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USING ELEMENTARY BEHAVIORISM
TO UNDERSTAND AND CREATE ROMANTIC LOVE

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Love is most often thought to be an invisible force, inside a person, that causes romantic behavior. This essay, first, briefly reviews two theories that use such "inner" explanations. The essay next introduces Skinner's (1953) "outer" approach for explaining behavior. Subsequently, the essay critically reviews Skinner's interpretations of love and offers a more complete "outer" interpretation by examining what a

fictitious Jack should do if he wants a fictitious Jill to romantically love him. There is, of course, a difference between what someone should do and what they are motivated and capable of doing. After discussing these issues, the essay reviews limitations and novel aspects of the theory offered here.

LOVE AS AN INNER CAUSE

Late in 12th century France, Andreus Cappellanus defined love as "a certain inborn suffering derived from the sight of and excessive meditation upon the beauty of the opposite sex, which causes each one to wish above all things the embraces of the other and by common desire to carry out all of love's precepts in the other's embrace" (1959, p. 28). Some 800 years later, Zick Rubin, defined romantic love to be ". . . an invisible package of feelings, thoughts, and behavioral predispositions within an individual" (1973, p. 212) with respect to a particular person of the opposite sex which includes three components:

attachment, reflecting "powerful desires to be in the other's presence, to make physical contact, to be approved of, to be cared for" (p. 213),

intimacy, reflecting ". . . close and confidential communication between two people, through nonverbal as well as verbal channels" (p. 214),

and

caring, reflecting "giving to another person"

(p. 213).

Rubin (1970) developed the following measure of romantic love. Each item requires a rating ranging from "Not at all true" to "Definitely true." A high level of love is indicated by rating each item to be true.

Table 1

Rubin's Romantic Love Scale

Attachment Items

If I could never be with _____, I would feel miserable.

It would be hard for me to get along without _____.

If I were lonely, my first thought would be to seek
_____ out.

Intimacy Items

I feel that I can confide in _____ about virtually everything.

I would greatly enjoy being confided in by _____.

I would forgive _____ for practically anything.

Caring Items

One of my primary concerns is _____'s welfare.

I would do almost anything for _____.

I feel responsible for _____'s well-being.

Culture always changes, yet there are similarities between Andreas's and Rubin's definitions. Andreas's definition suggests a strong _attachment_ component. His other observations, for example, "A true lover considers nothing good except what he thinks will please his beloved" (1959, p. 185) suggest a strong _caring_ component. Then, of course, there is sexual behavior which is explicit in Andreas's conception and implicit in Rubin's (see Dermer & Pyszczynski, 1978).

But there is an even more basic similarity: both conceptualize love to be an internal, invisible cause. Love is internal because it is supposedly an entity or process beneath a person's skin. Love is invisible because supposedly neither a person in love nor those around such a person can directly see the person's love. What can be seen, according to such a conceptualization, is only the person's romantic behavior.

The strategy of inferring internal, invisible entities and processes has been productive in the physical sciences. Modern electronic computers, being human creations, are well understood and have become useful models for building psychological theories that

utilize internal causes (see e.g., Berscheid, 1983, p. 127). Andreas could not use the computer as a model for the human mind, yet a sample of his "rules of love" reveals the following potential invisible, inner causes: love, shame, desire, value, character, jealousy, thought, and passion.

Partially because it is easy to invent invisible, inner causes there are many psychological terms and theories. So many inferred causes and theories of their inter-relations are postulated that it is difficult to use the work of others (see e.g., Allport, 1969; Staats, 1981). Skinner stated the problem this way:

What the political scientist has to say about man proves to be of little value to the psychotherapist, while the individual who emerges from educational psychology bears no familial resemblance to economic man. It is not likely that the human organism is compartmentalized in this way. (1953, p. 334)

The fragmentation is so great that scholars of human behavior often ignore each other's theories and research with other organisms.

LOVE AS BEHAVIOR UNDER THE CONTROL OF OUTER CAUSES

For behaviorists love is fundamentally behavior. Behavior is usefully defined as any activity that is under the control of current or past environmental conditions. The italicized phrase is very important. For example, although the physical form of a kiss provided because of love might be identical to a kiss provided because of promises of future monetary reward, these formally identical kisses would not, according to a behavioristic definition, be considered identical because they are controlled, in theory, by different environmental conditions. In everyday language, this distinction is made by noting that the meaning of the two kinds of kisses differ.

Just as kissing and other forms of public behavior can be defined in terms of their form and controlling variables, inner behavior such as seeing, hearing, and smelling can be similarly defined. Behaviorists consider such private behavior to be observable because there is often one person who can observe such behavior: the person in whose body these activities are occurring! Private behavior, however, is never considered to be a sufficient explanation for public behavior and it certainly is not considered necessary for public behavior (see Day, 1969; Skinner, 1945, 1953, 1957, 1974). Again, according to a behavioristic philosophy the ultimate explanation of all behavior, public and private, is the

current and past environmental conditions which control behavior.

Skinner's Interpretation of Love

In Skinner's utopian novel, *Walden Two*, Frazier says "What is love . . . except another name for the use of {positive reinforcement}?" and Burriss replies "or vice versa" (1948, p. 286). Later Skinner wrote "They were both wrong. They should have said 'an act of love'" (1980, p. 132). (Note: Technical terms are introduced in brackets and defined in the Appendix [see also Catania, 1992].)

To define love as using positive reinforcement certainly seems reasonable, but cash register operators {reinforce} shopper's affiliation with goods, yet register operators are not ordinarily described as loving shoppers. Furthermore, although positive reinforcement characterizes love, {negative reinforcement} may be involved as in helping a loved-one escape from a burning building.

In *Science and Human Behavior*, we find that "love might be analyzed as the mutual *tendency* of two individuals to reinforce each other, where the reinforcement may or may not be sexual" (italics added,

p. 310). Here the term love is being used as a behavioral disposition not as an inner cause. Such a disposition means only that a person "in love" has an "increased tendency to aid, favor, be with, and caress and a lowered tendency to injure in any way. . . . By describing behavior as fearful, affectionate, timid, and so on, we are not led to look for things [inside] called emotions" (Skinner, 1953, p. 162).

