

The Nature of Adolescent Competencies Predicted by Preschool Delay of Gratification

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Delay of gratification, assessed in a series of experiments when the subjects were in preschool, was related to parental personality ratings obtained a decade later for 95 of these children in adolescence. Clear and consistent patterns of correlations between self-imposed delay time in preschool and later ratings were found for both sexes over this time span. Delay behavior predicted a set of cognitive and social competencies and stress tolerance consistent with experimental analyses of the process underlying effective delay in the preschool delay situation. Specifically, children who were able to wait longer at age 4 or 5 became adolescents whose parents rated them as more academically and socially competent, verbally fluent, rational, attentive, planful, and able to deal well with frustration and stress. Comparisons with related longitudinal research using other delay situations help to clarify the important features of the situations and person variables involved in different aspects of delay of gratification.

For more than two decades the situational and cognitive processes influencing effective delay of gratification have been a focus of experimental investigation, using a paradigm that assesses children's voluntary self-imposed delay for preferred but delayed outcomes in the preschool years (e.g., Mischel, 1973, 1981; Mischel & Ebbesen, 1970). Other research on delay of gratification explored a number of conceptually related determinants of self-control (e.g., Kanfer, 1980; Karoly, 1978; D. T. Miller & Karniol, 1976a, 1976b; S. M. Miller & Green, 1985; Schack & Massari, 1973; Toner & Smith, 1977). As our understanding of the underlying cognitive processes grew, we also began collecting data to study the meaning of individual differences in effective voluntary delay behavior. The clarification of these individual differences is the focus of this article. Specifically, we focus on the possible links between delay behavior in the preschool child and indices of cognitive and social competence and coping obtained a decade later in the course of a longitudinal study.

Our expectations about the nature of the personality vari-

ables that might be revealed by the preschool child's behavior in the delay paradigm were guided by an analysis of the processes underlying effective self-imposed delay of gratification emerging from the experimental investigations of the ability to defer an immediate but less desired outcome for the sake of a preferred outcome contingent on waiting (e.g., Mischel, 1973, 1981, 1983). The initial results of these studies indicated that waiting was appreciably more difficult when the reward objects were physically exposed than when they were obscured from attention (Mischel & Ebbesen, 1970; Mischel, Ebbesen, & Zeiss, 1972). Further experimentation, however, showed that situational factors, such as the physical exposure of the reward, could be overcome and even totally reversed by self-induced changes in cognition and attention during delay (Mischel, 1983; Mischel & Baker, 1975; Mischel & Moore, 1973, 1980; Moore, Mischel, & Zeiss, 1976).

For example, when, through preexperimental instructions, preschoolers think about the rewards for which they are waiting in consummatory, arousing, or "hot" ways (e.g., focusing on their taste), they can hardly wait at all. But if they focus on the nonconsummatory, informative, or "cool" qualities (e.g., their shape), they can wait for them easily and even longer than if they distract themselves from the objects altogether. Thus, thinking about the hot aspects of the rewards appears to be more arousing and frustrating, leading to earlier termination of delay. In contrast, delay is facilitated by cool thoughts focusing on the abstract (rather than consummatory) features of the rewards, as well as by distraction from the rewards altogether, while continuing to retain the goal of eventually obtaining the desired reward. To bridge the delay period effectively, it is as though children must make an internal notation of what they are waiting for, perhaps reminding themselves of it periodically and abstractly, but spending the remaining time attending to other less frustrating internal and external stimuli, either by purposeful self-distraction from the stimulus pull of the rewards or by

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transforming and abstracting them cognitively to reduce the aversiveness of waiting. Effective delay in this paradigm appears to involve the ability to shift attention flexibly and to generate delay-enhancing thoughts, such as thinking about the reward abstractly, mentally transforming the rewards, or engaging in distracting but pleasant thoughts.

Related research supports the idea that the child's metacognitive understanding of these strategies, a second aspect of cognitive competence, may also play a part in effective self-control in our delay paradigm. Namely, in the course of development a regular, predictable sequence of insights appears to emerge, indicating progressive metacognitive knowledge and awareness of the basic rules underlying effective delay—the same rules that emerge from the experimental studies (Mischel, 1981). Thus, for example, by about age 5 most children know that waiting is easier if it is possible to distract oneself from the desired outcomes (e.g., by covering rather than exposing them during the delay period; Mischel & Mischel, 1983). They also begin to recognize the subjective and behavioral consequences (e.g., excessive frustration, arousal, and task interference) of attention focused on the rewards in the delay context. By the time that most children reach the sixth grade they know that abstracting the reward objects, rather than thinking about their consummatory aspects, facilitates waiting for them. Moreover, evidence is emerging that knowledge of the delay rules also appears to predict effective delay behavior (in children aged 7 to 13); this link is found even when the role of general verbal intelligence is controlled (Rodriguez & Mischel, 1987).

In light of these findings, we hypothesized in the longitudinal study reported here that preschool delay behavior may be linked especially to those aspects of cognitive and social coping competence that involve (a) the ability to deploy attention flexibly, to think about the rewards in abstract, nonconsummatory terms, and to generate distracting thoughts while keeping in mind that one is pursuing a desired but delayed goal; and (b) metacognitive understanding of the behavioral and subjective consequences of alternative types of thoughts or objects for attention (e.g., the frustration-inducing effect of focusing on the rewards' hot qualities). In sum, we expected that any continuity in the basic competences required for preschool delay of gratification should reflect cognitive and social competences and metacognitive insight of the sort implied by the experimental analyses of the determinants of effective self-imposed delay. Such qualities might in turn be reflected in later cognitive flexibility and planfulness, effective pursuit of goals, and adaptive coping with frustration and stress. Thus, to the degree that such continuity occurs, we expected the children who delayed successfully early in life to be among the more cognitively competent and personally effective adolescents.

