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The Psychology of Love

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Love Acts

The Evolutionary Biology of Love

BY DAVID M. BUSS

A song by the Doobie Brothers asks where we would be now, without love. This question captures two key themes of this chapter. The first is that love does not reside solely in our subjective thoughts, feelings, and drives. Instead, love involves overt manifestations or actions that have tangible consequences. Love is not simply a state; *love acts*. The second theme is that the key consequences of the phenomena of love center around reproduction. Thus, love acts owe their existence and urgency to prior evolutionary forces. These two themes are closely linked: evolution requires tangible manifestations on which selection can operate.

This chapter presents an evolutionary approach to love based on these themes. I outline a conceptual framework that depicts love as a natural category of acts. These acts are hypothesized to be products of evolution by natural selection. The basic idea is that acts of love occur primarily in the context of mating relationships, parent-child relationships, and other kin relationships. For humans, these relationships are crucial for reproducing. Thus, acts that fall in the category of "love" are hypothesized to have evolved to serve functions, accomplish tasks, or achieve goals that are linked with reproductive success. These proximate goals include resource display, exclusivity (fidelity and guarding), commitment and marriage, sexual intimacy, reproduction, resource sharing, and parental investment.

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present data from two studies of love acts that support several tenets of the evolutionary framework. Subsequently, I compare this evolutionary account with other approaches to the study of love. The final section draws out key implications and outlines a research agenda.

AN EVOLUTIONARY APPROACH TO LOVE

The evolutionary approach starts with the fundamental premise that love represents a category of naturally occurring actions. Acts of love exist in the present because in the past they have served several proximate goals in the generation of offspring who will in turn be reproductively successful. Perhaps the most central of these goals are mate selection and having children. The most striking evidence that love is centrally involved in mate selection comes directly from research on the criteria people say they use to select their mates. In a series of studies using the same eighteen-item instrument, "mutual love" consistently emerged as one of the most important prerequisites of selecting a mate (Hill, 1945; Hudson & Henze, 1969; McGinnis, 1958). If acts of love exist because they accomplish certain goals related to reproductive success, what, precisely, are those goals? The following set of goals represents a first approximation of an evolutionary theory of love. These goals result from a conceptual analysis of the tasks that usually must be accomplished in order to produce children who themselves become reproductively successful.

These tasks are ordered by the time sequence in which they typically occur. They function to (1) attract a mate, (2) retain that mate, (3) reproduce with the mate, and (4) invest parentally in the resulting offspring. In order to attract a reproductively valuable mate, it is often necessary to display certain resources that are desired by members of the opposite sex. Thus, the first goal of acts of love is resource display.

Resource Display

Display of key resources is typically crucial for attracting a desirable mate. Examples of love acts of resource display are "he bought her a necklace," "she made him a fantastic dinner," "he bought her an engagement ring," and "she made herself attractive for him." The purpose of such displays is to alert potential mates to reproductively relevant resources they could acquire by choosing this particular mate.

Major sex differences are predicted for the sorts of resources that will be displayed through love acts. These differences are based on the resources that are differentially scarce for males and females. Specifically, because

females have sharper constraints on the potential number of offspring they can produce, they should select mates most capable and willing to invest tangible resources in their offspring. Trivers's (1972) theory predicts that potential parental investment by males will be used by females as a basis for sexual selection: they will more frequently choose males who display resources. Thus, characteristics that lead to male resource acquisition and the signaling of the resources he can invest in a female and her offspring will be selected over generations. This leads to the prediction that male love acts will indicate willingness and ability to invest monetary and other tangible resources.

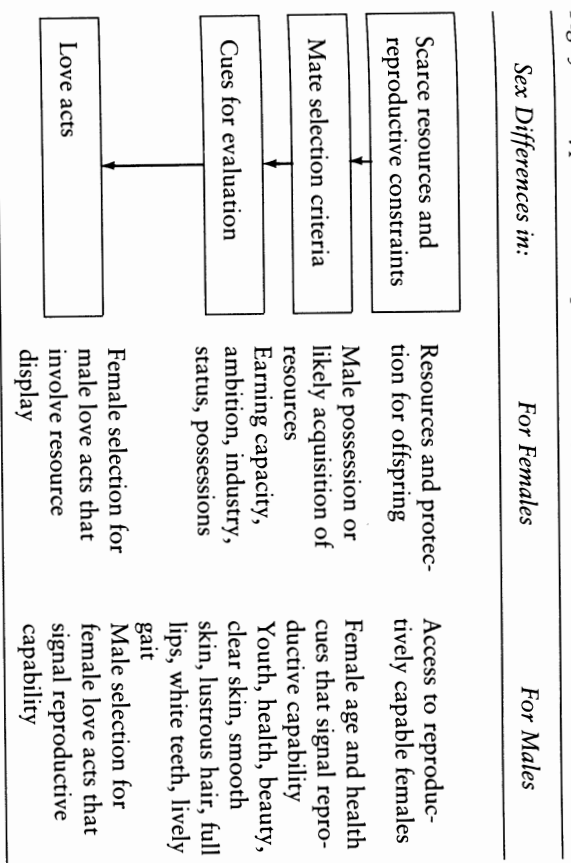
In contrast, the major reproductive limitation imposed on human males is access to reproductively valuable or fertile females. Thus such females become the resource that is in scarce supply for males. Males who select as mates reproductively valuable females will have relatively greater reproductive success than males who choose females less capable of producing offspring. Therefore, females who display love acts that signal high reproductive capability will be at a selective advantage over females who do not.

