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**"I'LL DO IT TOMORROW." A RADICAL BEHAVIORAL  
ANALYSIS OF PROCRASTINATION**

by

**Cassandra Ann Braam**

**A Dissertation  
Submitted to the  
Faculty of The Graduate College  
in partial fulfillment of the  
requirements for the  
Degree of Doctor of Philosophy  
Department of Psychology**

**Western Michigan University  
Kalamazoo, Michigan  
April 1994**

## **"I'LL DO IT TOMORROW." A RADICAL BEHAVIORAL ANALYSIS OF PROCRASTINATION**

**Cassandra Ann Braam, Ph.D.**

**Western Michigan University, 1994**

This study examined the problem of procrastination or the failure to complete tasks. Five similar rules were presented to five, four-year-old children, using a multielement design. The rules described contingencies varying in the specification of delays in the delivery of consequences and deadlines. In addition, a general statement of disapproval of procrastination was presented one time, in addition to a rule specifying a delayed consequence with no deadline, to determine its effect on an established pattern of procrastination. The results showed (a) rules specifying delayed consequences (indirect-acting contingencies) with no deadlines did not reliably control behavior, (b) rules specifying immediate consequences (direct-acting contingencies) with deadlines exerted reliable control, (c) rules specifying delayed consequence (indirect-acting contingency) with a deadline exerted less reliable control, and finally (d) a statement condemning procrastination added to a rule specifying an immediate consequence with a deadline briefly altered an established pattern of procrastination for four out of five children. The results suggest that the specification of a deadline in rules decreases procrastination. However, for many young children this control by rules specifying deadlines is only reliable when rules also specify immediate consequences (direct-acting contingencies).

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**Western Michigan University, 1994**

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Cassandra Ann Braam



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## CHAPTER I

### INTRODUCTION

#### The Problem of Procrastination

Webster (1964) defined *procrastination* as the act or habit of putting off doing a task until a future time. Until recently, as Green (1982) pointed out, "procrastination has received minimal theoretical analysis" and little research has been conducted on it (Ottens, 1982; Milgram, 1987). What has been done is based mainly on traditional theories of personality. Ellis and Knauss (1977) were among the first to formally identify procrastination as a problem. They defined procrastination as a failure to initiate or complete a task or activity by a predetermined time (i.e., by a deadline) to the point of experiencing subjective discomfort. Silver (1974) further defined procrastination as a "response" and attempted to analyze the conditions under which it occurs. He theorized that procrastination occurs because (a) a task is too aversive, or (b) there is insufficient reinforcement for task initiation or completion, or (c) there are impediments to performance based on irrational beliefs.

Based mainly on the above conceptualizations of procrastination, research has focused on three areas: (1) everyday procrastination or procrastination in daily living (Malott, 1986; Milgram, 1988); (2) academic procrastination; and (3) decisional procrastination (Effert & Ferrari, 1989), also referred to as neurotic indecision (Milgram, Sroloff, & Rosenbaum, 1988) or compulsive procrastination (Ferrari, 1991). Familiar examples of everyday tasks that often involve procrastination are paying bills, dieting, exercising, writing letters, returning phone calls, and cleaning the

garage (Malott, 1986; Milgram, 1988; Milgram, Sroloff, & Rosenbaum, 1988). Academic procrastination for college students has been found to be a problem when studying for examinations (Ely & Hampton, 1973; Hill, Hill, Chabot, & Barrall, 1978; Lay, 1991; McCown & Johnson, 1991; Rosati, 1975; Shoham, Avner, & Neeman, 1989; Sommer, 1990; Zeisat, Rosenthal, & White, 1978), when writing scholarly papers (Boice, 1989), when writing term papers (Beswick, Rothblum, & Mann, 1988; Rennie & Brewer, 1987), when completing theses and dissertations (Dillon & Malott, 1981; Gant, Dillon, & Malott, 1980; Garcia, Malott, & Brethower, 1988; Muszynski & Akamatsu, 1991), when scheduling exams in a Personalized System of Instruction (PSI) course (Roberts, Fulton, & Semb, 1988; Rothblum, Solomon, & Murakami, 1986; Wesp, 1986), and when scheduling tests and evaluations in instructor-paced courses (Lay, Knish, & Zanatta, 1992; Milgram, Dangour, & Raviv, 1992). Decisional procrastination on major life tasks (e.g. getting married, changing jobs, starting a family) has been found to be a problem and frequently treated in therapy (Beery, 1975; Burka & Yuen, 1983; Effert & Ferrari, 1989; Ellis & Knauss, 1977; Ishiyama, 1990; Rorer, 1983; Schuman, 1981).

Obviously there is a significant problem with procrastination or the failure of people to act in ways that promote health or advance professional and educational careers. There is also little consensus on the most effective methods to decrease the problem. One of the reasons for this lack of consensus is that most of the definitions and research on procrastination have been based on traditional theories of personality. Exceptions to this have been the work of researchers studying paradoxical interventions based on social learning theory and some researchers studying personalized systems of instructions (PSI). A radical behavioral conceptualization of "procrastination," however, is conspicuously absent from the literature. The analyses and research by

Malott and his colleagues (Dillon & Malott, 1981; Gant, Dillon, & Malott, 1980; Garcia, Malott, & Brethower, 1988; Braam & Malott, 1990) are the only published attempts to remedy this deficit. The purpose of the present paper is: (a) to present a critical review of representative theories and research on procrastination, from radical behavioral perspective and (b) to present the results of a radical behavioral study examining the problem of "procrastination" in young children.

### Personality Theory

Traditional personality theorists and psychotherapists conceptualize procrastination as a generalized personality trait (Milgram, Sroloff, & Rosenbaum, 1988), personality disorder (Ferrari, 1991), response pattern (Effert & Ferrari, 1989), or maladaptive coping mechanism (Janis & Mann, 1977). Their research has been conducted almost exclusively with college students, usually enrolled in introductory psychology courses and earning credit for participation in the studies. They have attempted to: (a) identify or correlate other traits characteristic of procrastinators (i.e., internal factors), (b) identify external factors or causes of procrastination, and (c) develop assessments or inventories to identify procrastinators.

### Academic Procrastination

Rothblum, Solomon, and Murakami (1986) defined academic procrastination as the "self-reported tendency to put off academic tasks and to experience problematic levels of anxiety." Using college students (n=126) they examined the relation between academic procrastination and academically related trait measures. Forty percent of the students reported a high level of procrastination. The subjective measure of procrastination (Procrastination Assessment Scales-Student or PASS developed by



Solomon and Rothblum, 1984) was found to be positively correlated ( $r=.15$ ) with an objective measure of procrastination (delay in taking self-paced quizzes). In addition, the subjective measure was negatively correlated ( $r=-.22$ ) with another objective measure (students' grade point averages for the semester). Although the correlations were very low, they concluded that students who report procrastination actually do so and attain lower grades than nonprocrastinators. From a behavioral perspective this conclusion would have been more valid if a relationship between the two objective measures of delayed quizzes and grade point had been shown. That is, if they had demonstrated that the students who got lower grades were actually the ones who delayed taking quizzes. It is possible, as suggested by Sommer (1990, reviewed below) that the students who delayed taking quizzes "aced" the course late in the semester.

In an earlier study Solomon and Rothblum (1984) studied the frequency of and reasons for procrastination on academic tasks. The subjects ( $n=342$ ) were students in two sections of an introductory psychology course (one instructor-paced and the other self-paced). Subjective, self-report measures consisted of the PASS and measures of self-esteem, anxiety, punctuality and organized study habits, assertion, depression, and irrational cognitions. Objective measures included the number of quizzes taken during the last five weeks of the semester and when students participated in an experiment for extra credit (PSI section only), and the final course grades (all students). They found that students reported procrastination when writing a term paper (46%), studying for exams (27%), and reading (30.1%). They also found low, but significant, correlations between the number of quizzes taken and reported procrastination when writing a term paper, studying for exams, and doing weekly readings ( $r=.24$ ,  $r=.19$ ,  $r=.28$ , respectively). An analysis of variance showed a significant effect for the date of

participation in the experimental session and reported procrastination ( $F(2,99)=3.41$ ,  $p<.05$ ).

Solomon and Rothblum concluded that students who reported frequent procrastination actually did so. However, because of the grouping of data it is not clear that the students who reported procrastination were actually the ones who procrastinated. They also stated that the number of completed quizzes was probably influenced by repeated prompts from the course instructors and, thus, the results were "confounded." Presumably these prompts inflated the number of quizzes taken and resulted in the low correlations with self-reported procrastination. This confounding may be the interesting finding from this study. That is, prompts from instructors were shown to decrease procrastination. However, again due to the grouping of data it is not clear if the students who were prompted actually completed more quizzes.

Solomon and Rothblum also did not find a correlation between course grades and reported procrastination. This finding is in contrast to the results of other studies (Semb, Glick, & Spencer, 1979; Rothblum, Solomon, and Murakami, 1986). Interestingly, they did not analyze the relation between course grades and the other objective measures of procrastination (i.e., delay in taking quizzes), so it is hard to determine the validity of their conclusions. For the other subjective measures they found low, but significant correlations between reported procrastination and depression, anxiety, self-esteem, and punctuality and organized study ( $r=.23$ ,  $r=.13$ ,  $r=.23$ ,  $r=.24$ , respectively). Astutely, Solomon and Rothblum pointed out that "conclusions about causality" cannot be made from this data.

A factor analysis of the reasons for procrastination showed that fear of failure accounted for the most variance (49.1%) and task aversiveness and laziness accounted for most of the rest of the variance (18%). A frequency analysis of items endorsed by

the subjects led them to conclude that there are two types of procrastinators. One small group reports that procrastination is the result of a fear of failure, low self-esteem, and high anxiety. And another, larger group reports that procrastination is the result of task aversiveness. Based on these analyses they recommended intervention strategies focused on decreasing evaluation anxiety and perfectionism, and increasing self-confidence for procrastinators endorsing fear of failure as a reason for procrastination. For the other group they recommended contingency management procedures.

The inclusion of so many statistical analyses makes both the study by Rothblum, Solomon, and Murakami and the study by Solomon and Rothblum somewhat overwhelming to read and analyze. It is also difficult to assess what the studies contributed to the literature on procrastination, because of the numerous, but low correlations. The researchers may have been overly ambitious in the number of variables studied due to their being among the first researchers studying procrastination using a correlational methodology. Their inclusion of objective measures for the dependent variable and treatment recommendations in both studies makes them among the few correlational researchers to do so.

Milgram, Dangour, and Raviv (1992) studied female college students ( $n=112$ ). They found subjective, self-reported test anxiety ( $r=.26$ ) and low self-regulation or self-control ( $r=.30$ ) to be moderately correlated to another self-reported measure of academic procrastination (latency in starting take-home measures). They also found that subjects reported more procrastination with self-imposed than with experimenter-imposed deadlines. This study might be considered interesting because the researchers attempted to include objective measures of the dependent and independent (e.g., a deadline) variables. However, the data were not checked for reliability and as the researchers pointed out, "the validity of the behavioral measures depends on the veracity

of the students." Thus, beyond showing correlations between self-reported measures of questionable reliability, this study contributes little to the literature on procrastination.

Ferrari (1992) studied college students ( $n=307$ ) and found that procrastination and perfectionism were correlated at a low, but significant level ( $r=.34$ ). In addition, based on separate factor analyses for procrastinators and nonprocrastinators he concluded that perfectionism "occurs because of different motives" for procrastinators and nonprocrastinators. That is, for procrastinators "perfectionism is aimed at impressing others by one's efforts" and occurs because procrastinators are motivated by social anxiety over what others think of their performance. For nonprocrastinators he concluded that perfectionism is a "strategy to demonstrate one's skills" and to "produce a flawless project." Thus, contrary to what many have suggested, Ferrari concluded that perfectionism is correlated with procrastination, but not the cause of it per se.

Ferrari (1991) studied female college students ( $n=210$ ) to determine personality characteristics associated with both procrastinators and nonprocrastinators. In comparison to nonprocrastinators he found that procrastinators self-reported lower self-esteem ( $t_{96} = -2.0, p < .05$ ), greater public self-consciousness ( $t=2.3, p < .05$ ), greater social anxiety ( $t=2.0, p < .05$ ), and more self-handicapping tendencies ( $t=5.1, p < .001$ ). From these analyses Ferrari concluded that women procrastinators are anxious, avoid public evaluation, have low self-confidence, and have high self-doubt. This study again offers little to the literature on procrastination, except to perpetuate the trait concept and to offer the same explanation of possible causal factors as many previous studies have done.

McCown and Johnson (1991) studied "chronic university student

procrastinators" (n=162) in an undergraduate psychology course to determine the relation between different personality variables. They found a total of 36 different correlations between neuroticism, extraversion, and psychoticism and various "study-related attitudes, affects and behaviors." In general, such a study is reminiscent of earlier studies such as Solomon and Rothblum (1984) which were overly ambitious in the number of variables studied and correlations demonstrated. However, unlike the earlier study this study offered little analysis and recommendations for treatment. Therefore, it offers little to the current literature on procrastination.

Flett, Blankstein, Hewitt, & Koledin (1992) studied college students (n=131) to study the "individual differences in perfectionism and procrastinatory behavior." Using two scales assessing perfectionism and two scales assessing procrastination they found that socially prescribed perfectionism (i.e., the perception that other people expect oneself to be perfect) was significantly associated with most procrastination measures. They also found socially prescribed perfectionism was associated with a greater fear of failure, but not with task aversiveness. This study supports the research by Solomon and Rothblum and their conclusion that fear of failure is associated with procrastination. However, this study also contradicts their contention that procrastination is the result of task aversiveness.

Adding confusion to the correlational literature on procrastination, Schouwenburg (1992) surveyed university students (n=278) and found their self-reported reasons for procrastinating were numerous. He further found that, contrary to conventional psychological wisdom, their reported "fear of failure" was not correlated with their reported procrastination. Unfortunately this review is based solely on the abstract of this study and the correlational data were not provided.

Anderson (1987) in two case studies from a psychoanalytical perspective

proposed that feelings of envy and jealousy caused procrastination. From a similar perspective, Widseth (1987) suggested that procrastination serves as a protection from the "unbearable eruption of archaic grandiose fantasies and subsequent feelings of worthlessness" experienced by college students. That is, procrastination is seen as a protective coping mechanism, when the development of normal narcissism leads to pathological grandiosity (i.e., an exaggerated sense of self-importance). Thus, by delaying tasks they also delay evaluation of their accomplishments and the subsequent feelings of worthlessness that may follow a less than perfect performance or evaluation of themselves.

#### Everyday Procrastination

Milgram, Sroloff, and Rosenbaum (1988) investigated "procrastination in routine life tasks" in another study with college students ( $n=314$ ). The students filled out self-report measures asking them to "imagine" or rate when they would perform various routine tasks. They also rated their promptness in scheduling and schedule adherence. They found these self-report measures of procrastination to be highly correlated ( $r=.67$ ). They concluded that people who promptly schedule tasks and adhere to their schedule, do so immediately or early in a time frame. They also found perceived unpleasantness or imposition of tasks and perceived lack of skills to be related to procrastination. However, they found no significant correlation between fear of failure and procrastination, which contradicts the results of other studies.

As with most such studies the results are based on unverified self-reports and, therefore, are of questionable reliability. However, the analyses presented by Milgram, et. al., are interesting for a radical behavioral analysis of procrastination. With the exceptions of Malott (1986) and Wesp (1986), they are among the few who have

attempted to analyze procrastination. For example, they discuss the subjective aspects of a definition of procrastination. They suggest that a person determines if a task is "put off" or completed "late" based on a personal time frame. This definition of "lateness" will vary between persons and a definition of procrastination based on these personal time frames will thus vary. They also discussed and studied variables (scheduling or planning when to do a task and adherence to a schedule) amenable to a behavioral definition and objective measure. Their choice of variables is interesting because they assume that procrastination is a generalized personality trait. Therefore, they define the task of those attempting to decrease procrastination as "to identify and treat various underlying personality characteristics fear of failure, low frustration tolerance..." (p.198). However, the variables they studied are more amenable to behavioral intervention. Indeed, in discussing "nonprocrastinators" they present an analysis that even suggests the importance of a behavioral approach "nonprocrastinators... employ behavioral strategies." They also inadvertently pay tribute and validate the importance of the work of behavior analysis when they explain their use of unverified self-reports. They state, "Observations of procrastination in tasks of everyday life are objective, but are not feasible because of the large number of tasks on which observations are required and the enormous investment of time and effort involved."