To examine these hypotheses, we obtained from our subjects' parents ratings of the children's cognitive and social coping during the adolescent years. We also included in our outcome measures the California Child Q-Set, or CCQ (Block & Block, 1969), because it was used by Funder, Block, and Block (1983) to investigate the personality correlates of early delay behavior in their longitudinal study using different delay-of-gratification situations. By using the CCQ we could compare the long-term personality correlates of preschool delay of gratification in our study with their results. More specifically, Funder et al. used two roughly orthogonal CCQ summary indices, *ego resiliency* and

ego undercontrol, to summarize the personality correlates of their measures of delay behavior. Fortunately, the items weighted heavily on the ego resiliency index seem to overlap substantially with the kind of cognitive, social, and stress-coping competence that we anticipated would be related to early delay of gratification in our situation. Therefore, we hypothesized that preschool delay behavior in our situation would be related to the ego resiliency index in adolescence. In contrast, given our competence interpretation of delay ability in our situation, we had no reason to expect links to the ego undercontrol index, which assesses insufficient versus excessive impulse control, hesitation, and inhibition (cf. Block & Block, 1980) rather than cognitive and social coping competence.

Method

Background

Preschool children's delay-of-gratification behavior was assessed during a period of approximately 6 years (1968 to 1974) in a series of experiments conducted at the Bing Nursery School at Stanford University (e.g., Mischel & Ebbsen, 1970; Mischel et al., 1972). In those studies a total of 653 children (316 boys and 337 girls) participated in at least one experiment dealing with some aspect of delay of gratification. About 10 years later (1981 to 1982), a follow-up questionnaire and CCQ were mailed to the 125 subjects' parents whose addresses could be located.

Subjects

The subjects of this study are the 95 children (53 girls and 42 boys) who participated in a basic self-imposed delay situation in preschool and whose parent(s) returned both the competence questionnaire and the CCQ or either one alone in the follow-up assessment a decade later. A total of 59 returned both; 8 returned the CCQ only and 28 the competence questionnaire only. This sample did not differ significantly in age from the larger pool of children when the initial delay measure was taken, nor did it differ in the actual length of the self-imposed delay period (i.e., voluntary waiting time). The mean age of the children in the present sample at the time of experimental assessment of delay of gratification was 4 years and 5 months ($M = 53.2$ months, $SD = 5.3$ months; girls: $M = 53.1$ months, $SD = 5.4$ months; boys: $M = 53.2$ months, $SD = 5.3$ months; t for sex differences = 0.06, $df = 92$, $p > .90$). Their mean delay time was 531.4 s with a standard deviation of 339 s (girls: $M = 551$ s, $SD = 341$ s; boys: $M = 506$ s, $SD = 339$ s; t for sex differences = 0.64, $df = 93$, $p > .50$). Mean age at the time of the follow-up was 15 years and 10 months ($M = 189.1$ months, $SD = 21.0$ months; girls: $M = 187.0$ months, $SD = 20.6$ months; boys: $M = 192.0$ months, $SD = 21.5$ months; t for sex differences = 1.11, $df = 85$, $p > .25$). Parent(s) of 67 of these children (32 boys, 35 girls) returned the CCQ and parent(s) of 87 of these children (36 boys, 51 girls) returned the follow-up questionnaire described later.

Assessment of Delay of Gratification Behavior

Delay of gratification was assessed in various versions of the basic self-imposed delay waiting paradigm described elsewhere in detail (Mischel, 1974; Mischel et al., 1972). Each child was escorted individually into an experimental room in the Bing Preschool, played briefly with some toys with the experimenter, and was told that he or she would play with them more later. Then the child was shown two sets of reward objects varying in pretested desirability (e.g., one small marshmallow vs. two) and a bell. After asking which of the objects in the choice (e.g., the one or the two marshmallows) the subject preferred, the experimenter intro-

duced the child to the contingency. The experimenter indicated that she or he had to go out of the room, but said,

if you wait until I come back by myself then you can have this one [pointing to the preferred object] . . . If you don't want to wait you can ring the bell and bring me back any time you want to. But if you ring the bell then you can't have this one [pointing to the preferred object], but you can have that one [pointing to the less preferred object].

After testing the child's comprehension of the contingency, the experimenter left the room, and returned when the subject rang the bell or when a predetermined criterion time was reached (usually 15 min, but sometimes 20 min depending on the particular study). The time until the child rang the bell was measured in seconds. In the present data analysis, delay times exceeding 15 min were truncated at 15 min to allow combining across studies.

There were two systematic experimentally introduced sources of variation within the basic self-imposed delay situations: (a) the types of objects available for attention during the delay (e.g., rewards, slides, nothing) and (b) the types of instructions given (e.g., think about the consummatory aspects of the rewards, think about the consummatory aspects of other objects not in the contingency, think about fun events, no instructions). There were a total of seven male experimenters and seven female experimenters, and within each formal experiment, subjects were randomly assigned to conditions and experimenters. Although some variations of the delay paradigm were also used in the original experiments (e.g., instrumental rather than passive delay; Mischel & Underwood, 1974), only the basic self-imposed delay situations are included in this study.

