Punished by Rewards

THE TROUBLE WITH GOLD STARS, INCENTIVE PLANS, A'S, PRAISE, AND OTHER BRIBES

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WITH A NEW AFTERWORD
BY THE AUTHOR

As one psychologist read the available research, people who are offered rewards tend to

> choose easier tasks, are less efficient in using the information available to solve novel problems, and tend to be answer oriented and more illogical in their problem-solving strategies. They seem to work harder and produce more activity, but the activity is of a lower quality, contains more errors, and is more stereotyped and less creative than the work of comparable nonrewarded subjects working on the same problems.[41]

In the next two chapters we examine why all this is true.

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THE TROUBLE
WITH CARROTS:
Four Reasons Rewards Fail

> It is better not to make merit a matter of reward
> Lest people conspire and contend.
>
> — Lao-tzu

CONFRONTED WITH IRREFUTABLE EVIDENCE that people who are trying to earn a reward end up doing a poorer job on many tasks than people who are not, researchers at first could only scratch their heads in puzzlement. A few tentatively suggested — or in one case, tried to prove — that the paradoxical effect of rewards must be due to the fact that they distract people from the task at hand.[1]

Indeed, it makes sense that the tantalizing prospect of receiving something we like might prevent us from focusing on what we are doing and thereby prevent us from doing it well. But subsequent research has shown that a lot more is involved than simple distraction. Thinking about a reward, as it turns out, is worse than thinking about something else equally irrelevant to the task.[2] Evidently rewards have a peculiarly detrimental effect on the quality of our performance.

There are, I believe, five core reasons for this failure, four of which are described in the sections that follow, with the fifth occupying the whole of the next chapter. (The second half of the book will play out the implications of these five points in the workplace, the classroom, and the family, and then discuss alternatives to the use of rewards.) Not all of these reasons pertain to the results of the laboratory studies described earlier; some account for the detrimental effects on achievement found in the real world. In any case, the problems I describe are more than explanations for why people don't perform as well when they expect to be rewarded. They are also serious indictments in their

own right, raising concerns about the use of rewards beyond what they do to productivity. Collectively they constitute the central case against pop behaviorism.

I. Rewards Punish

A growing number of parents, teachers, and managers have come to believe that punishment, defined as any attempt to change someone's behavior by forcing him or her to undergo something unpleasant, is bad news. Later in this book, I will defend the position that punishing people should indeed be avoided whenever possible, both for practical and moral reasons. For now, I want to address readers who already share this view, and who therefore try to use rewards instead.

In certain circles, it has come to be taken as revealed truth that we are supposed to stop punishing and criticizing and instead attempt to "catch people doing something right" and reward them with privileges or praise. It is nearly impossible to open up a book on management, or scan an article on raising children, or attend a seminar on teaching without coming across this counsel. The underlying assumption is that there are exactly two alteratives: punitive responses or positive reinforcement, sticks or carrots, "slaps or sugar plums."[3]

When the choice is framed this way, of course, only a sadist or a simpleton would fail to pick the latter in each pair. Rewards are less destructive than punishments, and the difference between the two becomes more important as the punishment in question becomes more harsh. But the dichotomy is a false one: our practical choices are not limited to two versions of behavior control. And that is very good news indeed because despite the relative superiority of rewards, the differences between the two strategies are overshadowed by what they share. The troubling truth is that *rewards and punishments are not opposites at all; they are two sides of the same coin. And it is a coin that does not buy very much.*

In respects major and minor, rewards and punishments are fundamentally similar. As Kurt Lewin, the founder of modern social psychology, recognized, both are used when we want to elicit "a type of behavior which the natural field forces of the moment will not produce."[4] Moreover, the long-term use of either tactic describes the very same pattern; eventually we will need to raise the stakes and offer more and more treats or threaten more and more sanctions to get people to continue acting the way we want.

Underlying these two features is an even more critical fact: punishment and reward proceed from basically the same psychological model, one that conceives of motivation as nothing more than the manipulation of behavior. This is not to say that behaviorists fail to distinguish between the two; in fact, Skinner argued fervently against the use of punishment in most circumstances. But the theory of learning and, ultimately, the view of what it is to be a human being are not significantly different for someone who says "Do this and you'll get that" and someone who says "Do this or here's what will happen to you."

The correspondence is no less striking when we turn from theory to practice. Although many people counterpose rewards to punishments, it is interesting to observe that the two strategies often go hand in hand in the real world. In a study reported in 1991, elementary school teachers from thirteen schools were observed carefully over a period of four months. It turned out that the use of rewards and punishments in the classroom were very highly correlated; the teachers who used one were more, not less, likely to use the other.[5] A survey of several hundred mothers of kindergarten-age children revealed a significant positive relationship between the frequent use of rewards and the frequent use of physical punishment.[6] Other studies have found that even praise, the form of reward usually viewed as the least objectionable, is often favored by people whose style of dealing with children is conspicuously controlling or autocratic.[7] These findings don't prove anything about the inherent nature of rewards, but they do offer one kind of answer to the question of how rewards and punishments are related.

The most compelling aspect of that relationship, though, can be succinctly described in two words: rewards punish. Those who dispense rewards in order to avoid punishing people may not have thought about the punitive features that are built into the process of rewarding. Two such features come to mind. The first derives from the fact that rewards are every bit as controlling as punishments, even if they control by seduction. I made this argument at some length in chapter 2 in the course of identifying what might be seen as an intrinsically offensive aspect of rewards. Philosophical objections aside, though, if reward recipients feel controlled, it is likely that the experience will assume a punitive quality over the long run, even though obtaining the reward itself is usually pleasurable.[8]

One education writer compares the tendency of teachers to "blithely administer . . . knee-jerk jolts of positive reinforcement" to

the use of electric cattle prods,[9] a comparison that may seem far-fetched until we pause to consider the ultimate purpose of rewards and how manipulation is experienced by those on the receiving end. Or try a different analogy: the question is not whether more flies can be caught with honey than with vinegar, but *why* the flies are being caught in either case — and how this feels to the fly.

That rewards punish is not due only to the fact that they are controlling. They also have that effect for a second, even more straightforward, reason: some people do not get the rewards they were hoping to get, and the effect of this is, in practice, indistinguishable from punishment. Many managers and teachers make a point of withholding or withdrawing a reward if their charges do not perform as instructed. The goody is dangled and then snatched away. In fact, this is precisely what many behaviorists recommend doing. While taking care to urge that children not be punished (by which is meant making something bad happen to them), they freely prescribe the use of "response costs" (by which is meant making something good *not* happen to them).[*] Unfortunately, those who haven't been trained to make such distinctions might fail to understand that when something desirable has been taken away they are not supposed to feel punished.

A parent tells a child that continued good behavior will be rewarded with a visit to the circus on Sunday. On Saturday, the child does something that annoys the parent, which prompts a familiar warning: "Keep this up and you can forget the circus tomorrow." Can there be any doubt that this threat to remove a reward is functionally identical to a threat to employ a punishment?

But even when the person with the power does not deliberately withdraw the reward — when meeting a clear set of criteria does result in the payoff — it often happens that some people won't meet these criteria and therefore will not get the reward. The more desirable the reward, and the more possible it once seemed to attain, the more demoralizing it will be to miss out. Given that there are disadvantages to the use of rewards even when people do manage to get them, and to the use of contests even for the winners, "imagine the effects of working for a reward and not getting it or of competing and losing!"[10]

There are, it would seem, only two ways around this problem. The first is to give a reward to people regardless of whether they fulfilled

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[*] "Negative reinforcement" is different from either of these. It means taking a bad thing not happen to someone — that is, removing something unpleasant. Contrary to common usage, it is thus closer to positive reinforcement (making a good thing happen to someone) than it is to punishment.

the stated requirements. Champions of equity theory, whose war cry is "Everything must be earned! No free lunches!" find this horrifying. (In fact, a number of criticisms of rewarding children that have appeared in the popular press over the last few years turn out to be criticisms only of giving rewards too frequently or too easily.) I have a different sort of objection: a goody given unconditionally is not really a reward at all. A reward, by definition, is a desired object or event made conditional on having fulfilled some criterion: only if you do this will you get that. If I promise to give you a banana tomorrow, that is not a reward. If I promise to give you a banana tomorrow for helping me out today, that is a reward — and if I don't give it to you, you will probably feel as if you are being punished. To avoid having this happen, I must avoid giving you things on a contingent basis.

The only other alternative is not to set out any criteria or promise any rewards in advance. Instead, the person in charge could present something after the fact: "For having helped me out yesterday, here's a banana." As it happens, most studies have found that unexpected rewards are much less destructive than the rewards people are told about beforehand and are deliberately trying to obtain. But apart from the practical problems of trying to keep people from expecting another reward tomorrow, it is no coincidence that the great majority of rewards *are* promised in advance. The whole point is to control people's behavior, and the most effective way to do this is to describe what will be given to them if they comply — or done to them if they don't comply. For this very reason, the possibility of ending up without the reward, which makes the process essentially punitive, is always present. The stick is contained in the carrot.

The objection here is anything but academic. Most businesspeople can remember an instance when they, or their colleagues, were expecting a bonus, only to become demoralized when they ended up, for whatever reason, not getting it. Parents readily tell stories of exactly the same thing happening when their children failed to get some reward at school that they were counting on. Most of us are familiar with this phenomenon, but few of us have considered that it is not merely widespread but endemic to the use of rewards.

The new school, which exhorts us to catch people doing something right and reward them for it, is therefore not all that much of an improvement over the old school, which had us catching people doing something wrong and threatening to punish them if they ever did it again. What is mostly taking place in both approaches is that a lot of people are being caught. This is more than a play on words. What we are talking about is the experience of being controlled and feeling

punished. These are problematic realities in their own right, and they also happen to be impediments to working or learning effectively.

II. Rewards Rupture Relationships

Earlier I suggested that rewards and punishments flourish in asymmetrical relationships, where one person has most of the power. Even more troubling, rewards and punishments create, or at least exacerbate, that imbalance. If, as a matter of principle, we would like to see disparities in power among people minimized whenever possible, we already have reason to turn away from applied behaviorism.

But this general principle is only the beginning of the story. Rewards also disrupt relationships in very particular ways that are demonstrably linked to learning, productivity, and the development of responsibility. They have these effects both with respect to horizontal relationships (those among peers) and vertical relationships (those among people whose status is different, such as teacher and student, parent and child, supervisor and employee).

In considering the question of relationships among workers or students, we need to begin by recognizing that cooperation does not just make tasks more pleasant; in many cases, it is virtually a prerequisite for quality. More and more teachers and managers are coming to recognize that excellence is most likely to result from well-functioning teams in which resources are shared, skills and knowledge are exchanged, and each participant is encouraged and helped to do his or her best.

Rewards, by contrast, are typically based on the faulty assumption "that the organization's effectiveness is the simple additive combination of individuals' separate performances," in the words of organizational psychologist Jone L. Pearce[11] — a reductive view that overlooks the nature and value of group interaction. In the classroom, one of the central messages communicated by teachers, especially those enamored of rewards and punishments, is that tired old slogan "I want to see what you can do, not what your neighbor can do." This training in individualism persists despite considerable evidence that when students learn together in carefully structured groups, the quality of their learning is typically much higher than what even the sharpest of them could manage in solitude. As one pair of educational psychologists likes to say, "All of us are smarter than any of us."[12]

At best, rewards do nothing to promote this collaboration or a sense of community. More often, they actually interfere with these

goals: an undercurrent of "strifes and jealousies" is created whenever people scramble for goodies, as educators in New York City found nearly two centuries ago after watching a behavior modification program in action (see footnote at page 5). "Complaints of unequal treatment" and "playing favorites" are common.[13]

As a rule, rewards are not conducive to developing and maintaining the positive relationships that promote optimal learning or performance. But two common arrangements for rewarding people take a bad thing and make it much worse by explicitly setting people against each other. The first of these is a condition of artificial scarcity. Imagine that you are one of twenty or thirty students in a classroom. The teacher announces at the beginning of the year that whoever makes the highest score on each Friday's quiz will be eligible to wear a GENIUS OF THE WEEK badge and enjoy a set of privileges that go with it. How is this likely to affect the way you view your fellow students? How inclined will you be to help someone else with an assignment? How easy will it be for a sense of community to take root in that room?

In this scenario, no matter how well everyone in the class does on each test, only one student is permitted to get the prize. The central message that is taught here — the central message of all competition, in fact — is that everyone else is a potential obstacle to one's own success. If the reward system sets people up as one another's rivals, the predictable result is that each will view the others with suspicion and hostility and, depending on their relative status, perhaps with contempt or envy as well.[14]

Of all the ways by which people are led to seek rewards, I believe the most destructive possible arrangement is to limit the number that are available. To do so is to replace the possibility that people will try to assist each other with the near certainty that they will try to defeat each other. But whether it is simply permitted by a standard individual incentive system* or actually required by a race for awards, contests are destructive for several reasons beyond the fact that they preclude the sort of teamwork that leads to success.

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*Some writers have acknowledged many of these problems and suggested that the solution is to stop rewarding individuals and use small group incentives instead, either in the workplace or the classroom. Unfortunately, offering goodies to teams simply shifts the rivalry to another level, maximizing the competition and thereby minimizing the coordination among groups. Moreover, the four other major problems discussed in this chapter and the next are not alleviated by changing how many people receive a reward. There is research to show that "shared incentives do not ameliorate the negative effects of performance-contingent rewards."[15]

First, most competition creates anxiety of a type and level that typically interferes with performance.[16] Second, those who believe they don't have a chance of winning are discouraged from making an effort; having been given no reason to apply themselves except to defeat their peers, and convinced that they cannot do so, these people are almost by definition demotivated.[17] Third, according to a series of studies by psychologist Carole Ames, people tend to attribute the results of a contest, as contrasted with the results of noncompetitive striving, to factors beyond their control, such as innate ability or luck. The result is a diminished sense of empowerment and less responsibility for their future performance.[18]

But competition is only one variation on the behaviorist theme that practically guarantees enmity. The other is the deployment of a collective reward. "If all of us stay on our very best behavior," intones the teacher (speaking here in the first person even though the teacher's own behavior is never at issue), "we will have an ice cream party at the end of the day!" An excited murmur in the room soon fades with the realization that any troublemaker could spoil it for everyone else. This gambit is one of the most transparently manipulative strategies used by people in power. It calls forth a particularly noxious sort of peer pressure rather than encouraging genuine concern about the well-being of others.[19] And pity the poor child whose behavior is cited that afternoon as the reason that "the party has been, I'm sorry to say, boys and girls, canceled." Will the others resent the teacher for tempting and then disappointing them, or for setting them against one another? Of course not. They will turn furiously on the designated demon. That, of course, is the whole idea: divide and conquer.

Collective punishment is widely seen as unfair, but collective reward is not much better. What's more, neither collective nor artificially scarce rewards are confined to elementary school. Many corporations explicitly rank employees against each other or hold out the possibility of an incentive based on an entire department's performance. In this setting there is no need to announce who was responsible for the disappointing results last quarter. Someone will be found to take the blame, irrespective of whether it is deserved. Furthermore, general distrust and stress flourish in just such a system. At one company where "the pay of all depends on everyone's efforts . . . peer pressure can be so high that the first two years of employment are called purgatory."[20]

Several studies have examined the way we come to regard others when their actions determine whether we get a reward. When older

girls were promised a reward for tutoring younger girls (see page 44), they not only became less effective teachers but also "valued the younger child as a function of her utility in obtaining the desired goal": if she wasn't learning fast enough, she came to be viewed negatively.[21] In a very different kind of experiment, merely calling the attention of young adults to the possible rewards of being involved in a romantic relationship (for example, impressing one's friends) led them to report less love for their partners than was expressed by people who hadn't focused on those factors.[22]

The major point here is that whether or not people are offered a direct incentive to wish each other ill, the very fact that they have been led to see themselves as working or learning in order to get something means that they are not very likely to feel well disposed toward others and to put their heads together.[23] Some reward programs promote competition and inhibit cooperation more than others do. But to whatever extent they have this effect, the result is ultimately likely to be to the detriment of quality.

