Level of Satiation on Social Reinforcers and Valence of the Reinforcing Agent as Determinants of Social Reinforcer Effectiveness

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The joint effect of (a) level of satiation with social stimuli (relative satiation) and (b) attitude of the child toward the reinforcing agent (valence) on social reinforcer effectiveness was investigated. The experiment was conducted in two parts. In Session 1, the valence manipulation, which consisted in showing subjects a film that depicted Experimenter 1 as nice or mean, was performed by Experimenter 1. In Session 2, 3 days later, the relative satiation manipulation was performed by Experimenter 2. The criterion task, administered by Experimenter 1, immediately followed the satiation manipulation. The positive valence condition resulted in longer playing times and faster initial performance on the criterion task. No such effects were found for the satiation variable. Neither valence nor satiation manipulations had a significant effect on the change in rate measure of social reinforcer effectiveness. The relationship among the dependent measures and the failure to replicate earlier relative satiation findings were discussed.

Recent years have witnessed a burgeoning concern with the determinants of adult's effectiveness in reinforcing children's behavior. (See Stevenson, 1965, for a review of the many studies that have been conducted.) This concern is understandable if one remembers that it is the role of parents and other adults as socially reinforcing agents that is central to the socialization process. Therefore, the discovery of those conditions that enhance or diminish an adult's reinforcing properties is a matter of considerable theoretical and practical import. The present article is concerned with two general approaches directed at illuminating this issue. The first of these is the social drive position originally advanced by Gewirtz and Baer (1958a, 1958b). This view maintains that there is a drive for social reinforcement that responds to deprivation and satiation manipulations as do primary appetitive drives. Thus, the child who has been deprived of social reinforcers will evidence an enhanced responsivity to such reinforcement, whereas the child who has been satiated on social reinforcers will evidence an attenuated responsivity.

The second approach is the valence position advanced by Zigler and his co-workers (Berkowitz, Butterfield, & Zigler, 1965; Berkowitz & Zigler, 1965; McCoy & Zigler, 1965; Shallenberger & Zigler, 1961). Within

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this framework the nature of the child's interactions with particular adults determines their effectiveness as reinforcing agents. A positive interaction with an adult results in the adult taking on a positive valence for the child. In subsequent interactions between the child and adult, the positive valence results in an enhanced effectiveness of the adult as a reinforcing agent. Similarly, a negative interaction between a child and an adult results in a negative valence with a subsequent diminution in the adult's social reinforcer effectiveness.

Although both the social drive (Berkowitz, 1964; Erikson, 1962; Gewirtz, 1967; Gewirtz & Baer, 1958a, 1958b) and valence (Berkowitz et al., 1965; Berkowitz & Zigler, 1965; McCoy & Zigler, 1965; Shallenberger & Zigler, 1961) positions have received considerable experimental support, a number of criticisms have been leveled against these positions. The enhanced effectiveness of social reinforcers following a 20-minute isolation period reported by Gewirtz and Baer (1958a, 1958b) in their now classic studies has been reinterpreted by other investigators as being due to general arousal or anxiety effects (Walters & Parke, 1964a, 1964b; Walters & Ray, 1960) and/or general, as opposed to social, stimulus deprivation effects (Hill & Stevenson, 1964; Stevenson & Odom, 1962). It should be noted that these alternative explanations are vitiated considerably by Gewirtz' (1967) recent replication of his earlier findings using a deprivation manipulation free of any arousal or general stimulus deprivation components. However, Gewirtz' new manipulation, which involves varying the number of social reinforcers a child receives prior to performing on the criterion learning task, leaves certain issues unresolved. A possible contaminating feature of Gewirtz' most recent procedure is the fact that the same individual administers both the experimental manipulation and the criterion task. This practice also raises an important theoretical issue. It may be that Gewirtz' recent positive findings were due to his subjects becoming satiated with respect to a specific adult, in which case the analogy between a social drive and primary appetitive drives is considerably weakened. Social drive theory clearly generates the prediction that relative satiation effects should hold across a change in reinforcing agents between the treatment and test situations. However, it should be noted that Gewirtz' analysis of "setting conditions" as determinants of social reinforcer effectiveness (stimulus salience) can account for a reduction in the effects of relative deprivation and satiation treatments on performance when the treatments are administered by an individual other than the one who subsequently reinforces performance. Among the setting conditions that heighten or lower salience of stimuli for behaviors, Gewirtz lists those operating across time as deprivation or satiation contexts, and those operating at the same time as the stimulus, as ground for the stimulus figure. In Gewirtz' (1967) studies, both of these setting conditions may have contributed to the results. (In the present study, only the former will be operative since the ground for the stimulus figure, that is, the reinforcing agent, is not differentially affected by the relative deprivation and satiation manipulations.)

