A large body of evidence has accumulated over the years demonstrating that behavior is controlled by its consequences. Until recently, however, investigations of reinforcement processes have been essentially confined to operations in which experimenters imposed particular contingencies upon subjects and administered reinforcing stimuli to them whenever the appropriate responses were performed. As a result, reinforcement has been generally equated with the performance-regulating functions of directly experienced consequences arising from external sources.

Under naturalistic conditions, reinforcement typically occurs within a social context. That is, people continually observe the behavior of others and the occasions on which it is rewarded, ignored, or punished. As will

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be shown later, observed rewards and punishments can play an influential role in regulating behavior. Observed consequences also provide a reference standard that determines whether a particular reinforcer that is externally administered will serve as a reward or as a punishment. Thus, for example, the same compliment is likely to be punishing for persons who have seen similar performances by others highly acclaimed, but positively reinforcing when others have been less generously praised.

Traditional research on reinforcement has established the relational character of reinforcing events by demonstrating that the same stimulus can have rewarding or punishing effects on behavior depending upon the nature, frequency, or magnitude with which subjects’ performances were previously reinforced. However, incentive-contrast effects, resulting from discrepancies between observed and directly experienced consequences, have received relatively little attention. Most human behavior, of course, is not controlled by immediate external reinforcement. Rather, people regulate their own actions to some extent by self-generated anticipatory consequences. This provides the stimulus for foresightful behavior. Homeowners, for instance, do not wait until they experience the discomfort of a burning house to buy fire insurance; housewives do not rely on painful hunger pangs to prompt them to purchase groceries; and usually, motorists do not wait until inconvenienced by a stalled automobile to replenish gasoline. Alternative courses of action are often initially performed covertly and either discarded or retained on the basis of anticipated outcomes. By engaging in symbolic trial and error, people are spared the hazards and travail involved in the enactment of ineffectual or detrimental modes of response. Thus, through representational mechanisms, future consequences can be converted into current stimuli that are functionally similar to external physical stimuli in their capacity to influence behavior.

Behavior can be self-regulated, not only by anticipated social and other external consequences, but also by self-evaluative responses to one’s own behavior. In preparing manuscripts, for example, authors engage in extensive self-corrective editing of their own writing performances until they are satisfied with what they have written. The self-editing often exceeds external requirements of what would be satisfactory to others. Similarly, in most other areas of functioning, people set themselves certain performance standards and respond to their own behavior in self-rewarding and self-critical ways in accordance with their self-imposed demands. Anticipation of self-disapproval for personally devalued actions provides an additional motivating influence to keep behavior in line with adopted standards. Such self-monitoring reinforcement mechanisms can serve to alter and to maintain behavior when external reinforcing feedback is absent or operates in conflicting directions. The present paper
examines in some detail the functional properties of vicarious and self-reinforcing events and the psychological mechanisms through which they regulate human behavior.

**Vicarious Reinforcement**

Vicarious reinforcement is defined as a change in the behavior of observers as a function of witnessing the consequences accompanying the performances of others. It should be emphasized here that vicarious reinforcement is simply a descriptive term referring to response changes produced by observed consequences; it does not contain any explanation of their effects. Relevant evidence will be cited later to support five different mechanisms through which vicarious reinforcement can operate to modify behavior.

**Vicarious punishment** is indicated when observers show either decrements in the modeled class of behavior or a general reduction of responsiveness as a result of seeing performers experience negative response consequences. The effects of observed punishment are difficult to evaluate because it contains two major stimulus components that generally operate in opposing directions: When modeled actions are subsequently punished, the power of modeling stimuli to increase matching behavior in observers is counteracted by the suppressive effects of adverse outcomes. Under conditions where these opposing influences are of comparable strength, persons who have observed modeled behavior punished and those who have had no exposure to the model may display an equally low incidence of response. Indeed, in experiments involving novel modeled behavior that is rarely performed by control subjects, vicarious punishment that produced complete response suppression would equal the zero control baseline but exceed it if the facilitative effects of modeling were only partially nullified. The capacity of vicarious punishment to reduce matching behavior is sometimes mistakenly questioned (Rosekrans and Hartup, 1967) on the grounds that model-punished and no-model conditions produce equally low rates of imitative behavior. Clarification of the influence of observed punishment, therefore, requires a comparison condition in which subjects observe the same modeled behavior without any evident consequences to assess the contribution of the modeling component. Nor can the reductive effects of seeing others experience negative outcomes be revealed in studies where control subjects, for one reason or another, fail to perform the relevant responses even though they exist in their repertoires and are situationally prompted (Stein, 1967).

The inhibitory effects of observed punishment have been assessed by several different methods. Crooks (1967) measured response decrements
from baseline levels after subjects had observed a model punished for performing one set of responses but experienced no adverse outcomes for alternative behavior. Differential vicarious punishment virtually eliminated in observers the negatively sanctioned behavior, whereas responses that incurred no consequences were performed at an undiminished rate.

Several experiments have been conducted (Bandura, 1965b; Bandura, Ross, and Ross, 1963) in which observers were shown a film depicting a model engaging in novel aggressive behaviors that were either rewarded, punished, or unaccompanied by any consequences. Postexposure tests revealed that subjects who had witnessed aggression punished performed significantly fewer matching responses than subjects in the aggression-rewarded or the no-consequence groups (Fig. 8-1). These differences were especially marked among girls for whom physical aggression is generally labeled sex-inappropriate and negatively sanctioned. In order to determine whether the obtained differences reflected response inhibition or learning deficits, subjects in all three groups were later given highly attractive incentives contingent upon their reproducing the aggressive responses that they had previously seen modeled. Boys who had previously observed the model either rewarded or experience no consequences performed under

![Graph](image)

**FIGURE 8-1.** Mean number of different matching responses performed by children as a function of response consequences to the model and positive incentives for reproducing the model’s behavior. (Bandura, 1965b.)
positive reinforcement all of the aggressive responses that they had learned, and no additional matching responses emerged. On the other hand, boys who had observed the model punished, and girls in all three treatment conditions, displayed significant increments in imitative behavior when they were rewarded for performing matching responses. The inhibitory effects of observed punishment are thus revealed in both the intergroup and the intrasubject differences in imitative aggressive behavior.

The foregoing studies demonstrate the inhibitory influence of observed adverse consequences to a model on the aggressive behavior of viewers. Walters and his associates (Walters, Leat, and Mezei, 1963; Walters and Parke, 1964; Walters, Parke, and Cane, 1965) have likewise shown that witnessing peer models punished for transgressive behavior increases observers' inhibition of deviant behavior when tempted with prohibited objects, as compared with conditions in which modeled transgressions are either rewarded or go unpunished. Results of a comparative study by Brenton (1967) indicate that, under some conditions, observed and directly experienced punishment may be equally efficacious in reducing deviant behavior. Children who observed peers punished for engaging in prohibited activities later showed the same amount of response inhibition as the punished performers.

Another method of assessing the effects of observed punishment is to use compound procedures in which different types of vicarious reinforcement serve as successive components. Rosekrans and Hartup (1967) measured imitative aggression in children who had observed the aggressive behavior of a model consistently rewarded, consistently punished, or successively rewarded and punished. Observation of successive reward and punishment of modeled aggression produced significantly less imitative behavior than consistent reward, but more than consistent punishment. These findings show that observed punishment attenuates the behavioral enhancement effects of rewarding consequences to the model. In accord with previous findings, consistent vicarious punishment reduced imitative responses to the near zero baseline of control subjects who had observed no model.

All of the preceding studies employed externally administered punishment to a model in the form of verbal reprimands or physically aversive consequences. In many instances, persons respond with self-punitice and self-devaluative reactions to their own behavior that may be considered permissible, or even rewardable, by external agents. Numerous experiments, which will be discussed in detail later, demonstrate that witnessing punishments self-administered by a model have inhibitory effects on observers with respect to devalued achievements. Observation of self-produced consequences by a model have also been shown by Porro (1968)
to have similar effects on transgressive behavior. For children who viewed a filmed model exhibiting self-approving responses to her transgressions, 80 per cent subsequently handled toys that were forbidden to touch, whereas the transgression rate was only 20 per cent for children who had observed the same model responding self-critically toward her own transgressions.

Behavior can be enhanced as well as reduced by observed outcomes. *Vicarious positive reinforcement* is evident when observers display an increase in matching behavior as a function of observing rewarding consequences to a model. It is of interest to note that, when models exhibit modes of behavior that are ordinarily inhibited, the absence of anticipated punishing consequences increases matching behavior in observers to the same degree as witnessing models rewarded (Bandura, 1965b; Marlatt, Jacobsen, Johnson, and Morrice, 1970; Walters and Parke, 1964; Walters, Parke, and Cane, 1965). The disinhibitory effects of observing transgressions going unpunished have also been convincingly demonstrated by, among others, Blake (1958), Ross (1971), and Wolf (1969). These findings indicate that to the extent that omission of anticipated punishment conveys permissiveness and produces vicarious fear extinction, behavioral restraints are thereby reduced and formerly inhibited responses are performed more freely. For this reason, experiments modeling prohibited behaviors that can be readily disinhibited through absence of consequences provide no clear evidence for the occurrence of positive vicarious reinforcement.

Results of numerous experiments involving neutral or positively sanctioned behaviors generally show that observed rewards augment matching responses compared to conditions in which exemplified actions produce no evident consequences. Thus, for example, vicarious positive reinforcement, either independently or in interaction with other variables, has been found to increase adoption of high performance standards of self-reinforcement (Bandura, Grusec, and Menlove, 1967a); novel food preferences (Barnwell, 1966); object preferences (Liebert and Fernandez, 1970); and choice behavior (Clark, 1965). Observation of the response outcomes of others also tends to enhance diverse psychological functioning, including motor responding (Kelly, 1966); verbal conditioning (Kanfer, 1965; Marlowe, Breecher, Cook, and Doob, 1964; Marston, 1966); and acquisition of conceptual behavior (Flanders and Thistlethwaite, 1969).