Although behavioral dispositions involving mutual reinforcement of affiliation characterize lovers, they may also characterize relations between prostitutes and their clientele. Moreover, love, unfortunately, need not be mutual.

Although Skinner's system is very useful, the interpretations described above can be improved. Foa and Foa (1980) describe a basic problem with Skinner's interpretations of love:

The assumption that all exchanges follow the economic rule of loss and gain fits well with the Skinnerian notion that any event which increases the frequency of emitting a given behavior is a reinforcement, and any event which decreases it is a punishment. The enquiry into what is exchanged was largely disregarded [by learning theorists]. (p. 78).

The kinds of {reinforcers} exchanged between two persons, the kinds of behaviors reinforced, and the role relations between these persons is critical to understanding romantic love and differentiating it from other relations such as parental love or mere liking.

The Scarce and Idiosyncratic Approach to Creating Romantic Love

Suppose that Jack and Jill worked in the same office and that Jack liked Jill. Suppose that Jack wanted a description of what he could do to make Jill love him and that I knew that Jack was without evil intent. Also suppose that Jack talks, walks, dresses, etc. in an appealing manner. What effective advice might Jack receive?

Given the _attachment_ component of the Love Scale, Jack should make stimulation from his body and behavior {discriminative} for Jill's orienting, approach, and other affiliative behavior. This in turn requires that Jack discover what and when certain stimuli are reinforcing for Jill.

Diagnosing Reinforcers

In the following sections, food is used to illustrate direct and indirect methods for diagnosing reinforcers.

The Direct Method:

The Experiment

Deprivation is one well-known operation for making events reinforcing. Jack could verify the reinforcing value of food, under conditions of food deprivation, by only permitting Jill to access food when she behaved in a particular way. If this contingency increased the frequency of similar future behavior then food, by definition, is reinforcing.

Such an experiment is likely, of course, to be impracticable. Not only must Jack make food contingent on Jill's behavior but he must control other variables to make certain that the behavior-food contingency increased the frequency of future behavior. Also, if Jack created the food deprivation and subsequently restricted Jill's access to food then Jill would likely resent this.

Nevertheless, Jack may sometimes experimentally determine what and when stimuli are reinforcers. Jill's resentful behavior will likely depend on the meaning of,

or reasons for Jack's behavior. In other words, Jill's resentment will likely depend on the current and past conditions that produced Jack's experimentation.

Indirect Methods

Jill, of course, will eventually become food deprived. Under food deprivation, food is not only a reinforcer but is also a {discriminative stimulus} for orienting towards food, approaching food, and eating food. Under conditions of deprivation (e.g., liquid, heat, intellectual) other stimuli (water, the sun, books, respectively) are discriminative for orienting, approach, and consummatory behavior. I would, therefore, urge Jack to note which stimuli Jill "seems to go for" and the various {disposing} operations that appear necessary for these stimuli producing such behavior.

Alternatively, Jack might diagnose reinforcers from what Jill says. Jill might, for example, say "I like tuna sandwiches." Talking is behaving. Saying "I like X" may be interpreted as behavior that is under the control of a discriminative stimulus: the extent X or an aspect of X has been or is a reinforcer (Skinner, 1974, p. 48). But I would not advise Jack, therefore, indiscriminately to use tuna sandwiches as reinforcers. Besides the possibility of lying (see Skinner, 1957), such

"expressions do not refer to instances of reinforcement but rather to a general susceptibility or lack of it" (Skinner, 1974, p. 48). That is, Jill may say "I like tuna sandwiches" because the sandwiches have been reinforcers in some situations (e.g., during lunch or on a picnic) and for some behavior (looking, approaching, and eating) but not in every situation and for every behavior. Everyday language is often imprecise. On the other hand, if Jack overheard Jill saying "I like eating tuna sandwiches on Friday afternoons," Jack might behave more effectively.

Indirect diagnostic approaches do not require intervention. Consequently, Jill is unlikely to resent Jack's conducting a diagnosis. Indeed, when Jack eventually provides reinforcers Jill may call Jack a "mind reader" when Jack was merely carefully observing Jill's behavior and making plausible guesses about the past and present circumstances that control her behavior.

Creating Discriminative Stimuli for
Affiliation by Reinforcing Affiliation

It is important to distinguish between two classes of reinforcers: (1) those that seem to work for everyone and are abundant in a culture and (2) those that seem to work for only one or a few people and are scarce. The

next sections discuss these classes of reinforcers in the context of reinforcing affiliation.

_Reinforcers that Work for
Most People and Are Abundant

If Jack has properly diagnosed appropriate disposing operations and reinforcers, then he could begin a conversation with Jill on a Friday during lunch and offer to share his tuna sandwich. Let us assume that Jill did not bring her lunch and accepts the offer.

In principle, Jill's eating the sandwich would increase her later affiliation given similar disposing operations and stimuli were present. When food is again reinforcing at the office, Jill might be likely to affiliate with Jack. The greater the similarity of the current stimuli and disposing operations to the original conditions, the more likely is Jill to affiliate.

One kind of reinforcer such as food, however, will not maintain Jill's affiliation because the disposing operations making food reinforcing and activating discriminative stimuli are not always in effect. Moreover, Jack probably will not be very excited on discovering that Jill only approaches when she is food-deprived. Jack may complain that he is being used;

it is the food and not him that interests Jill (Seligman, Fazio, & Zanna, 1980)!

So, Jack should contingently provide various other kinds of reinforcers. In this way, the discriminative functions of the stimuli he presents will best persist because they do not depend on a single disposing operation. Jack could provide sex, good drinks, or his warm body, contingent on Jill's affiliation. Given such a history, Jill should more frequently affiliate than when Jack only provided food. Jack should also reinforce affiliation at just about any time or place (provided neither Jill nor others are offended). In this way, Jack's discriminative stimulus function will additionally be freed from various temporal and spatial variables.

