Human affection exchange: III. discriminative parental solicitude in men's affectionate communication with their biological and nonbiological sons

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Human Affection Exchange: III. Discriminative Parental Solicitude in Men's Affectionate Communication with their Biological and Nonbiological Sons

Kory Floyd and Mark T. Morman

Although several investigations have addressed the nature of communication in men's relationships with their sons, relatively few have focused on positive interaction patterns, such as the exchange of affection, even though affection is of considerable importance to relational maintenance and satisfaction. According to affection exchange theory, affection is such a valuable relational resource because of the contributions it makes to humans' long-term viability and reproductive success. As such a resource, it should, thus, be governed by adaptive motivations, among which is the motivation for parents to invest in their children in ways that maximize their long-term evolutionary success. Using the theory of discriminative parental solicitude, we predicted differences in the amount of affection men communicate to their biological sons, adopted sons, and step-sons. We tested our predictions in two studies involving a total of 384 males. We discuss implications of the results for explaining the superordinate evolutionary motivations governing affectionate communication.

KEY CONCEPTS Affection, Fatherhood, Affection Exchange Theory, Evolution

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There are few male-male relationships that may be more socially significant than that between father and son. Although the strength and influence of friendships, work partnerships, and even fraternal relationships often wax and wane...
over the life course, fathers and sons can affect each other's lives substantially, in both positive and negative ways, even during sons' adult lives (see Beatty & Dobos, 1993). Positive father-son bonds benefit a number of aspects of men's lives, including sons' academic achievement (Snarey, 1993), sons' communicative behaviors (Buerkel-Rothfuss & Yerby, 1981; Fink, 1993), sons' relational communication with spouses (Beatty & Dobos, 1993) and children (Simons, Beaman, Conger, & Chao, 1993; Simons, Whitbeck, Conger, & Wu, 1991), fathers' and sons' emotional health (Berry, 1990), sons' healthy attitudes toward sexuality (Fisher, 1987), and fathers' adult development and psychosocial adjustment (Snarey, 1993). Indeed, Bochner (1976) argued that communication within the family of origin shapes how men communicate in nearly every aspect of their lives.

Although the father-son relationship is receiving increasing attention in both scholarly and popular arenas, most such attention has focused on the negative aspects of the relationship. Although some have examined correlates of relational satisfaction (Beatty & Dobos, 1992; Martin & Anderson, 1995), confirmation (Beatty & Dobos, 1993), and intimacy (Buerkel, 1996) in adult paternal relationships, scholars have paid far greater attention to aggressiveness (Beatty, Zelley, Dobos, & Rudd, 1994), conflict (Comstock, 1994), and dysfunction (Lee, 1987). Much of the extant literature seems to reflect a common assumption that most men have dysfunctional and emotionally distant relationships with their fathers. Dubbed the "role-inadequacy perspective" by Hawkins and Dollahite (1997), this orientation focuses on men's shortcomings as fathers and appears to permeate research on men and fatherhood (Doherty, 1991; Levant, 1992). Negative paternal relationships, it is assumed, propel men down a life-long path of emotional trauma and doom them to repeat the same cycle of negative fathering with their own sons.

There can be little argument that many paternal relationships are enormously challenging and that such characteristics as aggression and conflict are useful to study. A focus on these aspects, however, can obscure the more positive characteristics of the relationship, particularly those communication functions and behaviors that are associated with positive relational outcomes. One such class of behaviors that has received little scholarly attention in father-son relationships is the expression of affection, even though affectionate communication is a central component of familial relational development (see Floyd & Morman, 1997; Morman & Floyd, 1999) and has long been considered to be among the most fundamental of human needs (Bowlby, 1953; Rotter, Chance, & Phares, 1972; Schutz, 1958, 1966). Possibly because accounts abound of highly contentious father-son relationships, researchers may be inclined to believe that most fathers and sons are not especially affectionate. However, human relationships are often simultaneously characterized by seemingly contradictory communication patterns (see Baxter & Montgomery, 1996), which makes it quite possible that affection, as well as the expression of affectionate feelings, is important even in the most contentious father-son relationships. A clearer understanding of why some father-son relationships are more affectionate than others can, therefore, illuminate the predictors of this most beneficial communication pattern and, ideally, aid men's attempts to improve the quality of this most important bond.

The present studies examined affectionate communication in father-son relationships and the extent to which it is influenced by the type of relationship (whether biological or nonbiological). A secondary focus was on the benefits associated with expressing affection in such relationships. The research reported here was grounded
in affection exchange theory and the theory of discriminative parental solicitude, the tenets of which are described below.

**Affection Exchange Theory**

Like many forms of relational interaction, affectionate communication occurs within a host of individual, relational, and sociocultural priorities that operate at both proximal and ultimate levels of causation. Although a number of studies have examined predictors of affection at the level of the interaction itself (e.g., Floyd & Burgoon, 1999; Floyd & Voloudakis, 1999), they are largely characterized by a lack of higher-order explanations for why affection is an important relational resource and what adaptive motivations ought to govern it. Affection exchange theory (AET: Floyd, 2001, in press) conceives of affectionate communication as an evolved behavior that contributes to humans' superordinate motivations toward viability and fertility. Assumed in the theory is the Darwinian principle of selective fitness, whereby those organisms best adapted to the demands of their environments are most likely to survive and reproduce. AET draws explicit links between the communication of affection and humans' abilities to survive and procreate. Specifically, affectionate communication theoretically increases survival chances through its contribution to the development and maintenance of human pair bonds and their associated resources (Postulate 1). Moreover, affectionate communication is posited to increase individuals' reproductive opportunities by signaling to potential sexual partners that one would be a fit parent (Postulate 2). The third postulate is that individuals' long-term procreation motivations are further served when they communicate affection to their biological children because the benefits associated with receiving affection make the children more suitable as mates, thereby increasing the chances that the children will themselves reproduce and will pass on their parents' genes to yet a new generation.

