universal.* In all societies, kin relationships are classified with reference to each focal individual: My mother is not the same person as your mother. One could imagine a society without this feature. A man's kinship status might be fully specified, say, by some combination of his stable attributes (e.g., he was born a member of the Raven clan) and his ephemeral attributes (e.g., he is a prepubertal, unmarried male), without any reference to his relationships to particular others. However, no such society exists. Such nonrelational attributes are important elements of social identity in some societies, but never so important as to obviate the ego-centered kindred relations.

2. *Parent-offspring relationships are the fundamental building blocks of this ego-centered structure, so that the terminology implies a genealogy.* Again, one could imagine a society with no such notion of kinship. Special relations functioning in a manner analogous to kin relations might, in principle, be erected on some other basis. One's "brothers" could, for example, be defined as all those men who were born in the same lunar month as oneself. But again, this is not the way *Homo sapiens* conducts its social life.

3. *All kinship systems include terminological (and practical) distinctions according to sex.* No system lacks words to distinguish daughters from sons or mothers from fathers, for example. Neither is there anywhere a society lacking the notion that there are qualitative differences between these sexually distinguished relationships and attendant differences in the social behavior characteristic of and appropriate to each.

4. *All kinship systems include terminological (and practical) distinctions according to generation.* No system lacks words to distinguish daughters from mothers or sons from fathers, for example, and parental roles and filial roles are not reversible.

5. *Kin relations are universally understood to be arrayed along a dimension of closeness.* Once again, one could imagine a society in which this was not so, a society whose participants perceived no such ordinality in the qualities that they considered essential to their kinship categories. We can imagine such a system, but it would not be human kinship.

6. *This dimension of the characteristic closeness of kinship categories is always negatively correlated with the characteristic number of genealogical links defining them, and hence positively correlated with genetic relatedness (r).* The first five universals are apparently conceded by even the most biophobic of commentators. Where cultural determinists have tried to draw the line is on this sixth point. In a famous attempt to refute the applicability of Hamiltonian theory to human affairs, Sahlins (1976) claimed to have demonstrated "that the categories of 'near' and 'distant' vary independently of consanguineal distance and that these categories organize actual social practice" (p.112). He had, of course, demonstrated nothing of the sort. His evidence consisted entirely of typological descriptions of alleged practices in certain societies which, if verified, would indicate only that the correlation between "closeness" and genetic relatedness is sometimes less than perfect. Nobody ever doubted that there are mismatches in detail between conceptions of the charac-

teristic closeness of particular kinship categories in particular societies and the number of genealogical links involved (see Farber, 1981). But the categories of "near" and "distant" do not "vary independently of consanguineal distance," not in any society on earth.

It probably is not even true that kinship systems treat certain close genealogical relationships as socially significant while obliterating other equally close relationships, or at least not to the degree that Sahllins and other cultural determinists imagine. It is true that the relatives of one's mother are nominally excluded from one's kindred in a system with strict patrilineal descent reckoning, whereas in a matrilineal system, the male role in reproduction may be "unknown" or denied. But we would be naive to suppose that this represents psychological reality. As Meyer Fortes argued in many writings (e.g., 1953, 1969) and with many ethnographic examples, actual sentiments of attachment to kin are always bilateral. Articulated kinship systems are to a considerable degree ideologies, and like all ideologies, they are the arenas of contest and social manipulation, as we discuss in additional detail with respect to proposed universals 10 and 12.

The universality of a correlation between closeness and r is simply inexplicable for those who would divorce "culture" from "biology" and then place kinship in the former domain.

7. *There is everywhere a strong positive correlation between the average or characteristic r of kinship categories and the levels of solidarity and cooperation among those so related.* This is not quite the same proposition as point 6, for although solidarity and subjective closeness are strongly associated with one another, they are not synonymous. It is not merely that one considers one's brother a closer relative than one's cousin; they really do cooperate more. In situations of cooperative labor exchange, for example, brothers tolerate imbalances of reciprocity that would be considered unacceptably exploitative in a friendship not based on kinship (Hames, 1988). Close kin do violence to one another less and collaborate in violence against third parties more than one would expect on the basis of the opportunities provided by their proximity and frequency of contact (Daly & Wilson, 1988b). Even in a relatively nonkin-based society such as ours, people turn to close relatives when in need, and are increasingly likely to do so the greater the imposition or demand (Essock-Vitale & McGuire, 1985; Hogan & Eggebeen, 1995).