There are certain conditions, of course, under which observed reinforcement may have opposite effects upon recipients and observers. In an experiment conducted by Sechrist (1963), pairs of subjects solved similar problems concurrently, and, although both achieved correct solu-
tions, the performance of only one of the pairmates was either praised or criticized. A subsequent test on a related task revealed that witnessing others rewarded for equivalent performances operates as a punisher in decreasing the efforts of ignored participant observers. Conversely, seeing others criticized for comparable performances that are accepted without comment in observers is functionally similar to a positive reinforcer. Sechrest speculated that these “implicit” reinforcement effects are most likely to obtain in competitive situations where small groups of people engage concurrently in similar activities and where they achieve roughly comparable levels of performance that are plainly evident. Likeness in status and performance would undoubtedly create anticipation of similar response outcomes.

Implicit reinforcement should be distinguished from vicarious reinforcement. In the latter phenomenon, observers do not perform any responses during the influence period and, therefore, the model’s outcomes have no immediate personal consequences for observers. By contrast, in implicit reinforcement, individuals perform responses that are explicitly reinforced in some members and implicitly rewarded or punished in others. When the same deserving performances are praised in one case and ignored in the other, the slighted person is not only exposed to observed outcomes, but he experiences immediate direct consequences to his own behavior, which can have rewarding, punishing, or extinctive effects.

Relative effects of direct and vicarious reinforcement. Several experiments have been conducted in which behavioral changes in performers whose responses are directly rewarded are compared with those of observers who simply watch the reinforced performances. Results of some of these investigations are difficult to interpret, however, because they fail to include a group of observers who witness the model’s behavior without consequences which can, in itself, significantly increase appropriate responding (Bandura, 1962; Marston, 1965a; Phillips, 1968; Simon, Dichtchis, and Jamison, 1965). When the necessary control conditions are employed, exposure to modeled responses combined with reinforcing consequences to the model generally produces greater response changes in observers than modeling alone.

One would ordinarily expect direct reinforcement to exceed vicarious reinforcement in its capacity to maintain responsiveness. However, in some studies comparing discriminative responding under direct and vicarious reinforcement (Berger, 1961; Hillix and Marx, 1960; Marlatt, 1968; Rosenbaum and Hewitt, 1966), observers surpass reinforced performers on the same task. This somewhat surprising finding is attributed to the detrimental effects of interfering responses evoked by overt performance
and associated consequences. The interference may take several different forms. Persons who are absorbed in the task of creating, selecting, and enacting responses are slower to discern the response-reinforcement contingencies operative in the situation than the observers (Kanfer, 1965). Given valued incentives, knowledge of the responses required to produce reinforcement results in substantial increments in performance. When reinforcing stimuli have strong affective properties, anticipation of consequences by the performer can increase emotional arousal beyond optimal levels. Finally, direct experience of rewarding or punishing stimulation may be temporarily distracting, or it may create emotionally disruptive effects. Observers, on the other hand, can give their undivided attention to discovering the essential performance requirements of the situation.

Evidence supporting the relative superiority of vicarious reinforcement should be accepted with reservation for several reasons. The experiments on which this evidence is based simply require subjects to learn to discriminately perform responses that already exist in the repertoires of observers and performers. Consequently, selective vicarious reinforcement mainly serves an informational function in helping observers to identify the types of responses that bring rewards or punishments. As previously noted, this form of discrimination learning is apt to be hindered rather than aided by overt performance. However, on tasks involving the acquisition of new complex skills, reinforced performance would probably prove more efficacious than observation alone, particularly in response learning that requires abstracting subtle common properties from otherwise different instances and in developing skills containing important motoric components. It should also be noted that the studies have not demonstrated that vicarious reinforcement alone can sustain effortful behavior over a long period, which is usually the major function of direct reinforcement. One would not recommend to employers, for example, that they maintain the productivity of their employees by having them witness a small group of workers receiving paychecks at the end of each month. The overall findings indicate that vicarious reinforcement alone can have strong short-term behavioral effects. Moreover, as will be shown next, observation of other people's outcomes can have a continuing influence on the effectiveness of direct reinforcement by providing a standard for judging whether the reinforcements one customarily receives are equitable, beneficial, or unfair.

Since both direct and vicarious reinforcement inevitably occur together under natural conditions, the interactive effects of these two sources of influence on human behavior are of much greater social significance than their independent controlling power. It has been convincingly demonstrated (Premack, 1965) that reinforcement value is a relational rather
than an absolute property of contingent events. Findings based on studies of contrast of reinforcement, which are especially pertinent to the issue under discussion, lend further support to the view that the potency of a given reinforcer is largely determined by its relational rather than by its intrinsic properties. Buchwald (1959a,b) has shown that nonreward following punishing outcomes functions analogously to a positive reinforcer, whereas nonreward subsequent to a series of rewards operates as a negative reinforcer. In fact, even a weak positive reinforcer, when contrasted with more rewarding prior events, assumes negative reinforcing value (Buchwald, 1960).

The incentive-contrast effects demonstrated through variation in magnitude of reward that the same individual receives at different times also occur between individuals on the basis of social-comparison processes. In most situations, the consequences that individuals consider appropriate or equitable for given performances are not defined by the characteristics of the behavior itself. Rather, the outcomes experienced by others create expectations in observers about the type, the rate, and the magnitude of outcomes that will accompany similar performances. Hence, the effects of observed outcomes may serve as important determinants of the efficacy of directly administered reinforcers. As a rule, the reinforcing value of received rewards should be enhanced by favorable contrast with previously observed reinforcement, and decreased by unfavorable comparison.

Research is lacking on the behavioral effects of discrepancy between magnitude of observed and experienced outcomes. However, findings of several studies that are reviewed later demonstrate that observed schedules of reinforcement influence the persistence and vigor with which observers subsequently perform similar behavior under conditions of zero reinforcement. A number of experiments have been reported, however, in which the independent and interactive effects of vicarious and direct reinforcement are compared. In a study conducted by Kanfer and Marston (1963b), groups of subjects heard a tape recording of a model expressing in a free interview progressively more human nouns (e.g., hand, mouth, ear, leg, face and so forth) which were either consistently socially reinforced or were not accompanied by approving remarks. Later, subjects participated in a similar verbal-conditioning situation during which their verbalizations of human nouns were reinforced with social approval or accepted without comment. A control group performed the same task without any vicarious or direct reinforcement to furnish a baseline response rate. As shown in Fig. 8-2, performance of the appropriate response was unaffected by direct reinforcement alone, but was significantly increased by vicarious reinforcement. The combination of vicarious and direct reinforcement, however, produced the highest response rate and
the slowest extinction after approval for human nouns was discontinued. The authors attributed the ineffectiveness of direct reinforcement alone to the fact that most subjects never exhibited any of the required responses that could be reinforced.

Marlatt (1968) investigated the relative influence of vicarious and direct reinforcement, in the form of either positive, negative, or neutral feedback, when administered alone and in all possible combinations of these different types of reinforcement. The findings are summarized in Fig. 8-3. Positive vicarious reinforcement produced greater and more enduring changes in verbal behavior than did direct positive reinforcement. In the case of punishing consequences, however, both direct and vicarious negative reinforcement had comparable reductive effects on behavior. The data furthermore revealed that prior vicarious reinforcement, depending on its nature, can augment or diminish the behavior changes subsequently
FIGURE 8-3. Mean number of correct responses performed by subjects who received vicarious (VR) or direct reinforcement (DR) either independently or in various combinations. The symbols +, −, and n refer to approving, disapproving, and neutral feedback, respectively. (Marlatt, 1968.)

achieved through direct reward or punishment. Condrell (1967) and Ditrichs, Simon, and Greene (1967) similarly found that responsiveness to direct reinforcement was dependent upon previous vicarious reinforcement.

The foregoing results, and additional findings reported later, support the conclusions that the influence of direct reinforcement administered under social conditions cannot be understood fully without considering the effects of vicarious reinforcement. Social-comparison variables may alter the reinforcing value of given outcomes in more complex ways than has been investigated so far. The degree to which observers are influenced by witnessing the outcomes accruing to others undoubtedly depends upon the social rank, status, or role occupied by reinforced performers. Observers are more apt to be affected by comparison of their own outcomes with those of others whom they consider comparable to themselves than with the reinforcement schedules of persons who possess a dissimilar status. One would expect observed consequences to be least influential under conditions where observers have reason to believe that the model’s
contingencies do not apply to themselves. It is unlikely, for example, that witnessing social approval for physical aggression performed by a person occupying a unique role, such as a soldier, would enhance imitative aggressiveness in observant citizens to any great extent. Therefore, experiments are needed that test the magnitude of vicarious-reinforcement effects as a function of comparability of the contingencies and amount of reinforcement customarily applied to models and to observers.

**Interpretation of vicarious-reinforcement effects.** The previously reported research provides ample evidence that, like the effects of direct reinforcement, responses in observers can be increased by observed reward and decreased by observed punishment. Moreover, vicarious-reinforcement effects are partly determined by incentive variables such as the percentage, intermittency, and magnitude of reinforcement in essentially the same manner as when they are administered directly to performers. Witnessing others experiencing rewarding or punishing consequences can create diverse psychological effects and, hence, several mechanisms may be responsible for the changes accompanying vicarious-reinforcement operations (Bandura, 1965a). These alternative explanations are discussed in the sections that follow.

**Informational function.** Reinforcing stimuli not only function as rewards but they also convey information. By observing the differential consequences produced by variations in their behavior, performers develop and confirm hypotheses about the types of responses required to obtain or to avoid punishment. The acquired information can result in substantial increases in appropriate responding given adequate incentives (Dulany, 1968; Spielberger and DeNike, 1966).

One possible explanation of vicarious reinforcement is in terms of the discriminative or informational function of reinforcing stimuli presented to the model. Response consequences experienced by performers undoubtedly also convey information to observers about the probable reinforcement contingencies associated with analogous performances in similar situations. Knowledge concerning the types of responses that are likely to meet with approval or disapproval can, through self-instructional influences, later aid in facilitating or inhibiting matching behavior. Information gained from observed outcomes would be particularly influential in regulating behavior when ambiguity exists as to what actions are permissible or punishable, and where the observer believes that the models' contingencies apply to himself as well.

It would be predicted from the informational interpretation of vicarious reinforcement that under conditions where the correct responses are easily discernible and subjects are either required or willing to perform the
selected behavior, observed consequences are unlikely to serve as a contributing influence to behavior change. The findings of Flanders and Thistlethwaite (1969) and Liebert and Fernandez (1970) that vicarious reward does not facilitate accurate performance when subjects are required to select responses in simple discrimination tasks support this assumption. The fact that observers may identify the relevant responses from witnessed differential consequences does not necessarily mean that observers will subsequently perform what they have learned. An informational explanation alone cannot account for the differential effects that vicarious reinforcement has on observers who are equally aware of the proper behavior. Observed reinforcement is not only informative, but it can also have important motivational effects which are discussed later.

