The Effect of Cognitive Restructuring on Delay of Gratification

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NISAN, MORDECAI, and KORIAT, ASHER. *The Effect of Cognitive Restructuring on Delay of Gratification.* CHILD DEVELOPMENT, 1984, **55**, 492–503. 2 experiments evaluated predictions derived from a cognitive-developmental approach to delay of gratification. In the first, kindergarten children expressed preference for either a small but immediate reward or a large but delayed reward. They were then told about another child who made the opposite choice and were asked to produce reasons justifying the other child's choice. This procedure affected the children's subsequent choices, but only when the reasons supported the delayed choice. Merely presenting children with information that another child chose differently, without asking for reasons, had little effect. In the second experiment, children were presented with either an objective-rational or subjective-emotional argument contradicting their initial preference. The objective argument had a stronger effect on children's subsequent choices, and this effect was stronger when the argument was for delaying gratification than when it supported the immediate reward. Furthermore, children who switched from immediate to delayed reward tended to adhere to the new choice after 3 weeks, while those who switched from the delayed reward to the immediate reward were more likely to revert back to their initial choice. The results were interpreted in terms of a cognitive-developmental view of delay and were seen to indicate that cognitive restructuring may induce delay choices characteristic of a more advanced developmental stage.

Evidence accumulated thus far clearly indicates that the tendency to prefer larger but delayed rewards over smaller immediate ones increases systematically with age, with a major change occurring around age 6–8 (see, e.g., Mischel, 1958; Nisan, 1974a). This development has been considered by several theorists to be a crucial turning point in the evolution of higher cognitive processes and in the formation of the ego.

Three different accounts for this development have been offered. The first, based on social learning theory, was advocated by Mischel (1966, 1974). It attributes age changes in delay to the social reinforcements of delay behavior. These reinforcements result in a behavioral tendency to delay gratification or, in cognitive terminology, in an awareness that it is worthwhile and appropriate to prefer larger delayed rewards over smaller immediate ones. This account emphasizes the situational context of the development of delay behavior and its dependency on external conditions. Consistent with this view are the systematic cultural and social class differences found in delay behavior (Mischel, 1958; Walls & Smith, 1970). Also, Bandura and Mischel (1965) found that exposure to models who preferred immediate or delayed rewards affected subjects' behavior.

A second account is found in psychoanalytic theory (see Nisan & Koriat, 1977; Singer, 1955). According to this account, the capacity to delay gratification represents a major developmental achievement and is concomitant with the increased dominance of the reality principle over the pleasure principle. This development reflects maturational processes rather than cultural influences and is, by its very nature, unidirectional—from an uninhibited urge for immediate discharge toward a tendency to control impulses.

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A third account may be derived from the cognitive-developmental approach (Kohlberg, 1969; Langer, 1969b). This derivation has not yet been formulated explicitly, but its general form can be readily sketched. The increased tendency to delay gratification results from the child's cognitive growth and reflects the improved ability to structure events and to understand reality. This understanding includes the awareness that delay is a necessary condition for effective functioning and adaptation, and that it is a means for maximizing utility and gaining control over the environment. In addition, the development of delay behavior depends on such cognitive skills as the expansion of time perspective (Klineberg, 1968) and the ability to consider simultaneously the two aspects of the choice dilemma (e.g., time and amount of reward). The latter ability is attained at the beginning of the stage of concrete operations and coincides with the age of major changes in delay behavior (Nisan, 1976). Thus, according to the cognitive-developmental approach, the changes in delay of gratification behavior are inherently tied to general cognitive growth.

The cognitive-developmental and psychoanalytic accounts share the assumption that the development of delay behavior reflects maturational processes rather than environmental effects. They differ in that the former attributes this development to cognitive growth while the latter stresses motivational determinants. The role of cognitive processes in delay behavior was also recognized by research within the social learning theoretical framework. In fact, Mischel (1974, 1981) has demonstrated the decisive role of cognitive transformations of the reward in determining delay behavior. Yet, in the social-learning theory, cognitive processes are seen mainly as mediating the effects of social learning. In contrast, the cognitive-developmental approach views cognitive development, guided by the search for equilibrated (i.e., adaptive) action, as the direct source of the development of delay behavior.