As an evolved behavior, affectionate communication is governed (according to AET) by adaptive motivations for parents to invest in their children in such a way as to maximize their children's reproductive success. In this way, affection functions as does any other resource parents invest in their children, including shelter, food, clothing, economic support, and emotional support. One theory that is especially well suited to the task of explaining variance in the allocation of relational resources from parents to children is the theory of discriminative parental solicitude, the principles of which are detailed below. Given AET's conception of affectionate communication as an important parental resource, we draw on the theory of discriminative parental solicitude to formulate specific hypotheses about how affectionate communication will differ among different father-son relationships.

**Theory of Discriminative Parental Solicitude**

The theory of discriminative parental solicitude (DPS: Daly & Wilson, 1980, 1981, 1987, 1988, 1993, 1995) derives from the Darwinian principle of *inclusive fitness*, which holds that the characteristics of all organisms persist only to the extent that they contribute heritable elements to succeeding generations that cause those characteristics and prove to be more advantageous than alternative characteristics caused by the heritable elements of competing organisms. Thus, adaptability depends on reproductive ability not only in the short term (i.e., production of offspring) but also in the long term, wherein the ability of one's progeny to contribute one's genotypic elements to succeeding generations (to a greater extent than one's rivals) is the measure of suc-
Adaptive motivations operate at both an ultimate level of causation (dealing with long-term or higher-order adaptation) and a proximal level of causation (dealing with the short-term behaviors, emotions, and motivations that contribute to adaptive success in the long term). Daly and Wilson (1987) contended that “relatively proximal goals like eating, breathing, and copulating have evolved to be valued only because attaining these goals has contributed to fitness” (p. 92).

Importantly, DPS advances the view that psychological mechanisms evolve because of their contribution to fitness to no less an extent than physical mechanisms do. That is, just as the physical mechanisms of eating and copulating contribute to long-term viability, so too do emotions, such as love for one’s children, and psychological motivations, such as fierce protectiveness over one’s offspring, selflessness for the benefit of one’s offspring, and favoring one’s own offspring over another’s in the allocation of resources. DPS also recognizes, however, that not all offspring are equally capable of translating parental resources (whether physical, economic, social, or emotional) into long-term viability for parental genotypic material. Certain offspring are less capable than others of contributing their parents’ genes to successive generations because, for instance, they are physically unable to reproduce, socially unlikely to find mates, or they do not carry those genes at all (as in the case of adopted children or step-children). DPS posits that natural selection, thus, favors psychological mechanisms promoting the discriminative allocation of parental resources, toward, for instance, one’s biological offspring versus the biological offspring of others, toward offspring most in need of the resources versus offspring for whom the resources are superfluous, and toward offspring most likely to reproduce successfully versus those who are unable or unlikely to do so.

Specifically, DPS predicts that parental solicitude (or the investment of resources that contribute to offspring viability) varies systematically in relation to three sources of information (Daly & Wilson, 1987, 1995), perhaps the most potent of which concerns parental certainty, or the extent to which parents are confident that their offspring are indeed their own. For humans (as for all animals with internal fertilization), this is almost exclusively an issue of paternal certainty, for maternity is seldom in question. However, sexual infidelity on the part of the mother (whether voluntary or involuntary) makes possible fertilization by a man other than her mate. Because investing one’s resources in an unrelated person’s biological offspring is ultimately more maladaptive than investing in one’s own offspring, humans (and males, in particular) have evolved psychological mechanisms to mitigate this possibility. Jealousy and possessiveness over one’s mate are examples, insofar as they promote sexual fidelity. An additional example is the motivation for both mothers and fathers to contribute more resources to their biological children than to children who are known not to be their biological offspring. The latter category would include step-children, who ought (according to DPS) to receive fewer resources from their step-parent than from their biological parent. There is ample evidence that this is the case for types of resources other than affection (Anderson, Kaplan, Lam, & Lancaster, 1999; Case, Lin, & McLanahan, 1999; Fin, 1988; Marlowe, 1999; Zvoch, 1999).

DPS forwards a different prediction for adopted children, however. Even though it is often the case that they are the biological offspring of neither parent, DPS posits that the relative newness of adoption in the human experience has not yet allowed for the evolution of mechanisms protecting against maladaptive parental investment (Daly & Wilson, 1987). The ability of DPS to account for the special case of solicitude...
with adopted children was a focus of interest in the present studies.

The next section includes our hypotheses, which are direct tests of DPS and are based on additional contentions offered by AET.

Hypotheses

From the perspective of DPS, a fundamental principle of the human drive to maximize parental fitness is the acknowledgement that "not all offspring are equally capable of translating parental nurture into increments in the long-term survival of parental genetic materials" (Daly & Wilson, 1995, p. 1273). One direct implication of this evolutionary principle is that selection favors discrimination in parents' allocation of resources to their children, such that they direct the most resources to those children who are most capable and most likely to pass on their parents' genetic materials to a new generation. However, only biological children have the ability to pass on their parents' genes.

We do not imply here that men fail to invest in their step-children. This is infrequently the case among humans (although it is common among several other species; see Rohwer, 1986). Indeed, as Anderson, Kaplan, and Lancaster (1999) and Rohwer, Herron, and Daly (1999) have noted, men have adaptive motivations for investing in step-children even though those children do not carry their genes: investing in step-children serves as "mating effort," which increases future reproductive opportunities with the step-children's genetic parent. Of course, investing in one's biological children serves as mating effort, too, but it also serves as "parental effort," which increases the chances that one's biological children will contribute one's genetic materials to future generations.