Reproductive capability, however, is not something that can be evaluated directly. Instead, males have been selected to respond to external cues that are correlated with reproductive capability. In human females, perhaps the two strongest cues are *age* and *health* (Buss, in press; Symons, 1979). That is, females who are between the ages of fifteen and twenty are more reproductively valuable than are females between thirty-five and forty. But age and health themselves are not characteristics that can be evaluated directly. Instead, physical appearance must be used to evaluate them and hence the woman's reproductive capability (Buss, 1987; Buss & Barnes, 1986; Symons, 1979). This leads to the hypothesis that female love acts, more than male love acts, will center around enhancing physical appearance. These relations are depicted in figure 5.1

To summarize, both males and females have been selected to maximize gene replication. Characteristics that lead to greater gene replication will be favored over characteristics that do not or that are simply neutral. Males and females, however, have different limitations imposed on maximizing reproductive success. Females are constrained by the resources that are available for investment in their relatively few offspring. Males, in contrast, are constrained primarily by access to reproductively valuable females.

These fundamental differences lead to sex differences in the criteria people use to select their mates. Males should value characteristics in females that indicate their reproductive capability. Females should be se-

Fig. 5.1. Hypothesized Sequence Leading to Sex Differences in Love Acts



lected to value characteristics in males that indicate their ability and willingness to invest resources. Female reproductive value, then, will turn on physical attractiveness, age, and health, as well as the physical and behavioral characteristics (for example, smooth skin, spritely gait) that are correlated with them. In contrast, the cues to male resource potential are signs of money, possessions, status, and the behavioral characteristics that lead to their acquisition, such as ambition and industry.

Thus, male and female love acts should signal different sorts of resources. Male love acts should involve gift giving and other signs of willingness and ability to invest resources. Female love acts should involve appearing youthful, attractive, healthy, and reproductively valuable.

This conceptual framework leads to a set of testable predictions: (1) that female attractiveness, more than male, will be determined by the physical cues that vary with youth and health (for example, smooth skin, firm muscle tone, clear eyes, lustrous hair, full lips, white teeth, lively gait); (2) that males, more than females, will value physical appearance (attractiveness) in potential mates because it covaries more with reproductive capability than does male appearance; (3) that females will compete with one another in terms of physical characteristics that signal their ability to have children; (4) that males will compete among themselves for access to the resources that females value; (5) that where female deception of males

occurs, it will be in the direction of appearing young and healthy; (6) that male deception of females, when it occurs, will involve dissembling about their actual or potential resources; (7) that love acts performed by females will provide indications of their reproductive capability (attractiveness, age, and health) because that is the resource important to males; and (8) that love acts performed by males will indicate their willingness and ability to invest resources in the woman and her potential offspring.

Thus far, there is empirical support for hypotheses 1 (Cunningham, 1986) and 2 (Buss, 1985, 1987; Buss & Barnes, 1986), but only anecdotal support for the remaining hypotheses. An example of the latter would be the booming cosmetic industry for women (hypothesis 3) and female dissembling about age in the youthful direction (hypothesis 5).

Attracting a mate by a display of resources, however, is just the first step in the sequence of love. Once a mate is obtained, she or he must be retained and guarded to ensure fulfillment of the reproductive promise. Thus, exclusivity is the second task that is accomplished through acts of love.

Exclusivity: Fidelity and Guarding

Love acts that promote exclusivity also have an evolutionary biological basis. The purposes of exclusivity are (1) to ensure high confidence in paternity (maternity rarely being in doubt), and (2) to ensure mutual commitment to the reproducing pair. Love acts in this category include "she gave up going out with other guys," "he resisted the sexual opportunity he had with another woman," "she remained faithful to him when he was away," and "he became jealous when she talked to another guy."

Although there are undoubtedly many manifestations of exclusivity, two important forms are *fidelity* and *mate guarding*, which are hypothesized to occur for both sexes because each has an investment to protect. Female infidelity threatens male confidence in paternity; male infidelity threatens redirection of his resources to another female and her potential offspring. Males and females failing to ensure the fidelity of their partner will be at a selective disadvantage. Similarly, males and females failing to display love acts of fidelity will be at a selective disadvantage because they risk losing the reproductively relevant resources provided by their selected partner. Displays of fidelity as well as mate-guarding behaviors should evolve to protect resources for each sex.

