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**Personal goal setting and task performance as a function of  
Type A/B behavior pattern and task difficulty**

**Hui, Len Dang (Karina), Ph.D.**

**City University of New York, 1994**

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PERSONAL GOAL SETTING AND TASK PERFORMANCE  
AS A FUNCTION OF  
TYPE A/B BEHAVIOR PATTERN AND TASK DIFFICULTY

by

LEN DANG (KARINA) HUI

A dissertation submitted to the Graduate Faculty in  
Psychology in partial fulfillment of the requirements  
for the degree of Doctor of Philosophy, The City  
University of New York

1994

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## Abstract

### PERSONAL GOAL SETTING AND TASK PERFORMANCE AS A FUNCTION OF TYPE A/B BEHAVIOR PATTERN AND TASK DIFFICULTY

by

Len Dang (Karina) Hui

Advisor: Professor John L. Andreassi

Locke, Shaw, Saari, & Latham (1981) concluded in a review of the literature that individual differences neither predict goal setting behavior nor do they predict the effects of goal setting on performance. In their recent book, Locke & Latham (1990) maintain that the role of individual differences as a moderator of the goal setting-performance relationship remains unclear. The present study investigates whether the Type A/B behavior pattern (TABP) may be an exception to these conclusions. In addition, little empirical work on TABP and/or goal setting has been devoted to studying the effects of task complexity. The few studies that were conducted suggested that task complexity is an important moderator of the goal setting-performance relationship (Wood, Mento, & Locke, 1987; Garland, 1984; Campbell & Ilgen, 1976). This

study also explores the interaction effects of TABP and task difficulty on goal setting and performance. A sample of 242 male and female college students from three multi-racial urban universities were recruited for this experiment. Subjects were classified as Type A's or Type B's based on the Jenkins Activity Survey. A 2 (Type A/B) x 3 (easy, moderate, difficult tasks) multivariate repeated measures analysis of covariance design was used as the main design of this study. Contrary to what Locke et al. (1981) and Locke and Latham (1990) had concluded about individual differences not determining goal setting/performance, the TABP as an individual difference does affect goals as well as performance on tasks of different difficulty levels. The results of this study provide additional support for past Type A research through the study of goal setting and task complexity. Limitations of the present study were discussed. Finally, implications for organizations and suggestions for future research were offered.

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## CHAPTER I

### INTRODUCTION

This paper reviews the Type A behavior pattern and investigates how this behavior pattern may affect personal goal setting and task performance given different levels of task difficulty. The Type A concept first emerged in the 1950's when two cardiologists, Friedman and Rosenman, observed that their cardiac patients tended to share a particular set of behaviors and emotions that distinguished them from noncardiac patients. Subsequently, they labeled it the Type A behavior pattern (or TABP). The TABP is defined as an

"action-emotion complex that can be observed in any person who is aggressively involved in a chronic, incessant struggle to achieve more and more, in less and less time, and if required to do so, against the opposing efforts of other things or other persons. Persons possessing this pattern are also quite prone to exhibit a free-floating but extraordinary well-rationalized hostility" (Friedman and Rosenman, 1974, p. 67).

The major facets of the Type A behavior pattern are extremes of competitive and achievement strivings, a sense of time urgency and impatience, high levels of

aggressiveness, easily aroused hostility, and devotion to job or career (Friedman & Rosenman, 1974). Those with a relative absence of the above-mentioned characteristics are defined as Type B's.

At the outset of this paper, it is important to distinguish Type A behavior pattern from stress. This pattern indicates neither a stressful situation nor a stress reaction. In addition, it is not to be considered a personality trait. Rather, the TABP is a set of overt behaviors with which some people habitually confront challenging situations (Friedman & Rosenman, 1974). Furthermore, the TABP is not to be considered a discrete all-or-none typology. Rather, it is a continuum of behaviors ranging from extreme Type A to extreme non-Type A (or Type B). In fact, the TABP takes the form of a normal distribution where most people exhibit a mixture of both Type A and Type B behaviors.

In the last two decades, the TABP has become an increasingly popular topic of study not only in the area of medicine (Dembroski, Weiss, Shields, Haynes, & Feinleib, 1978) but also in psychology (Glass, 1977). Its increasing popularity in the field of psychology is

partly due to a growing body of research findings supporting an association between the TABP and task/job performance. One of the objectives of this study, therefore, is to investigate how the TABP may be related to performance.

Another area of study that has long received much attention from behavioral scientists is goal setting. Research that deals with the TABP has yet to make major inroads into this area. For a long time, however, it has been speculated that Type A individuals strive for excessively high goals or performance standards (Jenkins, 1975; Price, 1982). Only more recently have researchers begun to systematically study this particular relationship (e.g., Taylor, Locke, Lee, & Gist, 1984; Grimm & Yarnold, 1984; Ward & Eisler, 1987a,b). In this regard, the TABP has most often been studied in the context of personal (self-set) goal setting rather than in the context of other types of goal setting (e.g., assigned and participative). Thus, the second major objective of this paper is to study the relationship between TABP and personal goal setting. According to Ivancevich & Matteson (1988), Type A characteristics are encouraged and rewarded in

many, if not most, Western societies. Mettlin (1976) contended that the TABP is "integral to the modern occupational career". Also, Caplan & Jones (1975) pointed out that "from a practical point of view, it appears that employees with Type A traits would be of great value to organizations devoted to productivity and achievement" (p. 719). Howard, Cunningham, & Rechnitzer (1977) found that 61% of the managers from twelve different companies were classified as Type A's. Thus, a third major objective of this study is to investigate how the TABP interacts with goal setting to affect job/task performance.

In the present study, the empirical work related to the following areas will be reviewed: (1) the relationship between TABP and performance; (2) the relationship between goal setting and performance; and (3) the potential interaction of TABP and task difficulty with regard to personal goal setting and performance.

### Type A Behavior Pattern (TABP) and Performance

About twenty years ago, psychologists began to

investigate how the TABP may affect task/job performance. The basic question that they were trying to answer is, "Are Type A's better performers than Type B's?" One purpose of the present study is to examine the effects of TABP on performance. Since the research studies on TABP and performance are so diverse, laboratory and field studies will be discussed separately.

#### Evidence from Laboratory Studies

The laboratory studies pertaining to the TABP and performance relationship may be further divided into the following categories: time pressure, multiple task demands, and task incentives.

Time Pressure. Laboratory studies have indicated that Type A's outperformed Type B's on simple arithmetic tasks involving no deadlines. With deadlines, Type B's performed much like Type A's. Furthermore, Type A's performed at the same rate under deadlines and no-deadlines, whereas Type B's only performed better under deadlines (Burnam, Pennebaker, & Glass, 1975; Matthews & Volkin, 1981). These results suggest that Type A's strive to work at their maximal performance level, irrespective of the requirements of

the task. On the other hand, Type Bs' seem to perform according to task demands (i.e., deadlines). If number of arithmetic problems solved and degree of effort exerted on a task (as in the latter two studies) can be considered measures of performance quantity, then, in the absence of an imposed deadline, Type A's are better performers than Type B's. In the presence of a deadline, Type B's perform equally well as Type A's.

Using a similar paradigm as the two previous studies, Bingham & Hailey (1989) demonstrated that Type A's made significantly more errors on an anagram task in a timed but not in an untimed condition. Another study by Strube, Keller, Oxenberg, & Ladipot (1989) showed that Type A leaders tended to bring their groups to a faster decision than Type B leaders. In addition, groups led by Type A's (who are in conflict with a Type A group member) arrived at poorer decisions than groups led by Type B leaders. If 'number of errors' and 'quality of decision making' can be interpreted as measures of performance quality, then, Type As' performance quality, in comparison to Type Bs', seems to be hindered under situations that involve time pressure.

Multiple Task Demands. Some investigators have studied Type As and Bs' performance under multiple task demands. For example, Fazio, Cooper, Dayson, & Johnson (1981) found that Type A college students performed better than Type B college students on multiple tasks including proofreading, word-counting, and solving anagrams. In addition, Juszczak & Andreassi (1987) found that Type A college students displayed faster reaction times than Type B college students when simultaneously attending to either a cognitive or a perceptual motor task. Furthermore, Taylor et al. (1984) found that Type A faculty members who worked on multiple projects increased their productivity. Likewise, Overarchyn, Johnson, & Pretzel (1981) found that Type A's increased their workloads to a greater degree than Type B's both in school and on the job during the course of a semester (that is, Type A's took a greater number of course credits and spent more hours on unpaid work than Type B's). Still, Type A's achieved higher performance levels than Type B's. In another study, Lee, Early, & Hanson (1988) reported that TABP and performance quality were highly correlated when tasks were high in variety. These

studies suggest that Type A individuals outperform Type B individuals under multiple task demands.

Task Incentives. Blumenthal, McKee, Haney, & Williams (1980) investigated the interaction effects of TABP and task incentives on college students' performance during a verbal problem solving task. Type A's were found to perform significantly better when money was awarded for number of correct responses (monetary condition), but not when subjects were told that their task was a measure of intelligence (evaluative stressor condition). It thus appears that Type A's may be more sensitive to monetary rewards than to social evaluation. This may have implications for modifying the TABP. However, more research is necessary to confirm this finding.

Evidence from Field Studies. There are slightly fewer field studies on TABP and performance (N = 7) than there are laboratory studies (N = 10). Using a sample of academicians, Matthews, Helmreich, Beane, & Lucker (1980) found that faculty members who are cited more often and who are more productive have significantly higher Type A scores than those who are cited less often and are less productive. Similarly,

Taylor et al. (1984) found a significant positive relationship between TABP and quality and quantity indicators of faculty research productivity. These results seem to suggest that the TABP in faculty members is associated with superior scientific work (i.e., quality of performance) as well as higher productivity (i.e., quantity of performance).

Jamal (1985) examined performance quality and quantity among 218 white-collar employees of a manufacturing firm as well as the amount of effort they exerted on their jobs. Jamal found that Type A's tended to receive lower performance quality ratings than Type B's. In contrast, Type A's were rated significantly higher than Type B's on effort exerted on the job. However, no significant difference in quantity of performance was found between the two groups.

