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OF THE CROSS-SEX INTERACTION.  
The Ohio State University, Ph.D., 1975  
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SEX-SPECIFICITY IN THE SOCIAL SATIATION EFFECT:
ITS ADEQUACY AS AN EXPLANATION
OF THE CROSS-SEX INTERACTION

DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree Doctor of Philosophy in the
Graduate School of the Ohio State University

By
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The Ohio State University
1975

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CHAPTER I

INTRODUCTION

In recent studies of children's learning, experimental attention has broadened to include the social context in which the learning occurs and is demonstrated. One source of influence on children's performances is the interaction of certain subject characteristics with those of the experimenter. It has been demonstrated that opposite-sex combinations of experimenter and subject provide maximum facilitation of subject performance (Gewirtz, Baer, and Roth, 1958b; Stevenson, 1961; Baer and Goldfarb, 1962; Patterson, Littman, and Hinsey, 1964). The cross-sex effect, however, appears inconsistently and is seemingly sensitive to alterations in the ages of the interacting agents, certain pretraining conditions, and variations in the task and dependent measures used.

For methodological purposes, the occurrence of even a somewhat parochial interaction effect suggests the need to control for possible confounding of empirical results from this source. For theoretical purposes, however,
this same specificity of conditions under which the cross-sex effect is observed poses problems of interpretation. Any explanation of its appearance must be stated with sufficient precision to encompass instances in which it does not occur as well as those in which it does.

Stevenson (1965) and Gewirtz (1954) discuss this effect in terms of the Freudian Oedipal resolution. According to this interpretation, hostility toward the rival, same-sex parent will decrease and identification with him/her will increase at the fifth or sixth year (Freud, 1949). This interpretation predicts a developmental aspect to the cross-sex effect depending on the degree of completion of the Oedipal phase. On the other hand, both Stevenson (1961, 1965) and Gewirtz (1961) also admit that social learning may account for their results. Social reinforcers may operate either as discriminative stimuli or as generalized reinforcers. The cross-sex effect is thus explained as an indication that children respond differentially to opposite-sex social agents in laboratory settings as a generalization of stimulus properties or reinforcement expectancies learned in interaction with adults in naturally-occurring situations. There is indeed evidence that adults respond to opposite-sex children in such a way as to make them more
reinforcing; they are warmer, more permissive, and attentive (Rosenthal, 1966; Rothbart and Maccoby, 1966; Mischel, 1970).

In an elaborated statement of this effect and its probable causes, Stevenson (1965) again utilizes subjects' learning histories to interpret the cross-sex effect but arrives at the opposite conclusion about the naturally-occurring reinforcement contingencies. He reasons that sex-role training results in a child's being in frequent contact with same-sex reinforcing agents; opposite-sex agents are more reinforcing by virtue either of their novelty or, alternatively, of the subject's level of deprivation of such reinforcement.

This hypothesis derives from work done by Gewirtz and others (Gewirtz and Baer, 1958b; Landau and Gewirtz, 1967; Gewirtz, 1969) on the effects of deprivation and satiation manipulations on social reinforcement effectiveness. Despite disagreement as to its cause (Walters and Parke, 1964; Maccoby and Masters, 1970; Eisenberger, 1970), the deprivation/satiation hypothesis states and generally demonstrates that an inverse relationship obtains between frequency of social reinforcement and its effectiveness in later learning tasks. Experimental attention to the potency of novel nonsocial stimuli in motivating performance (Cantor, 1963; Mendel, 1965;
Cantor and Cantor, 1966; Cantor, 1969) is compatible with this explanation of the cross-sex effect. The concept has, in fact, been extended to social stimuli as well. Babad (1972) demonstrated that the satiation effect is person-specific; praise administered by one social agent does not affect the value of social reinforcement administered by a new agent. This finding indicates that subjects respond to novel human stimuli with increased motivation, analogous to their response to novel non-social stimuli.

A further parallel may exist in the work of Wickens and his associates (Wickens, Born, and Allen, 1963; Wickens, 1972) on the experimental phenomenon of proactive inhibition release. Proactive inhibition refers to the progressive decline in recall of verbal material over repeated trials; release of this inhibition occurs when a relevant dimension of verbal encoding is shifted. For example, subjects show significant improvement in recall following a shift from letters to numbers but little release following a change from words printed in red to words printed in black. As demonstration of a significant release is taken to be evidence that the shifted dimension is an important one in encoding, it is presumed that "letterness" is more utilized in categorizing verbal material than is the color in which the
material is printed.

The hierarchical arrangement of encoding dimensions has adaptive significance, as Wickens (1972) points out. The release phenomenon, too, is advantageous in verbal communication in order that recall of successive words should not be progressively inhibited since, ordinarily, syntactical structure insures dimensional shifts. It is unclear, however, that an analogous process in the perception of social stimuli would be similarly facilitative. Those persons that are most continuously present, such as a child's mother or father, would become progressively less effective in modifying behavior through social reinforcement.

It is the intention of this study to contribute evidence relating to the adequacy of the deprivation/satiation hypothesis as an explanation of the cross-sex effect. The major hypothesis to be examined is that social stimuli are composed of multiple independent dimensions along which satiation may occur and that one such dimension is the sex of the reinforcing person. Specifically, a change in both the sex and the person of a reinforcing agent between consecutive experimental sessions is predicted to result in less satiation than redundancy in one or both dimensions. Additionally, it is hypothesized that this dimension of social encoding,
if demonstrated, undergoes a developmental change. The prediction is that children will make increasing use of maleness and femaleness in categorizing social stimuli as they grow older.
CHAPTER II

LITERATURE REVIEW

The susceptibility of children to social influence is thought to underlie many of the changes occurring during socialization (Mischel, 1970) and the attempt to delineate the precise conditions under which social reinforcement is effective has increasingly occupied research attention. One result of this activity has been the production of a large body of findings which emphasize the importance of the social context in which experimental tasks are conducted (Sarason, 1966; Rosenthal, 1966; Stevenson, 1970). The interaction of experimenter characteristics with those of the subject is considered to be a possible source of confounding and controls for these influences are advised as soon as it becomes clear what they are.

The several observations of a cross-sex effect, an increase in performance for reinforcement administered by agents of the sex opposite that of the subject, have caused many experiments to be designed in such a way that inspection will reveal the presence or absence of an
interaction between the sexes. Unfortunately, it is often the case in such studies that the cross-sex effect is of methodological, rather than theoretical, importance. Its occurrence or non-occurrence is reported but is not itself the object of investigation. Consequently, interpretations of the effect are varied (Gewirtz, 1954; Rosenblith, 1959; Stevenson, 1961; Rosenthal, 1966; Mischel, 1970), and those instances in which it fails to appear go uninterpreted.

It is clear that any adequate explanation of the cross-sex effect will handle its nonappearances and appearances equally well. At the present time, no theory advanced in explanation of its occurrence allows for the great number of exceptions the literature contains. It is to be hoped that an examination of the evidence will produce, if not clarity, at least an awareness that integration of the data will be achieved only by more specific formulations than currently exist.

The typical paradigm in which the cross-sex effect is observed is outlined by Stevenson (1965). Although the interaction was noted prior to this statement (Gewirtz and Baer, 1958b; Gewirtz, Baer, and Roth, 1958), Stevenson and his associates have been predominantly responsible for whatever recognition and clarity the
effect has attained. To assess the effectiveness of social reinforcement, the experimental task must be intrinsically uninteresting, have no clear end or correct response, be relatively unaffected by prior learning or level of intelligence, and allow a response which can be measured in discrete units. It is thought that such tasks will provide sensitive measures of motivation for social reinforcement as subjects will presumably have no reason otherwise to engage in such uninteresting activities.

The task settled upon by the Stevenson group and used with slight modification in nearly all studies of this type is a marble-drop game. The subject is invited to drop marbles from one hugely-supplied bin into another, through randomly-spaced holes in its top. The measure taken is rate, the increase in marbles dropped per unit time over a base rate period in which no reinforcements are administered. It is the typical finding (Stevenson, 1961; Stevenson and Knights, 1962; Stevenson and Allen, 1964; Patterson, Littman, and Hinsey, 1964; Hill and Stevenson, 1965; Allen, Spear, and Johnson, 1969; Kaplan, 1970) that the rate of marble-dropping increases over the base rate by greater increments if social reinforcement is administered by an agent whose sex is opposite to that
of the subject, usually a child, than if he/she is of the same sex.

Cross-sex effects in studies departing from this paradigm are less in evidence but it is their existence which argues for its generality. Gewirtz has demonstrated the expected interaction on two different tasks. The earliest (Gewirtz, 1954) confronted subjects with adults of either low- or high-availability and scored the frequency with which behaviors defined as "attention-seeking" occurred. Children direct these behaviors primarily to opposite-sex adults. The later procedure utilized a two-choice discrimination problem. The subject was socially reinforced for responding to one class or category of objects over a specified number of paired choices. It was found (Gewirtz and Baer, 1958b; Gewirtz, Baer, and Roth, 1958) that subjects more frequently choose the alternative being socially reinforced when the reinforcing agent is of the sex opposite to their own. Similar results have come from a study of verbal conditioning (Baer and Goldfarb, 1962).