Males and females should differ, however, in the importance attached to fidelity and to mate guarding. Specifically, the hazards for a male of one-time female infidelity are far worse than the analogous hazards for females

of one-time male infidelity. Female philandering directly decreases her partner's confidence in paternity, thus decreasing her reproductive value to him and exposing him to the possibility of raising other men's children. In contrast, male infidelity is threatening to his partner only if it redirects his resources away from her and to another. This would be likely to occur in the case of a serious affair, but less likely in the case of a casual sexual liaison. In sum, the different nature of male and female reproductive resources leads to sex differences in the importance of fidelity.

This reasoning leads to three testable predictions about fidelity and guarding. The first is that female love acts displaying fidelity should be much more frequent than male love acts of fidelity. Second, females should be more forgiving than males of infidelity, especially if it involves casual sex and not serious involvement. And third, acts of mate guarding should be more frequently displayed by males than by females.

In addition to *behavioral* manifestations that ensure fulfillment of reproductive promise, most societies have developed *cultural institutions* for similar purposes. The most obvious one is the institution of marriage.

Commitment and Marriage

According to this evolutionary approach, love is central to the process of commitment, marriage, and mate selection. Data confirming this basic premise come from numerous studies in which mutual love is rated consistently high as the reason for choosing a mate (Hill, 1945; Hudson & Henze, 1969; McGinnis, 1958). One of the goals of love acts is marriage. Love acts included in this category are "he talked to her about marriage," "they discussed their future plans together," "she told him she wanted to marry him," "he agreed to marry her," and "they were wed."

Marriage serves to enforce exclusivity (including fidelity), to ensure commitment of resources, and to provide a context for bearing and raising children. Marriage is public commitment enforced by kin—those who have a genetic stake in ensuring that the resources promised are delivered. It is probably not chance that male failures surrounding work and female failures surrounding willingness and ability to bear children are treated with great concern in many cultures (Ford & Beach, 1951).

Sexual Intimacy

The fourth major goal of love acts is sexual intimacy, although this may often occur prior to, as well as after, marriage. Although emotional intimacy may be involved, sexual intimacy may be regarded as the sine qua

non of heterosexual love, at least in its mature stages. Sexual intimacy serves to seal the bond and results sometimes in conception. Love acts of sexual intimacy include "she gave up her virginity to him," "she was sexually open to him," "they had sexual intercourse," and "he made love to her."

There is some evidence that among humans sexual intercourse more frequently preoccupies males than females (Symons, 1979). This sex difference might be expected on the basis of our earlier discussion. Because males are limited in their reproductive success by sexual access to reproductively valuable females, they should be selected to initiate sex more often and to be more generally concerned about sex in the context of heterosexual relations, including those involving love. Females, in contrast, are not limited reproductively by sexual access to males. Indeed, only a trivial amount of sexual access is needed for a female to achieve full reproductive potential. Therefore, female concerns and activity initiation should involve sexual intercourse considerably less.

In sum, sexual intimacy, for the purposes of sealing a bond and for producing offspring is an important and necessary goal of love acts. Love acts of sexual intimacy sometimes produce tangible consequences—the conception of offspring.

Reproduction

There is a crucial sense in which the four previous functions of love lead up to and would be evolutionarily bankrupt without reproduction of children. Thus, reproduction represents a fifth goal of love acts. Love acts central to this category are "she got pregnant by him," and "she gave birth to his child."

It should be noted, however, that love acts surrounding reproduction need not be limited to direct conception and birth. Indeed, love acts by both sexes in the nine-month interval between conception and birth are critical to the survival of the coming child. Such acts might involve protection and provisioning by the male so that the female and her fetus thrive and do not succumb to aggressors or the hostile forces of nature.

Resource Sharing

While sexual intimacy and reproduction can be viewed as a female delivering the reproductive value she promised, resource sharing (such as financial support, protection) by the male can be viewed as a delivery of his reproductive promise. The purposes served by sharing such resources as

money, food, shelter, and territory are to provide security and organismic viability for the female and to provide materials to be invested in the offspring; sharing resources is important for both the survival and reproductive success of the male's mate and children. The families of males who fail to provide these resources are more susceptible to disease, poor nutrition, parasites, predation, aggression by others, and, for offspring, poor opportunities for learning and handicaps in their future lives.

Parental Investment

Once children are produced, they must be fed, nurtured, protected, taught, and loved. Among the varieties of love, that for a mate and parental love are probably the most intense and profound. Most theories of love, however, omit parental love or find it puzzling. For example, one prominent theorist recently noted, "The needs that lead many of us to feel unconditional love for our children also seem to be remarkably persistent, for reasons that are not at present altogether clear" (Sternberg, 1986, p. 133).