It is interesting to note, that Jack's physical features should become reinforcing independent of any particular disposing operation. In principle they should become {generalized reinforcers} because they have preceded and have covaried with the presentation of a variety of reinforcers. Jill, consequently, might view photographs of Jack when he is unavailable even though a photograph cannot provide the reinforcers Jack provides. Indeed, Jill might contend that there is something _intrinsic_ to Jack that she finds attractive; Jack might no longer complain that he is being used.

Miller and Siegel (1972) have advocated procedures similar to those outlined above for creating love, but from the standpoint of Mowrer's learning theory (1960). The strategy of rendering one's body and behavior discriminative stimuli for affiliation and generalized reinforcers follows from a number of learning approaches (also see Blau, 1964). The strategy of becoming a generalized reinforcer may work. Jack might be the most captivating person that "ever walked into Jill's life," if Jill is socially unskilled or, for other reasons, Jill cannot readily affiliate with others.

But if Jill is socially skilled and there are alternative persons with whom to affiliate, this strategy may fail. The wheels of industry critically depend on people captivating others by providing goods that roll off assembly lines or services that do not critically depend on idiosyncrasies. If Jack almost exclusively consequences Jill's affiliation with readily available reinforcers, then she may eventually affiliate with others who can provide them more immediately or in greater quantity than can Jack. Contrariwise, if there were reinforcers that Jack almost exclusively controlled and that others were unlikely even to attempt providing, Jack's providing such reinforcers more immediately or more abundantly than others would not be required.

_Reinforcers that Work for
_Only One or a Few People
and are Scarce

To reduce affiliation with others, Jack should also contingently provide a wide variety of reinforcers that are idiosyncratic to Jill and others cannot readily, if at all, provide. This is the most interesting aspect of a behavioristic interpretation of romantic love.

The control that Jack may come to exert over Jill's behavior, called "falling in love," usually results from repeated affiliative sequences (see e.g., Altman & Taylor, 1973; Levinger, 1974). In these interactions Jack should prompt Jill's descriptions and evaluations of her current circumstances, family, childhood, and eventually herself. As before Jack should also observe current variables controlling Jill's behavior.

Jack's actions may, consequently, be controlled by whether Jill "is sensitive to certain kinds of stimuli, whether [s]he responds to certain kinds of reinforcement, whether at the moment [s]he exhibits certain states of deprivation, and so on" (Skinner, 1953, p. 314). In short, Jack ought to know or understand Jill as no one else has!

Various classes of reinforcers are discussed below.

Every class need not be used in creating love and there are probably classes that I have overlooked. But it seems that scarce reinforcers of some kind are necessary given the exclusivity of love suggested by the _attachment_ component of the Love Scale. Various aspects of the _intimacy_ component are also addressed below.

Solving Personal Problems. If a complicated problem arises in Jill's life, then Jack may be one of a few people who can, when told the problem, readily offer helpful advice or even specify behavior that will terminate the problem (see Skinner's interpretation of "having a problem," 1953, pp. 246-252). Problems are aversive. Jack's advice can become positively reinforcing because it covaries with the termination of {aversive stimulation} (see Baron & Galizio, 1983).

Predicting Personal Outcomes. At times Jill may be unsure of what to do in personal situations. She may, for example, be unable to decide whether a note written to a friend will be effective. If Jill has spoken to Jack about this friend or Jack has interacted with this person, Jack's confirmation (Skinner, 1957, p. 425) may reliably precede the note's effectiveness and his dissent may precede its failure. Jack's predictions may acquire

a reinforcing function under this circumstance (see Perone & Baron, 1980; but also see Dinsmoor, 1983). If Jill's behavior is changed as a result of Jack's comments and the problem is solved, then this is merely an instance of helping solve personal problems.

Eliciting and {Conditioning} Sexual Behavior. An {eliciting stimulus}, by definition, invariably and with short latency produces a response. Although various stimuli--such as tactile stimulation of the genitalia--are sexual eliciting stimuli (e.g., producing vaginal lubrication), Jack should discover what works best for Jill.

Jill's descriptions would, of course, be most helpful. Jack should prompt and reinforce such descriptions. When Jack and Jill engage in various forms of sexual behavior, they may experimentally discover the most effective eliciting stimuli.

Certain features of Jack's body (e.g., chest hair) and behavior will occur just before the presentation of established sexual eliciting stimuli (e.g., genital stimulation). These stimuli will become eliciting stimuli if it is additionally true that: tactile stimulation of Jill's genitalia is more likely given the presence of Jack's chest hair than is tactile stimulation

given the absence of Jack's chest hair. In other words, the presence of Jack's chest hair covaries with tactile stimulation.

Unfortunately, for Jack, to the extent other people share Jack's physical features or use Jack's brand of cologne these stimuli will likely also function as conditioned eliciting stimuli. Jack should, therefore, attempt to produce unique, sexual eliciting stimuli. Jack and Jill may, for example, develop a secret erotic language. Most naturally, certain idiosyncratic features of Jack's body and behavior will covary with sexual stimuli.

As in the case of reinforcing affiliation, I would recommend that Jack administer the conditioned and most effective sexual eliciting stimuli at just about any time or place (provided neither Jill nor others are offended). In this way, the conditioned sexual eliciting stimuli will be freed from various temporal and spatial variables. Jill may say that Jack "turns her on like no one else" (see Maslow, 1970, p. 182).

Changing the Topic. If Jill has a problem that remains insolvable and she _publicly_ talks about the problem (this is traditionally called thinking out loud) then Jack may distract Jill. Of all the people in the

world, Jack can best do this because he can specify when and what stimuli produce behavior that is incompatible with Jill's public (or private) problem related behavior. Thinking about an insolvable problem is aversive; stimulation from Jack can acquire a reinforcing function by covarying with the termination of such aversive behavior.

Sometimes, of course, Jill may not at all publicly discuss a problem. She may, for example, have lied or cheated and she cannot stop thinking about it. Jill need not tell Jack that she feels guilty; changes in her public behavior may suffice. Stimuli which ordinarily produce Jill's talking, eating, or playing may not be effective. The reduced frequency of such behavior may again produce Jack's presenting stimuli that evoke incompatible behavior. Jill may reinforce Jack's interventions by saying, "you're just what the doctor ordered!"

