

ATTENTION IN DELAY OF GRATIFICATION¹

WALTER MISCHEL² AND EBBE B. EBBESEN

Stanford University

The role of attentional processes in voluntary delay of reward was explored by manipulating children's attention to the rewards for which they were waiting in a delay-of-gratification paradigm. Preschool children waited for a preferred but delayed reward while facing either the delayed reward, a less preferred but immediately available reward, both rewards, or no rewards. The dependent measure was the amount of time they waited for the preferred outcome before forfeiting it for the sake of the less desired but immediately available one. Results contradicted predictions from psychodynamic theory and from speculations concerning self-instructions during "time binding." Unexpectedly, but in accord with frustrative nonreward theory, voluntary waiting time was substantially increased when subjects could not attend to rewards during the waiting period. Implications are discussed for a theory of the development of delay of gratification.

The concept of voluntary postponement of immediate gratification for the sake of more distant long-term gains has a central place in conceptualizations of the development of complex human behavior. Formulations stressing the role of voluntary delay of reward range from the possible origins of "psychopathy" and antisocial behavior (e.g., Mowrer & Ullmann, 1945) to characterizations of societal and cultural adaptation patterns in terms of the renunciation of immediate gratifications in favor of disciplined seeking of more substantial future gains. At the empirical level, extensive experimental work has been done on delay of reward in animals (e.g., Renner, 1967). Surprisingly, although voluntary delay behavior has been assumed to be a critical component of such concepts as "ego strength," "impulse control," and "internalization," relatively little attention has been devoted to it in empirical work on human social behavior.

One line of research has tried to apply psychoanalytic concepts concerning ego functions to motoric inhibition and impulse control (e.g., Singer, 1955). Most of the resulting empirical work has relied on highly indirect

measures of delayed gratification and ego control, mainly inferred from human movement responses on the Rorschach (e.g., Spivack, Levine, & Sprigle, 1959).

In contrast, the present research is part of a larger project to investigate delay of reward with more direct behavioral measures. For example, subjects were required to choose among actual alternatives that varied in delay time and value (e.g., immediate smaller versus delayed but larger rewards) in realistic situations (e.g., Mischel, 1966). Past research in this vein has investigated the organization of self-control by exploring the relationship between various preference patterns for immediate smaller rewards or delayed larger rewards and other theoretically relevant aspects of personality functioning. The network of associations found here so far indicates, for example, significant relations between preference for delayed rewards and indexes of achievement orientation, social responsibility, age, sociocultural and rearing conditions, and intelligence (e.g., Klineberg, 1968; Mischel, 1961a, 1961b, 1961c; Mischel & Metzner, 1962). Relations have also been found with resistance to temptation (Mischel & Gilligan, 1964) and with severity of psychological disturbances (Shybut, 1968). Correlational studies were supplemented in recent years by experiments to investigate more precisely the determinants of voluntary delay of reward and similar forms of self-control in laboratory situations (e.g., Mischel & Staub,

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²Requests for reprints should be sent to Walter Mischel, Department of Psychology, Stanford University, Stanford, California 94305.

1965; Mischel, Grusec, & Masters, 1969). As a result of both correlational and experimental studies, some of the determinants of choice preferences for delayed rewards are becoming clearer (Mischel, 1966, 1968).

Although choice preferences for immediate or delayed rewards are beginning to be understood, the psychological mechanisms through which persons manage to bridge the temporal delay of reward required for attainment of deferred gratification remain remarkably unstudied. In spite of its seemingly evident importance, little is known about the self-regulatory mechanisms during the actual delay period when the individual must engage in the waiting dictated by his choice of delayed, larger gratification. Past research has studied verbal choice preferences between rewards varying in value and in the delay time required to attain them, but just how subjects are able to wait during the temporal delay remains unknown. Given that one has chosen to wait for a larger deferred gratification, how can the delay period be managed? The mechanisms that maintain goal-directed delay seem especially important, considering the fact that the ability to sustain self-imposed delay for the sake of larger but delayed consequences appears to be a chief component of most complex higher order human behavior. A main purpose of the present research, therefore, was to investigate the psychological processes that mediate sustained waiting behavior for delayed gratification.