The studies in support of the valence position have also employed a procedure that raises both methodological and theoretical issues. In these studies the experimenter interacted with the child in rigged "learning" situations. The child experienced either failure (negative valence) or success (positive valence) in these treatment conditions and received the corresponding censure or approbation of the experimenter. Here, again, there is a possible contamination of findings due to the experimenter's knowledge of the subject's treatment condition. At a more theoretical level, this procedure raises the possibility that the positive findings were due to a variety of effects (i.e., frustration and/or altered achievement levels) other than the valence ascribed to the adult by the child. It should be remembered that valence refers essentially to the child's positive or negative attitudes toward the experimenter as a person.

Although in certain studies (i.e., Berkowitz et al., 1965) the social drive and valence positions have been pitted against one
another, it should be noted that these effects are not basically antithetical and may indeed be independent determinants of reinforcer effectiveness. A major purpose of the present study was to test this possibility. This was accomplished by independently manipulating relative satiation and valence. The second major purpose of the present study was the introduction of procedures that would result in a more sensitive test of both positions. Unlike the earlier studies, the experimenter conducting the criterion task was unaware of the subject's treatment condition. Furthermore, a purer valence manipulation was employed. Rather than interacting with the experimenter as in earlier studies, the children simply saw a film in which the experimenter was displayed as being either very kind or rather horrid. Thus, the valence manipulation was not contaminated by the subjects' own experiences of success or failure at the hands of the experimenter. Two standard measures of reinforcer effectiveness were employed—the length of time and speed with which the child would play a very dull game in order to obtain social reinforcement.

Method

Subjects

The subjects were 60 second-grade boys from three predominantly middle-class New Haven, Connecticut, elementary schools. Fifty-five were white and 5 were Negroes spread as evenly as possible across experimental conditions. The basic design of the study involved 40 of these subjects who were randomly assigned to one of two valence conditions (positive or negative) and one of two relative satiation conditions (low or high). Twenty additional subjects were run without any valence manipulation (stranger condition)—10 in each satiation condition. These groups were to serve as a "base line" against which to compare the performance of the positive and negative valence groups. They were included for extra information rather than as part of the basic design since it is questionable whether a stranger represents an appropriate neutral point on a positive-negative valence continuum (cf. Berkowitz et al., 1965).

Experimenter

A white male and a white female graduate student served as experimenters. Experimenter 1 (the senior author) was the principal character in the valence films and showed these films to the 40 subjects in the basic design. In addition, she socially reinforced the children on the criterion task. The role of Experimenter 2 was limited to performing the relative satiation manipulations.

Valence Films

A positive and a negative valence film, each approximately 3 1/2 minutes in length, were made. In the negative valence film four boys (similar in age to the subjects) and Experimenter 1 were seated around a table. In the film, Experimenter 1 passed out crayons and paper to the children, telling them to draw and to be quiet while she read. Experimenter 2's manner was cold and hostile. A few whispers by the boys were met with harsh reprimands. When a pair of scissors was accidentally dropped on the floor, Experimenter 1 slammed her book on the table shouting, "I've had enough of this." She then grabbed the children's drawings, crumpled them, and ordered one child to throw them in the garbage. The movie terminated with Experimenter 1 taking out a bag of cookies and some soda saying, "We were going to have cookies and soda today, but I don't like you boys so I'm going to eat them all by myself."

The setting in the positive valence film was identical to that in the negative valence film. Only the behavior of Experimenter 1 differed. She behaved in a warm and supportive fashion, talking with each child about his drawings, giving praise and assistance. The movie ended with Experimenter 1 and the four children sharing soda and cookies.