Calculating the Deviation Score

Because our focus in this study is on individual differences in waiting time, the variation in waiting time due to experimental manipulation of the self-imposed delay situation—the prime focus of investigation in the initial experiments—now constitutes “error.” Therefore, a deviation score was calculated indicating children's waiting time relative to the mean waiting time for each type of situation. These situations were defined by a combination of one of the three types of objects and one of the seven types of instructions (e.g., reward present—think about fun events, reward absent—think about the consummatory aspects of the reward). Thus, waiting for 300 s in a situation where the average waiting time was 200 s would result in a deviation score of 100; waiting for the same 300 s in a situation where the average waiting time was 400 s would result in a deviation score of -100.¹

Of the sample of 95 children in the study, 30 had participated in more than one self-imposed delay situation in preschool, so for these children a second delay time was also available. Because the psychological meaning of the delay situation may change considerably in the second exposure, the deviation score was calculated separately for the first delay times and the second delay times. A child received one score for the first exposure and, if the child had a second delay exposure, the two scores were averaged. Normally, averaging multiple observations, such as the first and second delay time, has the desirable effect of increasing the reliability and therefore should be done when possible. However, because the delay measure is reactive and the second measure may systematically reflect extraneous sources of variance, this combination may produce some distortion. Moreover, only about one third of the subjects had a second delay experience. Therefore, we will report two types of analyses with delay scores. One type of analysis, first delay only, uses only the first delay times for all children. In the second type, first and second delay, we use the first (and only) delay times for the 65 children who were exposed to only one basic self-imposed delay situation. For the 30 children for whom both first and second self-imposed delay times are available, we use the average of the two measures. The second type

of analysis, while somewhat redundant, allows us to include all possible basic self-imposed delay measures available for all subjects.

The Follow-Up Competence and Coping Questionnaire

To assess the children's cognitive and social competences, coping, and adaptation, a four-item questionnaire was developed and included in the mailing to the parents about 10 years after the child's initial participation in the preschool research. The questionnaire was kept brief to avoid excessive demands on parental time and included the following questions:

Academic comparison rating: We would like your impression of how your child is doing academically, compared to his/her peers, using the following scale:

1	2	3	4	5	6	7
Not as strong academically as most peers		About equal to peers academically; no better, no worse			Much stronger academically than most peers	

Social comparison rating: We would like your impression of how your child gets along with his or her peers. We would like you to rate how skilled he or she is at maintaining friendships and getting along with peers, using the following scale:

1	2	3	4	5	6	7
Not very skilled at maintaining friendships and getting along with peers		Gets along with peers just as well as they all get along with each other; no better, no worse			Very skilled at maintaining friendships and getting along with peers	

Frequency-of-problems comparison rating: All children have problems as they grow up, some little and some more difficult. What is your impression of the frequency of problems, both large and small, in your son's (daughter's) life, as compared to his (her) peers?

1	2	3	4	5	6	7
Has many more social or personal problems than peers		Average number of problems, compared to peer group; no more, no less			Relatively free from social or personal problems compared to peers	

Coping comparison rating: Whether your child's problems have been big or little, we would like your impression of how well he or she has been able to cope with them. Please rate your impression of how well he or she has coped, compared to peers, with the problems that were of some importance.

1	2	3	4	5	6	7
Does not cope well with problems, compared to peers		Copes about the same as peers; no better, no worse			Copes much better than peers	

¹ Dividing these deviation scores by standard deviations observed in each condition would constitute standardizing within each condition. However, we chose to use deviation scores because the raw unit of measurement is well established (i.e., time measured in seconds) and is common across the conditions, so there is no need to establish a common scale using standard deviations as the unit. In addition, the number of subjects in some conditions is small and the standard deviations observed in these conditions may be quite unreliable. Dividing the deviation score by unreliable standard deviations may magnify the unreliability in the deviation score, especially when skewed distributions result in a small standard deviation. Nevertheless, we also analyzed the data using the standardized (*z*) scores rather than deviation scores and found no appreciable change in any results.

California Child Q-Set

The second measure in the follow-up mailing was the CCQ (Block & Block, 1969; Block, Block, & Harrington, 1974), an age-appropriate modification of the California Q-Set (Block, 1978), which consists of 100 widely ranging personality-relevant items. Parents were sent 100 cards, each printed with 1 of the CCQ items and complete instructions. The parents sorted the cards into nine equally sized piles (11 items each, except for one pile, which had 12 items) according to the descriptiveness of each item for their child. They then returned each pile of cards in a separate envelope, marked Pile 1 through Pile 9. Each child received a score for each of the items according to the pile into which the item was placed. Of the 67 subjects whose parents returned the CCQ, 46 were described by both parents, 3 by father only, and 18 by mother only. When both father and mother returned the CCQ describing their child, a composite CCQ description was formed by averaging both descriptions. The median interrater correlation between mother and father (calculated for each of the 100 items) was .42, and the median Spearman-Brown estimated reliability of mother-father composite was .60.

CCQ Indices for Comparisons With Related Research

Recall that we used the CCQ especially to allow comparisons of the present results with those of Funder et al. (1983), which also were based on the CCQ. We could compare the CCQ correlates from the two studies on an item-by-item basis, but given that 100 items are involved, such comparisons become redundant and difficult to grasp. Fortunately, Funder et al. used two convenient summary indices that seem to capture the largest portions of the information conveyed in the CCQ descriptions. The two indices correspond to the two dimensions, labeled ego resiliency and ego control, which have been proposed as an interpretation of the first two factors of the Minnesota Multiphasic Personality Inventory (Block, 1965). These CCQ indices were not based on actual factor analysis, but on descriptions of an ideally ego resilient and ideally ego undercontrolling child expressed in terms of the 100 CCQ items (Block et al., 1974).