Freud's (1959) classic discussion of the transition from primary to secondary process is one of the few theoretical treatments of how delay of gratification may be bridged. According to the psychoanalytic formulation, ideation arises initially when there is a block or delay in the process of direct gratification discharge (Rapaport, 1967, p. 315). During such externally imposed delay, according to Freud, the child constructs a "hallucinatory image" of the physically absent need-satisfying object. Gradually, as a result of repeated association of tension reduction with goal objects, and the development of greater ego organization, the imposed delay of satisfying objects results in the substitution of hallucinatory satisfactions and other thought processes that convert "free cathexes" into "bound

cathexes" (e.g., Freud, 1959; Singer, 1955). In spite of much psychoanalytic theorizing and speculation about the role of the mental representation of blocked gratifications in the development of delaying capacity, the process remains far from clear.

In their theoretical discussion of impulse control, Jones and Gerard (1967) reasoned that "time-binding," or the capacity to bridge delay of gratification, probably hinges on self-instructional processes through which the individual increases the salience of the delayed consequences or outcomes of his action. In their view, any factors (situational or within the individual) that make delayed consequences more salient should enhance impulse control and voluntary delay. Their position, while emphasizing the self-instructional aspects of attention to deferred outcomes, also implies covert self-reinforcement processes through which the subject may reinforce his own waiting behavior by vividly anticipating some of the positive consequences to which it will lead. Finally, a cognitive-developmental view might lead one to expect that young children may readily forget the delayed outcomes for which they are waiting, and hence cease to wait unless they are reminded of the relevant contingencies and rewards involved in the delay-of-gratification paradigm.

In line with all the foregoing arguments, it seems most plausible that conditions that help the individual to attend mentally to the delayed reward for which he is waiting should help him to sustain the delay. Operationally, these speculations would suggest that any cues that make the delayed gratification more salient—that help the person to make deferred consequences more psychologically vivid or immediate (e.g., by letting him look at them, by visualizing them in imagination, or by reminding him of the object for which he is waiting)—should facilitate waiting behavior. Such expectations also seem congruent with the results of earlier work on choice of immediate but smaller versus delayed but larger rewards (Maher, 1956; Mischel, 1966; Mischel & Metzner, 1962; Mischel & Staub, 1965). These earlier studies showed that an important determinant of choice preference for delayed rewards is the individual's expectation or "trust" that he will really get the

delayed (but more valuable) outcome. Consequently, conditions that increase the salience or visibility of the delayed gratification may enhance the subject's willingness to wait by increasing his subjective probability that the delayed outcome will really materialize and be available after the waiting time ends.

In light of the foregoing considerations, one might expect that voluntary delay behavior is facilitated when the subject converts, as it were, the deferred or delayed object into more tangible form by making it psychologically more immediate, as by providing himself with representations or physical cues about it. The most direct way to increase the salience of the deferred outcomes and to focus attention on them would be to have them physically present and facing the subject, so that he can attend to them readily and vividly. To investigate how attention to delayed and immediate outcomes influences waiting behavior for them, a first step would be to manipulate the availability of those outcomes for attention during the delay time.

Previous research on preference for delayed rewards has been conducted mainly with subjects at least 6 years of age or older. Preliminary observations of the actual waiting behavior of nursery school children suggested, however, that the capacity to wait for long-term goals and to inhibit both immediate gratification and motoric activity seems to develop markedly at about ages 3-4. It was hoped, therefore, that research with subjects in this young age range should be especially informative in revealing some of the processes that underlie the genesis of goal-directed waiting.