A departure from these paradigms in demonstrating cross-sex effects is the work of DeLucia (1963) in which the test-retest reliabilities of sex-typed choices was influenced by this interaction. The reliability coefficients were significantly lower when both tests were
administered by an experimenter of the same sex than when both test sessions were conducted by an opposite-sex experimenter. Since social reinforcement was not utilized in this study, it is unclear that these results reflect either increased motivation or heightened susceptibility.

Another study reporting an interaction of this kind is that of Rothbart and Maccoby (1966). Their research differed from that discussed thus far in that the adults' responses rather than those of the child were under observation. They required parents of children of both sexes to listen to a taped voice, identified as either that of a boy or a girl, and react to the messages. They found that parents are more permissive to opposite-sex children. This study provides important evidence that the cross-sex effect may reside as much in the behaviors of the reinforcing agents as it does in the responsiveness of the subjects. This viewpoint is also expressed by Rosenthal (1966) who distinguishes active, behavioral from passive, physical experimenter effects. He suggests that attention and warmth are differentially bestowed on subjects according to their sex and is reflected in their responsiveness.

A further interesting feature of the Rothbart and Maccoby study is the isolation of the sex variable from other personal characteristics of the agent by controlling
the information the parents received. In the Stevenson work, the experimenter's sex is only one of the constellation of perceptions which are available to the subject. Rothbart and Maccoby introduced a taped child's voice as male or female, thus avoiding the complications of the child's age, attractiveness, facial expression, and the like. The well-known Taylor and Epstein (1967) study of aggression between the sexes also exercised such a control. This strategy might be profitably adapted for use with children but, at least to the author's knowledge, it has not been. It remains uncertain to what extent the cross-sex effect is a function of other personality or physical traits related to sex and how much it is attributable to perception of the agent's sex alone. Stevenson and Allen (1964, 1967) suggest that a great deal of variability in subjects' rate of responding is due to individual characteristics of the experimenter independent of sex.

Several theoretical interpretations of this effect have been advanced post hoc (Stevenson, 1965; Mischel, 1970). Unfortunately, the dependent measures with which it has been demonstrated are not derivative from any particular theoretical construct, resulting in some ambiguity in assigning meaning to the empirical findings. An examination of the major theories along with the
available data bearing on their validity will perhaps illustrate the critical nature of this problem.

The psychoanalytic viewpoint provides a fairly rich documentation of the evolution of a child into a heterosexual adult and it is in this perspective that the cross-sex effect is cast. Presumably, responsiveness to and interest in the parent of the opposite sex is of great significance in this outcome (Freud, 1938). Freud (1949) distinguishes the pre-Oedipal from the post-Oedipal child in that the latter seeks identification with the same-sex parent in the attempt to minimize hostility and fear. Concurrently, the relationship with that parent lessens in intensity.

It is uncertain, however, which aspect of this process the marble-drop task represents. An improved performance rate in response to a reinforcing agent of the opposite sex suggests a pre-Oedipal object choice. Freud is explicit that the resolution of the Oedipal conflict does not simply repress the libidinal cathexis, but "it is literally smashed to pieces by the shock of threatened castration" (Freud, 1927). The resumption of the heterosexual object choice is further interrupted during latency, a period in which the sexual instinct is primarily autoerotic and partially sublimated:
not until completion of development at the time of puberty does the polarity of sexuality coincide with male and female (Freud, 1924).

The cross-sex effect in nursery-school children may be an indication of the powerful pre-Oedipal strivings directed toward the opposite-sex parent, but it is difficult to account for its continuation throughout the pre-pubertal years when the child is presumably solidifying an identification with the same-sex parent and peers. On the other hand, a differential susceptibility to social approval administered by a cross-sex agent may be interpreted as representing appropriate sex-role identification in social interactions. This interpretation, however, does not suffice in explaining the appearance of the effect when very young children are the subjects since their identification is thought to be with the mother.

Despite the difficulty in equating processes in psychoanalytic theory to task paradigms developed to study social reinforcement, Freud does provide predictions about the developmental course the object-choices and identifications will take. The first object-choice in children of both sexes is the mother. In boys, she is abandoned decisively upon the Oedipal resolution; in girls, the threat of castration which ends the complex in males is an understandably less powerful deterrent and, therefore,
the cathexis for the father does not undergo complete destruction but is only repressed (Freud, 1927). The Freudian orientation posits a clearer picture of these developments in males than in females but it is generally the case in both sexes that the pre-Oedipal object-choice of the opposite-sex parent undergoes some transformation around the age of five in which that object is relinquished. Thereafter, children largely devote themselves to same-sex identifications until puberty intervenes to redirect energy to appropriate, heterosexual objects.

There are, however, a good number of studies which show either same-sex effects, superiority for female experimenters, or superiority for male experimenters and interpret these results likewise as consistent with the Freudian position. Studies in which children are asked to choose between the sexes generally find that a child maintains a preference for his own sex (Kagan, 1956; Kagan and Lemkin, 1960; Sears, Rau, and Alpert, 1965; Kohlberg, 1966). By the third grade, however, both boys and girls begin to view the same-sex parent as less kind and more dominant (Kagan, 1956). This shift is not in close agreement with the psychoanalytic timetable.

Same-sex effects are also found in imitation studies (Maccoby and Wilson, 1957; Maccoby, Wilson, and Burton,
1958; Hetherington and Frankie, 1967) and these are often thought to reflect identification processes (Bandura and Walters, 1963). These data suggest that marble-drop and imitation tasks do not represent identical psychological processes. An interesting illustration of this distinction (Stevenson, Hale, Hill, and Moelly, 1967) is that children watching filmed marble-drop games were more responsive to same-sex models, contrary to Stevenson's usual results in face-to-face interactions over the same task. Rosenblith (1959, 1961) found male models to be more effective in inducing imitation in both boys and girls subject to variations in the task and the model's attentiveness to the child.

The results are inconsistent when social reinforcement rather than model effectiveness is assessed as well. Some studies find no effect of experimenter sex (Binder, McConnell, and Sjoholm, 1957; Gewirtz and Baer, 1958a; Stevenson and Odom, 1962; Gilmore and Zigler, 1964; Stevenson and Allen, 1967; Everhart, 1971; Babad, 1972; Hamilton, 1972) across an age range from preschoolers to college students. Other studies find maximally effective social reinforcement to be that dispensed by males (Rosenblith, 1959; Baer and Goldfarb, 1962) and, in some cases, by same-sex agents (Epstein and Liverant, 1963; Ransom, 1969; Allen, Spear, and Lucke, 1971; Blinn and
Another group of exceptions to the generality of the cross-sex effect is that in which subjects in some treatment conditions show the effect and others do not. When a pre-task social interaction is introduced, the nature of the interaction sometimes alters the effectiveness of the social reinforcer. If subjects are isolated prior to the experimental task, the cross-sex effect is enhanced whereas, under nondeprivation conditions, no cross-sex effects are observed (Gewirtz and Baer, 1958b).

Similarly, with either no or nonreinforcing pretraining, the cross-sex effect is found (Stevenson and Knights, 1962; Kaplan, 1970) but is either nonsignificant or in the opposite direction with warm or reinforcing interaction prior to the test trials (Gewirtz, Baer, and Roth, 1958; Gewirtz and Baer, 1958b; Stevenson and Knights, 1962; Hill and Stevenson, 1965; Kaplan, 1970). Patterson, Littman, and Hinsey (1964) utilized parents as reinforcing agents for the marble-drop task and found that the cross-sex effect is specific to restrictive homes. Permissive and warm homes apparently facilitate same-sex reinforcer effectiveness. Contrary results arise from measuring task performance under both social reinforcement and non-reinforcement conditions. Under the former, the cross-sex
obtains; under the latter, same-sex experimenters produce higher rates of responding (Hill and Stevenson, 1965).

The developmental picture presented by the data is incomplete and equally complex. Stevenson (1965) finds that three- and four-year-old children of both sexes prefer female-administered reinforcement. Between the ages of four to eighteen, the reinforcing value of the opposite sex occurs, subject to the restrictions already listed. Some studies report a corresponding increase in male reinforcing effectiveness (Stevenson, 1961; Baer and Goldfarb, 1962). No sex effects were found in a study in which college students acted as subjects (Stevenson and Allen, 1967) and ceiling effects during the base rate period precluded social reinforcement's increasing the rate over trials in an earlier study using adult subjects (Stevenson and Allen, 1964). In this earlier study, however, the cross-sex effect was observed during the base period, prior to the administration of social reinforcement.