The prediction that logically emerges from this discussion is that parents allocate greater resources to biological children than to step-children because doing so maximizes the parents' long-term fitness. Stated as a formal hypothesis with respect to affectionate communication,

H1: Men communicate more affection to biological sons than to step-sons.

DPS offers what some would consider to be a counterintuitive prediction regarding adopted children. One evolutionary perspective leads one to suspect that adoptive relationships should approximate step-relationships when it comes to the provision of parental resources, because both are nonbiological and, therefore, both preclude the children from contributing their parents' genes to a new generation. However, from the perspective of DPS, what holds for step-relationships does not necessarily hold for adoptive relationships, in part because the latter are substantially newer in the human experience (Daly & Wilson, 1995). Thus, the psychological and neurological mechanisms humans have evolved that motivate them to invest fewer resources in step-children than in biological children may not yet be adequately evolved for dealing with adopted children. As a result, parents may orient psychologically toward adopted children in the same way they orient toward biological children. This is important because DPS suggests that children's abilities to pass on their parents' genes have no effects on the parents' behaviors except through mechanisms that have evolved for that purpose. That is, parents do not invest discriminately in their children because they are conscientiously attempting to enhance their fitness, but rather because the evolutionary advantages of doing so have caused their psyches to evolve
in such a way that it seems beneficial to invest more, for instance, in one’s own offspring than in another’s offspring.

However, if such psychological mechanisms have yet to evolve with respect to adopted children, as DPS clearly indicates, then adopted children’s inability to pass on their adoptive parents’ genes does not necessarily preclude the provision of parental resources, as parents’ psyches do not lead them to invest strategically in adopted children in the way they do with step-children. In fact, Daly and Wilson contended that adoptive relationships may actually approximate biological relationships in terms of parental resources.

The juxtaposition of these theoretic perspectives leads to the following prediction:

**H2:** Men communicate more affection to adopted sons than to step-sons.

We advance no hypothesis for the comparison between biological and adopted sons because DPS holds that they do not differ significantly from each other. Thus, the ordering of the three relationship types is one in which biological and adoptive relationships are equal and are both greater (in terms of parental investment) than step-relationships.

A final issue of interest was the relational benefits associated with expressing affection. Affectionate communication is a valued resource—and, thus, subject to fathers’ adaptive drives to invest it discriminately—only if it is associated with positive outcomes. Although it is intuitive that affectionate communication is consistently welcomed and positively evaluated, some recent studies suggest that this may not be the case in all relationships. Rather, affectionate behavior by a relational partner can elicit negative responses if it comes as a negative expectancy violation (Floyd & Burgoon, 1999; Floyd & Voloudakis, 1999), if unfavorable attributions accompany it (Floyd & Morman, 2000b), or if it is communicated more intensely than is appropriate for the developmental trajectory of the relationship (Floyd, 1997). Importantly, however, social expectations surrounding affectionate behavior in the family mitigate many of these potential problems. For instance, one rarely has to worry whether an expression of affection in a parent-child relationship is romantic in nature or whether it is inappropriate due to a lack of familiarity between sender and receiver. Given the nature of the father-son relationship, it is logical to assume that fathers and sons judge affectionate communication favorably, as affection has long been considered to be among the most fundamental of human needs (Schutz, 1958). These observations point to the conclusion that affection exchange in father-son pairs contributes to several positive relational outcomes (including, for instance, how close fathers and sons are and how satisfied they are with their relationships). Stated as a formal hypothesis:

**H3:** Affectionate communication between fathers and sons is linearly related to their closeness, their satisfaction with their relationships, and their degree of positive involvement in each other’s lives.

### STUDY ONE

**Participants**

Participants were 182 adult males who were fathers of at least one son. The men ranged in age from 33 to 87 years, with a mean age of 48.87 (SD = 10.15). Just over
half (50.3%) lived in the Midwestern United States, 22.7% lived in the Southwest, 18.8% lived in the Northeast, 3.9% lived in the Northwest, 3.9% lived in the Southeast, and 0.4% lived in Puerto Rico. At the time of the study, 17.6% of the men had a high school education or less, 30.2% had completed some college but had no degree, 31.8% had an associates’ and/or baccalaureate degree, and 20.4% had a graduate or professional degree. Most (86.8%) were married; 11.6% were divorced, and 1.6% were never married. Just over a third of the sample (39.6%) were Caucasian; 36.3% were African-American, 18.1% were Hispanic, 4.4% were Native American, 1.6% were Asian, and 2.2% were of other ethnic origins. Participants had an average of 2.05 sons ($SD = 1.09$) and 1.27 daughters ($SD = 1.05$).

**Procedure**

Participants reported about their relationship with either a biological son ($n = 79$), a step-son ($n = 78$), or an adopted son ($n = 25$). Undergraduate research assistants identified potential participants and invited them to take part in the study. Regardless of the relationship type, the son about whom the fathers reported had to be at least 12 years old at the time of the study. Imposition of this requirement was based on research suggesting that the nature of father-son affection, including the amount and type of affection shared between fathers and sons, changes substantially once the sons enter adolescence. Specifically, prior to their sons’ adolescence, fathers tend not to discriminate in the types and amount of affection they show sons and daughters; however, once sons enter adolescence, sociocultural proscriptions involving male-male affection begin to constrict men’s patterns of affection exchange with their sons (but not with daughters) (see Salt, 1991). Because our purpose in this study was to examine father-son affection within these normative constraints, we excluded from consideration sons who were still young children.