The impact of the two films was assessed on a group of 41 second-grade children who did not serve as subjects in the experiment proper. Twenty children saw the positive and 21 saw the negative film. Immediately following the film, subjects filled out a series of four Likert-type scales that investigated their opinions about the adult (Experimenter 1) in the movie. On all four scales the children who had seen the positive valence film responded significantly more positively about the adult than did the children who had seen the negative valence film. Following the positive film, as compared to the negative, the children liked the adult more \((p < .01);\) thought she was nicer \((p < .01);\) and said they would be more willing to play a game with her in the future \((p < .05).\) On a more projective scale in which the children were requested to indicate which of three drawings (a scowling face, a neutral face, or a smiling face) looked most like the lady in the movie, children who had seen the positive valence film checked the smiling face significantly more often than children who had seen the negative valence film \((p < .01).\)

Procedure

Valence manipulations. Subjects were taken by Experimenter 1 from their classrooms in groups of four and led to the experimental room. There Experimenter 1 told them that she had a movie made of herself and some children she knew, which she wanted them to watch. Only the tone of voice of Experimenter 1 differentiated the instructions given to subjects in the positive valence condition from those given to subjects in the nega-
the former; cold and businesslike to the latter. Subjects in the stranger valence condition were not shown any film, and they had no interaction with Experimenter 1 prior to the test session.

Relative satiation manipulations. These manipulations were modeled after those recently employed by Gewirtz (1967). Three days after viewing the film, subjects were taken individually from their classrooms by Experimenter 2 and led to the experimental room. There the subject was seated at a table and told to draw some pictures while waiting for the lady with whom he was to play some games. Experimenter 2 sat at the other end of the table and busied himself with paperwork. Every 30 seconds, for subjects in the high-satiation condition, he looked up at the subject and said "good" or "fine" in a randomly determined order. This schedule of stimulation was continued for 10 minutes. Hence, subjects in the high-satiation condition received a total of 20 comments. Subjects in the low-satiation condition received a total of two social stimuli—one after 200 seconds and another after 400 seconds. At the end of the 10-minute treatment period, Experimenter 2 told the subject that he would go and see if he could find Experimenter 1. He walked out the door and a few seconds later Experimenter 1, who was blind to the subject's relative satiation condition, entered. (Showing the valence films to four subjects at a time in conjunction with the time interval between the valence manipulation and the test measure resulted for all practical purposes in Experimenter 1 also being blind to the subject's valence condition.)

Criterion task. Upon entering, Experimenter 1 greeted the subject and led him over to the Marble in the Hole (MITH) game saying, "We are going to play some games today." (See McCoy and Zigler, 1965, for a detailed description of the MITH game.) Instructions to the subjects were as follows:

This is a game we call Marble in the Hole. I'll tell you how to play it. See these marbles. Some of them are yellow and some of them are green. They go in the holes. The green ones go in this hole [Experimenter 1 pointed to the hole on the subject's right] and the yellow ones go in this hole [Experimenter 1 pointed to the hole on the subject's left]. Now show me a green marble. Put it in the hole it goes in. Now show me a yellow marble. Put it in the hole it goes in. You can put as many marbles in the hole as you want to. Just tell me when you want to stop. Remember, when you want to stop, just tell me. O.K.? You may begin now.

During the first minute of play no social reinforcers were dispensed, thus providing a base line for evaluating the effect of later reinforcement on response rate. At the end of the base-line period, subjects received a reinforcer ("good" or "fine") according to a randomly determined schedule after every tenth marble was inserted. When the subject indicated that he wanted to stop, he was told how to play a new game (Part II) in which the holes appropriate to the different color marbles were reversed. Subjects were allowed to play each part of the game for a maximum of 15 minutes.

Three dependent measures were obtained for each subject: (1) persistence—total time spent on the game; (2) base rate—number of marbles inserted during the first minute of play; (3) rate increase following the onset of social reinforcement.

Results

Persistence

Since the means and variances of the total time scores were correlated, each subject's time score was converted to log time. The mean log time spent in the MITH game for each of the groups is presented in Table 1. A 2 X 2 (Valence X Relative Satiation) factorial analysis of variance performed on the log time scores yielded a significant valence main effect \( F = 4.73, df = 1/36, p < .05 \). As can be seen in Table 1, subjects who had seen the positive valence film played longer than subjects who had seen the negative valence film. Neither the relative satiation condition \( F < 1 \) nor the interaction between valence and relative satiation \( F < 1 \) was significant.