Administering Therapy. Alternatively, if Jack has reinforced Jill's discussing socially acceptable problems and Jack generally has not punished Jill's blunders, Jill may confess. She may at first hesitate because confessing may be a conditioned {punisher} due to its having preceded and having covaried with the presentation of punishing stimuli.

Jack may initially ask Jill if she feels guilty, fearful, or sad if he cannot describe the events producing the changes in Jill's public behavior. Jill may not be able to do this either (see Skinner's interpretation of repression [1953])! Jack may prompt Jill to "get the problem off her chest."

Suppose that Jill had stolen money from her sister and had neither been caught nor had confessed. Also suppose that Jill had just attended a movie in which a similar action was depicted and it is the anniversary of her sister's death. The movie may produce {respondent} behavior which alters Jill's characteristic {operant} behavior. The movie together with the behavior it has produced may result in Jill saying that she feels guilty and fearful.

More specifically, Jill's privately visualizing her theft and talking about it may be interpreted as producing conditioned {aversive stimulation}. To eliminate the aversiveness of the stimulation from such behavior Jack should become a "nonpunishing audience" (Skinner, 1953, p. 370). That is, he should evoke Jill's visual and verbal behavior without administering additional aversive stimulation. In this way, he will have introduced an {extinction procedure} (see Skinner,

1953, pp. 370-371; Stampfl, 1975).

Because a person or "self" is not merely a body but is also characterized by certain behavioral patterns (Keller & Schoenfeld, 1950, p. 369), Jill may say that she "feels like a new person" or has "a new self" because personally aversive behavior such as muscle tension and pain have been eliminated (also see, Maslow, 1970, p. 185). Because public confession to Jack eliminated her guilt, she may describe Jack as a "life saver." Jack's status as a positive reinforcer may be enhanced because his presence has again covaried with the termination of aversive stimulation.

If Jill currently lives among people who repeatedly speak of sin, sinners, and punishment, however, this might counteract Jack's work. In this case, Jack might instead attempt "integrity therapy." Mowrer saw the problem of guilt in this way:

Guilt is the fear a person feels after having committed an act which is disapproved by the significant others in his life, before the act is detected or confessed. Guilt, in short, is the fear of being found out and punished And it persists (i.e., does not extinguish) for precisely the reason that in human society the mere passage of

time does not reduce culpability. Under the circumstances specified, the original act, is moreover, compounded by deception, which becomes an ongoing "sin" which was not merely committed then but is still being practiced and perpetuated, here and now. (1964, p. 226)

As an integrity therapist Jack might not only encourage Jill's imagining and describing her theft but also advise Jill to confess to other significant people in her life, make restitution, and behave better. If Jill were a theist, Jack might also recommend that she confess to God and seek forgiveness-- after she has behaved honestly and fairly with mortals on earth.

Integrity therapy may be particularly effective if Jill's history involved the "right" sequence: 1. inappropriate behavior; 2. failure to confess inappropriate behavior to significant others; 3. confession to significant others and statements of intent to do better; 4. description of inappropriate behavior, administration or specification of appropriate punishment by significant others; and 5. with the completion of punishment, the inappropriate behavior is never (or disparagingly) discussed by significant others and reinforcement of affiliation with significant others is,

for a brief period, followed with particularly effective reinforcers.

Step 5, however, may be absent. Jill's significant others may have often cruelly discussed Jill's inappropriate behavior long after Jill had repented and suffered appropriate punishment. Denny (1976) contends that a pervasive "free floating" anxiety may develop in the following way:

A young child may have been severely scolded or punished by [her] father, and after a passage of time, i.e., after beginning to relax, the child may approach the father and be met by a gruff, anxiety-provoking retort, "What in the hell do you want, kid?" If this consequence of events were to happen a number of times the clear possibility exists for fear [responses] to be conditioned to relaxation-produced stimuli. In consequence, every time our hypothetical individual begins to feel calm or relaxed, s[he] begins to feel anxious. (p. 319)

If Jill were raised in this way then perhaps Jack should only solicit her confession and her promise to do better. Indeed, in a discussion of restitution Jack might mention that Jill has paid sufficiently in guilty

behavior for stealing the money and keeping it secret for many years. Jack should not discuss Jill's inappropriate behavior again. Jill may come to no longer respond guiltily in Jack's presence, following confession and restitution. If Jill lives with unforgiving people, then Jack should help her find new associates.

Prompting and Maintaining Nostalgic Responses.

Because he is an expert about Jill and has extensively interacted with her, Jack may prompt nostalgic behavior. Only Jack, for example, may know that mentioning "Mr. and Mrs. B's apartment" will elicit "warm," reinforcing respondents down Jill's spine. Moreover, as time passes Jill's ability to describe such events without additional prompting may diminish. Jack's providing such scarce and idiosyncratic prompts may be particularly reinforcing. Dorothy Ogrizovich remarried after her first marriage had ended in divorce. She noted:

Memories are the scrapbook of a life. Without them, you have given up a piece of yourself. I make this point only to stress that when couples are considering divorce, they should also be aware of this subtle loss, which can be as painful as those that are so often publicized. . . . The wages of divorce or an untimely death of one's partner are, unfortunately, the same. They represent the loss of

an intangible treasure: shared memories. (1986, p. 9E)

Can and Will Affiliation with Others Be Reinforced?

The previous section specified what Jack should do if he wishes Jill to love him. Before continuing, it is important briefly to address whether Jack is capable and motivated to follow these suggestions.

Capability

Capabilities are usually conceptualized as inner causes, but they may more simply be names for behavior that has been under appropriate environmental control but the stimuli and disposing operations that control the behavior are now absent.

We may ask whether Jack can behave in ways that reinforce Jill's behavior. If Jill enjoys tennis, can Jack play tennis? If Jill enjoys political discussion, can Jack appropriately discuss politics? Many of the repertoires that Jack may need are likely to be quite complex. If Jack is without the appropriate repertoires then it may be difficult for his behavior to come rapidly under appropriate stimulus control. Even if Jack works

hard to acquire appropriate behavior, he may feel untrue to his "self" because his new behavior is not under strong discriminative stimulus control.