In a follow-up Milgram (1988) studied 77 university students. He found that contrary to previous results task aversiveness was not found to be an important variable. He also found self-reports of planning-scheduling and performing on schedule to be highly correlated ( $r=.83$ ). He concluded "that people who plan things in advance are happier and better adjusted than those who do not but are unable to conclude which is cause and which effect." Although probably not intentional, this is a

strong argument for behavioral interventions (e.g., time management). Also, they state that "efficiency in planning and scheduling...and following through...appear to be distinguishable behaviors with different antecedent and consequences."

### Decisional Procrastination

Effert and Ferrari (1989) purported to be studying "decisional procrastination". The subjects were college students (n=111) earning extra credit in a psychology class. The students completed psychometric scales measuring indecision, cognitive failures (i.e., forgetting), self-esteem, and task activity. They described decisional procrastination as "the purposive delay in making decisions within some specific time frame," presumably of major decisions as they state earlier. They also refer to decisional as a cognitive form of procrastination. In contrast, they describe everyday procrastination as a behavioral form, presumably involving minor decisions. This distinction is rather circular since presumably for these researchers all behavior is controlled by some hypothetical cognitive or personality factors. Indeed, they state that both everyday and decisional procrastination are related to low self-esteem (i.e., an internal factor).

### Summary

In summary, research on procrastination based on personality theories suggests the following internal (personality traits) and external variables are correlated with and theorized as causal factors in procrastination: low frustration tolerance, perfectionism, fear of failure and criticism from others, anxiety (social and test), poor self-regulation (e.g. time estimation), poor self-control (e.g., poor priorities and values, lack of goal-setting, poor time management), poor task planning and follow-through on tasks, low



self-esteem and self-confidence, irrational beliefs, depression, forgetfulness, impatience with deadlines, low competitiveness, low energy level, self-handicapping tendencies, high levels of self-criticism, emotions (envy and jealousy), task difficulty and perceived task pleasantness, skills deficits, lack of external control (e.g., instructor prompts), and ego-centricity. Although conflicting results have emerged from this line of research concerning the variables associated with a trait conceptualization of procrastination, researchers continue to pursue this line of research.

### Critique of Research

Research on procrastination based on personality theory mainly consists of correlational studies or statistical analyses of grouped data, and represents the majority of recent research on the topic. Interestingly, the correlations have generally been very low. However, many conclusions and suggestions for interventions have been based on them.

Correlational research is of limited usefulness to a radical behavioral analysis. It cannot lead to the determination of causal variables (i.e., distinguishing the independent from the dependent variables). It also does not lead to the generation of cause and effect predictions nor to interventions based these predictions. For example, some of the correlational research has suggested that procrastination is the result of low self-esteem and, indeed, studies have shown reported "low self-esteem" to be correlated with procrastination (Ferrari, 1991). However, causal status cannot be assigned to "low self-esteem" based on this correlation; to the contrary, a person with a serious problem with procrastination might have failed so often in meeting life's challenges that "low self-esteem" would reflect an accurate assessment. Therefore, it is not clear if an intervention should be focused on increasing self-esteem or decreasing

failures with behavioral techniques such as time management.

Correlational studies of procrastination have been almost exclusively based on subjective measures (i.e., self-reports of prospective and retrospective behavior). The majority of studies, thus, merely show the correlations between different subjective measures. However, without checks for the reliability or accuracy of self-reports the validity of such studies is questionable. Boice (1989, reviewed below) recently provided empirical evidence of this. Notably, some recent research has attempted to include more objective, observable, behavioral measures of the dependent variable (procrastination). For example, Milgram, et.al. (1988) included the latency in starting a test. However, no checks were made to determine the reliability of the self-reports. Rothblum, Solomon, and Murkani (1986) included the objective measure of the latency in a semester for taking tests in a PSI course. However, this objective measure was merely used to determine correlations with subjective measures of procrastination.

Another criticism of this line of research is that the range of postulated causal variables has been large, growing (i.e., note twenty-two listed above), and usually limited to internal factors. This is probably due to the conceptualization of procrastination as a generalized personality trait which is presumably related to other traits. In addition, the correlational data between these variables have often been conflicting or failing to support the presumed relationships between variables [e.g., lack of support for perfectionism as a major cause of procrastination in Ferrari (1992) or conflicting conclusions by Semb, et.al. (1979), and Effert and Ferrari (1989) and Lay (1986) regarding the relation between actual performance (e.g., grade point average) and procrastination]. The result has been that definitive causal variables have not been identified and few interventions have been postulated and tested. However, some of the external variables appear to be relevant to a radical behavioral analysis of

procrastination and, indeed, have been studied by some behavior analysts (reviewed below). Relevant variables include: instructor prompts, goal-setting, time- management including scheduling of tasks and assessment of follow-through, task difficulty, or skills deficits. Even the variables of perceived task aversiveness and irrational beliefs, if conceptualize and analyzed as private events or verbal behavior may be relevant. Interestingly, one of the most important variables-deadlines-has received minimal attention in the correlational, but not in the applied or behavioral research.

A related criticism concerns the distinctions made between academic, everyday, and decisional procrastination. The differences are unclear and seem to indicate that these are different sets of behaviors with different causal variables. The distinctions appear to be based on the subject population, the type of tasks, the presumed causal variables, and the whims of the researchers. For example, if clients in therapy are studied it is termed neurotic indecision, is conceptualized as a generalized personality trait, and involves major life tasks (e.g., marriage, job) If student are studied it is termed academic procrastination, is conceptualized as "behavioral, and presumably involves academic tasks. If students and their completion of routine life tasks are studied, it is termed everyday procrastination and is again considered behavioral. However, presumably for the researchers conducting these studies a circular explanation, involving a generalized personality trait or hypothetical cognitive construct, would be used to explain the occurrence of the behavior.

Effert and Ferrari (1989) further attempted to delineate the distinction between everyday and decisional procrastination. They studied college students and asked them to self-report on decisional procrastination. However, most college students in introductory courses probably make few major life decisions (e.g., about marriage, getting a job, starting a family). Therefore, their self-reports are presumably based on

their predictions of future behavior or might simply represent self-reports of present behavior (i.e., academic or everyday behavior). By blurring the distinctions, Effert and Ferrari may actually have simplified the matter for those subscribing to a theoretical orientation involving hypothetical personality factors. Decisional procrastination seems to account for all forms and makes the use of the terms academic, everyday, and neurotic superfluous. However, from a radical behavioral point of view the use of a hypothetical cognitive construct to describe behavior is still unacceptable because it obscures the identification of causal variables, as well as deterring the development of theory and an effective technology for decreasing the problem of procrastination.

A final criticism is that most of this research has been conducted with college-age subjects, usually undergraduate students enrolled in introductory psychology courses and receiving credit for participation in the research studies. Therefore, in spite of the large number of subjects, the generality of the results are limited. Furthermore, this restricted population might produce artificially lowered correlations between measures of procrastination and the causal variables, than if the population included people not attending college or children and adolescents.

#### Interventions Based on Personality Theories

Studies of techniques for preventing procrastination, based on personality theory, have been scarce, in comparison to the numerous correlational and assessment studies. Perhaps, one reason a coherent technology for reducing procrastination has not emerged is the conceptualization of "procrastination" as a personality trait, with the implication of stability and inherent difficulty in changing such a trait. Nevertheless, some researchers have attempted to formulate interventions, mostly based on some form of psychotherapy or counseling interviews.

### Academic Procrastination

Brown (1991) described a program for college students involving psychotherapy, including time and stress management. The goals of the program were: (a) to reinstate the thoughts and feelings associated with past academic distress in an effort to make the students more receptive to suggestions for avoiding future distress, (b) to help students understand the causal relationship between procrastination and their past academic distress, and (c) to induce students to increase stress earlier in a semester in order to reduce the stress that normally occurs later.

In a similar vein, Sommer (1990) analyzed procrastination and suggested psychotherapeutic strategies that make use of the "adaptational power contained in calculated procrastination, preparatory anxiety, and climatic cramming." Writing from a psychoanalytical perspective, he suggested that calculated procrastination and cramming are outward manifestations of an "intense private ritual" or "psychic drama" in which students engage to deal with external, academic demands (i.e., deadlines) inherent in college systems. Contrary to the commonly held view that academic procrastination is maladaptive or counterproductive (Burka & Yuen, 1983; Rothblum, Beswick, & Mann, 1984), Sommer suggested that procrastination is the way adept students privately and passively rebel against authority (i.e., professors) and at the same time "ace" the system. He also suggested that such behavior is normal and adaptive in college and the workplace, but nonadaptive when applied to personal relationships. He further suggested that therapists should attempt to change these behavioral patterns of procrastination only when students apply them to personal relationships (i.e., presumably decisional procrastination). Interestingly, he also suggested some behavioral interventions. For example, he recommended encouraging

students to schedule regular appointments with their professors (i.e., external supervision). Sommer did not provide data therefore, conclusions regarding his analyses and the effectiveness of his proposed interventions cannot be made.

Ottens (1982) also analyzed procrastination. He theorized that procrastination is avoidance behavior reinforced and maintained by the temporary reduction or relief (presumably in anxiety) that results when a task is postponed. He also described a program for college students that used a combination of traditional psychotherapy and behavior management. The program consisted of 5-7 sessions with a counselor in which students were taught to assess their procrastination styles, foster self-awareness, and develop anti-procrastination dialogues. The use of contracts and self-reward (behavioral techniques) was also encouraged and monitored for 1-2 weeks. Unfortunately, Ottens also did not provide data to support the effectiveness of the program. The brevity of the contracts and monitoring, however, in comparison to effective behavioral programs (reviewed below), suggest that the effects in reducing procrastination were probably temporary, at best.

Morse (1987) used multimodal group counseling with students of normal intelligence (grades 3-6) in an attempt to increase their homework completions and submissions. Subjects were considered procrastinators if they had a homework submission average of less than 75% for two weeks prior to intervention. The students were assigned to an intervention group or to a comparison control group placed on a waiting list. Morse conducted 29 counseling sessions (3 times per week and 25 minutes in length) for each of three groups. Examples of topics covered included: relaxation, brainstorming, feelings, peer and family relationships, problems with homework, communication skills, imagery, practicing positive self-talk, choices, time management skills, goal-setting, lists, how to do homework strategies, and how to

record progress. Treatment strategies included: discussion, worksheets, guided imagery and relaxation, and role-playing. Morse found a small statistically significant difference ( $t = -2.26$ ) between the mean homework submissions for the intervention ( $M = 7.96$ ) and control groups ( $M = 6.74$ ). This difference was, however, only an average of one more homework submission ( $7.96 - 6.74 = 1.22$ ) for the intervention group than for the control group. In addition, the mean preintervention homework submissions for the intervention group was  $M = 6.27$  and for the control group it was  $M = 5.51$ . Therefore, even without intervention the control group improved their homework submission rates over the course of the study (i.e., an average of 1.23 more submissions) and the results appear to be confounded. Although the intervention was time intensive and the results generally failed to show strong support, the study is noteworthy for its application to younger children, the attempt to empirically demonstrate the utility of generally accepted techniques typically used with college students to reduce procrastination, and the use of actual measures of procrastination. Even if the study had better demonstrated the effectiveness of the techniques, the multimodal approach would have made it difficult to identify the critical variables.

#### Decisional Procrastination

Although an early theorist, author, therapist, and workshop presenter on the problem of procrastination, Albert Ellis (1987) continues to provide only case studies to demonstrate the effectiveness of his techniques. In a recent study (1987 for example, he reported on the use of rational emotive therapy (RET) to treat a woman with numerous presenting problems, including procrastination. The therapy involved attacking identified irrational beliefs through direct challenge, teaching rational coping statements, cognitive distraction, psychoeducation, shame-attacking exercises,

reinforcement for completing homework, and social skills training. He reported a reduction in all symptoms. However, he does not provide objective measures of symptom reduction, making it difficult to determine the true effectiveness of the numerous techniques.

White (1988) suggested a directive behavioral approach may fail with some clients because it "often increases their resistance to working." Therefore, in a case study, White suggested the use of imagery as an alternative intervention. (See, however, the studies described below demonstrating equal success with both direct and paradoxical approaches and, also, the study by Boice demonstrating the effectiveness of a direct approach to reducing procrastination). Campbell (1992), although providing no data, suggested the use of meditation to overcome procrastination.

Finally, Ishiyama (1990) described the use of Morita therapy to reduce client inaction and neurotic procrastination. The therapy described is action-oriented and attempts to overcome attitudinal factors that contribute to procrastination. In essence, the therapy appears to suggest the initiation of behavior prior to changing the attitudes and feelings--actions overcome bad attitudes. However, this is merely a description paper and data are not provided.

In summary the following techniques based on personality theories have been suggested for reducing procrastination: (a) imagery; (b) meditation; (c) group counseling; (d) relaxation therapy; (e) shame therapy; (f) identifying and contradicting irrational beliefs and feelings such as fear of failure or success or perfectionism; (g) social skills training; (h) time and stress management; and (i) positive self-talk.

### Critique of Research

The data base supporting the effectiveness of many of these techniques has been



nonexistent, reported in case studies, based on statistical analysis of group data, or generally failed to show support for the proposed techniques. The methodology of these studies relied mostly on statistical analyses of self-reported measures of procrastination. Except for the study by Morse, objective measures have not been used, making it difficult to assess the effectiveness of the interventions. However, even in the Morse study the interventions were presented simultaneously and were too numerous to identify the effective variables. Finally, no follow-up data were provided in any of the studies and, except for the study by Morse, the research has been conducted mainly with college students, again limiting the generality of the results.

#### Paradoxical Interventions

Based on social learning theory and perhaps best classified as cognitive-behavioral techniques several groups of researchers have examined the effectiveness of paradoxical interventions to reduce procrastination. Paradoxical interventions are techniques used to induce change in clients by discouraging change (Haley, 1963; Watzlawick, Beavin, & Jackson, 1967; Seltzer, 1986). Symptom prescription or scheduling (Newton, 1968) (i.e., directions to continue or exacerbate a behavior), reframing (i.e., creating a different meaning for a behavior), and restraining (i.e., directions forbidding or inhibiting change in a behavior) are examples of paradoxical interventions that have been studied with a wide range of problems. Paradoxical techniques have been advocated in response to social psychological research suggesting that techniques directing people exactly how to change behavior stimulates defiance (Goodstadt, 1971; Pallak & Heller, 1973; Worchel & Brehm, 1970). These directives to change behavior are often called self-control directives or instructions prescribing activities that are different from clients' current behaviors. In addition, the therapists

using self-control directives directly praise clients for changing behavior.

Lopez and Wambach (1982) examined the effectiveness of paradoxical versus self-control directives in reducing procrastination for 32 male college students enrolled in an introductory psychology course. They selected subjects based on self-reported problems with procrastination and randomly assigned them to one of two intervention groups (i.e., paradox or self-control) or to a control group. The dependent variables related to procrastination were self-report measures the Procrastination Log (Strong, Wambach, Lopez, & Cooper, 1979) and a Procrastination Inventory (Strong, et.al., 1979). From the 11 items of the Procrastination Log, Lopez and Wambach developed a "Procrastination Behavior Scale" (PB) which was the sum of true-false ratings. The subjects completed the measures four times; once for a pretest, twice during the intervention, and once at a one-week follow-up.

Counselors met with subjects during two, thirty minute interview sessions, spaced one week apart. In the first of the self-control sessions counselors discussed the problem of procrastination as a learned habit and the subjects determined the conditions antecedent to procrastination for them. Counselors emphasized the importance of changing their behaviors, described the behaviors to change (e.g., increasing study time and decreasing socializing, etc.), directed the subjects to modify their study environment to decrease distractions, and directed them to self-monitor how they used their time for one week. In the second session the self-monitoring data was discussed and the counselors verbally reinforced the subjects' efforts. Subjects were again directed to change their behaviors and self-monitor for one more week.