Specifically, Block et al. (1974) described the hypothetical ideally ego resilient child as rated high on such items as: uses and responds to reason; is vital, energetic, lively; is resourceful in initiating activities; is curious and exploring; can recoup or recover after stressful experiences; is attentive and able to concentrate; responds to humor; is self-reliant, confident; and is competent, skillful. This ideally ego resilient child was rated low on such items as: tends to become rigidly repetitive or immobilized when under stress; tends to go to pieces under stress, becomes rattled and disorganized; and is inappropriate in emotive behavior. Note that this description of the ego resilient child contains many of the cognitive and coping competencies we expected to be associated with the ability to delay in our paradigm. In contrast, the ideally ego undercontrolled child, according to Block et al., was rated high on such items as: has transient interpersonal relationships; characteristically pushes and tries to stretch limits; has rapid shifts in mood, is emotionally labile; is emotionally expressive; and has a rapid personal tempo. This type of child is rated low on such items as: tends to keep thoughts, feelings, or products to self; is inhibited and constricted; is persistent in activities; is physically cautious; likes to be by him/herself; and is reflective. We did not expect such items to characterize children who delayed effectively in our situation.

Block et al. (1974) viewed these descriptions as criterion definitions of the ego resilient and ego undercontrolling child. When we use these terms in this article we refer only to these particular indices, not to any theoretical meanings of these constructs in the literature. To calculate these indices in our data, the actual CCQ profile of each subject was correlated with each of the two criterion definitions following the method of Funder et al. (1983). These correlations indicate the degree of similarity between the personality profile of the particular child, as judged by the parents, and the profile of the ideally ego resilient child

and of the ideally ego undercontrolling child. These correlations were assigned to each child as a score indicating his or her degree of ego resiliency and ego undercontrol.

Interrater correlation between mother and father was .63 for the ego resiliency index and .77 for the ego undercontrol index. Spearman-Brown estimates of the reliability of the mother-father composite were .77 and .87 for the two indices, respectively. The correlation between the two indices was $-.25$. Internal consistencies of the two indices cannot be calculated because they are themselves correlation coefficients between a particular profile and an ideal profile. For the purpose of estimating internal consistency we also formed simple additive scales consisting of the defining items illustrated earlier. Cronbach's alpha for these additive scales was .74 for ego resiliency and .71 for ego undercontrol.

Results

We first present the long-term personality correlates from this study and then compare them with results reported by Funder et al. (1983), who used quite different operations for assessing delay of gratification in their longitudinal research.

Long-Term Correlates of Preschool Delay

Table 1 shows the correlations of the child's mean preschool delay time and his or her first delay time with the four items on which parents rated the child's competence and coping in the follow-up questionnaire.² Seconds of preschool delay time were significantly correlated with rated academic, social, and coping competence in adolescence, and the findings are similar and consistent for both sexes.

Table 2 presents the CCQ items that correlated beyond $p < .10$ with delay time in the entire sample of 67 children for whom the CCQ was available. (Items at $p < .10$ were included to allow full comparison with earlier relevant publications, e.g., Funder et al., 1983, that used that criterion.) The CCQ correlates are shown separately for girls in Table 3 and boys in Table 4. The results are similar for both sexes, consistently in the directions hypothesized, and clearly beyond chance in frequency and magnitude of significant correlations obtained.

To summarize the main results, we consider the significant correlates of first and second delay combined for both sexes at $p < .05$, as indicated in Table 2, column 1. According to the parental ratings, those who delayed longer are more verbally fluent; use and respond to reason; are attentive and able to concentrate; are planful and think ahead; are competent and skillful; are resourceful in initiating activities; are self-reliant and confident; become strongly involved in what they do; can be trusted and are dependable; are self-assertive; are curious, exploring, and eager to learn; and show concern for moral issues. These children also do not tend to go to pieces under stress or become rattled and disorganized; are less likely to appear unworthy or think of self as bad; are not shy and reserved or slow to make social contacts; are not stubborn; do not tease other children; do not revert to more immature behavior under stress; are not afraid of being deprived or concerned about getting enough; do not tend to be suspicious and distrustful; do not show mannerisms or rituals; are not unable to delay gratification or wait for satisfaction; are not jealous or envious; do not

² All p values in this article are based on two-tailed tests.

Table 1
Correlations Between Preschool Delay Time and the Parent's Competence Ratings When Subjects Were Adolescents

Adolescent rating	1st & 2nd delay	1st delay only
Girls (N = 51)		
Academic competence	.22	.24
Social competence	.34**	.28**
Frequency of problems	-.09	-.09
Coping competence	.21	.23
Boys (N = 36)		
Academic competence	.32*	.26
Social competence	.43***	.45***
Frequency of problems	.24	.19
Coping competence	.25	.23
Combined (N = 87)		
Academic competence	.27**	.24**
Social competence	.39****	.35****
Frequency of problems	.05	.03
Coping competence	.23**	.23**

Note. All *p* values are two-tailed.
* *p* < .10. ** *p* < .05. *** *p* < .01. **** *p* < .001.

become rigidly repetitive or immobilized under stress; and do not withdraw or disengage when under stress.