When modeled behavior is repeatedly reinforced, observers gain information about the manner in which people respond to social influence as well as what responses are considered appropriate. An experiment by Ditriuchs, Simon, and Green (1967), in which models increased, decreased, or did not alter rewarded behavior, reveals that depicted influenceability subsequently affects observers' responsiveness to direct reinforcement. Children who observed models giving progressively more hostile responses for social approval later substantially increased their own output of hostile responses under positive reinforcement, whereas when models either progressively reduced their performance of rewarded behavior or responded in random fashion, observers did not modify their expression of similar responses even though they were positively reinforced.

Stimulus enhancement effects. In most studies of vicarious reinforcement, models are preinstructed to display certain responses at designated times, but no environmental cues are provided to signify the likely consequences for performing similar behavior under different stimulus conditions. Hence, in nondiscriminated modeling, observers can gain information only about the likelihood that given responses may be either rewarded, punished, or ignored. Under natural circumstances, however, the same modeled behavior is often differentially reinforced depending upon the persons toward whom it is directed, the social settings in which it is expressed, and other environmental factors. When differential consequences are correlated with different stimulus conditions, the model's responses and reinforcing outcomes may enhance the distinctiveness of the relevant environmental stimuli by drawing the observers' attention to them (Miller and Dollard, 1941). This attention-directing function of vicarious reinforcement enables observers to more readily identify the situations in which the modeled behavior is considered appropriate and reinforceable. The resultant discrimination learning can later facilitate performance of matching responses in the presence of the cues to which the model previously had been responding with favorable consequences.
The development of stimulus control through discriminated modeling has been investigated in numerous studies (Church, 1957; McDavid, 1962, 1964; Miller and Dollard, 1941; Wilson, 1958). These experiments typically employ discrimination tasks in which the correct-choice responses of the model are associated with distinctive environmental cues. During the imitation phase of the study, observers are exposed to the compound stimulus containing both the social cue of the model's rewarded choices and the environmental cue to which the model responds. Later, observers are tested for the extent to which they use the environmental cue alone to guide their choice behavior when the model is absent from the situation. The results generally show that, when models always respond to the reinforced stimulus, and hence modeling and environmental cues are perfectly correlated, observation of reinforced performances facilitates discrimination learning as compared to selective reinforcement of trial-and-error responding without the benefit of prior vicarious reinforcement (Miller and Dollard, 1941; Wilson, 1958). On the other hand, discrimination learning may be retarded when modeling cues and the relevant environmental stimuli are only partially correlated (McDavid, 1962, 1964). As long as models are successful most of the time, observers may become excessively dependent on modeling cues and less disposed to attend to pertinent environmental stimuli.

Taken together, the findings just discussed and those reported in the preceding section disclose that vicarious reinforcement can serve an informative function not only by singling out reinforceable responses, but also by identifying the specific social and environmental situations in which it is appropriate to perform the behavior.

Incentive-motivational effects. After certain actions have been repeatedly reinforced, a performer ordinarily comes to anticipate the rewarding or aversive outcomes. Anticipation of reinforcement can serve a motivating function that has incremental or decremental effects on behavior depending on the forms the anticipatory outcomes take. Countless studies of performance changes arising from variations in the amount, quality, delay, and probability of reinforcement have convincingly demonstrated that incentives function as motivators (Bolles, 1967; Logan and Wagner, 1965). In fact, under some conditions, expected rewards can exercise more powerful control over behavior than the conditions of reinforcement that are actually in effect.

Kaufman, Baron, and Kopp (1966) gave students either accurate or erroneous information concerning the schedule according to which their behavior would be rewarded. One group of students was accurately informed that rewards would be forthcoming each minute on the average (VI-1), whereas other groups were misled into believing that their behavior would be reinforced either on a fixed interval of one minute (FI-1),
or after they had performed 150 responses on the average (VR-150). Subjects then performed the task and their responses were in fact reinforced on a variable-interval schedule with reinforcements being administered one minute on the average. The illusory schedules governed students' responsiveness in much the same way as they do in reality: Anticipated fixed-interval reinforcement produced exceedingly low rates (median responses = 6); expected variable-ratio reinforcement maintained an extremely high-response output (median = 260); and anticipation of reinforcement on a variable-interval schedule generated intermediate rates of response (median = 66). Alleged schedules thus outweighed the influence of the program of reinforcement that was actually imposed on students' behavior.

Observation of another person's reinforcing outcomes may affect the motivation of observers in much the same way as incentives activate and sustain the behavior of performers. To the extent that the sight of desired reinforcers arouses in observers expectation of similar reward, one would expect their imitative performances to be enhanced. Thus, for example, witnessing a performer rewarded with a culinary treat for executing a given sequence of responses will convey the same amount of information about the probable reinforcement contingencies to a famished and to a satiated observer, but their subsequent imitative performances will, in all likelihood, differ radically because of the differential effects of deprivation state on the activating power of the anticipated rewards. As shown in the findings discussed next, incentive-generated motivation in observers is most likely to affect the speed, intensity, and persistence with which matching responses are executed.

An experiment reported by Bruning (1965) illustrates how variations in the magnitude of observed rewards, while providing equivalent information about the matching responses required for reinforcement, produce different motivational effects on observers. Children who observed a performer generously rewarded, subsequently responded more rapidly when they received smaller rewards for performing the same responses, whereas when observed rewards were smaller than the ones observers later received, they decreased their rate of responding. Shifts in magnitude of reinforcement produced analogous changes in the speed with which the performing models accomplished the responses. These unexpected effects that reversal in the amount of reinforcement had on performance were attributed by Bruning to frustrative motivational effects in the decremental-reward condition, and to satiation effects in the treatment involving incremental reward.

Several experiments have been conducted in which performing models are reinforced during acquisition either continuously or on a partial
schedule, after which response strength is measured in both models and observers on nonreinforced trials. Results of these studies show that variations in percentage of reinforcement have similar effects on performers and observers. Rosenbaum and Bruning (1966) found that, when subjects were required to complete a fixed number of responses, those who had previously experienced 100 per cent reinforcement, either directly or observationally, increased the speed with which they responded on successive nonrewarded trials, whereas subjects in the 50 per cent condition showed little change in the vigor of their behavior. Rosenbaum and Bruning explained the intensification of responding as due to frustrative emotional effects created by marked disparity between high expectancy of reward and omission of positive reinforcement. Under conditions where subjects are free to discontinue responding whenever they wish, observers who witness performers reinforced on an intermittent schedule display greater resistance to extinction than observers who have seen the model's behavior continuously (Berger and Johansson, 1968). It has been further shown by Hamilton (1970) that the behavioral effects of vicarious partial reinforcement can persist for a relatively long period.

**Vicarious emotional-conditioning effects.** In a vicarious reinforcement event, performers generally exhibit emotional responses while undergoing rewarding or punishing experiences. Observers can become highly aroused by the emotional experiences of others. The manner in which social affective cues serve as stimuli for emotional arousal in observers has been demonstrated most clearly by Miller and his colleagues (Miller, Banks, and Ogawa, 1962, 1963; Miller, Murphy, and Mirsky, 1959) through the use of an ingenious cooperative avoidance-conditioning procedure. In this experimental paradigm, monkeys are first trained to avoid an electric shock by pressing a bar whenever a light appears. Following the avoidance training, the animals are seated in different rooms, with the bar removed from the chair of one monkey and the light from the other. Thus, the animal having access to the light stimulus has to communicate by means of affective cues to his partner, equipped with the response bar, who can then perform the appropriate instrumental response that will enable both animals to avoid painful stimulation. Distress cues exhibited by the stimulus monkeys in anticipation of shock are highly effective in eliciting fear in their observing partner as reflected in increased heart rate and rapid performance of discriminated avoidance responses (Miller, 1967). The finding that color slides showing the stimulus animal in fear or pain elicited more avoidance responses than pictures of the same animal in nonfearful poses indicates that simple facial and postural expressions alone are sufficient cues for eliciting emotional responses. It was further shown that emotional responses in monkeys could be vicariously aroused not only by
the sight of their fearful experimental counterparts but also, through stimulus generalization, by another monkey who was never involved in the original aversive contingencies. Moreover, mere exposure to a monkey reacting in an apprehensive manner could reinstate avoidance responses in the observer after they had been extinguished.

Church (1959) has provided some evidence that social cues signifying affective arousal acquire emotion-provoking properties through essentially the same process of classical conditioning that is involved in the establishment of positive or negative valence to nonsocial environmental stimuli. That is, if affective expressions of others have been repeatedly paired with emotional consequences for observers, affective social cues alone gradually attain the power to instigate emotional reactions in observers. Vicariously elicited emotional responses in observers can become conditioned to formerly neutral stimuli through contiguous stimulation. Both direct and vicarious conditioning are governed by the same basic principle of associative learning, but they differ in the source of the emotional arousal. In the direct prototype, the learner himself is the recipient of pain- or pleasure-producing stimulation, whereas in vicarious forms, somebody else experiences the reinforcing stimulation and his affective expressions, in turn, serve as the arousal stimuli for the observer.

In laboratory investigations of vicarious classical conditioning (Bandura and Rosenthal, 1966; Berger, 1962), the model typically undergoes an aversive conditioning procedure in which a neutral stimulus is presented, and shortly thereafter, the model displays pain cues and other emotional reactions supposedly in response to shock stimulation. After witnessing the model’s emotional responses in conjunction with the neutral stimulus, observers begin to exhibit emotional responses to the conditioned stimulus alone, even though they have not themselves experienced the aversive stimulation directly. In a further extension of socially mediated conditioning, Craig and Weinstein (1965) found that observation of a performer experiencing repeated failure produces vicarious emotional arousal that becomes conditioned to previously neutral environmental cues.

The foregoing results indicate that emotional responses evoked in observers through vicarious reinforcement can become conditioned either to the modeled responses themselves or to environmental stimuli that are regularly correlated with the performer’s distress reactions. As a consequence, the later initiation of matching responses by the observer or the presence of the negatively valenced environmental cues are likely to evoke aversive emotional arousal and behavioral suppression.