During the first of the paradoxical sessions counselors discussed the problem of procrastination as a "lack of awareness and understanding." They encouraged the subjects to continue procrastinating and to try to understand what they were doing. The

counselors "forbid" the subjects to study and instructed them to "resist studying for a half-hour period each evening" and to "concentrate on procrastinating" for one week. During the second paradoxical session the subjects discussed their experiences with procrastination and were again instructed to practice procrastination.

Both of the intervention groups self-reported decreased procrastination over the four week period of the study. The means on the PB for the self-control group decreased from 52.90 to 38.10; the means for the paradoxical group decreased from 47.40 to 37.40. Thus, although the subjects in both intervention groups decreased their self-reported procrastination, the self-control group reported a greater reduction in procrastination than the paradoxical group (14.8 versus a 10 point decrease in means on PB, respectively). Interestingly, the control group also self-reported less procrastination over the course of the study (means decreased from 52.16 to 46.16). This suggests some reactivity to the self-report or dependent measures and confounds the results. Lopez and Wambach presented an adequate discussion of the methodological limitations of the study. For example, they discussed the lack of reliability checks on the subjects compliance with the suggestions made during the interview sessions and the lack of objective measures of procrastination. They collected some objective data, that is, latencies in the return of the two take-home measures (i.e., pretest and follow-up). Interestingly, these data failed to show any difference or decrease in procrastination among the subjects.

Wright & Strong (1982) studied the use of two paradoxical directives with college students ( $n=30$ ) to reduce procrastination. The dependent measures were self-reports (i.e., the Procrastination Log and Procrastination Inventory used by Strong, et al., 1979). Using a two-interview format, similar to that described in Lopez and Wambach, they compared the effectiveness of a paradoxical directive to continue the

same behaviors that resulted in procrastination ("exactly" group) and a directive suggesting that they choose only some behaviors to continue ("choose" group). They found that both types of directives were equally effective in reducing self-reported procrastination. ANOVA analyses showed the difference between the means for combined paradoxical intervention conditions and the means for the control group on the procrastination scales resulted in an  $F(1,27)$  of 21.84,  $p < .001$ . That is, on the procrastination scale of the Procrastination Log the mean scores for the "exactly" group dropped from  $M=39.8$  on the pretest to  $M=22.6$  on the posttest. For the "choose" group the means dropped from  $M=39.41$  on the pretest to  $M=24.21$  on the posttest. For a control group there was little change in the mean scores ( $M=39.30$  versus  $M=37.41$ ).

In a similar set of two studies Dowd, Hughs, Brockbank, Halpain, Seibel, and Seibel (1988) compared the use of restraining and reframing paradoxical directives versus nonparadoxical directives, on procrastination with college students ( $n=50$ ). Subjects were self-identified or identified as procrastinators based on a Procrastination Log pretest (Strong et. al, 1979) and were randomly assigned to conditions, including control groups. The dependent variables related to procrastination were two self-report measures used by Lopez and Wambach (1982) the Procrastination Log and the Procrastination Inventory (Strong, et. al, 1979). The intervention consisted of two interview sessions, as in the Lopez and Wambach study, spaced one week apart. In Study 1, during the restraining directive interview subjects were told the negative consequence of changing their procrastination behaviors and that they should "go slowly and cautiously in attempting change." For the nonparadoxical directives subjects were told the positive consequences of behavior change and were encouraged to change their behaviors as rapidly and as much as possible. All subjects assigned to the

intervention groups improved on self-reported measures of procrastination, in comparison to no change for the control group. Using repeated measures analyses of variance (ANOVA), they found decreases in self-reported procrastination in the paradoxical group ( $F(1,47)=62.56, p<.001$ ) and in the nonparadoxical group ( $F(1,47)=53.41, p<.001$ ) over time. For the control group ( $n=9$ ) they found no significant change ( $F(1,47)=.28, p>.05$ ). In Study 2, they compared reframing with restraining paradoxical interventions and found no evidence for treatment effects, in comparison to a control group.

### Critique of Research

Taken together, the results of studies examining the effectiveness of paradoxical versus nonparadoxical interventions to reduce procrastination appear to suggest that both types of interventions are "effective." That is, such interventions decrease self-reported procrastination. When Lopez and Wambach attempted to objectively measure procrastination in the form of latency in returning take-home measures, they found no difference between the two experimental groups and the control group. The results also appear to suggest that the assumption that direct behavioral interventions will stimulate "defiance" in some people may be invalid. Additional criticisms of these studies are similar to those outlined above for personality theory and interventions. That is, the studies were generally: (a) statistically analyzed group studies; (b) lacking in objective measures of the independent and dependent measures, relying instead on subjective measures of questionable reliability; (c) the interventions were probably too brief to affect behavior other than self-reported procrastination; and (d) conducted with college students as subjects, limiting the generality of the results.

### Traditional Behavioral Analysis: Delayed Consequences

A common behavioral analysis of procrastination suggests that a lack of self-control and competing immediate versus delayed consequences of behavior are the problems. For example, the noticeable positive effects or consequences of dieting and daily exercise appear to be delayed by weeks and months. Therefore, behavior analysts, as well as lay people, often cite the delay of these consequences as the cause of procrastination and also as evidence of the lack of self-control (e.g., failure to stay on a diet or exercise program). In addition, they also point to the more immediate, consequences that support not staying on a diet (e.g., the taste of sugary foods). There are other examples, however, appear to suggest that delayed consequences sometimes can control behavior. Most adults file their income-tax returns by the April 15th deadline; although the outcome (refund or avoidance of paying a penalty) is delayed. Also, many professionals submit presentation proposals to professional organizations by a deadline and wait months for the outcome (e.g., acceptance or rejection). If behavior appears to be controlled by such delayed consequences, then some might say there is procrastination because other types of consequences are not effectively controlling behavior. They further suggest that to increase self-control and to eliminate procrastination, techniques need to be developed to make those types of consequences more effective.

#### Delayed Consequences Research

Following from the above analysis, many contemporary behavioral researchers in the area of self-management and self-control (both experimental and applied) have focused on the control or lack of control of behavior by delayed consequences.

Underlying such research is the conceptualization of self-control as "delaying gratification" (a concept borrowed from traditional personality theory and extensively studied by Mischel and colleagues) or "maximizing" (i.e., behaving in ways that permit a person to access larger, delayed reinforcing or a greater density of, reinforcers rather than smaller, more immediate reinforcers) (Schweitzer & Sulzer-Azaroff, 1988). These researchers have studied the choice of delayed consequences in animals and human adults when concurrently competing contingencies are presented involving different combinations of time delays and outcome sizes (e.g., Ainslie, 1974; Ainslie & Herrnstein, 1981; Logue, Pena-Correal, Rodriguez, & Kabela, 1986; Rachlin & Green, 1972; Ragotzy, Blakely, & Poling, 1988). Using the same paradigm, researchers working with children have studied their choice of competing consequences in relation to varying delays, amounts, rates, and densities of reinforcers, and also to attentional variables, age, verbal ability, training, and history (Burns & Powell, 1975; Miller, Weinstein & Karniol, 1978; Mischel & Mischel, 1983; Sarifino, Russo, Barker, Consentino & Titus, 1982; Sonuga-Barke, Lea, & Webley, 1989; Sonuga-Barke, Lea, & Webley, 1989; Walls & Smith, 1970; Mischel & Ebberson, 1970).

In an example of this type of research, Schweitzer and Sulzer-Azaroff (1988) gradually increased the duration of the delay interval and demonstrated that impulsive four-year-olds increased their selection of larger, delayed reinforcers over smaller, immediate reinforcers. However, the delays used were no more than 90 seconds and the lack of a demonstration of the functional nature of the delayed reinforcers chosen make it difficult to extrapolate the results of this study to the everyday examples of adult behavior involving consequences delayed by weeks, months, and years.

Braam & Malott (1990) found the behavior of 6 four-year-olds to be effectively controlled by rules specifying immediate deadlines and one-week delays in the delivery

of consequences. However, although delayed consequences might be speculated to have controlled the children's behavior, the analysis below will suggest that the problem of procrastination is probably more complex than a person merely choosing and waiting for delayed consequences.

### Critique of Research

Malott (1989) and Malott and Garcia (pages 245-249, 1991) provide an in-depth review and analysis of some of this research. In it they suggest two reasons that the results of animal studies involving delayed consequences are not relevant to human behavior. First, the consequences of behaviors with which humans have difficulty or success (i.e., on which there is or is not procrastination) often appear to be delayed by hours, days, weeks or even years. These large delays make it unlikely that the consequences would have any reinforcing or punishing effect on the causal response. Second, they suggest that the intervals between the causal response and the delayed consequences alone would vary from time to time. This would likely discount a theory suggesting the development of a superstitious response chain (i.e., similar to that seen in experiments with pigeons) as support for the causal response class.

Overall, the methodology for behavioral research on delayed consequences, especially that involving animals and humans in experimental laboratories, has been rigorous. The dependent and independent variables have been well-specified and observable. Also, the subjects have not been limited to adults, unlike most nonbehavioral studies of procrastination.

Although incomplete, the analysis upon which this line of research is based, is probably of value to a behavioral analysis of procrastination. Of merit may be the concept that people have difficulty behaving in their best interests when contingencies



involve consequences that are not equally effective. Indeed, it is a problem of competing, unequally effective contingencies when a person smokes a cigarette and the more immediate consequences associated with it (e.g., the taste or effect of the nicotine on the body) maintain the behavior, even though other consequences are ultimately detrimental to them. The word "choice" is often used to denote the responding that occurs in such situations. However, of questionable value is any conceptualization involving or implying that in such situations humans "choose" the consequences or how to behave due to hypothetical cognitive or developmental variables (e.g., thoughts, cognitions, free will, attention, age, etc.). From a behavioral point of view behavior is controlled by the stimuli associated with the contingencies. This does not mean, however, that "choice" or "decision" processes are not involved on those occasions involving rational, verbal analyses of contingencies.

Also of questionable value is any implication that delayed consequences (i.e., "delayed reinforcement") somehow directly control the causal responses. As the following analysis will suggest, the control that appears to be exerted by long delayed consequences is not an instance of delayed reinforcement or delayed punishment. However, many researchers continue to follow this line of research on delayed consequences, which is interesting, but may be of limited use and perhaps misleading for an analysis of procrastination. For data on the dominance of behavior analysts' faith in delayed reinforcement see Schlinger, Blakely, Fillhard, and Poling (1991).

### A Radical Behavioral Analysis of Procrastination

#### Definition

From a radical behavioral perspective there are several problems with

conventional definitions and analyses of procrastination. First, procrastination is not considered a trait, response, action, or set of behaviors. That is, a person does not actively "procrastinate." Instead, procrastination might be conceptualized as the failure to behave or to do what one should. Thus, in essence, procrastination is a lack of control by relevant contingencies.

Many competing behaviors may be concurrently evoked when a person is not completing tasks that they should. However, these behaviors are not germane to a behavioral definition of procrastination. That is, they should not be construed as "procrastination." Behaviors which result in the postponement of tasks (e.g., daydreaming, eating, socializing, etc.) may simply be the result of competing contingencies and do not represent an active process or response called procrastination. For example, verbal behavior in the forms of promises (e.g., "I'll do it later") and reasons or excuses for why the task must be postponed are often offered. Frequently, this verbal behavior results in the person escaping or avoiding anticipated, immediate negative consequences (e.g., having to do the "aversive task" or being punished for not doing the task). For example, instead of punishing (e.g., taking away a privilege, verbally reprimanding or lecturing) a child for not making his or her bed, the parent may walk away or say "Well, OK; as long as you do it later." Thus, through a process of negative reinforcement the child's verbal behavior, in the form of promises and excuses is more likely to occur in the future. However, the parent has done nothing to strengthen the target behavior-making the bed! The main point, again, is that from a radical behavioral perspective, there is not a distinct behavior or class of behaviors that can be considered "procrastination." It is simply the failure to behave appropriately. These examples of promissory and excusing behaviors contribute to the problem of procrastination, but are not part of a class of behaviors called procrastination. This is

not say that these behaviors are not important.

A second problem with conventional definitions of procrastination is the subjective descriptions of procrastination in relation to a deadline (e.g., too late or at the last minute). Several others have attempted to analyze this issue. Sabini and Silver (1982) stated, "putting things off even until the last moment isn't procrastination if there is reason to believe they will take only that moment." Milgram, et. al., (1988) discussed the subjective aspect, "...somewhat late for one person is at the very last minute for another." That is, "when is operationally defined by self-ratings of promptly, somewhat later, or very late that are necessarily based on a personalized time frame" (p. 198). Scheffler (1989) suggested that "some things need putting off." In fact, efficient time management relies on prioritizing or postponing some tasks. Sommer (1990) went so far as to describe college students who deliberately procrastinate (i.e., "cram") as "adept" and suggested that trying to "break the habit of cramming is not productive." Therefore, from a radical behavioral perspective the issue of lateness or when a task is completed in relation to a nonelapsed deadline needs to be more objectively defined and measured. For example, procrastination might be defined as completion of a task two minutes before the deadline.

#### Small, Cumulative Consequences

Malott (1984, 1989) analyzed the problem of procrastination in terms of the competing contingencies involved. He divided behavioral contingencies into two general classes, according to the relationship between the consequences and the causal responses that produces those consequences. Direct-acting contingencies involve consequences that function as effective behavioral consequences for the causal response class. These consequences are effective (punish or reinforce the causal response)

because they are immediate, probable, and sizable. For example, touching a hot stove results in a burn and this consequence should effectively punish touching the stove in the future. In another example, the immediate taste of sugar for most children directly reinforces eating candy.

Not direct-acting contingencies involve consequences that do not function as effective behavioral consequences for the causal response class. That is, they do not directly reinforce or punish the causal response and also do not directly affect the future occurrence of these behaviors. These consequences are not direct-acting either because they are too delayed, too improbable, or too small and cumulative. Malott further divided contingencies that are not direct-acting into those that are effective (though indirect-acting) and those that are ineffective. Rules describing effective or indirect-acting contingencies, can reliably control behavior. These effective contingencies are described by rules and involve a delayed, sizable, and probable consequence. For example, the behavior of most people would probably be controlled by a rule stating, "If you mail this certificate by October 22, you will receive a \$10,000.00 rebate the following March."

In contrast, ineffective contingencies often fail to reliably control behavior, even when the contingencies are described in rules. These contingencies involve consequences that are either too improbable, or too small, but cumulating in significance. Examples of contingencies described by rules that do not reliably control behavior are: "If you continue to overeat, you will gain weight," or "If you wear your seat belt, you will not be hurt as badly in an accident."

Malott (1989) suggested that ineffective contingencies involving consequences that are less probable or too small and of only cumulative significance are the main causes of procrastination; the problem is not indirect-acting consequences that are

probable and sizeable, but delayed. For example, daily exercise produces small, immediate, benefits that accumulate over time. These positive consequences, however, are too insignificant on a day-to-day basis. That is, these small, beneficial consequences following each instance of exercise are too small to reinforce and maintain exercising. Furthermore, even though these small positive consequences accumulate, over a period of time, and become significant (e.g., measurable decrease in blood pressure and serum cholesterol, weight loss, an absence of life-style diseases such as arteriosclerosis, increased energy, and increased muscle tone), they still do not reinforce the causal behavior.

There is, then, a confounding of the small, but cumulative nature of problem consequences with the delay required for such consequences to accumulate into significance. And this confounding causes both lay people and behavior analysts to misconstrue the problem of procrastination as a problem of the failure of delayed reinforcement or the failure to delay gratification. Based on Malott's description of the various types of contingencies, then, procrastination can be analyzed as a problem of ineffective contingencies. For example, many people have problems exercising because contingencies involving immediate, probable, and sizable consequences compete with contingencies involving improbable or small and cumulating consequences (i.e., weight gain).