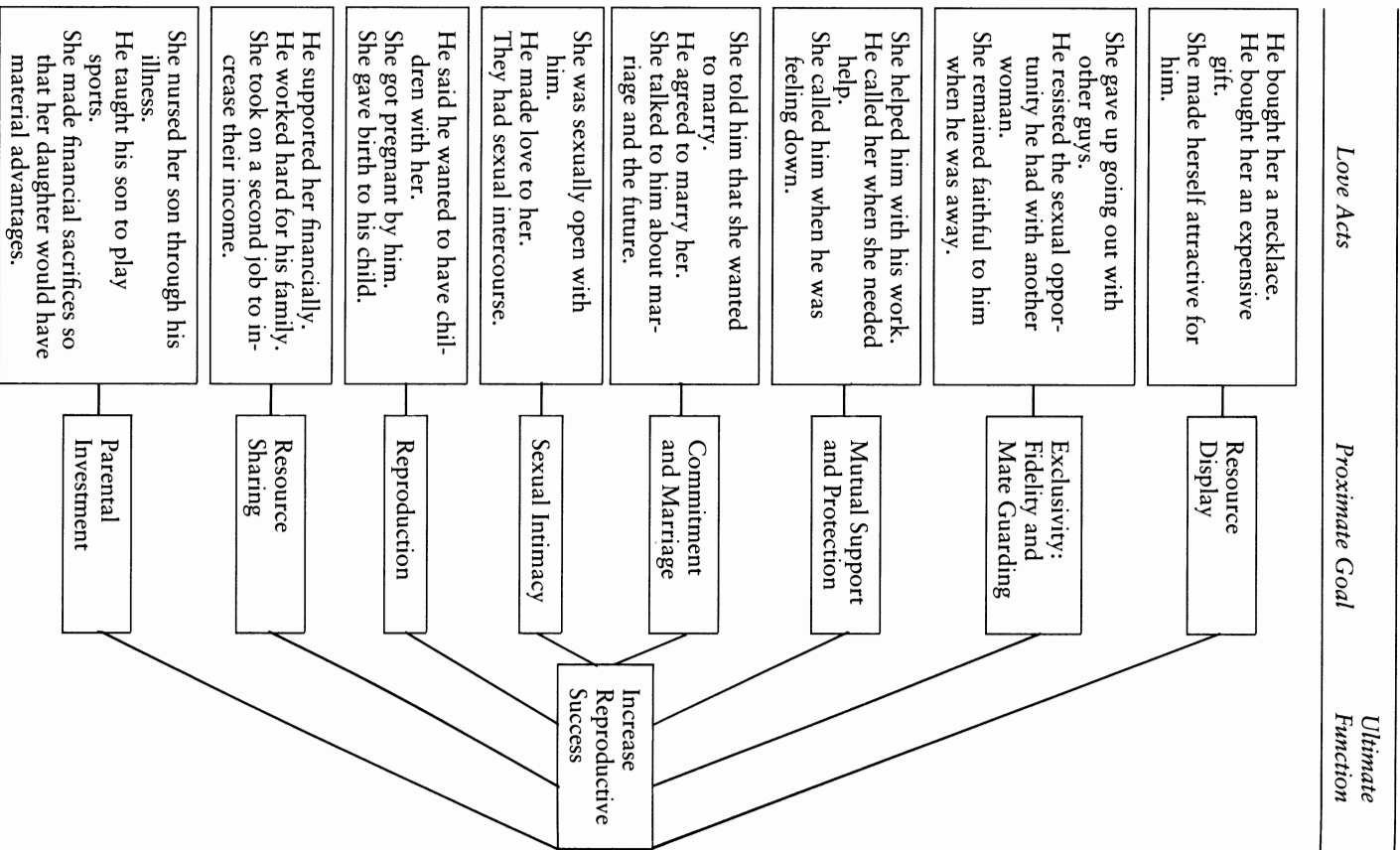
From an evolutionary perspective, however, it would be baffling if parental love for children were not a powerful force in social animals such as ourselves. Indeed, the successful accomplishment of the first six tasks of love would be evolutionarily bankrupt if the children produced by lovers did not themselves mature to reproductive age, find a mate, and reproduce in turn.

Acts of parental love are many and extremely varied. They include affection (for example, "she gave her daughter a hug"), commitment of resources ("she paid for her son's college education"), commitment of time ("he spent Saturday afternoon teaching his son to play baseball"), and self-sacrifice ("she gave up her own dinner so that her daughter could have more food"). The function served by parental love acts is to produce healthy, reproductively valuable offspring who will, in time, invest in their children.