In each condition, if a father had more than one son of the type corresponding to that condition who was at least 12 years old, the father was to report about the eldest son. Although it may somewhat limit generalizability, this decision rule was imposed in the interest of standardizing selection procedures among men with multiple sons so as to avoid a selection bias, whereby a father might choose to report about the son with whom he had the most positive relationship. Qualified participants received a packet of measures to complete and an addressed, postage-paid envelope in which to return them. Fathers were asked not to discuss the measures or their answers with their sons until the fathers had completed and returned the packets. The sons about whom participants reported ranged in age from 12 to 59 years, with an average age of 21.69 ($SD = 7.94$).

**Measures**

Affectionate communication was measured with the factor-based Affectionate Communication Index (ACI: Floyd & Morman, 1998). The 19-item, Likert-type instrument has three subscales for assessing the amount of affection participants communicate to a particular target through direct verbal expressions (e.g., saying “I love you”), direct nonverbal gestures (e.g., hugging), and affectionate social support (e.g., doing favors for each other). Fathers completed the ACI in reference to how affectionate they were with their target sons. The ACI has demonstrated multiple forms of convergent, discriminant, and predictive validity in both experimental and correlational studies (Floyd & Morman, 1998; Morman & Floyd, 1999). Additional measures...
were taken both to test the third hypothesis and so that these qualities could be con- 
trolled for in tests of the previous hypotheses.

Relational closeness was assessed with the Inclusion of Other in the Self (IOS) Scale
(Aron, Aron, & Smollan, 1992). The IOS scale consists of a set of Venn-like diagrams,
each of which represents different degrees of overlap of two circles. One circle in 
each pair is labeled "self," and the other circle is labeled "other"; participants select 
the pair of circles that best depicts the nature of the target relationship. The IOS scale 
has been extensively validated in both experimental and correlational research para-
digms (see Aron et al., 1992).

Positive relational involvement was measured with a 15-item Likert-type scale de-
veloped by Floyd and Morman (2000a; Floyd, in press). The scale includes items as-
sessing how much time fathers and sons spend with each other, how involved they 
feel in each other's lives, and how positive they see their interactions as being.

Finally, father-son satisfaction was assessed with a nine-item Likert-type scale de-
veloped by Floyd and Morman (2000a; Floyd, in press). The measure assesses the ex-
tent of participants' satisfaction and contentment with the nature of their father-son 
relationship (e.g., "My relationship with my son is just the way I'd want it to be").

Participants responded to all measures on a 1-7 scale wherein higher scores indi-
cate greater levels or intensities of the variables. Coefficient alphas for all multiple-
item measures appear in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study One Fathers</th>
<th>Study Two Fathers</th>
<th>Study Two Sons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational satisfaction</td>
<td>.86</td>
<td>.82</td>
<td>.93</td>
</tr>
<tr>
<td>Verbal affection</td>
<td>.85</td>
<td>.82</td>
<td>.86</td>
</tr>
<tr>
<td>Nonverbal affection</td>
<td>.84</td>
<td>.74</td>
<td>.87</td>
</tr>
<tr>
<td>Support affection</td>
<td>.76</td>
<td>.76</td>
<td>.74</td>
</tr>
<tr>
<td>Positive involvement</td>
<td>.91</td>
<td>.90</td>
<td>.92</td>
</tr>
</tbody>
</table>

Note. Reliability estimates are based on Cronbach's alpha.

Results

Initial data reduction. We subjected multiple-item measures to principal-compo-
nents factor analyses to assess their dimensionality. In the cases of relational satisfac-
tion, positive involvement, and fathers' gender orientations, the analyses produced 
clean single-factor structures with high primary loadings, strong internal reliability 
estimates, and few complex items. Examination of the eigenvalues and scree plots for 
the factor analysis of the ACI items suggested that either one- or three-factor solu-
tions were viable, and the instrument has been used both ways in published research 
(Floyd & Morman, 1998; Morman & Floyd, 1999). To allow us to test our hypotheses 
with greater precision, we elected in this study to use the three-factor solution, with 
separate subscales for verbal, nonverbal, and support-based affection.

Differences between biological and nonbiological relationships. The first two hypothe-
ses and the research question addressed differences in men's affectionate communi-
cation with their biological, step-, and adopted sons. We analyzed the three forms of 
affection (verbal, nonverbal, support) together (average r = .61, Bartlett test of sphe-
ricity χ² (3) = 223.112, p < .001) in a multivariate analysis of covariance (MANCOVA), 
with relationship type (biological, step-, or adoptive) as the independent variable. To
control for error variance due to the quality of the relationship or to the ages of the fathers and sons (all of which have been shown to influence affectionate communication; see Floyd & Morman, 1998, 2000a), we covaried out father's age, son's age, relationship satisfaction, relationship closeness, and positive relational involvement. The analysis revealed significant covariance from relational involvement, \( F(3, 165) = 16.35, p < .001, \eta^2 = .23 \). We removed the remaining covariates from the model and re-ran the MANCOVA, retaining relational involvement as the only covariate.

Relationship type produced a significant multivariate main effect on affectionate communication, \( L = .91, F(6, 350) = 2.77, p = .01, \eta^2 = .05 \). Univariate tests revealed that relationship type had a nonsignificant effect on support-based affection, \( F(2, 177) = 0.65, p = .52 \), but that it had significant effects on verbal affection, \( F(2, 177) = 3.36, p = .04, \eta^2 = .04 \), and on nonverbal affection, \( F(2, 177) = 5.12, p = .007, \eta^2 = .06 \). Means and standard deviations for the three forms of affectionate communication, separated by relationship type, appear in Table 2.

