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If one's goal is to account for patterns of variation in the communicative behaviors of family relationships, then we contend that no single theory explains as many aspects of family interaction, or explains them with as much depth, as does Darwin's (1859) theory of natural selection. In this article, we delineate the major precepts of the theory (and of associated theories that have been derived from it) and apply them to a number of relational phenomena in the marital and parent–child subsystems. We then speculate as to why the theory has not been widely used in family communication research, despite the breadth and depth of its explanatory power, and we offer suggestions to scholars wishing to incorporate principles of natural selection and evolutionary psychology into their research on families.

The family is an extraordinarily rich context for gathering information on human social behavior. The ability to accumulate, contextualize, understand, and draw appropriate inferences from such information relies largely on the availability of theories that can not only model or predict such behavior but also explain it. Family communication researchers are fortunate to have a number of theories on which to draw. In this article, we describe how Darwin's (1859) *theory of evolution by means of natural selection* (TNS) can be used to explain multiple aspects of rela-

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tional development, maintenance, and interaction in a variety of family relationships.

We opine herein that TNS is unparalleled, in both its breadth and its depth, by other theories being used in the family communication field, and we offer suggestions to researchers wishing to incorporate its principles into their own work. We begin with two short introductions. The first is an introduction to evolution, in general, and TNS and evolutionary psychology, in particular. The second is an overview of what TNS, and associated theories and principles from evolutionary psychology, have to say about family relationships in general. We then discuss two particular family subsystems—the marital and parent–child subsystems—and use evolutionary principles to explain various aspects of these relationships. Finally, we discuss the efficacy of TNS as a guide for family communication scholars and offer suggestions as to how researchers can incorporate the theory into their own work.

THEORY OF EVOLUTION VERSUS THEORIES OF EVOLUTION

The term *evolution* refers simply to change over time in the characteristics of living organisms. A gradual shift in the average length of the giraffe's neck or in the hue of the moth's wings are examples of such a change. It is easy enough, in many cases, to document that such changes occur (albeit slowly, often over long spans of time). Exactly how the process of evolution occurs, however, has been the topic of theoretic speculation for centuries. Despite references to the *Theory of Evolution,* there actually is no such theory. Rather, there are multiple perspectives that are most accurately described as *theories of evolution,* which detail different aspects of *how* evolution proceeds. The most prominent of these is Darwin's (1859) TNS.

In his theory, Darwin (1859) pointed out that, in any given generation, many more of a particular species are born than can possibly survive to maturity, creating what he referred to as a struggle for existence. Inherent in this struggle, he proposed, are two omnipresent drives, or goals to which all living organisms are continually attending. The first goal is to survive; the second is to procreate. In the struggle for existence, Darwin posited, these goals are always at the forefront. Specifically, the goal of procreation entails the drive to contribute one's own genetic materials into future generations—to make sure that one's genes live on—which can be accomplished through direct reproduction (having offspring of one's own) or through ensuring the health and survival of others who carry one's genes (one's children, siblings, nieces and nephews, grandchildren, cousins, etc.). This is an important clarification to make, given that few organisms are continually engaged in reproductive activities, but many are continually engaged in protecting, nurturing, and caring for their genetic relatives.[1]

The most innovative aspect of TNS is the idea that some organisms will be better equipped to meet these two goals than will others. For instance, giraffes with longer necks are better able to reach sources of food than are their shorter-necked colleagues; similarly, moths of certain colors may be better at attracting mates than are those of other colors. Some of these advantageous characteristics are heritable, meaning that they are passed (at least in part) genetically from parents to offspring. TNS provides that heritable characteristics that advantage an organism with respect to survival or procreation will be passed onto future generations with greater frequency than will those that are less advantageous. For example, because they have better access to food, giraffes with long necks are advantaged in survival and should produce more offspring, on average, than giraffes with shorter necks. To the extent that neck length is heritable, then, one should see a gradual increase in average neck length among giraffes. This is an illustration of a heritable characteristic—neck length—being selected for through the process of natural selection.

The discipline of evolutionary psychology brings two important principles to bear on Darwin's explanation of evolution (see Buss, 1999). The first is that humans are no less subject to evolution than are any other living organisms. For instance, if a particular characteristic advantages humans with respect to their survival or procreation abilities, evolutionary psychologists would expect that characteristic to be selected for in humans just as it would in any other organism. Second, and perhaps more important, is the idea that psychological characteristics are subject to the process of evolution just as much as physical characteristics. According to this perspective, the human brain, from whence all mental, emotional, and psychological activities flow, is a physical organ that ought to have evolved through natural selection in the same manner than did any other physical characteristic. Let us suppose, for example, that intelligence, empathy, emotional control, or a tendency toward jealousy are characteristics that improve a person's ability to survive or to procreate. Evolutionary psychologists would argue that these characteristics, to the extent that they are at all heritable, can be selected for—just as can be physical stature, strength, or a long neck. In the communication discipline, the communibiological perspective has focused specifically on personality and temperament characteristics and the extent to which they are heritable (see, e.g., Beatty & McCroskey, 1997; Beatty, McCroskey, & Heisel, 1998; Beatty, McCroskey, & Valencic, 2001).

Evolutionary psychologists, therefore, look for ways in which mental, emotional, or psychological characteristics, and the behaviors that follow from them,

[1]Darwin did not actually know about genetics when he proposed his theory. Rather, he merely proposed that particular traits were passed from generation to generation; discovery of genes and genetic transmission was made subsequent to Darwin's work.

might have been advantageous to our ancestors with respect to survival or procreation. Although the field of evolutionary psychology is founded on the principles offered in TNS, it has spawned numerous other evolutionary theories that extend various of these principles and apply them to specific domains. We discuss many of these newer theories in this article.