Rather than ask why there is procrastination (i.e., people failing to behave appropriately), perhaps a better question to ask is why do some people complete the tasks that they should, when others fail to complete the same tasks? Consider the person who exercises each day for a month before observing a one pound loss of weight. If the immediate consequences of exercise are too small to directly control behavior on a day-to-day basis, then what other variables control their behavior?

### The Role of Rules

One explanation of how delayed consequences control behavior is that behavior can sometimes be effectively controlled by verbal statements called rules (Malott, 1984, 1989) or contingency-specifying stimuli (Skinner, 1966). These rules specify the behavioral contingencies or the relationship of the consequences (e.g., weight loss or decreased blood pressure) to the causal behavior (exercise). It is the rule and not the consequences that more directly controls the behavior.

#### Rules as Discriminative Stimuli

Most behavior analysts have conceptualized rules as verbal discriminative stimuli or S<sup>D</sup>s (Baldwin & Baldwin, 1981; Brownstein, Zettle, & Rosenfarb, & Korn, 1986; Catania, 1984; Cerutti, 1989; Galizio, 1979; Hayes, Shimoff, Catania, & Matthews, 1981; Skinner, 1969; Vaughan, 1985; Zuriff, 1985). An S<sup>D</sup> is a stimulus that evokes a response due to a history of differential reinforcement in the presence of that stimulus (Michael, 1980; 1983). Thus, a rule would be a verbal stimulus that evokes behavior which in the past has been differentially reinforced in the presence of that stimulus.

In an extension of the analysis of rules as S<sup>D</sup>s, to explain how rules might control behavior in the absence of an obvious history of reinforcement for a particular rule, Cerutti and others have suggested that direct histories of reinforcement are not required for such stimuli to evoke behavior. Cerutti states that rules are "generalized discriminative classes" that can be "recombined in novel instructions that produce novel complex responses" (1989, p. 261, 262). That is, through a behavioral history of reinforcement for complying with and punishment for not complying with various rules

or generalized stimulus classes are established. When different rules (or perhaps just critical parts of rules) from the various generalized classes are combined in a novel way to develop another rule that rule, then, will evoke behavior, because previous histories of reinforcement and punishment were associated with the various other rules. The consequences that reinforce or punish compliance with rules can be the consequences specified in the rules or social consequences (Malott, 1989). (Recall, also, the above analysis of direct-acting contingencies). For example, a parent might state this rule, "Don't eat the pizza until it has cooled off or you will burn your mouth." Then, if the child does not follow the rule she will burn her mouth. The rule will then be more likely to suppress behavior in the future, because of the direct-acting contingency of punishment contingency associated with not complying with the rule in the past (i.e., a burned mouth). However, in the case of rules specifying contingencies that are indirect-acting (i.e., delayed consequences) additional consequences, often in the form of social consequences, must follow compliance or noncompliance with the rules. Such social contingencies play a major role in establishing and maintaining control by such rules (Malott, 1989).

#### Rules as Establishing Operations

Malott (1984) has analyzed how rules control behavior in terms of establishing operations (Michael, 1982, 1988). According to this analysis, through an appropriate conditioning history involving the pairing of aversive stimulation with noncompliance, the statement of a rule establishes noncompliance with the rule as an aversive condition. Compliance with the rule attenuates that aversiveness, possibly through the process of automatic (negative) reinforcement. The statement of a rule describing the contingencies then comes to govern behavior because the rule statement functions as an

establishing operation. Thus, a direct-acting contingency is created; one in which termination of the conditioned aversive event reinforces emitting the behavior specified in the rule (compliance).

### Rules as Function-altering Stimuli

Schlinger and Blakely have suggested that rules may affect behavior as function-altering stimuli (FAS), not as establishing operations or SDs (Schlinger, 1993; Schlinger & Blakely, 1987; Blakely & Schlinger, 1987). That is, rules or contingency-specifying stimuli (CSSs) alter the behavioral functions of other events or stimuli. Most relevant to the present analysis of procrastination would be their proposed action of the rule in a way analogous to the pairing of a neutral stimulus with an aversive stimulus. An example of such a pairing is when a neutral buzzer is paired with an aversive electric shock for a rat in a Skinner box. The pairing alters the function of the buzzer, so that it now functions as a learned aversive stimulus from which the rat will escape.

In an analogous manner, consider the rule stating, "If you don't write your paper by the deadline, you will get a failing grade." This rule statement alters the function of neutral stimuli in the environment (e.g., the stimuli of the clock or calendar approaching the deadline combined with the stimulus of a blank piece of paper). Perhaps, the rule alters the function of those neutral stimuli in a symbolic pairing of them with the aversive condition of failure or past social disapproval. That is, the statement of the rule suggesting failure causes those previously neutral stimuli to now function as learned aversive stimuli and also establishes a direct-acting contingency. The student then escapes the learned aversiveness of these stimuli by completing the paper before the deadline. In this manner, writing the paper is directly, and perhaps



automatically, reinforced (i.e., negatively) by a reduction in aversiveness of the previously neutral stimuli.

One reason there is procrastination or people failing to do what they should, then, might be that their behavior is not effectively controlled by rules describing the relevant contingencies. The reason for this failure might be that the rule does not sufficiently establish some crucial stimuli as aversive (or alter the function of other stimuli if a function-altering analysis is adopted); then a direct-acting contingency with an effective behavioral consequence (i.e., the reduction of the aversive condition through compliance) is not established to reinforce or punish the causal response class. Indeed, this is often the case for most rules describing improbable or small, cumulating consequences.

#### Research on Rule-governed Behavior

Most of the research on rule-governed behavior deals with rules describing direct-acting contingencies and the differences observed between contingency-shaped versus rule-governed behavior (Galizio, 1979). This work is not of great relevance to the issue of concern here: control by rules describing contingencies that are not direct-acting.

#### Importance of Deadlines

Malott (1989) suggested that another major cause of procrastination is the absence of a deadline specified in rules prescribing behavior. He suggested that deadlines make rules more effective because they clarify when rule violations occur. That is, deadlines make it easier to self-evaluate and for others to know when one is not complying with a rule. For example, when the task is large and the deadline is distant,

it is hard to evaluate if adequate work necessary to meeting that deadline is being completed. In other words, it is easy to misjudge the amount of time and work needed to complete a task. However, with small tasks and frequent deadlines, it is easier to estimate the amount of time needed to complete the tasks and the amount of time available for working on those tasks. Thus, the deadline makes it is easier to recognize the point of time when further failure to work on the task will prevent effective task completion. The recognition of that point in time in combination with verbal behavior concerning the consequences of not getting to work becomes an aversive condition, which can be escaped by working on the task.

Thus, approaching the deadline becomes aversive as a result of the statement of the rule that the person must comply by the time of the deadline. As a nonexample, consider the rule, "Do your homework (implicitly any time) or you'll get a bad grade." This rule does not specify a deadline; so it will not normally convert the stimuli arising from not doing the homework into an aversive condition. Therefore, such a rule will often fail to control behavior.

### Experimental Analysis of Deadlines

Many people have advocated the use of deadlines to reduce procrastination (Broadus, 1983; Dillon, Kent, & Malott, 1980; Dillon & Malott 1981; Ellis & Knauss, 1978; Glick & Semb, 1978; Kamali, 1991; Lamwers, Jazwinski, 1989; Metzger, 1982; Roberts, Fulton, & Semb, 1988; Starr, 1984). Empirical data demonstrating the importance of deadlines has come from research on personalized systems of instruction (PSI) and has shown that instructor-imposed deadlines (Keenan, Bono & Hursh, 1978; Morris, Surber & Bijou, 1978), student-imposed deadlines (Welsh, Malott & Kent, 1980;), and a combination of instructor-imposed plus student-imposed deadlines

(Roberts, Sulton, Semb, 1988) reduced procrastination of studying and completion of course requirements by college students. Also, in PSI and instructor-paced college courses, daily testing (i.e., a daily deadline) rather than weekly or tri-weekly testing reduced procrastination of studying and completion of coursework (Mawhinney, Bostow, Laws, Blumenfeld, & Hopkins, 1971).

Wesp (1986) studied the effectiveness of daily quizzes (instructor-set deadlines) or self-initiated quizzes (student-set deadlines) in a PSI course. He found that students in the daily quiz condition completed course work more rapidly and earned higher grades than did students in the completely self-paced condition. Wesp is one of the few researchers who has attempted to analyze procrastination and how deadlines work. He suggested that the more a student "procrastinates," the more difficult it becomes to resume work. This is because "other components of the course may become aversive due to the anxiety associated with continued procrastination. The students, then, avoid all components of the course, thereby reducing the likelihood of decreasing the anxiety and procrastination." It appears that Wesp suggested that through a process of conditioning previously neutral stimuli became conditioned aversive stimuli that the students avoid. He further suggested that the daily deadline insured that students did not "avoid all components of a course" and that by completing some course work on a daily basis they reduce their anxiety toward the course. Although he did not state it as such, it appears that he suggested a process of negative reinforcement to explain increased test-taking and studying. Even though his analysis is incomplete, he is one of the few, besides Malott, who has attempted to analyze how deadlines might work.

#### Prerequisites to Rule Control

Another part of the problem of procrastination is the extent to which behavioral

prerequisites, including a self-management repertoire, have been established and are operative. That is, even if there are rules that could potentially alter relevant neutral stimuli, there are prerequisites required for reliable control by these rules describing contingencies that are not direct-acting. Malott (1984) suggested that a functional relationship may exist between the early establishment of these prerequisites and control later in life by rules describing no deadlines and contingencies that are not direct-acting. (These prerequisites are not presumed to develop in sequential order, rather they are probably established concurrently). That is, there is likely to be less procrastination when delayed, improbable, or small and cumulative consequences are specified in a rule if the prerequisites are established and operative at an early age.

#### Verbal Repertoire

The first prerequisite is an adequate verbal repertoire. It might be expected that echoic, tact, mand, intraverbal and autoclitic repertoires (Skinner, 1957) need to be established and operative. The extent to which these verbal repertoires need to be established, however, remains to be determined.

#### Specific Rule Control

The second prerequisite is the control of behavior by a large number of specific rules (instructions or mands). These types of rules typically describe direct-acting contingencies where the behavior is directly reinforced or punished by the consequences specified in the rule. An example of this types of rule is: "Don't touch the hot stove or you will get burned."

### Generalized Rule Control

A third prerequisite is generalized control by rules describing direct-acting contingencies. That is, a person emits the behavior described in novel instances of general classes of rules or described in other types of rules such as those using the autoclitic frame (Skinner, 1957, p. 361) "If you \_\_\_\_\_, then \_\_\_\_\_." For example, the rule, "If you eat that hot pizza, then it will burn your mouth," usually controls a person's behavior, even if that person has never heard the specific rule or tried to eat the particular substance before. Generalized rule control is established through a history of reinforcement for emitting behaviors required by a wide variety of rules (often specifying deadlines) and a history of punishment for emitting behaviors prohibited by a wide variety of rules.

Furthermore, based on Malott's analysis of the importance of deadlines in rule control, generalized control by rules specifying deadlines are also a part of this prerequisite. However, deadlines are only relevant when rules specify behaviors that should occur (i.e., rules describing reinforcement, escape, or avoidance contingencies or their analog). For example, the rule, "You must do your homework by class tomorrow, or you will get a bad grade," specifies the deadline of "by class tomorrow." Deadlines are not relevant, however, for rules specifying behaviors that should not occur (i.e., rules describing punishment or penalty contingencies or their analog). For example, the rule, "If you cheat, you will get a bad grade," specifies no deadline; deadlines do not make sense with punishment contingencies.

Three additional prerequisites are related to self-management; they are presumed to be critical for control by rules describing indirect-acting contingencies.

### Rule Stating and Question-asking

In a fourth prerequisite a person states rules and asks relevant questions on the appropriate occasions. For example, on getting up in the morning a person looks at the clock and states the rules relevant to getting to work on time. For example, he might say, "I need to eat breakfast by 7:30, so I can leave the house by 8:00." Just as with rules stated by another person, this rule statement alters the function of the 7:20 a.m. displayed on the clock combined with no breakfast on the breakfast table. Those stimuli are now learned aversive stimuli which the person hastily escapes by putting the juice, cereal, and milk on the table, sitting down, and eating. In addition, the person asks questions such as: "What time do I have to be at work?" "What time is it now?" And, "How long will it take me to get ready?"

### Self-monitoring and Self-evaluation

The fifth prerequisites for control by rules describing indirect-acting contingencies are self-monitoring and self-evaluation. That is, a person determines the correspondence of his or her behavior to the behaviors described in a rule. For example, did they comply with the rule by emitting the behavior specified in the rule? Suppose the rule is, "I need to spend three hours doing my homework tonight." The person must then monitor his or her behavior and tact whether the current behavior is watching TV or doing the homework. However, people are often not taught and expected to monitor their behavior and, therefore, they are usually unaware of what they are doing at any given moment in such circumstances. Thus, being out of compliance with the rule might not be functioning as a learned aversive stimulus, and so the person might not return to the homework as a response by which he can escape

the aversiveness of noncompliance.

### Effective Learned Aversive Conditions

~ A sixth prerequisite for control by rules describing indirect-acting contingencies is that the stimuli arising from non-compliance with the rule must have become established as an effective learned aversive condition as a result of a prior history. So, in the earlier example, the 7:20 a.m. displayed on the clock combined with an empty breakfast table and an empty stomach must become established as learned aversive stimuli which the person escapes by preparing breakfast, etc. The ability of rule statements to work as an establishing operation requires a special history wherein noncompliance has been frequently paired with aversive conditions in the past, (e.g., "I told you to get ready so we could get to school on time and here you are wasting time. Shame on you.>").

### Experimental Analysis of Prerequisites

Researchers have examined the establishment of prerequisites in young children under the rubrics of "instructional control," "correspondence training," "compliance," "self-control," and "language training. The results of these studies have demonstrated that the prerequisites for control by rules describing contingencies that are not direct-acting can be established at an early age.

Children as young as four have learned to follow a rule (i.e., "Do this") while the experimenter simultaneously modelled the response to be imitated. Through repeated exposure to the procedure the children came under the generalized control of the rules and modelling (Baer & Sherman, 1964). Other than the previous studies by Braam and Malott (1990) and by Mistr and Glenn (1992), no research has

demonstrated generalized control by other types of rules such as rules using the autoclitic frame (Skinner, 1957, p. 361) "If \_\_\_\_\_, then \_\_\_\_\_."

Many researchers have shown that preschoolers can acquire a repertoire of "self-instructions" (i.e., "reciting rules to oneself" Schweitzer & Sulzer-Azaroff, 1988) to increase "on-task" behavior (Bornstein & Quevillon, 1976), to resist the temptation of going "off-task" and "delaying gratification" (Mischel & Patterson, 1976), and to learn a four response chain of behaviors (Vaughan, 1985).

Four-year-olds also have been taught to accurately self-evaluate (Risley & Hart, 1968) and to accurately self-deliver consequences based on self-evaluations (Drabman, Spitalnik & O'Leary, 1973). Studwell & Moxley (1984) demonstrated that children as young as 5 years of age could effectively use self-recording to increase their rate of learning basic skills. DeHaas-Warner (1991) used a multiple baseline design across subjects to teach self-monitoring (i.e., self-talk, self-evaluation, and self-recording) to two preschool children (ages 5-2 and 4-11). As a result of self-monitoring both subjects improved their "on-task" behavior from 24% to 87% for one subject and from 14% to 67% for the other subject. Finally, Masters, Furman, and Barden (1977) demonstrated that for four-year-olds, self-praise can be as effective a consequence as tokens in increasing behavior. Grusec (1966) investigated the development of self-criticism with kindergarten children (n=80). The children played a game and their performance was punished (i.e., criticized). The termination of punishment (i.e., negative reinforcement) was then made contingent or noncontingent on the occurrence of self-critical statements from the children. He found that self-criticism increased for the children in the negative reinforcement condition.