A study reported by Crooks (1967) illustrates how discriminative response suppression can be established solely on the basis of differential
vicarious fear conditioning. After being tested for the extent to which they handled play objects, monkeys observed distress vocalizations sounded (through a tape recorder) whenever a model monkey touched a particular object. Later the observers also received a control-conditioning procedure wherein they witnessed the model's contacts with different objects paired with the distress vocalizations played backwards, thus obliterating the distressing value of the sounds. In a subsequent test, the observers played freely with the control items, but actively avoided objects that accompanied supposedly painful experiences for another animal.

Fear arousal can be extinguished as well as acquired on a vicarious basis. Vicarious extinction of fears and behavioral inhibitions is achieved by having persons observe models performing fear-provoking behavior without any adverse consequence accruing to the performers (Bandura, Grusec, and Menlove, 1967b; Bandura and Menlove, 1968). In a detailed analysis of vicarious extinction, Bandura, Blanchard, and Ritter (1969) found that observers' fear arousal progressively declined with each successive exposure to the modeled approach behavior. Blanchard (1970) furthermore revealed that the more thoroughly fear arousal was vicariously extinguished in phobic subjects, the greater was the reduction in avoidance behavior and the more generalized the increase in formerly inhibited approach responses. These findings lend support to the view that vicarious conditioning and extinction of emotional arousal may partially account for the behavioral suppression or facilitation that results from observing the affective consequences accruing to a model.

In their interpretation of vicarious reinforcement, Lewis and Duncan (1958) also assigned importance to the emotional-conditioning function of observed consequences. According to these authors, during the acquisition phase the model's responses elicit in observers analogous covert verbalizations, and the observed outcomes are also experienced vicariously. As a result of contiguous occurrence, the pleasurable effects of observed rewards and the frustrating effects of observed nonreward become conditioned to the observer's covert verbalizations. It is further assumed that these vicariously established emotions are transmitted from verbalizations to similar motor actions on the basis of prior associations between these two modes of responding.

As was previously shown, observers can develop conditioned emotional reactions as a result of seeing others enduring painful consequences. It remains to be demonstrated, however, whether observed nonreward is emotionally arousing to observers; whether observers covertly verbalize the model's instrumental responses while observing them performed; and whether emotional properties are, in fact, conditioned to verbalizations. In the more cognitive interpretation of classical conditioning (Bandura,
1969a), when a stimulus is paired with aversive experiences, the stimulus alone produces emotional responses, not because it is invested with emotional properties but because it tends to elicit emotion-arousing thoughts. In other words, the emotional responses are to a large extent cognitively induced rather than automatically evoked by the conditioned stimuli. From this perspective, performance of responses that individuals had previously seen punished can instigate anticipatory self-arousal without requiring emotional responses to be conditioned initially to covert verbalizations which then serve as the vehicle for connecting emotions to overt actions.

Modification of model status. It has been abundantly documented (Bandura, 1969b; Blake, 1968; Campbell, 1961) that models who possess high status in prestige, power, and competence hierarchies are emulated to a considerably greater degree than models of subordinate standing. The influence of model status on matching behavior is generally explained in terms of differential reinforcement and generalization processes (Miller and Dollard, 1941). According to this interpretation, the behavior of high-status models is more likely to be successful in achieving favorable outcomes, and hence have greater utilitarian value for imitators, than the behavior of models who possess relatively low vocational, intellectual, and social competencies. As a result of repeated differential reinforcement for matching models who possess diverse attributes, the identifying characteristics and status-conferring symbols assume discriminatory functions in signifying the probable consequences associated with behavior modeled by different social agents. Moreover, the effect of a model's prestige tends to generalize from one area of behavior to another and to unfamiliar persons to the extent that they share similar characteristics with past reward-producing models.

Status can be conferred on performers by the manner in which their behavior is reinforced. In a series of studies conducted by Hastorf and his colleagues (1965), a subject who initially gained a subordinate status in group discussions was generously rewarded for whatever contributions he made, while his associates were reinforced on a less favorable schedule. Under these conditions of reinforcement, the ineffectual member increased his responsiveness and was attributed higher status by his colleagues not only in the experimental phase but even after arbitrary contingencies had been discontinued. Bandura, Ross, and Ross (1963), in addition, provided evidence that reinforcements administered to the model alone have important effects on both social evaluation and imitative performance. Punishment devalues the model and his behavior, whereas the same model assumes emulative qualities when his actions are rewarded. These changes in model status, in turn, are accompanied by corresponding
differences in the degree to which observers imitate the model's behavior. The generality of the latter findings was further extended by Shafer (1965), who measured imitative behavior as a function of reversal of model status. Children displayed high imitation of models presented as prestigious figures but later discarded matching behavior after the models' superior status was lowered through new information.

None of the foregoing explanations assumes that vicarious reinforcement produces its effects by strengthening responses or S-R associations. Such a mechanism of operation would require observers not only to perform covert matching responses concurrently with the model, but also to experience indirectly the internal events activated by reinforcing stimuli. A reinforcement process of this type is not implausible, though it seems highly improbable. An associative-strengthening explanation of vicarious reinforcement would be especially hard-pressed to account for response changes in observers when models perform a variety of responses that extend over a long time and the consequences are not administered until after the entire set of responses has been completed.

Although the material presented in preceding sections is primarily concerned with possible mechanisms through which vicarious reinforcement produces its effects in observers, it should be noted in passing that the alternative explanations apply equally to interpretation of the effects of direct reinforcement on performers. Reinforcing stimuli convey information to performers about the types of responses that are reinforceable; selective reinforcement directs performers' attention to correlated environmental stimuli and thus increases their effectiveness in regulating behavior; previous reinforcements create anticipated consequences that serve a motivating function in augmenting and sustaining reinforceable responses; punishments administered to performers can endow associated environmental stimuli or the responses themselves with emotion-arousing properties that have behavior-suppression effects; and finally, a given history of positive or negative reinforcement can alter persons' self-evaluations in ways that affect the frequency with which they exhibit behaviors that are discrepant with their self-attitudes and the determination with which they perform them. Explanations of reinforcement processes usually conceptualize vicarious reinforcement as though it possessed only informational content, and direct reinforcement as though it had only automatic associative-strengthening effects.

The conditions under which direct reinforcement is employed, and the specific forms it takes, largely determine the mechanisms through which it can affect behavior. In most human learning experiments, achievement-oriented college students are required to respond to stimulus material for a brief period during which they receive correctness feedback in the form
of lights, tones, or verbal cues that lack affective properties. In such situations, reinforcing stimuli can affect performance only through their informational value. In most behavior-modification programs, on the other hand, reinforcers influence behavior primarily through their incentive-motivational effects. Here, subjects are informed in advance as to what performances are required, and valued incentives are used to activate and to sustain a desired level of responding over a given period of time. An employer would soon be deserted by his staff members if their sole reinforcement was information indicating the number of production units that they successfully completed during each month.

Most of the experimental paradigms used to study the behavioral effects of direct reinforcement operations are suitable for assessing the informational value of feedback stimuli, but they are inadequate to establish whether response consequences have direct associative-strengthening effects. The question of whether performance changes must be symbolically mediated can be answered most decisively by studies in which the reinforced responses or the reinforcing events are unobservable to the performer and therefore fail to convey sufficient information to produce changes on a cognitive basis. Either of the latter conditions effectively precludes recognition of the response-reinforcement contingency employed. It has been shown that correct responding in food-deprived animals can be significantly increased by unnoticeable intravenous presentation of nutritive solutions contingent upon correct performances (Chambers, 1956; Coppock and Chambers, 1954). And Hefferline and his associates (Hefferline and Keenan, 1963; Hefferline, Keenan and Harford, 1959; Sasmor, 1966) have successfully conditioned covert responses in adult humans without their observing the rewarded response. In these experiments, visually imperceptible thumb contractions of a preselected magnitude (detected by the experimenter through electromyographic amplification) are increased substantially when reinforced with monetary points or termination of aversive stimulation, whereas they decline abruptly after reinforcement is withdrawn. Such changes are reliably achieved even though subjects are unable to identify the response that produces reinforcement.

Self-Reinforcement Processes

Most human behavior is altered and maintained in the absence of immediate external reinforcement. It is generally assumed that people can, and indeed, do, exercise some degree of control over their own actions by utilizing self-generated stimulation. Experimental investiga-
tions of self-regulatory processes have primarily focused on the manner in which self-produced verbal and imaginal representations of events serve a performance-guiding function. Another major aspect of self-control is concerned with whether people can regulate their own behavior through self-produced consequences. Until recently, self-reinforcement phenomena have been virtually ignored in psychological theorizing and experimentation, perhaps due to the strong set established by studies conducted with infrahuman subjects. Unlike humans, who generally respond to their own behavior in self-approving or self-criticizing ways, rats and chimpanzees are disinclined to pat themselves on the back for commendable performances, or to berate themselves for getting lost in cul-de-sacs. By contrast, people typically set themselves certain standards of behavior and self-administer rewarding or punishing consequences depending on whether their performances fall short of, match, or exceed their self-prescribed demands.

A self-reinforcing event includes several subsidiary processes, some of which have been extensively investigated in their own right. First, it involves a self-prescribed standard of behavior which serves as the criterion for evaluating the adequacy of one's performances. The standard-setting component has been explored in some detail in studies of aspiration level. Most performances do not provide objective feedback of adequacy, and consequently, the attainments of other persons must be utilized as the norm against which meaningful self-evaluation can be made. Thus, for example, a student who achieves a score of 160 points on a given examination, and who aspires to exceed modal performances, would have no basis for either self-approving or self-disparaging reactions without knowing the accomplishments of others who are selected as the appropriate comparison group. As a second feature, a self-reinforcing event, therefore, often entails social-comparison processes. Third, the reinforcers are under the person's own control, and fourth, he serves as his own reinforcing agent. The significance of the two latter defining characteristics should be underscored because in some studies designed to investigate self-reinforcement processes, subjects do not have free access to the rewards; hence, the procedures essentially represent variations on externally managed reinforcement systems. Johnson and Martin (1970), for example, report a study in which subjects activated a reward signal after making responses they judged correct, but only a small proportion of the signaled correct responses was actually reinforced by the experimenter. Although subjects in this study judged when their performances deserved to be rewarded, the reinforcement was, nevertheless, externally controlled.