So far I have been talking about the effects of rewards on relationships among people of comparable status. The other sort of relationship affected by a reward is that between the person who gives it and the one who gets it. Even in situations in which we have no objection to the fact of this unequal status, we need to understand what the process of rewarding does to the interaction between giver and receiver. Someone who is raising or teaching children, for example, probably wants to create a caring alliance with each child, to help him or her feel safe enough to ask for help when problems develop. This is very possibly the single most fundamental requirement for helping a child to grow up healthy and develop a set of good values. For academic reasons, too, an adult must nurture just such a relationship with a student if there is to be any hope of the student's admitting mistakes freely and accepting guidance. The same goal applies to the workplace, where it is critical to establish a good working relationship characterized by trust, open communication, and the willingness to ask for assistance.

This is precisely what rewards and punishments kill. If your parent or teacher or manager is sitting in judgment of what you do, and if that judgment will determine whether good things or bad things happen to you, this cannot help but warp your relationship with that person. You will not be working collaboratively in order to learn or grow; you will be trying to get him or her to approve of what you are doing so you can get the goodies. If, for example, "the principal basis

for compensation is the boss' whim, the only real incentive is to stay on his good side."[24] A powerful inducement has been created to conceal problems, to present yourself as infinitely competent, and to spend your energies trying to impress (or flatter) the person with power. At least one study has confirmed that people are less likely to ask for help when the person to whom they would normally turn wields the carrots and sticks.[25] Needless to say, if people do not ask for help when they need it, performance suffers on virtually any kind of task.

This result is somewhat easier to see when the individual in charge is perceived as a punisher: the parent who might send the child to her room, the teacher who might write a zero in his book, the supervisor who might turn in a negative performance appraisal. If you are the person who might be punished, you are approximately as glad to see that person coming as you are to see a police car in your rearview mirror. (This is one price that parents pay for presenting themselves as enforcers of "consequences" for misbehavior.)

What some observers have missed is that relationships are ruptured just as surely when we see the powerful person as someone to be pleased as when we see him or her as someone to be feared. William Glasser has labored for a quarter of a century to transform schools into places where students are not perpetually punished and made to feel like failures. But he errs in suggesting that teachers can "reduce the adversarial atmosphere" if they use "rewards instead of punishment."[26] Such a shift will not produce a different atmosphere; at least, it will not be different in the ways that matter. Both rewards and punishments induce a behavior pattern whereby we try to impress and curry favor with the person who hands them out. Whether we are looking to secure a reward or avoid a punishment is almost beside the point. Either way, what we *don't* have is the sort of relationship that is defined by genuine concern and that invites us to take the risk of being open and vulnerable — the sort of relationship that inspires people to do their best and can truly make a difference in their lives.

Just as the essentially controlling nature of rewards is most easily noticed by those who are being controlled, so the effects of rewards on relationships are most readily seen by those who must depend on others to get what they want. This is why it is important once again for someone who dispenses rewards to imaginatively put herself in the position of whoever is dependent on her, and to reflect on the kind of relationship that now exists between the two of them (and the consequences to the other person of not having a different kind of relation-

ship). This act of perspective taking is easier for someone who plays both roles at once, someone who is responsible for deciding what happens to his subordinates while simultaneously remaining at the mercy of a superior for his own rewards.

The presence or absence of rewards is, of course, only one factor among many that affect the quality of our relationships. But it is a factor too often overlooked in its tendency to cause flattery to be emphasized in place of trust and to create a feeling of being evaluated rather than supported. This, combined with its impact on the relationships among those seeking the goodies, goes a long way toward explaining how rewards often reduce achievement.

III. Rewards Ignore Reasons

Except for the places where their use has become habitual, punishments and rewards are typically dragged out when somebody thinks something is going wrong. A child is not behaving the way we want; a student is not motivated to learn; workers aren't doing good work — this is when we bring in the reinforcements.

What makes behavioral interventions so terribly appealing is how little they demand of the intervener. They can be applied more or less skillfully, of course, but even the most meticulous behavior modifier gets off pretty easy for one simple reason: *rewards do not require any attention to the reasons that the trouble developed in the first place.* You don't have to ask why the child is screaming, why the student is ignoring his homework, why the employee is doing an indifferent job. All you have to do is bribe or threaten that person into shaping up. (Notice that this too describes a fundamental similarity between punishments and rewards.)

A mother in Virginia wrote to me not long ago to challenge my criticism of behavioral manipulation. "If I cannot either punish (or allow consequences) or reward (bribe) my children . . . what do I do when my almost three year old . . . wanders out of her room again and again at bedtime?" she asked. Fair enough: let us consider three possible ways of dealing with a child who will not stay in bed. Behaviorist A favors "consequences": "If you're not back in that bed by the time I count to three, young lady, you won't be watching television for a week!" Behaviorist B favors rewards: "If you stay in bed until morning for the next three nights, honey, I'll buy you that teddy bear you wanted."

But the nonbehaviorist wonders how anyone could presume to propose a solution without knowing *why* the child keeps popping out of bed. With very little effort we can imagine several possible reasons for this behavior. Maybe she's being put to bed too early and simply isn't sleepy yet. Maybe she feels deprived of quiet time with her parents, and the evening offers the best opportunity for her to cuddle or talk with them. Maybe she's still wound up from what happened a few hours earlier and needs to rehearse and clarify the day's events to try to make sense of what happened. Maybe there are monsters under her bed. Or maybe she can just hear people talking in the living room. (Is there anyone too old to remember how all the excitement seemed to start after we were put to bed?)

The point is we don't yet know what's really going on. But the behaviorists' solutions don't *require* us to know. Echoing a beer commercial of the late 1980s, their credo seems to be "Why ask why?" That posture helps to explain the popularity of the reward-and-punishment model — and also its ineffectiveness over the long run. Each of the possible explanations for why this girl doesn't stay in bed at night would seem to call for a different solution. (This is one reason it is difficult to give a simple reply to people who demand to know what "the alternative" is to using rewards.) Rewards are not actually solutions at all; they are gimmicks, shortcuts, quick fixes that mask problems and ignore reasons. They never look below the surface.*

From one perspective, this sort of criticism is not new. It was offered decades ago by Freudians, who argued that behavioral therapy in effect addressed only the symptoms of deeper problems. It was said that the underlying emotional issues would force their way up again in the form of a new symptom. But one doesn't have to be a psychoanalyst to see what is deficient about the behavioral approach. It is not necessary to attribute our actions to unconscious wishes and fears or repressed childhood events to recognize that merely controlling an individual's behavior with bribes or threats misses most of what is going on.

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*Things are happening beneath the surface even when we think the reason for a behavior is straightforward. A child eats candy after being told not to do so, and we assume the motive is obvious: candy tastes good. But perhaps there is more than meets the eye here. Did lunch at school not fill him up? Is his blood sugar low? Are other, healthier snacks unavailable? Is he reaching for something forbidden as a way of expressing anger about something else? Even when we are sure that nothing complicated is going on and the cause of the objectionable behavior is really as obvious as it seems, we nevertheless need to address that cause somehow rather than just trying to change the behavior.

Let's say that a student repeatedly comes to class late or daydreams while the teacher is talking. Such behavior might signal that the student has given up on the subject matter after having struggled unsuccessfully to understand the assignments — perhaps for lack of adequate study skills, perhaps because of how the teacher presents the material, perhaps for some other reason. Whatever the real problem is, it remains unsolved if our intervention consists of promising a reward for an improvement in punctuality and attentiveness (or threatening a punishment if there is no improvement). Moreover, this reward will not be delivered if the student doesn't show sufficient progress, in which case the entire exercise is likely to lead to further alienation, an even more negative self-image, and a spiral of defeat.

The same goes for adults at work, regardless of the kind of work they do. A sudden deterioration in performance frequently turns out to be due to problems at home. A chronic record of mediocre performance, meanwhile, may indicate, among many other possibilities, that there is something wrong with the job itself or with an organizational structure that holds employees responsible for things that they are powerless to control. Turning the workplace into a game show ("Tell our employees about the fabulous prizes we have for them if their productivity improves . . .") does exactly nothing to solve these underlying problems and bring about meaningful change. Often it takes no great psychological sophistication to identify what is going on — only a willingness to do something other than dangle a goody in front of people.

Take another example, this one from the pages of public policy. Some politicians, noting that poor teenagers often give up on high school, have resorted to rewarding them with additional public assistance payments if they attend classes regularly, punishing them by cutting their benefits if they drop out, and sometimes even threatening to stop the checks to their parents in order to generate sufficient family pressure to get the teenagers back in school. Apart from concerns about the fairness of these tactics,[27] what interests me is the failure to consider the underlying reasons that someone, particularly in the inner city, might decide not to continue attending school. Rather than addressing the structural causes of poverty or the lack of perceived relevance of what the curriculum has to offer, the inclination is simply to manipulate people's behavior with a carrot or stick. If the money is needed desperately enough, the manipulation may succeed in increasing school attendance for a while. It will, of course, do nothing about the deeper issues.

Some people use rewards because they are impatient for results, however fleeting or superficial: their attention is focused on the bottom line and they don't particularly care about "deeper issues." But others are guided by the view that these issues actually make no difference. The core of behaviorism, on which some decisions to use behavioral strategies are based, is that human beings are no more than what they do. Change what they do and you have dealt with the problem. One writer concisely describes behaviorism as the "confusion of inner motives with their outward expression."[28] But my point is not just that the psychological theory is inadequate; it is that the practice is unproductive. If we do not address the ultimate cause of a problem, the problem will not get solved.

This is not to say that people who resort to incentives are necessarily so dull or insensitive that they will fail to see or care about other factors. A teacher who brandishes a grade book (on the theory that an appetite for A's or a fear of F's is "motivating") may nevertheless realize that a student is failing because of an abusive home environment, and may even endeavor to do something about this. My purpose, therefore, is not to generalize about the kind of people who use rewards but to examine the implications of the strategy itself. In principle, behavioral interventions *exclude* from consideration the factors that may matter most. In practice, behavioral interventions *distract* those who use them from attending to such factors. This gives us one more explanation for why trying to motivate people by rewarding them is not a very useful strategy.

IV. Rewards Discourage Risk-taking

Rewards can sometimes increase the probability that we will act the way someone wants us to act. But they do something else at the same time that many of us fail to recognize: they change the way we engage in a given behavior.[29] To start with, when we are driven by rewards, our focus is typically more narrow than when no rewards are involved; we are less likely to notice or remember things that aren't immediately relevant to what we are doing.

Say you are handed a pile of index cards, each of which has a different word printed on it. Each card also happens to be a different color. You are told that you will win a prize for successfully memorizing all of the words, and you set to work learning them. Later, after reciting as many as you can remember, you are unexpectedly asked to

try to recall the color of the card that corresponds to each word. Chances are you will not do nearly as well on this task as someone who was given the identical instructions but wasn't promised a prize.[30]

This is an example of what researchers call "incidental learning," a type of performance that rewards invariably undermine. But the reason this happens is even more important than the effect itself. The underlying principle can be summarized this way: *when we are working for a reward, we do exactly what is necessary to get it and no more.* Not only are we less apt to notice peripheral features of the task, but in performing it we are also less likely to take chances, play with possibilities, follow hunches that might not pay off. Risks are to be avoided whenever possible because the objective is not to engage in an open-ended encounter with ideas; it is simply to get the goody. One group of researchers explained that when we are motivated by rewards, "features such as predictability and simplicity are desirable, since the primary focus associated with this orientation is to get through the task expediently in order to reach the desired goal."[31] Another psychologist was more succinct: rewards, he said, are the "enemies of exploration."[32]

This doesn't mean that we can't get people to take some kinds of risks by holding out the possibility of a reward if they are successful. The sports section and the business section of the newspaper are full of activities on which people gamble money in the hopes of making more. But notice how narrow this sort of risk-taking is. First, gamblers try to maximize their winnings by minimizing the risks: this is why they study horses or stocks carefully before betting on them. The more they are concerned about the payback, the more certainty they seek — even within an activity that, by definition, cannot provide absolute certainty. Second, gamblers are engaged in doing something where the nature (and sometimes even the precise extent) of the risks has been clearly laid out. They are not involved in challenging the bounds of an activity by approaching it from a new direction. By playing the odds, they are, paradoxically, doing something quite straightforward.

By contrast, the far more meaningful kind of risk-taking entailed by exploring new possibilities is precisely what people are unlikely to do when they are trying to obtain a reward. Far more common in most activities is an orientation of unreflective expedience — the very opposite of what creativity requires.

Teresa Amabile, who specializes in this topic, asks us to picture a rat in the behaviorist's maze trying to find its way to the cheese. The rat does not stop to weigh the advantages of trying another route,

starting off on a path where the cheddar smell is less pronounced in the hope of finding a clever shortcut. No, it just runs toward where it thinks its breakfast waits, as fast as its tiny legs can take it. "The safest, surest, and fastest way out of the maze [is] the well-worn pathway, the uncreative route," says Amabile. "The more single-mindedly an external goal is pursued, the less likely ... that creative possibilities will be explored." The narrow focus induced by rewards is similarly worrisome, she adds, since being open to "the seemingly irrelevant aspects [of a task] might be precisely what is required for creativity."[33] Incidental learning may turn out to be integral.

But what if creativity is built into the process? If people will do whatever is required to obtain a reward, won't they think creatively if that's what it takes to get it? Alas, it's not that easy, as Barry Schwartz discovered. Using reinforcements, he tried unsuccessfully to get pigeons to peck in a sequence that was different from their pecking pattern in the preceding session. Eventually, he concluded that it was possible to produce variation, but only in the form of random responses. The difficulty of trying to operantly condition genuinely novel behavior, he argued, is not due to the fact that pigeons aren't very smart. It is inherent in the nature of reinforcement. We have to be able to specify a set of characteristics shared by certain behaviors so that we can offer a reward when they (and only they) appear. But this is impossible to do when what we are looking for is something new.[34]

Schwartz then switched to human subjects and more complicated tasks (see page 44). He found that rewards sometimes seemed to elicit a "stereotypic" or repetitive approach to doing things. After all, "once one finds some response pattern that works reliably [to secure a reward], it is pointless, even foolish, to deviate from it."[35] Unfortunately, Schwartz found, when we are rewarded for what we are doing, we are less likely to be flexible and innovative in the way we solve problems — even very different problems — that come along later. Why? "Reinforcement encourages the repetition of what has worked in the past, in part because the aim of the activity is not to produce something like a general principle or a rule, but to produce another reinforcer."[36]

To be a good scientist, behavioral or otherwise, one has to expect and even welcome some negative results. It is only by comparing events that lead to a certain outcome with those that don't lead to it that we can figure out what is going on and why. But, as Schwartz observes, people working for rewards don't want to risk negative results; they want to succeed as often and as quickly as possible. This,

of course, has important implications not only for how we train physicists but also how we set up organizations and classrooms in which we want to encourage people to think systematically about anything.