A first requirement was a paradigm in which such very young children would be willing to remain in an experimental room, waiting entirely alone for at least a short time without becoming upset and debilitatingly anxious. As an initial step (after the usual play periods for rapport building) each child was taught a game in which he could immediately summon the experimenter by a simple signal. This step was practiced repeatedly until the child clearly understood that he could immediately terminate his waiting period in the room simply by signaling for the experimenter, who regularly returned

from outside as soon as the child signaled. After this critical procedure had been clearly established, the child was introduced to the relevant contingency. He was shown two objects (e.g., snack-food treats), one of which he clearly preferred (as determined by pre-testing); to attain the preferred object he had to wait for it until the experimenter returned "by himself." The child was, however, entirely free throughout this waiting period to signal at any time for the experimenter to return; if he signaled, he could have the less preferred object at once, but would forego the more desirable one later.

To manipulate the extent to which children could attend to the reward objects while they were waiting, the rewards were removed from the experimental room in all combinations, creating four conditions with respect to the objects available for attention. In one condition, the children waited with both the immediate (less preferred) and the delayed (more preferred) reward facing them in the experimental room, so that they could attend to both outcomes. In another group neither reward was available for the subject's attention, both rewards having been removed from his sight. In the remaining two groups either the delayed reward only or the immediate reward only was left facing the child and available for attention while he waited. The dependent measure was the length of time before each child voluntarily terminated the waiting period.

In accord with the previously discussed theoretical ideas, it was predicted that conditions in which the delayed reward was present and visually available would enhance attention to it and hence increase voluntary delay time for it. It was anticipated that the condition in which the child was left without either reward would make it most difficult to bridge the delay time and therefore lead to the shortest waiting. In addition it was expected, although less confidently, that the condition in which both the delayed and immediate reward were available for attention would best facilitate waiting time. This condition might permit the subject to compare and contrast the two outcomes, possibly providing himself with persuasive arguments and self-instructions to help him delay long enough

to achieve his preferred gratification. On the other hand, one might also plausibly expect maximum delay when the child could focus his attention on the delayed reward without being tempted by the immediate gratification—that is, the condition in which the delayed reward was present for attention but the immediate one was not.

METHOD

Subjects and Experimenters

The subjects were 16 boys and 16 girls attending the Bing Nursery School of Stanford University. Three other subjects were run but eliminated because of their failure to comprehend the instructions as described later. The children ranged in age from 3 years, 6 months, to 5 years, 8 months (with a median age of 4 years, 6 months). The procedures were conducted by two male experimenters. Eight subjects (4 males and 4 females) were assigned randomly to each of the four experimental conditions. In each condition each experimenter ran 2 males and 2 females in order to avoid systematic biasing effects from sex or experimenters.

Procedure

The procedures were designed to develop a new method for studying delay behavior experimentally with young subjects. The development of this method was one of the chief goals of the project, and the procedures therefore are described in considerable detail.

In the week prior to the start of the experiment, the two male experimenters spent a few days playing with as many children in the nursery school as they could. These nurturant sessions were designed so that the children would more readily agree to accompany the experimenters to the "surprise room" and, once there, would be at ease. After obtaining the child's consent to go to the surprise room, the experimenter escorted the child to the experimental room.

The experimental room was a small private chamber containing a table, on which lay five $\frac{1}{2}$ -inch-long pieces of pretzel and an opaque cake tin. A chair was in front of the table, and on a second chair there was an empty cardboard box. Under the cake tin on the table were five 2-inch-long pretzels and two animal cookies. On the floor near the chair with the cardboard box were four battery-operated toys. On one wall, at right angles with the table, was a one-way mirror. Apart from these objects, the room was empty. The experimenter pointed out the four toys, and before the child could begin to play with the toys, asked the child to sit in the chair which was in front of the table. He then demonstrated each toy briefly in a friendly manner, saying with enthusiasm after each demonstration that they would play with the toys later on, placing each toy in the cardboard box out of sight of the child. These

references to the toys were designed to help relax the children and also to set up an expectancy that both the child and experimenter would play with the toys sometime later on in the session (thus, terminating the delay period would not mean having to terminate play in the surprise room).