The aim of this study was to examine certain hypotheses derived from the cognitive-developmental approach to delay behavior. According to this approach, the young child's preference for immediate reward derives from limited or inappropriate structuring of the delay situation rather than from the inability to inhibit impulse (as proposed by psychoanalytic theory) or from insufficient exposure to reinforcements of delay (as proposed by social learning theory). This inability may stem either from insufficiently developed cognitive skills or from the inability to apply these skills to the specific situation facing the child. Even the child who has developed a basic ability to understand the dilemma of delay may find it difficult to apply this ability to a specific situation. Assistance in structuring the choice situation and in organizing the relevant considerations may be expected to increase the tendency to delay gratification. This external assistance may help the child crystalize the appropriate cognitive structures and apply them to the particular situation at hand.

One way to motivate the child to restructure the situation is by inducing a cognitive conflict (Langer, 1969a). Such a conflict may be produced in a delay situation by presenting the child with considerations, or eliciting considerations, that contradict the child's choice. Such considerations have proved effective in fostering a balanced evaluation of the alternatives involved in a choice dilemma (Koriat, Lichtenstein, & Fischhoff, 1980). Accordingly, the design of Experiment 1 involved three conditions. In the "contradicting information" condition, children were presented with the choice between an immediate small reward and a delayed large one and asked to indicate which of these rewards they would recommend that another child choose. They were then told about another child who made the opposite choice from theirs and were asked to make a choice for themselves. In the "contradicting reasons" condition, after being presented with the other child's choice, children were also asked to provide reasons favoring this choice. In the "control" condition, the children simply indicated their recommendations for the other child and were then given a diversion task before being asked to choose for themselves.

Assuming that the choice recommended for another child reflects the subject's own preference, the first prediction is that the contradicting reasons condition will result in a change in delay behavior compared with the control condition. We also wish to compare the contradicting information and control conditions. If the contradicting reasons condition is found to have the same effects as the contradicting reasons condition, this may be seen to support the claim of social learning theory that the very exposure to a model affects the tendency to delay gratification (Bandura & Mischel, 1965). If, on the other

hand, only the contradicting reasons condition, but not the contradicting information condition, affects the child's choice, this will support the idea that this effect is mediated by a conflict that motivates the child to restructure the situation. This proposition rests on the premise that contradicting reasons are more likely to arouse cognitive conflict than exposure to contradicting information (Turiel, 1969).

A second prediction concerns the direction of the change. From a nondevelopmental point of view, the presentation of a contradicting reason should have the same effect whether it speaks for the delayed reward or for the immediate reward. The cognitive-developmental approach, on the other hand, assumes that reasons that favor the more developmentally mature choices will be more effective in changing behavior than those favoring the less developmentally mature choices. This is because the contradicting reasons are assumed to help the child apply cognitive skills and achieve an appropriate representation of the delay dilemma, one that is likely to result in an increased tendency to choose the delayed reward. Also, assuming that the child's immature tendency is to prefer an immediate reward (Nisan, 1974b), a child who chooses a delayed reward may be supposed to have weighed considerations in both directions and therefore should not necessarily be affected by considerations favoring the immediate choice.

Our approach parallels the theoretical position of Cowan, Langer, Heavenrich, and Nathanson (1969) in their debate with Bandura and McDonald (1963) concerning moral judgment. Bandura and McDonald (1963) expected the responses of a model to affect the responses of the subject both in the direction of judgment-according-to-intent and in the direction of judgment-according-to-consequence. Cowan et al. (1969) showed that the effect of the model was stable over time only when it was in the developmental direction—that is, favoring judgments according to intent.

Apart from the effects of the experimental manipulations on children's choices, we are also interested in the kinds of reasons produced and their relative effectiveness. We shall distinguish two types of reasons: subjective reasons, which pertain to the subject's attitudes toward the alternative options; and objective reasons, pertaining to "objective" characteristics of the options offered, particularly time and quantity. We propose that the activation of objective reasons induces a stronger tendency toward cognitive restructuring of the situation than the elicitation of subjective reasons; therefore it should be more likely to motivate delay behavior than subjective-emotional reasons.