Lee et al. (1988) studied 181 middle level managers in 18 companies representing a wide variety of product and service businesses. The sizes of these companies ranged from small (10 employees) to very large (more than 800 employees). A regression analysis revealed no significant relationship between TABP and

quality of performance as measured by supervisory ratings.

Sutherland & Cooper (1991) investigated the relationship between TABP and accident involvement in a sample of 360 personnel working on offshore drilling rigs and production platforms. The results revealed that Type A's were significantly more accident-prone and were more likely to be accident repeaters than Type B's in an offshore environment.

In a sample of 160 sales representatives of a manufacturing firm, Lee & Gillen (1989) found that TABP was unrelated to performance quality (as measured by supervisory performance ratings including job knowledge, selling effectiveness, and communication). Similarly, Matteson, Ivancevich, & Smith (1984) found no significant relationship between the behavior pattern of life insurance agents (N = 355) and three measures of sales performance (i.e., policy amount, premium income, and total policies). Generally, the studies using sales personnel have failed to support the view that Type A salespersons are better performers than Type B salespersons. It is possible that certain components of Type A may have negative consequences on

sales performance. For example, Lee and Gillen (1989) noted that consumer sales require salespeople to be cooperative with their clients. The job involvement component of the TABP may be helpful in this respect, but the hostility and impatience components of TABP may be detrimental in sales occupations.

Summary on TABP and Performance: Laboratory and Field Studies. Laboratory studies have shown no consistent relationship between TABP and 'performance quality'. On the other hand, field studies have demonstrated a negative relationship between these two variables. In terms of 'quantity of performance', laboratory studies have strongly indicated that Type A's are better performers than Type B's. In field studies, no consistent relationship between these two variables has been found.

However, it appears from the field studies that in some occupations (e.g., university faculty) the TABP is associated with better productivity, while in others (e.g., sales, management, white- and blue-collar work) no such relationship has been found. While one may speculate that Type A's perform better than Type B's in certain occupations than others, there are relatively

too few studies to draw any definite conclusions about the moderating effect of occupational type on the TABP-performance relationship.

Also, it should be noted that field studies have generally used subjective measures (i.e., supervisory performance ratings) to assess job performance, while laboratory studies have mainly used objective measures (i.e., number of items solved, number of correct responses, reaction time). Therefore, some subjectivity may have compromised the results obtained in the field studies.

In terms of the methodological issues observed in the Type A - performance literature, laboratory studies have generally used samples of college students. On the other hand, field studies have utilized a wide variety of occupational groups (e.g., scientists, salespeople, white- and blue-collar employees, managers, and CEO's) and settings (e.g., life insurance company, manufacturing firms, universities, and product and service businesses; offshore platforms). Most of the field studies have also used survey research, which makes it difficult to draw any causal statement with regard to the results obtained. Furthermore, up to 69%

of the surveys are sometimes not returned. Because of the limitations inherent in both laboratory and field studies, the generalizability of the results from this review is somewhat limited.

Still, other methodological issues derived from studies reviewed up to this point should be noted. Relative to the number of epidemiological studies published on Type A, there is a disappointing lack of literature available on the Type A-performance link. In addition, out of the seventeen studies (laboratory and field) reviewed, eight have used the Jenkins Activity Survey (JAS), three have used the Individual Behavior Activity Profile (I-BAP), none have used the Structured Interview (SI), and one each has used other less familiar measures to assess TABP (i.e., Sales Type A Scale, Framingham Type A Scale (FTAS), Bortner Scale, Vicker's Scale, and Matthews Youth Test for Health (MYTH)).

Individuals are also typically classified as Type A's if their scores fall above the median of the Type A scale distribution and as Type B's, if below (e.g., Burnam et al., 1975; Matthews & Volkin, 1981; Fazio et al., 1981). Only a few of the investigators who have

provided information on cut off scores have used the upper and lower thirds or quartiles of the distribution (e.g., Bingham & Hailey, 1989; Juszczak & Andreassi, 1987). As some investigators (Bingham & Hailey, 1989; MacDougall, Dembroski, and Musante, 1979; Yarnold, Mueser, & Lyons, 1988) have noted, agreement between the JAS and the SI ratings tends to be higher if JAS ratings above and below one standard deviation are used. The extreme cut off scores can remove the ambiguous cases where the same individuals, depending on the sample, could be classified as Type A's in one study and Type B's in another.

The most disturbing observation from the Type A-performance literature is that researchers (of both laboratory and field studies) have not systematically manipulated/assessed the characteristics of the tasks (e.g., level of difficulty). In other words, they have neglected to systematically describe the key aspects of the tasks that may have moderated the performance levels of Type A's and Type B's. Nevertheless, some preliminary conclusions can be drawn. It appears that Type A's perform better than Type B's on tasks that are characterized by high variety/multiple demands, low and

moderate difficulty levels, monetary incentives, absence of time pressure/deadline, and scientific work. Type B's, on the other hand, seem to perform better than Type A's on tasks that require quality of decision making and accuracy of responses. Thus, it can be assumed that the TABP may have a positive or a negative influence on performance, depending on the characteristics of the task and the type of performance criteria used (i.e., quality or quantity of performance measures).

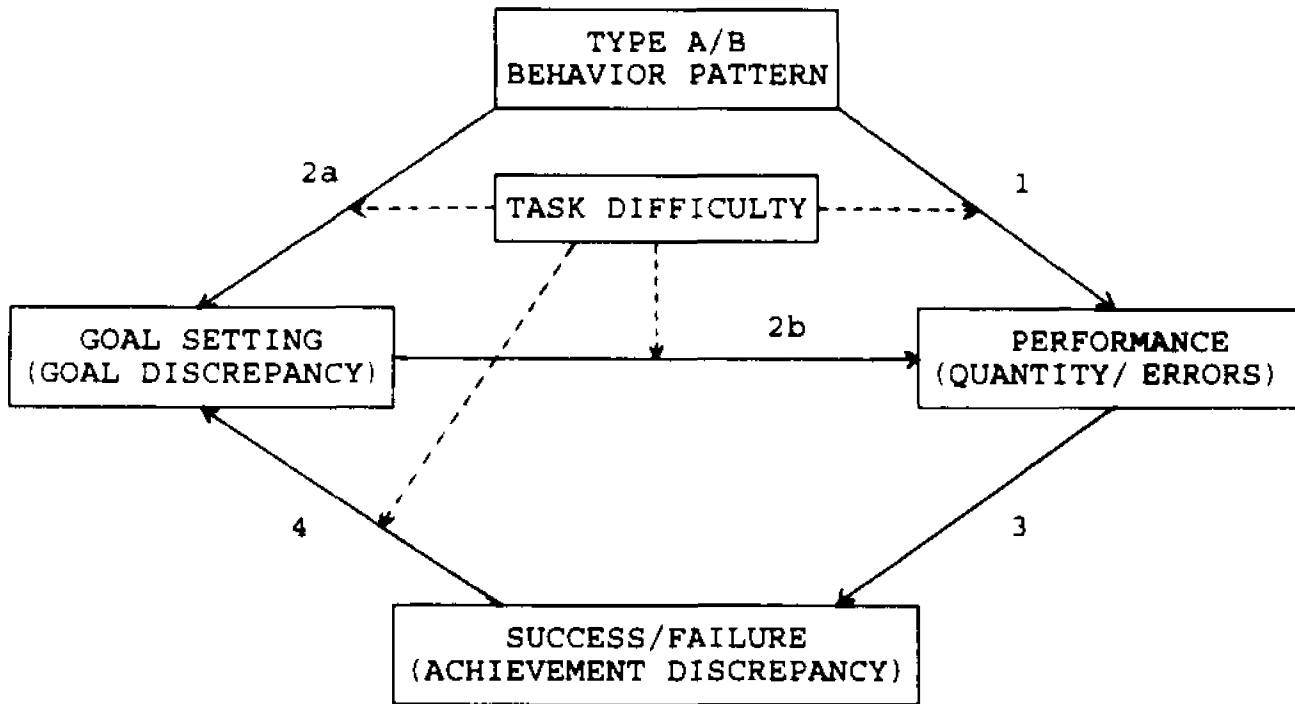
The somewhat different results obtained from the review of the laboratory and field studies may be related to the task/job complexity in each type of investigation. For example, laboratory studies have generally used simple tasks (e.g., arithmetic problems, reaction time), whereas field studies have generally used more complex tasks (e.g., scientific work, management) (also see Wood et al., 1987).

Based on a previous pilot study which incorporated not only easy but also moderately difficult and difficult tasks (Hui, 1992), evidence was found for the hypothesis that Type A's performed as well as Type B's using quality as a criterion. However, there was a

lack of support for the hypothesis that Type A's performed quantitatively better than Type B's. The latter finding is opposite to those of other laboratory studies which did find significant Type A effects on performance (e.g., Fazio et al., 1981; Juszcak & Andreassi, 1987; Taylor et al., 1984; Overarchyn et al., 1981; Lee et al., 1988; Blumenthal et al., 1980; Matthews et al., 1980; Taylor et al., 1984). This contradictory result can be explained by the fact that many of the laboratory studies have used mainly simple tasks. As in the pilot study mentioned above, different levels of task complexity will again be used in this experiment. Thus, the first hypothesis is formulated here:

Hypothesis 1: It is hypothesized that Type A individuals are not superior to Type B individuals on either quantity produced or in the number of errors committed, irrespective of the difficulty level of the tasks (see Figure 1: Arrow 1).

In the next section, a discussion will be presented on the goal setting and performance relationship.



**FIGURE 1.** The Added Variables of Task Difficulty and Success/Failure in Understanding The Relationships among Type A, Goal Setting, and Performance: A New Conceptual Approach

### The Goal Setting and Performance Linkage

This section of the review paper will be divided into three subsections: (1) effects of goal difficulty on performance; (2) influence of success/failure in goal attainment on subsequent goal setting and performance; and (3) the independent effects of goal difficulty and task difficulty on performance.