From this partial review, it appears that the Freudian explanation of the cross-sex effect will require some buttressing from other sources regarding the task, treatment, and age factors affecting its occurrence. The psychoanalytic interpretation seems to predict that females in general and mothers in particular will be most
reinforcing to pre-Oedipal children of both sexes. This is not always demonstrated (Gewirtz, Baer, and Roth, 1958; Stevenson, Keen, and Knights, 1963; Everhart, 1971; Hamilton, 1972). Once the Oedipal resolution is achieved, the mother is renounced by her sons, although girls may continue to harbor repressed desires for their fathers, and same-sex identification begins. Again, some data support this conjecture (Ransom, 1969; Allen, Spear, and Lucke, 1971; Blinn and Jacobson, 1973); some studies do not (Baer and Goldfarb, 1962; Patterson, Littman, and Hinsey, 1964; Kaplan, 1970).

Following puberty, the cross-sex effect should be most pronounced. As already mentioned in regard to post-pubertal subjects, the effect is either not demonstrated at all (Stevenson and Allen, 1967) or cannot be attributed to social reinforcement. In an early study of this question (Binder, McConnell, and Sjoholm, 1957), adult subjects of both sexes were more effectively conditioned by a female than by a male. The experimenters, however, were obviously selected for contrast and differed in age, physical size, and personal mannerisms as well as sex, making it impossible to infer that maleness or femaleness were the central characteristics eliciting subjects' responses.
Cognitive theory of sex-role development, as set forth principally by Kohlberg (1966), is infrequently invoked to explain the appearance of the cross-sex effect. These theories do, however, lead to certain predictions about the perceptions of same- and opposite-sex persons at different developmental levels. Kohlberg states that sexual identity is a conceptual attainment and is, therefore, dependent on the same Piagetian cognitive structures as are physical concepts. Specifically, the constancy of the child's own sex is consonant with the perception of object constancy and gender identifications are not correctly extrapolated beyond family members until the age of five or six. The recognition that one's sex is unalterable leads, says Kohlberg, to highly positive evaluations of behaviors, materials, and persons that correspond to it. Same-sex peer attachments are the result of this valuing and consequent modelling behavior in boys; girls' development is later and less consistent than that of boys in that the "femininity" of their interests declines rather than increases and they more frequently express the preference to be boys (Kohlberg, 1966). At puberty, presumably, the same-sex identification is sufficiently forged that reciprocal interactions begin with the opposite sex.
Again, it is uncertain whether cross-sex responsiveness to social reinforcement corresponds to an identification or to a reciprocal-interaction process because of the difficulty in translating Kohlberg's meaning into operant paradigms. Data suggest that it does, indeed, reflect identification. Epstein and Liverant (1963) found, for example, that high-masculine boys exhibit a greater responsiveness to male reinforcing agents than do low-masculine boys. Neither group exhibited much responsiveness to females.

A cognitive interpretation of cross-sex interactions depends on the presence of a construct of gender identity. Since Kohlberg denies that this construct is formulated before the age of five or six, early studies (Gewirtz, Baer, and Roth, 1958; Gewirtz and Baer, 1958b) in which the cross-sex effect is demonstrated in four-year-olds suggest either that the cognitive element necessary to identify gender correctly is present before Kohlberg anticipates it or that cognitive variables are not strongly implicated in the effect.

Mention must also be made of a study which conflicts with the distinction Kohlberg makes between the course of development in girls and boys. Reese (1966) found that boys from the sixth through the eighth grades show more
acceptance of girls than girls do of boys. Although a psychoanalytic defense may be posited to account for this finding, it does conflict with the predictions of Kohlberg as well as with those of David Lynn (1972), another cognitive theorist.

Social learning theories take two directions in attempting to interpret this effect. The first regards laboratory behaviors as generalizations from real-life contingencies. That a child is more responsive socially to reinforcing agents of the opposite sex leads to the inference that cross-sex persons are typically more reinforcing, as Rothbart and Maccoby (1966) suggest.

The second learning approach entails just the opposite inference about the naturally-occurring reinforcement contingencies. Based on the interesting work of Gewirtz and his associates (Gewirtz and Baer, 1958a; Landau and Gewirtz, 1967; Gewirtz, 1969) on deprivation and satiation operations on a hypothetical dependency drive, the cross-sex effect is attributed jointly to satiation of same-sex society and relative deprivation of the company of persons of the opposite sex. This interpretation garners support not only from the inverse relationship between amount of exposure to social reinforcement and its effectiveness in conditioning demonstrated by Gewirtz,
but also from studies which show that novelty itself has motivational and reinforcing properties (Cantor, 1963; Mendel, 1965; Cantor and Cantor, 1966; Cantor, 1969).

These two explanations are clearly conflicting; it is unlikely that deprivation of cross-sex reinforcement is occurring simultaneously with sufficiently warm and frequent reinforcers by cross-sex persons to produce enhanced responding along a generalization gradient in the experimental task. It is commonly supposed that young children receive more of their social reinforcers from females, either their mothers or the predominantly female teachers of nursery and first grade. Social contact with fathers and other adult men is a later occurrence. It is to be expected, therefore, in accordance with a generalization approach, that very young children of both sexes will respond preferentially to mothers over fathers, to women over men, and to either parent over a stranger. It is also to be predicted that girls will evidence cross-sex preferences later and less consistently than boys as a function of their continuing limited opportunity to interact with and be reinforced by males.

As is to be anticipated, the data are conflicting on all these points. Stevenson (1965) points out that females are more reinforcing to three- and four-year-old children of both sexes than are males. Breyer, May, and
Gable (1972) also find enhanced performance for female experimenters for five- and six-year-old children of both sexes. Although Stevenson, Keen, and Knights (1963) report a preference for mothers over fathers as reinforcing agents in children from three to five years of age, they also report a surprising advantage of strangers over either parent counter to the predictions generated by the generalization position. Another study (Everhart, 1971) reports no greater responding for one parent than the other in five-year-old children.

When either familiarity or warmth is manipulated in order to assess its effects on social reinforcement, the results are equally inconclusive. Liked or familiar adults are more reinforcing than unfriendly or strange adults (McCoy and Zigler, 1965; Brown, Helm, and Tedeschi, 1973). Of the studies that also include sex of reinforcing agent as a variable, those of Allen, Spear, and Johnson (1969) and Hill and Stevenson (1965) show that the cross-sex effect is greatly enhanced by warmth and debilitated by aloofness.

A singular study utilizing the parents of the subjects as reinforceurs, however, concludes that the cross-sex effect is not a characteristic of permissive, warm homes (Patterson, Littman, and Hinsey, 1964). Those homes rated as restrictive were the only ones in which
conditioning was enhanced by reinforcement administered by the parent of the sex opposite that of the child. As already described, certain treatments in which social reinforcement is administered prior to the criterion task frequently diminish or reverse the cross-sex effect (Gewirtz and Baer, 1958b; Stevenson and Knights, 1962; Kaplan, 1970). These are difficult data to incorporate into the explanation that cross-sex adults are salient as a result of generalization either of stimulus properties or of reinforcement contingencies.

On the other hand, the cross-sex effect is demonstrated primarily by young males rather than females, in response to female adults (Gewirtz, 1954; Gewirtz, Baer, and Roth, 1958). When either the actual mother of the subject or a strange female experimenter is the reinforcing agent, second-grade male subjects show greater preferential responding to the mother than do females (Ruebush and Stevenson, 1964). A further interesting distinction between boys and girls in the responsiveness to social reinforcement is that the performance of boys is more sensitive to negative social experiences than that of girls and that this effect is more pronounced when the experimenter is female (Gewirtz and Baer, 1958b; Allen, Spear, and Lucke, 1971). These findings are compatible with the interpretation that a male's cross-sex
interactions begin earlier and are more intense than the cross-sex interactions of girls largely as a result of the relative unavailability of fathers and other adult males in the environment of the young child.

This same unavailability, however, may contribute under some conditions to the effect of social reinforcement. As a result of several independent lines of research, the hypothesis has been advanced that children are more reinforced by opposite-sex adults because of this novelty. Most directly, this explanation is derivative from the work of Gewirtz (1954, 1961, 1967, 1969) who advances a drive model for viewing the effects of praise. According to this formulation, the satisfaction of dependency needs operates analogously to the homeostatic mechanisms which regulate hunger and other drives. In support of this construct, he presents evidence that children who undergo a twenty- or thirty-minute period of isolation prior to a discrimination task are significantly more likely to make choices which lead to social reinforcement than are those children who are tested immediately (Gewirtz, Baer, and Roth, 1958; Gewirtz and Baer, 1958b). Conversely, children who are exposed to a period of social interaction prior to the task appear satiated with such reinforcements and give fewer
responses leading to reinforcement than children who have not received prior treatment (Gewirtz and Baer, 1958a; Gewirtz, 1967; Landau and Gewirtz, 1967; Gewirtz, 1969).