In order to discern whether the positive valence was increasing playing time or the negative valence was decreasing it or both, relative satiation conditions were ignored and \( t \) tests were run comparing each of the valence groups to the stranger group. Although the means were in the right direction (positive > stranger > negative), neither \( t \) was significant. A linear trend analysis of variance yielded a marginally significant linear trend effect \( F = 3.89, df = 1/54, p < \)

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<td><strong>MEAN LOG TIME (IN SECONDS) SPENT ON CRITERION TASK BY EACH GROUP</strong></td>
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<tr>
<td>Relative satiation</td>
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The diminished statistical effect for the $3 \times 2$ linear trend analysis as compared with the $2 \times 2$ analysis was due to the large variance in the stranger conditions.

Since it is possible that both valence manipulations attenuate the relative satiation effects found in earlier studies, a $t$ test was performed between the high- and low-satiation stranger conditions. This $t$ proved to be insignificant ($t < 1$).

**Base Rate**

The groups' rate measures are presented in Table 2. All subjects played for at least the 1-minute base-line period. Rate-change scores were computed for only those subjects who played for at least 1 minute following the introduction of reinforcement. A $2 \times 2$ (Valence $\times$ Relative Satiation) factorial analysis of variance performed on the base-rate scores revealed a marginally significant main effect for valence ($F = 2.98$, $df = 1/36$, $p < .10$). As can be seen in Table 2 there was a tendency for subjects who saw the positive valence film to have higher base rates than subjects who saw the negative valence film. Neither relative satiation conditions ($F = 2.17$, $df = 1/36$, $p > .10$) nor the interaction between valence and relative satiation ($F < 1$) was significant.

Summing across relative satiation conditions, two $t$ tests were computed comparing the base rate of each valence group with that of the stranger group. Although these $t$'s were not significant, a linear trend analysis of variance was found to be marginally significant ($F = 3.37$, $df = 1/54$, $p < .10$).

**Rate-Change Score**

For the 32 subjects in the basic design and for the 16 subjects in the stranger condition who played for at least 1 minute following the onset of reinforcement, a rate-change score was computed by subtracting the subject's base rate from his mean rate for reinforced minutes in Part I of the task. (Although it was thought that the most meaningful rate-change score was that obtained between the base line and Part I, a change score was also computed between the base line and total time. Both rate-change scores resulted in comparable findings.)

The finding that lower base rates were correlated with higher change scores ($r = -.27$) made a straightforward analysis of variance on the change score data unsuitable. Analysis of covariance, with base rate as the covariate, was also inappropriate since the within-cell correlations were not homogeneous. Consequently, the subjects were divided at the median of their base rates and a $2 \times 2 \times 2$ (Base Rate $\times$ Valence $\times$ Relative Satiation) factorial analysis of variance was performed on the change scores. No significant effects were found for base rate ($F = 1.81$, $df = 1/24$) or valence ($F < 1$) and none of the interactions approached statistical significance. There was a slight tendency for high-satiation subjects to have smaller change scores than the low-satiation

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<th>Relative satiation</th>
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<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>Stranger</td>
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<tr>
<td>Base rate</td>
<td>Rate change</td>
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<tr>
<td>Low</td>
<td>22.5</td>
<td>+2.59</td>
<td>19.3</td>
<td>+3.84</td>
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<td>(N = 10)</td>
<td>(N = 9)</td>
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<td>(N = 6)</td>
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<tr>
<td>High</td>
<td>25.3</td>
<td>+1.46</td>
<td>21.9</td>
<td>+0.60</td>
<td>21.4</td>
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<td>(N = 10)</td>
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subjects \((F = 2.40, \text{df} = 1/24, p < .15)\). A further analysis of the change scores was done including the stranger subjects. As in the first analysis, no significant findings were obtained.

**Other Findings**

In view of the controversy concerning rate measures of social reinforcer effectiveness (Parton & Ross, 1965, 1967; Stevenson & Hill, 1966), the stability of each subject’s rate of responding was assessed. Correlations were computed between the mean rates for odd versus even minutes of total reinforced playing time. These correlations for the six groups proved to be quite high, five in the .90s with the sixth being .81. Ignoring experimental conditions, the correlation between total log playing time and base rate was \(r = .15\). The correlation between total log time and change in rate was found to vary with the experimental manipulations. The within-cell correlations were as follows: positive low satiated, \(r = -.37, n = 9\); positive high satiated, \(r = +.89, n = 9 (p < .01)\); negative low satiated, \(r = +.19, n = 6\); negative high satiated, \(r = -.06, n = 8\); stranger low satiated, \(r = +.62, n = 8 (p < .10)\); stranger high satiated, \(r = +.24, n = 8\). While these correlations suggest that persistence and rate change are not equivalent measures of social reinforcer effectiveness, they should be interpreted with care due to the small cell \(n\)’s.