Beside such obviously important capabilities as responding appropriately to English, listening carefully, being considerate, etc., there is patience which may be interpreted as continuing to engage in behavior even though reinforcement is intermittent or delayed. This capability is particularly important because Jack's romantic overtures may not be regularly or immediately reciprocated.

Of greater importance is trust which may be interpreted as permitting others to control strong reinforcers or punishers. If Jack, for example, is initially to evoke Jill's confessions then it is important that Jill in some way control strong reinforcers or punishers with respect to Jack, for otherwise she will be in a vulnerable position. Jack's disclosure to Jill of inappropriate behavior might suffice (see e.g., Derlega & Chaikin's [1975] discussion of the reciprocation of self-disclosure).

Being forgiving is also important as are conflict resolution skills (see e.g., Jacobsen & Margolin, 1979). If Jack were fortunate, these capabilities were acquired

when he interacted with members of his immediate family.

Motivation

Motives, like capabilities, are usually thought to be inner causes. Motives supposedly activate and direct behavior. Motives, of course, are not necessary for understanding behavior. Although it is true that stealing food can be plausibly explained by appealing to a robber's hunger, the theft can as plausibly be explained by the robber's having successfully stolen before, the robber's being without food for days and now being without money, the food smelling delicious, etc. Consider how changes in behavior that supposedly reflect changes in motivation may be understood environmentally.

Evolving Motivation. In the beginning, Jill may have provided stimuli that produced Jack's orienting and listening behavior. Even if Jill might have just moved into Jack's neighborhood, she may present stimuli similar to those presented by others that have covaried with Jack's orienting, approach, and other affiliative behavior being reinforced by others. Such affiliation producing stimuli may include anatomical features, name, professional title, and behavior, including the way she talks, walks, and dresses; and, of course, what she says.

Statements of agreement and liking may be particularly effective discriminative stimuli producing affiliation if in the past interpersonal agreement and positive evaluation have covaried with the reinforcement of affiliation (Hill, 1968). Of course, some persons may insincerely use discriminative stimuli and produce behavior but not provide reinforcement (see Jones and Wortman's [1973] discussion of ingratiation and Hake and Olvera's [1978, p. 215] behavioristic interpretation).

There is, also, the possibility that Jack might approach Jill because he has been instructed to do so. Instructions may be considered a special class of discriminative stimuli (see Baron & Galizio, 1983; Skinner, 1957; Winokur, 1976). There is, additionally, the possibility of delayed imitation: Jack might have seen Jill reinforce others' affiliation (Deguchi, 1984).

Most importantly, given the caring component of the Love Scale, Jack's affiliating, listening, caressing, and other loving behavior with respect to Jill will increase in frequency if Jill reinforces this behavior.

Instant Motivation. At the beginning of the previous section I depicted Jack's affiliation with Jill to be an instance of {stimulus generalization}. That is, his initial affiliation was not due to Jill having reinforced

his affiliation but due to his affiliation with others
having been reinforced by others.

I did not, however, discuss the kinds of reinforcers these others may have provided. If the reinforcers were all of one kind, for example food, then the stimuli that Jill provides may only produce Jack's affiliation if Jack were food deprived. But suppose the reinforcers that others provided were of various kinds, perhaps even some were scarce and idiosyncratic to Jack. If this were true, there might have been "love at first sight" (see Keller & Schoenfeld, 1950, pp. 375-376).

Some may question whether such a phenomenon exists but it is plausible (see Tennov's [1979] discussion of limerence which is only partially interpreted here). Jack may yearn to look at and affiliate with Jill, yet he may also respond anxiously because the stimulus control may not be mutual, and under these social circumstances Jack's affiliation covaried with the presentation of aversive stimuli i.e., his "expectations were dashed!"

Choice. Although the term "choice" was not used above, choice situations are ubiquitous. Choice is usually thought to reflect some invisible, internal process that determines which of two or more incompatible responses occur. Choice, however, can more simply denote

the occurrence of one of two or more incompatible responses. Such choice is determined, for example, by the discriminative stimuli present that control each incompatible response, the disposing operations that are in place and the {schedules of reinforcement}.

As Jack considers my advice he may note that if he alternatively mastered, for example, the stock market then he might earn so much money that he could attract many desirable women. Whereas, if he followed my advice and produced all sorts of events that functioned as reinforcers exclusively for Jill who else could appreciate his highly specialized knowledge and skills should Jill reject him, fall sick, or die? Jack faces a choice endemic to mass culture.

I might tell Jack that Jill is unlikely immediately to find someone better. This is because Jack provides a variety of idiosyncratic, scarce reinforcers contingent on Jill's affiliation. Although Jack might be able to attract a number of woman with "all the things that money can buy," money cannot maintain their continuing affiliation (unless they are socially unskilled) as effectively as can providing a variety of idiosyncratic, scarce reinforcers.

Of course, if Jill can eventually provide a wide

variety of reinforcers, particularly idiosyncratic, scarce reinforcers, then Jack may increasingly affiliate with Jill. This will be easiest if Jill's capabilities and behavioral dispositions are appropriate to Jack's, for then the major issue will not be what each does for each other but coordinating reinforcing behavior (see Kelley, 1979; Kelley & Thibaut, 1978). Not only will Jack come to feel true to his "self," but he may come to see "... in his own particular Jill charms and perfections to the enchantment of which we stolid onlookers are stone-cold" (James, 1914, p. 266). Jack's caring for Jill may become a "labor of love." His loving behavior may have become {automatically reinforcing} by having preceded and covarying with Jill's providing reinforcers.

Limitations

The theory offered here is, in part, limited because many advanced behavioristic principles and findings relevant to love are inappropriate for an introductory essay. The theory is in many other ways limited. For example, besides Andraeus's and Rubin's definitions of romantic love, there are many other conceptions (Lee, 1988). Most interesting is Davis and Todd's (1982) paradigm case formulation for defining love and other fuzzy concepts. Some other commonly mentioned

limitations are addressed below.

Isn't There Too Much

Calculation and Control?