The children studied were 5–6 years old, an age that we have found to be one of transition in the development of delay of gratification. According to the assumptions presented above, children of this age are likely to benefit from the conditions that induce cognitive restructuring.

Experiment 1

Method

Subjects.—Subjects were kindergarten children aged 5–6 from five different kindergartens in middle-class neighborhoods. Eighty-two children (42 boys and 40 girls) were in the contradicting reasons group; 37 children (20 boys and 17 girls) were in the contradicting information group; and 37 children (19 boys and 18 girls) were in the control group.

Procedure.—Each child was individually interviewed by a female undergraduate student. The child was told that the study was about "what children like." Following a few opening questions, the experiment itself was begun.

The first task was identical for all three groups and included making a recommendation for another child. Instructions were as follows:

"Yesterday I was in another kindergarten and there was a nice boy/girl there, called Yosi [Anat for girls]. Yosi/Anat likes to draw very much, and he/she made me a nice drawing. I told him/her that since he/she made such a nice drawing he/she could get a prize. The prize was either one chocolate bar today or two chocolate bars tomorrow. Yosi/Anat told me that he/she liked chocolate a lot and didn't know what to choose, so he/she asked me to ask other children what they suggested he/she should choose. Do you think it's better for him/her to choose one chocolate bar today or two chocolate bars tomorrow?"

After the child answered, the experimenter said, "I'll tell Yosi/Anat that you [the child's name] suggested that he/she choose one chocolate bar today/two chocolate bars tomorrow [according to the child's answer]."

Children were then assigned to the three experimental groups as follows. The first four children who recommended an immediate reward were divided so that the first and third child were assigned to the contradicting reasons group, the second to the contradicting information group, and the fourth to the control group. The same procedure was applied to children who recommended a delayed reward. This procedure was aimed to achieve a larger number of subjects in the contradicting reasons group to allow a more detailed analysis of the effects of the different types of reasons produced. (Because of a small error in assignment, the number of subjects in the contradicting reasons group was larger than planned.)

The second task varied according to condition. In the contradicting reasons group the instructions were: "In the same kindergarten there was another boy/girl called Danny/Dorit. Danny/Dorit also made a very nice drawing, and I told him/her, too, that he/she could have a prize—one chocolate bar today or two chocolate bars tomorrow. Danny/Dorit chose one chocolate bar today/two chocolate bars tomorrow [a choice opposite to that indicated by the subject in the first task]. Why do you think Danny/Dorit chose that prize?" The experimenter tried to solicit as many answers from the child as possible.

In the contradicting information group, a filler task was introduced. The experimenter showed the child three pictures, pointed to one of them, and said, "One child told me that this is the nicest picture. Why do you think he/she likes this one more than the others?"

Then the following instructions were given: "By the way, I forgot to tell you that yesterday, when I was in the kindergarten I told you about before, there was another boy/girl called Danny/Dorit, and Danny/Dorit also made a very nice drawing. I told him/her, too, that he/she could choose a prize—one chocolate bar today or two chocolate bars tomorrow—and Danny/Dorit chose one chocolate bar today/two chocolate bars tomorrow [a choice opposite to that indicated by the child in the first task]."

In the control group the second task included the picture task only.

The third task was again identical for all three groups: children were asked what they preferred for themselves—one chocolate bar today or two chocolate bars tomorrow. (All experiments were conducted in Hebrew.)

Results

The analysis to be presented will be based mainly on a comparison between the children's choices for themselves (third task) and their recommendation for another child (first task). Underlying these analyses is the assumption that the children's recommendations basically reflect the choice that they would have made for themselves. Support for this assumption comes from the fact that, in the control group, 81% of the subjects made the same choice for themselves as that recommended for the other child. Table 1 presents the number of boys and girls choosing immediate reward and delayed reward for themselves and for the other child, according to their experimental condition.