In sum, there are seven broad goals toward which love acts are directed: resource display, exclusivity (fidelity and guarding), commitment and marriage, sexual intimacy, reproduction, resource sharing, and parental investment. This evolutionary approach to love posits that love acts have evolved to serve these goals because of their consequences for reproductive success. This approach should not be regarded as final or exhaustive. Additional goals will undoubtedly be added as the specific functions served by love acts are explored empirically.

Nonetheless, the evolutionary approach is powerful because it offers

Fig. 5.2. Proximate and Ultimate Goals of Love Acts



testable empirical predictions. These include the following: (1) specific love acts should emerge from the nominations of acts that fit the category of love, (2) there should be reasonable consensus about which acts are central and which are peripheral members of the category of love, (3) these love acts should be categorized by agreement into the seven categories identified above, and (4) males and females should differ in the frequency of displaying acts within these categories such that (a) males should display more love acts of tangible resource display, (b) females should display more love acts signaling reproductive value, (c) females should display more love acts of fidelity, (d) males should display more love acts of mate guarding, (e) males should be more concerned about love acts surrounding sexual intimacy, and (f) males should display more love acts of resource sharing.

The links between love acts, their immediate goals, and the ultimate goal of reproductive success are depicted in figure 5.2. The following studies were designed to provide the first empirical tests of this evolutionary approach to love.

LOVE AS A NATURAL COGNITIVE CATEGORY

A basic premise of the evolutionary view is that love is not simply an internal state of feelings, drives, and thoughts. Love has tangible manifestations in everyday conduct, and these manifestations have clear goals and ultimate reproductive consequences. Therefore, it is crucial to demonstrate that love does have a behavioral medium consisting of acts forming the natural social category of love.

In this view, acts are the basic constituents of the behavioral world, as objects are of the inanimate world (Buss & Craik, 1983, 1984). Naturally occurring social categories such as love offer a system for categorizing acts by partitioning and granting conceptual order to the everyday stream of behavior. As natural constructs emerging from and subsuming temporally dispersed arrays of acts, social categories such as love can be analyzed in terms of their cognitive properties.

Two features warrant emphasis. First, social categories are treated as “fuzzy sets”: category members are not sharply demarcated and each category blends into adjacent ones. Thus, the category of love may blend into the categories of liking, lust, friendship, affection, or passion. Empirical work is needed to identify the fuzzy boundaries of each category, their relations to each other, and the transition zones between them. In this view, category membership is continuous or probabilistic rather than discrete. Second, not all members within a given social category possess equiv-

alent status within it. Rosch and her colleagues (Rosch, 1975; Rosch & Mervis, 1975; Rosch, Simpson, & Miller, 1976) have conceptualized the differing status of category members in terms of their prototypicality (clear cases, best examples, instances par excellence). Thus, social categories are composed of acts that differ in their status from highly central or prototypical to progressively more peripheral until the fuzzy borders are reached and the adjoining categories are entered. The following studies were conducted to explore categories of love acts based on this framework.

Study 1: Obtaining Examples of Love Acts

The purpose of this study was to identify the range of acts that belong within the category of love. Love is thought of as a natural category with specific acts, feelings, and thoughts as members. In order to identify the range and diversity of love acts, the following procedure was administered to a sample of one hundred subjects:

Please think of people you know of your own gender (sex) who have been or are currently in love. With these individuals in mind, write down five acts or behaviors that they have performed (or might perform) that reflect or exemplify their love. Be sure to write down acts or behaviors. An act is something that a person does or did, not something that they are. Do not say "he is infatuated" or "she is love-struck." These are not behaviors. You should describe acts or behaviors that someone could read and answer the questions: "Did you ever do this?" and "How often have you done this?"

After five acts were listed, subjects were instructed to name love acts performed by members of the opposite sex.

MOST AND LEAST FREQUENTLY MENTIONED CATEGORIES. Simple tallies were made of how many subjects mentioned a love act falling into each of the five categories. Acts involving exchange of resources (as giving gifts and providing financial support) were nominated by 44 percent of the sample. Acts of fidelity were nominated by 14 percent, although acts representing the guarding aspect of exclusivity were absent. Marriage was nominated by 17 percent of the sample in one form or another ("the proposed marriage to her," "she agreed to be his wife," "they were betrothed"). Sex was mentioned by 19 percent of the sample, and having children, by 8 percent.

Two other themes that received relatively high frequencies were not anticipated by the evolutionary framework. One concerned acts of sacrifice

such as "she changed her career plans to be with him" and "he canceled his important engagement in order to be with her." Such acts were nominated by 15 percent of the sample. The second theme concerned acts involving the parents of the lovers. These included such acts as "she introduced him to her parents," and "she made a special effort to get along with his parents even though they were bitchy." Acts involving parents were mentioned by 12 percent of the sample. Interestingly, most of these acts involved the female's parents.