It is not entirely accurate, though, to say that when we are working for rewards we just want fast and frequent success. The truth is even worse than that. Our objective is not really to succeed at the task at all (in the sense of doing it well); it is to succeed at obtaining the reward. If it were somehow possible to obtain it without finishing the assignment, we would abandon the task in a minute. Kurt Lewin said as much in the 1930s; two researchers confirmed this effect empirically in the 1980s.[37]*

If we do usually complete the task, it is only because doing so is a prerequisite for getting the goody. But even when this is true, we will, given a choice, select the easiest possible task. At least ten studies have found just that, with preschoolers working for toys, older children working for grades, and adults working for money all trying to avoid anything challenging.[39] Furthermore, research indicates that (1) the bigger the reward, the easier the task that people choose;[40] (2) when the rewards stop, those who received them earlier continue to prefer to do as little as possible;[41] and (3) easier tasks are selected not only in situations where rewards are offered but by people who are, as a general rule, more reward oriented.[42]

The basic proposition here makes logical sense. If you have been promised a reward, you come to see the task as something that stands between you and it. The easier that job is, the faster you can be done with it and pick up your prize.[43] It's logical, all right, but the practical implications are staggering. Our workplaces and classrooms, saturated in pop behaviorism as they are, have the effect of discouraging people from taking risks, thinking creatively, and challenging themselves.

Consider the popular program that offers free pizza to children for reading a certain number of books. If you were a participant in this program, what sort of books would you be likely to select? Probably short, simple ones. And what would be the likely effect of this prefer-

*By contrast, from the perspective of the individual doling out the rewards, "the ultimate goal of behavior modification should always be to get the maximum behavior for the minimum reinforcement," as two advocates of token economies put it.[38] The very essence of rewarding people, then, sets the reward giver and recipient to working at cross-purposes — another way to think about its effects on relationships.

ence on your reading skills and your attitude toward books? The answer is distressingly obvious. If we want children to read more, to read carefully, and to care about reading, then offering them bribes — edible or otherwise — is exactly the wrong way to go about it.

Likewise, in getting students to concentrate on the grades they will receive for successfully completing an assignment, we may manage to get them to do it. But what sort of tasks will they come to prefer as a result? Every time a teacher reminds the class what an assignment is "worth" (not in terms of its meaning, of course, but in terms of how many points toward a grade it represents), every time a parent asks a child what he "got" on a paper (rather than what he got from the act of writing it), an important lesson is being taught. The lesson is that school is not about playing with ideas or taking intellectual risks; it is about doing what is necessary, and only what is necessary, to snag a better letter or number. Most students will quickly accommodate us, choosing "to do that which will maximize the grade and not attempt[ing] tasks in which they might fail, even though they would choose to challenge themselves to a greater degree under other circumstances."[44]

The last part of that quotation is critical. If it has escaped our notice up until now that rewards — grades, of course, being only one example — have these unhappy effects, this may be because we assume that people naturally avoid challenging themselves, that it is "human nature" to be lazy. The evidence shows that if anything deserves to be called natural, it is the tendency to seek optimal challenge, to struggle to make sense of the world, to fool around with unfamiliar ideas. Human beings are inclined to push themselves to succeed at something (moderately) difficult.[45] As a rule, we retreat from doing so and take the easy way out only when something else intervenes — something like rewards. If people all around us generally pick the easy task, it may be because rewards are all around us too.

Just as it is possible for a behaviorally oriented teacher to think about the deeper reasons for a student's actions, so it is conceivable that someone promised a reward could choose to take risks and work on challenging tasks. Theoretically, for that matter, almost any psychological effect can be overcome by someone who is sufficiently determined. But for this to happen, one must swim upstream, attempting to transcend the mindset that rewards, by their very nature, tend to induce. Most people prodded by the promise of a reward will approach tasks in the manner described here. If that orientation disturbs us, then urging people to "be creative" or "go the extra mile" is

apt to be far less effective than taking a hard look at our use of rewards to get people to perform.

"Do this and you'll get that" makes people focus on the "that," not the "this."[46] Prompting employees to think about how much will be in their pay envelopes, or students to worry about what will be on their report cards, is about the last strategy we ought to use if we care about creativity. We can summarize this discussion as follows: *Do rewards motivate people? Absolutely. They motivate people to get rewards.*

CHAPTER

6

Behavioural Views of Learning

What Would You Do?

TEACHERS' CASEBOOK

You were hired in January to take over the class of a teacher who moved away. This is a great school. If you do well, you might be in line for a full-time opening next fall. As you are introduced around the school, you get a number of sympathetic looks and many—too many—offers of help: "Let me know if I can do anything for you."

As you walk toward your classroom, you begin to understand why so many teachers volunteered their help. You hear the screaming when you are still halfway down the hall. "Give it back, it's MINE!" "No way—come and get it!" "I hate you." A crashing sound follows as a table full of books hits the floor. The first day is a nightmare. Evidently the previous teacher had no management system—no order. Several students walk around the room while you are talking to the class, interrupt you when you are working with a group, torment the class goldfish, and open their lunches (or other students') for a self-determined, mid-morning snack. Others listen, but ask a million questions off the topic. Simply taking roll and introducing the first activity takes an hour. You end the first day exhausted and discouraged, losing your voice and your patience.

- How would you approach the situation?

- Which problem behaviours would you tackle first?

- Would giving rewards or administering punishments be useful in this situation? Why or why not?

Understanding Learning

When we hear the word "learning," most of us think of studying and school. We think about subjects or skills we intend to master, such as algebra, French chemistry, or karate. But learning is not limited to school. We learn every day of our lives. Babies learn to kick their legs to make the mobile above their cribs move, teenagers learn the lyrics to all their favourite songs, middle-aged people learn to change their diet and exercise patterns, and every few years we all learn to find a new style of dress attractive when the old styles (the styles we once loved) go out of fashion. This last example shows that learning is not always intentional. We don't try to like new styles and dislike old; it just seems to happen that way. We don't intend to become nervous when we see the dentist fill a syringe with Novocain or when we step onto a stage, yet many of us do. So what is this powerful phenomenon called learning?

Learning: A Definition

In the broadest sense learning occurs when experience causes a relatively permanent change in an individual's knowledge or behaviour. The change may be deliberate or unintentional, for better or for worse. To qualify as learning, this change must be brought about by experience—by the interaction of a person with his or her environment. Changes simply caused by maturation, such as growing taller or turning gray, do not qualify as learning. Temporary changes resulting from illness, fatigue, or hunger are also excluded from a general definition of learning. A person who has gone without food for two days does not

Learning Process through which experience causes permanent change in knowledge or behaviour.

learn to be hungry, and a person who is ill does not learn to run more slowly. Of course, learning plays a part in how we respond to hunger or illness.

Our definition specifies that the changes resulting from learning are in the individual's knowledge or behaviour. While most psychologists would agree with this statement, some tend to emphasize the change in knowledge, others the change in behaviour. Cognitive psychologists, who focus on changes in knowledge, believe learning is an internal mental activity that cannot be observed directly. As you will see in the next chapter, cognitive psychologists studying learning are interested in unobservable mental activities such as thinking, remembering, and solving problems (Schwartz & Reisberg, 1991).

The psychologists discussed in this chapter, on the other hand, favour behavioural learning theories. The behavioural view generally assumes that the outcome of learning is change in behaviour and emphasizes the effects of external events on the individual. Some early behaviourists like J. B. Watson took the radical position that because thinking, intentions, and other internal mental events could not be seen or studied rigorously and scientifically, these "mentalisms," as he called them, should not even be included in an explanation of learning. Before we look in depth at behavioural explanations of learning, let's step into an actual classroom and note the possible results of learning.

Learning Is Not Always What It Seems

Elizabeth was beginning her first day of solo teaching. After weeks of working with her cooperating teacher in a grade eight social studies class, she was ready to take over. As she moved from behind the desk to the front of the room, she saw another adult approach the classroom door. It was Dr. Ross, her supervisor from the university. Elizabeth's neck and facial muscles suddenly became very tense and her hands trembled.

"I've stopped by to observe your teaching," Dr. Ross said. "This will be my first of six visits. I tried to reach you last night to tell you."

Elizabeth tried to hide her reaction, but her hands trembled as she gathered the notes for the lesson.

"Let's start today with a kind of game. I will say some words, then I want you to tell me the first words you can think of. Don't bother to raise your hands. Just say the words out loud, and I will write them on the board. Don't all speak at once, though. Wait until someone else has finished to say your word. Okay, here is the first word: Métis."

"Red River." "Louis Riel." "Rebellion." The answers came very quickly, and Elizabeth was relieved to see that the students understood the game.

"All right, very good," she said. "Now try another one: Batoche."

"Duck Lake." "Fish Creek." "John A. Macdonald." "Big Mac." "Sir Ronald McDonald!" With this last answer, a ripple of laughter moved across the room.

"Ronald McDonald?" Elizabeth sighed dreamily. "Get serious." Then she laughed too. Soon all the students were laughing. "Okay, settle down," Elizabeth said. "These ideas are getting a little off base!"

"Off base? Baseball," shouted the boy who had first mentioned Ronald McDonald. He stood up and started throwing balls of paper to a friend in the back of the room, simulating the style of Roger Clemens.

"Expos." "No, the Blue Jays." "The SkyDome." "Hot dogs." "Popcorn." "Hamburgers." "Ronald McDonald." The responses now came too fast for Elizabeth to stop them. For some reason, the Ronald McDonald line got an even bigger laugh the second time around, and Elizabeth suddenly realized she had lost the class.

Behavioral Learning Theories Explanations of learning that focus on external events as the cause of changes in observable behaviours.

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Are there experiences in your "learning history" that have made you anxious about speaking in public or taking tests? How might behavioural principals of learning help to explain the development of these anxieties?

Contiguity Association of two events because of repeated pairing.

Stimulus Event that activates behaviour.

Response Observable reaction to a stimulus.

"Okay, since you know so much about the Rebellion, close your books and take out a pen," Elizabeth said, obviously angry. She passed out the worksheet that she had planned as a cooperative, open-book project. "You have 20 minutes to finish this test!"

"You didn't tell us we were having a test!" "This isn't fair!" "We haven't even covered this stuff yet!" "I didn't do anything wrong!" There were moans and disgusted looks, even from the most mellow students. "I'm reporting you to the principal; it's a violation of students' rights!"

This last comment hit hard. The class had just finished discussing human rights as preparation for this unit on the Rebellion. As she listened to the protests, Elizabeth felt terrible. How was she going to grade these "tests"? The first section of the worksheet involved facts about events leading up to the Northwest Rebellion, and the second section asked students to create a news-style program interviewing ordinary people touched by the war.

"All right, all right, it won't be a test. But you do have to complete this worksheet for a grade. I was going to let you work together, but your behaviour this morning tells me that you are not ready for group work. If you can complete the first section of the sheet working quietly and seriously, you may work together on the second section." Elizabeth knew that her students would like to work together on writing the script for the news interview program.

It appears, on the surface at least, that very little learning of any sort was taking place in Elizabeth's classroom. In fact, Elizabeth had some good ideas; but she also made some mistakes in her application of learning principles. We will return to this episode later in the chapter to analyze various aspects of what took place. To get us started, four events can be singled out, each possibly related to a different learning process.

First, Elizabeth's hands trembled when her college supervisor entered the room. Second, the students were able to associate the phrases *Red River* and *Lous Riel* with the word Métis. Third, one student continued to disrupt the class with inappropriate responses. And fourth, after Elizabeth laughed at a student comment, the class joined in her laughter. The four learning processes represented are classical conditioning, contiguity, operant conditioning, and observational learning. In the following pages we will examine these four kinds of learning, starting with contiguity.

Early Explanations of Learning: Contiguity and Classical Conditioning

One of the earliest explanations of learning came from Aristotle (384–322 B.C.). He said that we remember things together (1) when they are similar, (2) when they contrast, and (3) when they are *contiguous*. This last principle is the most important, because it is included in all explanations of *learning by association*. The principle of contiguity states that whenever two or more sensations occur together often enough, they will become associated. Later, when only one of these sensations (a stimulus) occurs, the other will be remembered too (a response) (Rachlin, 1991).

Some results of contiguous learning were evident in Elizabeth's class. When she said "Métis," students associated the words "Red River" and "Louis Riel." They had heard these words together many times in a movie shown the day before. Other learning processes may also be involved when students learn these phrases, but contiguity is a factor. Contiguity also plays a major role in another learning process best known as *classical conditioning*.

Pavlov's Dilemma and Discovery: Classical Conditioning

Classical conditioning focuses on the learning of *involuntary* emotional or physiological responses such as fear, increased heartbeat, salivation, or sweating, which are sometimes called respondents because they are automatic responses to stimuli. Through the process of classical conditioning, humans and animals can be trained to react involuntarily to a stimulus that previously had no effect—or a very different effect—on them. The stimulus comes to *elicit*, or bring forth, the response automatically.

Classical conditioning was discovered by Ivan Pavlov, a Russian physiologist, in the 1920s. In his laboratory, Pavlov was plagued by a series of setbacks in his experiments on the digestive system of dogs. He was trying to determine how long it took a dog to secrete digestive juices after it had been fed, but the intervals of time kept changing. At first, the dogs salivated in the expected manner while they were being fed. Then the dogs began to salivate as soon as they saw the food. Finally, they salivated as soon as they saw the scientist enter the room. The white coats of the experimenters and the sound of their footsteps all *elicited* salivation. Pavlov decided to make a detour from his original experiments and examine these unexpected interferences in his work.

In one of his first experiments, Pavlov began by sounding a tuning fork and recording a dog's response. As expected, there was no salivation. At this point, the sound of the tuning fork was a neutral stimulus because it brought forth no salivation. Then Pavlov fed the dog. The response was salivation. The food was an unconditioned stimulus (US) because no prior training or "conditioning" was needed to establish the natural connection between food and salivation. The salivation was an unconditioned response (UR), again because it occurred automatically—no conditioning required.

Using these three elements—the food, the salivation, and the tuning fork—Pavlov demonstrated that a dog could be conditioned to salivate after hearing the tuning fork. He did this by contiguous pairing of the sound with food. At the beginning of the experiment, he sounded the fork and then quickly fed the dog. After Pavlov repeated this several times, the dog began to salivate after hearing the sound but before receiving the food. Now the sound had become a conditioned stimulus (CS) that could bring forth salivation by itself. The response of salivating after the tone was now a conditioned response (CR).

Generalization, Discrimination, and Extinction

Pavlov's work also identified three other processes in classical conditioning: *generalization, discrimination,* and *extinction.* After the dogs learned to salivate in response to hearing one particular sound, they would also salivate after hearing similar tones that were slightly higher or lower. This process is called generalization because the conditioned response of salivating generalized or occurred in the presence of similar stimuli. Pavlov could also teach the dogs discrimination—to respond to one tone but not to others that are similar—by making sure that food always followed only one tone, not any others. Extinction occurs when a conditioned stimulus (a particular tone) is presented repeatedly but is not followed by the unconditioned stimulus (food). The conditioned response (salivating) gradually fades away and finally is "extinguished"—it disappears altogether.

Focus on...

Classical Conditioning

- How does a neutral stimulus become a conditioned stimulus?
- Discriminate between generalization and discrimination.
- After several painful visits to the dentist, you feel your heart rate increase when you sit down in the dentist's chair to have your teeth cleaned. Analyze this situation in terms of classical conditioning.

Classical Conditioning Association of automatic responses with new stimuli.

Respondents Responses (generally automatic or involuntary) elicited by specific stimuli.