We shall first examine the results for each of the three groups separately, focusing on the change in response from the first (recommended) choice to the last (own) choice. As can be seen in Table 1, 36 (43.9%) of the 82 subjects in the contradicting reasons group changed their choice. In both the control and contradicting information

TABLE 1

RECOMMENDED CHOICES AND CHOICES FOR SELF FOR BOYS AND GIRLS ACCORDING TO CONDITION

Recommended Choice/ Choice for Self	Contradicting Reasons			Contradicting Information			Control		
	Boys	Girls	All	Boys	Girls	All	Boys	Girls	All
Immediate/immediate ...	5	6	11	5	6	11	6	3	9
Immediate/delayed	10	13	23	2	2	4	3	1	4
Delayed/immediate	7	6	13	1	2	3	1	2	3
Delayed/delayed	20	15	35	12	7	19	9	12	21
Total	42	40	82	20	17	37	19	18	37

groups, exactly the same percentage of children—18.9%—changed their choice. It seems, then, that presenting contradicting reasons affected the subjects' choices for themselves.

This effect was stronger for subjects who initially chose the immediate reward than for those who preferred the delayed reward. In the contradicting reasons group, 68% of the former but only 37% of the latter changed their preferences, $\chi^2 = 13.3$, $p < .005$. This pattern was obtained for both boys, $\chi^2 = 6.64$, $p < .01$, and girls, $\chi^2 = 6.35$, $p < .05$. It seems, then, that the requirement to produce reasons supporting the contradicting choice affected those who initially chose the immediate reward more than those who initially chose the delayed reward. This interaction between initial choice and likelihood of change was not obtained in the other two groups. Although in both groups more children changed in the developmental than in the nondevelopmental direction, the differences were not significant. The respective percentages were 31% and 12% for the control condition, and 27% and 14% for the contradicting information condition.

Since the results of the contradicting information and control groups are very similar (see Table 1; a χ^2 comparing the distribution of the four choice patterns in the two groups, yielded $\chi^2 = .03$), they were combined in the following analyses to form a combined control group. Focusing only on those who initially preferred a delayed reward, 13% of the children in the combined control group and 27% of the children in the contradicting reasons group changed in favor of the immediate reward, $\chi^2 = 2.87$, N.S.

A similar analysis for children who first recommended the immediate reward indicated that 68% of the contradicting reasons group and 29% of the combined control group changed in favor of the delayed reward, $\chi^2 = 9.38$, $p < .01$.

The results, then, are clearly consistent with the cognitive-developmental approach. While the mere presentation of information about a child who chose differently had little effect, the additional request to produce reasons justifying this choice affected the child's choice significantly when the initial choice was for the immediate reward. When the initial choice was for the delayed reward, however, the solicitation of contradicting reasons had no effect.

We shall now examine the reasons raised in the contradicting reasons group as they might relate to the likelihood of a subsequent change. Table 2 presents the distribution of the types of reasons produced. The categories appearing in this table are identified by short phrases, which speak for themselves. Most important for us are the first two categories—subjective-emotional reasons and objective-rational reasons. It should be noted that the data in Table 2 specify the number of reasons produced, not the number of children. Therefore, it is not possible to perform a χ^2 analysis on these data. However, it can be seen that there is no support for the hypothesis that a change in

TABLE 2

TYPES OF REASONS PRODUCED IN THE CONTRADICTING REASONS CONDITION OF EXPERIMENT 1

	Recommend Immediate				Recommend Delayed			
	Immediate for Self		Delayed for Self		Immediate for Self		Delayed for Self	
Type of Reason	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Subjective-emotional ("I like it," "I want it," "It is tasty," etc.)	3	2	6	6	2	2	12	6
Objective-rational (refer to time or quantity)	1	1	4	3	3	1	3	3
External-circumstantial ("has one," "has to treat others")	2	2	2	2	3	1	5	1
Reference to personality traits (modesty, wisdom, altruism)	1	2	2	3	0	0	1	3
No reason	1	0	1	4	2	3	2	5
Others	0	0	0	0	0	0	3	5
Total	8	7	15	18	10	7	26	23

favor of delaying gratification is more likely to be brought about by an objective-rational reason than by a subjective-emotional reason.

Discussion

The results of Experiment 1 are consistent with the two major predictions derived from the cognitive-developmental approach. First, producing arguments that contradicted one's initial choice increased preference for the delayed reward. On the other hand, presenting information about another child who chose differently had no effect whatsoever. At the least, these results suggest that the effect found in the contradicting reasons group is not related to the presentation of a different opinion (i.e., to something like a modeling effect), but to the production of contradicting arguments.