SEX DIFFERENCES IN ACTOR NOMINATIONS. Preliminary tests were made of several of the sex differences that are hypothesized by the evolutionary account. These tests should be regarded as tentative, awaiting further replication. The first concerned sex differences in resource display and sharing. Such acts were mentioned by 43 percent of the sample for male actors, but by only 15 percent for female actors. This large sex difference confirms the prediction that males, more than females, will display love acts signaling tangible resources.

Second, having children was nominated as a love act by 8 percent of the sample for female actors, but by only a single subject for males. In contrast, no sex differences occurred with respect to marriage or commitment.

Love acts involving fidelity were nominated by 12 percent of the sample for female actors, but by only 6 percent for males. Interestingly, several love acts involved forgiveness for a partner's infidelity. When this occurred, it was exclusively female forgiveness for her male partner's infidelity.

Finally, there were no major sex differences between male and female actors in nominations of love acts surrounding sex. Sex acts were nominated for male actors by 15 percent of the subjects, and for females by 13 percent. However, an interesting sex difference occurred in *who* nominated sex acts as love acts. Whereas only 8 percent of the female sample mentioned sex as a love act, a full 32 percent of the male subjects nominated sexual love acts. These preliminary data suggest that sex may be more integral to love in the minds of men than in the minds of women.

Study 2: Prototypicality Judgments of Love

The acts were then prepared for the second study. Acts judged to be duplicates were eliminated, as were general tendency statements, single adjectives, or descriptions too vague to constitute an observable act. After

these elimination procedures, 115 clear and reasonably distinct acts remained. For the purposes of the next stage of the study, 15 acts were randomly eliminated to obtain a more manageable number. Thus, 100 love acts formed the final product of this nomination stage. Examples of love acts were "he ignored his friends to spend time with her," "he bought her flowers," "she dressed up more than he usually did," "he tried to befriend all of her friends," "he took her out to dinner," and "she made love to him."

This study was designed to identify the relative centrality or prototypicality of each act within the love category. The following instructional set was adapted from Rosch and Mervis (1975) and Buss and Craik (1980):

This study has to do with what we have in mind when we use words that refer to categories. Let's take the word *red* as an example. Close your eyes and imagine a true red. Now imagine an orangish red . . . imagine a purple red. Although you might still name the orange-red or the purple-red with the term *red*, they are not as good examples of red (as clear cases of what red refers to) as the clear "true" red. In short, some reds are "redder" than others.

In this specific study you are asked to judge how good an example of a category various instances of the category are. The category is LOVE. Below are listed 100 acts. You are to rate how good an example of that category each act is on a 7-point scale. A "7" means that you feel the act is a very good example of your idea of what LOVE is; a "1" means you feel the act fits very poorly with your idea of what LOVE is (or is not a member of the category at all). A "4" means that you feel the act fits moderately well. Use the other numbers to indicate intermediate judgments.

Participating in this stage of the study were forty subjects, none of whom had been involved in the act-selection stage. Twenty subjects were males and twenty were females. Half of the males and females rated the prototypicality of love acts involving a male as actor; the remaining half of the males and females rated the prototypicality of love acts involving a female as actor.

RELIABILITY OF PROTOTYPICALITY JUDGMENTS. Alpha reliability coefficients were computed for male raters, female raters, acts with male as actor, acts with female as actor, and all judges and actor forms combined. Male and female raters achieved composite reliabilities of .89 and .88, respectively. Male as actor and female as actor achieved alpha reliabilities

of .88 and .90, respectively. Across all forty judges, the alpha reliability was .94. These results suggest a moderate consensus among judges concerning which acts are more and less prototypical for the category of love.

MOST PROTOTYPICAL LOVE ACTS. Table 5.1 shows the forty acts judged by the forty subjects to be the most prototypical of the category of love, along with their mean ratings and standard deviations. It is clear from perusal of these acts that several of the goals identified earlier are present. The acts "he surprised her with a gift" (twenty-five) and "he brought her a special present" (thirty-four) suggest *resource display*. The act "she remained faithful to him when they were separated for more than a month" (two) implies *fidelity* and *exclusivity*. The act "she agreed to marry him" (one) suggests *commitment*. The acts "she spent the night with him" (thirty-seven) and "he made love to her" (thirty-nine) imply *sexual intimacy*. The act "he told her that he wanted to have children with her" (twelve) points to the importance of *reproduction* in love.

It is equally clear that a theme of mutual support emerged that was not anticipated by the evolutionary framework. This included acts such as "called her/him when she/he was feeling down," "canceled his/her plans to be with her/him when she/he was upset," and "listened devotedly to his/her problems." Although love acts involving mutual support are not incompatible with the evolutionary approach, they highlight the point that not all facets of human love can be predicted by this theory. They also illustrate the value of the act-selection and prototypicality judgment procedures in the context of discovery.