The next phase required teaching the child the technique for terminating the waiting period and summoning the experimenter at will. For this purpose the experimenter said:

Sometimes I have to go out of the room and when I do, you can bring me back. Do you see these tiny pretzels? [The experimenter pointed to the five $\frac{1}{2}$ -inch pieces of pretzel that would serve as signals.] Well, if I go out of the room and you eat one of these pretzels you can make me come back into the room. You can make me come back! Let's try it. I'll go out of the room now and shut the door. As soon as I do, you eat one of the pretzels and make me come back.

The instructions were repeated, if necessary, until the child seemed to understand them completely.

The experimenter then left the room and shut the door, observing through a small viewing hole in the door when the child ate the pretzel. As soon as the child put the pretzel in his mouth, the experimenter returned, laughing playfully and exclaiming how well the child brought him back into the room. To insure that the child learned reliably how to bring the experimenter back, this sequence was repeated four times with four of the five small pieces of pretzel, still leaving the last small piece lying next to the as yet unopened cake tin.

Next the experimenter lifted the cake tin, revealing the two sets of reward objects lying there (two cookies and five 2-inch pretzels). The experimenter asked the child which of the two rewards he liked better, and after the child chose, said:

Oh well, you know what? In order for you to eat those _____ [naming the preferred reward] you will have to wait here in your chair and sit very still. I have to go out of the room for a while and when I come back you can eat those _____ [preferred reward] all up. You can take them off the table and eat them right up. But, you know, sometimes, I'm gone a long time and if you want to bring me back you can. Do you know how to bring me back? [All children did know how.] That's right. You eat that little piece [pointing to signal] and I have to come back. But I have to tell you something else. If you eat that and make me come back you can't have _____ [preferred reward]. You can't have them. But you can have all the _____ [naming less preferred reward]! If you sit very still in your chair until I come back *by myself*, then you can eat the _____ [preferred reward]! But if you want to make me come back all you have to do is eat that [pointing to signal] and I'll come back; but then you can't have the _____ [preferred reward]; but you can have all the _____ [less preferred].

Thus the instructions faced the child with a choice: he could either continue waiting for the more preferred reward until the experimenter returned, or he could stop waiting by bringing the experimenter back. If he stopped waiting, then he would receive the less favored (but more immediately available) reward and forego the more preferred one. The waiting contingencies were repeated once more, and then, to assess if the subject understood them, the experimenter asked three questions: "Can you tell me how to bring me back?" "What happens if you eat the pretzel?" "But what happens if you sit very still in your chair and wait for me to come back by myself?" Three children were unable to answer these questions correctly and were therefore excluded from the data a priori.

At this point the experimenter was informed of the condition in which the subject was to be placed by consulting a slip of paper concealed in the room. This method assured that the experimenter remained unaware of the subject's experimental condition until the last possible moment in the procedure. Depending on the condition and the child's choice of preferred reward, the experimenter picked up the cake tin and along with it either nothing, one of the rewards (the more preferred reward or the less preferred reward), or both. The physical arrangement was such that the rewards, if left, were directly in front of the child at about shoulder level. In all conditions the signal for summoning the experimenter was left on the table in front of the child. Thus, depending upon the condition to which the child had been assigned, he was left waiting either with both the delayed and immediate rewards, with either the delayed but more preferred or the immediate but less preferred reward, or with neither reward available for attention. Finally, in all conditions the experimenter excused himself to leave, and as he was leaving, resummarized the waiting instructions and reminded the child that "no matter what you do, whether you sit and wait for me to come back by myself or whether you bring me back . . . No matter what you do, we're going to play with my toys when I get back." This instruction was included to stress that the child's waiting behavior would not affect his later play period in the surprise room.

Waiting time was scored from the moment the experimenter shut the door. The experimenter returned either as soon as the child signaled or after 15 minutes—the criterion time—if the child did not signal. To determine whether or not the child remembered the waiting contingencies, when the experimenter finally returned he asked the child, "What happens now?" All children answered this question correctly. Subjects were also asked why they had or had not waited. Children who waited to criterion were allowed to eat the chosen, more preferred reward. Those who did not wait to criterion were allowed to eat the unchosen reward. Thereafter each child played with the toys for a while and then was escorted back to his nursery school playroom.