Before applying TNS to the study of families, let us draw two other important prefaces, the first of which concerns the level of abstraction at which evolutionary psychologists discuss causality. A given behavior can be said to have multiple causes, and sometimes, the difference between the causes is a difference in abstraction. For instance, let us consider the question of why people eat. One answer is that they get hungry; another is that they eat to get the nutrients they need to survive. These are, respectively, examples of what evolutionists refer to as a *proximal cause* and an *ultimate cause.* The former is the cause that is apparent in the given environment: humans experience the sensation of hunger and are driven to eat. The latter is the higher-order cause, the one that connects the effect to survival or procreation: humans must eat to survive. Importantly, these are not competing explanations for the same behavior; rather, they simply represent different levels of abstraction. Thus, an evolutionist would say that we eat because we are hungry, but we get hungry because we will die if we do not eat.

Often, confusion over the explanations offered by TNS for various behaviors is confusion over the level of abstraction. A good example concerns the idea, referenced by Dawkins (1976), that humans marry to procreate and advance their genes into future generations. This is certainly the explanation that TNS would provide; however, most people would say they got married because they fell in love and could not imagine their lives without the other person—not to be nice to their genes. As in the earlier example, however, these are not competing explanations; they simply reflect the difference between proximal and ultimate causes (for discussion of proximal and ultimate causality in romantic relationships, see Kenrick & Trost, 1989).

The second important preface is that physical or psychological adaptations need not be adaptive for modern living. Rather, scientists using the evolutionary perspective to predict human behavior most often assess the adaptability of a given characteristic for life in hunter-gatherer societies, where humankind has spent more than 99% of its history (Morris, 2001). Evolutionary psychologists acknowledge that evolution typically advances very slowly—over millennia—and thus, they are most interested in what would have been adaptive in hunter-gatherer societies because it is unlikely that significant changes would have occurred in physical and psychological adaptations since the introduction of modernity. Evolutionists refer to the period during which a given characteristic would have been adaptive as the *environment of evolutionary adaptedness* (EEA; see Tooby & Cosmides, 1992). This is an important preface because some characteristics that may have been adaptive in the EEA are not necessarily adaptive for modern living.

A good example is the human preference for sweets, which would have helped hunter-gatherers to ensure that they consumed needed nutrients but can be maladaptive in modern times, when processed sugar is so readily available.

WHAT DOES TNS HAVE TO DO WITH FAMILIES?

Biological family relationships are unique among all human bonds because they are both social and genetic. They have the ability, therefore, to influence people's procreative success in ways that nongenetic relationships do not. The field of evolutionary psychology proposes that humans are continually motivated to advance their genes into future generations and that they act in ways that promote this goal, whether or not they do so conscientiously. Of course, nongenetic relations contribute to this goal as well: friends or colleagues can help us to attract romantic partners by arranging introductions, and spouses help us procreate directly (see Kenrick & Trost, 2000). Because our biological relatives are the only ones who actually carry our genes, however, they are able to influence our procreative success, and we theirs, in ways that other relationships simply cannot. Families are, as such, extremely worthy of scholarly attention, and theories of evolution are uniquely positioned among scientific theories to explain the dynamics of family interactions and relationships (for an extended discussion on relationship development from an evolutionary perspective, see Nash, 1988).

According to TNS, the omnipresent motivations of survival and procreation should matter when it comes to predicting and understanding family behavior. In this article, we discuss a number of specific applications of this theory to the study of families. First, however, we explore the nature of genetic relatedness more explicitly, because it has clear implications for the creation of closeness, the maintenance of solidarity, and the provision of resources in family relationships. In particular, we will discuss the tendency toward nepotism as an example of inclusive fitness, or the drive to promote our genes. We discuss this topic first, before examining issues in specific family subsystems, because it has implications for all family relationships.

Nepotism, Inclusive Fitness, and Hamilton's Rule

Nepotism is the tendency to favor one's relatives over nonrelatives in the distribution of resources. These can include material resources, such as money or property, as well as resources like time, attention, love, affection, protection, and social or emotional support. All other things being equal, humans (and many other species) have a strong tendency to give more resources to their families than to people to whom they are not related. We love our children more than other people's children. We provide for the needs of our families before providing for the needs of others.

Even when we die, it is almost always to our relatives to whom we leave our possessions (Smith, Kish, & Crawford, 1987).

Why do families occupy this unique position? More intriguingly, why do humans favor their family relationships, in terms of the provision of resources, even when satisfaction in those relationships is low? (One may feel closer to a number of friends and colleagues than to one's own siblings, for instance, yet still favor siblings in the provision of resources.) One theoretic perspective might offer that this is a product of cultural socialization, but such an explanation is lacking, for two reasons. First, the tendency toward nepotism is characteristic of multiple human cultures and is also found in nearly every species, so it is neither uniquely American nor even uniquely human. Second, the socialization explanation simply changes the level of abstraction in the question; if one accepts that humans are nepotistic because they are socialized to be so, one needs only to ask why we are socialized in that way to find that one has not really answered the question at all.