Documenting and measuring the relevance of genealogical relatedness to cooperative action has been one of the principal achievements of evolution-minded anthropologists. An important limitation of the ethnographic record is its typological nature: In this society inheritance is matrilineal; in that society cross-cousins are preferred as marriage partners. What we cannot tell from such claims is how well they describe practice. Is such a characterization a valid generalization, an ideal, or what? Although ethnographers have often noted imperfect adherence to professed rules and even conflicts of interest, few have bothered to quantify their

incidence or resolutions. Why worry about who really marries whom, how the resources actually flow, or who honors or reneges on what obligations, if your agenda is descriptive and "interpretative" rather than hypothesis testing? An experienced fieldworker such as Sahllins could persist in believing that merely nominal kinship categories "organize social practice" because he never felt the need to evaluate the fit between a prediction and data. But the anthropologists who began using Hamiltonian theory to generate hypotheses about commonalities and conflicts of interest within societies, and about social manipulation and ideology, needed behavioral data, and so they collected it. If evolutionists had contributed nothing else to ethnographic practice, anthropology would be in their debt for their insistence on behavioral observation and quantification. But of course, they have contributed more than methodological rigor: What these studies have consistently shown is that cooperative and conflictual interactions are best predicted from genealogical relatedness, even when ideology and lip service say otherwise (Betzig & Turke, 1986; Chagnon, 1981; Flinn, 1988; chapters in Chagnon & Irons, 1979).

8. *In all societies, persons related by marriage are deemed to be in a sort of quasi-kinship relationship.* The marital relationship brings one's spouse into one's kindred—after a sort. As we noted earlier, the marital relationship is analogous to genetic relatedness in the fact that people who reproduce together have genetic relatives in common (their descendants) with resultant shared interests. The same applies, albeit more weakly, to the two kindreds: As children of a marriage are produced, the relationship between the two marriage partners' separate kindreds becomes qualitatively more like a degree of kinship. One's spouse's brother becomes a sort of figurative or partial brother (as is hinted at by such qualifiers as "brother-in-law"), but he never becomes indistinguishable from a "real" brother.

9. *In all societies, people are motivated to inquire how strangers and new acquaintances might be genealogically linked to people they already know, and feel that they have acquired useful social information when such links are uncovered.* Insofar as kinship links are predictive of social sentiments and action, as they certainly are, it makes good sense that we should wish to situate people who are unknown and therefore unpredictable in matrices of kinship. And we do.

10. *In all societies, certain people make it their business to know genealogies and to educate others, especially their relatives, about exactly how they are related to one another.* Knowing our genealogical links serves our own interests and those of our kin, by helping us to manage our social affairs as effectively nepotistic. But more than this, the fact that kinship imparts only a partial congruence of interests means that there is room for those engaged in familial socialization and education to exert self-interested influence. It is a predictable corollary of Trivers's (1974) parent-offspring conflict theory, for example, that senior family members will pressure those in subsequent generations to take a stronger benevolent interest in collateral kin than would otherwise be their inclination. For a focal female, for example, a sister's

son ($r = .25$) represents a vehicle of potential fitness with half the value of an otherwise equivalent son of her own ($r = .5$), but from the son's perspective, his mother's sister's son is a mere cousin ($r = .125$) for whom any sacrifice would have to yield 8 times what it cost the son for it to be worthwhile. Thus the old have special reason to remind the young of their links of collateral kinship and to urge that they base their cooperative undertakings on those links rather than on reciprocal ties of friendship. This sort of pressure can be at least partly effective, both because it comes from a communicator with a genuine interest in the listener's welfare and because it contains an element of valid wisdom.