Clearly, these results do not indicate that delay behavior is not affected by the behavior of models. In this study the child said to have chosen differently was not a child of prestige such as would be expected according to social learning theory to influence the subject's response. The results do indicate, however, that reasoning about the choices of such "unprestigious" models may affect behavior. From a cognitive-developmental point of view, we would argue that mere information about the behavior of an unprestigious child does not induce reflections on the reasons for one's own choice. Such reflections might be necessary for a change to occur. It is interesting to note that the models used by Bandura and Mischel (1965) not only made a certain choice but also presented a detailed explanation for their choice, and this might have evoked reflections on the reasons for their different choice.

The second finding is that the effect obtained in the contradicting reasons group was most pronounced in the direction of delaying gratification. According to the cognitive-developmental approach, this is so because the effect of the contradicting reasons is to *advance* the child's thinking on the issue by creating a disequilibrium that induces a cognitive restructuring of the situation at a more mature level. This restructuring, we assume, is more likely to call for delay rather than nondelay behavior, whatever the causes of the disequilibrium are.

Bandura and Mischel (1965) also obtained a higher incidence of change in the direction of delay than in the direction of nondelay. This was attributed by them to the influence of the powerful cultural norm to delay gratification. This explanation, however, is not consistent with their finding that many subjects did choose an immediate reward, and there was no unanimous agreement in one direction or the other. The explanation seems still less likely in our case; the children studied were in the transitional period and had just entered the stage of preferring delayed gratification. In addition, no pressure was exerted on the subjects in this study; the experimenter was unfamiliar to the children, and the choice was made in private, not in public.

The interpretation of the results in terms of the concepts of cognitive conflict and cognitive restructuring is consistent with previous studies. It should be indicated, though, that in these studies (e.g., Turiel, 1966), the conflict was caused by "external" intervention, whereas in this study the conflict was "internally" created, by having the children themselves raise reasons against their own choices. This latter procedure may have guaranteed that the reasons were not too remote from the children's level of understanding and could be assimilated by them. It seems that only under such conditions can the reasons be adopted by children and affect their behavior (Berkowitz, Gibbs, & Broughton, 1980).

The change of choice following the production of contradicting reasons may be interpreted in terms of Bem's (1967) self-perception theory that, by voicing arguments in favor of an alternative choice, children come to perceive themselves as favoring that choice. This theory, however, would not predict the unidirectional effect found in this study.

Inconsistent with the cognitive-developmental approach, we found no indication that objective-rational arguments are more effective than subjective-emotional ones. One explanation for this failure is that emotional considerations can constitute cognitive elements in the representation of the situation (Koriat & Nisan, 1978) and may therefore have cognitive implications. A second explanation is that the reasons produced by the subjects verbally did not fully capture the reasons they actually thought of (see Nisbett & Wilson, 1977). Both explanations are difficult to evaluate. Whatever the case might be, it appears that the hypothesis regarding the relative effectiveness of objective and subjective reasons in motivating change can be better evaluated if the choice

of reasons is experimentally manipulated rather than subject-selected. The first aim of Experiment 2 was to examine this possibility.

A second aim was to check the stability of the changes achieved by the contradicting reasons. In the context of the cognitive-developmental approach, a distinction may be drawn between two types of behavioral changes. In the first, which may be labeled "structural" or "developmental" (see Furth, 1969; Kohlberg, 1969), the change reflects the reorganization of thought toward a better equilibrated state and a more adaptive understanding of reality. The second, which may be termed "learning," constitutes a temporary adaptation to external stimuli like that occurring as a result of reinforcement or modeling, without necessarily implying a better understanding of the situation. If the changes produced by the contradicting reasons are structural in nature, they should exhibit one of the basic characteristics of such changes—namely, stability over time (Kuhn, 1974).

Experiment 2 examined the following questions: (1) Are objective reasons more effective than subjective reasons in increasing delay of gratification? and (2) Is the change in the direction of increased delay more durable than that of reduced delay? In Experiment 2, then, children made a recommendation concerning the choice of another child. Then they were told about a second child's choice and presented with arguments in support of this latter choice, the arguments being either objective-rational or subjective-emotional. Following this procedure, the children were asked to indicate their own choices. To assess stability of choice, the last task was repeated 3 weeks later.