Alternatively, we may summarize and illustrate the CCQ results using different criteria. For example, using the criterion of significant correlations (*p* < .05) with their first preschool delay time among girls and boys separately as well as for the sexes combined, children who delayed longer were later described by their parents as follows: are verbally fluent, can express ideas well in language; use and respond to reason; are attentive and able to concentrate; are playful, think ahead; are competent, skillful; and do not tend to go to pieces under stress, become rattled and disorganized. In addition, girls who delayed longer were described as follows: are interesting and arresting; are curious, exploring, eager to learn, open to new experiences; are resourceful in initiating activities; become strongly involved in what they do; are creative in perception, thought, work, or play; have an active fantasy life; are not shy and reserved; do not tease other children; are not inhibited and constricted; do not revert to more immature behavior when under stress; do not look to adults for help and direction; and tend not to be indecisive and vacillating. Boys who delayed longer were also described as follows: can be trusted, are dependable; are self-reliant, confident, trust own judgment; do not appear to feel unworthy, think of self as "bad"; cannot acknowledge unpleasant experiences and admit to own negative feelings; are not jealous and envious of others.

Comparisons With Alternative Measures of Early Delay

Next we compare our results with those obtained by Funder et al. (1983), who used different operations, namely gift delay and resistance to temptation, to assess early delay behavior. In the gift-delay situation, the experimenter showed a gift-wrapped package to the child and exclaimed, "Look what I found over

here! It's a present for you! I wonder what it could be? I'll put it over here [to the right of the child, just out of his or her reach], and you can have it as soon as you finish this puzzle" (Funder et al., 1983, p. 1200). When the puzzle was completed, the experimenter busied herself with papers for a 90-s period. The delay score was a composite of (a) delay time (time it took for the child to reach for and take the present measured from the completion of the puzzle), (b) number of verbal behaviors directed toward the present, (c) number of physical behaviors directed toward the present, and (d) delay in present opening (whether child opened the present immediately, on the way back to nursery school, or put it in a locker to take home). Resistance to temptation is an index of the degree to which the child approached an attractive but forbidden toy during a 6-min temptation period. We compared the patterns of CCQ descriptions yielded by the gift delay and resistance to temptation measures with those obtained with the self-imposed delay measure, using the indices of ego resilience and ego undercontrol as summarized in our Method section.

Table 5 gives the correlations between the measures of delay of gratification and these indices. The upper half shows the correlations between the CCQ indices and the delay behavior observed in our standard self-imposed delay situation (Mischel et al., 1972), using first and second delay time combined as the predictors.³ The lower half shows correlations summarized from Table 1 of Funder et al. (1983). These correlations are between the CCQ indices at the oldest age they reported (11 years old, the age closest to our adolescent subjects) and the delay behaviors observed in their preschool gift delay and resistance to temptation situations combined.

Table 5 indicates that delay of gratification in our self-imposed delay waiting situation is, as expected, quite strongly associated with ego resiliency and is virtually unrelated to ego undercontrol. The correlations we obtained between our preschool delay measure and the Ego Resiliency index are significant. Also as expected, the correlations with ego undercontrol are not significant. These patterns of results are consistent for both sexes.

Interestingly, this pattern of correlates appears very different from that obtained by Funder et al. (1983). They found that "Experimentally evaluated delay of gratification is negatively associated with ego undercontrol," while "ego resiliency does not appear, in this sexes-combined analysis, to be strongly or consistently related to delay-of-gratification behavior" (p. 1202). Thus, delay of gratification on the gift delay and resistance to temptation measures tended to predict ego overcontrol but not ego resilience in the age groups closest to that of our subjects.⁴ In contrast, the correlations between our self-im-

³ The correlations using only the first exposure to self-imposed delay were similar. With ego resiliency, the correlations were .48 (girls), .45 (boys), and .47 (combined). With ego undercontrol, the correlations were .19 (girls), -.18 (boys), and -.03 (combined).

⁴ Table 1 of Funder, Block, and Block (1983) included correlations between their delay-of-gratification measure taken when the children were 4 years old and four separate CCQ descriptions made when the children were 3, 4, 7, and 11 years old. They found their delay measure was positively and significantly related to their resilience index among girls at ages 4 and 7, while among boys the correlation was always negative. The results most relevant to this study, however, are the correlations

Table 2
Q-Sort Correlates ($p < .10$) in Adolescence of Preschool Self-Imposed Delay: Sexes Combined

Q-sort item	1st & 2nd delay	1st delay only
Is verbally fluent, can express ideas well in language.	0.48****	0.47****
Uses and responds to reason.	0.47****	0.42****
Is attentive and able to concentrate.	0.46****	0.44****
Is planful, thinks ahead.	0.42****	0.40****
Is competent, skillful.	0.38***	0.41****
Is resourceful in initiating activities.	0.35***	0.32***
Is self-reliant, confident, trusts own judgment.	0.32****	0.33***
Becomes strongly involved in what s/he does.	0.29**	0.34***
Can be trusted, is dependable.	0.29**	0.23*
Is self-assertive.	0.27**	0.26**
Is curious, exploring, eager to learn, open to new experiences.	0.25**	0.27**
Shows concern for moral issues, e.g., reciprocity, fairness, and the welfare of others.	0.25**	0.18
Is persistent in activities; does not give up easily.	0.24*	0.25**
Is an interesting, arresting child.	0.24*	0.23*
Is admired and sought out by other children.	0.23*	0.17
Has high standards of performance for self.	0.22*	0.18
Is considerate and thoughtful of other children.	0.21*	0.13
Is helpful and cooperative.	0.21*	0.18
Tends to go to pieces under stress, becomes rattled and disorganized.	-0.47****	-0.43****
Appears to feel unworthy, thinks of self as "bad."	-0.43****	-0.38***
Is shy and reserved, makes social contacts slowly.	-0.39***	-0.42****
Is stubborn.	-0.36***	-0.25**
Teases other children.	-0.32***	-0.29**
Reverts to more immature behavior when under stress.	-0.31**	-0.34****
Is afraid of being deprived, is concerned about getting enough.	-0.27**	-0.18
Tends to be suspicious and distrustful of others.	-0.27**	-0.22*
Shows specific mannerisms or behavioral rituals.	-0.27**	-0.23*
Is unable to delay gratification, cannot wait for satisfactions. (When placed low, implies needless or excessive delay.)	-0.26**	-0.20
Is jealous and envious of others.	-0.26**	-0.23*
Tends to become rigidly repetitive or immobilized when under stress.	-0.26**	-0.23*
Tends to withdraw and disengage when under stress.	-0.25**	-0.17
Overreacts to minor frustrations; is easily irritated and/or angered.	-0.24*	-0.19
Tends to be indecisive and vacillating.	-0.24*	-0.29**
Tends to be sulky or whiny.	-0.24*	-0.24*
Has unusual thought processes; thinks and perceives in uncommon ways.	-0.23*	-0.14
Is inappropriate in emotive behavior.	-0.23*	-0.20
Attempts to transfer blame to others.	-0.23*	-0.19
Is restless and fidgety.	-0.23*	-0.16
Has rapid shifts in mood, is emotionally labile.	-0.21*	-0.20
Is inhibited and constricted.	-0.20*	-0.24*
Has a readiness to feel guilty, puts blame on self (whether verbalized or not).	-0.19	-0.21*