In our society and many others, the interests of firstborn young may be especially well served by familial solidarity, and it is of interest that firstborns are disproportionately inclined to assume the role of family genealogist (Salmon, 1997). Ours is certainly not what anthropologists would call a kin-based society, and kinship networks and knowledge are evidently truncated in comparison to those in many traditional societies. Alexander (1979) claimed, citing Schneider and Cottrell (1975), that "most people in a modern technological society may know of the existence, at least, of all of their first cousins but few could count, let alone name, all of their second or third cousins" (p. 148). However, interest in genealogical research is considerable. Approximately 3,000 people visit the Mormon Genealogical Library in Salt Lake City each day (Shoumatoff, 1985), and it is estimated that in 1980, there were half a million North Americans who were active genealogists (Taylor, 1986).

Both sexes appear to be interested in genealogy as a hobby, but several studies suggest that women are particularly inclined to maintain active kin networks (Hogan & Eggebeen, 1995; Schneider & Cottrell, 1975). Troll (1987) provides evidence that men's kinship bonds operate through the influence of their wives or parents, and that older women typically adopt the role of "kinkeeper," providing family news updates, organizing get-togethers, maintaining contacts among family members, and training daughters or granddaughters for the role. And North American women do indeed know their own genealogies better than men (Salmon & Daly, 1996; Schneider & Cottrell, 1975).

This sex difference is probably not a universal, however. Although women in our society continue to rely heavily on relatives (Hogan & Eggebeen, 1995; Komarovsky & Philips, 1962), men's need for kin support may be substantially reduced in a modern nation state in comparison with societies in which kinsmen are crucial allies in intergroup conflict. In other social ecologies, therefore, men may well be keener genealogists. Among the Yanomamö, for example, knowledge of genealogy is a valuable social tool for negotiating male-male alliances and marital entitlements, and men appear to know more (or at least to be quicker in accessing) genealogical information than do women (Chagnon, 1988). Whether the evolved basis of kinship cognition is in any way sexually dimorphic thus remains an open question.

11. *In all societies, one's beliefs about one's genealogical links are core components of the phenomenology of self.* In a society organized into patrilineal fraternal interest groups, people grow up to perceive clan identity as paramount. Born into a Montenegrin tradition of blood feuds, for example, Milovan Djilas (1958) recalled:

My forebears were drummed into my head from earliest childhood, as was the case with all my countrymen. I can recite ten generations without knowing anything in particular about them. In that long line, I am but a link, inserted only that I might form another to preserve the continuity of the family (p. 6).

In the context of more individualistic ideologies, of which the contemporary North American version may represent an extreme, this degree of familial subordination is alien. When asked "who are you?" one's kinship status is high on the list of responses for some people, but not for others (Salmon & Daly, 1996). However, familial links remain profoundly important to identity even here. To appreciate this, one need only consider the psychological impact of the discovery that a trusted link is a social artifact rather than a genetic fact, as in revelations of adoptive status (Hoopes, 1990; Kirk, 1981) or of donor insemination (Scheib & Daly, 1997).

12. *In all societies, some kinship terms incorporate more than one genealogical relationship, but people are nowhere oblivious to the distinctions that terminology obscures or ignores.* Although some primary kinship terms, especially those of the parent-offspring relationship, apply to one and only one genealogical relationship, others are extended to encompass more than one. Terminological extension and ambiguity have repeatedly been invoked against the proposition that kinship has a "biological basis" or that the primary meanings of kinship terms are genealogical (Sahlins, 1976; Schneider, 1984; Hirschfeld, 1986). After all, if a Yanomamö man, for example, places his brother ($r = .5$), and his patrilineal cousin ($r = .125$), and perhaps some more distant relatives as well, all in the same kinship category, well then, the cultural thing that we call kinship must not be about genealogical relatedness at all.

Chagnon's Yanomamö research provides two rejoinders to this argument. The first is that the terminological conflation of distinct relationships does not bespeak a failure to discriminate between them. Both my brother and my cousin may address me as *Abawä*, but the former is more likely to come to my aid in a conflict than the latter (Chagnon & Bugos, 1979). Terminological kinship is a predictor of who allies himself with whom, but genealogical relatedness is a significantly better predictor (Chagnon, 1981).