By contrast, TNS provides a clear, higher-order explanation for this pervasive tendency, which is grounded in the notion of inclusive fitness. The idea behind inclusive fitness is a simple one. It begins with the premise that people differ in their levels of genetic relatedness to others. In a technical sense, genetic relatedness refers to the probability that any particular gene found in one person will also be found in another. The highest level of genetic relatedness is found between identical (monozygotic) twins; because they share 100% of their genes, they are said to have 100% genetic relatedness.[2] Humans typically have 50% relatedness to their biological parents, their biological children, and their full-biological siblings (including fraternal, or dizygotic, twins). We generally have 25% relatedness to our half siblings, aunts and uncles, nieces and nephews, our grandparents, and our grandchildren. Our relatedness to our first cousins is typically 12.5%, and of course, we generally have 0% relatedness to steprelatives, adoptive relatives, in-laws, and spouses.[3]

In his *theory of inclusive fitness,* Hamilton (1964) proposed that the level of genetic relatedness between individuals matters to their potential evolutionary success. He recognized that humans can further their reproductive success not only by procreating but also by contributing to the health and welfare of others who carry

[2]The same applies to monozygotic triplets, quadruplets, or other monozygotic multiple-birth siblings.

[3]This discussion illustrates the difference between the genetic and social aspects of family relationships. For example, suppose that a pair of identical twin brothers and a pair of identical twin sisters intermarry (i.e., each brother marries one of the sisters). Suppose, further, that each married couple produces children. In a social sense, the children from the two marriages would be cousins to each other. In a genetic sense, however, all of the children are siblings. Because the two fathers are genetically identical to each other, as are the two mothers, then their offspring are equally related to their parents as to their aunts and uncles, and equally related to their cousins as to their siblings (50% relatedness in all cases).

their genes. For example, if a man produces one biological child, he has contributed approximately 50% of his genes to a succeeding generation. He can achieve the same level of reproductive success, however, if he gives resources to his biological sister and she produces two children of her own. In either case, roughly the same percentage of the man's genes will live on. (And, as we discuss later, the man may actually achieve greater reproductive success by contributing his resources to his sister's children than by contributing his resources to his own children, because of differences in paternity certainty.) Hamilton argued that the level of genetic relatedness between people should therefore be a factor in determining their likelihood of sharing resources, because giving resources to close relatives benefits the giver more than does giving resources to more distant relatives. Specifically, he proposed a formula that predicts people's probability of resource-sharing, which has come to be known as Hamilton's Rule:

$$c < rb$$

In this formula, c refers to the cost to the giver, r is the degree of genetic relatedness between the giver and receiver, and b refers to the benefit to the receiver. Hamilton's (1964) specific proposal was that behaviors we would normally consider to be altruistic—giving social or material support to another without an explicit demand of reciprocity, for instance—are adaptive only to the extent that the cost to the giver is less than the product of the benefit to the receiver and the receiver's level of genetic relatedness to the giver. An applied example of Hamilton's Rule was offered by Buss (1999). Let us suppose that a man passes by a river, only to find that his genetic relatives are drowning in the current. He has the option of jumping into the water to save his relatives' lives, but such an act would cost him his own life. According to Hamilton's Rule, it would be adaptive for the man to sacrifice his own life to save three of his siblings, for instance, but not to save only two. In this example, the cost to the giver is his life (a loss of 1.0 lives), but the benefit to saving three of his siblings is the gain of 3.0 lives multiplied by their levels of genetic relatedness to the giver (in this case, 0.5). Thus, by sacrificing his life to save three siblings, the man has a net gain of 1.5 lives, in terms of the levels of genetic relatedness to himself (that is, one and a half times the level of his own genes that can live on to succeeding generations).

There are some important caveats about Hamilton's (1964) ideas that are worth mentioning. First, neither Hamilton, nor any evolutionary psychologist who has applied his ideas, would suggest that people behave in this manner conscientiously. That is, the idea behind Hamilton's Rule does not imply that people consciously go through a form of mental calculus before deciding how to act. Rather, the idea is that natural selection favors those who are attuned to genetic relatedness when giving out benefits and incurring costs on another's behalf, whether or not they are consciously aware of the evolutionary reasons behind their decisions.

Daly and Wilson (1980) capitalized on this idea in their *theory of discriminative parental solicitude,* which offers that, despite their best intentions not to, parents routinely discriminate among their children when investing their resources (including time, money, affection, opportunity) in a manner that maximizes their own reproductive success. We take up this issue in greater detail later.

Second, although TNS, in general, and Hamilton's Rule, in particular, propose that genetic relatedness is one influence on how people share their resources with others, neither proposes that it is the only influence. This is important to acknowledge explicitly, given that people routinely share their time, money, and affection with friends, colleagues, and others to whom they have no genetic relatedness. Many of these relationships are enormously important and no evolutionary psychologist would suggest otherwise. However, as we pointed out earlier, family relationships are unique among all human bonds because they are both social and genetic, and therefore influence people's procreative success in ways that nongenetic relationships do not. Families are, as such, extremely worthy of scholarly attention, and theories of evolution are uniquely positioned, among scientific theories, to explain the dynamics of family interactions and relationships.

In the next two sections, we discuss the implications of an evolutionary approach for two family subsystems: marriage and parent–child relationships. In each section, we identify aspects of the relationship that can be explained by TNS and principles of evolutionary psychology, contrasting these with competing explanations where appropriate. We also review empirical findings relevant to these points. Importantly, TNS has implications for many other family relationships, including between siblings, in-laws, cousins, and aunts and uncles and nieces and nephews, that space does not permit us to detail in this article. We have elected to focus on the marital and parental subsystems, to the exclusion of these others, only because they are so commonly the focus of research in the family communication field.