Effects of Goal Difficulty on Performance. Goal setting is a highly effective technique for increasing motivation. For more than two decades, researchers have been exploring the effects of goal setting on performance. One specific area in the goal setting literature that is heavily researched and well-established deals with the effect of goal difficulty on task/job performance. In both laboratory and field studies, Locke and his colleagues have repeatedly demonstrated that the more difficult the goal the higher the level of performance. For example, in a literature review, Locke (1968) found a .78 rank-order correlation between goal difficulty (when goals were accepted) and performance. They also found that when individuals tried for goals that are so high

that the probability of attaining the goal is reduced, they would still perform better than those who set relatively easy goals. Thus, the basic tenet set forth by Locke is that as goal difficulty increases, the amount of effort expended for goal attainment and performance will increase.

Locke's (1968) proposition that difficult goals lead to higher performance than easy goals was supported by two types of studies: (a) studies which use correlations between "self-stated" goals and subsequent performance and (b) empirical studies which compare two or three different levels of "assigned" goals with performance. Most of the research studies on goal setting have focused on the latter; that is, on the relationship between levels of assigned goal setting and performance. The major disadvantage of this method is the implicit assumption that goals that are assigned by others can be equated with goals set by the individuals themselves. In other words, it is often assumed that individuals readily accept the goals that authorities (e.g., experimenters, organizational superiors) assigned to them. In realization of this, Locke reformulated his earlier proposition to include

the following: goal difficulty will be positively and linearly related to performance given that the subjects accept the goal. For instance, it would be only logical for employees who are assigned a difficult goal by their superiors to work harder, provided that they have accepted the goals that are assigned to them.

Three independent reviews of the goal setting literature (i.e., Steers & Porter, 1974; Latham & Yukl, 1975; Locke et al., 1981) have concluded that existing evidence provides strong support for Locke's (1968) proposition that difficult goals, if accepted, result in better performance than easy goals. In addition, Mento, Steel, & Karren's (1987) meta-analysis on 70 goal setting studies published from 1966 to 1984 also found that goal difficulty was strongly related to task performance across a variety of tasks (mean effect size = .58). This effect size equals an expected 11.6% increase in average performance above baseline.

In a recent laboratory study with 60 undergraduate business students working on a managerial decision making task, Bandura & Jourdan (1991) also found that personal goal setting acted as a significant determinant of performance. (Performance was defined

as quality of management decision making.) More specifically, they found that the higher one's self-set goals, the higher one's level of performance.

In their review of field research on goal setting, Steers & Porter (1974), however, discovered that the relationship between goal difficulty and performance is more complex than what Locke and his associates had postulated before. While laboratory studies have generally shown a positive relationship between goal difficulty and performance, field studies have demonstrated a more complex relationship or a lack of relationship.

Similarly, in a meta-analysis of the goal setting literature (N = 87), Tubbs (1986) found that the effects were weaker in studies which used subjective measures of goal difficulty (surveys; mean effect size = .19) than in those which used more direct measures of goal difficulty (controlled studies; mean effect size = .82). In addition, when testing the effects of goal difficulty on performance, stronger effects were obtained in the laboratory (Mean effect size = .90) than in the field (Mean effect size = .52) (see also Steers & Porter, 1974).

These findings also complement those found in the Type A literature, and may be explained in the following way: asking subjects to judge the difficulty level of their goals (as is usually done in surveys) and then correlating the responses with performance is a less reliable method (which therefore leads to weaker effect sizes) than objectively measuring the goal difficulty levels (as is usually done in laboratories) and then relating them to performance (which therefore leads to stronger effect sizes). In other words, self-reports obtained from survey research do not tap goal difficulty as accurately as more direct measures have. In addition, survey studies generally have relatively large sample sizes which often enable small effects to reach traditional levels of significance. The above reasoning does not demonstrate that laboratory studies are superior to field studies. For example, in laboratory studies, subjects may be more willing to accept an extremely difficult goal when they know that they will have to work for a short period of time. Thus, the generalizability of both laboratory and field studies need to be questioned.

Although the literature generally supported the

notion that more difficult goals led to increased performance than easier goals, exceptions to this trend were noted (e.g., subjective measures, field settings). The complexity of goals has even been noted by Locke (1982). In a sample of 247 college students working on a brainstorming task (i.e., students were asked to give uses for common objects without regard to quality), Locke reported that goals were linearly related to performance when they ranged from easy to difficult, but were unrelated to performance when they became impossible. That is, performance did not drop as goals reached impossible levels. Rather, students tried to achieve their goals and there was a tendency for students' performance to improve only slightly as goals became impossible.

The Influence of Success/Failure in Goal Attainment on Subsequent Goal Setting and Performance. Lewin (1958) claimed that experiences of success and failure on a task are not determined by one's absolute level of performance, but rather by one performance in relation to one's personal standard or level of aspiration. Level of aspiration is defined as the standard used to appraise performance. If the standard

is met or exceeded, the individual experiences success. If the individual does not meet the standard, failure is experienced.

Success/failure on a previous goal also influences subsequent goal setting and performance. For example, Lewin (1958) noted that individuals are more likely to set higher goals after success and lower goals after failure. The findings obtained by Vance & Colella (1990) also suggested that individuals respond to performance improvement (i.e., success) by raising their goals, and to respond to failure by setting lower or more realistic goals. Also, Campion and Lord (1982) conducted a longitudinal field study in a college classroom where students were asked to set their own grade goals for five exams as well as a course goal during the term. They found that students were significantly more likely to set lower goals for the course grade after failing to reach a test goal, and to increase their grade goals for both the course and subsequent tests after success in attaining a test goal.

Furthermore, Zander & Newcomb (1967) found that previous success/failure moderated the relationship

between goal difficulty (i.e., how far a goal was above previous performance) and subsequent performance improvement. More specifically, goal difficulty was significantly correlated with subsequent performance improvement for those with more prior successes than failures. Conversely, goal difficulty was not significantly correlated with performance improvement for those with more prior failures than successes. Zander & Newcomb attributed the consistent failure in the latter group to this group's high goal setting behavior, and its refusal to lower its goals after experiencing failure (by setting even higher goals above previous performance with still no obvious performance improvement).

A similar explanation was provided by Zander, Forward, & Albert (1969). They compared consistently successful and unsuccessful groups and found that the successful group set significantly higher goals and attained significantly higher levels of performance. They also found that the goals (defined as the percentage of previous year's performance) of the successful groups were more reasonable than were those of the unsuccessful groups. In other words, these

goals were more likely to be perceived as challenging yet attainable rather than impossible or unattainable.

In a similar vein, Matherly (1986) investigated the influence of success and failure on one task on the subsequent task performance on another task of 118 undergraduate students. They found that prior experience of failure (compared to prior experience of success) on a cognitive discrimination task resulted in a poorer performance on a subsequent anagram solution task. When students were permitted to set their own goals those who had prior failure experiences performed better than those who were not permitted to set their own goals.

The Independent Effects of Goal Difficulty and Task Difficulty on Performance. It may very well be that goal setting is confounded with task difficulty. Generally, the goal setting literature has not made a distinction between the two. One study, however, specifically investigated the relative contribution of goal setting and task difficulty (Campbell & Ilgen, 1976). In this study, 82 undergraduate students solved easy, moderately difficult, or difficult chess problems after being assigned an easy, moderately difficult, or

difficult goal. The results of this study indicated that both goal difficulty and task difficulty contributed independently to task performance. No interaction effect was observed among these two variables with respect to performance.

Other investigators have looked at the role of task complexity as a potential moderator of the goal setting-performance relationship. For example, Early, Lee, & Hanson (1990) studied the moderating effects of task difficulty using a sample of survey respondents from various job levels (e.g., sales, clerical, production, management, executive, owner) of 18 different companies. These companies represented a wide variety of product and service businesses (e.g., electronic, furniture moving). The results of a regression analysis indicated that task complexity moderated the effect of goal setting on performance. More specifically, goal setting had a stronger effect on jobs low in task complexity than on jobs high in task complexity.

Erez, Gopher, & Arzi (1990) also studied the effects of goal difficulty and self-set goal setting on performance. They found that goal difficulty was

positively related to performance on simple tasks. However, performance on a complex task was more likely to be affected by moderate goals. In addition, Garland (1984) noted a positive linear relationship between goal difficulty and performance on simple tasks (i.e., tasks that require little ability). However, on complex tasks (i.e., tasks that require greater ability, effort, information integration, and time), difficult goals are unrelated to performance. Using a regression equation, Wright (1990) was able to determine that task complexity (when controlling for goal difficulty) accounted for a significant 7% of the variance in performance.

Similar results were obtained by Wood et al. (1987). These investigators used a meta-analysis to assess the moderating effects of task complexity in the goal setting studies published from 1966 to 1985 (N = 125). They found that goal setting has stronger performance effects on easy tasks such as reaction time, brainstorming, and simple arithmetic problems (mean effect size = .69), and weaker performance effects on complex tasks such as business game simulations, faculty research productivity, and science

and engineering work (mean effect size = .48) (also see Summary on TABP and Performance). Thus, task complexity served as a significant moderator of the goal setting-performance relationship. More specifically, the magnitude of the goal-performance effects decreased as the task complexity increased.

An important observation made by Wood et al. (1987) is that tasks used in goal setting studies have generally been more simple. One of the objectives of the present study is to investigate how the relationship between goal setting and performance varies as a function of task difficulty (and the TABP) (see Method section).

Summary of Goal Setting and Performance. The goal setting literature has generally demonstrated that the higher/more difficult the goals, the higher the resulting performance. However, there are exceptions to this trend. With more prior 'failures' in goal attainment, goal difficulty is 'uncorrelated' with performance improvement. With more prior 'successes' in goal attainment, goal difficulty is 'correlated' with performance improvement (Zander & Newcomb, 1967; Zander et al., 1969; Matherly, 1986). 'Unsuccessful'

goal attainment also tends to be followed by 'high' goal setting, whereas 'successful' goal attainment tends to be followed by 'moderate' (reasonable) goal setting (Locke, 1982; Zander & Newcomb, 1967; Zander et al., 1969). In addition, goal setting does not significantly improve performance on very complex tasks (e.g., Garland, 1984; Wood et al., 1987; Locke et al., 1981; Locke, 1982; Early et al., 1990; Erez et al., 1990). In other words, it appears that task complexity acts as moderator of the goal setting-performance relationship. Lastly, little empirical work has been devoted to studying the effects of goal difficulty (and task difficulty) on performance, in the context of the TABP. This will be the focus of the next section of the paper.