Neutral Stimulus Stimulus not connected to a response.

Unconditioned Stimulus (US) Stimulus that automatically produces an emotional or physiological response.

Unconditioned Response (UR) Naturally occurring emotional or physiological response.

Conditioned Stimulus (CS) Stimulus that evokes an emotional or physiological response after conditioning.

Conditioned Response (CR) Learned response to a previously neutral stimulus.

Generalization Responding in the same way to similar stimuli.

Discrimination Responding differently to similar, but not identical stimuli.

Extinction Gradual disappearance of a learned response.

Pavlov's findings and those of other researchers who have studied classical conditioning have implications for teachers. It is possible that many of our emotional reactions to various situations are learned in part through classical conditioning. For example, Elizabeth's trembling hands when she saw her college supervisor might be traced to previous unpleasant experiences. Perhaps she had been embarrassed during past evaluations of her performance, and now just the thought of being observed elicits a pounding heart and sweaty palms. Remember that emotions and attitudes as well as facts and ideas are learned in classrooms. This emotional learning can sometimes interfere with academic learning. Procedures based on classical conditioning also can be used to help people learn more adaptive emotional responses, as the Guidelines on page xxx suggest.

Operant Conditioning: Trying New Responses

So far we have concentrated on the automatic conditioning of involuntary responses such as salivation and fear. Clearly, not all human learning is so automatic and unintentional. Most behaviours are not *elicited* by stimuli, they are *emitted* or voluntarily enacted. People actively "operate" on their environment to produce different kinds of consequences. These deliberate actions are called operants. The learning process involved in operant behaviour is called operant conditioning because we learn to behave in certain ways as we operate on the environment.

Using Principles of Classical Conditioning

Associate positive, pleasant events with learning tasks.

Examples

1. Emphasize group competition and cooperation over individual competition. Many students have negative emotional responses to individual competition that may generalize to other learning.

2. Make division drills fun by having students decide how to divide refreshments equally, then letting them eat the results.

3. Make voluntary reading appealing by creating a comfortable reading corner with pillows, colourful displays of books, and reading props such as puppets (see Morrow & Weinstein, 1986, for more ideas).

Help students to risk anxiety-producing situations voluntarily and successfully.

Examples

1. Assign a shy student the responsibility of teaching two other students how to distribute materials for map study.

2. Devise small steps toward a larger goal. For example, give ungraded practice tests daily, and then weekly, to students who tend to "freeze" in test situations.

3. If a student is afraid of speaking in front of the class, let the student read a report to a small group while seated, then read it while standing, then give the report from notes instead of reading it verbatim. Next, move in stages toward having the student give a report to the whole class.

Help students recognize differences and similarities among situations so they can discriminate and generalize appropriately.

Operants Voluntary (and generally goal-directed) behaviours emitted by a person or an animal.

Operant Conditioning Learning in which voluntary behaviour is strengthened or weakened by consequences or antecedents.

Examples
1. Explain that it is appropriate to avoid strangers who offer gifts or rides but safe to accept favours from adults when parents are present.

2. Assure students who are anxious about taking college entrance exams that this test is like all the other achievement tests they have taken.

The Work of Thorndike and Skinner

Edward Thorndike and B. F. Skinner both played major roles in developing knowledge of operant conditioning. Thorndike's (1913) early work involved cats that he placed in problem boxes. To escape from the box and reach food outside, the cats had to pull out a bolt or perform some other task; they had to act on their environment. During the frenzied movements that followed the closing of the box, the cats eventually made the correct movement to escape, usually by accident. After repeating the process several times, the cats learned to make the correct response almost immediately. Thorndike decided, on the basis of these experiments, that one important law of learning was the law of effect: Any act that produces a satisfying effect in a given situation will tend to be repeated in that situation. Because pulling out a bolt produced satisfaction (access to food), cats repeated that movement when they found themselves in the box again.

Thorndike thus established the basis for operant conditioning, but the person generally thought to be responsible for developing the concept is B. F. Skinner (1953). Skinner began with the belief that the principles of classical conditioning account for only a small portion of learned behaviours. Many human behaviours are operants, not respondents. Classical conditioning describes only how existing behaviours might be paired with new stimuli; it does not explain how new operant behaviours are acquired.

Behaviour, like response or action, is simply a word for what a person does in a particular situation. Conceptually, we may think of a behaviour as sandwiched between two sets of environmental influences: those that precede it (its antecedents) and those that follow it (its consequences) (Skinner, 1950). This relationship can be shown very simply as antecedent–behaviour–consequence, or A–B–C. As behaviour unfolds, a given consequence becomes an antecedent for the next ABC sequence. Research in operant conditioning shows that operant behaviour can be altered by changes in the antecedents, the consequences, or both. Early work focused on consequences, often using rats or pigeons as subjects.

B. F. Skinner's work on operant conditioning changed the way we think about consequences and learning.

Types of Consequences

According to the behavioural view, consequences determine to a great extent whether a person will repeat the behaviour that led to the consequences. The type and timing of consequences can strengthen or weaken behaviours. We will look first at consequences that strengthen behaviour.

Reinforcement. While reinforcement is commonly understood to mean "reward," this term has a particular meaning in psychology. A reinforcer is any consequence that strengthens the behaviour it follows. So, by definition, *reinforced behaviours increase in frequency or duration.* Whenever you see a behaviour persisting or increasing over time, you can assume the consequences of that behaviour are reinforcers for the individual involved. The reinforcement process can be diagrammed as follows:

Antecedents Events that precede an action.

Consequences Events that are brought about by an action.

Reinforcement Use of consequences to strengthen behaviour.

Reinforcer Any event that follows a behaviour and increases the chances that the behaviour will occur again.

CONSEQUENCE   EFFECT

Behaviour ——▶ Reinforcer ——▶ Strengthened or repeated behaviour
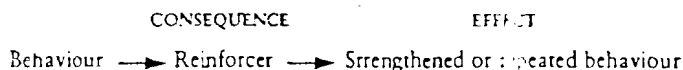
We can be fairly certain that food will be a reinforcer for a hungry animal, but what about people? It may not be clear why an event acts as a reinforcer for an individual, but there are many theories about why reinforcement works. For example, some psychologists suggest that reinforcers satisfy needs, while other psychologists believe that reinforcers reduce tension or stimulate a part of the brain (Rachlin, 1991). Whether the consequences of any action are reinforcing depends on the individual's perception of the event and the meaning it holds for her or him. For example, students who repeatedly get themselves sent to the principal's office for misbehaving may be indicating that something about this consequence is reinforcing for them, even if it doesn't seem rewarding to you.

Reinforcers are those consequences that strengthen the associated behaviour (Skinner, 1953, 1989). There are two types of reinforcement. The first, called positive reinforcement, occurs when the behaviour produces a new stimulus. Examples include a peck on the red key producing food for a pigeon, wearing a new outfit producing many compliments, or falling out of your chair producing cheers and laughter from classmates.

Notice that positive reinforcement can occur even when the behaviour being reinforced (falling out of a chair) is not "positive" from the teacher's point of view. In fact, positive reinforcement of inappropriate behaviours occurs unintentionally in many classrooms. Teachers inadvertently help maintain problem behaviours by reinforcing them. For example, Elizabeth may have unintentionally reinforced problem behaviour in her class by laughing when the boy answered, "Ronald McDonald." The problem behaviour may have persisted for other reasons, but the consequence of Elizabeth's laughter could have played a role.

When the consequence that strengthens a behaviour is the *appearance* (addition) of a new stimulus, the situation is defined as positive reinforcement. In contrast, when the consequence that strengthens a behaviour is the *disappearance* (subtraction) of a stimulus, the process is called negative reinforcement. If a particular action leads to stopping, avoiding, or escaping an aversive situation, the action is likely to be repeated in a similar situation. A common example is the car seatbelt buzzer. As soon as you attach your seatbelt, the irritating buzzer stops. You are likely to repeat this action in the future because the behaviour made an aversive stimulus disappear. Consider students who continually "get sick" right before a test and are sent to the nurse's office. The behaviour allows the students to escape aversive situations—tests—so getting "sick" is being maintained, in part, through negative reinforcement. It is negative because the stimulus (the test) disappears; it is reinforcement because the behaviour that caused the stimulus to disappear (getting "sick") increases or repeats. It is also possible that classical conditioning plays a role. The students may have been conditioned to experience unpleasant physiological reactions to tests.

The "negative" in negative reinforcement does not imply that the behaviour being reinforced is necessarily unrewarding. The meaning is closer to that of "negative" numbers—something is subtracted. Associate positive and negative reinforcement with adding or subtracting something following a behaviour.

Punishment. Negative reinforcement is often confused with punishment. The process of reinforcement (positive or negative) always involves strengthening behaviour. Punishment, on the other hand, always involves *decreasing or suppressing behaviour.* A behaviour followed by a "punisher" is *less* likely to be repeated in similar situations in the future. Again, it is the effect that defines a consequence as punishment, and different people have different per-


Positive Reinforcement Strengthening behaviour by presenting a desired stimulus after the behaviour.

Negative Reinforcement Strengthening behaviour by removing an aversive stimulus.

Aversive Irritating or unpleasant.

Punishment Process that weakens or suppresses behaviour.

ceptions of what is punishing. One student may find suspension from school punishing, while another student wouldn't mind at all. The process of punishment is diagrammed as follows:
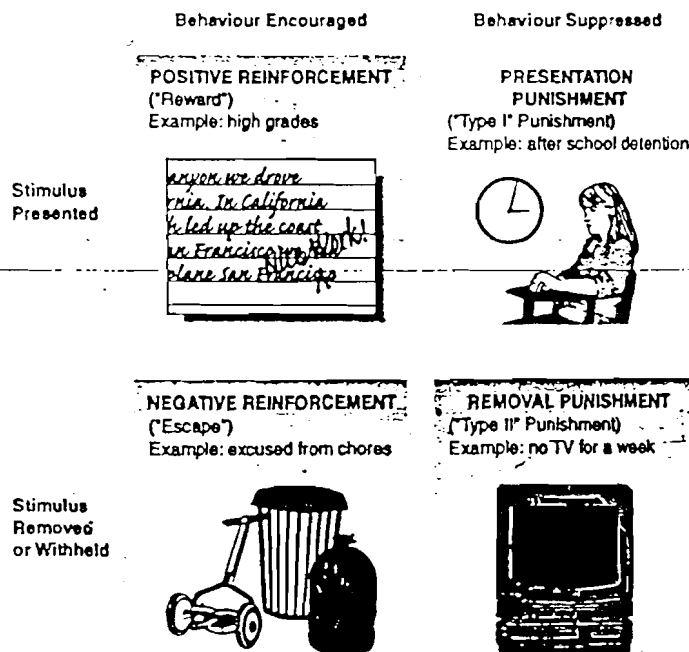
CONSEQUENCE   EFFECT

Behaviour —▶ Punisher —▶ Weakened or decreased behaviour
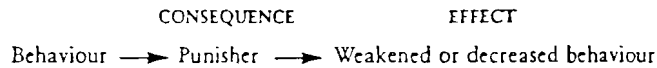
Like reinforcement, punishment may take one of two forms. The first type has been called Type 1 punishment, but this name isn't very informative, so we use the term presentation punishment. It occurs when the appearance of a stimulus following the behaviour suppresses or decreases the behaviour. When teachers assign demerits, extra work, running laps, and so on, they are using presentation punishment. The other type of punishment (Type II punishment) we call removal punishment because it involves removing a stimulus. When teachers or parents take away privileges after a young person has behaved inappropriately, they are applying removal punishment. With both types, the effect is to decrease the behaviour that led to the punishment. Figure 6.1 summarizes the processes of reinforcement and punishment.

FIGURE 6.1

Kinds of Reinforcement and Punishment

Negative reinforcement and punishment are often confused. It may help you to remember that reinforcement is always associated with increases in behavior, and punishment always involves decreasing or suppressing behavior.

	Behaviour Encouraged	Behaviour Suppressed
Stimulus Presented	POSITIVE REINFORCEMENT ("Reward") Example: high grades	PRESENTATION PUNISHMENT ("Type I" Punishment) Example: after school detention
Stimulus Removed or Withheld	NEGATIVE REINFORCEMENT ("Escape") Example: excused from chores	REMOVAL PUNISHMENT ("Type II" Punishment) Example: no TV for a week

Presentation Punishment Decreasing the chances that a behaviour will occur again by presenting an aversive stimulus following the behaviour; also called Type I punishment.

Removal Punishment Decreasing the chances that a behaviour will occur again by removing a pleasant stimulus following the behaviour; also called Type II punishment.

Casino slot machines are a good example of the effectiveness of intermittent reinforcement: People "learn" to persist in losing their money on the chance that they will be rewarded with a jackpot.

Reinforcement Schedules

When people are first learning a new behaviour, they will learn it faster if they are reinforced for every correct response. This is a continuous reinforcement schedule. Then, when the new behaviour has been mastered, they will maintain it best if they are reinforced intermittently rather than every time. An intermittent reinforcement schedule seems to help students maintain skills without expecting constant reinforcement.

There are two basic types of intermittent reinforcement schedules. One—called an interval schedule—is based on a time interval that passes between reinforcers. The other—a ratio schedule—is based on the number of responses learners make between reinforcers. Interval and ratio schedules may be either *fixed* (predictable) or *variable* (unpredictable). Table 6.1 summarizes the five possible reinforcement schedules (the continuous schedule and the four kinds of intermittent schedules).

Summarizing the Effects of Reinforcement Schedules

Speed of performance depends on control. If reinforcement is based on the number of responses you make, then you have more control over the reinforcement: the faster you accumulate the correct number of responses, the faster the reinforcer will come. A teacher who says, "As soon as you complete these ten problems correctly, you may go to the student lounge," can expect higher rates of performance than a teacher who says, "Work on these ten problems for the next 20 minutes. Then I will check your papers and those with ten correct may go to the lounge."

Persistence in performance depends on predictability. Continuous reinforcement and both kinds of fixed reinforcement (ratio and interval) are quite predictable. We come to expect reinforcement at certain points and are generally quick to give up when the reinforcement does not meet our expectations. To encourage persistence of response, variable schedules are most appropriate. In fact, if the schedule is gradually changed until it becomes very "lean"—meaning that reinforcement occurs only after many responses or a long time interval—then people can learn to work for extended periods without any reinforcement at all. Just watch gamblers playing slot machines to see how powerful a lean reinforcement schedule can be.

Reinforcement schedules influence how persistently we will respond when reinforcement is withheld. What happens when reinforcement is completely withdrawn?

Focus on...

Consequences

- What defines a consequence as a reinforcer? As a punisher?
- How are negative reinforcement and punishment different?
- How can you encourage persistence in a behaviour?

Continuous Reinforcement Schedule Presenting a reinforcer after every appropriate response.

Intermittent Reinforcement Schedule Presenting a reinforcer after some but not all responses.

Interval Schedule Length of time between reinforcers.

Ratio Schedule Number of responses between reinforcers.

Extinction. In classical conditioning, we saw that the conditioned response was extinguished (disappeared) when the conditioned stimulus appeared but the unconditioned stimulus did not follow (tone, but no food). In operant conditioning, a person or an animal will not persist in a certain behaviour if the usual reinforcer is withheld. The behaviour will eventually be extinguished (stop). For example, if you go for a week without selling even one magazine door-to-door, you may give up. Removal of reinforcement altogether leads to extinction. The process may take a while, however, as you know if you have tried to extinguish a child's tantrums by withholding your attention. Often the child wins—you give up ignoring and instead of extinction, intermittent reinforcement occurs. This, of course, may encourage even more persistent tantrums in the future.