**Discussion**

The findings obtained on the persistence measure were generally in keeping with the valence position. As in the earlier studies, children who performed a dull task in order to obtain the social reinforcers dispensed by a positively valenced adult persisted longer than children who performed for a negatively valenced adult. To the extent that a faster playing time reflects the enhanced reinforcer effectiveness of the adult, further support for the valence position was found in the base-rate data. Parallel to the persistence findings, children playing with the positively valenced adult had higher base rates than those playing with a negatively valenced adult. The valence findings in the present study do not appear to present the interpretive difficulties of the earlier valence investigations. The use of films resulted in a valence effect uncontaminated by such factors as the child’s success or failure experiences that were inherent in the valence manipulations employed in earlier studies.

No valence effects were found on the rate-change measure. It may be that rate change over a nonreinforced base rate is a poor dependent measure to use for assessing the effectiveness of reinforcement when the experimental manipulations themselves can influence the base rate.

The present study offers little support for the social drive position. No significant effects of relative satiation conditions were found on the three measures. Consistent with the social drive formulation, there was a tendency \((p < .15)\) for low-satiation subjects to show a greater increase in rate as a function of reinforcement than high-satiation subjects.

The question is raised of why the relative satiation effects reported earlier were not replicated in the present study. This study differed from earlier ones in three important respects: (a) the experimenter was unaware of the subject’s relative satiation condition; (b) the subjects were relatively satiated or deprived of social reinforcers by an adult other than the one administering the criterion task; and (c) different measures of social reinforcer effectiveness were employed. Several possibilities are thus raised. It is an open question of exactly how much the effects reported in earlier studies were influenced by the experimenter’s knowledge of the subject’s relative satiation condition. It should be noted, however, that the dependent measures employed in earlier studies do not appear to be highly susceptible to experimenter bias effects.

The failure to find relative satiation effects with a change of experimenters does raise an intriguing theoretical issue. Rather than reflecting general social drive effects, the earlier positive findings may have been due to the subject’s social motivation toward the particular adult who administered both the relative satiation manipulations and the criterion task. Within Gewirtz’ (1967) formulation this would suggest that the “setting conditions” responsible for his findings were
not deprivation or satiation contexts operating across time, but rather those setting conditions operating concurrently with the reinforcing stimulus, that is, the reinforcing agent as ground for the emitted social stimuli. Whichever language one chooses to use, these interpretations, if valid, would require an important revision in the social drive position as originally formulated.

A final word is in order concerning the different dependent measures employed in the present as compared with the earlier relative satiation studies. In the earlier studies, a preference measure was employed, whereas in the present study, persistence and rate measures were used. Exactly what constitutes a satisfactory measure of social reinforcer effectiveness has become an extremely thorny issue in social reinforcement research (Parton & Ross, 1965, 1967; Stevenson & Hill, 1966). It is not terribly surprising that the rate measures did not produce significant relative satiation effects. As noted above, rate scores may simply be insensitive indicators of social reinforcer efficacy in the present design. The failure to find relative satiation effects on the persistence data presents a less easily answered question for social drive theory. There is nothing in the theory which suggests that a persistence measure would be insensitive to relative satiation effects. Within the framework of the social drive position it seems quite reasonable to expect a child who is relatively satiated with positive verbal stimuli to stop performing a dull task sooner than a child who is relatively deprived when the only reward for continuing is a "good" or a "fine" after every tenth response. The possibility that the highly satiated subjects wanted to stop playing sooner but were reluctant to do so is ruled out by the ease with which subjects in the negative valence criterion terminated play. There is, of course, the possibility that persistence and preference measures reflect different aspects of the child’s social motivation. This issue could be clarified by assessing the effects of valence and relative satiation manipulations across a number of conventional measures of social reinforcer effectiveness. If differences between measures are found, both the social drive and valence formulations would be forced to deal with the issue of how particular types of preliminary social interactions arouse particular motive states that spell themselves out in differential behaviors.

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