IMPLICATIONS FOR MARITAL RELATIONSHIPS

Many in the family communication field focus their research efforts on understanding marriage, and for good reason. Marriage is perhaps the principal and most consequential relationship in the life course, as it engages people mentally, emotionally, sexually, physically, socially, and financially. Marriage is found in every known human society (Benshoof & Thornhill, 1979; Daly & Wilson, 1988), and is believed to have evolved because of the benefits that pair bonds provide for offspring, including resources that help ensure their survival to sexual maturity (Emlen, 1995). To the extent that marriage contributes to the survival of offspring, and to the extent that the motivation to pair bond is at all heritable, it is of little surprise that marriage plays such an important role in the human social experience. Fisher (1999) offered the following:

> Much would stem from this remarkable adaptation [pair-bonding]. The husband, the wife, the father, the nuclear family, our myriad customs of courtship, our procedures for marriage and remarriage, our terms for kin, the plots in our operas, novels, plays, movies, and poems: hundreds of thousands of human traditions stem from the ancient human drive to pair and rear young children as a team. Attachment is the foundation stone of human social life. (p. 259)

In this section, we address two questions that are important when considering marriage: why do marriages succeed and why do they fail? In particular, what adaptations exist that help to ensure successful marriages, and what evolutionarily significant threats are there to marital success? We begin in this section by discussing two important adaptations that work to sustain pair bonds: love, which makes the pair bonds rewarding, and jealousy, which mitigates important threats to their fidelity.

Romantic Love

Few concepts are more central to the study of relationships than love. Love is one in a small number of basic emotions that are considered to be essential for survival in our social environment (Epstein, 1984; Fehr & Russell, 1984; Shaver, Schwartz, Kirson, & O'Connor, 1987). Indeed, it appears that our capacity to love is so closely linked to our survival that it is built into the fabric of our genetic code (Mellen, 1981). Few people would disagree that love is important, but why do we experience love in the first place? From the perspective of TNS and evolutionary psychology, the most direct answer is that love makes pair bonds work. Specifically, the emotional and physical experience of love bonds us to others because it makes us feel good in their presence and makes us desire to be around them more. As the Captain and Tennille offered in the mid-1970s, "love will keep us together." Of course, humans experience many different shades of love, some of which bond us to our families, others of which bond us to our friends. All of these types of love are important in an evolutionary sense, because all of these relationships contribute to our survival and the quality of our lives. Romantic love, however, works to promote the creation and maintenance of romantic pair bonds, such as marriages, which contribute not only to humans' survival and procreation goals but also to the survival and eventual procreation of their offspring.

Love is a complex emotion, in that it involves cognitive, affective, and physiological components. Although people may be most aware of the cognitive and affective aspects of their experiences of love, some research suggests that specific hormones play important roles both in the feelings of infatuation that accompany falling in love and in the feelings of attachment that accompany long-term bonding. In particular, some have suggested that the interplay of hormones such as dopamine, seratonin, and norepinephrine works to create the euphoria of falling in love and acts to "anesthetize" potential romantic partners from each other's faults (see Liebowitz, 1983). After the infatuation stage of a new romantic relationship, the anesthetizing effect tends to wear off and the relationship moves either toward dissolution or toward long-term bonding; if the latter, hormones such as oxytocin, vasopressin, and endogenous opioid peptides may play a role in making the bonding rewarding (see Carter, 1992; Panksepp, 1998; for a review, see Floyd, in press). From the evolutionary perspective, love is an important adaptation that acts to keep pair bonds together by making them rewarding. Another adaptation, jealousy, works to keep pair bonds together, not through its reward value but through its ability to mitigate threats to the fidelity of the bond.

Sexual Jealousy

Although a number of things can threaten the success of a pair bond, one of the most consequential threats is infidelity on the part of one or both partners. Why does infidelity damage relationships to the extent that it often does? Proximal explanations are that infidelity breaks a social, emotional, or legal contract between spouses and that it threatens the nature of the couple's identity as a committed couple. These may well be important causes of the distress associated with infidelity, but the evolutionary perspective equips us to examine higher-order, ultimate causes. In this section, we discuss why, from the perspective of TNS, infidelity can be so damaging to relationships and then discuss the emotion of jealousy as an adaptation evolved to mitigate the threat of infidelity.

The evolutionary point of view offers that men and women differ from each other in the types of infidelity that threaten their relationships and in the reasons why they threaten. Buss, Larsen, Western, and Semmelroth (1992), for instance, reported that women are more distressed by their partners' *emotional* infidelity, whereas men are more distressed by their partner's *sexual* infidelity (for a review, see Andersen & Guerrero, 1998; Guerrero & Andersen, 1998). It stands to reason from an evolutionary perspective that men will view sexual infidelity as more of a threat because the stakes of ensuring paternal certainty are much higher for men, and sexual infidelity on the part of a spouse increases the likelihood that the spouse's subsequent children will not be the husband's own. This, in turn, raises the risk that the husband will be cuckolded, or "tricked" into investing his resources in children who cannot contribute his genetic material to future generations. By contrast, Buss et al. (1992) explained that women give more weight to emotional infidelity because of the long-term diversion of investment that it signals. That is, if a husband is emotionally invested in a woman other than his wife, this increases the likelihood that he will give resources to the rival that could be used to ensure the survival of the wife and the well-being of her children. As Buss et al. (1992) noted, these findings hold across cultures.

How does jealousy mitigate the threat of infidelity? One answer is that it precipitates what are sometimes radical behaviors that work to ensure fidelity. For instance, there is evidence to suggest that male sexual jealousy is a leading cause of spousal abuse (Daly, Wilson, & Weghorst, 1982). In fact, men will go to extreme lengths to ensure the fidelity of their mates. Laws permitting the homicide of adulterous wives are found worldwide and throughout human history. In the case of honor killings, a father, husband, brother, or son is felt to be duty-bound to kill a female family member who allegedly has brought shame on the family by committing adultery. In many cultures, punishment for relationships out of wedlock is stipulated as 100 lashes if the woman is single, or if married, death by stoning.