Note. $N = 67$; all p values are two-tailed.

* $p < .10$. ** $p < .05$. *** $p < .01$. **** $p < .001$.

posed delay and the Ego Resiliency index are significantly greater than the corresponding correlations obtained by Funder et al. with their gift delay and resistance to temptation situations to assess delay among girls ($z = 2.97, p < .01$), and boys ($z = 3.74, p < .001$), as well as in the sex-combined analysis ($z = 4.94, p < .0001$). In sum, the personological meaning of self-imposed delay in our delay paradigm is quite different and contrasts with the pattern of correlates obtained by Funder et al. with their delay measures.

when the subjects were 11 years old, the age closest to that of our sample. At age 11, Funder et al. found that the correlation with ego resiliency was negative for both sexes. In contrast, as Table 5 shows, the correlation we obtained using our self-imposed delay situation was strongly positive for both sexes.

Discussion

The results of this study help to clarify the meaning of effective self-imposed delay of gratification as an early indicator of an apparently long-term personal quality. The seconds of time preschool children were willing to delay for a preferred outcome predicted their cognitive and social competence and coping as adolescents, as rated by their parents a decade later. The magnitude of these relations is impressive given that they are based on a specific preschool behavior, that they span a lengthy period of early development, that they apply to both sexes, and that they occur even for a single early act (i.e., seconds of first delay time). Because the temporal coherences and continuity indicated by these data are based on links with the child's own behavior assessed objectively and independent of the parents' perception of their children, they cannot be interpreted as reflecting only stability in the rater's implicit personality theories.

Table 3
Q-Sort Correlates (p < .10) in Adolescence of Preschool Self-Imposed Delay: Girls

Q-sort item	1st & 2nd delay	1st dclay only
Is verbally fluent, can express ideas well in language.	0.53****	0.54****
Is an interesting, arresting child.	0.46***	0.43***
Is attentive and able to concentrate.	0.46***	0.43**
Uses and responds to reason.	0.44***	0.37**
Is planful, thinks ahead.	0.43***	0.38**
Is curious, exploring, eager to learn, open to new experiences.	0.39**	0.41**
Shows concern for moral issues, e.g., reciprocity, fairness, and the welfare of others.	0.39**	0.32*
Is a talkative child.	0.37**	0.33*
Is competent, skillful.	0.35**	0.46***
Is resourceful in initiating activities.	0.34**	0.34**
Is self-assertive.	0.32*	0.25
Becomes strongly involved in what s/he does.	0.32*	0.41**
Is admired and sought out by other children.	0.31*	0.26
Tries to manipulate others by ingratiation.	0.31*	0.19
Tends to arouse liking and acceptance in adults.	0.29*	0.13
Is creative in perception, thought, work, or play.	0.29*	0.41**
Has an active fantasy life.	0.28	0.35**
Appears to have high intellectual capacity.	0.25	0.30*
Is shy and reserved, makes social contacts slowly.	-0.55****	-0.61****
Tends to go to pieces under stress, becomes rattled and disorganized.	-0.53***	-0.48***
Tends to be sulky or whiny.	-0.45***	-0.41**
Teases other children.	-0.43***	-0.39**
Appears to feel unworthy, thinks of self as "bad."	-0.40**	-0.30*
Overreacts to minor frustrations; is easily irritated and/or angered.	-0.39**	-0.28*
Is inhibited and constricted.	-0.39**	-0.45***
Reverts to more immature behavior when under stress.	-0.37**	-0.41**
Tends to keep thoughts, feelings, or products to self.	-0.36**	-0.32*
Is inappropriate in emotive behavior.	-0.36**	-0.26
Tends to be judgemental of the behavior of others.	-0.33*	-0.20
Tends to be suspicious and distrustful of others.	-0.33*	-0.26
Is stubborn.	-0.33*	-0.19
Looks to adults for help and direction.	-0.30*	-0.40**
Tends to be indecisive and vacillating.	-0.29*	-0.38**

Note. N = 35; all p values are two-tailed.
 * p < .10. ** p < .05. *** p < .01. **** p < .001.