Gewirtz's explanation for the inverse relationship between amount of exposure to social reinforcement and its effectiveness in motivating response in a discrimination paradigm has been challenged from several quarters (Stevenson, 1965; Maccoby and Masters, 1970). Among the alternatives proposed to account for Gewirtz's results is that of Walters and Parke (1964, 1965). They suggest that children learn attentional responses to social cues. Isolation thus increases emotional arousal which alters response thresholds and attention to cues. In addition, they argue that isolation experiences constitute stimulus deprivation generally and not only deprivation of social reinforcement. Following isolation, material reinforcers are equally as effective as approval (Walters and Foote, 1962).

Other experimental evidence argues for the specificity of social deprivation. Stevenson and Odom (1962) isolated one group of subjects in the typical ways, a second group was isolated from other persons but was given a variety of high-interest toys, and a third group was tested without any pretreatment. Both isolation groups differed from the control but did not differ from
one another, suggesting that stimulus deprivation contributes little to the subject's increased social motivation following isolation. A second study (Rosenhan, 1967) examined the relative effectiveness of social and nonsocial reinforcers following both deprivation and satiation operations. In order to bring the satiated subjects to the same level of performance demonstrated by the deprived subjects for social reinforcement, it was necessary to use a light as a signal for correct responding. These findings argue that the satiation and deprivation manipulations specifically affect the salience of social reinforcement, a conclusion reached also by Eisenberger (1970) after an extensive review of the numerous studies utilizing Gewirtz's paradigm.

Because increased effectiveness of social reinforcement following isolation has been variously attributed to arousal, frustration, stimulus deprivation, and anxiety, in addition to Gewirtz's hypothesized dependency drive, satiation operations are the preferred procedure for influencing a child's responsiveness to social cues (Gewirtz, 1967). Yet, these manipulations, too, admit alternative explanations. Zigler and a group of his associates (Gilmore and Zigler, 1964; Butterfield and Zigler, 1965; Berkowitz, Butterfield, and Zigler, 1965;
Unruh, Grosse, and Zigler, 1971) argue that satiation experiences affect attitudes toward the experimenter specifically rather than a drive for social reinforcement generally. The simple fact of prior exposure to an experimenter does not necessarily diminish the effectiveness of social reinforcement, as studies which find children preferring their mother or another familiar person to a stranger indicate (McCoy and Zigler, 1965). Instead, each familiar person is a cue for both approach and avoidance behaviors. A child's response to an adult will therefore be mediated by the approach/avoidance balance of the reinforcement history with that person in conjunction with immediate situational and cognitive variables.

An indication of the importance of the latter factors in influencing response to social reinforcement is provided by Babad (1973). In one experiment, third-grade subjects were given information prior to the actual treatment of satiation, deprivation, or immediate testing relating to that experimenter's tendency to emit reinforcements. The results suggested that the manipulation of expectancies can produce the satiation/deprivation effect in the absence of actual treatment. In agreement with Zigler, Babad believes that children interpret the
level of reinforcement provided by an experimenter as a characteristic of that person, not as a function of the task or their responses to it.

A similar view is that children show satiation effects because they learn that the adult is providing task-irrelevant information during the satiation period. Warren and Cairns (1972) utilized a satiation procedure differing somewhat from the story-telling interaction favored by Gewirtz in that their pre-experimental tasks had obviously correct responses with tangible results. While the child engaged in these tasks, the experimenter made approving comments either contingently or noncontingently on the child's appropriate responding. It was found that satiation does not occur if the reinforcing agent continues to fulfill an informational function. Presumably, children stop attending to social reinforcement if its cuing function becomes redundant and, therefore, are less likely to utilize it in the criterion task. A similar result is obtained following shifts from social to nonsocial cues in learning tasks in that learning is retarded if the child must redirect his attention in order to solve an experimental problem (Barnhart, 1968). These results indicate that cognitive factors must be considered jointly with motivational ones in predicting a child's response pattern to an experimental
task, particularly when it follows pretreatments which may have generated a variety of expectations.

Several studies of social reinforcement support the contention that novelty or unexpectedness enhance performance. Elevations in rate of responding are observed when social reinforcements are delivered by disliked rather than liked peers (Patterson and Anderson, 1964; Hartup, 1964; Titkin and Hartup, 1965), for younger or older rather than peer children (Ferguson, 1964), for changes in the reinforcement schedule utilized by the experimenter (Kaplan, 1970), and for changes in the experimenter during the experiment (Babad, 1972). As has been noted several times, the novelty of cross-sex adults has been offered as an explanation for their greater effectiveness (Stevenson, 1961; Stevenson, Keen, and Knights, 1963; Stevenson, 1965). The same explanation, however, has been advanced to explain those occasions in which males are more effective reinforcing agents for children of both sexes by virtue of their infrequent contacts with young children (Rosenblith, 1961).

Stevenson (1961, 1965) assumes that the consequence of sex-role stereotyping is a deprivation of opposite-sex companionship. Because the years from school entrance to puberty witness the greatest insistence upon sex-appropriate behaviors and because this impetus is greater
for boys than for girls (Lynn, 1972), Stevenson reasons that boys are more deprived of cross-sex reinforcement than girls and that this deprivation increases with age. Empirical support for this interpretation comes from studies showing that the cross-sex effect increases across grades (Baer and Goldfarb, 1962) and is more pronounced for boys (Gewirtz, 1954; Gewirtz, Baer, and Roth, 1958; Gewirtz and Baer, 1958b; Allen, Spear, and Lucke, 1971).

This explanation encounters difficulty when it attempts to incorporate evidence of simultaneously increasing efficacy of male experimenters and slightly declining female experimenter effectiveness across ages. The cross-sex effect is also increasing in these same studies (Stevenson, 1961; Baer and Goldfarb, 1962). The deprivation/satiation interpretation of this finding leads to the inference that males become increasingly less available throughout a child's development. Assuming a greater number of male teachers at the more advanced grades and more involvement of fathers in activities suitable for older children, this inference is unlikely to be valid although no available evidence bears directly on this issue.
Recent studies (Warren and Cairns, 1972; Babad, 1972, 1973) support the view that cognitive developments, rather than actual changes in the interaction patterns and availabilities of adults, produce the satiation effect. It is not known to what extent the sex of a social partner ties into cognitive systems influencing expectancies about reinforcement contingencies or appropriate reciprocal roles, but the demonstrated effectiveness of cognitive factors in modifying responses for social reinforcement suggests that such belief systems are a potential source of variation in the appearance of the cross-sex effect as well.

A theoretical base for the importance of expectancies in interpersonal behaviors is the writing of Kelly (1955) on the psychology of personal constructs. In the Kellian scheme, each person is engaged in making as much conceptual sense of his environment as possible in order to predict and control events affecting his life. This task is made simpler by the utilization of constructs, dichotomous concepts organized in some systematic way. Personal constructs do undergo developmental change but are rather more remarkable in that they maintain greater constancy than do the events they were developed to predict (Mischel, 1970). It is this cognitive tenacity, Mischel
contends, that produces the illusion that personality is constant. Though persons behave in a great variety of ways, dependent on specific situational cues, an observer perceives and construes these behavioral inconsistencies in accordance with an enduring set of concepts. As a result, it appears to the observer that behavior and personality are continuous across time and situation whereas, in actuality, it is his own perception which has remained unaltered.

Kelly himself did not claim universality for any one dichotomous construct, believing that they were derived from individual experience and, therefore, not replicable. On the other hand, certain descriptions and characteristics are so frequent in any given culture that it seems likely that a majority of adults utilize a constant group of constructs in interpreting and predicting the behaviors of those with whom they are in contact. Among the many distinctions which may be made in this manner, sex of a social partner is likely to be an important categorization to make because such interactions are under quite specific social sanctions.

It is not known whether children regularly perceive the sex of a reinforcing agent as an important characteristic in predicting reinforcement contingencies though a great number of studies demonstrate that interactions are
influenced by this variable. Kelly's technique for determining an individual's personal construct systems is a rather elaborate paper-and-pencil test which requires the abstraction of similar and contrasting traits in significant persons named by that individual. Despite the theoretical necessity of clarifying the developmental changes occurring in the content and use of personal constructs, the nature of the test makes it unsuitable for extensive use with children. The absence of empirical information on children's constructs is particularly unfortunate in light of the inadequate explanations of the cross-sex effect. On the basis of the satiation interpretation, opposite-sexness is more reinforcing as a result of its being less affected by satiation (Stevenson, 1965). This explanation entails the assumption that children can make the distinction between males and females and that they typically do so in categorizing social reinforcement.

The work of Wickens (Wickens, Born, and Allen, 1963; Wickens, 1972) on release from proactive inhibition provides a useful analogy for the concept that social stimuli are categorized along specific dimensions in the area of verbal encoding. Release from proactive inhibition is a phenomenon related to perception and recall of verbal
material. Inspection of performance curves for recall of words reveals a perceptible decline across trials attributable to interference from previously learned words. Wickens and his associates (1963) demonstrated that, as inhibition across experimental trials accumulates, certain kinds of changes in the presentation lists will "release" the inhibition as evidenced by increased ability to recall the stimulus word immediately following the shift.