Acts of parental love did not emerge in these studies. It seems likely that most of the undergraduate subjects were thinking of romantic love rather than parental love when they suggested love acts. Future research could directly request acts for the categories of mother love, father love, brother love, and so on. In addition, future research could profitably use a larger age range of subjects to elicit love acts at different stages of life.

In sum, these results suggest that love can be viewed as a natural social category, with specific love acts as members. Furthermore, the category of love is structured so that some acts are more central and others are more peripheral. Subjects can readily recall acts of love, as well as making consensual judgments about the relative centrality of these acts.

Preliminary support was found for several evolutionary predictions surrounding sex differences in love acts. Male love acts more frequently involved resources. Female love acts more frequently involved fidelity and having children. Males nominated sex acts as love acts about four times as

TABLE 5.1 Love Acts Ordered by Prototypicality: Top Forty Love Acts

No.	Mean	SD	Love Acts ¹
1	6.05	1.08	She agreed to marry him.
2	5.95	0.90	She remained faithful to him when they were separated for more than a month.
3	5.83	1.11	He called her when she was feeling down.
4	5.80	1.20	He canceled his plans in order to be with her when she was upset.
5	5.75	1.03	She gave up going out with other men for him.
6	5.75	1.03	She listened devotedly to his problems.
7	5.70	1.38	He resisted the sexual opportunity he had with someone else.
8	5.68	1.53	He told her that he wanted to marry her.
9	5.60	1.19	She stuck up for him when someone tried to put him down.
10	5.78	1.39	She told him "I love you."
11	5.58	1.41	He put up with her "bad days."
12	5.58	1.47	He told her that he wanted to have children with her.
13	5.55	1.24	He talked to her about marriage and the future.
14	5.38	1.50	She took care of him when he was sick.
15	5.30	1.26	She talked to him about her personal problems.
16	5.25	1.51	He ignored the other attractive females at the party.
17	5.23	1.10	He traveled a long distance to be with her.
18	5.11	1.41	He gave her verbal support for her tough decision.
19	5.10	1.63	She told him a very private secret about her past.
20	5.05	1.36	She gave him a symbolic ring.
21	5.00	1.59	He told his friends that he was madly in love with her.
22	5.00	1.28	He gave her a prolonged hug.
23	4.90	1.37	She became distraught after she had a fight with him.
24	4.85	1.41	She said "I miss you" when she hadn't seen him for a day.
25	4.83	1.20	He surprised her with a gift.
26	4.82	1.26	He cooked a special meal for her.
27	4.80	1.68	He called her up when he needed help.
28	4.78	1.23	She dropped by unexpectedly just to see him.
29	4.75	1.53	She lost sleep thinking about him.
30	4.75	1.39	He went for a walk with her at night.
31	4.75	1.43	He gazed into her eyes.
32	4.73	1.55	She nuzzled him.
33	4.73	1.28	She wrote him a poem.
34	4.70	1.34	He bought her a special present.
35	4.70	1.29	He wrote her a love note.
36	4.68	1.56	She worked to keep in shape for him.
37	4.65	1.31	She spent the night with him.
38	4.65	1.69	He held her hands.
39	4.65	1.82	He made love to her.
40	4.63	1.73	She cried when he had to go away for a time.

¹These means and standard deviations represent the statistics for the entire sample of 40 raters, including those who rated the "he . . ." and "she . . ." acts. The male and female pronouns are alternated for expositional clarity. The rating scale used was 1-7, with 7 being the most prototypical love act, and 1 being the least prototypical love act. This table shows only the most prototypical 40 love acts out of the 100 acts that were rated.

often as did females. These results, however, should be regarded as tentative, awaiting replication in other samples and with other methods. Nevertheless, they suggest that this evolutionary approach may bear much empirical fruit.

COMPARISON WITH OTHER MODELS OF LOVE

Several features of the evolutionary framework bring it into sharp contrast with other approaches to love and are worth enumerating. One central feature of this framework is that, unlike earlier ones, it posits an *ultimate* (evolutionary) *causal account*. Other approaches, if they propose causal explanations at all, deal exclusively with immediate ones (see Mellon, 1981, for an exception). Natural and sexual selection favored in the past those individuals who engaged in the actions that now fall within the category of love. The existence of love acts may be traced ultimately to the reproductive advantages conferred on those performing such acts effectively. Thus current love acts may be traced to their ultimate selective advantage.

The second feature of this evolutionary model that sets it apart from others concerns its emphasis on *action*. Rubin (1970) considers love to be an "attitude," whereas Sternberg (1986) considers love to consist of the conjunction of certain cognitions, emotions, and drives. Acts of love are derivative and subsidiary in these approaches; in contrast, they are central to the evolutionary model. Evolution requires overt phenotypic manifestations on which selection can operate.

The third unique feature of this model concerns its emphasis on *tangible consequences*. Thoughts, feelings, and drives may exist within the organism without, in principle, exerting any impact on the surrounding social world. In contrast, acts of love have tangible consequences whose effects extend into the social and biological world.