#### The Potential Interaction of TABP and Personal (Self-Set) Goal Setting with Regard to Performance

Friedman and Rosenman (1959, 1974) described an extreme Type A person as one who strives to achieve a series of goals (or tasks) in the shortest period of time. On the other hand, a Type B individual is

described as one who is relatively uninterested in pursuing multiple goals (or tasks) subject to time restrictions. Also, Price (1982) commented that Type As' excessively high and rigid goal setting represents their foremost and all-pervasive characteristic.

This review on TABP and goal setting is devoted to the examination of the relationship between TABP and goal setting, and among TABP, goal setting, and performance. Only in recent years have researchers begun to show interest in these areas.

According to Hom & Murphy (1985), goal setting studies for the most part have not been designed to assess individual differences (e.g., the Type A/B behavior pattern). Locke et al. (1981) also concluded in their review of the goal setting literature that individual differences are generally unsuccessful in predicting goals or in predicting the effects of goals on performance. However, they suggested that such relationships are more likely to emerge when individuals set their own goals rather than when goals are assigned to them (because the demand characteristics of a situation could easily overshadow the effects of individual differences). Locke,

Frederick, Lee, & Bobko (1984) also stated that "perhaps self-set goals are held more flexibly, because they are simply a matter of personal preference" (p. 250). In addition, Hollenbeck & Brief (1987) demonstrated that when individuals are allowed to set their own goals, they experience higher expectancy of goal attainment as well as higher valence for goal attainment. Similarly, Racicot, Day & Lord (1991) found that Type A's experience higher levels of goal commitment, goal acceptance, and expectancy of success than Type B's. In addition, Locke & Latham (1990) and Erez & Kanfer (1983) argued that providing individuals with a choice in the goal setting process would result in feelings of control which, in turn, would affect goal commitment. With all these issues in goal setting considered as well as those on TABP (see page 3), this section of the paper will focus on the interaction among TABP, self-set or personal goal setting, and performance. Other types of goal setting studies (e.g., studies on assigned and group goal setting) will be included whenever they are useful in illustrating certain points. Self-set or personal goal setting in this paper will refer to the level of performance

individuals expect to attain (also see Method section).

It has been speculated that Type A individuals set higher performance standards/goals than Type B individuals (Jenkins, 1975). Indirect evidence supporting this notion emerges from studies which show, for example, that Type A's work harder than Type B's (Burnam et al., 1975; Carver, Coleman, & Glass, 1976) and that their published work is more often cited than those of Type B's (Matthews et al., 1980; Taylor et al., 1984). Frese, Stewart & Hannover (1987) also found the TABP to be significantly related to goal orientation. Goal orientation was defined as taking one's goals very seriously, focusing one's actions on attaining one's goals, doing things that lead only toward one's goals, and acting immediately on what one has decided to accomplish. More direct evidence that Type A's set higher goals come from research studies that find a direct positive relationship between TABP and goal level (e.g., Racicot et al., 1991; Taylor et al., 1984; Snow, 1978). These studies will be described in greater detail below.

The field study conducted by Taylor et al. (1984) is very interesting. These researchers have

investigated the mechanism(s) through which the TABP might lead to (higher) performance. Through a path analysis, they discovered that the TABP indirectly led to higher productivity (quantity of performance) through Type A faculty setting high performance goals. In addition, their results indicated a significant, direct relationship between TABP and quality of faculty performance (number of citations of their work).

The relationship between TABP and goal setting was also examined in another field study. Using a sample of 197 male and female college students, Grimm & Yarnold (1984) found that Type A's set significantly higher performance goals (i.e., expected percentile ranks on both midterm and final examinations) than Type B's, despite the fact that the two groups did not differ significantly in their actual performance. In addition, Type B college students based their subsequent performance standards on their prior performance, while Type A college students set (high) performance standards independent of their prior performance.

Snow (1978) conducted a similar study, using a sample of 53 college students. This investigator also

found that Type A's set significantly higher goals than Type B's on a series of puzzles; yet, they did not perform better than Type B's. Furthermore, Type A's, when compared to Type B's, showed significantly greater goal discrepancy scores (i.e., level of aspiration for a puzzle minus the attainment score on a previous puzzle) and greater attainment discrepancy scores (i.e., attainment on a specific puzzle minus level of aspiration for that puzzle). Thus, Snow's study shows that Type A's set higher goals than Type B's but do not perform better than Type B's. Also, Type A's consistently set unrealistically high goals on each task and failed to achieve these goals. It thus appears that Type A's do not learn from their earlier failures or accept the limitations of their ability/time and, therefore, fail to modify their high goal setting behavior on subsequent tasks.

In two separate investigations, Ward and Eisler (1987a,b) found that Type A college students set significantly higher goals than Type B's on two sequential information tests, that Type A's did not perform significantly different from Type B's, and that Type A's showed greater achievement discrepancies than

Type B's (i.e., Type A's were less likely to achieve their personally established goals than Type B's). Similar to the explanation in Snow's (1978) study, Ward & Eisler (1987a,b) reported that Type A's' failure to achieve their goals may be due to their tendency to set goals beyond their ability to perform. What is unique about the latter two studies is that Type A's tended to set goals on a subsequent task that were higher than their previous performance to a greater extent than Type B's, but only when they failed to achieve their previous goals. In other words, Type A's tend to set more difficult goals vis-a-vis their past performance than Type B's in response to failure. Such goal setting behavior did not appear in Type A's who did achieve their previous goals.

It may be interesting to learn why Type A's consistently set high goals or goals that are above their past level of performance than Type B's. Some speculations have been expressed in the literature, and will be discussed next.

Why Type A's Consistently Set High Goals: Some Speculations. Very little research exists that

systematically examines the factors which may lead Type A individuals to set high/difficult goals. Locke et al. (1981) pointed out that setting high personal goals is not inherently problematic or maladaptive. A high/difficult goal may serve as a source of motivation such that an individual will achieve the difficult goal or a higher level of performance. For example, Type A's may believe that high goals will increase their level of performance. Although the relationship between high goal setting and enhanced performance has been well-documented (e.g., Locke et al., 1981), other evidence has indicated that high goals are not necessarily associated with better performance in Type A individuals (e.g., Ward & Eisler, 1987a,b; Grimm & Yarnold, 1984; Snow, 1978). Thus, the reason why Type A's set relatively high goals cannot be explained by the motivational factor alone. Other factors are operating.

One possible factor is that Type A's feel satisfied only if they meet high goals or high performance standards (Grimm & Yarnold, 1984). However, satisfaction ratings have generally failed to reveal any Type A/B differences based on performance or

discrepancies between performance and goal setting (e.g., Suls et al., 1981; Grimm & Yarnold, 1984).

A second factor may be that Type A's are influenced by external agents to set high goals (e.g., they see others being praised for setting high goals) (White, Mitchell, & Bell, 1977) or they set high goals to avoid unfavorable consequences such as embarrassment, loss of pride, disapproval, or criticism (Price, 1982). Therefore, Type A's may have attempted to avoid these potential unfavorable aspects of evaluation which may have induced them to set unrealistically difficult goals. However, Blumenthal et al. (1980) have shown that this is not the case. In fact, Type A's are more sensitive to monetary rewards than to social evaluation.

Friedman and Rosenman (1974) have provided yet another explanation. They theorized that Type A's have no internalized standards of excellence. Their feelings of self-worth are often contingent on the feedback they get from significant others rather than from their own self-appraisals. In contrast, Suls et al. (1981) hypothesized that Type A's are more interested in performance standards than Type B's.

Their findings revealed that Type A's were indeed more interested in (a) how their performance compared to past performance, (b) how they perform relative to the best possible performance, and (c) how they socially compare to others. Consistent with the second point (b), Ward & Eisler (1987b) have also shown that Type A's, when setting their own goals, were more interested in information regarding performance excellence than Type B's. In support of the third point (c), Matthews & Siegel (1983) found that Type A children, even after having met an explicit performance standard, preferred to compare their performance with that of a superior comparison other.

Future attempts to systematically investigate these psychological issues may provide further insight as to why Type A's set high personal goals, and may also help to explain why Type A's frequently fail to achieve their goals. Some speculations concerning the latter will be offered next.

Why Type A's Consistently Fail to Achieve Their High Goals: Some Speculations. Type As' failure to achieve their goals may arise from the fact that as the difficulty of the goal increases, the probability of

goal attainment decreases. Other reasons have also been suggested as to why Type A's are less likely to achieve their personal goals than Type B's: (a) Type A's set high goals that exceed their performance potential (Ward & Eisler, 1987b; Grimm & Yarnold, 1984; Price, 1982); (b) Type A's may already be performing at or near their maximum capacity level because they are so hard-driving (Burnam et al., 1975; Price, 1982); (c) cognitive interference resulting from a prior negative outcome or a perceived threat to self-esteem may have had an inhibitory effect on subsequent performance (Ward & Eisler, 1987b); and (d) the harder the goal, the greater the pressure to perform and the greater the chances for failure (White, Mitchell, & Bell, 1977).

It also seems that Type A's tend to deny their real abilities, to refuse to accept/adjust their limitations, or to unrealistically assess their capabilities (Rime & Bonami, 1976; Price, 1982). Such attitudes will certainly lead to higher rates of failure.

Friedman & Ulmer (1984) found that aspirations that exceeded performance potential resulted in chronic and frequent failure which, in turn, led to

dissatisfaction and negative psychological states. Similarly, Ward & Eisler (1987b) noted that unrealistic high personal goals and failure to achieve these goals led to increased dissatisfaction with performance as well as increased psychological distress for Type A's. In addition, Brunson & Matthews (1981) reported that JAS-defined Type A's who were exposed to repeated failures tended to exhibit withdrawals and performance deficits characteristic of learned helplessness. More work is needed to establish why Type A's are more likely to experience negative psychological states and learned helplessness than Type B's as a result of not achieving their personal goals.