Given the current theoretical analysis of procrastination and control by rules describing contingencies that are not direct-acting, rule-generated learned aversive



conditions appear to be the most relevant. Ample research has also demonstrated that rules can alter the function of neutral stimuli to function as learned reinforcers as in the case of tokens in token economies and also in the numerous studies in the literature on compliance training.

### The Causes of Procrastination

Based on the analyses presented in this paper there appear to be three main reasons for procrastination or a failure for people to do what they should:

1. The problem of competing contingencies. That is, it is difficult to behave in ways that are beneficial over an extended period of time when the contingencies involve improbable, delayed, or small and cumulating consequences competing with contingencies involving immediate, sizable, and probable, direct-acting consequences.
2. The lack of prerequisites related to rule control and self-management.
3. The lack of a deadline specified in a rule.

### Experimental Analysis of Procrastination

#### College Students

Green (1982) found a combination of self-monitoring plus self-reward to be effective for increasing academic behaviors, for producing decreases in related procrastination (i.e., tardiness and postponed assignments and studying), and for increasing grades for six minority college students. For academic behaviors, he found mean increases of 0.64 more days of class attendance, 2.87 more assignments completed, and 35 more minutes of studying, compared to baseline responding. In addition, there were mean decreases of 23 minutes for tardiness, 34.5 days for late

assignments, and 6 days for delayed studying, in comparison to baseline. Self-monitoring plus self-reward produced mean increases in grades over baseline of 45.59 points on assignments and 52.66 points on exams.

Lamwers & Jazwinski (1989) studied the effectiveness of four types of course contingencies in a PSI course in psychology. These contingencies were: (1) Contracting (i.e., the student and instructor jointly determining testing dates); (2) Instructor-set deadlines; (3) Instructor-set deadlines plus tokens (i.e., bonus credits for early completion of coursework); and (4) Student-set (self-paced) deadlines. The dependent variables were delay to first testing attempt, midterm progress (i.e., number of units completed), course withdrawal rates, and final grades. They compared the effectiveness of the four different types of contingencies across four groups of students enrolled over four years. They found that the contracting condition produced the most midterm progress, the greatest percentage of students completing a course, and relatively less procrastination (than the instructor-set and student-set deadlines groups). The instructor-set deadlines and the instructor-set deadlines plus tokens contingencies resulted in less procrastination (in comparison to the student-set deadlines), but did not result in greater student progress or greater numbers of students completing courses. As the authors point out, however, "the high withdrawal rate in the two doomsday (i.e., deadline) conditions is most likely the result of the enforced deadline to withdraw from the course if two units of work were not completed by early in the semester. The instructor-set deadlines plus tokens condition resulted in the greatest percentage of students receiving a grade of "A" and the contracting condition resulted in the greatest number of students receiving "As" and "Bs" (93%). Overall, however, there was no so significant difference in grade distributions between the four groups.

Garcia, Brethower, and Malott (1988) studied procrastination at the graduate

school level. They evaluated the effectiveness of a research supervisory system that included various incentives, detailed tasks specifications, weekly meeting and frequent task deadlines. The study involved both within-group (i.e., between students in the supervisory group) and between-group comparisons (i.e., with two control groups). The supervisory group consisted of psychology graduate students (n=29), one control group consisted of other psychology graduate students (n=22), and the other control group consisted of graduate students from other departments (n=53). The independent variables included: (a) individualized, weekly performance contracts for each of three research phases (i.e., generating, implementing, or writing) that specified tasks to be completed, acceptable proofs of task completion, and possible points per task; (b) written instructions about general procedures for contract completion, article reviews, etc.; (c) individual, weekly supervisory and advisory meetings; and (d) weekly individualized and group feedback about student performance.

Additional independent variables included several different incentive systems. These were: (a) letters of recommendation, which included the percentage contracted tasks completed and the student's rank performance in comparison to other students in the supervisory group; (b) letters of recommendation and a semester credit contingency that required students to complete greater than 85% cumulative percentage of tasks per semester to receive the research credit for which they had enrolled; (c) letter of recommendation and a bi-weekly credit contingency, in which a student failing to complete greater than 85% cumulative percentage of tasks for two consecutive weeks lost research credit for the semester; and (d) no incentive.

The dependent variable was contracted tasks completed or points per week. Proofs of tasks completed were required to earn points. The results demonstrated that for all incentive conditions "standard" students completed a higher percentage of tasks

than student with "special circumstances" (i.e., those who had health problems, moved away, completed coursework before research started, or worked full-time, etc.). Also, the standard students completed the most tasks under the letter and semester contingency (101%) and the letter plus biweekly contingency (97%). In comparison, they completed only 63-89% during the letter only condition. To further demonstrate the effectiveness of the letter and bi-weekly contingency the researchers used a reversal design and placed the students in a no incentive condition, where they completed only 86% of tasks. The no incentive condition was similar to the conditions typical for graduate students when they sign up for research credit with no required weekly meetings with an advisor, etc. When the students were again placed in the letter and bi-weekly contingency they completed a higher percentage of tasks (108%). Statistical analysis (one-tailed) revealed a significant difference ( $t(14)=4.06$ ,  $p<.01$ ) between the mean percentage of contracted tasks completed under all credit contingencies and those completed under the no credit contingencies (i.e., letter only). The students classified as having special circumstances completed the greatest percentage of tasks during the twice implemented letter and biweekly conditions (68% and 76% respectively). In comparison, they completed only 1% of tasks during an intervening no incentive condition, only 31% of tasks during the letter and semester condition, and 26% of tasks during the letter only condition. In comparison to the two control groups, the students in the supervisory group completed more research (30%) even though they had lower mean cumulative GPAs, had been in graduate school for less time, and took more academic credits simultaneously with research credit. The authors concluded that the greater progress was due to the supervisory system and the various incentives.

### University Professors

Boice (1989) described two studies of procrastination with new university faculty as subjects. The dependent measure was the amount of time spent working on or the number of pages of scholarly writing completed. In Study 1, he used a retrospective survey (n=108) and repeated self-reports with direct-observations (i.e., reliability checks) of eighteen of these faculty (randomly selected) to determine how they spent their time at work.

Although methodologically a behavioral study, Boice obviously bases his research on traditional personality theory. Thus, he describes the behavior patterns observed in terms of "bingeing" (i.e., a pattern of exclusivity or working on only one task for long periods of time) and "busyness" (i.e., the psychological need for exclusivity).

On the survey, the faculty estimated that they worked an average of 58.3 hours per week and that they planned to spend half their time writing. When eighteen of the faculty kept logs of how they spent their time and these logs were checked for reliability, they reported spending only about 30 hours per week on work-related tasks (e.g., teaching, lecture preparation, grading, etc.). They also reported a baseline level of only one half hour per week of writing. This was far from their original estimate of 50% of their time or 20 hours per week. Boice concluded that procrastination is hard to observe and is not reliably self-reported.

In Study 2 he intervened with ten of the faculty members. The dependent measure was the number of pages of scholarly papers written. They scheduled brief (i.e., thirty minute average), daily writing sessions. They self-monitored their adherence to their schedules and were monitored by the researchers bi-weekly. The

intervention decreased procrastination (i.e., increased their writing) and "bingeing" in writing scholarly papers. The ten faculty completed a mean of 144 pages of writing in one year. In comparison to the year preceding the intervention, the same faculty completed an average of only 0.3 papers (for comparison purposes it is presumed that 0.3 papers equals approximately 15 pages). A comparison group of ten faculty, who also self-monitored, but did not schedule daily writing sessions nor receive visits from the researchers, completed a mean of 97.6 pages during the year. Finally, another comparison group who did not self-monitor nor schedule sessions completed only 25.6 pages in the same year.

Although Boice's analyses are based on traditional theories of personality, this study is noteworthy for the behavioral dependent and independent variables. That is, he used observable, quantifiable measures (e.g., time spent writing papers and on other tasks such as lecture preparation) and reliability observers to verify the subjects self-reports. As a result of this more rigorous methodology he found that retrospective surveys and self-report measures did not correspond to direct-observations or actual measures of behavior. The results, thus, shed doubt on the reliability and validity of the numerous studies of procrastination that rely solely on unverified self-reports of procrastination. In addition, the results of study 2 demonstrated that procrastination is a problem amenable to modification with direct behavioral interventions, rather than traditional psychotherapy. This suggests that a trait conceptualization may not be as valid as a behavioral one.

Boice's conclusions regarding the counterproductiveness of bingeing and his assumption that increased writing was the result of decreased "bingeing" for the productive faculty, however, may be inaccurate. To draw such a conclusion would have required data on the number of missed writing sessions or how much real time

was spent on writing. That is, the increase observed may actually have been the result of "bingeing" which might have occurred as the deadline for determining tenure approached.

### Summary

In summary, the data from behavioral research suggests the following techniques to reduce procrastination: (a) Frequent deadlines (daily if possible) and schedules set by oneself or by others; (b) Contracting that includes detailed activity or task specification, proofs, deadlines or schedules, rescheduling of tasks not completed by the deadline, and a criterion level or proportion of activities that must be completed; (c) Supervision of activity by others to whom one can regularly report progress, perhaps in a structured meeting format; (d) Contingencies of various types using incentives such as feedback, rewards (e.g., letters of recommendations, extra credit grades), and response cost (e.g., loss of a grade or research credit); and (e) Environmental management such as using lists, forms, written guides or objectives and avoiding interruptions.

### Critique of Experimental Analysis of Procrastination

The data base on behavioral studies of procrastination and techniques to decrease procrastination continues to grow. It has developed from group and individual studies, both with and without statistical analyses. The experimental methodology has generally been more rigorous than that used in the correlational studies reviewed earlier. This methodology has included: (a) well-defined, observable measures of the dependent and independent variables (e.g., percentage of contracted tasks completed, units completed in self-paced courses, letters of recommendation,

course credit, etc.); (b) experimental designs that better demonstrate the effectiveness of independent variables on the dependent variables (e.g., Garcia et al., used a reversal design to demonstrate effectiveness of various incentives); and (c) use of reliability checks to determine the veracity of self-reported data. The interventions have been longer in duration (usually for a semester) than the other studies reviewed above (e.g., study skills counseling or paradoxical studies). Although the number of subjects involved in behavioral studies is inherently limited, in comparison to the vast numbers of subjects that can be studied using surveys and other unverified self-report measures, the more rigorous methodology allows for more confidence in the results. Replication of the various studies with a wider variety of subjects is needed, because these studies, as with the others reviewed, have relied mainly on college students enrolled in psychology classes.

#### Young Children, Delayed Consequences, and Deadlines

The results of two previous studies (Braam & Malott, 1990; Mistr & Glenn, 1992) with preschool children will be discussed at greater length in the discussion section. However, in summary, the results showed that for many four-year-olds: (a) rules specifying only response requirements (i.e., requests) did not reliably control their behavior; (b) rules specifying immediate consequences with deadlines exerted reliable control over their behavior; (c) rules specifying an immediate deadline with a one-week delay in the delivery of the consequence exerted control over the behavior of some, but not most children this age; and (d) rules specifying no deadline with a one-week delay in the delivery of the consequence exerted little control over their behavior.

Deadlines appeared to be critical features in rules that decreased procrastination even for children as young as four years of age. Thus, the results may suggest that



people do not "learn to procrastinate", because it already occurs at such an early age. Also, the availability and the delay in the delivery of the consequence specified in a contingency-specifying stimulus appeared to be critical for compliance with four-year-olds. In other words, as predicted by the current theoretical analysis, the specification of direct-acting contingencies in rules resulted in better control over behavior than the specification of indirect-acting contingencies.

The present study is the second by this author in a thematic line of research attempting to understand and analyze how humans learn to cope with unstructured environments. As with the previous study, the present study was conducted with four-year-old children. The purpose was to replicate the results of the previous study and also to answer several new questions. Specifically, the study examined the differential control exerted by: (a) rules specifying a deadline and the immediate delivery of a consequence; (b) rules specifying no deadline and the immediate delivery of a consequence; (c) rules specifying a deadline and a one-week delay in the delivery of a consequence; (d) rules specifying no deadline and a one-week delay in the delivery of a consequence; and (e) rules specifying a deadline and no delivery of a consequence. Finally, the study examined the effects on the behavior of the children of a general statement of disapproval of procrastination.

## CHAPTER II

### METHOD

#### Subjects

The subjects were five students at the Child Development Center (CDC) of the Grand Rapids Public Schools, Grand Rapids, Michigan. They ranged in age from 4-5 years in age. Two of the subjects, one boy (S5) and one girl (S1) were from two-parent, Caucasian families. The other three girls (S2, S3, S4) were from single parent families and were Caucasian, Black, and Hispanic. The Hispanic girl came from a family headed by the father and the other two were headed by mothers. Four of the children (S1, S2, S3, S4) met the criteria for "tuition waiver" placement in the school program (i.e., lower income). One of the children (S5) was a tuition paying student.

The experimenter used three criteria to select subjects. She selected children who: (1) sat quietly and attentively during large group activities of approximately twenty minutes duration, to select children with adequate attention spans; (2) performed at age-appropriate levels on a standardized test (Dial R Test) given at the beginning of the school year by the teachers; and (3) regularly attended school.

#### Setting

The experimenter conducted the study at CDC during the school year from October to May during a half-hour free-play period Monday through Thursday. A total of thirty-six sessions were conducted. The center is an open classroom design, divided into smaller areas by partitions, tables, signs, and masking tape on the floor. The

children completed the tasks in the library area of the center, between the two large main areas of the classroom. The children could move around to both large rooms and play areas without restrictions, including during a trial. Two moveable screens partially separated the experimental area from the main areas. The children, experimenter, and reliability observer moved freely between the experimental and play areas. Within the experimental area were two small tables (2'x 4') and three small chairs. The size of the experimental area allowed the experimenter to work with only one child at a time.

### Materials

The experimenter used a suitcase called the "Magic Box" (Braam & Malott, 1990). It contained a variety of potential reinforcers (e.g., stickers, stamper, tops, magnets, little plastic animals, cars, "Muscle Men," and toy jewelry).

The experimenter used a variety of toys and learning materials found in the classroom as experimental tasks: (a) a wooden pegboard by Judy consisting of 100 holes into which colored wooden pegs can be placed; (b) a pegboard called a "Mosaic Board," into which small, triangular, plastic, colored pegs are placed; and (c) a large plastic bucket with a lid, a plastic clothes basket, numerous small toys, 200 plastic blocks (1"x 1"), and clothes for a pick-up tasks. The toys used appeared to be of equal difficulty and each required between five and thirty minutes to complete.

The experimenter used a cassette recorder to intermittently record the experimental sessions (25%). She recorded these sessions in an effort to calibrate the consistency of her rule presentations and to get samples of the children's verbal behavior. She placed the recorder on a table or on the floor, in full view of the students and staff, prior to the presentation of each rule.

### Definition of Behaviors

The dependent variable was the completion of experimental tasks and for the purposes of the study noncompletions of tasks, by the deadline specified in the rules, was defined as procrastination. In the case of no deadlines noncompletion of tasks within three sessions constituted procrastination. The children completed the wooden and mosaic pegboards by putting pegs in all the holes. They completed the pick-up task by either putting all the blocks in a plastic bucket or putting all the clothes and shoes in a basket. The experimenter chose the pick-up tasks because it was a low effort task, no special skills were required to complete it, and it was a task frequently requested by teachers and parents. It was also, a task parents reported their children typically procrastinated on at home. In addition to completion of tasks, the experimenter also tracked several other variables previously determined to be of interest in analyzing patterns of work during no deadline conditions (Braam & Malott, 1990).