The second point is more subtle. Cultural determinists maintain that even to translate the word *Abawä* as *brother* and then to speak of its "extension" to patrilineal parallel cousins is to commit the error of ethnocentrism. There is no English translation of *Abawä*, according to this line of reasoning, because the way the Yanomamö partition their social universe is incommensurate with the way we

partition ours. Chagnon's riposte is simplicity itself: Ask a native speaker. Having shown an informant some photographs of his brother and his cousin and having determined that both are *Abawā* to the speaker, Chagnon then asks (in Yanomamō, of course) "which one is your real *Abawā*?" To a cultural determinist, this would appear to be a vacuous question, compounding the ethnocentrism. However, the Yanomamō informant understands it perfectly well, and points to the brother. In other words, it is not just the western ethnographer who considers common parenthood to define the primary referent of *Abawā* and the inclusion of certain kinds of cousins to be a figurative extension; this is the Yanomamō's own understanding as well.

At least one critic of the proposition that kinship is fundamentally a matter of genealogy has rejected even this sort of evidence, arguing as follows (Fürschfeld, 1986):

My younger brother and my older brother have distinct referents and as phrases mean different things, but the component term brother in both cases has a unique meaning. Similarly, qualifiers and hedges like "real" or "true" are readily attached to kin terms and frequently accompanied by a term or gesture associated with the womb and notions of procreation. But from the fact that it represents a culturally salient (perhaps even universal) distinction it does not follow that it is a necessary part of the meaning of a term any more than the recognition of younger and older entails that these always are part of the meaning of a term. (pp. 220-221)

In other words, "real brothers" are just one of an infinite number of arbitrarily delimited subsets of real "brothers"! If this argument were taken seriously, one would have to conclude that it is impossible to identify the primary or literal meaning of any word, as distinct from its figurative or metaphorical meanings.

In claiming that people remain sensitive to the distinctions among terminologically conflated categories of kin, we do not mean to imply that terminology has no behavioral impact. The extension of brotherhood to a group of men with patrilineal links, for example, reinforces the salience of certain connections and diminishes others. People make terminological distinctions that meet their social purposes. Many would find it bizarre that English speakers should use the single term *cousin* to encompass matrilineal and patrilineal parallel and cross-cousins of both sexes, but usage here both reflects and reinforces the absence of significant differentiations of social roles among these types of cousins in our society. (Note that we also call more distant relatives cousins too, a situation more analogous to the *Abawā* case, and that no one is deceived into assuming that the relationships are equally close psychologically.)

Insofar as kinship terminology affects social perceptions and behavior, however, the implication is not the sort of simple one-way cultural determinism to which many anthropologists still subscribe. People pursuing self-interested agendas exert at least as much influence on the use of kin terms as vice versa. Kinship terminology

reinforces and advertises social entitlements and obligations and can be a contested domain for that reason. An example occurs in our society when a remarried woman calls her new mate "your dad" in speaking to her child of a former union. In tribal societies, more than one genealogical connection to a potential interactant may be known, and modes of address are then chosen for social advantage, such as in order to transfer someone into a marriageable category, often to the chagrin of other interested parties who stress an alternative relationship (Chagnon, 1982; Fredlund, 1985). People are obviously not completely bamboozled by such terminological manipulations, as Fortes (1969) showed by documenting bilateral kin attachments in unilineal descent systems, but they apparently are not completely unaffected either.

The fact that kinship terminology is a manipulable social device engenders one more putative universal, the last one that we discuss.

13. *In all societies, kinship terms are extended further still, being deployed figuratively rather than literally, for evocative and propagandistic purposes.* "Brother, can you spare a dime?" Speakers who wish to emphasize or promote kinlike beneficence commonly address nonrelatives with kin terminology. Perhaps even more common (and more effective) is the metaphorical brothing of a potential ally in a joint venture, when the speaker wishes to focus attention on a genuine (or at least plausible) shared interest and promote kinlike solidarity (Johnson, 1986).

Metaphors have been called "those sometimes explicitly acknowledged but often unconsciously or tacitly employed conceptual systems of images through which social life is interpreted and around which social life is organized" (Turner, 1987, p. 56). If kinship is the primary organizing principle in human relations and the bedrock of most altruism, it is perhaps unsurprising that one should invoke kinship metaphorically in the negotiation of nonnepotistic cooperation. Indeed, Alexander (1974) and other writers have suggested that the cognitive abilities necessary for nonnepotistic reciprocal altruism must have evolved previously in the context of nepotistic sociality.