As depicted here, Jack is unlikely to be initially conditioning Jill's affectionate behavior without calculation. Instead, contrary to Skinner's assertion that "we do not act to change behavior" (Skinner, 1980, p. 132) when in love, Jack is likely to be thinking about just that! His behavior has been depicted as being controlled, in part, by the instructions I have provided.

Nevertheless, in principle, Jack could behave with less calculation, if he had "naturally" received training in loving others by having been raised in a loving family. Moreover, to the extent that Jack primarily controls Jill's behavior through positive reinforcement the control that he is exerting may not be, at least initially, terribly conspicuous:

The effects [of positive reinforcement] are not as easily recognized as those of aversive contingencies because they tend to be deferred, and applications

have therefore been delayed . . . (Skinner, 1971, p. 33)

_What About Fantasy?

From the standpoint of radical behaviorism fantasy may be understood by recalling that hearing, seeing, smelling, etc. are private behavior (Skinner, 1953, pp. 257-282). Jill's physical presence may be interpreted to produce Jack's seeing Jill. The private stimuli produced by seeing Jill may become reinforcing because they have preceded and covaried with Jill's providing reinforcement. Seeing may, consequently, occur when relevant disposing operations are in effect:

It is characteristic of men under strong sexual deprivation, not only that they indulge in sexual behavior as soon as an occasion presents itself or concern themselves with the production or enjoyment of sexual art or engage in sexual self-stimulation, but that they also see sexual objects or activities in the absence of relevant stimuli. . . . A . . . response which can be made when the appropriate stimulus is absent has certain advantages. It does not require the sometimes troublesome precurrent behavior which generates an external stimulus, and

it can occur when such behavior is impossible--as when we daydream of a lost love or an opportunity which is wholly out of the question. (Skinner, 1953, p. 272).

If Love Primarily Involves

Positive Reinforcement, How

Can This Theory Explain

Emotional Ambivalence?

Assume that Jack and Jill love each other. Emotional ambivalence can characterize Jack's behavior with respect to Jill because Jill may administer tremendous punishment by threatening or actually rapidly withdrawing the idiosyncratic reinforcers that she uniquely provides. Moreover, if Jack has confessed punishable behavior, Jill may threaten to reveal his transgressions. Clearly the social interaction that produces love may also produce strong avoidance or "hate."

If Jill can more effectively control Jack's behavior than Jack does Jill's, Jill may force Jack to engage in punishing behavior. It has been noted that "in any sentimental relation the one who cares less can exploit the one who cares more" (Ross, 1920, p. 136). Jack may continue to affiliate with Jill because of the schedule

of reinforced affiliation, the inavailability of alternative sources of reinforcement, etc. It is possible that Jack may discover new idiosyncratic, sources of reinforcement that control Jill's behavior. It is also possible that Jill might come to reinforce so little of Jack's affiliation that eventually his affiliation will cease (see Homans' [1974] discussion of power).

How Can Romance Fade Over
Time Even Though Reinforcement
Is Still Forthcoming?

Romantic love has been described as a race against time. Why does love diminish even though reinforcement is forthcoming?

Reductions in the Quality and Quantity of Reinforcement. In his first book on happiness, Alan Watts noted that "where the roses . . . bloom in their glory there will certainly be a bed of manure" (1940, p. 61). The provision of a variety of idiosyncratic, scarce reinforcers at a high rate critically depends on various disposing operations being in effect and the person susceptible to love being incapable of responding effectively.

Suppose that Jill had never before fallen

romantically in love. In this case there may be a variety of unresolved personal problems that have _accumulated over time_. Once Jack offers advice that helps solve these problems or more directly eliminates such problems, powerful bases of reinforcement are eliminated.

For example, if Jill not only felt guilty about stealing money from her sister but additionally described herself to be sexually unappealing, Jack's prompting Jill's confession etc. might eliminate Jill's guilt, and Jill's body functioning as an erotic eliciting stimulus would likely terminate her disparaging remarks about her sex appeal. Jill might occasionally feel guilty about her theft or anxious about her sex appeal, but the aversive features of these "problems" should be less than if Jill had never interacted with Jack.

Thus, as Jack and Jill continue interacting they will reach a point at which they cannot reinforce affiliation at ever increasing rates particularly with idiosyncratic, scarce reinforcers. The tendency to affiliate may, therefore, begin to decrease as a greater proportion of the reinforcers used are available from others.

Indeed, even common reinforcers may less frequently be forthcoming. For example, if Jack and Jill marry there

will be less competition for each other's affection. The complex pattern of social stimulation called "low competition" may serve as a disposing operation that reduces mutual reinforcement of affiliation. Moreover, Jack and Jill will likely come to share the same "home sweet home." Consequently there will be less reinforcement of affiliation than when they lived separately because each will, to some extent, affiliate with the other when returning home.

Automatic reinforcement may also be involved in reducing the use of common reinforcers. The conditioned properties of stimuli typically do not change as rapidly as the contingencies of reinforcement. Behavior that is automatically reinforcing may, therefore, persist for some time in the absence of exogenous reinforcement. This may produce a social advantage. For example, Jill may have reinforced, at a high rate, Jack's preparing lunches but the reinforcement rate declined after Jack's behavior became automatically reinforcing. Jill may, consequently, come to reinforce lunch preparation less frequently than before.

Weakening Conditioned Stimulation From Jack. Aspects of Jack's body or behavior may have initially been reinforcing and sexually arousing for Jill. It is likely, for example, that during the early stages of

their romance, the probability of sexual stimulation given the presence of Jack's hairy chest was high whereas the probability of sexual stimulation given its absence was quite low. Indeed, if Jack sexually stimulated Jill at various times and in various settings, then the conditioned reinforcing and eliciting functions of Jack's hairy chest should hold over time and place.

Contrariwise, as Jill affiliates more and more with Jack the covariation between his hairy chest and more effective sexual stimulation, such as tactile stimulation of her genitalia, will likely diminish. This will easily happen if Jack and Jill share the same bedroom where Jack's hairy chest will be exposed but tactile genital stimulation will less often occur than in early stages of their romance. This change, according to the contingency account of conditioning (see Rescorla, 1967), will weaken the conditioned reinforcing and eliciting functions of Jack's hairy chest.