The attributes suggested by the adolescent correlates of self-imposed delay as a person variable are highly congruent with the earlier analyses provided by the experimental research on self-imposed delay as a process. Recall that the process analysis of the essential ingredients for effective delay in the waiting paradigm focused on the ability to divert and control attention flexibly, mentally transform the reward, and purposefully distract oneself from the excessive arousal and frustrativeness of the situation while maintaining the necessary goal-directed perseverance (e.g., Mischel, 1973, 1981, 1983). The correlations found in the present longitudinal study depict the child who delayed in preschool as an adolescent who is seen by parents as more academically and socially competent than peers and as more able to cope effectively. On the CCQs these children are seen as verbally fluent and able to express ideas, using and responding to reason, attentive and able to concentrate, planful and thinking ahead, and competent and skillful. They also are seen as able to cope and deal with stress more maturely, and seem more self-assured.

These ratings are consistent with the competencies expected from our experimental analysis of the meaning and determinants of effective self-imposed delay. They also suggest some

possible overlap between the sorts of cognitive competencies related to delay ability and those related to performance on intelligence tests. In further research it should be interesting to identify more objectively the relations between intelligence and the ability to delay gratification, and to specify the similarities and differences between the competencies they involve.

When taken together, the experimental analyses and the present correlational data yield a more complete view both of the psychological requirements for effective self-imposed delay and of the qualities of the individuals who met those requirements early in life. These results also illustrate the usefulness of jointly investigating the contextual and cognitive determinants of self-regulation. The results of experimental studies of the delay process thus can complement and facilitate investigations of individual differences. Obviously the investigator's purposes must guide the selection of which facet—the process or the person qualities—he or she selects as the focus at any juncture, but a comprehensive account of self-regulation ultimately requires attention to both.

Long-term coherences of the sort found here imply that the early self-imposed delay situation taps enduring personal qualities. Interestingly, the links found between preschool delay time

Table 4
Q-Sort Correlates ($p < .10$) in Adolescence of Preschool Self-Imposed Delay: Boys

Q-sort item	1st & 2nd delay	1st delay only
Uses and responds to reason.	0.49***	0.47***
Is attentive and able to concentrate.	0.47***	0.46***
Can be trusted, is dependable.	0.44**	0.38**
Is verbally fluent, can express ideas well in language.	0.43**	0.41**
Is planful, thinks ahead.	0.42**	0.43**
Is competent, skillful.	0.39**	0.36**
Has high standards of performance for self.	0.38**	0.31*
Is self-reliant, confident, trusts own judgment.	0.36**	0.39**
Is resourceful in initiating activities.	0.35*	0.30*
Is helpful and cooperative.	0.33*	0.31*
Is reflective; thinks and deliberates before speaking or acting.	0.30*	0.23
Is persistent in activities; does not give up easily.	0.30*	0.28
Appears to feel unworthy, thinks of self as "bad."	-0.47***	-0.47***
Tends to go to pieces under stress, becomes rattled and disorganized.	-0.42**	-0.37**
Is stubborn.	-0.39**	-0.32*
Is restless and fidgety.	-0.38**	-0.33*
Can acknowledge unpleasant experiences and admit to own negative feelings.	-0.35*	-0.39**
Is afraid of being deprived, is concerned about getting enough.	-0.34*	-0.27
Shows specific mannerisms or behavioral rituals.	-0.33*	-0.31*
Can recoup or recover after stressful experiences.	-0.32*	-0.29
Is jealous and envious of others.	-0.32*	-0.36**
Is unable to delay gratification, cannot wait for satisfactions. (When placed low, implies needless or excessive delay.)	-0.30*	-0.29
Has bodily symptoms as a function of tension and conflict.	-0.29	-0.32*

Note. $N = 32$; all p values are two-tailed.

* $p < .10$. ** $p < .05$. *** $p < .01$.

and coping and competence in adolescence seem considerably stronger and clearer (although of the same type) than those obtained from concurrent measures in the preschool years (Mischel, 1983, Table 1). Perhaps the ability to delay gratification effectively for the sake of larger goals may itself play an increasingly powerful and pervasive role in cognitive and social coping as the child matures, and therefore becomes increasingly linked with indicators of adaptive coping. For example, flexible attention deployment and rational planful behavior, as well as meta-cognitive insightfulness, may be more significant for the life of the adolescent than they are for the preschool child. It is also noteworthy that the adolescent competency ratings associated with preschool delay time yield similar patterns for both sexes.

Table 5
Correlations Between Preschool Delay Measures and Later CCQ Indices

Delay measure	Sex	Ego-resiliency	Ego-undercontrol
Self-imposed delay ^a	Girls ($N = 35$)	.56**	.11
	Boys ($N = 32$)	.49**	-.22
	All Ss ($N = 67$)	.53***	-.09
Gift delay and resistance to temptation ^b	Girls ($N = 57$)	-.03	-.11
	Boys ($N = 59$)	-.31*	-.43**
	All Ss ($N = 116$)	-.18	-.32**

Note. All p values are two-tailed.

^a As assessed in the present study. ^b Funder, Block, & Block (1983).

* $p < .05$. ** $p < .01$. *** $p < .001$.

Both these results and those of Funder et al. (1983) attest to the personological significance of delay of gratification. However, the meaning of delay behavior, as seen in the patterns of personality correlates obtained, seems quite different, depending on whether delay of gratification was measured in our self-imposed delay situation or in the situations involving gift delay and resistance to temptation used by Funder et al. Specifically, we found that, as predicted, our measure of delay time was strongly associated with the ego resiliency index, while it was virtually unrelated to the ego undercontrol index, as described earlier. In the study by Funder et al., a very different pattern occurred; their delay of gratification (gift delay and resistance to temptation) was related clearly and negatively to the ego undercontrol index but not to the ego resiliency index when their subjects were closest in age to ours.