Investigations of self-reinforcement processes involve two separate lines of research. One set of studies is primarily designed to identify the
conditions under which self-reinforcing responses are acquired and modified. In these experiments, self-rewarding and self-punishing responses constitute the dependent variables. The second line of research is principally concerned with whether self-administered rewards and punishments serve a reinforcing function in controlling the person's own behavior. In testing for reinforcing effects, self-reinforcement serves as the independent variable that is measured in terms of its power to influence performance.

Determinants of self-reinforcing responses. Several paradigms have been used to explore the acquisition of self-reinforcing responses. In the procedure typically employed by Kanfer and Marston, subjects perform a task in which their performances remain ill-defined; they are instructed to press a button that flashes a light or dispenses a token whenever they think their responses are correct. These accuracy judgments are interpreted as self-reinforcing responses.

In some of the studies conducted within this approach (Kanfer and Marston, 1963a; Marston, 1970a) subjects were presented with a pseudo-sUBLIMAL perception task in which the same unrecognizable nonsense syllable was flashed on the screen on each trial, and subjects were required to guess which of several designated words they saw; in other studies (Kanfer and Marston, 1963b; Marston, 1964a) subjects selected what they considered to be the correct nonsense syllable from among alternatives that were randomly chosen as right; in other experiments (Marston, 1970b), subjects took tokens when they believed that they had hit the bull's-eye with darts tossed while blindfolded, when they assumed that they had judged the length of lines correctly, or when they judged their responses to projective-test stimuli as accurate or popular (Marston, 1964b); and in still other investigations (Kanfer, 1966), the number of times that children claimed they guessed correctly the number ranging from 0 to 100 that the experimenter would pick on each trial was used as an index of self-reward. Considering the extremely low probability of correct matches, high responses on the latter task more likely reflect fabrication than positive self-evaluation.

Certain interpretive problems arise when self-reinforcing responses are defined in terms of accuracy judgments. The major difficulties stem from the fact that correctness evaluations and self-commendations may be only partially correlated. There are many occasions when people evaluate their performances as accurate but not deserving of self-praise. The lack of relationship between these two sets of responses is most likely to obtain when individuals are required to perform tasks that they regard as simple or trivial, or that they personally devalue. Similarly, people may designate their responses on a particular task as inaccurate, but these judgments are
unaccompanied by self-disparagement if the assignment is viewed as excessively difficult, irrelevant, or inappropriate to their background training. A mathematician, for example, who is asked to solve elementary arithmetic problems would undoubtedly judge his calculations to be accurate but hardly worthy of self-reward; conversely, a humanities enthusiast might rate most of his responses on tests of engineering competence inaccurate without engaging in any self-condemnation.

The necessity for distinguishing between the two types of responses would readily become evident if the experimental procedures previously described included two sets of response buttons, one signifying accuracy judgments and the second measuring self-approving reactions. The mathematician solving elementary arithmetic problems would frequently press the “accurate” button, but he might rarely, if ever, press the “commendable” button. The dual-response arrangement would also provide information on whether procedures in which subjects’ performances remain ill-defined produce an adequate amount of self-reinforcing behavior. Under conditions of performance ambiguity, people may be willing to make tentative guesses about their responses but view the situation as providing insufficient basis for engaging in self-reward.

The foregoing comments, while questioning the substitution of accuracy estimates for direct measures of self-reinforcing behavior, are not meant to imply that categorization of one’s responses on an accuracy dimension under low-feedback conditions is irrelevant to self-reinforcement processes. Performance designation serves as one of several factors determining whether individuals will respond with self-praise or self-reproof. Research conducted within this general paradigm (Kanfer, 1970) has identified many variables that influence the incidence with which ambiguous performances are self-defined as accurate.

Ordinarily, self-reinforcement occurs in response to performances that are clearly discernible. That is, golfers see the distance and direction of their drives; students receive explicit scores on their academic tests; and authors can recognize the amount of material that they have written within a given period. In investigating the determinants of self-reinforcing responses, one must, of course, avoid performances that either produce distinct evaluative feedback or for which there are pre-existing norms. When self-evaluative responses are already linked to differential performance levels, subjects’ covert self-reinforcement may obscure the influence of experimentally manipulated variables. It is therefore advantageous to choose tasks which produce performances that have no pre-established, self-evaluative significance. In other words, subjects can observe their attainments, but they have no basis for judging their adequacy. A person who receives a score of thirty on an unfamiliar motor task, for example,
cannot determine whether it represents a mediocre, an adequate, or a superior achievement. By eliminating evaluative feedback, it is possible to study the conditions under which self-reinforcing responses can be established to particular performances. The paradigm originally employed by Bandura and Kupers (1964) was selected with the above requirements in mind.

Establishment of self-reinforcing responses through differential reinforcement. Self-reinforcing responses are undoubtedly developed to some extent through selective reinforcement. In this learning process, an agent adopts a criterion of what constitutes a worthy performance and consistently rewards persons for matching or exceeding the adopted criterion level, but nonrewards or punishes performances that fall short of the minimum standard. When persons subsequently respond to their own behavior they are likely to reinforce themselves in a similarly selective manner. The effects of differential reinforcement of qualitative variations in performance on patterns of self-reward have not as yet been investigated experimentally. Kanfer and Marston (1963a) have shown that miserly and indulgent pretraining can influence the rate at which subjects administer tokens to themselves for responses they judge to be correct. The performances of some adults were generously rewarded with token reinforcers accompanied by an approving attitude toward self-reward, whereas with others the experimenter parted grudgingly with a few tokens and cautioned subjects against requesting rewards for performances of questionable accuracy. Those who received lenient training later rewarded themselves more frequently on a different task than subjects who were stringently trained, even though the achievements for both groups were comparable.

Establishment of self-reinforcing responses through modeling. There exists a substantial body of evidence that modeling processes play a highly influential role in the transmission of self-reinforcement patterns. In the standard paradigm (Bandura and Kupers, 1964; Bandura, Grusec, and Menlove, 1967a), subjects observe a model performing a bowling task in which he adopts either a high-performance standard or a relatively low criterion of self-reinforcement. On trials in which the model attains or exceeds the self-imposed demand, he rewards himself with candy or exchangeable tokens and expresses positive self-evaluations, but when his attainments fall short of the adopted requirement he denying himself available rewards and reacts in a self-derogatory manner. Later, observers perform the task alone, during which time they receive a predetermined set of scores and the performances for which they reward themselves are recorded. The results show that people tend to adopt standards for self-reinforcement displayed by exemplary models, they evaluate their own
performances relative to that standard, and then they serve as their own reinforcing agents. In the study by Bandura and Kupers (1964), children who observed a model setting a high standard of self-reinforcement later rewarded themselves sparingly and only when they achieved superior performances, whereas children exposed to models who considered low achievements deserving of self-reward later tended to reinforce themselves generously for mediocre performances (Fig. 8-4). A control group

![Graphs showing frequency of self-reward](image)

**FIGURE 8-4.** Frequency with which children rewarded themselves at three performance levels after observing models reinforce themselves either according to a high standard (score of 20 points) or a low criterion (10-point score) of achievement. Control subjects had no prior exposure to models. The figure on the left depicts the patterns of self-reward for children who observed adult models; the figure on the right presents the distribution of self-reward for children who were exposed to peer models. (Bandura and Kupers, 1964.)

of children, who had no exposure to models, did not reward themselves selectively for differential levels of achievement. Subjects in the experimental conditions not only adopted the modeled standards of self-reinforcement, but they also matched variations in the magnitude with which the models rewarded their own performances.

In laboratory studies, a self-reinforcing response typically combines self-administration or self-denial of available tangible rewards with verbal self-praise or self-criticism. The verbal self-evaluation is an important defining component of a self-reinforcing event. The fact that a person passes up available edibles or exchangeable tokens does not by itself signify a self-punishing response. The absence of a response may be due to satiation, to disinterest in the material objects, or to any number
of extraneous factors. However, when a model refrains from taking rewards and derogates his performances, there is no question that he is engaging in self-punitive behavior. Some investigators have either deleted (Colle and Bee, 1968) or varied (Liebert, Hanratty, and Hill, 1969) the verbal self-evaluation component on the assumption that it represents a "rule structure."

Verbal self-commendation and self-derogation following differential attainment provide the basis for inferring the guiding standard, but the specific modeled examples do not constitute the rule. In fact, in experiments in which performances vary over a relatively wide range, post-experimental interviews disclose that the standard of self-reinforcement children derive from the models' performances does not always correspond to the one that was actually modeled. One must distinguish between a rule statement that defines the minimum criterion for self-reinforcement from self-critical and self-approving verbalizations accompanying specific performances. There is a marked difference between derogating oneself for a particular performance (e.g., "That's poor; it doesn't deserve a treat") and verbalizing a rule for self-reinforcement that applies to all instances (e.g., "I reward myself only when I get a score of twenty points or above"). To delete the verbal self-reinforcing reactions is to remove an important feature of the very phenomena being studied. As might be expected, matching self-rewarding behavior is more effectively established when verbal self-evaluative responses are modeled than when they are not.

Manipulation of verbal self-reinforcement also tends to introduce other unintended variations in treatment conditions. It is difficult to make changes in verbal self-reinforcement without producing corresponding variations in the emotional intensity with which self-reinforcing responses are modeled. Results are therefore not easily interpretable from studies where self-reinforcing responses are performed enthusiastically when accompanied by verbal self-evaluations and perfunctorily when verbal self-reinforcers are omitted (Liebert, Hanratty, and Hill, 1969).

It will be recalled that social-comparison processes were assigned a prominent role in self-reinforcement. In the preceding experiment by Bandura and Kupers (1964), both the model and the subjects obtained a wide and overlapping range of scores; consequently, subjects had no reliable basis for judging their ability level. Ordinarily, social groups contain models of clearly differing abilities so that a given individual must select the modeled standards against which to evaluate his own performances. According to social-comparison theory (Festinger, 1954), persons tend to choose reference models who are similar in ability, and to reject those who are too divergent from themselves. One might also expect a history of negative reinforcement of achievement behavior to lower
people's evaluation of their own performances (Stotland and Zander, 1958) and hence reduce the frequency and generosity with which they reward themselves.