As an example, subjects typically show a reliable decline in their ability to recall nonsense trigrams as presentation trials proceed. If, however, the stimulus list changes from letters to numbers, the subjects show an increased recall corresponding to the shift. Demonstration of a significant release is considered to be evidence that the shifted dimension is a relevant one in the encoding of verbal material. All changes in stimulus characteristics do not produce equal release. Wickens (1972) concludes a review of this work with the observation that individuals are

particularly reactive to semantic attributes of words, mildly reactive to the method of their physical presentation, and essentially impervious to their syntactical characteristics.
A suggestive study with college students has demonstrated that the maleness or femaleness of word connotations is, in fact, a dimension used in encoding verbal information (Ickes, 1971). Subjects showed release from proactive inhibition following a shift in sexual connotation of the stimulus presentations. A satiation study (Babad, 1972) parallels this design with social stimuli. With children as subjects, it was found that introducing another experimenter following the satiation pretreatment eliminated the satiation effect. It should be noted that Babad's experimenters were a male and a female. Any change from one experimenter to another was also a change from one sex to the other, although Babad interprets his findings as a demonstration of the person-specificity rather than the sex-specificity of the satiation procedure.

This particular satiation paradigm may be viewed as roughly analogous to the release studies. Prior familiarization with a reinforcing agent may cause an accumulation of social inhibition which will be released following shifts or changes in relevant characteristics of the reinforcing agent. Alternately, novelty of the experimenter may eliminate satiation effects by increasing subjects' attention or motivation. Both views would predict an increase in responding for reinforcement after
a change in the agent delivering it.

As previously noted (Rosenblith, 1961; Stevenson, 1961; Ferguson, 1964; Kaplan, 1970), the cross-sex effect has been interpreted as a result of same-sex groupings which produce satiation for one's own sex and relative deprivation of persons of the opposite sex. If this interpretation is valid, it may be assumed that satiation may occur independently along other dimensions as well, for blondes, adults, or friends, as well as for males or females. Some dimensions are conceivably more powerful than others, as has been shown to be the case in verbal encoding.

The results of experiments which manipulate changes in reinforcing agents from phase to phase of the design are not, however, uniform. Babad (1972) shows that satiation is eliminated by such a change, Paletz (1970) finds no effect, and Berkowitz, Butterfield, and Zigler (1965) find effects on only one of their two dependent measures. The satiation studies are seemingly quite sensitive to methodological variations as are studies assessing differential reinforcing effectiveness of men and women. Though age of the subjects are comparable in the cited studies, other experimental features are not.

The satiation phase of this type of paradigm usually consists of an unspecified interaction between the
experimenter and the subject of various lengths. The variations present in such interactions are undoubtedly important in understanding the discrepant findings but, unfortunately, many studies do not report sufficient detail on the satiation phase that it can be replicated reliably. Babad's satiation treatment apparently consisted of noncontingent reinforcement. The subject was seated away from the experimenter and invited to look at books or pictures while the experimenter completed some work. Sitting at his desk, the experimenter then said "Good" aloud, either few or many times, over a specified time interval, being careful that the comment did not coincide with any action of the child's which might be inadvertently reinforced.

This extreme noncontingency is a departure from the satiation treatment employed by Gewirtz (Gewirtz, Baer, and Roth, 1958; Landau and Gewirtz, 1967) as well as from that of the other two studies which manipulate changes in the reinforcing person. The early Gewirtz treatment involved an adult attending closely to a child's painting efforts. The later work utilized pretraining tasks in which the number of reinforcements administered could be varied for theoretical purposes. Both the Paletz (1970) and the Berkowitz et al. (1965) satiation treatments conformed to this latter procedure. In all these studies,
social reinforcement was dispensed noncontingently in that it did not follow any defined behavior on the part of the subject, but not in the sense that the subject was unable to determine that he/she was the recipient of it. Consequently, it is uncertain to what degree Babad's subjects were satiated with social reinforcement and to what degree they regarded that agent's "Good" comments as entirely irrelevant to them and their behaviors. A new experimenter in such a design may only reclaim subjects' attention rather than diminish satiation in the sense meant by Gewirtz.

Paletz (1970), utilizing the more typical satiation treatment, found no effect of switching the sex of the reinforcing person between the pretraining and the criterion tasks. The number of factors considered in his study, however, resulted in an extremely small number of subjects in each cell of the design and a correspondingly small amount of confidence in his findings.

Berkowitz, Butterfield, and Zigler (1965) predicted that a change in the experimenter between the satiation and the test periods of the experiment should have no effect if Gewirtz's conception of the homeostatic drive for social reinforcement is correct, but should eliminate the satiation effect if subjects learn attentional or attitudinal responses to specific persons which do not
generalize widely. Because Zigler prefers persistence, length of time a subject engages in the marble-drop task, as the dependent variable rather than the number of reinforced choices on a discrimination task, the experiment utilized both dependent measures in the design. On the persistence task, a changed experimenter produced less persistent responding than did the same experimenter. In a two-color light discrimination task, no significant effects of any kind were observed. These results provide no clear support for either Gewirtz's or Zigler's position. The discrepancy between the two dependent measures of responsivity to social reinforcement is particularly difficult to interpret.

The proper measure for such studies is the topic of considerable discussion (Stevenson, 1965; Stevenson and Hill, 1966; Parton and Ross, 1967; Eisenberger, 1970). In addition to the two measures included in the Berkowitz et. al. study, the rate of marble-dropping, preferred by Stevenson, is also used as a reflection of effectiveness of social reinforcement. A criticism of both rate and persistence studies is their failure, as a rule, to use nonreinforcement control groups to demonstrate differential effects of social reward. A further complication in both rate and persistence measures is that they are also sensitive indices of anxiety (Hill, 1967; Unruh,
Grosse, and Zigler, 1971), thus making it difficult to
determine whether a child is responding rapidly or
persistently as a function of the experimenter's rein-
forcing or fear-inducing potential. Additionally, rate
studies are unsatisfactory because they often encounter
ceiling effects and inadequate statistical adjustments
for base rate differences. Pawlicki (1972) produced
large increments in rate of responding by making social
comments contingent upon increased rate rather than at
random intervals, suggesting that studies which show
inconsistent changes in rate do so as a result of inadver-
tent reinforcement of both accelerations and decelera-
tions.

In summary, the existing literature on the cross-sex
effect is inconsistent at some point with each of the
major theoretical explanations for its appearance. Much
of the conflicting data may be due to variations in
subject age, pretreatments, and the dependent measure
employed in these studies. Although no single explana-
tion adequately encompasses the cross-sex data, three
lines of research lend credibility to the satiation
theory. These contributing lines of work are the
increased recognition that novelty enhances the rein-
forcement value of nonhuman stimuli (Berlyne, 1960;
Cantor, 1963), the work on release from proactive
inhibition (Wickens, 1970) in which shifts in relevant encoding dimensions of verbal material produces increments in recall performance, and the impressive number of studies documenting the robustness of the satiation effect itself (Gewirtz, 1967; Eisenberger, 1970).
CHAPTER III

METHODOLOGY

Purpose of study

It is the purpose of this study to contribute data pertinent to the satiation interpretation of the cross-sex effect. According to this explanation, reinforcement dispensed by opposite-sex agents is more effective than that dispensed by same-sex agents as a joint function of the deprivation of the former and satiation of the latter type of reinforcement. This hypothesis implies that sex of reinforcing agent is a dimension utilized by subjects in their responsiveness to social reinforcement. Because the literature on males indicates that the cross-sex effect is more pronounced and sensitive to experimental treatment than in female subjects, a male sample will be examined to test the validity of the following hypotheses:

I. Social satiation takes place along specific dimensions, one of which is sex. Shifts in a relevant dimension will result in less satiation than redundancy in that dimension.
Specifically, a treatment in which the satiation and test phases are conducted by experimenters of different sexes should result in less satiation than a treatment in which the test phase is conducted by a different person, but one of the same sex as the experimenter in the satiation phase. Both treatments should produce less satiation than one in which both phases of the experiment are conducted by the same experimenter.

II. Cross-sex effects will disappear if subjects are equated for prior exposure to agents of both sexes. Specifically, male subjects given a familiarization experience with a female experimenter in the satiation phase will not exhibit a preference for female experimenters in the test phase.

III. The relevance of the dimension of maleness or femaleness in categorizing social stimuli, if demonstrated, increases as a function of development. Specifically, the magnitude of the treatment differences outlined in Hypothesis I
above will be greater in fifth-grade males than in first-grade males.

Subjects

Subjects for this study were 120 males. Sixty of these subjects were enrolled in the first grade with an average age of 7.1 years, and sixty subjects were enrolled in the fifth grade with an average age of 11.0 years. The subjects were drawn from a single elementary school in Westerville, Franklin County, Ohio. The school is predominantly composed of middle-class children. Parental permission was required for participation in the study. One boy from each grade level was excluded as a result of parental preference. Another subject was omitted because of failure to follow instructions in the experimental task. No other selection criteria were applied and subjects were randomly assigned to treatment conditions.