### TABLE 2

Means and Standard Deviations for Three Forms of Affection by Relationship Type, Study 1

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Verbal</th>
<th>Nonverbal</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological</td>
<td>4.81(1.47)</td>
<td>3.55(1.41)</td>
<td>5.77(0.89)</td>
</tr>
<tr>
<td>Step</td>
<td>3.51(1.42)</td>
<td>2.70(1.02)</td>
<td>5.37(0.99)</td>
</tr>
<tr>
<td>Adoptive</td>
<td>4.51(1.48)</td>
<td>3.45(1.44)</td>
<td>5.63(1.07)</td>
</tr>
</tbody>
</table>

**Notes.** Means are based on seven-point scales wherein higher scores indicate more affectionate communication. Standard deviations are in parentheses.

Single-df focused contrasts served as tests of the hypotheses. The first hypothesis was that fathers are more affectionate with biological sons than with step-sons, and the second hypothesis was that fathers are more affectionate with adopted sons than with step-sons. To test these predictions, we fit contrast coefficients of 1, -2, and 1 to the biological, step-, and adoptive relationship categories, respectively. Due to the directional nature of the prediction, we applied the contrast to support-based affection despite its nonsignificant omnibus effect. The contrasts revealed that fathers communicated more affection to biological and adopted sons than to step-sons using verbal statements, \( t(178) = 4.33, p < .001, \eta^2 = .11 \), nonverbal gestures, \( t(178) = 3.46, p < .001, \eta^2 = .06 \), and supportive activities, \( t(178) = 1.72, p = .04, \eta^2 = .02 \). The first and second hypotheses are supported.

**Relational correlates of affectionate communication.** The third hypothesis indicated linear relationships between fathers’ affectionate communication with their sons and the closeness, relational satisfaction, and relational involvement characterizing their father-son relationships. The hypothesis was tested with one-tailed Pearson correlations against a familywise Bonferroni-corrected alpha of .012. The coefficients, which appear in Table 3, reveal hypothesis-consistent correlations for all three forms of affection. The third hypothesis is supported.

**Discussion**

In this study, we examined differences in the amount of affection men communicate to their biological sons, step-sons, and adopted sons. In line with DPS, we predicted that men are more affectionate with biological sons than with step-sons, and that men are more affectionate with adopted sons than with step-sons. Both predic-
tions received support for all three forms of affection. These findings lend support to DPS and they also support the contention derived from AET that affectionate communication is a valued resource that should be subject to adaptive motivations for parents to invest discriminately in their children.

Among the more interesting issues raised by DPS is the extent to which parents fail to differ in their investments in biological children and adopted children. Although one might expect that, because adoptive relationships are nonbiological, parents would invest less in adopted children than in their biological offspring, DPS suggests otherwise. This suggestion follows from the argument that the psychological mechanisms that cause parents to invest more in their biological than their nonbiological offspring may not yet have evolved to influence parents’ behavior with adopted children, since adoption is newer in the human experience than step-parenting (see Daly & Wilson, 1995). Consistent with this position, we posited no difference between biological and adoptive fathers in their affectionate communication with their sons; indeed, a perusal of the means in Table 2 indicates that differences between the two groups were negligible.

Finally, we examined the associations between affectionate communication and the closeness, satisfaction, and involvement characterizing men’s relationships with their sons. As predicted, all three forms of affection were linearly related to how close, satisfied, and involved participants were with their sons. Notable were the magnitudes of the coefficients, all of which constitute medium or large effects. These are important findings, if intuitive, because they support the contention of AET that affectionate communication is a valued relational resource associated with positive aspects of this important pair bond. This, in turn, fuels the predictions of DPS that parents’ adaptive motivations to contribute more to their biological offspring than to the offspring of others influence affectionate communication, in the same way that they do other important resources.

Taken collectively, these findings lend support to both AET and DPS and they indicate that adoptive relationships approximate biological relationships in terms of parental allocation of resources (in this case, affectionate communication). DPS provided reason for expecting that this may be the case, and the present results confirm that, in fact, adoptive and biological fathers did not differ in their allocation of any of the three forms of affectionate communication measured (although both groups exceeded the allocations of the step-fathers). This finding nicely illustrates the principle of DPS that humans are only influenced by what is adaptive to the extent that physical, mental, and/or psychological mechanisms have evolved that make adaptive choices more likely than maladaptive ones. Specifically, the fact that contributing resources to an adoptive child is largely maladaptive presumably would influence

<table>
<thead>
<tr>
<th>Variable</th>
<th>Verbal</th>
<th>Nonverbal</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closeness</td>
<td>.48**</td>
<td>.41**</td>
<td>.53**</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>.39**</td>
<td>.33**</td>
<td>.48**</td>
</tr>
<tr>
<td>Involvement</td>
<td>.56**</td>
<td>.46**</td>
<td>.62**</td>
</tr>
</tbody>
</table>

*Note. **p < .001, based on one-tailed Pearson correlations.*
parental behavior only if the appropriate psychological mechanism has evolved; Daly and Wilson (1995) asserted that the relative newness of adoption in the human experience to date has precluded such a mechanism from yet evolving.

An important limitation of Study One, however, is that it relied exclusively on fathers' reports. This single-source approach had the potential to inflate the magnitude of relationships between variables, as well as the absolute magnitude of the positive relational reports themselves, as a function of social desirability bias. To replicate the tests using data from both fathers and sons, we conducted a second study in which dyadic data were collected. The same hypotheses posed in the first study were again tested in the second study.