Experiment 2

Method

Subjects.—Subjects were kindergarten children, aged 5–6, from five different kindergartens in middle-class suburbs. Sixty children (31 boys and 29 girls) were in the objective reason group; 64 children (31 boys and 33 girls) were in the subjective reason group.

Procedure. The first task was identical to that of Experiment 1 and was the same for all children. For the second task, children were assigned to the subjective-emotional or objective-rational conditions, so that, of those who first recommended an immediate reward, the first was assigned to the subjective reason condition, the second to the objective reason condition, and so forth; the same was done for those children who recommended the delayed reward. Three children did not complete the tasks and were not included in the final sample.

In the objective reason group, instructions were as follows: "In that kindergarten there was a boy called Danny [or a girl called Dorit]. Danny/Dorit also made a very nice drawing. I told him/her that he/she could have a prize. He/She could have either one chocolate bar today or two chocolate bars tomorrow. Danny/Dorit chose one chocolate bar today/two chocolate bars tomorrow [a choice opposite to the child's suggestion]. When I asked Danny/Dorit why he/she chose this prize, he/she answered [if Danny's or Dorit's choice was two tomorrow]: 'Because he/she wanted lots, and two tomorrow is more than one today'/[if Danny's or Dorit's choice was one today]: 'Because he/she wanted the chocolate quickly, and one today is sooner than two tomorrow.' What do you think about Danny's/Dorit's reason?"

In the subjective reason group, the rest of the instructions were identical, except that the reason attributed to Danny/Dorit was different. The reason was identical for both choices: "When I asked Danny/Dorit why he/she chose this prize, he/she answered me that he/she likes chocolate a lot, it's tasty, and he/she wants this prize. What do you think of Danny's/Dorit's reason?"

The third question was then identical for both groups: "Let's say I asked you now what you'd like to have as a prize—one chocolate bar today or two chocolate bars tomorrow. What would you choose?"

The second session of the experiment took place 3 weeks after the first session. Since Experiment 2 was conducted during the last few weeks of the school year, only three kindergartens (79 children) were available for the second session. For this session, the experimenter came back to the kindergartens, met groups of children, and told them, "I want to thank you very much for helping me in my research, so I'd like to give you the prize you wanted for yourselves. I don't remember exactly what each of you wanted, so I'd like you to come up to me now and tell me what you would like to have, one chocolate bar today or two chocolate bars tomorrow. Whoever chooses one chocolate bar today will get it at the end of

the school day, and whoever chooses two chocolate bars tomorrow will get them tomorrow from the teacher." The children went in, one by one, to the room where the experimenter sat and told her their choices.

Results

Table 3 presents the distribution of the first and second choices according to sex and type of reason presented to the child. The number of children who chose a delayed reward was similar in the two groups as a result of the procedure used to assign children to groups. Since preliminary analyses indicated no significant sex differences, the results for boys and girls were combined in the analyses to be reported. As can be seen, the objective reason had a more pronounced effect than the subjective reason. Thirty-two of the 60 subjects who were given an objective reason changed their opinion, whereas only 18 of the 64 who were given a subjective reason did so, $\chi^2 = 7.16$, $p < .01$.

This difference, however, was more pronounced for those who first chose an immediate reward. Focusing on the objective reason group only, of those who recommended immediate reward, 75% changed following an argument favoring delay. An objective argument favoring immediate gratification, on the other hand, affected only 39% of those who first chose a delayed reward, $\chi^2 = 7.54$, $p < .01$. Thus, an objective reason is more effective when it supports delay of gratification than when it supports preference for immediate gratification.

Examination of the subjective reason group shows that the effect here is more symmetrical. An argument favoring delay affected 33% of the children, and an argument in favor of immediate gratification induced a change in 25% of the children, $\chi^2 = .19$, N.S.

If we focus only on subjects who first chose an immediate reward, 79% of the children in the objective reason group and 33% of the children in the subjective reason group changed their choice, $\chi^2 = 8.4$, $p < .01$. On the other hand, if we focus on subjects who first chose a delayed reward, the percentage of children who changed their preference following the objective reason (39%) was not significantly different from the percentage of those who changed their preference following the subjective reason (25%), $\chi^2 = 1.7$.