TABLE 6.1   Reinforcement Schedules

Schedule	Definition	Example	Response Pattern	Reaction When Reinforcement Stops
Continuous	Reinforcement after every response	Turning on the television	Rapid learning of response	Very little persistence; rapid disappearance of response
Fixed-interval	Reinforcement after a set period of time	Weekly quiz	Response rate increases as time for reinforcement approaches, then drops after reinforcement	Little persistence; rapid drop in response rate when time for reinforcement passes and no reinforcer appears
Variable-interval	Reinforcement after varying lengths of time	Pop quizzes	Slow, steady rate of responding; very little pause after reinforcement	Greater persistence; slow decline in response rate
Fixed-ratio	Reinforcement after a set number of responses	Piece work Bake sale	Rapid response rate; pause after reinforcement	Little persistence; rapid drop in response rate when expected number of responses are given and no reinforcer appears
Variable-ratio	Reinforcement after a varying number of responses	Slot machines	Very high response rate; little pause after reinforcement	Greatest persistence; response rate stays high and gradually drops off

Antecedents and Behaviour Change

In operant conditioning, antecedents—the events preceding behaviours—provide information about which behaviours will lead to positive consequences and which to negative. Skinner's pigeons learned to peck for food when a light was on, but not to bother when the light was off, because no food followed pecking when the light was off. In other words, they learned to use the antecedent light as a cue to discriminate the likely consequence of pecking. The pigeons' pecking was under stimulus control, controlled by the discriminative stimulus of the light. You can see that this idea is related to discrimination in classical conditioning, but here we are talking about voluntary behaviours like pecking, not reflexes like salivating.

We all learn to discriminate—to read situations. When should you ask to borrow your roommate's car, after a major disagreement or after you both have had a great time at a hockey game? The antecedent cue of a school principal standing in the hall helps students discriminate the probable consequences of running or attempting to break into a locker. We often respond to such antecedent cues without fully realizing that they are influencing our behaviour. But teachers can use cues deliberately in the classroom.

Cueing.   By definition, cueing is the act of providing an antecedent stimulus just before you went a particular behaviour to take place. Cueing is particularly useful in setting the stage for behaviours that must occur at a specific time but are easily forgotten. In working with young people, teachers often find themselves correcting behaviours after the fact. For example, they may ask students, "When are you going to start remembering to . . . ?" Such reminders often lead

Stimulus Control Capacity for the presence or absence of antecedents to regulate behaviours.

Cueing Providing a stimulus that "sets up" a desired behaviour.

to irritation. The mistake is already made, and the young person is left with only two choices, to promise to try harder or to say, "Why don't you leave me alone?" Neither response is very satisfying. Presenting a nonjudgmental cue before this happens can help prevent these negative confrontations. When a student performs the appropriate behaviour after a cue, the teacher can reinforce the student's accomplishment instead of punishing the student's failure.

Prompting. Sometimes students need help in learning to respond to a cue in an appropriate way so the cue becomes a discriminative stimulus. One approach is to provide an additional cue, called a prompt, following the first cue. There are two principles for using a cue and a prompt to teach a new behaviour (Becker, Engelmann, & Thomas, 1975). First, make sure the environmental stimulus that you want to become a cue occurs immediately before the prompt you are using, so students will learn to respond to the cue and not rely only on the prompt. Second, gradually use the prompt less and less—fade it— so students do not become dependent on it.

An example of cueing and prompting is providing students with a checklist or reminder sheet. Figure 6.2 is a checklist for the steps in peer tutoring. Working in pairs is the cue; the checklist is the prompt. As students learn the procedures, the teacher may stop using the checklist, but may remind the students of the steps. When no written or oral prompts are necessary, the students have learned to respond appropriately to the environmental cue of working in

Prompt A reminder that follows a cue to make sure the person reacts to the cue.

FIGURE 6.2

Written Prompts: A Peer-Tutoring Checklist

By using this checklist, students are reminded how to be effective tutors. As they become more proficient, the checklist may be less necessary.

pairs—they have learned how to behave in tutoring situations. But the teacher should continue to monitor the process, recognize and reinforce good work, and correct mistakes. Before a tutoring session, the teacher might ask students to close their eyes and "see" the checklist, focusing on each step. As students work, the teacher could listen to their interactions and continue to coach students as they improve their tutoring skills.

Applied Behaviour Analysis

Applied behaviour analysis is the application of behavioural learning principles to change behaviour. The method is sometimes called behaviour modification, but this term has negative connotations for many people and is often misunderstood (Alberto & Troutman, 1990; Kaplan, 1991).

Ideally, applied behaviour analysis requires clear specification of the behaviour to be changed, careful recording of the behaviour, analysis of the antecedents and reinforcers that might be maintaining inappropriate or undesirable behaviour, interventions based on behavioural principles to change the behaviour, and careful measurement of changes. In research on applied behaviour analysis, a method or design called ABAB is common. That is, researchers take a baseline measurement of the behaviour (A), then apply the intervention (B), then stop the intervention to see if the behaviour goes back to the baseline level (A), and then reintroduce the intervention (B). If the behaviour during the B phases differs from the behaviour during the A phases, the consequences are effective.

In classrooms, teachers usually cannot follow all the ABAB steps, but they can do the following:

1. Clearly specify the behaviour to be changed and note the current level. For example, if a student is "careless," does this mean two, three, four, or more computation errors for every ten problems?

2. Plan a specific intervention using antecedents, consequences, or both. For example, offer the student one extra minute of computer time for every problem completed with no errors.

3. Keep track of the results, and modify the plan if necessary.

Let's consider some specific methods for accomplishing step 2—the *intervention.*

Methods for Encouraging Behaviours

As we discussed earlier, to increase behaviour reinforce it. There are several specific ways to encourage existing behaviours or teach new ones. These include praise, the Premack principle, shaping, and positive practice.

Reinforcing with Teacher Attention. Early work such as that of Madsen, Becker, and Thomas (1968) demonstrated that teachers can improve student behaviour by ignoring rule-breakers and praising students who are following the rules, many psychologists advised teachers to "accentuate the positive"—liberally praise students for good behaviour while ignoring mistakes and misbehaviour. This *praise-and-ignore approach* can be helpful, but we should not expect it to solve all classroom management problems. Several studies have shown that disruptive behaviours persist when teachers use positive consequences (mostly praise) as their only classroom management strategy (Pfiffner, Rosen, & O'Leary, 1985; Rosen, O'Leary, Joyce, Conway, & Pfiffner, 1984).

Applied Behaviour Analysis The application of behavioural learning principles to understand and change behaviour.

Behaviour Modification Systematic application of antecedents and consequences to change behaviour.

There is a second consideration in using praise. The positive results found in research occur when teachers *carefully* and *systematically* praise their students. Unfortunately, praise is not always given appropriately and effectively. Merely "handing out compliments" will not improve behaviour. To be effective, praise must (1) be contingent on (immediately follow) the behaviour to be reinforced, (2) specify clearly the behaviour being reinforced, and (3) be believable (O'Leary & O'Leary, 1977). In other words, the praise should be sincere recognition of a well-defined behaviour so students understand what they did to warrant the recognition. Teachers who have not received special training often violate these conditions (Brophy, 1981). Ideas for using praise effectively, based on Brophy's extensive review of the subject, are presented in the Guidelines.

Guidelines

Using Praise Appropriately

Be clear and systematic in giving praise.

Examples

1. Make sure praise is tied directly to appropriate behaviour.
2. Make sure the student understands the specific action or accomplishment that is being praised. Say, "You returned this poster on time and in good condition," not, "You were very responsible."

Recognize genuine accomplishments.

Examples

1. Reward the attainment of specified goals, not just participation.
2. Do not reward uninvolved students just for being quiet and not disrupting the class.
3. Tie praise to students' improving competence or to the value of their accomplishment. Say, "I noticed that you double-checked all your problems. Your score reflects your careful work."

Set standards for praise based on individual abilities and limitations.

Examples

1. Praise progress or accomplishment in relation to the individual student's past efforts.
2. Focus the student's attention on his or her own progress, not on comparisons with others.

Attribute the student's success to effort and ability so the student will gain confidence that success is possible again.

Examples

1. Don't imply that the success may be based on luck, extra help, or easy material.
2. Ask students to describe the problems they encountered and how they solved them.

Make praise really reinforcing.

Examples

1. Don't attempt to influence the rest of the class by singling out some students for praise. This tactic frequently backfires, since students know what's really going on. In addition, you risk embarrassing the student you have chosen to praise.
2. Don't give undeserved praise to students simply to balance failures. It is seldom consoling and calls attention to the student's inability to earn genuine recognition.

Some psychologists have suggested that teachers' use of praise tends to focus students on learning to win approval rather than on learning for its own sake. Perhaps the best advice is to be aware of the potential dangers of the overuse or misuse of praise and to navigate accordingly.

Selecting Reinforcers: The Premack Principle.   In most classrooms, there are many readily available reinforcers other than teacher attention, such as the chance to talk to other students or feed the class animals. But teachers tend to offer these opportunities in a rather haphazard way. Just as with praise, by making privileges and rewards directly contingent on learning and positive behaviour, the teacher may greatly increase both learning and desired behaviour.

A helpful guide for choosing the most effective reinforcers is the Premack principle, named for David Premack (1965). According to the Premack principle, a high-frequency behaviour (a preferred activity) can be an effective reinforcer for a low-frequency behaviour (a less-preferred activity). This is sometimes referred to as "Grandma's rule": first do what I want you to do, then you may do what you want to do. Elizabeth used this principle in her class when she told them they could work together on their news program after they had quietly completed the first section of the worksheet on their own.

If students didn't have to study, what would they do? The answers to this question may suggest many possible reinforcers. For most students, talking, moving around the room, sitting near a friend, being exempt from assignments or tests, reading magazines, or playing games are preferred activities. The best way to determine appropriate reinforcers for your students may be to watch what they do in their free time.

For the Premack principle to be effective, the low-frequency (less preferred) behaviour must happen first. In the following dialogue, notice how the teacher loses a perfect opportunity to use the Premack principle:

Students: Oh, no! Do we have to work on grammar again today? The other classes got to discuss the film we saw in the auditorium this morning.

Teacher: But the other classes finished the lesson on sentences yesterday. We're almost finished too. If we don't finish the lesson, I'm afraid you'll forget the rules we reviewed yesterday.

Students: Why don't we finish the sentences at the end of the period and talk about the film now?

Teacher: Okay, if you promise to complete the sentences later.

Discussing the film could have served as a reinforcer for completing the lesson. As it is, the class may well spend the entire period discussing the film. Just as the discussion becomes fascinating, the teacher will have to end it and insist that the class return to the grammar lesson.

Some teachers use questionnaires like the one in Table 6.2 to identify effective reinforcers for their students. Remember, what works for one student may not be right for another. And students can get "too much of a good thing"—reinforcers can lose their potency if they are overused.

Shaping.   What happens when students cannot gain reinforcement because they simply cannot perform a skill in the first place? Consider these examples:

A grade-four student looks at the results of the latest mathematics test. "No credit on almost half of the problems again because I made one dumb mistake in each problem. I hate math!"

A grade-ten student tries each day to find some excuse for avoiding the softball game in gym class. The student cannot catch a ball and now refuses to try.

"HEY, WAIT A MINUTE! YOU'RE CLEANING ERASERS AS A PUNISHMENT? I'M CLEANING ERASERS AS A REWARD!"

(© 1991 Tony Saltzman)

Premack Principle Principle stating that a more-preferred activity can serve as reinforcer for a less-preferred activity.

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TABLE 6.2   What Do You Like? Reinforcement Ideas
from Students

Name _____   Grade _____ Date_____

Please answer all the questions as completely as you can.

1. The school subjects I like best are:

2. Three things I like most to do in school are:

3. If I had 30 minutes' free time at school each day to do what I really liked, it would be:

4. My two favourite snacks are:

5. At recess I like most to (three things):

6. If I had $5 to spend on anything, I would buy:

7. Three jobs I would enjoy in the class are:

8. The two people I most like to work with in school are:

9. At home I really enjoy (three things):

Source: From G. Blackham and A. Silberman (1979). *Modification of child and adolescent behavior,* 3rd ed., pp. 281–283. Copyright © 1979 by Wadsworth Publishing Co. Reprinted by permission of the publisher.

In both situations the students are receiving no reinforcement for their work because the end product of their efforts is not good enough. A safe prediction is that the students will soon learn to dislike the class, the subject, and perhaps the teacher and school in general. One way to prevent this problem is the strategy of shaping, also called successive approximations. Shaping involves reinforcing progress instead of waiting for perfection.

In order to use shaping, the teacher must break down the final complex behaviour the student is expected to master into a number of small steps. One approach identifying the small steps is task analysis, originally developed by R. B. Miller (1962) to help the armed services train personnel. Miller's system begins with a definition of the final performance requirement, what the trainee (or student) must be able to do at the end of the program or unit. Then the steps that will lead to the final goal are specified. The procedure simply breaks down skills and processes down into subskills and subprocesses.

Consider an example of task analysis in which students must write a position paper based on library research. If the teacher assigned the position paper without analyzing the task in this way, what could happen? Some of the students might not know how to use the card catalogue. They might search through one or two encyclopedias, then write a summary of the issues based only on the encyclopedia articles. Another group of students might know how to use the card catalog, tables of contents, and indexes, but have difficulty reaching conclusions. They might hand in lengthy papers listing summaries of different ideas. Another group of students might be able to draw conclusions, but their written presentations might be so confusing and grammatically incorrect that the teacher could not understand what they were trying to say. Each of the groups would have failed in fulfilling the assignment, but for different reasons.

A task analysis gives a picture of the logical sequence of steps leading toward the final goal. An awareness of this sequence can help teachers make sure that students have the necessary skills before they move to the next step. In addition, when students have difficulty, the teacher can pinpoint problem areas.

Krumboltz and Krumboltz (1972) have described the following three methods of shaping: (1) reinforce each subskill, (2) reinforce improvements in accuracy, and (3) reinforce longer and longer periods of performance or participation.

Shaping Reinforcing each small step of progress toward a desired goal or behaviour.

Successive Approximations Small components that make up a complex behaviour.

Task Analysis System for breaking down a task hierarchically into basic skills and subskills.

Many behaviours can be improved through shaping, especially skills that involve persistence, endurance, increased accuracy, greater speed, or extensive practice to master. Because shaping is a time-consuming process, however, it should not be used if success can be attained through simpler methods like cueing.

Positive Practice. A strategy for helping students replace one behaviour with another is positive practice. This approach is especially appropriate for dealing with academic errors. When students make a mistake, they must correct it as soon as possible and practise the correct response (Gibbs & Luyben, 1985; Kazdin, 1984). The same principle can be applied when students break classroom rules. Instead of being punished, the student might be required to practise the correct alternative action.

The Guidelines summarize approaches encouraging positive behaviour.

Guidelines

Using Positive Reinforcement

Make sure you recognize positive behaviour in ways that students value.
Examples
1. When presenting class rules, set up positive consequences for following rules as well as negative consequences for breaking rules.
2. Recognize honest admissions of mistakes by giving a second chance: "Because you admitted that you copied your paper from a book, I'm giving you a chance to rewrite it."
3. Offer desired rewards for academic efforts, such as extra recess time, exemptions from homework or tests, extra credit on major projects.