Another extreme measure that men will take to protect access to women is in the form of genital mutilation. Female genital mutilation (FGM) refers to the removal of part, or all, of the female genitalia. According to Amnesty International, an estimated 135 million women worldwide have undergone genital mutilation, and another 2 million girls a year are at risk of mutilation. In many societies, an important reason given for FGM is the belief that it reduces a woman's desire for sex, therefore reducing the chance of sex outside marriage (Lightfoot–Klein, 1989). In many FGM-practicing societies, it is extremely difficult, if not impossible, for a woman to marry if she has not undergone mutilation. In many cases, women are "sewn up" and "opened" only for her husband. Women are prevented from indulging in "illegitimate" sex because the honor of the whole family is seen to depend on it.

In this section, we have discussed jealousy as an adaptation that works to mitigate the threat of infidelity. It is not a foolproof strategy, of course, and marriages quite frequently fail. Although extensive research has examined various proximal causes of marital dissolution (e.g., Gottman, 1994), the evolutionary perspective offers that infidelity, unless it is mitigated by jealousy or lack of opportunity, will be a significant ultimate cause of relational distress and dissolution.

Sexual and Emotional Infidelity

We have already discussed the reasons why sexual and emotional infidelity is so harmful to long-term pair bonds; so why does it occur? Research by evolutionary psychologists has suggested that men and women engage in adulterous behavior for largely different reasons. Across cultures, men report that they have extramarital affairs largely for sexual pleasure, instead of to form new pair bonds that would compete with their marriage or primary pair bond (Glass & Wright, 1985). This is a proximal explanation, of course; evolutionary psychologists would offer that the ultimate explanation for the desire of sexual pleasure is that it motivates behavior that increases access to women who can provide genetic variation in any resulting offspring. From the point of view of TNS, the desire to seek variety is a key adaptation because it has served to enhance genetic variability in offspring.

What evolutionary benefit would women gain from having extramarital affairs? If they can conceal the affairs from their mates, women can benefit in the evolutionary sense by gaining access to genes (through insemination by a new partner) that may be superior to those possessed by her husband or long-term mate. This strategy would give women the best of both worlds, evolutionarily speaking; they would have superior genes to pass on to their children while maintaining the love, support, and investment of a long-term relational partner. Interestingly, women subconsciously have extramarital affairs most often while ovulating, the time of peak fertility (Bellis & Baker, 1990). Of course, if either men or women fail to conceal their infidelities, they risk relational dissolution, which we discuss next.

Divorce

Despite the considerable benefits marriage brings to humans, mutually satisfactory marriages are not easy to maintain. Interestingly, there is significant sex difference on why men and women end marriages. Betzig (1989) found that, across 160 cultures, men seek divorce most often when their wives are unfaithful, whereas women are more likely to seek divorce when their husbands are sterile, or cruel, financially and domestically irresponsible, or physically violent. In other words, women leave a marriage when there is a threat to the promotion and rearing of offspring. The finding that a woman's infidelity is a more prevalent cause of divorce is especially striking because men are more likely than women to be unfaithful (Daly & Wilson, 1988).

However, could divorce be evolutionarily advantageous? There is evidence that suggests that it may. Since 1947, the United Nations has published data every decade on marriage and divorce in over 60 countries. In analyzing these data, Fisher (1999) discovered some striking patterns. Men and women in their mid-20s with no children or with one dependent child tend to divorce during and around the 4th year of marriage. As people get older, bear more offspring, or as the marriage moves past 3 to 7 years, the probability of staying married for life increases (Fisher, 1999). Fisher suggested that this propensity to leave the marriage around the 4th year is rooted in our evolutionary past. Men and women began to form attachments that lasted the length of infancy and lactation of a single child, about 4 years. Once the child had been weaned, siblings, grandparents, aunts, or others could share the burden of parenting. So, if a couple did not bear a second child, they were free to copulate with other mates, increasing the variability of their genetic lineages. Subsequently, over time, men and women fell in love, pair bonded, conceived a child, reared it at least through infancy, and then separated (Fisher, 1999). Therefore, the "4-year itch" that is present today is likely to be an adaptation that was selected from years of evolution.

IMPLICATIONS FOR PARENT–CHILD RELATIONSHIPS

Many would describe their parent–child relationships as being studies in contradiction. On one hand, parents and children love and care for each other and often enjoy a level of interpersonal intimacy that is unparalleled by other social bonds. On the other, parent–child relationships can be heavily laden with conflict and a source of ongoing frustration for both parties. TNS and principles of evolutionary psychology are able to explain both aspects of this apparent contradiction, that is, why the parent–child relationship can be characterized both by the seemingly altruistic sharing of love and resources and by divisive interpersonal conflict. In this next section, we review theory and research on the sharing of resources between parents and children and then on parent–child conflict.

Sharing of Resources

Why do parents devote so much of their temporal, economic, and emotional resources to caring for their children? Earlier in this article, we discussed the phenomenon of nepotism, or the tendency to favor one's own kin over other kin in the distribution of resources, whether material (e.g., money, shelter, possessions) or immaterial (e.g., love, attention, affection, opportunity). From the perspective of TNS, nepotism acts to ensure that parents' resources produce a return on their investment, in the form of greater procreative success. There are two systematic inequities in the investment of resources that are worth noting, however. The first concerns parents' inequitable investments in their own children, and the second concerns inequity in mothers' investments, as compared to fathers. We take up both issues subsequently.