Table 4 presents the number of children who chose an immediate reward and a delayed reward in the second session as a function of their choices in the first session and the type of reasons presented. These data, it should be recalled, are based on only 79 children who were available for retesting 3 weeks after the first session took place.

It can be seen that children who were not affected by the contradicting reasons tended to remain consistent even after 3 weeks. Thus, of the 13 children who chose an immediate reward for other and for self in the first session, 11 chose an immediate reward in the second session as well. All of the 32 children who chose a delayed reward both for other and for self in the first session, chose a delayed reward in the second session as well.

Thirty-four children changed their choices during the first session following the presentation of reasons. Of those, 21 (62%) reverted back to their original preference after 3 weeks. The proportion of subjects who retreated to their initial preference, however, varied greatly depending on the nature of the original choice. Thus, of the 17 who first recommended a delayed reward but changed to an immediate reward following the reasons manipulation, 15 (88%)

TABLE 3

NUMBER OF CHILDREN CHOOSING IMMEDIATE AND DELAYED REWARDS FOR OTHER AND FOR SELF ACCORDING TO SEX AND TYPE OF REASON PRESENTED

	Recommend Immediate						Recommend Delayed					
	Immediate for Self			Delayed for Self			Immediate for Self			Delayed for Self		
Type of Reason	Boys	Girls	All	Boys	Girls	All	Boys	Girls	All	Boys	Girls	All
Objective	3	3	6	10	8	18	8	6	14	10	12	22
Subjective	8	8	16	4	4	8	5	5	10	14	16	30
Total	11	11	22	14	12	26	13	11	24	24	28	52

TABLE 4

NUMBER OF CHILDREN CHOOSING IMMEDIATE AND DELAYED REWARDS FOR OTHER AND SELF IN SESSION 1 AND FOR SELF IN SESSION 2 ACCORDING TO TYPE OF REASON PRESENTED

	RECOMMEND IMMEDIATE 1				RECOMMEND DELAYED 1			
	Immediate for Self 1		Delayed for Self 1		Immediate for Self 1		Delayed for Self 1	
	Immediate for Self 2	Delayed for Self 2	Immediate for Self 2	Delayed for Self 2	Immediate for Self 2	Delayed for Self 2	Immediate for Self 2	Delayed for Self 2
Objective reason	4	0	3	9	2	8	0	14
Subjective reason	7	2	3	2	0	7	0	18
Total	11	2	6	11	2	15	0	32

reverted back to their original choice. On the other hand, of the 17 who first chose an immediate reward but changed to a delayed reward following the reasons manipulation, only six (35%) reverted back to their original choice. This difference yielded $\chi^2 = 10.08, p < .01$. This result is consistent with the proposition that the increase in delay choices following the presentation of contradicting reasons is structural in nature.

This increase appears relatively more stable when it follows objective reasons than when it follows subjective reasons. Of those who first chose an immediate reward but changed to a delayed reward following an objective reason, 75% persisted with their new preference after 3 weeks. The respective figure for those who received a subjective reason was only 40%. Although the number of children in each cell is too small to allow definite conclusions, the general pattern of results is consistent with the cognitive-developmental approach to delay behavior.

Discussion

Experiment 2 offers additional support for the finding of Experiment 1 that contradicting reasons are particularly effective when they coincide with the developmental tendency toward preference for delayed rewards. In addition, the finding that an objective reason had a greater effect than a subjective reason supports the argument that the effect of contradicting reasons is mediated by the creation of a cognitive disequilibrium. Such disequilibrium occurs when individuals come to doubt their choice not as a consequence of external pressure but because of reasons that relate to the very logic of the choice. Such doubts are more likely to rise following an objective or rational reason than following a subjective-emotional one.

It may, of course, be argued that the observed advantage of objective arguments results from the nature of the specific arguments chosen to represent the two categories. It should be noted, however, that the arguments employed were based on reasons produced by the subjects themselves in Experiment 1, and they appeared to us to be both typical and the most convincing.