The fourth feature is that these consequences can be categorized by the *proximate functions* they serve. Among these, as we have seen, are resource display, exclusivity, mate selection and marriage, sexual intimacy, reproduction, resource sharing, and parental investment. These functions can be reduced conceptually to effective means of resource acquisition and allocation as strategies of achieving reproductive success (Alexander, 1979).

CONCLUDING COMMENTS

I have proposed an evolutionary approach to love in which love is manifested in tangible actions or love acts. These acts serve several immediate

goals such as mate selection, exclusivity, copulation, conception, and resource sharing. Achieving these goals is hypothesized to have been linked in the past, and perhaps in the present, with reproductive success. According to this approach, love cannot be understood without identifying (1) specific acts of love, (2) the functions they serve, and (3) their links with natural and sexual selection. As noted in the opening quote, "Without love, where would you be now?"

Sex differences in the manifestation of love are central to the evolutionary approach. As depicted in figure 5.1, there are sex differences in the biological constraints on reproductive success. For females, the major constraint is access to resources for her offspring; for males, it is access to reproductively valuable females. These sex differences lead to differences in criteria for choosing a mate: females value males with resources and males value females who appear to be able to have children. The cues for these attributes reduce to wealth, ambition, industriousness, status, and expensive possessions in males, and youth, health, beauty, clear skin, full lips, lustrous hair, lively gait, and white teeth in females (Buss, 1987; Symons, 1979). These differences lead to differences in the love acts that will have evolved in males and females. Males should be selected to display love acts surrounding resource display; females should be selected to display love acts surrounding the signaling of reproductive capability. Preliminary empirical support for these predictions has been found here and elsewhere (Buss, 1987; Symons, 1979).

One intriguing issue concerns cultural influences on love. Some theorists would argue, for example, that romantic love is a relatively recent phenomenon, occurring mainly in Western societies, and that thus it is anchored in culture, not in biology. The evolutionary perspective on love offered here suggests that acts of love have existed among humans long before the linguistic category of love was invented to describe those acts. That is, males and females have long used various resources to attract each other (for example, large game, protection, shelter, mating opportunities, implied parental investment). Males and females have long formed couples, implied the mates they acquired, and attempted to ensure their fidelity. Males and females have long engaged in sexual relations with each other, usually in private and suffused with a "special feeling." Males and females have long borne children and then protected, cared for, nurtured, fed, clothed, and taught them. The fact that linguistic categories lag behind the performance of clusters of acts for which they were named does not imply that the *phenomena* in act form did not exist prior to the cultural invention of the label "love."

More generally, it is a common misunderstanding of evolutionary perspectives on human behavior that they are somehow opposed to, or in competition with, cultural perspectives. The misunderstanding stems from a confusion of two levels of analysis: proximate and ultimate. To say that a cluster of acts exists because it has been linked with reproductive success in our evolutionary past (ultimate explanation) does not negate the fact that there are *simultaneously* many proximate causes of those acts in culture, immediate situations, or even physiology (proximate explanations). It is clear, for example, that the sorts of resources that males choose to display will vary tremendously across cultures—from goats and cows to prestigious plots of land to money to fast cars. Both ultimate and proximate explanations are needed for a complete account of the phenomena of love.

Much empirical work remains to be done. Identification and assessment of specific love acts, the functions they serve, and their links with current reproductive success are challenging enterprises. It is anticipated that other immediate functions of love acts will emerge as these links are examined more closely. Thus, the present approach to love represents only a beginning. But perhaps like conception, it is a beginning whose promise reaches beyond the narrow confines of its current proximate boundaries.

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Triangulating Love

BY ROBERT J. STERNBERG

The cool ocean breeze brushed gently against them. It was midnight, and the beach was deserted. He had been waiting for a moment like this to make his solemn pronouncement. A large wave crested, spraying them lightly with cold ocean water. They laughed and gazed in each other's eyes. The moment was right. He said it: "I love you, honey." It came out as a whisper.

"And I love you, too, dearest."

That night, he gave her the ring he had brought with him, saving it for just the right moment. She accepted. Three months later they were married.

Five years and countless battles later, they were ready to throw in the towel. The marriage was not working at all.

"If you loved me, you would listen to me, and spend time with me, and support me when I get down in the dumps," she said to him, bitterness in her voice.

"But I do love you. If you loved me, you wouldn't be complaining about me all the time, and besides, you'd make love when I get horny, instead of always finding reasons to do something else."

"I can't make love to a man who doesn't have much use for me except as a sex object. The only time you want to spend with me is when we're in bed."

"At least you don't complain then."

A year later they were divorced, both convinced that their love was one-sided.

What went wrong in this relationship? What goes wrong in the close to half of all marriages that end in divorce—and in the many other marriages