STUDY TWO

Participants

Participants were 202 males who comprised 101 father-son dyads. The fathers ranged in age from 29 to 85 years, with a mean age of 50.34 (SD = 8.38); the sons ranged in age from 12 to 59 years, with a mean age of 22.31 (SD = 6.80). Over half of the fathers (61.0%) and just under half of the sons (49.0%) lived in the Southwestern United States, 16.0% of the fathers and 12.0% of the sons lived in the Midwest, 14.0% of the fathers and 28.0% of the sons lived in the Southeast, 6.0% of the fathers and 7.0% of the sons lived in the Northeast, and 3.0% of the fathers and 4.0% of the sons lived in the Northwest. At the time of the study, 8.9% of the fathers and 28.9% of the sons had a high school education or less, 18.8% of the fathers and 37.1% of the sons had completed some college but had no degree, 41.6% of the fathers and 30.9% of the sons had an associates' and/or baccalaureate degree, and 30.7% of the fathers and 3.1% of the sons had a graduate or professional degree. Most of the fathers (92.1%) and 14.0% of the sons were married, 5.9% of the fathers and 3.0% of the sons were divorced, and 2.0% of the fathers and 83.0% of the sons were never married. Most of the fathers (83.2%) and sons (81.2%) were Caucasian, 11.9% of fathers and sons were African-American, 4.0% of fathers and sons were Hispanic, 3.0% of fathers and 2.0% of sons were Native American, 4.0% of sons were Asian, and 1.0% of fathers and 2.0% of sons were of other ethnic origins.

Procedure and Measures

The procedure was identical to that used in Study One, with the exception that father-son dyads were used. The dyads represented either biological father-son relationships (n = 44), father-step son relationships (n = 41), or father-adopted son relationships (n = 16). In this study, both the father and the son in each relationship completed the measures with respect to the amount of affection the father communicated to the son. We recruited participants in the same manner as in Study One and the measures used were identical. Coefficient alphas for multiple-item measures from Study Two appear in Table 1.

Results

Differences between biological and nonbiological relationships. The first two hypotheses addressed differences in men's affectionate communication with their biological, step-, and adopted sons. Given the dyadic nature of our data in the second study, we employed a mixed-model MANCOVA, with relationship type (biological, step-, or adoptive) as the between-subjects variable, role (father or son) as the within-sub-
jects variable, and the three forms of affectionate communication as the dependent variables. To control for error variance due to the quality of the relationship and/or to the fathers’ or sons’ ages, we covaried out father’s and son’s ages, relationship satisfaction, relationship closeness, and positive relational involvement.

After we discarded nonsignificant covariates and re-ran the MANCOVA, the analysis revealed significant covariance from fathers’ relational involvement, $F(1, 79) = 8.87, p = .004, \eta^2 = .10$, and sons’ relational involvement, $F(1, 79) = 9.47, p = .003, \eta^2 = .11$. Relationship type produced a significant multivariate main effect on affectionate communication, $L = .86, F(6, 172) = 2.25, p = .041, \eta^2 = .07$. Univariate tests revealed that relationship type had nonsignificant effects on support-based affection, $F(2, 87) = 0.76, p = .47$, and on nonverbal affection, $F(2, 87) = 1.38, p = .26$, but that it had a significant effect on verbal affection, $F(2, 87) = 3.13, p = .04, \eta^2 = .07$. Means and standard deviations for the three forms of affectionate communication, separated by relationship type and by fathers and sons, are reported in Table 4.

<table>
<thead>
<tr>
<th>Relationship Type</th>
<th>F Verbal</th>
<th>S Verbal</th>
<th>F Nonverbal</th>
<th>S Nonverbal</th>
<th>F Support</th>
<th>S Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological</td>
<td>4.88(1.26)</td>
<td>4.56(1.36)</td>
<td>3.24(0.84)</td>
<td>3.10(1.22)</td>
<td>5.82(0.86)</td>
<td>5.45(1.06)</td>
</tr>
<tr>
<td>Step</td>
<td>3.86(1.63)</td>
<td>3.56(1.72)</td>
<td>2.90(1.02)</td>
<td>2.41(0.93)</td>
<td>5.59(1.08)</td>
<td>5.18(1.25)</td>
</tr>
<tr>
<td>Adoptive</td>
<td>4.29(1.45)</td>
<td>3.89(1.61)</td>
<td>3.12(1.06)</td>
<td>2.71(1.03)</td>
<td>5.52(1.00)</td>
<td>5.16(1.26)</td>
</tr>
</tbody>
</table>

Notes. "F" and "S" in heading refer to fathers’ and sons’ reports, respectively. Means are based on seven-point scales wherein higher scores indicate more affectionate communication. Standard deviations are in parentheses.

Single-df focused contrasts were used to test the hypotheses. The first hypothesis was that fathers are more affectionate with biological sons than with step-sons, and the second hypothesis was that fathers are more affectionate with adopted sons than with step-sons. Again, we fit contrast coefficients of 1, -2, and 1 to fathers’ and sons’ reports of fathers’ affection in the biological, step-, and adoptive relationship categories, respectively. Due to the directional nature of the prediction, we applied the contrast to nonverbal and support-based affection despite their nonsignificant omnibus effects. For fathers’ reports, the contrasts revealed that fathers communicated more affection to biological and adopted sons than to step-sons through verbal statements, $t(96) = 4.05, p < .001, \eta^2 = .14$, and nonverbal gestures, $t(96) = 3.05, p = .002, \eta^2 = .07$. For sons’ reports, the contrasts also revealed that fathers communicated more affection to biological sons than to step-sons using verbal statements, $t(97) = 1.90, p = .03, \eta^2 = .06$, and nonverbal gestures, $t(97) = 1.97, p = .026, \eta^2 = .06$. The first and second hypotheses are supported with respect to verbal and nonverbal affection.