To test the above propositions, an experiment was conducted (Bandura and Whalen, 1966) in which children underwent a series of success or failure experiences, following which they were exposed to either a superior model adopting a high criterion for self-reward, an inferior model displaying a very low standard of self-reinforcement, an equally competent model exhibiting a moderately high self-reward criterion, or they observed no models. Children who witnessed the inferior model subsequently rewarded themselves more frequently at low-performance levels and more generously than subjects who observed competent models adopting higher criteria of self-reinforcement. Upward discrepancies from adult models thus enhanced children's evaluation of their attainments. In accord with social-comparison theory, children rejected the self-imposed reinforcement contingencies of the superior model and adopted a lower standard commensurate with their achievements. Experimental subjects who had undergone failure experiences generally rewarded themselves less frequently than their successful counterparts. However, superior attainments outweighed the effect of reinforcement history so that subjects in all modeling conditions exhibited equally high rates of self-reward for outstanding performances regardless of whether they had previously met with repeated success or failure.

Although the exacting norms of highly divergent models tend to be rejected, nevertheless it is not uncommon for people to adopt stringent standards of self-reinforcement. An experiment by Bandura, Grusec and Menlove (1967a) investigated some of the social conditions under which persons emulate austere standards of self-reinforcement even though the self-imposition of such contingencies produces negative self-evaluative consequences. Children were exposed to an adult model who performed the bowling task at a consistently superior level and adopted a high criterion of self-reward. Half the subjects experienced a prior rewarding interaction with the model, whereas with a second group of children the same model behaved in a nonnurturant manner. This relationship variable was selected on the assumption that the rewarding quality of the model, which tends to increase interpersonal attraction, would facilitate emulation of the model's norms. Adherence to high standards of achievement is generally rewarded and publicly recognized. Therefore, with half the subjects in each of the two levels of nurturance, the adult model was praised for adopting stringent standards of self-reinforcement, but with the remaining children the model received no social recognition for high standard-setting behavior.
Ordinarily, individuals are exposed to a multiplicity of modeling influences, many of which operate in opposing directions. Speculations about the influence of multiple modeling on social learning generally assign importance to conflicting identification with adult and peer models. In order to determine the effects of simultaneous exposure to antagonistic modeling influences, half the children in each subgroup observed both the stringent adult and a peer model who displayed a low standard of self-reward. When faced with a conflict between adult and peer standards, children would be predisposed toward peer modeling because emulation of high aspirations results in frequent negative self-reinforcement of one’s performances. It was assumed, however, that the tendency for peer modeling to reduce the impact of adult modeling might be counteracted by the operation of opposing influences arising from positive ties to the adult model, and from vicarious positive reinforcement of high standard-setting behavior.

Figure 8-5 presents the per cent of trials in which children rewarded themselves for performances below the minimum criterion adopted by the adult model. As shown graphically, children exposed to conflicting modeling influences were more inclined to reward themselves for low achievements than children who had observed only the adult model consistently adhere to a high standard of self-reinforcement. Children were also more likely to impose severe criteria of self-reward on themselves when the adult model received social recognition for his high standard-setting behavior than when the model’s stringent achievement demands went unrewarded. However, contrary to expectation, subjects who had experienced a highly nurturant interaction with the adult model were more likely to accept the low-performance standard set by the peer than if the adult model was less beneficent. Apparently, a nurturant relationship was interpreted by the children as permissiveness for lenient self-demands.

Comparison of subgroups containing various combinations of variables revealed that the influence of the peer’s liberal self-reward was effectively negated by social reinforcement of the adult’s high standard-setting behavior. The most austere pattern of self-reinforcement was displayed by children who experienced a relatively nonnurturant relationship with the adult model, who had no exposure to conflicting peer norms, and who witnessed the adult receive social recognition for adhering to high standards (see Fig. 8-5). These children, who rarely considered performances that fell below the adult’s criterion worthy of self-reward, displayed unyielding self-denial. The adoption and continued adherence to unrealistically high self-evaluative standards is especially striking, considering that the self-imposition of rigorous performance demands oc-
FIGURE 8.5 Per cent of trials in which subjects rewarded themselves for performances below the minimum standard adopted by the adult model as a function of model nurturance, vicarious reinforcement of high standard-setting behavior, and exposure to conflicting peer-modeling influences. (Bandura, Grusec, and Menlove, 1967a.)

curred in the absence of any social surveillance, under high permissiveness for self-gratification, and the modeled standards resulted in considerable self-devaluation and self-forbiddance of freely available rewards.

Comparative studies (Liebert and Allen, 1967; Liebert and Ora, 1968) disclose that modeling and direct training, in which experimenters judge which of the performer's attainments are deserving of reward, are equally effective in transmitting high standards of self-reinforcement. Under naturally occurring conditions, modeling and reinforcement practices often operate concurrently in ways that either supplement or counteract each other. Findings of research in which both of these sources of influence are varied simultaneously (McMains and Liebert, 1968; Mischel and Liebert, 1966; Rosenhan, Frederick, and Burrowes, 1968) show that
rewards are most sparingly self-administered when stringent standards have been consistently modeled and imposed, whereas social-learning conditions in which persons both model and reinforce lenient performance demands produce generous self-reward patterns of behavior. Discrepant practices, on the other hand, in which models prescribe stringent standards for others but impose lenient ones upon themselves, or who impose austere demands on themselves and lenient ones on others, reduce the likelihood that high standards will be adopted.

The transmission of self-reward patterns through a succession of models has been demonstrated by Mischel and Liebert (1966). Children who adopted the standards of reinforcement of adults subsequently both modeled the same self-rewarding behavior with peers and applied the same reinforcement contingency to their performances. Marston (1965a) has likewise shown in an experiment with adults that witnessing models reinforcing their own performances at either high or low rates not only affected the self-reinforcing behavior of the observers, but also influenced the frequency with which they later reinforced another person performing the same task. Results of these laboratory experiments are in accord with field studies demonstrating that, in cultures where austerity is consistently modeled and reinforced as the dominant social norm, not only are positive reinforcements sparingly self-administered, but because of the emphasis on personal responsibility for high standards of conduct, self-denying, self-punitive, and depressive reactions occur with high frequency (Eaton and Weil, 1955). By contrast, in societies in which generous self-gratification patterns predominate, self-rewards are usually made contingent upon minimal performances (Hughes, Tremblay, Rapoport, and Leighton, 1960).

**Self-reinforcement, self-concept, and achievement behavior.** In the aforementioned laboratory studies, individuals who had been exposed to models favoring lenient standards of self-reinforcement were highly self-rewarding and self-approving for comparatively mediocre performances. By contrast, persons who observed models adhering to stringent performance demands later displayed self-denial and self-dissatisfaction for objectively identical accomplishments. These contrasting self-reactions illustrate how self-esteem, self-concept, and related self-evaluative processes can be conceptualized within a social-learning framework. From this perspective, self-esteem is the result of discrepancies between a person's behavior and the standards that he has selected as indices of personal merit. When behavior falls short of one's evaluative standards, the person judges himself negatively or holds himself in low self-esteem. On the other hand, when performances coincide with, or exceed, a person's
standards, he evaluates himself positively, which is considered indicative of high self-esteem.

The self-concept, which is assigned a prominent role in some theories of personality, also reflects the phenomenon of self-reinforcement. Self-concept usually signifies a person's disposition toward positive and negative self-evaluation of different aspects of his behavior. In measuring this personality characteristic, individuals are presented with a set of evaluative statements in adjective check lists, Q sorts, or inventories, and asked to rate which statements apply to them. The individual responses are then summed to provide a global index of self-evaluation. Within a social-learning approach, a negative self-concept is defined in terms of a high frequency of negative self-reinforcement of one's behavior and, conversely, a favorable self-concept is reflected in a relatively high incidence of positive self-reinforcement (Marston, 1965b).

Dysfunctions in self-reinforcement systems often assume major importance in psychopathology through their capacity to create excessive self-punishment and aversive conditions that can maintain other forms of deviant behavior. Many of the people who seek psychotherapy are highly competent and free of debilitating anxiety, but they experience a great deal of personal distress stemming from excessively high standards of self-evaluation that are often supported by unfavorable comparisons with models noted for their extraordinary achievements. Talented individuals who have high aspirations that are possible but difficult to realize are especially vulnerable to self-dissatisfaction despite their notable achievements. As Boyd (1969) graphically describes this phenomenon, "Each violinist in any second chair started out as a prodigy in velvet knickers who expected one day to solo exquisitely amid flowers flung by dazzled devotees. The 45-year-old violinist with spectacles on his nose and a bald spot in the middle of his hair is the most disappointed man on earth."

In its more extreme forms, an austere system of self-reinforcement gives rise to depressive reactions, chronic discouragement, and feelings of worthlessness and lack of purposefulness. Excessive self-disparagement, in fact, is one of the defining characteristics of psychotic depression. As Loeb, Beck, Diggory, and Tuthill (1967) have shown, depressed adults evaluate their performances as significantly poorer than do nondepressed subjects, even though their actual achievements are the same. People also suffer from considerable self-devaluation when they experience loss in ability due to age or physical injury but continue to adhere to their original standards of achievement. In the latter instances, most of their performances are negatively self-reinforced to the point where eventually they become apathetic and abandon significant aspects of their behavioral
repertoire. When a person's behavior produces self-punishing consequences, any activities that avert or reduce these aversive outcomes are thereby strengthened and maintained. Many forms of deviant behavior, such as alcoholic self-anesthetization, grandiose ideation, and reluctance to engage in activities that may have self-evaluative implications, serve as means of escaping or avoiding self-generated aversive stimulation.

The discussion thus far has emphasized the personal negative by-products of stringent self-reinforcement. Social problems can arise from deficient or deviant self-reinforcement systems. Individuals who have failed to develop well-defined standards necessary for adequate self-regulating reinforcement, and those who make self-reward contingent upon skillful performance of antisocial behavior, readily engage in transgressive behavior unless deterred by externally imposed controls. Similarly, individuals who set lax behavioral standards for themselves are inclined to display low achievement strivings.

There is reason to assume, from findings reported later, that self-reinforcement serves both a motivating and a reinforcing function with respect to achievement behavior. It has been repeatedly demonstrated (Locke, Cartledge, and Koeppel, 1968) that performance standards are a major determinant of level of productivity. The higher the standards that people set for themselves, the higher their attainments. Setting performance goals by itself does not automatically produce achievement behavior. Rather, the motivational effects of goal-setting are most likely mediated by self-reinforcement. After a person has committed himself to a specified level of performance, his self-approval becomes contingent upon goal attainment. This leads him to intensify his efforts in order to exceed self-disappointing performances. Having achieved a given performance, people are usually no longer content with it and make self-reward contingent upon progressively more difficult accomplishments. In the present interpretation, motivational effects derive not from the goals themselves but from the fact that people respond evaluatively to their own achievements and, therefore, regulate their level of effort accordingly.