In our view, this difference in the patterns of correlates reflects differences between the two studies in the psychological meaning of the two preschool delay-of-gratification situations. In the waiting situations used in our study, the preferred outcome was contingent on delay: Children understood they could obtain the preferred reward if and only if they waited. They were strongly motivated to delay, and their delay time reflected their ability to wait in this type of frustrating, long, and difficult waiting situation. Indeed, earlier analyses of self-regulation have contrasted this type of delay ability or competence with the motivational preference for delayed larger versus immediate, smaller gratification (Mischel, 1966, 1973). The experimental analyses of the delay process have repeatedly indicated that a major determinant of delay competence is the child's ability to deploy attention effectively and engage in delay-enhancing

thoughts and distractions to reduce the aversiveness and arousal during delay while persisting in the task. Likewise, metacognitive knowledge of the processes that facilitate or impede the ability to delay for a preferred outcome also appears to be a component of delay competence (Rodríguez & Mischel, 1987). These qualities seem to be key ingredients of the cognitive and social competence and self-regulatory skills proposed earlier as basic person variables in a cognitive social learning approach to personality (Mischel, 1973). The CCQ description of the ideally ego resilient child thus contains features of the cognitive flexibility, attention deployment skills, and metacognitive competence that seem so important for delay in the self-imposed delay situation. On the other hand, the index of ego overcontrol (vs. undercontrol) has little relevance to delay ability in that situation and instead deals with such qualities as excessive or insufficient inhibition and hesitation.

The waiting situations used in the Funder et al. (1983) study are structured quite differently and therefore understandably yield different correlates. For example, children in the gift delay situation have already fulfilled the contingency (completed the puzzle) so that the rewards are already theirs to take; the delay measure simply assesses the child's hesitation before taking the gift. It is not surprising that such hesitation should be related to ratings of excessive control (ego overcontrol) rather than to indices of cognitive and social competence or ego resilience. Thus, although the three delay situations (self-imposed, gift delay, and resistance to temptation) have all been called delay of gratification, their common label should not mask their major differences.

It is unlikely that the differences in the patterns obtained in the two studies are due to differences in the two samples of subjects because the samples appear quite similar in many ways. The children appear similar at least in age at delay assessment and in geographical location, as well as in the cohort to which they belong. Both samples were tested in the late 1960s to the early 1970s and were located in the San Francisco Bay area. There appears to be considerable commonality even in the socioeconomic status of the subjects' families (i.e., mostly white, intelligent, well-educated, well employed, and living in a university community; see Harrington, Block, & Block, 1983, p. 612). On the other hand, the two studies differ in the age of the subjects when the CCQ descriptions were obtained from parents in the follow up. Our subjects were on the average 15 years old, whereas the subjects of the Funder et al. study were 11 years old in the last administration of CCQ reported and used in our comparisons. Moreover, the CCQ correlates they report are based on teacher Q-sorts, whereas ours were obtained from parents. However, it is difficult to see how these differences could explain the difference in the patterns yielded by the two sets of results.

Taken as a whole, the findings on delay of gratification as a process and as a person variable provide intriguing evidence both for the discriminativeness of delay behavior (across even seemingly similar contexts) and for its long-term implications. We see cross-context discriminativeness in the fact that the preschool child who delays effectively in some situations may not do so in other, even slightly different situations. For example, the correlation between preschool delay time with experimenter present versus experimenter absent during the self-imposed delay in otherwise similar situations was .22 (Mischel, 1983; Mis-

chel & Peake, 1982). The correlation between the first and second delay time (in deviation score) in the original sample of this longitudinal study is also quite modest ($r = .22$, $n = 153$).⁵ The correlations between the two delay measures used by Funder et al. (1983) were similarly modest ($r = .20$). However, as this study indicates, we also find significant enduring links between a single observation of the preschooler's delay time while waiting and indices of his or her cognitive and social competence, coping skills, and school performance years later. Under appropriate conditions, even single acts, without benefit of aggregation, sometimes can predict important long-term outcomes. In our view, the outcomes those acts can predict, however, depend crucially on the specific psychological conditions in which they are assessed and which importantly affect the meaning of the sampled behavior. Different measures of delay of gratification can predict not only different but contrasting personal qualities depending on the meaning of the particular situation.

The impressive correlates of self-imposed delay obtained with the present paradigm for both sexes and spanning many years suggests that such delay assesses a stable and seemingly basic cognitive and social competence that may have extensive implications for the individual's cognitive and social coping and adaptation. The specification of the parameters and limits of this competence, already visible in the preschool child, has long been an exciting challenge in personality psychology and now seems increasingly possible.

⁵ Contributing to the low correlations between the first and second measures of delay time may be the extremely reactive nature of the delay measure itself, because the first delay experience is likely to influence the second experience. For example, in the self-imposed delay situation, children are initially unaware of the time they would have to wait for the reward. But in their second exposure, those who waited the full 15 min initially may now expect that the required delay will again be as long as 15 min and decide that the larger reward is not worth waiting that long. In contrast, those who did not wait in the first exposure may be more motivated to obtain the reward when given the second opportunity. Therefore, the first and second exposure to the delay situation may not be a simple, repeated measure. In the language of reliability theory, the errors may not be uncorrelated, but rather represent a factor that systematically lowers the correlation otherwise expected from the common source of variance. Consequently it is easier to understand the relatively high correlations found between first delay time and later personality ratings despite the low correlations between repeated delay measures.

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