Relational correlates of affectionate communication. The third hypothesis indicated linear relationships between fathers’ affectionate communication with their sons and the closeness, relational satisfaction, and relational involvement characterizing their father-son relationships. Because we had dyadic data, we tested the hypothesis by comparing both fathers’ and sons’ reports of fathers’ affection with both fathers’ and sons’ reports of their closeness, satisfaction, and involvement. The hypothesis was tested with one-tailed Pearson correlations against a familywise Bonferroni-corrected alpha of .003. The coefficients, reported in Table 5, indicate significant correlations between fathers’ reports of affection and the relational variables, and between sons’
reports of fathers’ affection and the relational variables. In addition, many of the correlations between fathers’ reports of affection and sons’ reports of the relational variables were significant, and approximately half of the correlations between sons’ reports of affection and fathers’ reports of the relational variables were significant, per the Bonferroni-corrected alpha (several other coefficients achieved significance at the uncorrected .05 alpha level). The third hypothesis is supported.

For illustrative purposes, we computed within-dyad correlations for the three forms of affective communication. The coefficients are reported in Table 6.

### TABLE 5

**Correlations Between Affection Forms and Relationship Variables, Study 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>F Involvement</th>
<th>F Satisfaction</th>
<th>F Closeness</th>
<th>S Involvement</th>
<th>S Satisfaction</th>
<th>S Closeness</th>
</tr>
</thead>
<tbody>
<tr>
<td>F Verbal</td>
<td>.59**</td>
<td>.38**</td>
<td>.46**</td>
<td>.46**</td>
<td>.39**</td>
<td>.62**</td>
</tr>
<tr>
<td>S Verbal</td>
<td>.48**</td>
<td>.24*</td>
<td>.28**</td>
<td>.28*</td>
<td>.21*</td>
<td>.43**</td>
</tr>
<tr>
<td>F Nonverbal</td>
<td>.46**</td>
<td>.35**</td>
<td>.26*</td>
<td>.52**</td>
<td>.40**</td>
<td>.70**</td>
</tr>
<tr>
<td>S Nonverbal</td>
<td>.44**</td>
<td>.23*</td>
<td>.52**</td>
<td>.39**</td>
<td>.29**</td>
<td>.55**</td>
</tr>
<tr>
<td>F Support</td>
<td>.39**</td>
<td>.28*</td>
<td>.31**</td>
<td>.29**</td>
<td>.29**</td>
<td>.55**</td>
</tr>
<tr>
<td>S Support</td>
<td>.29**</td>
<td>.29*</td>
<td>.35**</td>
<td>.33**</td>
<td>.33**</td>
<td>.51**</td>
</tr>
</tbody>
</table>

*Notes.* *Correlation significant at uncorrected .05 alpha level. **Correlation significant at Bonferroni-corrected .003 alpha level.*

### TABLE 6

**Within-Dyad Correlations for Affection Forms, Study 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Biological</th>
<th>Step</th>
<th>Adoptive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonverbal Aff.</td>
<td>.42**</td>
<td>.38*</td>
<td>.45**</td>
<td>.52</td>
</tr>
<tr>
<td>Verbal Aff.</td>
<td>.48**</td>
<td>.28a</td>
<td>.59**</td>
<td>.32</td>
</tr>
<tr>
<td>Support Aff.</td>
<td>.51**</td>
<td>.51**</td>
<td>.55***</td>
<td>.41</td>
</tr>
</tbody>
</table>

*Notes.* Coefficients on the same line with the same subscript differ significantly from each other, per Z-tests. *p < .05; **p < .01; ***p < .005.

**Discussion**

In the second study, we again tested for differences in men’s affection with their biological, step-, and adopted sons, this time using both fathers’ and sons’ reports. The first hypothesis, that men are more affectionate with biological sons than with step-sons, received support for verbal and nonverbal affection using both fathers’ and sons’ reports. This lends support to the logic behind DPS suggesting that parents invest more resources in their biological children than in nonbiological children. The mean differences for fathers’ supportive affection with biological and step-sons were in the predicted directions (for both fathers’ and sons’ reports), but the difference was nonsignificant. The second hypothesis, that men are more affectionate with adopted sons than with step-sons, also received support for verbal and nonverbal affection, but not for support-based affection. The mean differences for fathers’ verbal and nonverbal affection (using both fathers’ and sons’ reports) were all in the predicted directions.

In the case of supportive affection, however, the mean differences between fathers’ affection with adopted and step-sons were not in the predicted directions for either fathers’ or sons’ reports. In both instances, rather, fathers reportedly communicated greater support affection to step-sons than to adopted sons, although the differences were so small (.07 and .02 for fathers’ and sons’ reports, respectively) as to be
negligible. This finding comports neither with DPS nor with our findings in Study One; given the inconsequential magnitudes of the mean differences, we defer speculation as to its meaning until a later replication.

Finally, we tested for associations between fathers' affectionate communication and the closeness, satisfaction, and involvement characterizing the father-son relationships. Because of the dyadic nature of our data in Study Two, we were able to examine four times as many correlations as in Study One. That is, we compared fathers' reports of affection with fathers' reports of the relationship, sons' reports of affection with sons' reports of the relationship, fathers' reports of affection with sons' reports of the relationship, and sons' reports of affection with fathers' reports of the relationship. As one would anticipate, the within-person correlations (e.g., fathers' reports of affection correlated with their own reports of the relationship) were of greater magnitudes than the between-person correlations (e.g., fathers' reports of affection correlated with sons' reports of the relationship), although several of the between-person correlations were still significant and most of the coefficients in the correlation matrix represented medium or large effect sizes.