We are aware of only one experimental investigation suggesting the efficacy of such usage. Johnson, Ratwick, and Sawyer (1987) made students listen to political speeches in which the audience was addressed either with kin terminology or as "fellow citizens"; results were in the direction of the kin terms being both more physiologically arousing and more persuasive. This preliminary study was less than conclusive and needs replication, but it is hard to doubt that addressing someone as *brother* works at least to some degree, sometimes, or it would not be so prevalent. Yet it also seems likely that natural selection should have equipped us with psychological defenses against being manipulated by easily faked words from the mouths of persons whose self-interests are not necessarily compatible with our own. Perhaps saying *brother* achieves little more than to signal to the listener that a claim of common cause is about to follow, a claim that the listener may still reject, but that he has at least been prepared to consider.

Metaphors evoking solidarity are most often those of sibship. "The Brotherhood of Free Masonry" or the feminist slogan "Sisterhood is powerful" are declarations of common cause (and implied threat against common foes) by ostensible equals. But asymmetrical kin relationships are also invoked metaphorically, especially by those laying claim to authority, as when kings and priests style themselves "fathers." Any implied threats in this case are mainly against the "children." Aptly, we call this style of imposing authority paternalism, even if kinship terminology is not prominent. According to van den Berghe (1985),

If power is to be justified (so as to be more readily exercised), the aim of power must be hidden or denied. The best denial of the effect of power is that oppression is in the interest of the oppressed. . . . Paternalism mimics the genuine concern of the parent for the child, which is founded on the real overlap of interest inherent in genetically based nepotism, and thus hides the overwhelmingly conflictual basis of the ruler-subject relationship. Paternalism models itself on a relationship of genuine dependence and incapacity, in which the helpless child's survival and well-being is contingent on adult care, and extends it to a situation in which the dependence is reversed. The ruler who parasitizes the subject disguises parasitism as altruism. (p. 262)

In developing his Oedipal theory of "primal parricide," Freud (1913/1950) turned this manipulative metaphor on its head, maintaining that it is the subjects who make the ruler into a symbolic father to appease their guilty psyches. But despite Oedipal theory's tenacity in literary criticism and pop psychology, there is not and never was any evidence for it (see review by Daly & Wilson, 1990).

The metaphor of a religious denomination as family has wide appeal, perhaps especially among beleaguered sects. Religious leaders quite rightly perceive genealogical loyalties as rivals and threats to their own dynastic ambitions (Betzig, 1986; Goody, 1976), and have commonly offered a purported substitute. One discussion of the pseudofamilial structure and function of a Christian church described this phenomenon as follows (Anderson & Guernsey, 1985):

The church as the new family of God, however, is not formed by mere consensuality between its members. Through spiritual rebirth we each become a brother or sister of Jesus Christ through adoption into the family of God. Consequently, we are all brother and sister to each other. (p. 81)

As genealogical kin share a common identity by virtue of the circumstances of their birth, the religious "family" forges a common identity through "rebirth" with all its solidary and authoritative implications.

People use the relatively egalitarian fictive kinship of nominal brotherhood and sisterhood in individualized contexts as well as in the context of groups such as

freemasons and feminists. Close friends may invent secret rituals that make them "blood brothers," for example, and African American women "make family" by establishing functionally sororal partnerships with "play sisters," perhaps especially when helpful blood kin are scarce (Johnson & Barer, 1990; Stack, 1974; Staples, 1985; Taylor, Chatters & Mays, 1988). Kinship is evidently the dominant mental model for helpful social interaction (Bailey, 1988), and hence provides an almost inescapable metaphor for establishing, describing, or explaining cooperative relationships with nonrelatives.

UNRESOLVED ISSUES IN THE SOCIAL COGNITION OF KINSHIP

Cognitive psychologists have concerned themselves with ostensible general processes of categorization/similarity (Brooks, 1990). But is kinship a special domain with its own rules? One reason it might be is that children acquire an understanding of kinship terminology in ways that cannot be accounted for by the hypothesis of domain-general inductive processes, but that seem to require an "innate theory" of the nature of human social relationships (Hirschfeld, 1989).