### Verbal Behavior and Task Assessment

Three verbal repertoires (i.e., echoic, intraverbal, and tact as defined by Skinner, 1957) were briefly assessed to determine if they were established, to some extent, by the age of four. Skinner defined the echoic as a verbal response under the control of a prior verbal stimulus with point to point correspondence. All of the children consistently emitted echoic responses of up to four words in length (e.g., "If you finish, then \_\_\_\_"). Two of the children emitted echoic responses of five words in length (e.g., "Done is when all the \_\_\_\_"). Skinner (1957) defined an intraverbal response as a verbal response under the control of a prior verbal stimulus without point to point correspondence. All of the children emitted intraverbal responses, usually one

word in length, after the experimenter presented such phrases as, "the color of an apple is \_\_\_\_\_"). In addition, all the children correctly tacted ten objects (paper, pencil, cup, spoon, penny, chair, truck, table, block, tape recorder). Skinner (1957) defined the tact as a verbal response under the control of a nonverbal stimuli. All the children consistently demonstrated control by five one-step instructions or requests such as, "Put your finger on your nose," "Put the pencil on the floor." The experimenter recorded the children's verbal responses after each trial during the study. In addition, all the children completed the pegboard and picking-up tasks to determine their competencies to complete the tasks.

### Experimental Design

A variation of a within-subjects multielement baseline design, subclass multiple schedule, was used to assess the control different types of rules exerted on children's completion of tasks (Hartman, Shigetomi & Barrios, 1978). The rules and task conditions constituted the various elements. Table 1 presents the experimental

Table 1  
Experimental Conditions

| Condition | Consequence | Deadline  | Contingency     |
|-----------|-------------|-----------|-----------------|
| IC/D      | Immediate   | Immediate | Direct-acting   |
| NC/D      | None        | Immediate | Direct-acting   |
| IC/ND     | Immediate   | None      | Direct-acting   |
| DCND      | Delayed     | None      | Indirect-acting |
| DC/IC     | Immediate   | Delayed   | Indirect-acting |

conditions in the order of first presentation. Trials consisted of the experimenter stating

rules differing in the specified deadlines, tasks, and delivery times of consequences.

Table 2 presents the rules in the order of first presentation.

Table 2  
Examples of Rules

| Condition | Rules  |
|-----------|--|
| IC/D      | "If you do the pegboard now, you can go to the 'Magic Box' when you are done."                           |
| NC/D      | "If you do the pegboard now, you won't go to the 'Magic Box' when you are done."                         |
| DC/D      | "If you do the pegboard now, you can go to the 'Magic Box' one week after you finish."                   |
| IC/ND     | "You can do the pegboard whenever you want and when you are done you can go to the 'Magic Box'."         |
| ND/DC     | "You can do the pegboard whenever you want and you can go to the 'Magic Box' one week after you finish." |

#### General Procedure

The experimenter approached a child playing in one of the two large play areas during free-play time. She placed the tape recorder on the floor next to the child and said, "Listen to the rule(s): (stated a complete rule(s)). I don't care if you do it or not. Come and tell me when you are finished." To minimize the probability of inadvertently cuing compliance or noncompliance with the rules, the experimenter stated the rules with a neutral voice (e.g., monotonic, limited inflection, etc.), with minimal eye contact, and no physical contact. In an effort to minimize the potential effects of implied social consequences or extraneous variables (Orne, 1962; Rosenthal, 1966,

1967; Thorensen & Mahonney, 1974) overshadowing the delivery of the consequences specified in the rules, the phrase, "I don't care if you do it (the task) or not" was added. By the age of four, most children probably have a significant behavioral history of reinforcement (e.g., praise such as, "Good boy, you did what asked!") for following requests or instructions and history of punishment (e.g., criticism such as, "You didn't do what I asked, did you?") for not following instructions. Therefore, the request or instructions of teachers, parents, and adults sharing similar stimulus features, probably exert considerable generalized stimulus control over the behavior of young children due to the social consequences implied in a request or instruction format. This phrase was added even though the experimenter was not, in fact using social reinforcement or punishment.

The experimenter stated the rules when the subjects were playing alone. If they were with other children, she took them aside or asked the other children to leave the immediate area. She instructed the adults to limit their interactions with the children during the experimental sessions. This was done to decrease the participation of other children and to minimize the social consequences from other adults and children that might alter the control by the rules.

After stating the rules(s), the experimenter asked the children to overtly repeat the rule(s). If they omitted key parts she prompted them to repeat these parts. For example, if a child stated a partial rule, omitting the deadline, the experimenter said, "When do you do the (task)?" After the child provided the missing part of the rule the experimenter said, "Now tell me the whole rule." In addition, she again prompted them to tell her when they had finished a task.

After stating the rule(s), the experimenter left the immediate area, engaged in another task (e.g., read a book, talked with another child) while recording the

children's responses, and ignored attempts to interact. During this time she remained in view of the child at a distance of 30 to 75 feet and avoided eye contact with the child. She waited for the child to tell her when s/he was finished. At that time, she went back to the experimental area, checked the child's work, provided neutral feedback, and took the child to the Magic Box, when appropriate. For example, if the child completed the task described in the rule, the experimenter said, "You did the (task specified). You can go to the Magic Box (time specified).\" If the child did not complete the task specified in the rule the experimenter said, "You did not do (task specified). You can't go to the Magic Box.\" The children could then return to the previous task.

### Experimental Conditions

The different conditions are described in the order of first presentation.

#### Immediate or No Consequences With Deadlines (IC/D or NC/D)

The experimenter stated a complete rule describing either a deadline and the immediate delivery of a consequence or a deadline and no consequence (See Table 1). Thus, using a randomly alternating multiple schedule of consequence versus no consequence she stated rules describing direct-acting contingencies. The active component of the schedule was determined by a random numbers table for each child on a session-to-session basis. Different children were in different conditions (i.e., consequence versus no consequence) on the same day. However, only one condition was in effect per day for a given child, consisting of one to two trials.

During the consequence condition the experimenter stated a rule specifying an immediate deadline, a pegboard, and the immediate delivery of a consequence. For example, she stated, "Listen to the rule. If you do the pegboard now, you can go to the



Magic Box when you are done. I don't care if you do it or not. Come and tell me when you are finished. What's the rule?"

During the no consequence condition the experimenter stated a rule specifying an immediate deadline, the pegboard, but no delivery of a consequence. For example she said, "Listen to the rule. If you do the pegboard now, you won't go to the Magic Box when you are done. I don't care if you do it or not. Come and tell me when you are finished. What's the rule?"

The experimenter provided neutral performance feedback and a consequence immediately after a child completed a pegboard and told the experimenter s/he was finished, in the consequence condition. For example, she said, "Nicole, you followed the rule about completing the pegboard right away, now you can go to the Magic Box." The experimenter provided neutral feedback, but no other consequence, if a child did not start the pegboard within five minutes after the rule was stated. For example, she said, "Nicole, you didn't follow the rule about completing the pegboard right away, now you can't go to the Magic Box." She also provided feedback but no other consequence, after a child completed or did not complete a pegboard during the no consequence condition. For example, she said, "Nicole, you completed (or did not complete) the pegboard right away, remember you can't go to the Magic Box today." Five minutes after giving feedback the experimenter again stated a rule, depending on the random order of presentation selected prior to the session.

This condition ended when the children differentially responded to the two rules. That is, when they completed the task on two consecutive trials after the experimenter stated the rule specifying a consequence; and when they did not complete the task, on two consecutive trials, after the experimenter stated the rule specifying no consequence. The experimenter presented the rules during this condition to determine

if the children's behavior was under the control of the rule's description of the contingencies or the generalized demand characteristics of the environment and/or experimenter. In addition, she used this condition to briefly assess if one of the prerequisites suggested for control by rules describing contingencies that are not direct-acting--generalized control by rules describing direct-acting contingencies--was established to some extent. For those children in whom such generalized control appeared to be less well-established (i.e., they did not differentially respond to the two rules on the first trial each was presented), the experimenter began to establish such control, using two easily discriminable types of rules.

It should be noted that the experimenter provided neutral feedback and did not punish (i.e., criticize) noncompliance with the no consequence rule. This was done in an attempt to control for the establishment of control by "extraneous" variables such as the implied social consequences described above.

#### Immediate Consequences With No Deadlines (IC/ND)

During the condition using no deadlines with immediate consequences, the experimenter stated rules describing another direct-acting contingency. That is, she stated rules specifying no deadline, a pegboard or pick-up tasks, and the immediate delivery of a consequence. The experimenter removed the deadline in the rules to increase the probability that procrastination would become a problem. The experimenter said, "Listen to the rule. You can do the pegboard whenever you want and when you are done you can go to the Magic Box. I don't care if you do it or not. Come and tell me when you are finished. What's the rule?" The experimenter provided neutral performance feedback and a consequence immediately after a child completed a task and told the experimenter that s/he was finished. For example, she

said, "Lee, you followed the rule about doing the pegboard, now you can go to the Magic Box."

The experimenter stated the rule once at the beginning of a session to each child participating in the study that day. During a session the children were allowed leave a task and return to it at any time. If a child began a task but did not complete it during a session, the experimenter noted the extent to which the task was completed. She provided no feedback and ignored attempts by the child to interact. At the next session she put out the same task and presented the rule stated in the previous session. The child could then start the task at the point at which s/he had stopped during the previous session. If a child did not start a task for three consecutive sessions (one and one-half weeks), the experimenter recorded a noncompletion.

#### Disapproval of Procrastination

On one trial for each child when procrastination became a problem, the experimenter presented another rule, in addition to the rule describing no deadline with an immediate consequence. She said, "Listen to the rules. The first one is: You can do the pegboard whenever you want and when you are done you can go to the Magic Box. The other rule is: It is not good to do it later, it's better to do it now." The experimenter presented the second rule to determine the effects of a general statement of adult disapproval of procrastination. In theory, such a rule might increase the aversive condition associated with procrastination and decrease procrastination.

#### Delayed Consequences With Deadlines (DC/D)

The experimenter stated rules specifying a one-week delay in the consequence with a deadline. This phase was brief, due to the end of the school year and few data

points were generated. A one week delay was arbitrarily chosen for the convenience of the experimenter in the previous study that this study was replicating. One week following task completion the experimenter delivered feedback and a consequence when appropriate. For example, she said, "John, remember you followed the rule and finished the puzzle last week, now you can go to the Magic Box." Before the one-week delay was over, the experimenter did not initiate contact with the child and ignored any attempts by the child to evoke social consequences for completing the tasks. The experimenter presented the next rule to a child in the session following the feedback and consequence delivery.

#### Delayed Consequences With No Deadlines (DC/ND)

The experimenter stated rules specifying no deadline and a one-week delay in the consequence. This phase was also brief, because of the impending end of the school year. In addition, due to the one-week delay in the delivery of the consequence few data points could be generated during this condition.

#### Transfer of the Effects of Disapproval

The experimenter intermittently stated rules specifying immediate consequences with no deadline and the task of picking up in an effort to replicate the results across behaviors.

#### Probes

The experimenter intermittently stated rules describing deadlines and immediate consequences or deadlines and no consequences, as described above, during the remaining conditions of the study. This was done to control for some of the effects of

the order of presentation of rules, as well as the effects of the competing, free-play tasks.

#### Data Collection and Interobserver Agreement

The experimenter conducted all primary observations of dependent variables. A teacher's aide served as a reliability observer. She independently recorded data during 33% (12) of the sessions, distributed evenly across all experimental conditions. In addition, the reliability observer helped the experimenter calibrate her procedure by providing feedback on the experimenter's behaviors (vocal and nonvocal) during her presentations of the rules prior to the study and during reliability sessions.

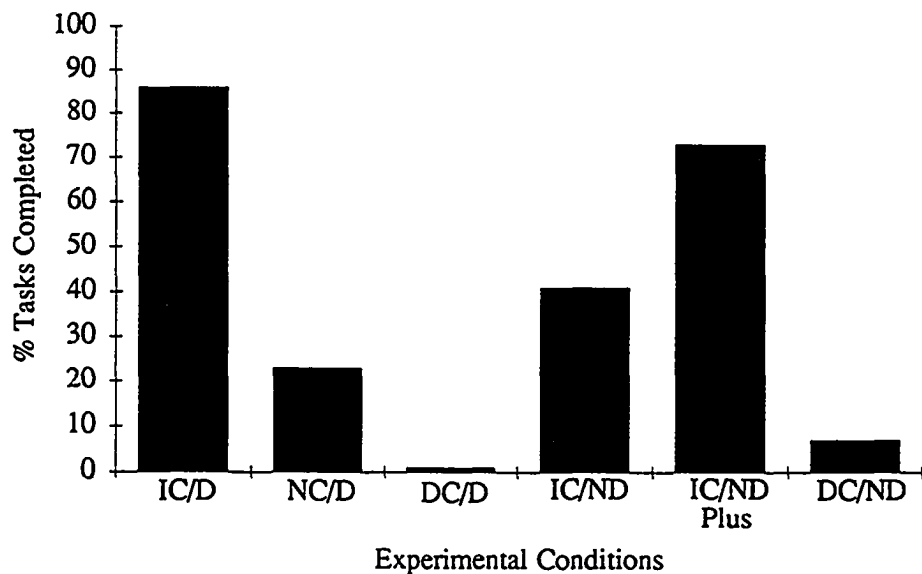
Agreement was calculated separately for occurrences and nonoccurrences for completions. An agreement was counted if both observers recorded that a child completed (or did not complete) a task during a session. The percentage of agreement was then calculated by dividing the sum of agreements by the total number of agreements and disagreements. Percentages of agreement for occurrences of task completions averaged 98%. Percentages of agreement for nonoccurrence of task completions averaged 100%

The experimenter also intermittently (25% of sessions) tape recorded her statements of the rules and the children's verbal behavior, including their statements of the rules. The experimenter used this data to calibrate her rule presentations.

### CHAPTER III

#### RESULTS AND DISCUSSION

The overall purpose of this study was to replicate Braam and Malott (1990) and to further evaluate the extent to which rules describing various contingencies control the behavior of four-year-olds. As seen in Figure 1 within the present parameters, rules



D=Deadline; ND=No Deadline; NC=No Consequence; IC=Immediate Consequence; DC=Delayed Consequence; Plus=Plus Disapproval Rule.

Figure 1. Group Mean Percentages Tasks Completed.

describing delayed consequences or indirect-acting contingencies failed to exert control; this was true whether the rules specified a deadline or not. Rules describing the absence of a deadline, also failed to exert control; this was usually true whether the rules described an immediate or a delayed consequence. Only rules describing

immediate consequences (direct-acting contingencies) with deadlines exerted reliable control. Finally, disapproval of procrastination added to a rule describing immediate consequences with deadlines, briefly decreased an established pattern of procrastination for three of four children. A more detailed analysis of the results follows.

#### Immediate or No Consequences With Deadlines (IC/D or NC/D)

As an initial step, it was necessary to demonstrate that rules describing direct-acting contingencies could effectively control the behavior of the children. In other words, that rules describing an immediate consequence with a deadline functioned as SDs and consistently controlled the childrens' behavior. To control for potential control by extraneous variables associated with the experimenter or setting, it was also necessary to demonstrate that rules describing no consequence (NC) did not effectively control their responding. As seen in Table 3 and Figure 2, such was the case: 86% responding to the SD rule and 0% responding after approximately one to two exposures to the no consequence rule.

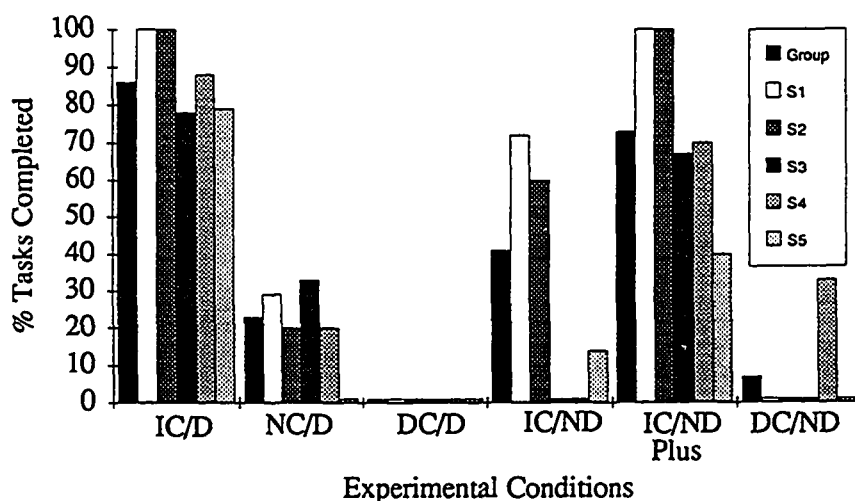
As see in Figure 3, these results also replicated those found in Braam and Malott (1990) and in Mistr and Glenn (1992).