TABLE 1
MEAN MINUTES AND STANDARD DEVIATIONS OF
WAITING TIME FOR A DELAYED REWARD
AS A FUNCTION OF ATTENTION

Statistic	Available for attention			
	No rewards	Both rewards	Delayed reward	Immediate reward
<i>M</i>	11.29	1.03	4.87	5.72
<i>SD</i>	6.84	2.39	6.57	6.43

RESULTS

In accord with the previously discussed theorizing, it was expected that as the degree of attention paid to the delayed rewards increased, the length of time which the children waited would increase. To determine whether or not this prediction was fulfilled, the mean length of time waited (in minutes) was computed for each of the four attention conditions and is depicted in Table 1. Inspection of these results revealed that unexpectedly, the children waited longest when the rewards were entirely absent—that is, in the condition in which neither the delayed nor the immediate reward was available for attention during the waiting period. Furthermore, the children waited the shortest length of time when both the delayed and the immediate rewards were facing them during the waiting session. These results were exactly opposite to the predictions.

An analysis of variance of the mean delay times (Table 2) demonstrated that the overall effect of attentional conditions was significant ($F = 4.42$, $df = 3/28$, $p < .025$). To determine the relative contribution of the conditions to the overall effect, orthogonal contrasts were computed (Winer, 1962). The first orthogonal contrast (C_1 in Table 2) compared the effect of having any reward present for attention with having no reward present during the delay period. This comparison yielded an F of 9.52 ($p < .005$, $df = 1/28$). Thus, children waited much longer for rewards when the rewards were absent than when any rewards were left available for attention. The second orthogonal contrast (C_2) compared mean delay times when both rewards were present with mean delay times when either the delayed or the immediate re-

TABLE 2
ANALYSIS OF VARIANCE FOR MEAN WAITING
TIMES (IN MINUTES) IN EACH
ATTENTION CONDITION

Source	df	MS	F
Between	3	144.2	4.42**
C ₁	1	310.5	9.52***
C ₂	1	112.4	3.45*
C ₃	1	9.8	<1
Error	28	32.63	

* $p < .10$.
** $p < .025$.
*** $p < .005$.

ward was available for attention. The results of this contrast suggested a slight trend toward shorter delay when both rewards were present for attention, rather than when only one reward was present ($F = 3.45$, $df = 1/28$, $p < .1$). The final contrast, (C₃), comparing attention to the delayed reward with attention to the immediate reward, was not statistically significant ($F < 1$).

The absolute mean waiting times were probably depressed by the low maximum waiting period used, that is, 15 minutes. Ten subjects out of the total 32 in the study waited the maximum time. Table 3 shows the number of subjects in each condition who waited the full 15 minutes. An overall frequency analysis yielded a significant chi-square ($\chi^2 = 11.07$, $p < .025$, $df = 3$). Note that not a single child waited the maximum time in the condition in which both rewards were available, whereas 6 out of 8 children waited the maximum time when neither reward was present. These results further support the findings of the parametric analysis, showing greatest delay of gratification when the reward objects were not available for attention. In summary, children who were given the opportunity to attend to any of the rewards while

TABLE 3
NUMBER OF CHILDREN WAITING THE MAXIMUM
TIME (15 MINUTES) IN EACH
ATTENTION CONDITION

Situation	Rewards available for attention			
	None	Both	Delayed	Immediate
Not waiting	2	8	6	6
Waiting	6	0	2	2

they were waiting delayed less long than children who could not attend to any rewards while waiting.

Follow-Up Data

To test the stability of these findings, a partial replication was conducted in later follow-up work. In this replication, the method was altered in one major way. It was recognized that interpretation of the reported results might be somewhat hampered by the fact that the signal for terminating the delay involved eating a tiny pretzel, and that pretzels also were the rewards. Therefore, instead of the tiny pretzel, a desk bell was used as the signal to terminate the delay period in the follow-up.

Subjects of comparable age from the same nursery school were run in the two conditions that had yielded the main effects. Namely, 12 children were left waiting with neither the delayed nor immediate rewards present and 12 with both rewards present.