GENERAL DISCUSSION

As Daly and Wilson (1987, 1995) have argued, if one accepts that genetic characteristics of humans and other organisms have evolved in adaptation to environmental demands, then there is no logical reason not to accept that psychological characteristics have likewise evolved. In particular, DPS posits the existence of adaptive psychological mechanisms, both in humans and other organisms, that promote the long-term transfer of one's genetic materials to succeeding generations through strategic investment of resources in those who can facilitate that transfer (i.e., one's offspring). This perspective has considerable explanatory power in accounting for, among other things, why we feel love for our children, why we freely sacrifice for their benefit, why it devastates us to discover that our children are not actually our biological offspring, and, most pertinent to the current investigation, why we love, protect, and provide for our own children more than other people's children. DPS explains all of these phenomena as the result of evolved psychological mechanisms that, in the long term, contribute more to the survival and procreative success of those who have such characteristics than of those who do not.

The primary contribution of the current investigations lies in the demonstration that such a perspective can account not only for discrimination in emotions that are beneficial to children's survival, such as love, but also in beneficial communicative behaviors, such as the communication of affection. As AET predicts (and a host of empirical data supports), affectionate behavior is associated with numerous physical, emotional, social, and even intellectual benefits, which makes it logical to conclude that those who receive more affection are advantaged in the evolutionary process, just as are those who have more money or better looks or greater intelligence. We contend herein that, as such a resource, affectionate communication should be subject to the same adaptive drives that cause parents to invest discriminately in their children, and that one result of these drives would be that parents (in this case, fathers) would express greater affection to their children (in this case, sons) if they were biological children than if they were step-children. This prediction received support in both studies for verbal and nonverbal forms of affection, as well as for supportive affection in the first study.
Importantly, the prediction was supported even after we covaried out the effects of relational involvement (and tested for potential error variance as a function of closeness, relationship satisfaction, and fathers' and sons' ages, all of which have previously shown associations with the amount of affection fathers communicate to their sons). We note this here to acknowledge that social and relational factors (such as how close two people are or how involved they are in each others' lives) do tend to influence the amount of affection people communicate to each other. By adopting an evolutionary perspective on communication behavior, we are in no manner dismissing the effects of social and relational factors, but are, instead, arguing that such factors should account for less variance, overall, than evolutionary adaptations should.

This finding is important not only because it provides support for DPS and AET, but because, in a larger sense, it reflects the relevance of evolutionary logic to human communicative behavior. Of course, neither of these theories would justify the contention that all communication behavior is adaptive, any more than that every emotion or every genetic characteristic is adaptive. Rather, AET posits direct and specific adaptive features to affectionate communication that make it subject to the motivational drives for parental investment that DPS predicts.

Supportive affection did not exhibit the predicted pattern in the second study. We echo speculation that individuals, and men in particular, may use supportive affection differently than the more direct verbal statements and nonverbal gestures as a way of encoding affectionate messages "covertly," particularly when directed at other males (see, e.g., Swain, 1989). If it is subject to different motives and priorities than the verbal and nonverbal forms, then supportive affection understandably might deviate from the patterns we observe for the other forms of affection. It may also be the case that men see the provision of support, and supportive affectionate behaviors, as inherent in the role of fatherhood, irrespective of whom they are fathering, which would make this a resource that one is less likely to invest discriminately in children.

Finally, we replicated other recent studies by examining the association between affectionate communication and the positive characteristics of father-son relationships, including their closeness, their level of positive involvement, and their level of satisfaction. Numerous hypothesis-consistent relationships were identified, many at medium or large effect sizes. Although these findings may seem intuitive, they nonetheless provide important support for AET (thereby fueling the predictions of DPS) by demonstrating that affectionate communication is a relationally beneficial, rather than problematic, behavioral pattern. Were affection to have proved inversely related to closeness, satisfaction, or involvement, then the predictions of DPS would not logically have applied to it.

We believe that the present findings provide support for the application of evolutionary principles in general, and the logic of AET and DPS in particular, to human affectionate behavior and, by extension, to other communicative behaviors that contribute to the superordinate evolutionary goals of survival and procreation. As additional empirical tests are conducted, further refinement of both AET and DPS will be facilitated.

NOTES
1. Some readers may be inclined to dismiss this explanation with observations that men sometimes invest in step-children even when further reproduction with the children's mother is improbable or medically impossible. In response, we would remind readers that an evolu-
tionary adaptation (whatever its form) need not be adaptive in every individual instance. Rather, it need only provide greater advantage over time, with respect to viability and fertility, than is provided by alternatives. Thus, the fact that every individual step-father does not have children with his step-children's mother in no way renders maladaptive the motivation to invest in those step-children.

2. These percentages sum to more than 100 because some participants indicated more than one ethnic background.

3. It may strike some as odd that we discuss sociocultural variables in a paper driven by an evolutionary perspective. One could opine, for instance, that the force of evolutionary adaptation lies in its ability to overpower social or cultural norms. However, such an argument misses the distinction between ultimate and proximal causes of behavior. The tendency to invest more in some children than in others is based on adaptive motivations in an ultimate, long-term sense, but evolutionary psychologists acknowledge that any individual's behavior is constrained by the options available to him or her at the time. These options are often affected by proximal, relatively short-term characteristics, which include social and cultural norms for behavior.

REFERENCES