When students are tackling new material or trying new skills, give plenty of reinforcement.
Examples
1. Find and comment on something right in every student's first drawing.
2. Reinforce students for encouraging each other. "Russian pronunciation is difficult and awkward at first. Let's help each other by eliminating all giggles when someone is brave enough to attempt a new word."

After new behaviours are established, give reinforcement on an unpredictable schedule to encourage persistence.
Examples
1. Offer surprise rewards for good participation in class.
2. Start classes with a short, written extra-credit question. Students don't have to answer, but a good answer will add points to their total for the semester.
3. Make sure the good students get compliments for their work from time to time. Don't take them for granted.

Use cueing to help establish new behaviours.
Examples
1. Put up humorous signs in the classroom to remind students of rules.
2. At the beginning of the year, as students enter class, call their attention to a list on the board of the materials they should have with them when they come to class.
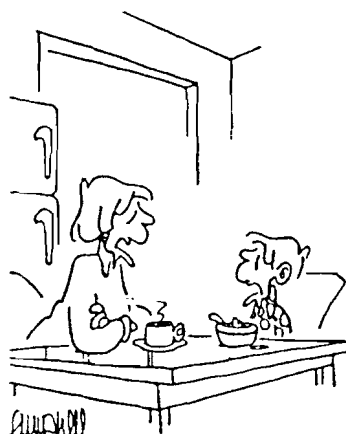
Make sure all students, even those who often cause problems, receive some praise, privileges, or other rewards when they do something well.
Examples
1. Review your class list occasionally to make sure all students are receiving some reinforcement.
2. Set standards for reinforcement so that all students will have a chance to be rewarded.

Positive Practice Practising correct responses immediately after errors.

"OF COURSE YOU DON'T HAVE
TO GO TO SCHOOL, DEAR.
WOULD YOU GET SOME LIVER
OUT OF THE FREEZER TO
DEFROST FOR OUR LUNCH?"

(© Martha Campbell. From *Phi Delta Kappan.)*

Establish a variety of reinforcers.
Examples
1. Let students suggest their own reinforcers or choose from a "menu" of reinforcers with "weekly specials."
2. Talk to other teachers or parents about ideas for reinforcers.

Use the Premack principle to identify effective reinforcers.
Examples
1. Watch what students do with their free time.
2. Notice which students like to work together. The chance to work with friends is often a good reinforcer.

Coping with Undesirable Behaviour

No matter how successful you are at accentuating the positive, there are times when you must cope with undesirable behaviour, either because other methods fail or because the behaviour itself is dangerous or calls for direct action. For this purpose, negative reinforcement, satiation, reprimands, and punishment all offer possible solutions.

Negative Reinforcement. Recall the basic principle of negative reinforcement: If an action stops or avoids something unpleasant, then the action is likely to occur again in similar situations. Negative reinforcement was operating in Elizabeth's classroom. When she gave in to the moans and complaints of her class and cancelled the test, her behaviour was being negatively reinforced. She escaped the unpleasant student comments by changing her assignment.

Negative reinforcement may also be used to enhance learning. To do this, you place students in mildly unpleasant situations so they can "escape" when their behaviour improves. Consider these examples:

Teacher to a grade-three class: "When the supplies are put back in the cabinet and each of you is sitting quietly, we will go outside. Until then, we will miss our recess."

High school teacher to a student who seldom finishes in-class assignments: "As soon as you complete the assignment, you may join the class in the auditorium. But until you finish, you must work in the study hall."

You may wonder why these examples are not considered punishment. Surely staying in during recess or not accompanying the class to a special program is punishing. But the focus in each case is on strengthening specific behaviours (putting away supplies or finishing in-class assignments). The teacher strengthens (reinforces) the behaviours by removing something aversive *as soon as the desired behaviours occur.* Because the consequence involves removing or "subtracting" a stimulus, the reinforcement is negative.

Negative reinforcement also gives students a chance to exercise control. Missing recess and staying behind in study hall are unpleasant situations, but in each case the students retain control. As soon as they perform the appropriate behaviour, the unpleasant situation ends. In contrast, punishment occurs after the fact, and a student cannot so easily control or terminate it.

There are several rules for negative reinforcement: Describe the desired change in a positive way. Don't bluff. Make sure you can enforce your unpleasant situation. Follow through despite complaints. Insist on action, not promises. If the unpleasant situation terminates when students promise to be better next time, you have reinforced making promises, not making changes (Krumboltz & Krumboltz, 1972; O'Leary, 1995).

Satiation. Another way to stop problem behaviour is to insist that students continue the behaviour until they are tired of doing it. This procedure, called satiation, should be applied with care. Forcing students to continue some behaviours may be physically or emotionally harmful or even dangerous.

An example of an appropriate use of satiation is related by Krumboltz and Krumboltz (1972). In the middle of a grade-nine algebra class, the teacher suddenly noticed four students making all sorts of unusual motions. In response to persistent teacher questioning, the students finally admitted they were bouncing imaginary balls. The teacher pretended to greet this idea with enthusiasm and suggested the whole class do it. At first, there was a great deal of laughing and joking. After a minute this stopped, and one student even quit. The teacher, however, insisted that all the students continue. After five minutes and a number of exhausted sighs, the teacher allowed the students to stop. No one bounced an imaginary ball in that class again.

Teachers also may allow students to continue some action until they stop by themselves, if the behaviour is not interfering with the rest of the class. A teacher can do this by simply ignoring the behaviour. Remember that just responding to an ignorable behaviour may actually reinforce it.

In using satiation, a teacher must take care not to give in before the students do. It is also important that the repeated behaviour be the one you are trying to end. If the algebra teacher above had insisted that the students write, "I will never bounce imaginary balls in class again" 500 times, the students would have become satiated with writing rather than with bouncing balls.

Reprimands. In the *Junction Journal*, an elementary-school newspaper, were the following lines in a story called "Why I Like School," written by a fourth grader: "I also like my teacher. She helps me understand and learn. She is nice to everyone. . . . I like it when she gets mad at somebody, but she doesn't yell at them in front of the class, but speaks to them privately."

A study by Dan O'Leary and his associates examined the effectiveness of soft, private reprimands versus loud, public reprimands in decreasing disruptive behaviour (O'Leary, Kaufman, Kass, & Drabman, 1970). Reprimanding a problem student quietly so that only the student can hear seems to be much more effective. When the teacher in the study spoke to offenders loudly enough for the entire class to hear, the disruptions increased or continued at a constant level. Some students enjoy public recognition for misbehaviour. If reprimands are not used too often, and if the classroom is generally a positive, warm environment, then students usually respond quickly (Kaplan, 1991; Van Houten & Doleys, 1983).

Response Cost. The concept of response cost is familiar to anyone who has ever paid a fine. For certain infractions of the rules, people must lose some reinforcer (money, time, privileges, pleasures). In a class, the concept of

<div>

Focus on...

Applied Behaviour Analysis

- What are the steps in applied behaviour analysis?
- How can the Premack principle help you identify reinforcers?
- When is shaping an appropriate approach?
- What are some of the possible side effects of punishment?

Satiation Requiring a person to repeat a problem behaviour past the point of interest or motivation.

Reprimands Criticisms for misbehaviour; rebukes.

**Response Cost** Punishment by loss of reinforcers.
</div>

*This student is in "social isola-
tion." What conditions would help
make this a useful intervention?*

response cost may be applied in a number of ways. The first time a student breaks a class rule, the teacher gives a warning. The second time, the teacher makes a mark beside the student's name in the grade book. The student loses two minutes of recess for each mark accumulated. For older students, a certain number of marks might mean losing the privilege of working in a group or going on a class trip.

Social Isolation. One of the most controversial behavioural methods for decreasing undesirable behaviour is the strategy of social isolation, often called time out from reinforcement. The process involves removing a highly disruptive student from the classroom for five to ten minutes. The student is placed in an empty, uninteresting room alone. It seems likely that the factor that actually decreases behaviour is the punishment of brief isolation from other people (O'Leary & O'Leary, 1976). A trip to the principal's office or confinement to a chair in the corner of the regular classroom does not have the same effect as sitting alone in an absolutely empty room.

Some Cautions. Punishment in and of itself does not lead to any positive behaviour. Thus, whenever you consider the use of punishment, you should make it part of a two-pronged attack. The first goal is to carry out the punishment and suppress the undesirable behaviour. The second goal is to make clear what the student should be doing instead and to provide reinforcement for those desirable actions. Thus, while the problem behaviours are being suppressed, positive alternative responses are being strengthened. The Guidelines give ideas for using punishment for positive purposes.

Guidelines

Using Punishment
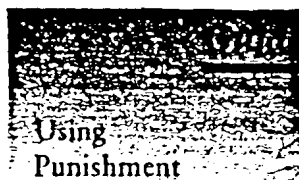
Try to structure the situation so you can use negative reinforcement rather than punishment.

Examples

1. Allow students to escape unpleasant situations (completing additional workbook assignments, weekly tests of math facts) when they reach a level of competence.
2. Insist on actions, not promises. Don't let students convince you to change terms of the agreement.

Be consistent in your application of punishment.

Examples

1. Avoid inadvertently reinforcing the behaviour you are trying to punish. Keep confrontations private, so that students don't become heroes for standing up to the teacher in a public showdown.
2. Let students know in advance the consequences of breaking the rules by posting major class rules for younger students or outlining rules and consequences in a course syllabus for older students.
3. Tell students they will receive only one warning before punishment is given. Give the warning in a calm way, then follow through.
4. Make punishment as unavoidable and immediate as is reasonably possible.

Focus on the students' actions, not on the students' personal qualities.

Examples

1. Reprimand in a calm but firm voice.
2. Avoid vindictive or sarcastic words or tones of voice. You might hear your own angry words later when students imitate your sarcasm.

Social Isolation Removal of a disruptive student for five to ten minutes.

3. Stress the need to end the problem behaviour instead of expressing any dislike you might feel for the student.

Adapt the punishment to the infraction.

Examples
1. Ignore minor misbehaviours that do not disrupt the class, or stop these misbehaviours with a disapproving glance or a move toward the student.
2. Don't use homework as a punishment for misbehaviours like talking in class.
3. When a student misbehaves to gain peer acceptance, removal from the group of friends can be effective, since this is really time out from a reinforcing situation.
4. If the problem behaviours continue, analyze the situation and try a new approach. Your punishment may not be very punishing, or you may be inadvertently reinforcing the misbehaviour.

Social Learning Theory

In recent years, most behavioural psychologists have found that operant conditioning offers too limited an explanation of learning. Many have expanded their view of learning to include the study of cognitive processes—such as expectations, thoughts, and beliefs—that cannot be directly observed. A prime example of this expanded view is Albert Bandura's (1986, 1997) social cognitive theory. Bandura believes that the traditional behavioural views of learning, while accurate, are incomplete. They give only a partial explanation of learning and overlook important elements, particularly the social influences on learning.

Elements of Social Cognitive Theory

Bandura distinguishes between the *acquisition of knowledge* (learning) and the *observable performance based on that knowledge* (behaviour). In other words, Bandura suggests that we all may know more than we show. Students may have learned how to simplify fractions, but perform badly on a test because they are anxious or ill or have misread the problem. While learning may have occurred, it may not be demonstrated until the situation is right or there are incentives to perform. In social learning theory, therefore, both internal and external factors are important. Environmental events, personal factors and behaviours are seen as interacting in the process of learning. Personal factors (beliefs, expectations, attitudes, and knowledge), the environment (resources, consequences of actions, and physical setting), and behaviour (individual actions, choices, and verbal statements) all influence and are influenced by each other. Bandura calls this interaction of forces reciprocal determinism.

In the social cognitive view people are neither driven by inner forces nor automatically shaped and controlled by external stimuli. Rather, human functioning is explained in terms of a model of triadic reciprocality in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other. (Bandura, 1986, p. 18)

Bandura poses a second distinction, between *enactive* and *vicarious* learning. Enactive learning is learning by doing and experiencing the consequences of your actions. This may sound like operant conditioning all over again, but it

Social Cognitive Theory Theory that emphasizes learning through observation of others.

Reciprocal Determinism An explanation of behaviour that emphasizes the mutual effects of the individual and the environment on each other.

3. Stress the need to end the problem behaviour instead of expressing any dislike you might feel for the student.

Adapt the punishment to the infraction.

Examples

1. Ignore minor misbehaviours that do not disrupt the class, or stop these misbehaviours with a disapproving glance or a move toward the student.

2. Don't use homework as a punishment for misbehaviours like talking in class.

3. When a student misbehaves to gain peer acceptance, removal from the group of friends can be effective, since this is really time out from a reinforcing situation.

4. If the problem behaviours continue, analyze the situation and try a new approach. Your punishment may not be very punishing, or you may be inadvertently reinforcing the misbehaviour.

is not. The difference has to do with the role of consequences. Proponents of operant conditioning believe that consequences strengthen or weaken behaviour. In enactive learning, however, consequences are seen as providing information about appropriate actions, creating expectations, and influencing motivation (Schunk, 1996).

Enactive learning is learning by doing; *vicarious learning* is learning by observing others. Bandura believed that traditional behavioural theories overlook the powerful effect that modelling and imitation can have on learning. People and animals can learn merely by observing another person or animal learn, and this fact challenges the behaviourist idea that cognitive factors are unnecessary in an explanation of learning. If people can learn by watching, they must be focusing their attention, constructing images, remembering, analyzing, and making decisions that affect learning.

Learning by Observing Others

When Elizabeth laughed at the "Ronald McDonald" comment in class, she communicated that laughing was appropriate in this situation. Soon all the students were laughing along with her, and she did not try to stop them until it was too late. They were learning through modelling or observation, even though this was not the type of learning Elizabeth had intended. Elizabeth, through her behaviour, provided a model for her students to imitate. Through modelling we learn not only how to perform a behaviour but also what will happen to us in specific situations if we do perform it.

There are two main modes of observational learning. First, observational learning can take place through vicarious reinforcement. This happens when we see others being rewarded or punished for particular actions and then modify our behaviour as if we had received the consequences ourselves. For example, if you compliment two students on the attractive illustrations in their lab reports, several other students who observe your compliments may turn in illustrated lab reports next time. This demonstrates vicarious reinforcement. Punishment can also be vicarious: you may slow down on a stretch of highway after seeing several people get speeding tickets there.

In the second kind of observational learning, the observer *imitates* the behaviour of a model even though the model receives no reinforcement or punishment while the observer is watching. Often the model is demonstrating something the observer wants to learn and expects to be reinforced for mastering; for example, the proper way to position hands while playing a piano or the correct way to assemble laboratory equipment. But imitation can also occur when the observer simply wants to become more like an admired or high-status model. Models need not be real people. We may also use fictional characters or stereotypical images as models and try to behave as we imagine the model would (Hill, 1990; Pintrich & Schunk, 1996).

Observation can be a very efficient learning process. The first time children hold hairbrushes, cups, or hockey sticks, they usually brush, drink, or shoot as well as they can, given their current muscle development and coordination. Let's take a closer look at how observational learning occurs.

Elements of Observational Learning

Observational Learning Learning by observation and imitation of others.

Bandura (1986) notes that there are four important elements to be considered in observational learning. They are *paying attention, retaining information or impressions, producing behaviours,* and *being motivated* to repeat the behaviours.

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*Teachers must draw students' attention to the critical features of a
lesson by making clear presentations and highlighting important
details. Good demonstrations allow students to focus on the impor-
tant features and make observational learning easier.*

Attention. In order to learn through observation, we have to pay atten-
tion. We typically pay attention to people who are attractive, popular, compe-
tent, or admired (Schunk, 1996; Sulzer-Azaroff & Mayer, 1986). For younger
children this could mean parents, older brothers or sisters, or teachers. For older
students it may mean popular peers, rock stars, or TV idols.