Several investigators have provided the explanation that Type A's fail to achieve their personal goals because of their self-evaluation styles (Smith & Anderson, 1986; Brunson & Matthews, 1981; Weidner, 1980; Musante, MacDougall, & Dembroski, 1984). More specifically, they provided evidence suggesting that Type A's differ from Type B's in three types of self-evaluation following task performance: (1) Type A's, in comparison to Type B's, evaluate their performance more negatively by expressing more anger,

frustration, and annoyance; (2) Type A's tend to blame themselves or attribute negative events (i.e., failure) to internal causes (e.g., lack of ability, skill, or effort), whereas Type B's attribute negative events to external causes (e.g., chance; task difficulty); and (3) Type A's selectively attend to negative rather than positive feedback.

Thus, the combination of unrealistic (high) performance standards combined with the above-mentioned self-evaluation styles by Type A's is likely to produce a larger perceived discrepancy between goals and performance. This discrepancy, when combined with Type A's more negative responses to failure (e.g., Gastorf & Teevan, 1980), is likely to motivate Type A's to strive to reduce this perceived discrepancy by setting high or even higher goals and, therefore, to perpetuate their behavior pattern (Smith & Anderson, 1986; Ward & Eisler, 1987b).

Summary on TABP and Goal Setting with Regard to Performance. Although the studies on TABP, personal goal setting, and performance are relatively few, these studies tend to have certain characteristics in common. That is, Type A's tend to set significantly higher

goals than Type B's; yet, they do not perform better than Type B's (Grimm & Yarnold, 1984; Snow, 1978; Ward & Eisler, 1987a,b). It appears that Type A's do not achieve their personal standards because they tend to set unrealistically high (initial) goals. They also respond to failure to achieve these goals (i.e., high achievement discrepancy) by setting subsequent goals that exceed their previous performance (high goal discrepancy) (Snow, 1978; Ward & Eisler, 1987a,b).

Some investigators (Locke et al., 1981; Ward & Eisler, 1987b) have pointed out that setting high personal goals is in itself not maladaptive. It is maladaptive only if it results in failure to achieve these goals and not if it leads to higher levels of performance. An attempt to explain the above findings have led several investigators (Ward & Eisler, 1987a,b; Grimm & Yarnold, 1984) to suggest that Type As' overestimation of their performance potentials on an initial task and their continual overestimation of their performance potential when they were unsuccessful in achieving their goals represent a maladaptation/misregulation of their achievement strivings. A case in point is Burnam et al.'s (1978) study, which

demonstrated that Type A's approached all tasks in an indiscriminately hard-driving manner, whereas Type B's respond more closely to the nature of the task requirements.

Thus, the second hypothesis will be offered here:

Hypothesis 2: It is hypothesized that Type A's will set higher goals than Type B's on all tasks irrespective of their difficulty levels; however, Type A's will not perform<sup>1</sup>better than Type B's (Grimm & Yarnold, 1984; Snow, 1978; Ward & Eisler, 1987a,b) (see Figure 1: Arrows 2a and 2b).

None of the studies on TABP, goal setting, and performance have looked into the effects of task complexity. However, preliminary results obtained by Hui (1992) showed that both Type A and Type B groups failed to attain their goals when the tasks ranged from moderately difficult to difficult levels, but that both groups achieved their goals when the task was easy. Furthermore, Type A's failed significantly more than Type B's on the moderately difficult and difficult tasks. On the easy tasks, Type B's achieved their

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<sup>1</sup>Performance here refers to performance quantity and is defined as the number of anagrams solved correctly.

goals to a greater extent than Type A's.

Hence, the third hypothesis:

Hypothesis 3: It is expected that Type A's will experience smaller (positive) achievement discrepancy scores (i.e., performance on a task minus the goal set for that task) than Type B's on the easy task but that Type A's will experience greater (negative) achievement discrepancy scores than Type B's on the moderately difficult and difficult tasks (see Figure 1: Arrow 3).

Simply put, it is expected that both Type A's and Type B's will achieve their goals on the easy task, but Type B's will achieve more than Type A's. In addition, both Type A's and Type B's will fail to achieve their goals on the moderately difficult and difficult tasks; however, Type A's will fail to a greater extent than Type B's.

According to Raynor and Smith (1966), the higher the goal in relation to past performance (i.e., the higher the positive goal discrepancy score), the more difficult the goal. On the other hand, the lower the goal in relation to past performance (i.e., the lower the negative goal discrepancy score), the easier the goal. Thus, relatively "small positive" and relatively

"large positive" goal discrepancies are assumed to represent moderate and very difficult goals, respectively; while relatively "small negative" and relatively "large negative" goal discrepancies are assumed to represent somewhat easy and very easy goals, respectively.

To date, no research has systematically investigated Type As and Type Bs' goal setting behavior on tasks of various difficulty levels, and especially after they have experienced success or failure on a previous task. However, the results of a pilot study by Hui (1992) revealed that both Type A's and Type B's set significantly lower goals (on a moderately difficult task) in response to success (on an easy task), but that Type A's set significantly higher goals (on a difficult task) than Type B's in response to failure (on a moderately difficult task). These results are not unique to Type A's and Type B's, however. Somewhat similar results have been obtained by Champion & Lord (1981) and Bandura & Cervone (1986). These researchers reported that between 16.7% to 35% of all those who succeeded in reaching their goals eventually decreased their goals on their next task,

and that between 30% to 36% of all those who failed subsequently increased their goals. They suggested that some individuals viewed their goals in terms of a means-end strategy through which they raise their future goals to compensate for past failures.

An important question raised by Pervin (1992) was "whether people seek to attain goals or reduce the discrepancy between where they are and where they want to be -- whether it is goals per se that are motivating or the movement toward or away from them that is motivating". It appears that Type A's strive for higher goals (i.e., mobilize higher levels of effort) to increase their performance because they want to compensate for their past failures, whereas Type B's seek to reduce the discrepancies between goals and performance by lowering their future goals in order to successfully attain these goals. This strategy by Type B's may actually be superior to that of Type A's, because it minimizes the discrepancies between goals and performance and ensures success in goal attainment.

Thus, Hypothesis 4:

Because it is expected that Type A's set high goals in relation to their past performance, in

particular when they failed on a prior task, Type A's should have larger (positive) goal discrepancy scores than Type B's. Because it is expected that Type B's set moderate or intermediate difficult goals in relation to their past failures, Type B's should have smaller (positive) goal discrepancies than Type A's. Consistent with previous findings (Hui, 1992), it is also expected that both Type A's and Type B's will experience (negative) goal discrepancy scores (on the moderately difficult task after success (on the easy task), but that there will be no significant difference in the (negative) goal discrepancy scores between the two groups (see Figure 1: Arrow 4).

Simply put, after success (on the easy task) both Type A's and Type B's will lower their goals (on the moderately difficult task), but there will be no significant difference between the two groups. In addition, after failure (on the moderately difficult task) both Type A's and Type B's will raise their goals (on the difficult task), but Type A's will raise their goals more than Type B's.

A final integration of both Type A and goal setting literatures will be discussed next.

The Type A and Goal Setting Literatures: A Final Note

In general, the Type A literature has neglected to investigate how Type As' performance may be influenced by the way they set goals under various levels of task difficulty. Likewise, an important gap in the theory building and research on goal setting is the relatively lack of an attempt to integrate level of task difficulty and individual differences (i.e., TABP) in the study of the goal setting - performance relationship. These issues become even more complex when prior successes and failures in goal attainment of Type A's and Type B's are taken into consideration.

However, one interesting study that came very close to addressing all these issues (i.e., goal setting, task difficulty, success/failure in goal attainment, and performance) was carried out by Rime and Bonami (1976). These investigators studied the goal setting behavior in two groups of cardiovascular patients (i.e., coronary<sup>2</sup> and hypertensive) and in a

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<sup>2</sup>It is assumed here that coronary subjects are also Type A's because it has been shown in the literature that Type A's have a greater likelihood of suffering from coronary heart disease than Type B's.

control group (i.e., persons treated for fractures). Rime and Bonami found that coronary patients set significantly higher goals and experienced significantly more failures than the controls. They also tended to set higher goals after failure when compared to the controls. Furthermore, success followed by moderate goal setting occurred more often in the control group than in the comparison group. One drawback of this study was that it used only one level of task difficulty (i.e., a simple coordination task).

Building on past research, the present investigator has developed a process model that incorporates the main components of Type A, task difficulty, goal setting, and performance. It is specifically developed with the four hypotheses in mind. This model is depicted in Figure 1. The numbers in the figure correspond to the number of the hypotheses.

In the next few sections of this study, a methodology that encompasses all these various components (i.e., Type A/B behavior pattern, task difficulty, goal setting, performance, and prior success/failure) will be further described and tested.

## CHAPTER II

## METHOD

## Subjects

A total of 842 undergraduate students enrolled in Psychology classes at three urban universities participated in this experiment (521 females, 319 males). Five hundred fifty-four were Introductory Psychology students and were recruited through one of the colleges' subject pool. These students received class credits for their participation. Two hundred eighty-eight were volunteers from Introductory Psychology, Industrial-Organizational Psychology, and Social Psychology classes, and some received class credits for their time.

In selecting subjects for data analyses, three criteria were used. First, non-native English speakers (N = 350, 41.6%) were dropped from data analyses (based on a previous decision) because their limited English proficiency skills may affect their performance on the anagram tasks. Second, subjects who had no prior work experience (N = 107, 12.7%) were also eliminated from

data analyses due to the fact that the Type A scale used contained work-related items that could not be answered by this group. Third, only subjects who scored in the upper and lower third of the Type A scale distribution (N = 465 or 55.2%) were retained for data analyses to minimize the probability of misclassifying subjects who were in the middle one third. This criterion is important because extreme scores on the JAS were found to result in 60% to 90% agreement with the Structured Interview (Matthews, 1982; Jenkins, Zyzanski, & Rosenman, 1979).

The remaining subjects from the original sample (i.e., those who met all three criteria stated above) numbered 242 (28.7%). One hundred thirty-six of these were classified as Type A's (53 Males, 83 Females) and 106 were classified as Type B's (36 Males, 70 Females). Of the 136 Type A's, 48 were Whites, 43 were Blacks, 22 were Hispanics, 11 were Asians/Pacific Islanders, and 12 were in the Other category. Of the 106 Type B's, 23 were Whites, 36 were Blacks, 15 were Hispanics, 20 were Asians/Pacific Islanders, and 12 were in the Other category.