Experimenters

Four experimenters in their twenties, two males and two females, served as data collectors in the study. With the exception of the author, all experimenters were undergraduate students conducting research for credit in a psychology course. Consequently, all were informed of
the purposes and hypotheses of the study. An attempt was made to insure uniformity of procedure by having Es conduct the experiment under observation prior to beginning the actual research.

**Instruments**

Materials for the satiation phase of the experiment were two *Sesame Street* magazines with full-page color illustrations. The apparatus for the experimental task was a marble-dropping game adapted from the device described by Stevenson (1965). The game consisted of two bins, bright yellow in color. One bin was open, containing approximately two hundred colored marbles, roughly a third each of red, blue, and green. The other bin was equipped with a lid in which three 3/4" holes were placed diagonally. Each hole was outlined in a color corresponding to one of the three marble colors. Additional equipment included a manual counter and a stopwatch, both remaining in the possession of the experimenter throughout the experimental sessions.

**Procedure**

The Ss were tested individually in a vacant room provided by the school from which the sample was taken.
Each participating teacher was asked to determine an order of subject testing which could be conveniently managed coincident with the class's activities for the day. Several teachers used alphabetical order, others the seating arrangement of the classroom.

Each S was conducted to the experimental room by the satiating E and was seated beside the E in front of a table upon which the marbles game and the magazines had been placed. The S was asked his first name and birthdate which the E recorded. The E then introduced himself/herself, picked up one of the magazines, turned to the first picture, and said:

I'm going to play this marbles game with you but first I'd like to know you better. Will you tell me a story about this picture?

During the next five minutes, the E emitted the social reinforcement "Good," "This is a good story," or "I like this story" at approximately twenty-second intervals, resulting in fifteen reinforcements over five minutes for each S. If the S finished a story before the five minutes of the satiation period had elapsed, he was presented the next picture with the same request, "Will you tell me a story about this picture now?"

At the conclusion of the satiation period, the E, if in the same-experimenter condition, said:
Please excuse me just a minute. I'll be right back to play the marbles game with you. Wait right here.

In the other-experimenter conditions, the satiating E said:

Please excuse me. I'll send my friend in to play the marbles game with you. Wait right here.

After thirty seconds, the test phase began. The E entered the testing room and introduced himself/herself in the different E treatments. He/She then said:

We are going to play the marbles game now. I think you will like it. See, some of the marbles are red and go in the red hole (points), some of them are green and go in this green hole (points), and some of them are blue and go in this blue hole here (points). Do you understand? Now, in this game you can only pick up one marble at a time and you can only use one hand at a time. You can use all the colors and go as fast or as slow as you want to. I'll tell you when to stop. Ready? Go.

Following these instructions, the S dropped five marbles to determine both his comprehension of the instructions and his initial color preference. The least-represented color was selected as the "correct" response and was reinforced with "good," "fine," or "you're doing fine" from the sixth trial on. The dependent measure was the number of "correct" marbles
dropped over the next hundred trials, excluding the five initial preference trials. The E recorded the reinforced responses on a score sheet shielded from the S's view and the total number of marbles dropped on an audible manual counter. After each twenty marbles dropped, the number of reinforced ones was scored so that the S's responding was in the form of five blocks of trials.

At the conclusion of the test phase of the experiment, the S was told he had done very well, was thanked for his cooperation, and escorted back to his classroom.

**Design**

Ten children at each of the two grade levels were assigned at random to one of the six cells resulting from the 3 (treatment conditions) X 2 (sex of testing E) design. The treatment conditions were as follows:

1. Same E for both satiation and test phases
2. Change in person, same-sex E from satiation to test phase
3. Change in person and sex of E from satiation to test phase

Each treatment was conducted with an E of each sex in the test phase, resulting in six cells:

<table>
<thead>
<tr>
<th>Satiation phase</th>
<th>Test phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. F</td>
<td>F</td>
</tr>
<tr>
<td>2. F</td>
<td>F</td>
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<td>3. M</td>
<td>F</td>
</tr>
<tr>
<td>4. M</td>
<td>F</td>
</tr>
<tr>
<td>5. M</td>
<td>M</td>
</tr>
<tr>
<td>6. F</td>
<td>M</td>
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CHAPTER IV

RESULTS

In order to test the adequacy of the satiation explanation for the occurrence of the cross-sex effect, 120 male subjects were tested on a marble-drop game in which social reinforcement was administered following the S's selection of an arbitrarily-selected "correct" color of marble. After a uniform satiation exposure, Ss were tested by either the same E, a different but same-sex E, or an opposite-sex E to determine whether satiation effects are person- and/or sex-specific.

The number of "correct" responses in each block of twenty trials was subjected to a 3 (treatment) X 2 (sex of testing E) X 2 (age of S) X 5 (trial blocks) analysis of variance. The results of the four-way analysis revealed a significant F for sex of testing E, \( F(1, 108) = 3.92, p < .05 \), indicating that the male E was more effective in conditioning. None of the other main effects or interactions reached the .05 level of significance. The results of this analysis are presented in Table 1.
TABLE 1

ANALYSIS OF VARIANCE OF REINFORCED RESPONSES
GROUPED INTO BLOCKED SCORES

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of S (A)</td>
<td>1</td>
<td>16.33</td>
<td>4.40**</td>
</tr>
<tr>
<td>Sex of E (B)</td>
<td>1</td>
<td>101.68</td>
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<tr>
<td>Treatment (C)</td>
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<tr>
<td>A X B</td>
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<td>27.74</td>
<td>1.20</td>
</tr>
<tr>
<td>A X C</td>
<td>2</td>
<td>2.42</td>
<td></td>
</tr>
<tr>
<td>B X C</td>
<td>2</td>
<td>11.53</td>
<td></td>
</tr>
<tr>
<td>A X B X C</td>
<td>2</td>
<td>29.12</td>
<td>1.26</td>
</tr>
<tr>
<td>Error</td>
<td>108</td>
<td>23.12</td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Trial Blocks (D)</td>
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<td></td>
</tr>
<tr>
<td>A X D</td>
<td>4</td>
<td>25.25</td>
<td>2.28*</td>
</tr>
<tr>
<td>B X D</td>
<td>4</td>
<td>9.70</td>
<td></td>
</tr>
<tr>
<td>C X D</td>
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<td>19.93</td>
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<tr>
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**p < .05
*p < .10
The trial block effect approached significance, \( F(4,\infty) = 1.94, p < .10 \). The mean scores across trial blocks are 6.6, 7.4, 7.7, 7.4, and 7.6, presented graphically in Figure 1. The Neuman-Keuls test of equal means was used to compare the scores across blocks of trials. The results of this test, presented in Table 2, indicate that the first block of trials differs from all the later ones but that there are no differences among them. Conditioning apparently has taken place within the first forty trials.

Because of the small conditioning effect across trials, the dependent measure was collapsed into one score for each subject to facilitate discussion and subjected to a 3 (treatment) X 2 (sex of testing) X 2 (age of S) analysis of variance. The sex of testing is again significant at the .05 level; none of the other effects are. This analysis is given in Table 3 and cell means for the collapsed scores are reported in Table 4.

In order to facilitate discussion of the experimental hypotheses, several nonsignificant interactions are depicted graphically. Figures 2 and 3 present the conditioning curves when scores are subdivided into trial blocks. Figures 4 and 5 utilize only the total number of reinforced responses made over one hundred
FIGURE 1  CONDITIONING ACROSS TRIAL BLOCKS

TABLE 2  NEUMAN-KEULS TEST OF EQUAL MEANS
FOR TRIAL BLOCK SCORES

<table>
<thead>
<tr>
<th>Block</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>5</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>.792*</td>
<td>.858*</td>
<td>1.058*</td>
<td>1.166*</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>.067</td>
<td>.267</td>
<td>.375</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>.200</td>
<td>.308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>.108</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 3

ANALYSIS OF VARIANCE OF REINFORCED RESPONSES
(Collapsed Scores)

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of S (A)</td>
<td>1</td>
<td>85.01</td>
<td></td>
</tr>
<tr>
<td>Sex of B (B)</td>
<td>1</td>
<td>508.41</td>
<td>4.40*</td>
</tr>
<tr>
<td>Treatment (C)</td>
<td>2</td>
<td>16.76</td>
<td></td>
</tr>
<tr>
<td>A X B</td>
<td>1</td>
<td>138.67</td>
<td>1.20</td>
</tr>
<tr>
<td>A X C</td>
<td>2</td>
<td>11.56</td>
<td></td>
</tr>
<tr>
<td>B X C</td>
<td>2</td>
<td>57.26</td>
<td></td>
</tr>
<tr>
<td>A X B X C</td>
<td>2</td>
<td>143.42</td>
<td>1.24</td>
</tr>
<tr>
<td>Error</td>
<td>108</td>
<td>115.57</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05
TABLE 4

MEAN NUMBER OF REINFORCED RESPONSES
(COLLAPSED SCORES)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>First Grade</th>
<th>Fifth Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>F → F</td>
<td>35.5</td>
<td>32.5</td>
</tr>
<tr>
<td>F₁ → F</td>
<td>32.9</td>
<td>36.4</td>
</tr>
<tr>
<td>M → F</td>
<td>36.2</td>
<td>34.3</td>
</tr>
<tr>
<td>M → M</td>
<td>36.6</td>
<td>45.1</td>
</tr>
<tr>
<td>M₁ → M</td>
<td>37.8</td>
<td>37.7</td>
</tr>
<tr>
<td>F → M</td>
<td>36.1</td>
<td>39.2</td>
</tr>
</tbody>
</table>
FIGURE 2  TRIAL BLOCKS X SEX OF E INTERACTION
FIGURE 3

AGE OF S X SEX OF E X TRIAL BLOCKS INTERACTION
FIGURE 4  
AGE OF S X SEX OF E INTERACTION

FIGURE 5  
AGE OF S X SEX OF E X TREATMENT INTERACTION
trials.