Moreover, sexual behavior may eventually be confined to a particular time (before going to sleep) and place (the bedroom, particularly if there are children) which should further diminish Jack's hairy chest functioning as a conditioned stimulus over time and place. Also, after Jill's working hard all day, Jack's tactile sexual stimulation of Jill may be less effective (see Tennoy,

1977, pp. 171-175) than when they first dated.

There is the related matter of the effectiveness of the unconditioned stimulation, for example, tactile stimulation of the genitalia. There may be an optimal interval of sexual inactivity for maximizing the reinforcing and eliciting functions.

Fading Joy and Happiness. "Joy" and "happiness" may be considered verbal responses that are complexly controlled by rapid increases in the level of reinforcement, not the particular level of reinforcement. More details for this interpretation can be found in Rachlin's (1980, Chap. 3) provocative behavioristic analysis. Because Jack and Jill cannot perpetually provide positive transitions in mutual levels of reinforcement, the tendency to describe each other as current sources of joy and happiness will likely diminish.

SO WHAT'S NEW?

This section compares certain general characteristics of the present approach with traditional approaches to attraction and affection. Before proceeding further, however, it is useful to summarize the interpretation or theory of romantic love offered here in

the form of a definition.

In the case of Jack and Jill, love is a name for a relation in which Jill's orienting, approach, and other affiliative behavior is followed by a wide variety of (mostly positive) reinforcers, particularly ones that are idiosyncratic to Jill that cannot at all or readily be provided by others. Moreover, except possibly for sexual reinforcers, Jack has not directly created the disposing operations which render the stimuli that he provides reinforcing (e.g., Jack has not attempted to make Jill confess by making her feel guilty). As a consequence, Jill's behavior is controlled by many discriminative, and reinforcing stimuli that are unique to Jack. (Because stimuli that are reinforcers often have an eliciting function, elicitation by implication is involved.)

It is important to note that this definition and many facets of the behavioristic interpretation detailed above are extensions of Gewirtz's systematic and provocative application of behaviorism to understanding love between a child and a principal caretaker (see especially, Gewirtz's [1972] discussion of "attachment" relations).

Structure, Acquisition, and History

In social psychological studies of attraction and relationships, researchers are most often concerned with determining structure (often as a means for inferring inner causes of behavior). A researcher may arrange various social stimuli and measure various orienting, verbal, or affiliative behavior classes to identify the forms of social stimuli and behavior that covary and the form of the covariation. Research concerned with covariation between responses, or stages of relationship development are clearly structural.

A behavioristic interpretation of human behavior must also consider structure. In commenting on Freud's work, for example, Skinner noted, "We may quarrel with any analysis which appeals to a self or personality as an inner determiner of action, but the facts which have been represented with such devices cannot be ignored" (1953, p. 284). Many behaviorists, unfortunately, have chauvinistically rejected entire cognitive social psychological analyses. Consequently, they have failed to appreciate the importance of the classes of stimuli, responses, and their interrelations that cognitive social psychologists have isolated (see Catania, 1973; Wilcox & Katz, 1982). The present interpretation for example, depends very heavily on Rubin's structural research concerning the Romantic Love Scale.

But the present interpretation is also concerned with suggesting what may have been done in the world beyond the laboratory to produce structure. It attempts to answer the question "Why is stimulus of form X related to behavior of form Y in such and such a way" by appealing to a conditioning history (see Skinner, 1953, p. 302). It is less likely, therefore, to confuse basic with culturally determined structures and processes (see Gergen, 1980; Greenfield, 1973) than traditional ahistorical exchange theories (see e.g., Kelley & Thibaut, 1978, pp. 321-323).

A major weakness of any behavioristic interpretation of behavior is reference to unseen, invented reinforcement histories. Behavioristic research rarely makes front page headlines, but each time a behavioristic experiment involving conditioning is conducted, history is made. Although behaviorists have not studied love, as defined above, or close relationships, as defined by Kelley et al. (1983), behaviorists have studied aspects of such relations.

Hake and Schmid (1981), for example, studied the acquisition and maintenance of trust. Moreover, these studies are not considered to be analogues or simulations; the laboratory is in the real world. By learning, for example, how to create history in a

laboratory environment so that persons learn to share or trust, perhaps even given a history of competition, interpretations of creating or recreating love in the world beyond the laboratory are likely to be more valid.

The Unit of Analysis and the Idiosyncratic

In traditional research, responses are typically averaged across organisms or interacting organisms, depending on the unit of analysis. Consequently, one cannot be sure how the regularities apply to particular units.

The present interpretation, however, is fundamentally concerned with the individual organism or the individual dyad. The interpretations are an extension of research concerned with specifying the operations that control the behavior of individual organisms and dyads. In the study of trust, for example, the data is presented on a session-by-session basis for each participant and dyad. Moreover, in this research tradition, procedures must often be modified to the idiosyncratic characteristics of an organism or dyad.

In the present interpretation the role of idiosyncratic factors--particularly idiosyncratic reinforcers--is critical to understanding love (and

differentiating it from other forms of affection, see Dermer [1985]). Researchers concerned with attraction and close relationships, however, have been slow to recognize the importance of idiosyncratic reinforcers. For example, before reviewing the literature on attraction and love Berscheid and Walster noted:

Since it is so difficult to calculate what one individual at one specific point in time will find rewarding or punishing, interpersonal attraction researchers have . . . settled on a more realistic goal: to learn which behaviors and events most people, most of the time, find rewarding. (1978, p. 26)

Later, however, in commenting on the reinforcement approach and social exchange theories Berscheid notes:

A pellet is likely to be [a] reward to a rat who has not eaten for several days, but what is a reward or a cost is not so easily determined for humans in social situations. As a consequence, not only has recent theorizing moved toward taking an interactive approach, but it also has moved toward careful consideration of the meaning and value of stimulus events to the individual. (1985, p. 439)

Theorists are gradually recognizing the importance

of idiosyncratic aspects of relations to understanding love (see Altman and Taylor, 1973; Blau, 1964; Foa & Foa, 1980; Rosenblatt, 1977). But reliance on between-subject or dyad research methods may make it particularly difficult to study the meaning and value of events "to the individual." This, of course, is an old problem:

The modern methodologist, no less than his predecessors throughout the history of psychological science, fails to see the peculiar need in psychology for the prediction of the individual event. Of the two kinds of prediction appropriate to psychology--the actuarial and the individual--the former only, up to now, has received the attention it deserves. (Allport, 1940, p. 16)

Allport noted that actuarial prediction was useful for certain purposes, but he nevertheless felt that psychology was obligated to understand the individual case.