## Materials

### The TABP Scale

All subjects completed the Jenkins Activity Survey in classroom settings (JAS-Form C; Jenkins, Zyzanski, & Rosenman, 1979). The JAS-Form C is a widely used, self-report paper-and-pencil questionnaire. It is cost-effective, objective, and efficient. That is, it can assure a large sample size, and is also quick and easy to administer. It consisted of 52 items (see Appendix B for a copy).

The JAS Sub-Scales. The JAS-Form C yields a Type A scale<sup>3</sup> and three factorially derived subscales: (1) Speed and Impatience; (2) Job Involvement; and (3) Hard-driving and Competitive (Zyzanski & Jenkins, 1970). The 'Speed and Impatience' subscale deals with time urgency and threshold for irritability, such as self and others' reports of one eating rapidly and hurrying the speed of others. The 'Job Involvement' subscale deals with the degree of job demands in one's life and the degree of dedication to one's occupation. The 'Hard-driving and Competitive' subscale involves

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<sup>3</sup>The Type A scale is derived from a discriminant function analysis with the structured interview serving as the criterion.

self and others' ratings of one being hard-driving, competitive, responsible, serious, energetic, preoccupied with deadlines, and concerned with a work schedule even over holidays.

Scoring. The scoring was done by computer, in accordance with the JAS manual and the scoring key. Each item contributed to a scale score, and each item was scored on at least one of the four scales of the JAS. Scoring of the items was based on optimal weights generated by discriminant function analyses to predict the same Structured Interview (SI) classifications of Type A and Type B behavior in middle-aged employed men (Jenkins, Zyzanski, & Rosenman, 1971)<sup>4</sup>. The sum of the weights for each item within a scale equalled the raw score for that scale. The raw scores were then converted into standard scores, and from standard scores into percentile ranks.

Type A/B Classification. The JAS scores are normally distributed in the validation sample. The Type A scale and the three subscales are standardized

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<sup>4</sup>A discriminant-weighting procedure is employed in scoring the Adult JAS (JAS-Form C), in contrast to a unit weighted procedure used with the Student JAS (JAS-Form T).

to have a mean of zero and a standard deviation of 10. Positive scores on the Type A scale indicate a Type A direction and negative scores, a Type B direction (Jenkins, Rosenman, & Zyzanski, 1974). In the present study, individuals who scored in the upper and lower thirds of the Type A scale distribution were subsequently designated as Type A's and Type B's, respectively.

Reliability. Inter-rater reliability between two independent raters hand-scoring the JAS scale was 86% (Blumenthal et al., 1981). Internal consistency alpha coefficients for the Type A scale ranged from .83 to .85 (Jenkins et al., 1979). Test-retest reliability across a four to six month interval ranged from .65 to .82 (Jenkins et al., 1974), across a one year interval, it was .66 (Krantz, Glass, & Snyder, 1974), and across a 1 to 4 year interval, it ranged from .60 to .70 (Jenkins, 1974, 1978).

Convergent Validity. The convergent validity among the JAS and SI (Structured Interview) is only moderate. In other words, these two Type A measures do not show high levels of agreement in distinguishing Type A individuals from Type B individuals. For

example, one study found that the JAS agreed with the SI classification of middle-aged white-collar and undergraduate men in about 60% to 70% of the cases (Matthews, 1982). However, agreement between the JAS and SI tended to increase when the JAS ratings above and below one standard deviation from the mean were used (Bingham & Hailey, 1989). That is, when the ambiguous cases were dropped.

Thus, although the SI and the JAS classified people similarly above chance level, they also classified a substantial proportion of people differently. For example, Jenkins (1978) reported that 35% of middle-aged men were classified differently by the JAS and the SI.

Summary. This review of the JAS suggested two conclusions: (a) the reliability of the JAS was moderate to moderately high; and (b) the predictive validity of the JAS is unknown. That is, neither the JAS nor the SI had been validated with performance criteria.

### Experimental Tasks

Subjects were asked to solve anagrams<sup>5</sup>. Anagrams have frequently been used in goal setting research (e.g., Tang, Liu, & Vermillion, Jr., 1987; Tang & Liu, 1989; Strube & Boland, 1986; Bingham & Hailey, 1989; Hollenbeck & Brief, 1987; Racicot et al., 1991; Vance & Colella, 1990). Each subject was given three sets of anagram solution tasks to solve: easy, moderately difficult, and difficult. (Note: The difficulty levels of the three anagrams sets were not revealed to the subjects). The objective difficulty levels were determined using the median solution times of the anagrams (Tresselt & Mayzner, 1966), and were categorized into: (a) 'easy' with a Mean = 30.45 sec (or 0.51 min) and a Range = 7 to 72 sec (or 0.12 to 1.20 min); (b) 'moderately difficult' with a Mean = 120.4 sec (or 2.01 min) and a Range = 81.5 to 159.5 sec (or 1.36 to 2.66 min); and (c) 'difficult' with a Mean = 222.2 sec (or 3.70 min) and a Range = 182.5 to 240 sec (or 3.04 to 4.00 min). Each set of anagrams contained 10 items of five letters in length and

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<sup>5</sup>An anagram is a scrambled set of letters that can be re-arranged to make a word.

occupied a page to allow for instructions as well as ample space for subjects to work on. Prior to each anagram set, subjects were provided with practice trials (i.e., easy practice items prior to the easy task, moderately difficult practice items prior to moderately difficult task, and difficult practice items prior to the difficult task). Examples of easy anagrams were 'oewrp' (power) and 'rbloa' (labor). Examples of moderately difficult anagrams were 'tlcee' (elect) and 'reckl' (clerk). Examples of difficult anagrams were 'datir' (triad) and 'canoe' (ocean). Anagram lists are presented in Appendix B.

Each level of task difficulty was administered to a subject only once. The order of administering the three tasks was identical across subjects; that is, every individual received the same order of anagrams starting with the easy anagrams and followed by the moderately difficult and then the difficult anagram sets. Counterbalancing the order of presentation was not used in this study, because it would confound with level of goal setting and level of performance which, in turn, would affect the interpretation of the goal discrepancy scores.

### Procedure

Subjects were given a brief explanation of the purpose of the study as well as examples and rules for solving anagrams. They were then asked to read and sign an Informed Consent Form and to fill out the Biographical Data Form, which contained the following information: (1) whether they were a native English speaker<sup>6</sup> or not; (2) gender (TABP appeared to be more prevalent in men than in women); and (3) prior experience in solving anagrams (familiarity with these tasks would increase the true performance scores). In the latter question, subjects were asked to estimate the number of times in the past year they had spent on solving anagrams and/or word puzzles, on a Likert scale of 1 to 5 where 1 = never; 2 = 1-2 times; 3 = 3-4 times; 4 = 5-6 times; and 5 = 7 or more times.

After completing both the Subject Consent Form and the Biographical Data Form, subjects were asked (1) to fill out the Survey Questionnaire (i.e., the JAS-Form C), (2) to practice on a sample of items prior

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<sup>6</sup>Native English speakers refer to those individuals for whom English is their native language or to those individuals for whom English is most often spoken at home.

to task 1, and (3) to state how many anagrams out of a maximum of 10 they expected to solve correctly within 5 minutes. The latter served as a measure of goal setting for the first anagram task. Subsequently, subjects were given 5 minutes to work on the actual anagrams.

At the completion of the first anagram task, subjects were asked to rate the difficulty level of the task on a 5-point Likert scale, where a score of 1 = extremely easy; 2 = somewhat easy; 3 = neither easy nor difficult; 4 = somewhat difficult; and 5 = extremely difficult.

A second question asked subjects to rate how interesting the first anagram task was on a 5-point Likert scale, where 1 = extremely uninteresting; 2 = somewhat uninteresting; 3 = neither uninteresting nor interesting; 4 = somewhat interesting; and 5 = extremely interesting.

In a third question, subjects were asked whether they thought they had succeeded in obtaining their goal on the first anagram task, where 1 = yes and 2 = no.

A fourth question was designed to measure subjects' willingness to continue with the next anagram

task on a 5-point Likert scale, where 1= extremely unwilling, 2 = somewhat unwilling, 3 = neither willing nor unwilling, 4 = somewhat willing, and 5 = extremely willing.

Similar procedures were followed for the second and third anagram tasks. When all the materials were collected, students were debriefed and thanked for their participation. The entire experimental session lasted approximately one hour and fifteen minutes<sup>7</sup>.

#### Design

A 2 (Type A/B) x 3 (easy, moderately difficult, difficult task) multivariate analysis of covariance (MANCOVA) was chosen as the main design in the present study, with task difficulty serving as the repeated factor (see Table 1). Also refer to Appendix C for the reasoning behind the choice of MANOVA over ANOVA.

#### Independent Variables Defined

Type A/B. Individuals scoring in the upper and lower thirds of the distribution, according to

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<sup>7</sup>Based on a pilot study (Hui, 1992), the author was able to determine how much time needs to be allocated to each segment of the experiment; that is, an average of 14.5 minutes for the Consent Form and the Bibliographical Data Form, 18.2 minutes for the JAS, 25.2 minutes for the three anagram tasks -- for a total of 57.9 minutes -- and about 5-15 minutes for debriefing.

Table 1  
A 2 \* 3 Multivariate Repeated Measures Analysis of Covariance (MANCOVA) Design as The Main Design of The Study

		LEVEL OF TASK DIFFICULTY		
		Easy	Mod. Diff.	Diff.
BE-HA-VIOR PAT-TERN	Type A			
	Type B			

Covariates:

1. Gender
2. Part-/Full-Time
3. Ethnicity
4. Experience
5. Type of Experience
6. No. of Experience
7. Perceived Task Difficulty
8. Interest Level
9. Perceived Success/Failure
10. Motivation Level

Independent Variables:

1. Type A/B
2. Level of Task Difficulty (Easy, Mod. Difficult, Difficult)

Dependent Variables:

1. Performance Quantity & Number of Errors
2. Level of Goal Setting
3. Achievement Discrepancy
4. Goal Discrepancy

Note: A 2 \* 3 Multivariate Repeated Measures Analysis of Covariance (MANCOVA) Design Was Used as The Main Design of This Study. Multiple Analyses Were Carried Out from This Design to Test The Various Hypotheses of This Study.

normative data for the JAS, were classified as Type A's and B's, respectively.