Inspection of the results indicates that the treatment conditions contributed very little to the variance. As the treatments were intended to determine to what degree satiation is sex-specific, the inclusion of students from rooms with male teachers at the fifth-grade level was felt to be a possible source of confounding. To examine this possibility, a 2 (sex of teacher) X 2 (sex of E) analysis of variance was conducted on the fifth-grade scores alone. Results of this analysis are shown in Table 5. Neither main effects nor the interaction reached significance. Since, however, the subjects were assigned to treatments without regard for teacher's sex, the unequal numbers in the cells of this analysis necessitated use of the approximate method of unweighted means, a procedure warranting caution in interpreting the results of this particular analysis. The nonsignificant interaction (p < .27) is depicted in Figure 6.
### Table 5

**Analysis of Variance, 2 (Teacher Sex) x 2 (Sex of E)**  
Approximate Method of Unweighted Means

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher sex (A)</td>
<td>1</td>
<td>0.61</td>
<td>0.37</td>
</tr>
<tr>
<td>Sex of E (B)</td>
<td>1</td>
<td>0.21</td>
<td>1.25</td>
</tr>
<tr>
<td>A X B</td>
<td>1</td>
<td>0.20</td>
<td>1.22</td>
</tr>
<tr>
<td>Error</td>
<td>56</td>
<td>0.16</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 6: Teacher Sex X Sex of E Interaction**  
Fifth Grade
CHAPTER V

DISCUSSION

The results are largely inconsistent with the experimental hypotheses. Before examining the predictions in light of the data, it is necessary to note the rather minimal conditioning effect throughout all cells in the design. Analyses indicate that the effects of social reinforcement are slight and have maximum impact within the first forty trials. This meagre conditioning is, of course, consistent with the satiation literature since all children in the study were exposed to a satiation interaction prior to engagement in the criterion task. It is possible, therefore, that the satiation effect takes precedence over subtler effects in these results.

Again, before discussing the results, the very large variances should also be pointed out. Large mean differences may fail to reach statistical significance as a consequence of this variability. The range of scores is from 15 to 77 and it is interesting to note that both extreme scores appear in the fifth grade, male E group.
It is clear that subjects bring individual response biases to the experimental situation that are unaffected by the imposed treatments.

The first experimental hypothesis, that subjects respond differentially to shifts in experimenter and experimenter sex, received no support from these data. In fact, among the smallest F ratios are those interactions in which the treatment conditions enter. Furthermore, there is a nonsignificant tendency for the subjects to respond preferentially to the male experimenter when their satiation experience was also with him. This tendency is in direct contradiction to the prediction that greatest responsivity will result from maximum shifts in the characteristics of the reinforcing agent.

These results indicate that novel social stimuli are not analogous to novel nonsocial stimuli in their effects on subject responding. The present study contributes no evidence that a brief satiation experience with an individual reduces specifically the effectiveness of that person's social reinforcements. Instead, prior interaction seems to depress the subject's susceptibility to all agents. This finding is in disagreement with those of Babad (1972) in which the satiation effect was mitigated by a change in experimenter between the interaction and the test sessions. Babad interpreted his results as
evidence for the person-specificity of the satiation effect, an interpretation not possible in the present study.

One possible source of this difference in results is the different contingencies in the satiation phases of the two experiments. Babad's subjects were seated apart from the experimenter who then emitted a specified number of "good"s as if to himself, noncontingently upon subject behavior. The children in the present sample heard reinforcing comments which seemed directly dependent on their story-telling though actually contingent on time intervals rather than subject performance. It is therefore unclear that Babad's subjects perceived the experimenter as reinforcing since they may have been unaware that the comments were addressed to them. Consequently, his subjects may have learned a certain inattention to a specific experimenter due to the perceived irrelevancy of his comments. A change in experimenter may reflect, in this design, a restoration of social attention. The study of Warren and Cairns (1972), in which satiation effects were observed only if social reinforcement was ambiguous, offers some support for this point of view. If the reinforcement provided information relevant to subsequent task solution, the usual decline in performance following satiation did not appear. Similarly, a study which manipulated changes from social to nonsocial cues
on a learning task demonstrated that changes in relevant cues cause retardation in learning and that this result applies equally to social and nonsocial cues (Barnhart, 1968).

The effect of novelty in enhancing children's responding may require the qualification that it does so only if the novel stimulus serves primarily a reinforcing function. In the event a stimulus also bears information relating to problem solving, novelty may be disruptive.

Social satiation paradigms do not clearly separate the reinforcing from the cuing aspects of social reinforcement. In studies which use rate or persistence as the dependent measures, the belief that there is a correct response may influence the subject's performance in directions not predictable by reinforcement contingencies. Several subjects in the present study verbalized their belief that speed of responding was the experimental focus, and frequently maintained such a high rate of responding that they made mistakes on the only requirement of the task, that they match the color of the marble to the color of the hole into which it is dropped. It is unknown to what extent those subjects were affected by the actual reinforcement contingency. The social comments may have been seen as supporting their prior, erroneous
interpretations of the task's nature.

Stevenson (1965) has stated that experimental tasks to assess motivation for social reinforcement must be ambiguous in regard to correctness of response. Such tasks, however, probably insure that subjects will perceive experimenter comments both as cues for problem-solving as well as rewards for right performance. It is difficult to assume that subjects, particularly those of school age, do not expect their responses to be either right or wrong. During the satiation phase of this study, in which the subject's stories were solicited only in order to have a structure upon which to hang a number of social reinforcements, the experimenters were surprised at the number of boys who expressed concern that they had said the right thing. The confounding of motivation to succeed with motivation for social reward is considered a serious problem in interpreting studies of the deprivation/satiation hypothesis (Eisenberger, 1970) and Babad (1973) has demonstrated that anticipation of contingencies can, by itself, mimic the effects of the actual deprivation and satiation operations.

The absence of any demonstrable effect of the treatment conditions imposed by this study may be attributed to this confounding. If, as seems likely, subjects enter an experimental situation with the expectation that
problem-solving behavior will be required, they may be motivated primarily by the desire to do well and, consequently, regard the comments of the experimenter as informational in character. The results may thus represent at least two tendencies. On the one hand, information-seeking of the subject may be disrupted by introduction of a novel cue source; on the other, because the comments in the satiation phase were not, in fact, helpful in determining the adequacy of his performance, the subject's attention to any experimenter comment may have been somewhat attenuated in the test phase. Jointly, these tendencies may account for the very slight conditioning that took place.

If, in fact, the informational aspects of social reinforcement supercede its reward value in certain cases, the question of independent dimensions of satiation analogous to those in verbal encoding may require additional controls. According to the present evidence, however, social stimuli is not encoded in this way. Nothing resembling a release is found as a consequence of shifts in experimenters between phases of the experimental treatment; instead, there is a nonsignificant tendency for older boys to prefer a male experimenter with whom they are familiar.
One interpretation of these findings is that subjects do not satiate specifically on sex of a reinforcing agent and that this explanation of the cross-sex effect is unsatisfactory. It is possible, of course, that the brevity of the satiation treatment in this paradigm is insufficient to produce sex-specific effects. Boys from the rooms of female teachers did make more correct responses for a male experimenter than did boys from rooms of male teachers, although not significantly so. Further studies may achieve greater clarity on this point by instituting longer and varied satiation periods, dividing the population equally between those with male and those with female teachers, or by studying children from single-parent families. The deprivation/satiation hypothesis, as currently formulated, will require several qualifications in order to provide an adequate explanation of the cross-sex effect.