Discriminative parental solicitude. Despite what may be their best intentions, parents of multiple children do not, on average, invest equally in all of their children. Rather, there is ample evidence that they invest discriminately, giving more resources to those children who are most likely to contribute their genetic materials to succeeding generations than to those children who are less likely to do so, either because they are less likely to reproduce (as in the case of homosexual children or those who are physically incapable of reproducing) or because they do not carry the parents' genes to begin with (as in the case of stepchildren). Daly and Wilson (1980, 1981, 1987, 1988, 1993, 1995) have explained this pattern in their theory of discriminative parental solicitude as an adaptation by which parents are motivated to invest their resources in ways that maximize return on those investments, in the form of reproductive success (for an in-depth discussion of mothering from an evolutionary perspective, see Hrdy, 1999).

Several studies are illustrative. For example, Anderson, Kaplan, and Lancaster (1997) examined patterns of parental investment in their children's college educations and found that, compared to stepchildren, biological children were nearly six times as likely to receive money for college from their parents, and they received an average of $15,000 more than did stepchildren. In two studies, Floyd and Morman (2001) found that men received less affection from their stepfathers than from their biological fathers, and (most important) that this difference could not be accounted for by the closeness or satisfaction levels of the relationships, by the fathers' involvement in the relationships, or by the ages of the fathers or sons. Similarly, in two other studies, Floyd (2001) and Floyd, Sargent, and Di Corcia (2004) found that bisexual and homosexual men received less affection from their biological fathers than did heterosexual men. There is evidence that grandparents practice discriminative solicitude as well (see, e.g., DeKay, 1995; Euler & Weitzel, 1996).

Several other studies have identified even more striking contrasts. In a survey of 841 Canadian households, for instance, Daly and Wilson (1985) found that children living with one biological parent and one stepparent were approximately *40 times* more likely to be physically abused than were children living with only biological parents, and that this difference cannot be accounted for by other factors, such as poverty or socioeconomic status. In a different project that utilized several data sets, Daly and Wilson (1988) discovered that preschool-aged children were between *40 and 100 times* more likely to be killed by a stepparent than by a biological parent. There is some evidence that this finding replicates cross-culturally (Daly & Wilson, 1988). Even in biological parent–child relationships, children are more likely to suffer infanticide if they are younger than if they are older (Daly & Wilson, 1988). This reflects the notion that, all other things being equal, older children are more likely to survive to reproduce themselves than younger children are, and support for this interpretation is found in the fact that nonbiological parents are more likely to kill older children than younger children (Daly & Wilson, 1988).

Maternal versus paternal care. Why do mothers, on average, provide so much more in the way of parental care than do fathers? Feminist scholars have argued that such a division of parental labor is a product of the culturally-sanctioned subjugation of women (see, e.g., Chodorow, 1978). However, this is not a uniquely human phenomenon; as Clutton–Brock (1991) noted, maternal care exceeds paternal care in a huge range of species, including many species of insects, fish, reptiles, amphibia, and birds. It is reasonable, therefore, to argue that this division of parental labor is not merely a social or political construction, but is reflective of motivations that are generalizeable beyond *Homo sapiens.*

Researchers working with TNS have offered various explanations for why maternal care exceeds paternal care in so many species. The most developed of these hypotheses concerns paternity certainty, which is defined as a father's level of certainty that his children are indeed his biological progeny. Maternity certainty is seldom in question; the very act of giving birth gives women certainty that their children are their own biological offspring.[4] For humans (as for all animals in whom sexual fertilization occurs internally), paternity certainty is much more vulnerable, because sexual infidelity on the part of the mother (whether voluntary or involuntary) makes possible fertilization by a man other than her mate. As Daly and Wilson (1987) noted, "maternity is a fact, paternity a conjecture" (p. 109). The reason paternity certainty is so significant is that any resources men contribute to children who are not his biological offspring are "wasted" in terms of their ability to further the man's reproductive success. Of course, this doesn't mean that such contributions are wasted in every sense of the term. As Pinker (2002) acknowledged, parenthood is important for many reasons that have nothing to do with genetic propagation; most notably, parents have moral and ethical responsibilities to love, care for, and provide for their children regardless of the children's levels of genetic relatedness or their likelihood of reproducing. No evolutionary psychologist would contend that men do (or should) invest nothing in children who are not their biological offspring. Rather, the paternity certainty hypothesis contends that men's investments are affected by (among other things) their level of certainty in their genetic relatedness to their children.

According to this hypothesis, then, men contribute less effort toward child care than women do because they are usually less certain than women are about whether the children are their biological offspring. Let us reiterate the caveat that no evolutionary psychologists argue that men do this conscientiously. According to TNS, they don't have to. The evolutionary pressure to maximize one's resources by investing them where they will have the largest reproductive payoff has already selected for the motivation in men to invest less in children do than women. Men who are not sensitive to paternity certainty, therefore, risk being *cuckolded,* or "tricked" into raising children who are not biologically their own. Because they contribute their resources to children who do not carry their genetic materials, such men ought to produce, on average, fewer biological offspring than men who are sensitive to paternity certainty. To the extent that such sensitivity is at all heritable, therefore, a lack of sensitivity to paternity certainty ought to be selected against by the normal process of natural selection.