Task Difficulty. Level of task difficulty for the first, second, and third anagram tasks were characterized as easy, moderately difficult, and difficult, respectively (as defined above).

#### Dependent Variables Defined

Performance Quantity. "Performance quantity" refers to the number of correctly completed anagrams.

Errors. "Errors" refers to the the number of anagrams that are fully completed (i.e., with 5 letters) but are not correct, and/or the number of anagrams with more than one full answer (e.g., two solutions are given to an anagram with one being correct and the other one being incorrect). It does not include the number of anagrams tried but not finished.

Level of Goal Setting. "Level of goal setting" is defined as the number of anagrams, out of a total of 10, a subject expects to solve correctly.

Achievement Discrepancy. "Achievement discrepancy" (or AD) is defined as a subject's performance quantity on a given anagram task minus the

goal the subject sets for that anagram task, where a positive AD score indicates success in goal attainment and a negative AD score indicates failure in goal attainment. For example, if a subject expects to solve 7 anagrams (goal setting) but completes 9 anagrams correct (performance quantity), then this person will have an AD score of +2 (positive AD = success). Conversely, if a subject expects to solve 7 anagrams (goal setting) but only completes 5 anagrams correct (performance quantity), then this person will have an AD score of -2 (negative AD = failure).

Goal Discrepancy. "Goal discrepancy" (or GD) is defined as the goal a subject sets on a subsequent anagram task minus the performance quantity score on a previous anagram task, where a positive GD score refers to a goal that is above the level of past performance and a negative GD score refers to a goal that is below previous performance. For example, if a subject completes 7 anagrams correct on a given anagram task (performance quantity) and then expects to solve 9 anagrams correct on a subsequent anagram task (goal setting), then this person's GD score will be +2 (positive GD = harder goal). Conversely, if a subject

completes 7 anagrams correct on a given task (performance quantity) and then expects to solve 5 anagrams correct on a subsequent task (goal setting), then this person's GD score will be -2 (negative GD = easier goal).

### CHAPTER III

#### RESULTS AND DISCUSSION

##### Checks on Experimental Manipulations

##### Gender

A 2 x 2 Chi-square ( $X^2$ ) Contingency Test was conducted to determine whether there was a relationship between TABP and gender; that is, to investigate whether significant differences existed in the observed number of cases and their expected frequencies among the following four groups: (1) Type A Males; (2) Type A Females; (3) Type B Males; and (4) Type B Females.

As indicated in Table 2, the probabilities for Males and Females did not differ significantly as a function of TABP,  $X^2(1, N = 242) = 0.64, p > .05$ . Since the TABP did not depend on gender, the data for

Table 2  
Testing Significance of Difference among Four Type by  
Gender Groups Using  $X^2$  Test of Independence

Behavior Pattern	Males	Females	Total
Type A	53 (50.02)	83 (85.98)	136
Type B	<u>36</u> (38.98)	<u>70</u> (67.02)	<u>106</u>
Total	89	153	242

O	E	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
53	50.02	2.98	8.88	0.18
83	85.98	-2.98	8.88	0.10
36	38.98	-2.98	8.88	0.23
70	67.02	2.98	8.88	<u>0.13</u>
				$X^2=0.64$

males and females were pooled and analyzed together.

#### Number of Experiences As A Covariate

Subjects were assessed on their 'number of experiences with anagrams and/or word puzzles' (i.e., their ability in solving these tasks) to determine whether it was significantly correlated with 'performance quantity', 'performance accuracy', and 'goal setting'. Toward this end, nine (9) Spearman rank-order correlation coefficients (3 for each of the 3 tasks) were computed (See Table 3).

With Performance Quantity. As indicated in Table 3, the Spearman rank-order correlations showed that 'prior experience' correlated significantly with performance quantity on all the three tasks: easy task,  $r_s(242) = .29, p < .0001$ ; moderately difficult task,  $r_s(242) = .25, p < .0001$ ; and difficult task,  $r_s(242) = .32, p < .0001$ .

With Errors. 'Prior experience' did not correlate with number of errors on any of the three anagram tasks. (See Table 3).

With Goal Setting. In addition, 'prior experience' correlated with goal setting on all the three tasks: easy task,  $r_s(240) = .23, p < .0001$ ;

Table 3  
Spearman Rank-Order Correlations for Number of Experiences and Performance Quantity, Errors and Goal Setting under Three Different Levels of Task Complexity

	PERRFORMANCE QUANTITY		
	Easy Task	Moderately Difficult Task	Difficult Task
No. of Experience	.29****	.25****	.32****
	NUMBER OF ERRORS		
	Easy Task	Moderately Difficult Task	Difficult Task
No. of Experience	-.05	-.02	-.02
	GOAL SETTING		
	Easy Task	Moderately Difficult Task	Difficult Task
No. of Experience	.23****	.20**	.21***

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

\*\*\* $p < .001$ , two-tailed. \*\*\*\* $p < .0001$ , two-tailed.

moderately difficult task;  $r_s(241) = .20$ ,  $p < .01$ ; and difficult task,  $r_s(242) = .21$ ,  $p < .001$ . (See Table 3.)

Summary. It appears that one's 'prior experience' with anagrams and/or word puzzles is related to one's performance quantity and goal setting scores. In otherwords, the more experience one has with anagrams, the more one produces on these three anagram tasks and the higher the goals one sets on these tasks. However, past experience with anagrams and/or wordpuzzles is not related to number of errors.

Since 'prior experience' is significantly correlated with two out of three dependent measures (i.e., performance quantity and goal setting), it serves as a potential covariate in later multivariate analyses of covariance (MANCOVA's) procedures.

#### Perception of Task Difficulty As A Covariate

At the end of each experimental task, subjects were asked to rate the difficulty level of the tasks. Spearman rank-order correlations were conducted to assess whether perception of task difficulty was related to 'performance quantity,' 'number of errors,' and 'goal setting'. (See Table 4.)

Table 4  
Spearman Rank-Order Correlations for Perceived Task Difficulty and Performance Quantity, Accuracy, and Goal Setting under Three Different Levels of Task Complexity

PERFORMANCE QUANTITY			
PERCEIVED TASK DIFFICULTY	(1)	(2)	(3)
Task 1 (1)	-.57****	-.44****	-.20***
Task 2 (2)	-.15*	-.47****	-.03
Task 3 (3)	.21**	-.12	-.33****

NUMBER OF ERRORS			
PERCEIVED TASK DIFFICULTY	(1)	(2)	(3)
Task 1 (1)	.02	.07	.11
Task 2 (2)	.03	-.01	.02
Task 3 (3)	.05	-.04	-.15

GOAL SETTING			
PERCEIVED TASK DIFFICULTY	(1)	(2)	(3)
Task 1 (1)	-.21***	-.38****	-.37****
Task 2 (2)	-.02	-.12	-.19**
Task 3 (3)	-.07	-.00	-.02

Note: Tasks 1, 2, and 3 represent the easy, moderately difficult, and difficult tasks, respectively.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

\*\*\* $p < .001$ , two-tailed. \*\*\*\* $p < .0001$ , two-tailed.

With Performance Quantity. Spearman rank-order correlations show that 'perceived difficulty on task 1' correlated negatively with performance quantity on all three tasks: task 1,  $r_s(242) = -.57, p < .0001$ ; task 2,  $r_s(242) = -.44, p < .0001$ ; and task 3,  $r_s(242) = -.20, p < .001$ . Also, 'perception of difficulty on task 2' correlated negatively with performance quantity on task 1,  $r_s(242) = -.15, p < .05$ ; and with performance quantity on task 2,  $r_s(242) = -.47, p < .0001$ . Finally, 'perception of difficulty on task 3' correlated negatively with performance on task 1,  $r_s(241) = .21, p < .01$ ; and performance on task 3,  $r_s(241) = -.33, p < .0001$ . (See Table 4.)

Thus, the more difficult a person perceived the three anagram tasks to be, the lower was his/her performance on these tasks, and vice versa. Furthermore, the more difficult a person perceived the first anagram task to be, the lower was his/her performance on a subsequent anagram task (i.e., task 2).

With Errors. Perception of task difficulty was not significantly correlated with performance errors (see Table 4).

With Goal Setting. 'Perceived difficulty on task 1' correlated negatively with goal level on all three tasks: task 1,  $r_s(240) = -.21$ ;  $p < .001$ ; task 2,  $r_s(241) = -.38$ ,  $p < .0001$ ; and task 3,  $r_s(242) = -.37$ ,  $p < .0001$ . Furthermore, 'perception of task difficulty on task 2' correlated negatively with goal setting on task 3,  $r_s(242) = -.19$ ,  $p < .01$ . (See Table 4.)

It appeared that the more difficult one perceived the first anagram task to be, the lower the goal one set on subsequent anagram tasks. Higher level of perceived difficulty on task 2 was also related to lower goal setting on task 3, and vice versa.

Summary. Since 'perception of task difficulty' is significantly related to performance quantity and goal setting, it will be considered as a potential covariate in later statistical analyses (i.e., MANCOVA's).

#### Interest in Anagram Tasks As A Covariate

A second question at the end of each experimental task measured subjects' perceived interest in solving anagrams. Spearman rank-order correlations were performed to test whether 'perceived interest' was correlated with 'performance quantity', 'number of errors' and 'goal setting'. (See Table 5.)

Table 5  
Spearman Rank-Order Correlations for Interest in Solving Anagram Tasks and Performance Quantity, Accuracy, and Goal Setting under Three Different Levels of Task Complexity

INTEREST IN ANAGRAM	PERFORMANCE QUANTITY		
	(1)	(2)	(3)
Task 1 (1)	.20***	.14*	.12
Task 2 (2)	.30****	.24****	.21***
Task 3 (3)	.16*	.15*	.24****

INTEREST IN ANAGRAM	NUMBER OF ERRORS		
	(1)	(2)	(3)
Task 1 (1)	-.15*	.07	.00
Task 2 (2)	-.06	.03	-.03
Task 3 (3)	.05	.06	.00

INTEREST IN ANAGRAM	GOAL SETTING		
	(1)	(2)	(3)
Task 1 (1)	.05	.10	.11
Task 2 (2)	.17**	.25****	.27****
Task 3 (3)	.06	.12	.16*

Note: Tasks 1, 2, and 3 represent the easy, moderately difficult, and difficult tasks, respectively.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

\*\*\* $p < .001$ , two-tailed. \*\*\*\* $p < .0001$ , two-tailed.