There is also an a priori reason to think that kin classification might require its own mental processes: Unlike most other categorizations, kinship cannot be represented as a nested hierarchy because of sexual reproduction. In a phylogenetic descent diagram, all branching ("radiation") is downward: Several species may belong to a genus and several genera to a family, but no entity at one level in the hierarchy can have multiple ancestors at a higher level. Our ancestors, by contrast, double at each generation, making "family" an altogether different computational problem. Yet people often seem determined to bend their conceptualization of family links to fit the inappropriate nested hierarchy model, as when they belong to one or another named family (usually a patrilineage).

Why do human beings so often resort to this inappropriate mental model? Or do they? Are clan memberships and shared patrilineal names really such powerful elicitors of familial feeling as they sometimes appear? Fortes's (1969) claim that even the most extreme systems of unilineal descent reckoning do not suppress bilateral affiliation and sympathy is relevant here. How do people retain their sensitivity to genealogical relatedness while operating within a clan structure?

Hughes's (1988) reanalysis of Bryant's (1981) genealogy of a Tennessee mountain community is intriguing in this context. All Bryant's subjects were nominal members of one of four named "families," and when she discovered that patrilineal descent from the putative male founders of the four families could not explain membership status, she concluded that genealogical related-

ness was not the basis of kinship at all. Hughes (1988) showed, however, that "family" membership was perfectly accounted for by one's degrees of relatedness to all the as-yet-unmarried young people in the community:

They appear to use a metaphor of descent to describe groups that are in actuality based on relatedness to focal offspring. . . . As long as the four "founding ancestors" are remembered by name, groups that contain at least some of their descendants can use their names as convenient labels even if group membership is in fact based on a principle other than descent. If the actual focus of family groups is dependent offspring, the offspring themselves will grow up and may move out of the area or even join other families. (p. 83)

There would seem to be some logic to defining family with reference to those close relatives who have yet to marry and whose eventual reproductive careers are therefore most vulnerable to kin influence. But what might these results imply about how the human mind computes kin ties? Unfortunately, Hughes (1987, 1988) has obscured the psychological interest of this and his other analyses by declaring an extreme version of the view that inclusive fitness maximization is a proximate cause of behavior, a view that has been cogently criticized by Symons (1989) and Tooby and Cosmides (1990).

Kin recognition and assessment are germane both to effective nepotism, as we have discussed at length, and to mate choice, which we have ignored. Evolutionists have been greatly interested in inbreeding avoidance, and the possible role of cosocialization of children in inducing sexual indifference (the "Westermarck effect"; see Wolf, 1993; Wolf & Huang, 1980). But are inbreeding avoidance and nepotism subserved by common evolved psychological mechanisms and processes by which we infer kinship, or are they achieved by independent means?

The study of social cognition is ripe for an infusion of evolutionary theory and a serious consideration of kinship.

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11

Four Grammars for Primate Social Relations

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The recent rise in the fortunes of evolutionary approaches to psychology has been especially kind to social psychologists, who find themselves in a vanguard position. Many of the animating concerns of evolutionary psychology overlap the traditional content domains of social psychology, and both disciplines share a methodological commitment to understanding the individual in context. Besides having this basic affinity, the evolutionary perspective offers social psychologists a unifying explanatory framework that often departs intriguingly from folk intuitions, an unaccustomed pleasure. As a result, social psychological questions are now central to the mission of evolutionary psychology.

It is now generally accepted, for instance, that many of the most crucial selective pressures operating over the course of primate and hominid evolution arose from the complexities of group living. The complexity of social organization appears to have increased in tandem with increases in cognitive capacity, and we are more and more willing to grant that the former may have driven the latter (Humphrey, 1976; Byrne & Whiten, 1988). We have come to see primate and hominid social life as a more demanding arena for problem solving than the technical challenges of subsistence (Quiatt & Kelso, 1985) and have deduced that social competence must call upon an impressive array of adapted skills and propensities (Cosmides & Tooby, 1995). Understood in this way, social intelligence fragments into an assemblage of mental modules dedicated to the tasks of face recognition, cooperation, mental state attribution, affect perception, reciprocity, kin recognition, mate choice, deception, cheater detection, and so forth.

Two aspects of this emerging program are particularly important. First, evolutionary social psychology explicitly concerns aspects of human sociality that are