The findings clearly supported the previous results. The mean waiting time for the condition in which neither reward was present for attention was 8.9 minutes ($SD = 5.26$), while the mean waiting time when both rewards were visible was only 3.09 minutes ($SD = 5.59$). These means were significantly different in the same direction found previously ($t = 2.61$, $df = 22$, $p < .025$). We therefore may conclude that this attentional condition produced reliable differences in the length of time that children delayed gratification (regardless of the signal used to terminate the delay period).

DISCUSSION

Throughout this study unexpected results emerged. A first surprise was the long duration of the waiting periods that many of these young children were able to maintain under some conditions. In pilot work, for example, some of the preschool youngsters waited for the preferred reward quietly by themselves, seated alone in a chair for periods sometimes exceeding 1 hour—an observation that is surprising, considering the widespread belief that young children are incapable of sustained delay of gratification. Moreover, throughout the entire study not a single child violated

the stated contingency rule by consuming the preferred but delayed reward before the experimenter's return.

The experimental conditions exerted potent effects on the children's delay behavior, as seen in the finding that six out of eight children waited the maximum 15-minute time when they could attend to neither the immediate nor the delayed rewards, whereas the mean waiting time was about 1 minute when they could attend to both rewards. These differences between conditions suggest that it is inappropriate to conceptualize delay of gratification as if it hinged on an all-or-none "ability." Instead, most of the subjects in the present study, in spite of their young age, seemed capable of delay of gratification; the extent to which they did delay depended critically on the specific conditions of the delay period.

The initial theorizing about delay behavior led to predictions of results which were the direct opposite of the obtained findings. It was predicted that attention to the outcomes available in the choice situation while waiting would enhance delay behavior; instead it sharply reduced delay of gratification. Extensive observations of the children's behavior during the delay period provided some clues for a better understanding of the mechanisms through which they mediated their own goal-directed waiting.

One of the most striking delay strategies used by some subjects was exceedingly simple and effective. These children seemed to facilitate their waiting by converting the aversive waiting situation into a more pleasant non-waiting one. They devised elaborate self-distraction techniques through which they spent their time psychologically doing something (almost anything) other than waiting. Instead of focusing prolonged attention on the objects for which they were waiting, they avoided looking at them. Some children covered their eyes with their hands, rested their heads on their arms, and found other similar techniques for averting their eyes from the reward objects. Many seemed to try to reduce the frustration of delay of reward by generating their own diversions: they talked to themselves, sang, invented games with their hands and feet, and even tried to fall asleep

while waiting—as one child successfully did. These elaborate self-distractions occurred mainly in the rewards-absent condition and almost never in the both-rewards-present condition, since in the latter group the children quickly terminated the delay period.

These observations, while obviously inconclusive, suggest that diverting one's attention away from the delayed reward (while maintaining behavior directed toward its ultimate attainment) may be a key step in bridging temporal delay of reward. That is, learning *not* to think about what one is awaiting may enhance delay of gratification, much more than does ideating about the outcomes.

These observations also seem consistent with theoretical considerations which (post hoc) could correctly predict the obtained results. Namely, from the perspective of "frustrative nonreward" theory (e.g., Amsel, 1958, 1962; Wagner, 1966), the occurrence of non-reward when reward is expected elicits a primary frustration reaction. Congruent with this formulation, when the anticipation of reward is increased, the aversive frustration effect also should be greater. Hence one might predict that cues that enhance the salience of anticipated but still unavailable (delayed) rewards should increase the aversiveness of the delay period. Presumably the greater and more vivid the anticipation of reward, the greater the frustration generated by its delay. This line of reasoning would suggest that conditions that decrease the subjects' attention to the blocked reward—and that distract him by internal or overt activity from the frustrative delay of reward—would make it less aversive for him to continue his goal-directed waiting and hence permit him to wait longer for delayed gratifications. These theoretical expectations seem closely congruent both with the obtained findings and with the more informal observations of the children's delay behavior.