#### Immediate Consequences With No Deadlines (IC/ND)

It also seemed reasonable to assume that rules describing direct-acting contingencies (immediate consequences) would reliably evoke behavior, even when no deadline was specified. This assumption was made because such rules are procedurally SDs, just like the light in the Skinner box is an SD in the presence of which the completion of a stimulus response chain will be immediately reinforced. Furthermore, such SDs reliably evoke responding in the Skinner box, even without a deadline.

Table 3  
Individual and Group Mean % of Task Completions

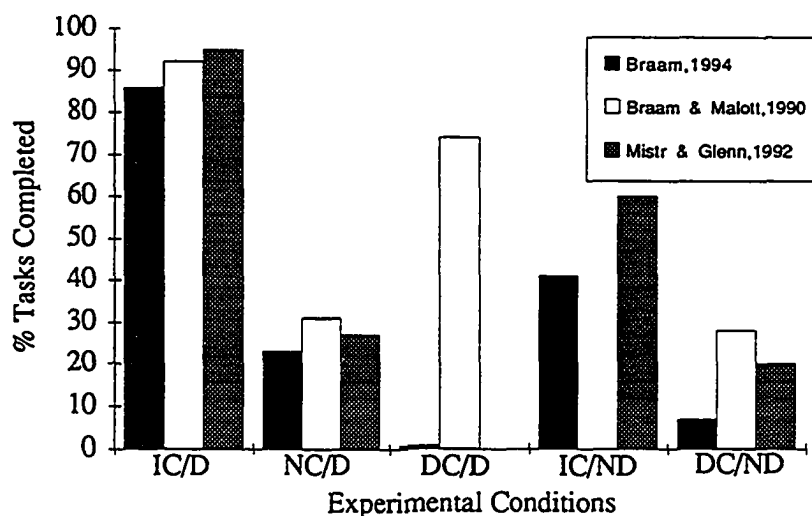
| Subject | IC/D           | NC/D          | IC/ND          | IC/ND Plus     | DC/D         | ND/DC        |
|---------|----------------|---------------|----------------|----------------|--------------|--------------|
| Group   | 86%<br>(36/42) | 23%<br>(6/26) | 41%<br>(12/29) | 73%<br>(24/33) | 0%<br>(0/10) | 7%<br>(1/14) |
| S1      | 100%<br>(5/5)  | 29%<br>(2/7)  | 72%<br>(8/11)  | 100%<br>(3/3)  | 0%<br>(0/2)  | 0%<br>(0/5)  |
| S2      | 100%<br>(6/6)  | 20%<br>(1/5)  | 60%<br>(3/5)   | 100%<br>(6/6)  | 0%<br>(0/2)  | 0%<br>(0/3)  |
| S3      | 78%<br>(7/9)   | 33%<br>(2/6)  | 0%<br>(0/4)    | 67%<br>(6/9)   | 0%<br>(0/2)  | 0%<br>(0/2)  |
| S4      | 88%<br>(7/8)   | 20%<br>(1/5)  | 0%<br>(0/2)    | 70%<br>(7/10)  | 0%<br>(0/2)  | 33%<br>(1/3) |
| S5      | 79%<br>(11/14) | 0%<br>(0/3)   | 14%<br>(1/7)   | 40%<br>(2/5)   | 0%<br>(0/2)  | 0%<br>(0/1)  |



D=Deadline; ND=No Deadline; NC=No Consequence; IC=Immediate Consequence; DC=Delayed Consequence; Plus=plus disapproval rule.

Figure 2. Subject and Group Mean Percentages Tasks Completed.





D=Deadline; ND=No Deadline; NC=No Consequence; IC=Immediate Consequence; DC=Delayed Consequence.

Figure 3. Group Mean Percentages Tasks Completed.

Surprisingly, rules describing immediate consequences (IC) with no deadlines (ND) generated mixed results. As seen in Figure 2, such rules (displayed in IC/ND) failed to evoke much behavior from S3, S4, and S5. The rules also evoked somewhat less behavior from S1 and S2 (i.e., 60% and 72%). In other words, when the deadline was removed considerable procrastination (i.e., the failure to complete tasks) occurred for three of the subjects and a moderate amount occurred for two other subjects. This was so even though the consequences were immediate (i.e., the rule described a direct-acting contingency).

What accounted for the discrepancy between these results and the typical Skinner box results? Perhaps it was a difference of parameters; the consequences might have been too small relative to the size of the task and relative to the concurrently competing consequences for other behaviors. In any event, the consequence was powerful enough to control responding when a deadline was specified. This then

raised the question of what role the specification of the deadline played. As previously discussed, perhaps the inclusion of the deadlines increases the effectiveness of the rules.

#### Disapproval of Procrastination (Plus)

It was postulated that there might be other ways to improve the control of rules specifying direct-acting contingencies (i.e., immediate consequences) with no deadlines. That is, there might be ways of establishing stimuli associated with procrastination as aversive stimuli. To test this hypothesis the experimenter presented a rule condemning procrastination in addition to the rule describing an immediate consequences with no deadline.

As seen in Figures 4, 5, and 6, and somewhat in the grouped data in Figures 1 and 2, the results were in keeping with the hypothesis. That is, after the experimenter presented the additional rule condemning procrastination, established patterns of procrastination improved for 4 of the children. Three of the children initially completed no tasks when the rules specified immediate consequences with no deadlines. However, with the addition of the second rule, the patterns abruptly changed for S3. This change lasted for three trials over a period of one week, before her performance began to become more variable. The changes were more gradual for S4, but lasted for six trials over a period of two weeks. The additional rule had a minimal effect on the behavior of S5. S1 and S2 both completed many tasks before procrastination became a problem. Therefore, the second rule was added at the point when their behavior changed. As was the case for S3, their behavior patterns changed abruptly back to the originally high percentage of task completions. This pattern then lasted for the duration of the study.

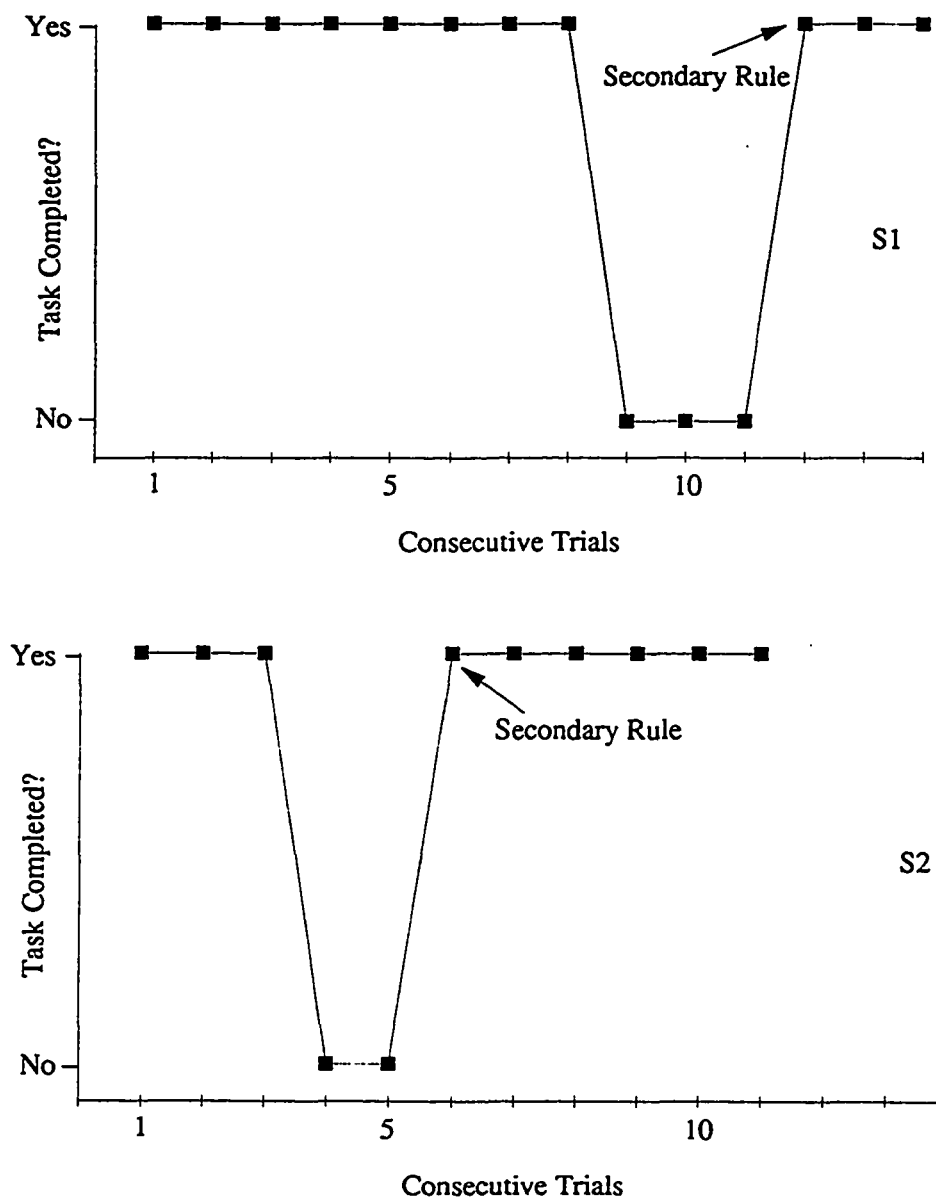


Figure 4. Effects of Disapproval Plus Rule Specifying Immediate Consequences With No Deadlines (IC/ND) for Subjects 1 and 2.

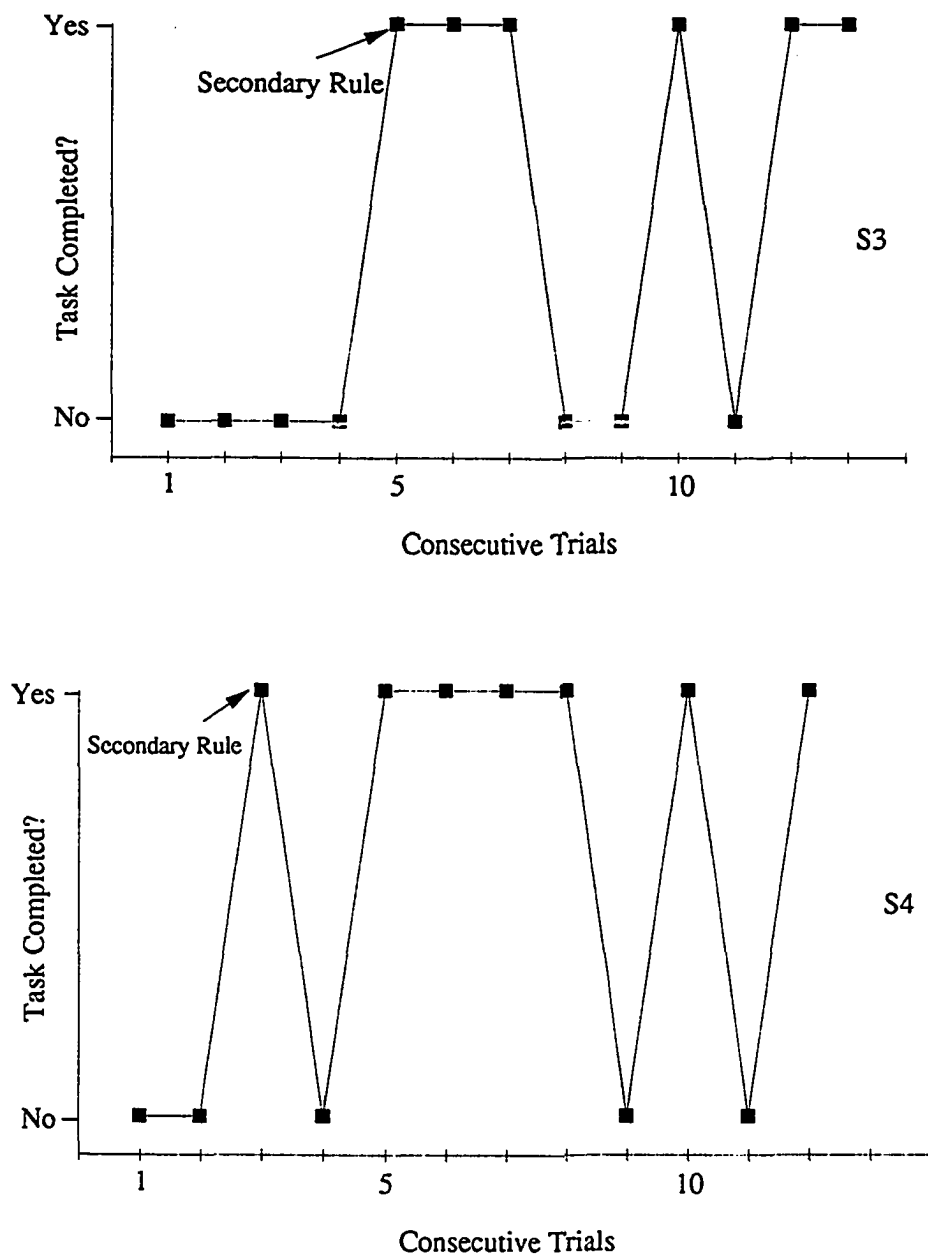


Figure 5. Effects of Disapproval Plus Rule Specifying Immediate Consequences With No Deadlines (IC/ND Plus) for Subjects 3 and 4.

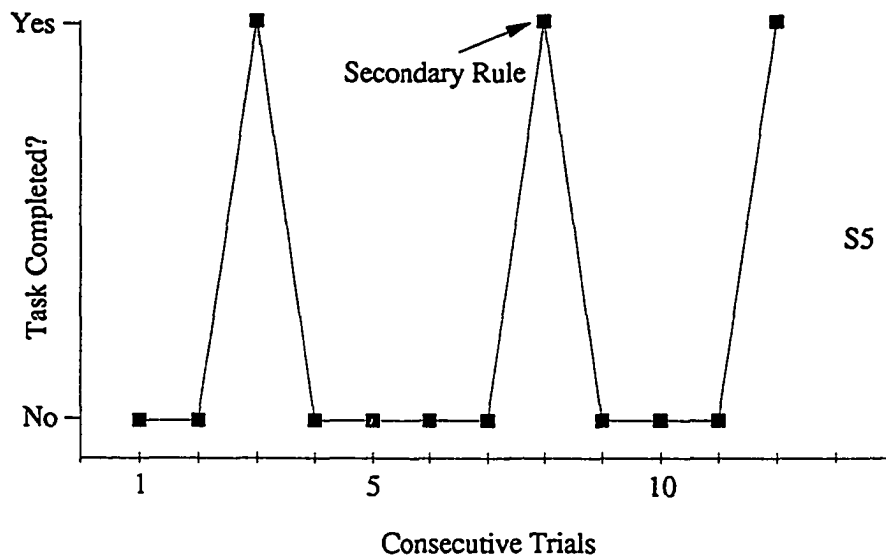


Figure 6. Effects of Disapproval Plus Rule Specifying Immediate Consequences With No Deadlines (IC/ND Plus) for Subject 5.

#### Delayed Consequences With Deadlines (DC/D)

As seen in Figure 3 contrary to earlier results (Braam & Malott, 1990), rules describing a one-week delay in the consequences (DC) with an immediate deadline (D) failed to control any behavior. Procrastination or noncompletion of tasks was at 100% for all subjects. It remains for future researchers to determine whether this failure of control was a result of task difficulty or a difference in behavioral histories between the two groups of subjects. The subjects in the first study were from a different (higher) socio-economic and educational background than the children in the second study. Perhaps the parents of the children in the first study more consistently provided additional social consequences (i.e., reinforcing and punishing) for those children when they followed or did not follow rules specifying indirect-acting contingencies (delayed consequences) with deadlines. [Recall the analysis presented above concerning the need for additional consequences to support those that are not direct-

acting and specified in rules.]