Conditions maintaining self-reinforcing responses. In preceding sections, processes have been examined whereby evaluative and reinforcing functions performed by others are transferred to the individual himself so that he serves as the reinforcer of his own actions. An interesting, but inadequately explored, question is what maintains discriminative self-reinforcing responses after they have been acquired through modeling and direct training. No elaborate theory is needed to explain why people engage in self-rewarding behavior. The more challenging question requiring
explanation is why people deny themselves available rewards over which they have full control, and why they punish themselves.

*Conditioned relief.* One possible interpretation is that self-evaluative responses acquire secondary reinforcing properties through repeated association with primary or social reinforcement. According to this classical-conditioning view, which has been advanced by Aronfreed (1964), transgressive behavior arouses anticipatory anxiety as a result of past association with punishment. Under conditions where social disapproval occurs contiguously with termination of anxiety or punishment, verbal criticism attains anxiety-attenuating value. The subject therefore applies critical labels to his own behavior because they serve as automatic anxiety reducers. To test this notion, Aronfreed (1964) conducted an experiment in which children performed an ambiguous task; on designated trials a buzzer sounded, signifying a transgression, following which the children were verbally reprimanded for behaving the "blue" way and deprived of some candy. For one group of subjects, the critical label "blue" was expressed when the buzzer and punishment were terminated; for a second group the label coincided with the onset of buzzer and punishment; while with control children the blue label was verbalized as the buzzer was turned off, without any accompanying punishment. On two test trials, during which the buzzer signaled a transgression, children who experienced labeling at the termination of punishment were more inclined to verbalize the critical label than either the controls or the children receiving labeling at the onset of punishment, who did not differ from each other.

The above findings are consistent with a conditioned-reinforcement view, although interpretation of the data is complicated by the fact that children rarely uttered the critical label on their own and did so only after being verbally prompted by the punishing agent through a series of questions concerning their actions. Given anxiety arousal, one would expect an anxiety reducer to be performed rapidly and spontaneously. An alternative interpretation of the data is that the verbal response was performed because of its anticipated functional value rather than for its conditioned mollifying effects. That is, by uttering the critical label, the children could terminate the experimenter's verbal probing. Subjects who had earlier learned that a particular verbalization discontinues punishment by the experimenter should be more willing to produce it when prompted to do so than children for whom the verbal response brought on the punishing experiences. The differential expectations established through prior training might be expected to persist over more than two trials. The conditioned-reinforcement theory of self-punishment would also require several complicated assumptions to explain how children adopt self-punishing
responses by observing punishments self-administered by a model for devalued behavior without observers experiencing any direct aversive consequences.

**Self-arousal.** There is a growing body of evidence (Bandura, 1969a) that in humans the effects of paired stimulation are largely governed by an intervening self-stimulation mechanism. These findings indicate that a stimulus is not automatically endowed with emotion-arousing or emotion-reducing properties through association with primary reinforcement. Rather, as a result of paired experiences, a conditioned stimulus assumes informative value that is capable of activating emotion-provoking or calming thoughts. The self-stimulation view of conditioning based on thought-produced arousal suggests a somewhat different mode of operation of self-punishment than is assumed in the conditioned-reinforcement explanation.

In everyday situations, the performance of punishable behavior creates anticipatory arousal that is likely to persist in varying degrees until the person is reprimanded. Punishment not only terminates distressing thoughts about impending discovery of the transgression and possible social condemnation, but it also tends to restore the favor of others. Thus, punishment can provide relief from self-generated aversive stimulation that is enduring and often more painful than the actual reprimand itself. This phenomenon is most vividly illustrated in extreme cases where people torment themselves for years over relatively minor transgressions and do not achieve equanimity until after making reparations of some type. Self-punishment may serve a similar distress-relief function. Having criticized or punished themselves for undesirable actions, individuals are likely to discontinue further upsetting ruminations about their behavior.

The way in which self-punishing responses can be maintained by averting anticipated punishing consequences is strikingly demonstrated by Sandler and Quagliano (1964). After monkeys learned to press a lever to avoid being shocked, a second contingency involving self-administered painful stimulation was introduced. A lever-press prevented the occurrence of the original shock, but it also produced an electric shock of lesser magnitude. As the experiment progressed, the self-administered shock was gradually increased in intensity until it equalled the aversive stimulation being avoided. However, the animals showed no reduction in the frequency of self-punishing responses although this behavior no longer served as a “lesser of two evils.” Even more interesting, after the avoided shock was permanently discontinued but lever-pressing responses (which had now become objectively functionless) still produced painful consequences, the animals continued to punish themselves needlessly with shock intensities that they had previously worked hard to avoid. This
experiment reveals how self-punishment can become autonomous of contemporaneous conditions of reinforcement and be maintained through its capacity to forestall anticipated aversive experiences.

Further support for the emotion-reducing function of self-punitive behavior is furnished by Stone and Hokanson (1969). When adults could avoid painful shocks by administering to themselves shocks of lesser intensity, self-punitive responses not only increased but they were accompanied by reduction in autonomic arousal. Self-punishing responses continued to be performed at an undiminished rate, though with increased autonomic arousal, after conditions were altered so that self-administered punishment was only partially effective in avoiding painful stimulation.

The preceding analysis of self-punishment can be applied as well to self-disappointing performances as to transgressive behavior. The valuation of performances which fall short of, match, or exceed a reference norm is partly achieved through differential reinforcement. For example, parents who expect their children to exceed the average performance of their group in whatever tasks they undertake will selectively reward superior achievements and find fault with average and lower-level attainments. Differential achievement levels thus take on positive and negative value, and the performance standard common to the various activities is eventually abstracted and applied to new endeavors. That is, a person for whom average performances have been repeatedly devalued will come to regard modal achievements on new tasks as inadequate and attainments that surpass modal levels as commendable. It is assumed that, like transgressive behavior, inferior performances can be a source of disconcerting thoughts and social disapproval that individuals will strive to reduce by criticizing or punishing themselves.

As shown earlier, specific patterns of self-reinforcement can be acquired observationally without the mediation of direct external reinforcement. Once the evaluative properties of differential accomplishments are well established, favorable or inadequate matches with adopted standards are likely to elicit self-reactions that, in turn, give rise to self-rewarding or self-punishing behavior. At this stage the whole process becomes relatively independent of external reinforcement, but remains dependent upon cognitive evaluations based on the match between self-prescribed standards, performance, and the attainments of reference models.

*External reinforcement.* Although self-punishment can operate autonomously to some extent by reducing self-generated aversive stimulation, self-reinforcing responses are partly sustained by periodic external reinforcement. Adherence to high standards of self-reinforcement is actively supported through a vast system of rewards involving praise, social recognition, and a variety of awards and honors, whereas few accolades
are bestowed on people for rewarding themselves on the basis of mediocre performances. To the extent that people choose a reference group whose members share similar behavioral norms for self-reinforcement, a given individual’s self-evaluations are undoubtedly influenced by the actual or anticipated reactions of members whose judgments he values highly. Once established, patterns of self-reinforcement are thus intermittently reinforced and upheld through selective association.

In everyday life, high evaluative standards are not only favored, but negative sanctions are frequently applied to discourage inappropriate positive self-reinforcement. Rewarding oneself for inadequate or undeserving performances is more likely than not to elicit critical reactions from others. Similarly, lowering one’s performance standards is rarely considered praiseworthy. As a result of extensive social training, performances that are self-defined as failures come to elicit self-devaluative reactions that are incompatible with self-rewarding behavior and thus reduce its occurrence.

Finally, it should be noted that self-punishment often serves as an effective means not only of lessening negative consequences administered by others, but in eliciting commendations from them as well. By criticizing and belittling themselves, people can predictably get others to enumerate their noteworthy accomplishments and abilities, and to issue reassuring predictions that continued effort will produce future triumphs.

Reinforcing function of self-administered consequences. The studies reported earlier were designed primarily to identify some of the variables governing the acquisition of self-rewarding and self-punishing responses. Given that individuals can be influenced to engage in self-reinforcing activities, the basic question remains whether self-generated consequences serve a reinforcing function in regulating behavior. Demonstrations of the behavioral effects of self-produced response consequences require experimental situations in which self-reinforcing events serve as the controlling variables in relation to other forms of behavior.

To test the relative efficacy of self-monitored and externally imposed systems of reinforcement, Bandura and Perloff (1967) conducted an experiment that proceeded in the following manner: Children worked at a manual task in which they could achieve progressively higher scores by performing increasingly more effortful responses. Eight complete rotations of a wheel were required to advance 5 points so that, for example, a total of 16 cranking responses was necessary to achieve a 10-point score, 24 responses to attain a 15-point score, and so on. Children in the self-reinforcement condition selected their own achievement standards and rewarded themselves with tokens whenever they attained their self-prescribed level of performance. Children assigned to an externally im-
posed reinforcement condition were individually matched with partners in the self-reward group so that the same performance standard was externally set for them and the reinforcers were automatically delivered whenever they reached the predetermined level. To ascertain whether subjects' behavioral productivity was due to the operation of contingent reinforcement or to gratitude for the rewards that were made available, children in an incentive control group performed the task after they had received the supply of rewards on a noncontingent basis. A fourth group worked without any incentives to estimate the amount of behavior generated by the characteristics of the task itself. Because the capacity to maintain effortful behavior over time is one of the most important attributes of a reinforcement operation, the dependent measure was the number of responses the children performed until they no longer wished to continue the activity.

![Graph showing mean number of responses performed by boys and girls across different reinforcement conditions.](image)

**FIGURE 8-6.** Mean number of responses maintained by self-monitored, externally imposed, and noncontingent systems of reinforcement. (Bandura and Perloff, 1967.)