Results of the 3-week posttest support the contention that the effect of the reasons manipulation is structural in nature. The difference between the objective reason and subjective reason groups continued to manifest itself; those who changed their opinions following an objective argument tended to adhere to their choice, whereas most of those who changed their opinion following a subjective reason reverted to their previous choice.

The distinction between a structural and a nonstructural choice is clearly reflected in the comparison between those who changed to an immediate reward and those who changed to a delayed reward. Of the former, 80% returned to their first choice, a delayed reward, whereas of those who changed to a delayed reward only 35% changed back. It should be mentioned that, of those who consistently chose an immediate reward, only two changed to a delayed reward.

General Discussion

The results of the two experiments highlight the value of the cognitive-developmental approach for understanding delay of gratification. The basic assumption of this approach is that delay behavior is a product of the development of the child's understanding, not of reinforcement or adoption of a social norm. What develops is the child's understanding that delay is called for by the very nature of reality. The psychoanalytic approach also views delay behavior as concomitant with the development of the secondary process and the reality principle. However, it stresses the motivational aspects of this development. A cognitive-developmental approach complements the psychoanalytic argument by elaborating on the cognitive aspect of this development and the mode of functioning of the reality principle. It assumes that, by creating a cognitive conflict or disequilibrium, it is possible to advance the child's development or enable functioning at a more advanced level. This study offers support for this proposal and also indicates a means for the arousal of such a conflict: the elicitation of reasons contradicting one's own choice, or the presentation of objective-rational reasons in support of developmentally advanced choices.

In our conceptualization, the effect of the contradicting reasons is assumed to be mediated by a disequilibrium that "forces" the individual to conduct a restructuring and reach an equilibrium at a higher level (Piaget & Inhelder, 1969). The elicitation of contradicting reasons was assumed to have an effect on delay behavior not by influencing this behavior in a direct and specific manner but by inducing structural changes. By this we mean a new perception of the delay dilemma in terms of which the child's

previous decision appears wrong not as it applies to the specific situation at hand but in principle. Two criteria for distinguishing a structural change from a nonstructural change, directionality and stability, were examined, and the results supported the contention that the effects of contradicting reasons were structural. First, the changes produced were in the developmental direction of increased delay. Second, only changes in the developmental direction exhibited a degree of stability, and this too only following objective-rational arguments.

Proponents of social learning theory may argue that objective-rational reasons are more effective because they give more authority and power to a social model. This is because children in our society are conditioned to value a model who presents such reasons more than one who relies on subjective-emotional arguments. A social learning theorist may also claim that the change is stronger in the direction of delay of gratification than in the opposite direction because of the strong social norm in support of delay. These ad hoc arguments deserve experimental evaluation.

A cognitive-developmental approach to delay assumes a Socratic view that emphasizes cognitive rather than motivational factors. According to this view, knowledge and understanding are sufficient to ensure a choice of the adaptive course of conduct. However, although some of the nondelay behavior of young children apparently derives from their limited understanding and would be changed with the acquisition of the necessary skills or remedied by external assistance in the cognitive construction of the situation, there are no doubt additional reasons for nondelay. Thus, a person may acknowledge the advantage of delaying reward and yet, unable to resist temptation, may still yield to the urge for immediate satisfaction (Nisan & Koriat, 1977).

It should be stressed that the conditions of the present study may have made the choices more sensitive to cognitive factors than to affective factors. Thus, the reward objects were not in view, making them less tempting (Mischel, 1974); the "immediate" reward was expected "today" (i.e., at the end of the school day) rather than at once; and the first (recommended) choice related to an anonymous child. These limitations notwithstanding, the results strongly support the claim that cognitive processes are involved in the development of delay behavior.

Our findings are in line with previous results related to the cognitive-developmental approach to delay of gratification. Thus, for example, Nisan (1974b) found that the instruction to think increased delay of gratification and that group discussion (Nisan, 1976) had the same effect. The first experiment was conducted on the assumption that the individual's immediate reaction tends to be preference for immediate gratification and that thinking, as such, inhibits this response. Perhaps the instructions "to think" encouraged the child to review reasons contradicting his spontaneous choice. As far as the effects of group discussion are concerned, the children were clearly exposed to contradicting reasons, and those may have been responsible for the increased tendency to delay gratification.

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