### Delayed Consequences With No Deadlines (DC/ND)

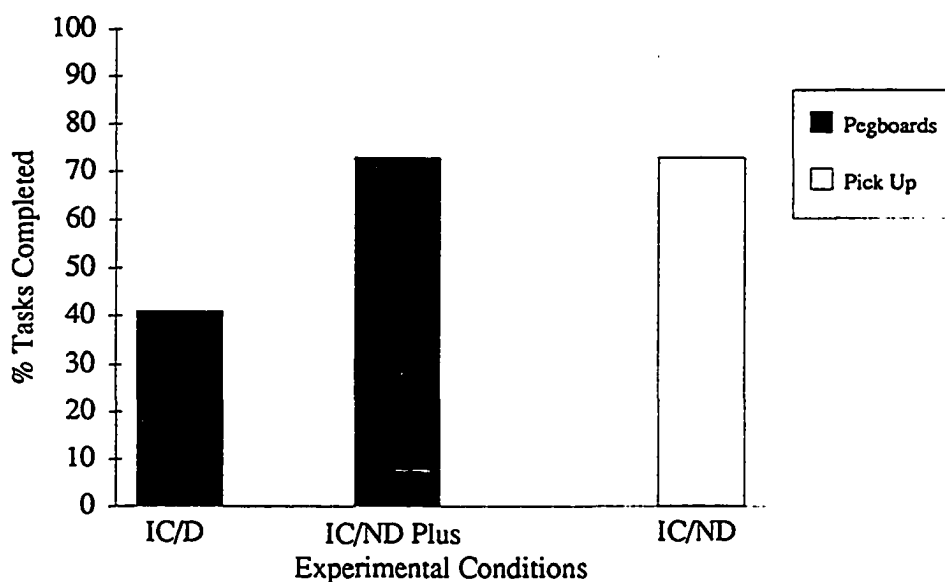
Given the poor control exerted by rules without deadlines and rules with delayed consequences, it was no surprise that rules describing delayed consequences with no deadline did not reliably control the children's behavior. As seen in Table 3 only one child responded once, producing a group mean of 93% procrastination. These results are slightly different from those obtained previously (Braam & Malott, 1990). These results suggest that both no deadlines and delayed consequences are critical variables affecting the control exerted by rules.

### Transfer of the Effects of Disapproval

The effect of the second rule condemning procrastination was considerable and pronounced, when that rule was associated with a particular task. Therefore, the next question posed was whether the control by the anti-procrastination statement would transfer or generalize to other rules specifying immediate consequences with no deadlines, but other tasks in a similar direct-acting contingency. To answer this question, picking up toys and clothes was substituted for completing pegboards. As seen in Figure 7, the rules exerted the same moderate amount of control, even without deadlines, for the new task. Control was better than that exerted by similar rules specifying a pegboard, before the statement of the secondary ethics training.

As previously, S1's performance was again the exception, with no procrastination and 100% task completion. Although the results are interpreted in terms of increasing control with the second rule, other explanations are possible. For example, the type of task specified in the rule, as well as the history of reinforcement

associated with a particular task might account for some of the differences in task completions.



ND=No Deadline; IC=Immediate Consequence; Plus=Plus Disapproval Rule.

Figure 7. Comparisons Between Tasks.

It remains for future researchers to ascertain more clearly whether the relatively better control exerted by the pick-up rule was due to the transfer of greater control with a disapproval rule, due to the task being easier, or due to a behavioral history of avoidance of "scoldings" by picking up when instructed to do so.

#### Behavior Patterns During No Deadline Conditions

An analysis of trials when no deadline was specified showed three patterns of behavior. In one, the children immediately started (within one minute of the presentation of the rule) and finished a task, without taking breaks. In the other they simply walked away or said "no" and then walked away without completing the task.

Only two of the children (S3, S4) displayed (on three trials) what many people consider a typical pattern of procrastination. That is, they put off starting a task until a future time and then completed it. The latencies for delayed starts and completed tasks, ranged from several minutes to one day.

The children's verbal behavior during the no deadline conditions also indicated the weaker control exerted by the rules describing no deadlines. For example, on 16 out of the 72 trials on which they did not complete a task they had said "Later" or "I promise I'll do it" or "I'll do it tomorrow." However, the data show there was little correspondence between their promises and later behavior.

### Summary of Results

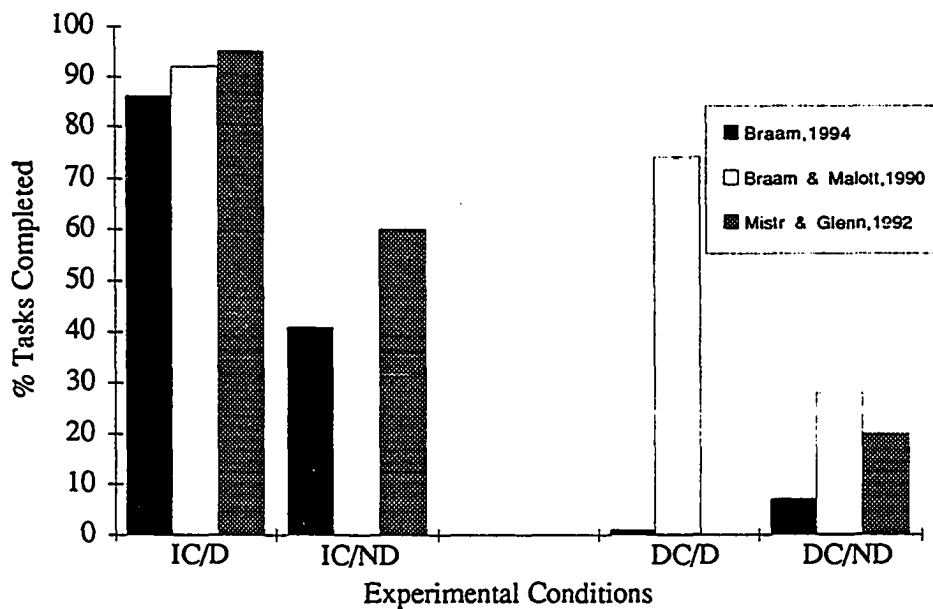
Rules specifying immediate consequences (direct-acting contingencies) with deadlines exerted reliable control over the behavior of the children. Rules specifying one-week delays in the consequences (indirect-acting contingency) with deadlines exerted less reliable control. Rules specifying one-week delays in the consequences (indirect-acting contingency) with no deadlines exerted little control. In addition, when another rule stating that procrastination is not good was stated along with a rule specifying no deadline and the immediate delivery of the consequence. Finally, a statement condemning procrastination, added to a rule specifying an immediate consequence with no deadline, briefly altered an established pattern of procrastination for four out of the five children.



## CHAPTER IV

### CONCLUSIONS

The current study showed that rules specifying immediate consequences (direct-acting contingencies) more reliably control the behavior of young children than rules specifying delayed consequences (indirect-acting contingencies) and result in the least amount of procrastination. This appeared to be true, whether or not deadlines were specified. As seen in Figure 8, these results generally replicated the results of Braam and Malott (1990) and Mistr and Glenn (1992).



D=Deadline; ND=NoDeadline; IC=Immediate Consequence;  
DC=DelayedConsequence.

Figure 8. Direct- Versus Indirect-acting Contingencies. Group Mean Percentages Tasks Completed.

The current study also showed that rules specifying a combination of delayed

consequences (indirect-acting contingencies) with no deadlines control the least amount of behavior in young children and result in the greatest amount of procrastination. As seen in Figure 3 these results also generally replicated those in Braam and Malott (1990) and Mistr and Glenn (1992). (It should be noted that in Mistr and Glenn, the conditions with delayed consequences also included delayed opportunities to respond, which may make these comparisons less than ideal.)

The results showing apparent control by delayed consequences (i.e., Figure 3), however, should not be construed to extend or support other research on self-control or "delayed reinforcement" for several reasons.

First, the line of research presented in this paper is based on a radical behavioral analysis suggesting that most complex human behavior, including self-control and control by indirect-acting contingencies (delayed consequences), is the result of reliable control by rules and not directly by the contingencies themselves. Therefore, the delay specified in a rule is not as critical an issue and the concepts of "delayed gratification" or "delayed reinforcement" are considered misleading. Instead, the present analysis suggests that the poor control by rules specifying indirect acting contingencies was due to their ineffectiveness in functioning as establishing operations. That is, the rules did not as effectively establish the aversiveness of procrastination as when they specified direct-acting contingencies (immediate consequences) with deadlines.

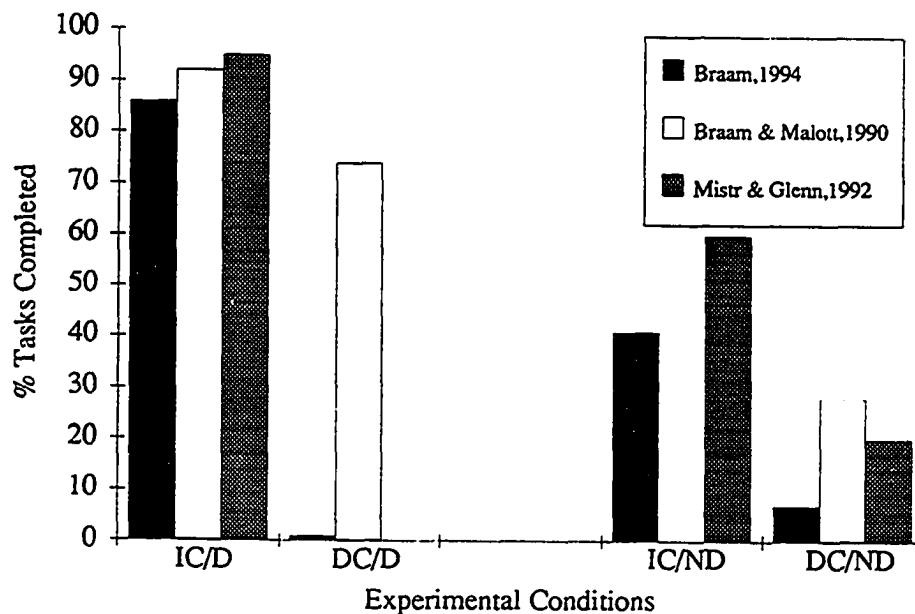
Second, this research is not based on traditional developmental theories and the assumption that factors such as age, sex, intelligence determine when self-control emerges or can be taught. The current research is based, instead, on a radical behavioral analysis which assumes that other factors are more important in determining when the seven prerequisites and "self-control" can be taught. For example, of more importance are the skills of parents and teachers in consistently exposing young

children to rules specifying various consequences and deadlines. Of additional importance are their skills in providing consequences (usually social) to support and increase the control by rules that are not direct-acting and in developing an appropriate history establishing noncompliance with many different types of rules as an aversive condition.

Third, the research presented in this paper is not focused on developing methods to teach children how to maximize reinforcement (Schweitzer & Sulzer-Azaroff, 1988) or to wait for "delayed rewards" (Mischel and colleagues). This is not to say that learning to wait for consequences is not important. However, the length of delay (i.e., in seconds of time) demonstrated to be effective in these studies does not appear to be crucial to the present analysis involving consequences delayed by days, weeks, and months. Therefore, the research presented in this paper was focused on determining the conditions under which rules specifying various consequences and deadlines exerted control. For example, this study examined the effectiveness of an additional "not good" rule in decreasing procrastination. Indeed, the effect of this ethics training with the second rule was considerable, if somewhat transitory for some of the children.

The current study showed that rules specifying deadlines somewhat more reliably control the behavior of young children and result in less procrastination than rules specifying no deadlines. Additionally, it showed that rules specifying immediate consequences with deadlines most reliably control young children's behavior and result in the least amount of procrastination. As Figure 9 shows, this generally supports and extends the findings of Braam and Malott (1990) and Mistr & Glenn (1992). The less than consistent demonstration of the importance of deadlines (note results of immediate consequences with no deadline in Braam and Malott, 1990) suggests that sufficient

behavioral histories establishing consistent control by rules specifying deadlines versus no deadlines varies considerably at this age. However, taken together, the results of



D=Deadline; ND=No Deadline; IC=ImmediateConsequence;  
DC=Delayed Consequence.

Figure 9. Deadlines Versus No Deadlines. Group Mean Percentages Tasks Completed.

the three studies suggest that by the age of four, deadlines are already becoming critical features in rules that can reduce procrastination, whether the consequences are immediate or delayed.

Many researchers studying procrastination have cited the practical importance of deadlines in reducing procrastination (Broadus, 1983; Dillon, et al, 1980; Dillon & Malott 1981; Ellis & Knauss, 1978; Glick & Semb, 1978; Kamali, 1991; Lamwers, Jazwinski, 1989; Metzger, 1982; Roberts, Fulton, & Semb, 1988; Starr, 1984). However, only Malott (1989) and the line of research presented in this paper have attempted to analyze why deadlines are important. Recall it has been theorized that

deadlines make rules more effective because deadlines clarify when rule violations occur. For example, when a task is large and the deadline is distant it is hard for a person to evaluate if they are doing the work necessary to meet that deadline. In other words, it is easy to misjudge the amount of time and work needed to complete the task. However, with small tasks and frequent deadlines, it is easier to estimate the amount of time needed to complete the task and the amount of time available for working on that task. That is, it is easier to recognize the point of time when further failure to work on the task will prevent effective task completion. The recognition of that point in time, then, is an aversive condition which the person escapes by working on the task.

Data from two of the studies (Braam & Malott, 1990; and the current study) suggest that behavioral histories with respect to the type of task specified in a rule might be important. The children in these studies completed fewer tasks involving assembling toys (i.e., puzzles, pegboards) than tasks involving picking up toys, across all conditions. The differential effect associated with different types of tasks is addressed in most studies and analyses of procrastination. That is, task difficulty or lack of motivation for certain types of tasks is often cited as variables that cause procrastination. From a radical behavioral perspective, however, the particular tasks are not as important as the longer histories of reinforcement and punishment associated with certain tasks and with following different types of rules. For example, the greater control exerted by rules specifying picking up toys is predicted, because it is a behavior often requested by teachers and parents and some generalized control by rules specifying the behavior of picking up toys is probably established for many children at an early age.

The demonstration of procrastination in four-year-olds appears to suggest that, contrary to popular misconception, people do not "learn to procrastinate", but never

"learn not to". Variables that appear to affect procrastination in young children include: (a) the specification of a deadline; (b) the availability and delay in the consequences specified in rules (i.e., direct- versus indirect-acting contingencies); (c) the history of reinforcement and punishment associated with following various rules, especially in establishing noncompliance as an aversive condition; (d) the histories associated with various tasks specified in the rules; (e) additional antecedent variables, such as stating the "not good" rule; and (f) the completeness of rules (recall the poor control demonstrated by requests in Braam and Malott (1990) and in Mistr and Glenn (1992)); (g) the early establishment of the prerequisites.

Finally, it is suggested that a radical behavioral analysis of complex problems of self-control, such as procrastination, will prove more useful than correlational studies or other behavioral analyses that rely on the concept of "delayed reinforcement." Critical features of a radical behavioral analysis are the emphasis on control by rules, especially those specifying direct-acting contingencies with a deadline and an emphasis on environmental, rather than "personality" or "developmental" variables in establishing this control at an early age.

## **Appendix A**

### **Approval Letter From the Human Subjects Institutional Review Board**



Western Michigan University  
Kalamazoo, Michigan 49008-3899

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*Human Subjects  
Institutional Review Board*

TO: Cassandra Braam  
Dr. Malott

FROM: Ellen Page-Robin, Chair *EP-R*

RE: Research Protocol #86-11-08

DATE: January 14, 1987

This letter will serve as confirmation that your research protocol, "Reduction of Procrastination in Preschool Children" has been approved by the HSIRB. The Board suggests however, that you not destroy the tapes until after your papers derived from the study are accepted. If you decide to hold the tapes for this purpose, the consent form needs modification to reflect that. Please send us a copy of the modified consent form.

If you have any questions, please contact me at 383-4917.



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