As shown graphically in Fig. 8-6, both self-monitored and externally imposed reinforcement systems sustained substantially more behavior than either the contingent reward or the nonreward condition, which did not differ from each other. In the case of boys, externally administered
rewards generated more behavior than self-reinforcement, but otherwise the two systems of reinforcement proved equally efficacious. Of even greater interest is the prevalence with which children in the self-monitored condition imposed upon themselves highly unfavorable schedules of reinforcement. Not a single child chose the lowest score which required the least effort, while approximately half of them selected the highest achievement level as the minimal performance meriting self-reward. Moreover, a third of the children subsequently altered their initial standard to a higher level, without a commensurate increase in amount of self-reward, thereby imposing upon themselves a more unfavorable work-to-reinforcement requirement. This behavior is all the more striking because the self-imposition of stringent performance demands occurred in the absence of any social surveillance and under high permissiveness for self-reward.

It can be reasonably assumed that most older children have acquired standards of achievement through modeling and differential reinforcement, and that they have undergone experiences in which rewarding oneself for performances judged to be unworthy has been socially disapproved. Hence, under conditions where persons are provided with opportunities to optimize their material outcomes by engaging in behavior which has low self-regard value, conflicting tendencies are likely to be aroused. On the one hand, individuals are tempted to maximize rewards at minimum-effort costs to themselves; they can achieve this by simply lowering their performance standards. On the other hand, low-quality performances produce negative self-evaluative consequences, which, if sufficiently strong, may inhibit undeserving self-compensation. Apparently, subjects were willing to deny themselves rewards over which they had full control rather than risk self-disapproval for unmerited self-reward. Many of the children, in fact, set themselves performance requirements that incurred high-effort costs at minimum material recompense. These findings are at variance with what one might expect on the basis of reward-cost theories, unless these formulations include the self-esteem costs of rewarding devalued behavior. The desire to avoid aversive self-devaluative consequences may also partly explain why children willingly give up rewards they possess in response to substandard performances after having observed models relinquished rewards and criticize themselves for behavior they judged inadequate (Herbert, Gelfand, and Hartmann, 1969).

In recent years, self-reinforcement procedures have begun to be employed to modify and to maintain response patterns in treatment programs. These studies usually measure the frequency with which deviant responses occur during baseline conditions and after self-administered consequences are made explicitly contingent upon selected behaviors. Goodlet and Goodlet (1969), for example, compared the incidence of aggressively disruptive behavior in boys during a baseline period, when
teachers rewarded the children with exchangeable tokens for reductions in aggressiveness, and when the boys evaluated their own performances and reinforced their own behavior accordingly. The mean amount of disruptive behavior displayed by the boys under these three conditions was 35.33, 8.92, and 9.95, respectively. These findings indicate that self-administered consequences can aid in controlling one's own behavior; but the comparative data should be accepted with reservation because the sample size is small and the two systems of reinforcement were not administered in counterbalanced order. Lovitt and Curtiss (1969) and Glynn (1970) also provide evidence that when behavioral objectives and contingency systems are clearly specified, children are able to manage their own behavior as well as more effectively by self-reinforcement than is achieved through similar externally administered consequences.

Several studies have been reported in which self-administered, aversive consequences were used with some degree of success to reduce disfluencies (Goldiamond, 1965), obsessive ruminations (McGuire and Vallance, 1964), craving for addictive drugs (Wolpe, 1965), and deviant sexual behavior (McGuire and Vallance, 1964). The preliminary findings of these studies, while most interesting, require further validation through systematic manipulation of self-reinforcement procedures.

Recent investigations of techniques of self-control also assign a principal role to self-managed reinforcement. In these treatment programs (Ferster, Nurnberger, and Levitt, 1962; Harris, 1969; Stuart, 1967), changes in highly refractory behavior are induced by having subjects regulate the stimulus conditions that ordinarily control undesired and competing response patterns. However, unless positive consequences for self-controlling behavior are also arranged, the well-intentioned practices are usually short-lived. Self-controlling behavior is difficult to maintain because it tends to be associated, at least initially, with relatively unfavorable conditions of reinforcement. Prepotent activities such as heavy drinking by alcoholics and excessive eating by obese people are immediately rewarding, whereas their detrimental consequences are not experienced for some time. Conversely, self-control measures usually produce immediate unpleasant effects while the personal benefits are considerably delayed. Self-reinforcement practices are, therefore, employed to provide immediate support for self-controlling behavior until the benefits that eventually accrue take over the reinforcing function. This is achieved by having individuals select a variety of activities that they find rewarding and make them contingent upon the performance of self-controlling behavior. Successful results have been achieved with self-managed programs of behavioral change. However, self-reinforcement is only one component in a multiple method, and its relative contribution to the measured outcomes has not been adequately assessed.
Covert self-reinforcement. All of the preceding studies involved self-administration of tangible reinforcers. Of considerable interest is the question of whether symbolically produced consequences can serve a reinforcing function in regulating overt behavior. Weiner (1965) reports some evidence that symbolized outcomes may possess reinforcing properties that are similar to their physical equivalents. Inappropriate motor responses by adults were either punished by withdrawal of monetary points or by having the subjects imagine the same loss of monetary points, or their performances had no consequences. Weiner found that imagined aversive consequences and the actual occurrence of the same negative outcomes both reduced responding compared to the condition involving no feedback. Covert self-punishment, however, produced somewhat weaker reductive effects. These findings suggest that overt behavior can be partly regulated by covert self-reinforcement operations.

To the extent that covert self-reinforcement can substitute for, supplement, or reduce the effects of extrinsic consequences (Kanfer, 1968), this factor may partly account for intersubject variability in the degree of control exercised over human behavior by external reinforcement. It is also likely that covert self-reinforcement mediates the effects of many extrinsic events that are attributed reinforcing properties. For example, informative feedback of performance can enhance and maintain responding even when the information signifies level of attainment rather than accuracy which can improve performance through its response-guidance functions. Confirmation of correctness by itself does not have inherent rewarding value. Performance knowledge assumes positive or negative qualities only when evaluated by the performer in relation to his intrinsic standards. In other words, it is not the lights or the tones signifying correct responses that are reinforcing; rather, they serve as cues for subjects to apply to themselves positive or negative self-evaluations which function as the critical reinforcing events. Hence, correctness feedback on tasks that are personally de-valued or regarded as trifling is unlikely to operate as a reward. On the other hand, confirmation of attainments that exceed personal standards of what constitutes a worthy performance will tend to activate positive self-reinforcement. Knowledge of past achievements may also lead subjects to raise their performance standards for positive self-evaluation, thus increasing their level of effort on the task. The motivational and goal-setting effects of knowledge of results are well documented by Locke, Cartledge, and Koeppe (1968).

Possible applications of covert self-reinforcement are discussed by Homme (1965) in a paper concerned with implicit psychological activities. In reducing detrimental behaviors that produce immediate and automatic reinforcing effects, the individual selects numerous aversive
consequences of the behavior which can be employed as covert negative reinforcers. Whenever he is instigated to perform the undesired behavior, he immediately symbolizes the aversive effects or revivifies other unpleasant experiences. Miller (1951) and Grose (1952) have shown that negatively valenced thoughts generate strong emotional responses. In fact, imagined painful stimulation can produce subjective distress and physiological arousal similar to those responses induced by actual painful stimulation (Barber and Hahn, 1964). To the extent that sufficiently strong affective consequences can be symbolically produced contingent upon undesired behavior, its occurrence may be significantly reduced. Covert self-reinforcement is likely to exert greatest controlling power when applied to weaker incipient forms of the behavior than when the response tendency is quite compelling, or after the undesired behavior and its attendant reinforcement have already occurred.

Thought-induced affective experiences have been most extensively employed in aversive counterconditioning for the purpose of controlling injurious addictive behavior or intractable response patterns that can create serious social consequences (Bandura, 1969a). In the application of this procedure, the objects to which individuals are markedly attracted are repeatedly paired with aversive reactions that are symbolically induced. The negative contents are usually drawn from disagreeable, painful, or revolting experiences that the individuals have previously undergone either in connection with the pleasurable objects and activities or in other contexts. Preliminary results based upon clinical applications reveal that aversions can be established in this manner for modifying alcoholism (Anant, 1967; Ashem and Donner, 1968; Miller, 1959); obesity (Cautela, 1966); deviant sexual behavior (Davison, 1968; Miller, 1963); and drug addiction (Kolvin, 1967).

The foregoing procedure gains support from experimental investigations of classical conditioning that rely upon symbolically induced emotional responses. Subjects are informed that the CS will sometimes be followed by shock; they are given a sample shock or a single confirmation trial during the acquisition series, but otherwise the CS is never paired with any externally administered aversive stimulation. Subjects develop conditioned autonomic responses in the absence of an external UCS by generating fear-producing thoughts in conjunction with the occurrence of the CS (Dawson and Grings, 1968; Grings, 1965). Bridger and Mandel (1964), in fact, report that autonomic conditioning was similar regardless of whether the CS was associated with threat of shock alone, or with threat and actual shock stimulation. Some suggestive evidence for the influential role of self-stimulation in symbolic conditioning is provided by Dawson (1966) who found that the degree to which subjects
believed that shock would follow a certain signal and the severity of the shock they anticipated were positively correlated with the extent of autonomic conditioning.

Modification of thought processes through self-reinforcement. The preceding section discussed how symbolically produced effects can be employed as reinforcing events to control overt behavior. Often, certain trains of thought produce strong emotional responses that are subjectively distressing or behaviorally disruptive, in which case the problem becomes one of controlling the covert events themselves. Assuming that symbolic activities obey the same psychological laws as overt behavior, it should be possible to significantly influence the nature, incidence, and potency of covert events. The difficulties in detecting the presence of implicit responses present a major obstacle to their control by reinforcement practices if one adheres to the conventional paradigm in which an external agent monitors the occurrence of the desired behavior, imposes the contingencies on subjects, and administers the reinforcers to them. However, as Homme (1965) points out, the occurrence or absence of covert events can be easily and reliably detected by the person doing the thinking. Consequently, such responses can be most easily influenced through self-reinforcement. In this type of approach, implicit events are self-monitored, the contingencies are self-prescribed, and the consequences are self-produced.

Homme suggests that Premack's (1965) differential-probability principle (i.e., any highly preferred activity has reinforcing capabilities) might be utilized in the contingency arrangement and selection of self-reinforcers. In this approach, the strength and incidence of certain classes of thoughts are modified by making preferred activities contingent upon their occurrence. If thought processes are controllable by this means, then depressive, infuriating, and other vexatious ruminations could be reduced by self-reinforcement of more constructive lines of thought. The results of both clinical and laboratory studies are sufficiently promising to warrant further investigation of self-reinforcement processes and their role in the self-regulation of behavior.

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