From the point of view of adaptation, it would appear advantageous that children are not, in fact, highly responsive to unfamiliar persons since the child is, during his earliest years, in contact with only a small number of adults. Inattention to their instructions as a consequence of satiation would severely limit the child's socialization training. Maximum adaptation suggests a progressively heightening sensitivity to
interpersonal cues with increased familiarity rather than the reverse, although unfamiliarity may alert a child to potential danger and so enhance responding on certain types of tasks. Because social directives in natural situations usually convey both information and attachment, it is unclear that a process analogous to release from proactive inhibition is similarly adaptive. Informational and affective stimuli may be relegated to independent systems exhibiting quite different motivational and attentional behaviors in response to novelty.

The second experimental hypothesis predicts that cross-sex effects will disappear as a result of equating subjects' exposure to experimenters of both sexes. The data do, indeed, show that the usual cross-sex effect did not occur. The existence of a significant same-sex effect coincident with no treatment effects whatsoever indicates, however, that the rationale leading to the prediction is not validated by this result. Because the design included only one experimenter of each sex in the test phase, it is possible that the many individual differences in addition to sex are the cause of this effect. The male experimenter may have been more reinforcing because he is warmer, taller, or louder; alternately, the female experimenter may be somehow more satiating in the pretreatment exposure. As Table 4
indicates, the lowest scores are obtained following satisfaction experiences with females. Results specific to the experimenters of this particular study cannot be ruled out, of course, in the absence of random sampling across relevant experimenter characteristics. Research to identify such relevant characteristics has been difficult to interpret (Stevenson and Allen, 1967).

Same-sex effects do appear in the literature (Kohlberg, 1966; Epstein and Liverant, 1963) along with studies in which children of both sexes are more responsive to male than to female experimenters (Baer and Goldfarb, 1962; Rosenblith, 1959, 1961). Though the present study does not allow these two conditions to be distinguished from one another, it is important for further studies to do so. Uniform effects for both sexes, such as both boys' and girls' preferring females as sewing teachers and males for auto mechanics, may result from cultural prescriptions to a large extent. The male experimenter's enhanced effectiveness, if demonstrated for female subjects as well, may reflect the greater authority with which males in school systems are usually empowered.

Demonstration of a same-sex effect, however, would constitute evidence regarding the developmental determinants of sex-role. Should girls in this paradigm exhibit increased responsiveness to females, a likely
interpretation would be that modelling or cognitive labels are important in sex-role development (Kohlberg, 1966). It must be stressed, however, that a recent review of literature relating to the development of sex differences (Maccoby and Jacklin, 1974) found surprisingly little evidence for divergence along sex lines during the course of growth. One documented difference refers to the energizing effect which the presence of males has on the behavior of other males. Comparable results in all-female interactions are not generally demonstrated. Before such an interpretation can be confidently offered for the same-sex effect observed in this study, however, it is clear that a replication with females as subjects must be undertaken.

The third hypothesis, that boys would increasingly utilize sex as a response dimension as a function of age, received no support. The main effect of age was not significant, nor was the age by treatment interaction. Instead, Figure 4 illustrates the nonsignificant interaction between age of subject and sex of experimenter, suggesting that the major contribution to the significant sex of experimenter effect is made by the older group of boys. This tendency accords well with either a male or a same-sex advantage. Older boys might be expected to respond preferentially to same-sex models as their own
sex-role development progresses; similarly, they might also be expected to exhibit greater sensitivity to a male as a cultural symbol of authority or competence.

This study offers little evidence to support any of the current theories of opposite-sex interactions. Its major contribution may be, instead, the difficulty it poses specifically for novelty and satiation explanations of social reinforcer effectiveness. In particular, the data conflict with those of Babad (1972). His study demonstrated that satiation operations are person-specific. The present study was designed to ask if satiation operations are sex-specific as well. Subject to several qualifications, the answer appears to be no. Furthermore, the failure to replicate Babad's findings raises questions about the theoretical importance of seemingly minor methodological variations. As discussed previously, the primary difference between the present study and Babad's is the latter's use of noncontingent reinforcement in the satiation phase.

The results are consistent, on the other hand, with those of studies finding that the cross-sex effect is attenuated by prior nurturant interactions (Gewirtz and Baer, 1958b; Stevenson and Knights, 1962; Patterson, Littman, and Hinsey, 1964; Kaplan, 1970). This qualification of the effect suggests that induced anxiety on
the part of the subject alters his or her perception of
the adult's role from that of a dispenser of information
to that of a dispenser of affection or security. In situa-
tions in which anxiety is allayed by warmth and approval
from the adult, a problem-solving orientation may supplant
the need for approval. Discrimination tasks may be more
susceptible to this motivational ambiguity than a task in
which social reinforcement has no cuing or informational
function, such as the persistence task of Zigler. The
Berkowitz, Butterfield, and Zigler (1965) study demon-
strates that these two measures are not equally sensitive
to experimental manipulations similar to the ones employed
in this study. The persistence measure showed effects as
a function of changing experimenters; the discrimination
' task did not. A replication of the present design with
persistence as the dependent measure should clarify further
the degree to which task ambiguity affects results.

Though the data support none of the proposed hypo-
theses, they do suggest general modifications to theories
of the cross-sex effect. The first of these is that the
effect is quite vulnerable; prior nurturant interactions
and variations in task characteristics are among the
variables which influence it. One explanation for this is
that children are able to make choices between the sexes
on basis of the roles in which they are most competent.
As Johnson (1963) speculates, the mother and father are perceived by their children as having, respectively, expressive and instrumental functions. Children who are exposed to anxiety-arousing conditions may seek opposite-sex reinforcement because they find the opposite-sex parent is typically more sympathetic (Maccoby and Wilson, 1966). Non-anxious children may base preferential responding and imitation on the nature of the task and the sex thought to be more adept in its solution (Bandura and Kupers, 1964; Hicks, 1965). Rosenblith's studies (1959, 1961) suggest a further source of variance; girls exhibit more imitation of task-irrelevant behavior while boys imitate task-relevant behavior.

In conclusion, the present study offers no evidence that satiation, at least in the sense in which the term is used by Gewirtz and his associates, is at the root of the cross-sex effect. Its sensitivity to methodological variations suggests instead that children utilize a certain amount of discriminative ability in selecting models for their behavior.

The results of this study are seen as being in consonance with the view of Mischel (1970):

...the reinforcing consequences produced by behavior in naturalistic life contexts depend not only on the performer's sex and on the context of the behavior, but also
on the particular circumstances in which it occurs and on the social agent who controls outcomes.

In this light, the males in this study perceived the discrimination task as a problem for which the best sources of information were the social comments of the male experimenters, largely due to cultural beliefs regarding the relative competency of men and women.

As always, further research is necessary in order to verify any interpretation. One suggested test involves the induction of anxiety in the subjects. Presuming that the nurturance aspect of social reinforcement then becomes dominant, the subjects might respond preferentially to the female or to the cross-sex agent as a more appropriate source for this type of gratification. A second recommendation is the refinement of the measures currently in use in social reinforcement research in order to separate the effects of fear, attachment, and information-seeking in children's performances. Persistence measures are suggested as being somewhat less influenced by this plurality. An additional clarification of these results will involve male- and female-appropriate tasks and, of course, female as well as male subjects.
CHAPTER IV

SUMMARY

In explanation of the facilitative effect which opposite-sex experimenters have on children's performance for social reinforcement, it has been proposed that, during the course of sex-role development, children satiate on same-sex agents. This satiation renders same-sex reinforcement less effective than that dispensed by opposite-sex agents which is relatively infrequent during this period. This explanation involves the assumption that children perceive the sex of a social reinforcer as a significant determinant of its value.

To test the adequacy of this explanation, sixty males from the first grade and sixty males from the fifth grade were exposed to satiation experiences with an adult experimenter and subsequently tested on a discrimination task in which social reinforcements were administered by the same person, by a different person of the same sex, or by a person of the sex opposite that of the satiating agent. Both sexes of experimenters were included, resulting in a \(2^{\text{age of S}} \times 2^{\text{sex of E}} \times 3^{\text{treatment}}\) design.
The results indicate that the satiation paradigm as currently formulated is inadequate to account for the appearance of the cross-sex effect. The satiation treatment in this study was neither person- nor sex-specific; changes in experimenter did not release the satiation effect. Conditioning effects were modest across all subjects and treatment conditions.

A significant advantage for the male experimenter was interpreted as an indication that context considerations modify children's attention to social influences. The present study is consistent with others which find that cross-sex effects are more likely to appear following isolation or deprivation experiences than following non-threatening interactions of the type used in this research. Apparently, children's needs and their expectations regarding potential gratification of these needs interact in determining their social choices.

Recommendations for future research are expansion of the design to include female subjects, a sample of experimenters of each sex, and sex-typed tasks. A methodological consideration is the interplay of anxiety, attachment, and problem-solving in mediating attention to social reinforcement. Until dependent measures discriminate sufficiently among these motivations, a plurality of theoretical interpretations will remain viable for any
empirical result.
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