In teaching, you will have to ensure students' attention to the critical fea-
tures of the lesson by making clear presentations and highlighting important
points. In demonstrating a skill (for example, threading a sewing machine or op-
erating a lathe), you may need to have students look over your shoulder as you
work. Seeing your hands from the same perspective as they see their own directs
their attention to the right features of the situation and makes observational
learning easier.

Retention. In order to imitate the behaviour of a model, you have to re-
member it. This involves mentally representing the model's actions in some
way, probably as verbal steps ("Hwa-Rang, the eighth form in Tae Kwan Do
karate, is a palm-heel block, then a middle riding stance punch, then . . . "),
or as visual images, or both. Retention can be improved by mental rehearsal
(imagining imitating the behaviour) or by actual practice. In the retention
phase of observational learning, practice helps us remember the elements of
the desired behaviour, such as the sequence of steps.

Production. Once we "know" how a behaviour should look and re-
member the elements or steps, we still may not perform it smoothly. Sometimes
we need a great deal of practice, feedback, and coaching about subtle points
before we can reproduce the behaviour of the model. In the production phase,
practice makes the behaviour smoother and more expert.

Motivation and Reinforcement. As mentioned earlier, social cognitive theory distinguishes between acquisition and performance. We may acquire a new skill or behaviour through observation, but we may not perform that behaviour until there is some motivation or incentive to do so. Reinforcement can play several roles in observational learning. If we anticipate being reinforced for imitating the actions of a model, we may be more motivated to pay attention, remember, and reproduce the behaviours. In addition, reinforcement is important in maintaining learning. A person who tries a new behaviour is unlikely to persist without reinforcement (Barton, 1981; Ollendick, Dailey, & Shapiro, 1983). For example, if an unpopular student adopted the dress of the "in" group but was greeted with teasing and ridicule, it is unlikely that the imitation would continue.

Bandura identifies three forms of reinforcement that can encourage observational learning. First, of course, the observer may reproduce the behaviours of the model and receive direct reinforcement, as when a gymnast successfully executes a front flip/round-off combination and the coach/model says, "Excellent!" But the reinforcement need not be direct—it may be vicarious. As mentioned earlier, the observer may simply see others reinforced for a particular behaviour and then increase his or her production of that behaviour. Most TV ads hope for this kind of effect. People in commercials become deliriously happy when they drive a particular car or drink a specific juice, and the viewer is supposed to do the same; the viewer's behaviour is reinforced vicariously by the actors' obvious pleasure. The final form of reinforcement is self-reinforcement, or controlling your own reinforcers. This sort of reinforcement is important for both students and teachers. We want our students to improve not because it leads to external rewards but because the students value and enjoy their growing competence. And as a teacher, sometimes self-reinforcement is all that keeps you going.

Factors That Influence Observational Learning

What causes an individual to learn and perform modelled behaviours and skills? Several factors play a role, as shown in Table 6.3. The developmental level of the observer makes a difference in learning. As children grow older, they are able to focus attention for longer periods of time, use memory strategies to retain information, and motivate themselves to practise. A second influence is the status of the model. Children are more likely to imitate the actions of others who seem competent, powerful, and prestigious—so parents, teachers, older siblings, Barney, athletes, action heroes, rock stars, or film personalities may serve as models—depending on the age and interests of the child. Third, by watching others, we learn about what behaviours are appropriate for people like ourselves, so models who are seen as similar are more readily imitated. All students need to see successful, capable models who look and sound like them, no matter what their ethnicity, socioeconomic status, or sex.

The last three influences involve goals and expectations. If observers expect that certain actions of models will lead to particular outcomes (such as particular practice regimens leading to improved athletic performance) and the observers value those outcomes or goals, then the observers are more likely to pay attention to the models and try to reproduce their behaviours. Finally, observers are more likely to learn from models if the observers have a high level of self-efficacy—that is, if they believe they are capable of doing the actions needed to reach the goals, or at least of learning how to do so (Bandura, 1995; Pintrich & Schunk, 1996). We will discuss goals, expectations, and self-efficacy in greater depth in Chapters 10 and 11 on motivation.

Self-Efficacy A person's sense of being able to deal effectively with a particular task.

TABLE 6.3   Factors That Affect Observational Learning

Characteristic	Effects on Modelling
Developmental status	Improvements with development include longer attention and increased capacity to process information, use strategies, compare performances with memorial representations, and adopt intrinsic motivators.
Model prestige and competence	Observers pay greater attention to competent, high-status models. Consequences of modelled behaviors convey information about functional value. Observers attempt to learn actions they believe they will need to perform.
Vicarious consequences	Consequences to models convey information about behavioral appropriateness and likely outcomes of actions. Valued consequences motivate observers. Similarity in attributes or competence signals appropriateness and heightens motivation.
Outcome expectations	Observers are more likely to perform modelled actions they believe are appropriate and will result in rewarding outcomes.
Goal setting	Observers are likely to attend to models who demonstrate behaviors that help observers attain goals.
Self-efficacy	Observers attend to models when they believe they are capable of learning or performing the modelled behavior. Observation of similar models affects self-efficacy ("If they can do it, I can too").

Source: From Learning theories: An education perspective, 2/e, by Dale H. Schunk, p. 121.
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Observational Learning in Teaching

There are five possible outcomes of observational learning: teaching new behaviours and attitudes, encouraging existing behaviours, changing inhibitions, directing attention, and arousing emotions. Let's look at each of these as they occur in classrooms.

Teaching New Behaviours.   Modelling has long been used, of course, to teach dance, sports, and crafts, as well as skills in subjects such as home economics, chemistry, and shop. Modelling can also be applied deliberately in the classroom to teach mental skills and to broaden horizons—to teach new ways of thinking. Teachers serve as models for a vast range of behaviours, from pronouncing vocabulary words, to reacting to the seizure of an epileptic student, to being enthusiastic about learning. For example, a teacher might model sound critical thinking skills by thinking "out loud" about a student's question. Or a high school teacher concerned about girls who seem to have stereotyped ideas about careers might invite women with nontraditional jobs to speak to the class.

Modelling, when applied deliberately, can be an effective and efficient means of teaching new behaviour (Bandura, 1986; Schunk, 1987). Studies indicate that modelling can be most effective when the teacher makes use of all the elements of observational learning described in the previous section, especially reinforcement and practice.

Modelling   Changes in behaviour, thinking, or emotions that occur through observing another person—a model.

Models who are the same age as the students may be particularly effective. For example, Schunk and Hanson (1985) compared two methods for teaching subtraction to grade-two who had difficulties learning this skill. One group of students observed peers learning the procedures, then participated in an instructional program on subtraction. Another group of students watched a teacher's demonstration, then participated in the same instructional program. Of the two groups, the students who observed peer models learning not only scored higher on tests of subtraction after instruction, but also gained more confidence in their own ability to learn. For students who doubt their own abilities, a good model is a low-achieving student who keeps trying and finally masters the material (Schunk, 1996).

Encouraging Already-Learned Behaviours. All of us have had the experience of looking for cues from other people when we find ourselves in unfamiliar situations. Observing the behaviour of others tells us which of our already-learned behaviours to use: the proper fork for eating the salad, when to leave a gathering, what kind of language is appropriate, and so on. Adopting the dress and grooming styles of TV idols is another example of this kind of effect.

Strengthening or Weakening Inhibitions. If class members witness one student breaking a class rule and getting away with it, they may learn that undesirable consequences do not always follow rule breaking. The class may be less inhibited in the future about breaking this rule. If the rule breaker is a well-liked, high-status class leader, the effect of the modelling may be even more pronounced. One psychologist has called this phenomenon the ripple effect (Kounin, 1970). The ripple effect can work for the teacher's benefit. When the teacher deals effectively with a rule breaker, especially a class leader, the idea of breaking this rule may be inhibited for the other students viewing the interaction. This does not mean that teachers must reprimand each student who breaks a rule, but once a teacher has called for a particular action, following through is an important part of capitalizing on the ripple effect.

Focus on...

Social Learning Theory

- What is vicarious reinforcement?
- Describe the four elements of observational learning.
- What are the possible outcomes of observational learning? Give an example of each outcome from your own experience.

Directing Attention. By observing others, we not only learn about actions, we also notice the objects involved in the actions. For example, in a preschool class, when one child plays enthusiastically with a toy that has been ignored for days, many other children may want to have the toy, even if they play with it in different ways or simply carry it around. This happens, in part, because the children's attention has been drawn to that particular toy.

Arousing Emotion. Finally, through observational learning people may develop emotional reactions to situations they themselves have never experienced, such as flying or driving. A child who watches a friend fall from a swing and break an arm may become fearful of swings. Students may be anxious when they are assigned to a certain teacher because they've heard frightening stories about how "mean" that teacher is. Note that hearing and reading about a situation are also forms of observation. The Guidelines will give you some ideas about using observational learning in the classroom.

Ripple Effect "Contagious" spreading of behaviours through imitation.

Guide

Model behaviours and attitudes you want your students to learn.

Examples

1. Show enthusiasm for the subject you teach.
2. Be willing to demonstrate both the mental and the physical tasks you expect the students to perform. One teacher sat down in the sandbox while her four-year-old students watched her demonstrate the difference between "playing with sand" and "throwing sand."
3. When reading to students, model good problem solving. Stop and say, "Now let me see if I remember what happened so far," or "That was a hard sentence. I'm going to read it again."

Use peers, especially class leaders, as models.

Examples

1. In group work, pair students who do well with those who are having difficulties.
2. Ask students to demonstrate the difference between "whispering" and "silence—no talking."

Make sure students see that positive behaviours lead to reinforcement for others.

Examples

1. Point out the connections between positive behaviour and positive consequences in stories.
2. Be fair in giving reinforcement. The same rules for rewards should apply to the problem students as to the good students.

Enlist the help of class leaders in modelling behaviours for the entire class.

Examples

1. Ask a well-liked student to be friendly to an isolated, fearful student.
2. Let high-status students lead an activity when you need class cooperation or when students are likely to be reluctant at first. Popular students can model dialogues in foreign-language classes or be the first to tackle dissection procedures in biology.

Self-Regulation and Cognitive Behaviour Modification

The most recent application of behavioural views of learning emphasizes self-management—helping students gain control of their own learning. As you will see throughout this book, the role of students in their own learning is a major concern of psychologists and educators today. This concern is not restricted to any one group or theory. Different areas of research and theory all converge on one important idea, that responsibility and the ability to learn rest within the student. No one can learn for someone else (Manning & Payne, 1996; Winne, 1995; Zimmerman, 1990; Zimmerman & Schunk, 1989). .. ,. .

One reason that behavioural psychologists became interested in self-management is that students taught with classic behavioural methods seldom generalized their learning to new situations. For example, some research indicates

Self-Management Use of behavioural learning principles to change your own behaviour.

that inattentive students could learn to pay excellent attention to lessons in a small group. But when they returned to the regular classroom, they did not take their new skill back with them (Woolfolk & Woolfolk, 1974). Many behavioural psychologists decided that generalization would be encouraged if students became partners in the behaviour change procedures. About this same time, Donald Meichenbaum (1977), of the University of Waterloo, was having success teaching impulsive students to "talk themselves through" tasks, so there was evidence that students could benefit from what Meichenbaum termed "cognitive behaviour modification" (Manning, 1991).

Self-Management

If one goal of education is to produce people who are capable of educating themselves, then students must learn to manage their own lives, set their own goals, and provide their own reinforcement. In adult life, rewards are sometimes vague and goals often take a long time to reach. Think how many small steps are required to complete an education and find your first job. Life is filled with tasks that call for this sort of self-management (Kanfer & Gaelick, 1986).

Students may be involved in any or all of the steps in implementing a basic behaviour change program. They may help set goals, observe their own work, keep records of it, and evaluate their own performance. Finally, they can select and deliver reinforcement. Such involvement can help students master all the steps so they can perform these tasks in the future (Kaplan, 1991).

Goal Setting. It appears that the goal-setting phase is very important in self-management (Pintrich & Schunk, 1996; Reeve, 1996). In fact, some research suggests that setting specific goals and making them public may be the critical elements of self-management programs. For example, S. C. Hayes and his colleagues identified college students who had serious problems with studying and taught them how to set specific study goals. Students who set goals and announced them to the experimenters performed significantly better on

Self-management programs allow students to record and monitor their own progress and judge their performance.

tests covering the material they were studying than students who set goals privately and never revealed them to anyone (Hayes, Rosenfarb, Wulfert, Munt, Korn, & Zettle, 1985).

Higher standards tend to lead to higher performance (McLaughlin & Gnagey, 1981). Unfortunately, student-set goals have a tendency to slip lower and lower. Teachers can help students maintain high standards by monitoring the goals set and reinforcing high standards. In one study, a teacher helped first-grade students raise the number of math problems they set for themselves to work on each day by praising them whenever they increased their objective by 10 percent. The students maintained their new, higher work standards, and the improvements even generalized to other subjects (Price & O'Leary, 1974).

Recording and Evaluating Progress. Students may also participate in the recording and evaluation phases of a behaviour change program. Some examples of behaviours that are appropriate for self-recording are the number of assignments completed, time spent practising a skill, number of books read, and number of times out of seat without permission. Tasks that must be accomplished without teacher supervision, such as homework or private study, are also good candidates for self-monitoring. Students keep a chart, diary, or checklist recording the frequency or duration of the behaviours in question.

A progress record card can help older students break down assignments into small steps, determine the best sequence for completing the steps, and keep track of daily progress by setting goals for each day. The record card itself serves as a prompt that can be faded out (Jenson, Sloane, & Young, 1988). Because cheating on records is a potential problem, especially when students are rewarded for improvements, intermittent checking by the teacher plus bonus points for accurate recording may be helpful (Hundert & Bucher, 1978).

Self-evaluation is somewhat more difficult than simple self-recording because it involves making a judgment about quality. Very few studies have been conducted in this area, but it appears that students can learn to evaluate their behaviour with reasonable accuracy (Rhode, Morgan, & Young, 1983). One key seems to be periodically checking students' self-evaluations and giving reinforcement for accurate judgments. Older students may learn accurate self-evaluation more readily than younger students. Again, bonus points can be awarded when the teachers' and students' evaluations match (Kaplan, 1991). One teacher found that his grade-eight science class could learn to give themselves fair and accurate grades when he used such a system.

Self-Reinforcement. The last step in self-management is self-reinforcement. There is some disagreement, however, as to whether this step is actually necessary. Some psychologists believe that setting goals and monitoring progress alone are sufficient and that self-reinforcement adds nothing to the effects (Hayes et al., 1985). Others believe that rewarding yourself for a job well done can lead to higher levels of performance than simply setting goals and keeping track of progress (Bandura, 1986). If you are willing to be tough and really deny yourself something you want until your goals are reached, then perhaps the promise of the reward can provide extra incentive for work. With that in mind, you may want to think of some way to reinforce yourself when you finish reading this chapter. A similar approach helped me write the chapter in the first place.

At times, families can be enlisted to help their children develop self-management abilities. Working together, teachers and parents can focus on a few goals and, at the same time, support the growing independence of the students. The Guidelines give some ideas.

Self-Reinforcement Providing yourself with positive consequences, contingent on accomplishing a particular behaviour.

Guidelines

Family and Community Partnerships for Student Self-Management Programs

Introduce the system to parents and students in a positive way.