It behooves mothers to be sensitive to paternity certainty, as well, given that their children ought to have a higher likelihood, on average, of surviving to reproductive age with the aid of the father's investment than without it. There is ample research to suggest that mothers are motivated to perceive and draw attention to evidence of paternity, even within minutes after giving birth. After examining videotapes of American births, Daly and Wilson (1982) transcribed verbal utterances made by mothers before, during, and after delivery. Of 111 videotapes, 68 con-

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[4]Of course, in cases of surrogate motherhood, women generally have equivalent certainty that the children they bear are not their biological offspring. In either instance, women's parental certainty approaches 100%, whereas men's is almost never as high.

tained explicit verbal references to the baby's appearance. Of those remarks, 80% referred to the baby's resemblance to its father, whereas only 20% referred to the baby's resemblance to its mother. In a second study in the same article, Daly and Wilson asked Canadian mothers of newborn babies to indicate which parent the baby resembled the most. Results were similar to those with the American sample: 81% of mothers indicated that their babies most resembled the father, whereas 19% indicated that their babies most resembled themselves. Others have found similar results (e.g., Macfarlane, 1977; Robson & Moss, 1970), even with samples collected from outside North America (Regalski & Gaulin, 1993). It even appears that this motivation manifests itself prior to delivery; in an interview study of expectant mothers, Leifer (1977) reported that "in their fantasies, most women imagined the newborn as looking like their husband" (p. 94).

Compounding the effect of paternity certainty on men's and women's differential investment is the inherent inequity in the sexes' reproductive potentials. Over the course of a life span, men are physically capable of producing thousands of times more offspring than are women, whose reproductive capabilities are finite and comparatively restricted. As a result, each child represents a comparatively greater reduction in future reproductive opportunities for women than for men, creating additional incentive for women to invest more of their resources in the rearing of children than do men (see Hrdy, 1999).

Thus far in this section, we have explored the evolutionary reasons why parents invest in their children, why parents (and grandparents) invest discriminately, and why mothers and fathers typically invest differentially. All of these topics capitalize on the idea that parents' investments in their children produce a return, in the form of furthering the parents' own procreative success. Given that, however, why is it that parents and children so often find themselves in conflict with each other? We take up this issue next.

Parent–Child Conflict

From the perspective of TNS, parents and their biological children are invested in each other's welfare because they share, on average, 50% of their genes. This means, of course, that they differ genetically by the other 50%, which suggests that, although parents' and children's priorities overlap, they do not perfectly coincide. According to evolutionary psychologists, this provides fertile ground for conflict between parents and children, specifically conflict over resources. In particular, the evolutionary approach to parent–child conflict suggests that parents and children have different stakes in the investment and acquisition of resources (whether money, time, attention, love, or other types of resources). Parents are driven to invest their resources in their children in ways that maximize evolutionary returns (as we discussed earlier in the section on discriminative parental solicitude). Children, however, are driven by their motivation to survive to acquire as many resources as they can, even if that means depriving their siblings of those same resources.

By way of example, let us suppose that a mother has $100 to divide between her two adolescent children. If both children are biologically related to her and if both are healthy and likely to reproduce, the mother maximizes her investment by giving each child $50. From each child's perspective, however, it is better to try to get more than $50, because although resources given to a sibling benefit oneself (because of the .50 genetic relatedness to biological siblings), resources given to oneself benefit oneself more (because of the 1.0 genetic relatedness to oneself). This explains, from the evolutionary perspective, why parent–child relationships may seem so prone to conflict, and also why the parent–child relationship can sustain both cooperation and conflict to the degree that it can.

By this point in our discussion, it should be apparent to family communication scholars that TNS and its associated theories and principles of evolutionary psychology have numerous implications for marital and parent–child relationships that can inform the study of interaction in those relationships (see, additionally, Cappella, 1991; Stern, 2002). In truth, we have only scratched the surface, in this discussion, of how many aspects of these relationships TNS can explain, and we have barely mentioned the implications it has for a host of other family relationships, including siblings, in-laws, adoptive relationships, stepfamilies, and relationships between cousins. The explanatory power that TNS offers for understanding family communication is both exceptionally broad and deep. We find, however, that few researchers in the family communication field have elected to capitalize on these strengths in their own research. To conclude this article, we speculate as to why this is the case and offer suggestions to aid researchers wishing to incorporate evolutionary principles into their own work.

(WHY AREN'T WE) USING TNS IN FAMILY COMMUNICATION RESEARCH

Despite the considerable depth and breadth of its explanatory power, TNS has been virtually ignored by family communication researchers. Of all of the empirical studies reported thus far in the *Journal of Family Communication* (Vol. 1.1 to Vol. 5.1), for instance, only one (Gottman, Levenson, & Woodin, 2001) even mentions Darwinian principles and none uses TNS (or any other theories of evolution) as a basis for formulating hypotheses or research questions. This is true even of studies on topics about which TNS would have clear and testable implications, such as jealousy (e.g., Aune & Comstock, 2002) or parent–child conflict (e.g., Pecchioni & Nussbaum, 2001). TNS does not fare much better in family communication textbooks. The theory is not even mentioned, let alone explained, in the most recent editions of the textbooks by Turner and West (2002), Galvin and Brommel (2000), Arliss (1993), or Yerby, Buerkel–Rothfuss, and Bochner (1998).

Why has TNS been used so scarcely by family communication researchers? One reason may be a simple lack of familiarity with the theory and the predictive and explanatory power it offers. We would surmise that most researchers working in the field of family communication have been trained (as we were) primarily in the tradition of social learning theory and related paradigms. This naturally leads researchers to focus on proximal causes for behavior, such as socialization, family rules and roles, cultural prescriptions, relationship "types," or individual emotions, motivations, or attachment styles. None of these influences is immaterial or unimportant and we do not wish to suggest otherwise. However, those researchers who are familiar with the tenets of TNS and other evolutionary theories (including theories of inclusive fitness, differential parental investment, and discriminative parental solicitude) have the dual advantages of being able to explain a wider range of family behaviors than can be explained by such proximal causes, and of being able to provide more ultimate, higher-order explanations for those behaviors. For example, instead of explaining a parent–child interaction with reference to a family rule, a researcher working within TNS can explain the reasons why the rule may have evolved in the first place and how the given interaction contributes to the evolutionary goals of the participants.