The present terminology focuses on the frustrative aspects of not being able to immediately obtain the preferred reward in the delay-of-gratification paradigm. The same theoretical considerations, however, apply to the aversiveness of the waiting period and of the continuous decisional conflict (between terminating versus waiting longer). In part,

attending to the rewards in the waiting paradigm may be aversive, because it increases the frustration of anticipating the attainment of a blocked reward; in part it may be frustrating, because it enhances the aversiveness of the waiting situation and accentuates the ongoing decisional conflict. All of these sources of frustration seem an integral part of the delay-of-gratification situation, and attention to them makes effective delay behavior more difficult.

It is of considerable interest that delay behavior was about the same, regardless of whether the reward in front of the child was the immediately available one or the delayed, more preferred outcome. This finding seems most clearly to contradict any Freudian theoretical expectations that a mental focus on the delayed outcome (rather than the immediate gratification) serves to bridge temporal delay of gratification by providing an internal or "hallucinatory" representation of the desired but deferred or blocked outcome.

It might also be thought that the children's waiting behavior in the present situation depends on implicit "experimenter demands." Such speculations would predict that the presence of the delayed reward should serve as a cue to the subject that waiting for the delayed outcome is expected by the experimenter. Similarly the condition in which only the immediate reward is present should cue less lengthy waiting and enhance willingness to terminate the delay and settle for the immediate outcome. These interpretations are untenable, however, because waiting times were similar in the condition in which only the delayed reward was present and the condition in which only the immediate reward was present.

One further alternative interpretation that may be suggested is that attention to the rewards simply decreases their subjective value through some sort of habituation process, and therefore subjects wait less long. In that case one would expect the attention to the delayed reward to result in its subjective devaluation and hence predict shorter waiting when the delayed reward is present, as indeed occurred. The same reasoning, however, also would predict that the presence of the immediate reward should lead to its devaluation

and hence generate longer waiting times for the more preferred and absent delayed outcome. The finding that the presence of only the immediate reward in fact led to less delay argues against such a habituation or value-reduction interpretation of the role of attention in delay behavior.

Throughout the present study it has been assumed that the content of subjects' ideation while waiting would be correlated with the attentional conditions to which they were assigned. Thus it was assumed that making rewards(s) available for attention by facing the subject with them would increase the likelihood that he would actually attend to them during the delay period. While this assumption seems straightforward and parsimonious, it might conceivably be argued that subjects would actually attend mentally more to the reward objects when the rewards were not physically present than when they were facing them. In that unlikely event, however, one would again have to predict a difference in waiting time between the immediate reward only and delayed reward only conditions. Presumably subjects would then be fantasizing and thinking more about the absent outcome, which should lead to different waiting times in the immediate reward and delayed reward only attention conditions.

The lack of significant difference in waiting time when the subjects faced the immediate reward or the delayed one does seem understandable from the perspective of frustrative nonreward theory. When the subject attends to the immediate reward and is tempted to take it, he is frustrated by recalling the contingency that attainment of it now prevents his getting the preferred reward later. When the subject attends to the delayed reward, he is frustrated by the fact that he wants it now but cannot have it yet. When he attends to both objects, both of the above aversive frustrations occur, and hence delay tends to be most difficult—as was the case. In contrast, when the rewards are not visually present for attention, and therefore not made mentally salient, the subject can more easily avoid the frustration of blocked reward by engaging in various distraction maneuvers both overtly and in his thought processes.

Thus perhaps the most compelling interpretation of the findings may be in terms of the frustrativeness of delay of reward: the presence of the rewards serves to increase the magnitude of the frustration effect and hence decreases delay of gratification by making the waiting period more difficult. The overall findings tentatively suggest that learning to inhibit frustrative ideation, and to divert attention away from temptations by focusing, externally and internally, on competing and less frustrating stimuli, may be essential steps for mastery of delay of gratification. If that is true, then the attentional and cognitive processes through which people manage to transform aversive and frustrative conditions into bearable ones by generating their own frustration-reducing distractions become intriguing questions for future research on self-control. Such research should help us to understand more definitively the mechanisms underlying the present findings.

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