Examples

1. Invite family participation and stress possible benefits to all family members.
2. Consider starting the program just with volunteers.
3. Describe how you use self-management programs yourself.

Help families and students establish reachable goals.

Examples

1. Have examples of possible self-management goals for students such as starting homework early in the evening, or keeping track of books read.
2. Show families how to post goals and keep track of progress. Encourage everyone in the family to work on a goal.

Give families ways to record and evaluate their child's progress (or their own).

1. Divide the work into easily measured steps.
2. Provide models of good work where judgments are more difficult, such as in creative writing.
3. Give families a record form or checklist to keep track of progress.

Encourage families to check the accuracy of student records from time to time, and help their children to develop forms of self-reinforcement.

Examples

1. Have many checkups when students are first learning, and fewer later.
2. Have siblings check one another's records.
3. Where appropriate, test the skills that students are supposed to be developing at home and reward students whose self-evaluations match their test performances.
4. Have students brainstorm ideas with their families for rewarding themselves for jobs well done.

Sometimes, teaching students self-management can solve a problem for teachers and provide fringe benefits as well. For example, the coaches of a competitive swim team with members aged 9 to 16 were having difficulty persuading swimmers to maintain high work rates. Then the coaches drew up four charts indicating the training program to be followed by each member and posted the charts near the pool. The swimmers were given the responsibility of recording their numbers of laps and completion of each training unit. Because the recording was public, swimmers could see their own progress and that of others, give and receive congratulations, and keep accurate track of the work units completed. Work output increased by 27 percent. The coaches also liked the system because swimmers could begin to work immediately without waiting for instructions (McKenzie & Rushall, 1974).

Cognitive Behaviour Modification and Self-Instruction

Self-management generally means getting students involved in the basic steps of a behaviour change program. Cognitive behaviour modification adds an emphasis on thinking and self-talk. For this reason, many psychologists consider cognitive behaviour modification more a cognitive than a behavioural approach. We present it here because it serves as a bridge to Chapters 7 and 8 on cognitive learning.

As noted in Chapter 2, there is a stage in cognitive development when young children seem to guide themselves through a task using private speech. They talk to themselves, often repeating the words of a parent or teacher. In cognitive behaviour modification, students are taught directly how to use self-instruction. Meichenbaum (1977) outlined the steps:

> **Focus on...**
>
> ### Self-Management
>
> - How could you use the elements of self-management to study in this course?
> - What are the steps in self-instruction?

1. An adult model performs a task while talking to him- or herself out loud (cognitive modelling).

2. The child performs the same task under the direction of the model's instructions (overt, external guidance).

3. The child performs the task while instructing him- or herself aloud (overt, self-guidance).

4. The child whispers the instructions to him- or herself as he/she goes through the task (faded, overt self-guidance).

5. The child performs the task while guiding his/her performance via private speech (covert self-instruction). (p. 32)

Brenda Manning and Beverly Payne (1996) list four skills that can increase student learning: listening, planning, working, and checking. How might cognitive self-instruction help students develop these skills? One possibility is to use personal booklets or class posters that prompt students to "talk to themselves" about these skills. For example, one grade-five class designed the four posters in Figure 6.3 on page 236.

Actually, cognitive behaviour modification as it is described by Meichenbaum and others has many more components than just teaching students to use self-instruction. Meichenbaum's methods also include dialogue and interaction between teacher and student, modelling, guided discovery, motivational strategies, feedback, careful matching of the task with the student's developmental level, and other principles of good teaching. The student is even involved in designing the program (Harris, 1990; Harris & Pressley, 1991). Given all this, it is no surprise that students do seem to generalize the skills developed with cognitive behaviour modification to new learning situations (Harris, Graham, & Pressley, 1991).

Problems and Issues

The preceding sections provide an overview of several strategies for changing classroom behaviour. However, you should be aware that these strategies are tools that may be used responsibly or irresponsibly. What, then, are some issues you should keep in mind?

Cognitive Behaviour Modification Procedures based on both behavioural and cognitive learning principles for changing your own behaviour by using self-talk and self-instruction.

Self-Instruction Talking oneself through the steps of a task.

FIGURE 6.3

Posters to Remind Students to "Talk Themselves Through" Listening, Planning, Working, and Checking in School

These four posters were designed by a grade-five class to help them remember to use self-instruction. Some of the reminders reflect the special world of these preadolescents.

Poster 1	Poster 3
While Listening:	While Working:
1. Does this make sense?	1. Am I working fast enough?
2. Am I getting this?	2. Stop staring at my girlfriend and get back to work.
3. I need to ask a question now before I forget.	3. How much time is left?
4. Pay attention.	4. Do I need to stop and start over?
5. Can I do what he's saying to do?	5. This is hard for me, but I can manage okay.

Poster 2	Poster 4
While Planning:	While Checking:
1. Do I have everything together?	1. Did I finish everything?
2. Do I have my friends tuned out for right now?	2. What do I need to recheck?
3. Let me get organized first.	3. Am I proud of this work?
4. What order will I do this in?	4. Did I write all the words? Count them.
5. I know this stuff!	5. I think I finished. I organized myself. Did I daydream too much?

Source: From B. H. Manning and B. D. Payne, *Self-talk for teachers and students: Metacognitive strategies for personal and classroom use,* p. 125. Copyright © 1996 by Allyn & Bacon. Adapted by permission.

Ethical Issues

The ethical questions related to the use of the strategies described in this chapter are similar to those raised by any process that seeks to influence people. What are the goals? How do these goals fit with those of the school as a whole? Might students be rewarded for the "wrong" thing, though it seems "right" at first? By what criteria should strategies be chosen? What effect will a strategy have on the individuals involved? Is too much control being given to the teacher, or to a majority?

Goals. The strategies described in this chapter could be applied exclusively to teaching students to sit still, raise their hands before speaking, and remain silent at all other times (Winett & Winkler, 1972). This certainly would be an unethical use of the techniques. It is true that a teacher may need to establish some organization and order, but stopping with improvements in con-

Criticisms of Behavioural Methods

Properly used, the strategies in this chapter can be effective tools to help students learn academically and grow in self-sufficiency. Effective tools, however, do not automatically produce excellent work. The indiscriminate use of even the best tools can lead to difficulties. Critics of behavioural methods point to two basic problems that may arise.

Some psychologists fear that rewarding students for all learning will cause them to lose interest in learning for its own sake (Deci, 1975; Deci & Ryan, 1985; Kohn, 1993, 1996; Lepper & Greene, 1978; Lepper, Keavney, & Drake, 1996; Ryan & Deci, 1996). Studies have suggested that using reward programs with students who are already interested in the subject matter may, in fact, cause students to be less interested in the subject when the reward program ends, as you can see in the Point/Counterpoint on page xxx.

Just as you must take into account the effects of a reward system on the individual, you must also consider the impact on other students. Using a reward program or giving one student increased attention may have a detrimental effect on the other students in the classroom. Is it possible that other students will learn to be "bad" in order to be included in the reward program? Most of the evidence on this question suggests that using individual adaptations such as reward programs does not have any adverse effects on students who are not participating if the teacher believes in the program and explains the reasons for using it to the non-participating students. After interviewing 98 students in grades one through six, Cindy Fulk and Paula Smith (1995) concluded that "Teachers may be more concerned about equal treatment of students than students are" (p. 416). If the conduct of some students does seem to deteriorate when their peers are involved in special programs, many of the same procedures discussed in this chapter should help them return to previous levels of appropriate behaviour (Chance, 1992, 1993).

Focus on...

Criticisms of Behavioural Approaches

- Is it ever appropriate to reward students for learning? Why or why not?
- What are the main criticisms of behavioural approaches?

POINT COUNTERPOINT

Should Students Be Rewarded for Learning?

For years educators and psychologists have debated whether students should be rewarded for school work and academic accomplishments. As a recent example, Judy Cameron and W. David Pierce (1996) of the University of Alberta published an article on reinforcement in the *Review of Educational Research* that precipitated extensive criticisms and rebuttals in the same journal from Mark Lepper, Mark Keavney, Michael Drake, Alfie Kohn, Richard Ryan, and Edward Deci. Earlier, Paul Chance and Alfie Kohn had exchanged opinions in several issues of *Phi Delta Kappan:* Kohn, A. (1991, March) "Caring kids: The role of the schools"; Chance, P. (1991, June) "Backtalk: A gross injustice"; Chance, P. (1992, November) "The rewards of learning"; Kohn, A. (1993, June) "Rewards versus learning: A response to Paul Chance"; Chance, P. (1993, June) "Sticking up for rewards." What are the arguments?

POINT Students are punished by rewards.

Alfie Kohn (1993) argues that "Applied behaviorism, which amounts to saying, 'do this and you'll get that,' is essentially a technique for controlling people. In the classroom it is a way of doing things *to* children rather than working *with* them" (p. 784). Kohn goes on to contend that rewards are ineffective because when the praise and prizes stop, the behaviours stop too. "Rewards (like punishments) can get people to do what we want: buckle up, share a toy, read a book. . . . But they rarely produce effects that survive the rewards themselves. . . . They do not create an enduring *commitment* to a set of values or to learning; they merely,

and temporarily, change what we do" (p. 784).

The problem with rewards does not stop here. According to Kohn, rewarding students for learning actually makes them less interested in the material:

All of this means that getting children to think about learning as a way to receive a sticker, a gold star, or a grade— or even worse, to get money or a toy for a grade, which amounts to an extrinsic motivator for an extrinsic motivator—is likely to turn learning from an end into a means. Learning becomes something that must be gotten through in order to receive the reward. Take the depressingly pervasive program by which children receive certificates for pizzas when they have read a certain number of books. John Nicholls of the University of Illinois comments, only half in jest, that the likely consequence of this program is "a lot of fat kids who don't like to read." (p. 785)

COUNTERPOINT Learning should be rewarding.

According to Paul Chance (1993):

Behavioral psychologists in particular emphasize that we learn by *acting on* our environment. As B. F. Skinner put it: "[People] act on the world, and change it, and are changed in turn by the consequences of their actions." Skinner, unlike Kohn, understood that people learn best in a responsive environment. Teachers who praise or otherwise reward student performance provide such an environment. . . . If it is immoral to let students know they have answered questions correctly, to pat students on the back for a good effort, to show joy at a student's understanding of a concept, or to recognize the achievement of a goal by providing a gold star or a certificate—if this

is immoral, then count me a sinner. (p. 788)

Do rewards undermine interest? In their review of research, Cameron and Pierce concluded, "When tangible rewards (e.g., gold star, money) are offered contingent on performance on a task [not just on participation] or are delivered unexpectedly, intrinsic motivation is maintained" (p. 49). Even psychologists such as Edward Deci and Mark Lepper who suggest that rewards might undermine intrinsic motivation agree that rewards can also be used positively. When rewards provide students with information about their growing mastery of a subject or when the rewards show appreciation for a job well done, then the rewards bolster confidence and make the task more interesting to the students, especially students who lacked ability or interest in the task initially. Nothing succeeds like success. If students master reading or mathematics with the support of rewards, they will not forget what they have learned when the praise stops. Would they have learned without the rewards? Some would, but some might not. Would you continue working for a company that didn't pay you, even though you liked the work? Will freelance writer Alfie Kohn, for that matter, lose interest in writing because he gets paid fees and royalties?

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SUMMARY

Understanding Learning

Although theorists disagree about the definition of learning, most would agree that learning occurs when experience causes a change in a person's knowledge or behaviour. Behavioural theorists emphasize the role of environmental stimuli in learning and focus on behaviour—observable responses. Behavioural learning processes include contiguity learning, classical conditioning, operant conditioning, and observational learning.

Early View of Learning: Contiguity and Classical Conditioning

In contiguity learning, two events that repeatedly occur together become associated in the learner's mind. Later, the presence of one event causes the learner to remember the other.

In classical conditioning, discovered by Pavlov, a previously neutral stimulus is repeatedly paired with a stimulus that evokes an emotional or physiological response. Later, the previously neutral stimulus alone evokes the response—that is, the conditioned stimulus brings forth a conditioned response. Conditioned responses are subject to the processes of generalization, discrimination, and extinction.

Operant Conditioning: Trying New Responses

In operant conditioning, a theory of learning developed by B. F. Skinner, people learn through the effects of their deliberate responses. Operant conditioning is most applicable to classroom learning. For an individual, the effects of consequences following an action may serve as reinforcement or punishment. Positive and negative reinforcement strengthens a response, while punishment decreases or suppresses the behaviour. In addition, the scheduling of reinforcement influences the rate and persistence of responses. Ratio schedules encourage higher rates of response, and variable schedules encourage persistence of responses. In addition to controlling consequences of behaviour, teachers can also control the antecedents of behaviour through cueing and prompting.

Applied Behaviour Analysis

Applied behaviour analysis provides teachers with methods for encouraging positive behaviours and coping with undesirable ones. Teachers can reinforce positive, appropriate student behaviour through attention, recognition, praise, and the judicious use of reinforcers. The Premack principle, that a more-preferred activity can be used as a reinforcer for a less-preferred one, can help teachers choose effective reinforcers for individuals as well as groups. Teachers can use shaping and positive practice to help students develop new responses. Negative reinforcement, satiation, and forms of punishment—such as reprimands, response cost, and social isolation—can also help change behaviour but must be used with caution.

Social Learning Theory

Social learning theorists such as Bandura emphasize the role of observation in learning and in nonobservable cognitive processes, such as thinking and knowing. Observational learning occurs through reinforcement and imitation of high-status models and involves paying attention, retaining information or impressions, producing behaviours, and repeating behaviours through reinforcement or motivation. Teachers can use observational learning to teach new behaviours (providing peer models, for example), encourage already-learned behaviours, strengthen or weaken inhibitions, focus attention, or arouse emotions.

Self-Regulation and Cognitive Behaviour Modification

Cognitive psychologists have influenced behavioural views, pointing, for example, to the importance of self-regulation in learning. Students can apply behaviour analysis on their own to manage their own behaviour. Teachers can encourage the development of self-management skills by allowing students to participate in setting goals, keeping track of progress, evaluating accomplishments, and selecting and giving their own reinforcements. Teachers can also use cognitive behaviour modification, a behaviour change program described by Meichenbaum in which students are directly taught how to use self-instruction.

Problems and Issues

The misuse or abuse of behavioural learning methods is unethical. Critics of behavioural methods also point out the danger that reinforcement could decrease interest in learning by overemphasizing rewards and could have a negative impact on other students. Guidelines do exist, however, for helping teachers use behavioural learning principles appropriately and ethically.

KEY TERMS

CHECK YOUR UNDERSTANDING

Preschool and Kindergarten

- A student in your class is terrified of the class's pet guinea pigs. The child won't get close to the cages and wants you to "give them away." How would you help the child overcome this fear?

Elementary and Middle School

- You want your students to improve their time management and self-management abilities so they will be prepared for the increased demands of high school next year. What would you do?

Junior High and High School

- You have been assigned an emotionally disturbed student. She seemed fine at first, but now you notice that when she encounters difficult work, she often interrupts or teases other students. How would you work with this student and the class to improve the situation?

- It takes you ten minutes to get your class to settle down after the bell rings. Analyze this situation. What could be maintaining this problem? What could you do?

Cooperative Learning Activity

Work with two or three other members of your educational psychology class to develop a plan using applied behaviour analysis to tackle one of the following problems:

- Three students who "hang out" together in your class repeatedly say insulting and disrespectful things to you, often in front of the entire class.

- Your class has gotten into the habit of ignoring due dates.

- One of the students in your class continues to attack other students verbally and physically.