A second reason why TNS is not used more often in family communication research may be found in generalized objections to the evolutionary approach that are grounded in misunderstanding. One such objection is the idea that if a behavior is said to have any measure of genetic or biological cause, that negates that principle of human free will and implies that (a) the actor cannot control the behavior, so therefore (b) he or she should not be held accountable for it. This is the idea behind the principle of biological determinism and it is imperative to note that *no one working in the field of evolutionary psychology espouses it.* Rather, several researchers have offered extended discussions exposing the fallacy of this argument (see, e.g., Pinker, 2002; Thornhill & Palmer, 2000). Specifically, it is an untenable argument that if something has a genetic basis, it is therefore unalterable. Hair color is genetically determined, for example, but it is changeable at will. It is equally invalid to suggest that if someone has a biological tendency to enact a particular behavior, then he or she cannot be held accountable for that behavior. No one would disagree, for example, that eating behavior is biologically motivated; we eat to survive, not because we were socialized into eating. However, that doesn't render children blameless when they eat cookies against their mothers' orders and spoil their appetites. The idea of biological determinism is a fallacy that is not even implicitly suggested by TNS and is argued *against* by researchers who use it. One sees this argument invoked only by those wishing to discredit TNS by falsely suggesting that it implies biological determinism (for further discussion, see Alcock, 2001).

Researchers in the field of communication have many effective theories from which to choose, and many different reasons for choosing the ones they do. We strongly believe, however, that for those studying family communication, no single theory even approaches TNS in terms of either the breadth or the depth of its explanatory power. In this article, we have reviewed research on multiple diverse aspects of marriage, parenthood, and family relationships in general. TNS provides the basis for predicting and explaining *all* of these findings, as well as many others that space does not permit us to detail here. Moreover, it explains them with a level of theoretic depth that transcends the level of the interaction, the relationship, the family, the society, and the culture. In these respects, we opine that TNS is unparalleled in its utility to researchers working to understand the intricacies of family communication.

How can family communication researchers incorporate TNS into their work? We can offer a few preliminary suggestions, the first of which is to *conceptualize research questions in terms of ultimate causality.* Researchers should consider the communication behaviors that are of interest to them and the relationship those behaviors might have either to survival or procreation. The links for some behaviors might be fairly obvious; one can certainly identify how a behavior like flirting is related (eventually) to procreation, or how making children dress warmly or take vitamins is related to their survival. The links for other behaviors may be less apparent, but there nonetheless. In this article, for instance, we have discussed how preferring one's biological children over one's stepchildren is ultimately adaptive, although stepparents may rarely engage in such reasoning conscientiously. Researchers in evolutionary psychology have also studied such diverse behaviors as rape, affection displays, deception, and cosmetic use for their implications for survival and procreation. Conceptualizing research questions in terms of ultimate causality requires the researcher to consider the survival or procreative purposes that a given behavior might serve.

A second suggestion is that researchers *formulate hypothesis tests to rule out rival explanations.* This is a basic precept of the scientific design, of course, but it is of particular importance for researchers studying communication from an evolutionary perspective. The reason is that one can often deduce the same prediction using evolutionary and non-evolutionary theories; although the explanations differ, the basic prediction may be the same. A good example comes from the Floyd and Morman (2001) study comparing biological fathers and stepfathers in terms of the amount of affection they communicated to their sons. The prediction that men are more affectionate with biological sons than stepsons can easily be derived on the basis of inclusive fitness theory, but one might also arrive at the same prediction by reasoning that men feel closer to their biological sons than to stepsons because they have longer histories with biological sons. This situation requires the researcher to test the hypothesis in such a way that one explanation can be ruled out. If closeness is what causes men to be more affectionate with biological sons than stepsons, for example, then the predicted mean difference should fail to manifest (or at least, be diminished) if the level of closeness is controlled for. Floyd and Morman (2001) instead found that the mean difference held even when closeness and other relational characteristics were covaried out. Of course, ruling out one rival hypothesis does not provide unqualified evidence that one's own hypothesis is true, but it strengthens one's claim. By carefully crafting research designs to rule out rival causes, researchers can truly test their hypotheses, rather than just *demonstrate* them.

Finally, we encourage researchers to *consider context carefully, to avoid oversimplified hypotheses.* Advice to attend to the context may strike some as odd, given that we are proposing a focus on the evolutionary influences of behavior, not on situational or contextual influences. Importantly, however, researchers using the evolutionary paradigm agree that context is extremely influential, given that the characteristics evolution selects for in individuals are selected to manifest themselves only in particular contexts. For example, particular people may be more genetically prone than others to respond to aggression with aggression. Does this mean that their overall level of aggressiveness is higher than average? Not necessarily, because this genetic tendency will only manifest itself in contexts that are already aggressive.

Careful consideration of the social context and environment will help researchers avoid oversimplification of their hypotheses. We encourage researchers to keep in mind that evolutionary adaptiveness matters, in terms of predicting behavior, but it is not the only thing that matters. If we take stock only of natural selection as a predictor of behavior, we might be inclined, for instance, to predict that people will give twice as many resources to their full-biological siblings than to their half-biological siblings, because the level of relatedness is 50% in the former relationship and only 25% in the latter. This would be a flawed prediction, however, because although relatedness is one influence on interpersonal behavior, no evolutionary psychologist would propose that it is the only influence. Contextual influences, such as the history of the relationship or the type of resource being offered, must be considered by researchers who wish to avoid oversimplified hypothesizing.

In this article, we have reviewed the application of Darwin's theory of natural selection to the understanding of family relationships. Given the breadth and depth of its explanatory power, TNS can be an extraordinarily useful tool for family communication scholars.

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