Lewin commented on the same problem and outlined a solution:

In the time of the Greeks, geometry shifted from a "classificatory" method (which groups geometric figures according to "similarities") to a "construc

tive" or "genetic" method (which groups figures according to the way, they can be produced or derived from each other). Ever since, the "genetic definition" has dominated mathematics. In physics, a similar development occurred at the time of Galileo Biology tried to take a major step in this direction when the system of Linnee was superseded by Darwin. (1951, p. 61)

Lewin did not comment on Darwin's describing a plausible historical process responsible for speciation, but Lewin did note that one can use basic "elements" of psychology to bridge the gap "between generalities and specifics, between laws and individual differences" (p. 61). But of course, this is what I have attempted to do in providing a behavioristic interpretation of Jack and Jill's romance.

CONCLUSION

There are many reasons for studying love; the methods and theories will vary accordingly. If one's concern, however, is with helping people create love or rekindle love then I suspect a behavioristic interpretation may be particularly useful because behaviorists most often use individual subjects as the unit for isolating principles. Moreover, in applied

behavioristic research _interpretations are routinely tested with respect to individual persons_. Few other approaches in psychology have used the prediction and control of the behavior of the individual as a validity test. Even as passionate a cognitive psychologist as Meehl, who has carefully considered actuarial versus clinical prediction, deems behavior modification to be one of five noble traditions in clinical psychology "that have permanent merit and will still be with us 50 or 100 years from now" because of its "remarkable technological power" (1978, p. 817). Contrariwise, Gergen (1980) notes that "commitment to any given theory within the social sciences is perilous" because, in part, "any given theory dismisses much that could be relevant to making any given decision, and renders one insensitive to entire domains of potentially significant experience" (p. 277).

In this interpretation I have provided a theoretical integration without proliferating concepts. Moreover, I believe that future behavioristic interpretations will be enhanced by research concerned with _conditioning_ various patterns of human interaction (see e.g., Hake & Olvera, 1978) and verbal behavior. In so doing, future interpretations will better help understanding and creating romantic love.

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Appendix

AUTOMATIC REINFORCER: A reinforcer that is produced automatically by a response. For example, masturbation is automatically reinforced by orgasm.

AVERSIVE STIMULUS (STIMULATION): See NEGATIVE REINFORCER.

CONDITIONED (CONDITIONING): Changing behavior or the function of a stimulus by using a contingency. See, for example, EXTINCTION and DISCRIMINATIVE STIMULUS, respectively.

CONDITIONED REINFORCER: A stimulus which has become a reinforcer by having preceded and having covaried with the presentation of a reinforcer.

CONTINGENT: Event Y is said to be contingent on event X, to the extent X must first occur before Y can occur. For operants, X is a response and Y is a reinforcing or punishing consequence.

DISCRIMINATIVE STIMULUS: A stimulus in whose presence a response is reinforced and in whose absence similar responses are not reinforced or reinforced less, with the result that these responses come to be emitted in the presence of the stimulus but are less likely emitted when the stimulus is absent.

DISPOSING OPERATION: An operation which controls the extent another operation will control behavior. For

example, food deprivation controls the extent food will function as a reinforcer.

ELICITING STIMULUS: A stimulus which invariably and with short latency produces a response (see **RESPONDENT**).

EXTINCTION: For operants, discontinuing the consequence that have maintained the behavior, for example, eliminating the response contingent presentation of reinforcers. For respondents, presenting the **CONDITIONED STIMULUS** so that it either does not immediately precede or covary with the eliciting stimulus.

GENERALIZED REINFORCER: A stimulus which has become a reinforcer by having preceded and having covaried with the presentation of many different kinds of reinforcers.

NEGATIVE REINFORCER (NEGATIVE REINFORCEMENT): See **REINFORCER**.

OPERATION: Any environmental procedure or condition, e.g., the withholding of food, or onset of a tone.

OPERANT: A class of behavior controlled by its consequences.

POSITIVE REINFORCER (POSITIVE REINFORCEMENT): See REINFORCER.

PUNISHER: A response contingent event that decreases the rate similar responses are emitted. For POSITIVE punishers, the "event" is the presentation of stimulus; for NEGATIVE punishers, the "event" is the removal of a stimulus. PUNISHMENT: As a name for an operation, this term denotes the response contingent presentation of a punisher. As a name for a behavioral process, this term denotes the decrease in the rate of a response attributable to the punishment operation.

RESPONDENT: The behavior controlled by eliciting stimuli.

RESPONDENT CONDITIONING: As an operation, this term denotes arranging a neutral stimulus to immediately precede and covary with an eliciting stimulus. Pavlov arranged tones and food powder in this way. As a name for a behavioral process, this term denotes the increase in control that the neutral stimulus has over elicited behavior because of respondent conditioning operations. The tone, for example, came to produce salivation because of its relation to the presentation of food powder.

REINFORCEMENT: As a name for an operation, this term

denotes the response contingent presentation of a reinforcer. As a name for a behavioral process, this term denotes the increase in the rate of a response attributable to the reinforcement operation.

REINFORCER: A response contingent event that increases the rate similar responses are emitted. For **POSITIVE** reinforcers, the "event" is the presentation of stimulus; for **NEGATIVE** reinforcers, the "event" is the removal of a stimulus.

SCHEDULE OF REINFORCEMENT: A rule which specifies which responses are reinforced.

STIMULUS GENERALIZATION: Given that behavior has been brought under the control of a particular stimulus, other stimuli may come to exert similar control. The spread of this effect is called generalization.