With Performance Quantity. As Table 5 showed, performance quantity on task 1 correlated significantly with 'interest in solving anagram task 1',  $r_s(242) = .20$ ,  $p < .001$ ; 'interest in solving anagram task 2',  $r_s(242) = .30$ ,  $p < .0001$ ; and 'interest in solving anagram task 3',  $r_s(241) = .16$ ,  $p < .05$ . 'Interest in solving anagram task 1' also correlated with performance quantity on task 2,  $r_s(242) = .14$ ,  $p < .05$ ; and 'interest in solving anagram task 2' correlated with performance quantity on task 3,  $r_s(242) = .21$ ,  $p < .001$ . Furthermore, performance quantity on task 2 correlated significantly with 'interest in solving anagram task 2',  $r_s(242) = .24$ ,  $p < .0001$ ; and with 'interest in solving anagram task 3',  $r_s(241) = .15$ ,  $p < .05$ . Finally, performance quantity on task 3 correlated with 'interest in solving anagram task 3',  $r_s(241) = .24$ ,  $p < .0001$ .

Generally, the more interest a person showed toward anagram tasks, the better was his/her performance on these tasks, and vice versa. Furthermore, the higher one's performance on task 1, the higher one's interest was on subsequent tasks (ie., tasks 2 and 3). Similarly, the better one performed on

task 2, the more interest one showed toward task 3. Finally, the more interest a person showed toward tasks 1 and 2, the higher was his/her performance on task 2 and 3, respectively.

With Errors. In general, 'interest in solving anagram tasks' did not correlate with performance errors on any of the three anagram tasks (See Table 5.)

With Goal Setting. Goal setting on task 1 correlated significantly with 'interest in solving anagram task 2',  $r_s(240) = .17, p < .01$ ; goal setting on task 2 correlated with 'interest on task 2',  $r_s(241) = .25, p < .0001$ ; and goal setting on task 3 correlated with 'interest on task 3',  $r_s(241) = .16, p < .05$ . In addition, 'interest in solving anagram task 2' correlated significantly with goal setting on task 3,  $r_s(242) = .27, p < .0001$ .

In other words, the higher one's goal on task 1, the more interesting one found anagram task 2 (and vice versa). Also, the higher one's goal on tasks 2 and 3, the more interesting one found these tasks (and vice versa). Likewise, the more interesting one found anagram task 2, the higher was one's goals on task 3 (and vice versa).

Summary. Overall, these findings indicate that 'level of interest' tends to be highly correlated with performance quantity and goal setting. However, 'level of interest' is more likely to be correlated with quantity than with goal setting. In addition, 'interest level' is not significantly correlated with errors. Given the significant results obtained, level of interest will be used as a covariate in the separate MANCOVA procedures for performance quantity and goal setting.

#### Willingnes to Continue As A Covariate

A third question at the end of each anagram task asked subjects to rate their willingness to work on subsequent anagram tasks (regardless of whether they succeeded or failed on a previous anagram task). (See Table 6.)

With Performance Quantity. As Table 6 indicated, a significant correlation existed between performance quantity on task 1 and 'motivation to continue' with task 2,  $r_s(241) = .17, p < .01$ ; task 3,  $r_s(241) = .19, p < .01$ ; and task 4,  $r_s(241) = .17, p < .01$ . In addition, performance quantity on task 2 correlated significantly with 'motivation to continue with task

Table 6  
Spearman Rank-Order Correlations for Willingness to Continue with Subsequent Anagram Tasks and Performance Quantity, Accuracy, and Goal Setting under Three Different Levels of Task Complexity

WILLINGNESS TO CONTINUE	PERFORMANCE QUANTITY		
	(1)	(2)	(3)
Task 1, Continue Task 2	.17**	.07	-.05
Task 2, Continue Task 3	.19**	.21***	.14*
Task 3, Continue Task 4	.17**	.15*	.24****

WILLINGNESS TO CONTINUE	NUMBER OF ERRORS		
	(1)	(2)	(3)
Task 1, Continue Task 2	.12	.09	.00
Task 2, Continue Task 3	.11	-.04	-.06
Task 3, Continue Task 4	.04	-.07	-.04

WILLINGNESS TO CONTINUE	GOAL SETTING		
	(1)	(2)	(3)
Task 1, Continue Task 2	.18**	.32****	.23****
Task 2, Continue Task 3	.23****	.33****	.35****
Task 3, Continue Task 4	.19**	.26****	.28****

Note: Tasks 1, 2, and 3 represent the easy, moderately difficult, and difficult tasks, respectively.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

\*\*\* $p < .001$ , two-tailed. \*\*\*\* $p < .0001$ , two-tailed.

3',  $r_s(241) = .21, p < .001$ ; and with 'motivation to continue with task 4',  $r_s(241) = .15, p < .05$ . Also, 'motivation to continue with task 3' correlated significantly with performance quantity on task 3,  $r_s(241) = .14, p < .05$ ; and performance quantity on task 3 correlated significantly with motivation to continue with task 4 (a hypothetical anagram task),  $r_s(241) = .24, p < .0001$ .

In other words, the higher one's performance was on task 1, the more motivated one was to continue with tasks 2, 3 and 4. Similarly, the higher one's performance on task 2, the higher one's motivation on tasks 3 and 4. Likewise, the higher one's performance on task 3, the more willing one was to continue with task 4 (a hypothetical task). The data also revealed that the more willing one was to continue with task 3, the better one performed on task 3.

With Errors. 'Motivation to continue' did not correlate with number of errors (See Table 6).

With Goal Setting. Overwhelmingly, 'motivation to continue' was highly associated with goal setting on all three tasks. More specifically, goal setting on task 1 correlated significantly with 'motivation to

continue' with task 2,  $r_s(239) = .18$ ,  $p < .01$ ; task 3,  $r_s(239) = .23$ ,  $p < .0001$ ; and task 4,  $r_s(239) = .19$ ,  $p < .01$ . In addition, goal setting on task 2 correlated with 'motivation to continue' with task 3,  $r_s(240) = .33$ ,  $p < .0001$ ; and task 4,  $r_s(240) = .26$ ,  $p < .0001$ . Also, goal setting on task 3 correlated significantly with 'motivation to continue with task 4',  $r_s(241) = .28$ ,  $p < .0001$ . It was further observed that 'motivation to continue with task 2' was significantly related to goal level on task 2,  $r_s(240) = .32$ ,  $p < .0001$ ; and task 3,  $r_s(241) = .23$ ,  $p < .0001$ ; and 'motivation to continue with task 3' was significantly related to goal level on task 3,  $r_s(241) = .35$ ,  $p < .0001$ . (See Table 6).

In other words, the higher one's goals on an anagram task, the more motivated one was to continue with subsequent anagram tasks. Conversely, the higher the motivational level on an anagram task, the higher the goal level on the next anagram tasks.

#### Summary of All The Covariates

To summarize, all the covariates discussed in this study were found to influence performance quantity and goal setting to some extent, but not number of errors.

Although significant correlation coefficients were observed for all the covariates, a large number were due to 'motivation to continue with the next task', followed by interest in anagrams, perceived task difficulty, and number of experiences. In addition, the outcome measures most likely to be affected by these covariates were: (1) performance quantity (through 'interest in anagram tasks', and equally as likely through 'perceived task difficulty' and 'motivational level'); and (2) goal setting (through 'motivational level'). In subsequent multivariate analyses in this study, the effects of each of these potential covariates will be partialled out if found to be significant.

#### Hypotheses Tests

Hypothesis 1. Hypothesis 1 states that Type A individuals are not superior to Type B individuals in either quantity produced or in the number of errors committed, irrespective of the difficulty of the tasks.

"Performance quantity" refers to the number of anagrams completed correctly on an anagram task.

"Errors" refers to the the number of anagrams fully attempted but not answered correctly, and/or the number

of anagrams with more than one full solution. It does not include the number of anagrams tried but not finished.

Hypothesis 1A: Type A's are not superior to Type B's in quantity produced.

A MANCOVA was performed to assess differences in performance quantity among Type A's and Type B's across three different tasks. After partialling out the effects of the significant covariates, it was expected that an absence of a Type A/B main effect (on performance quantity), a main effect for task difficulty, and a lack of interaction between TABP and task difficulty would demonstrate support for Hypothesis 1A.

Partialling Out The Effects of Covariates from Performance Quantity. With the MANCOVA procedure, the effects of the following covariates were controlled for: 1) number of experiences; 2) perceived task difficulty; 3) interest in anagram tasks; and 4) perceived success/failure. The results revealed a highly significant effect for all the four covariates: 'prior experience',  $\underline{t}(239) = 4.021, p < .0001$ ; 'perceived task difficulty',  $\underline{t}(239) = 6.144, p < .0001$ ;

'interest in anagram tasks',  $t(239) = 4.824$ ,  $p < .0001$ ; and 'perception of success/failure',  $t(239) = 5.907$ ,  $p < .0001$ . Thus, all these covariates which accounted for the observed differences in subjects' performance quantity scores were partialled out by the MANCOVA procedure.

Effect of TABP on Performance Quantity. As expected, there was no significant Type A/B main effect, effect size<sup>a</sup> = 0.05,  $F(1,233) = 0.46$ ,  $p > .05$ . In other words, Type A's did not perform significantly better or worse than Type B's across the three different tasks. (See Figure 2.) This suggests that the magnitude of the Type A/B effect is the same for each task condition.

Effects of Task Difficulty on Performance Quantity. There was a highly significant main effect for task,  $F(2,230) = 96.12$ ,  $p < .0001$ . Univariate F-tests contrasting the performance quantity scores for each task condition showed a highly significant difference between task 1 versus task 2, effect size = 3.53,  $F(1,232) = 123.89$ ,  $p < .0001$ ; and between task 1

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<sup>a</sup>For the purpose of this paper, effect size refers to the difference between means.

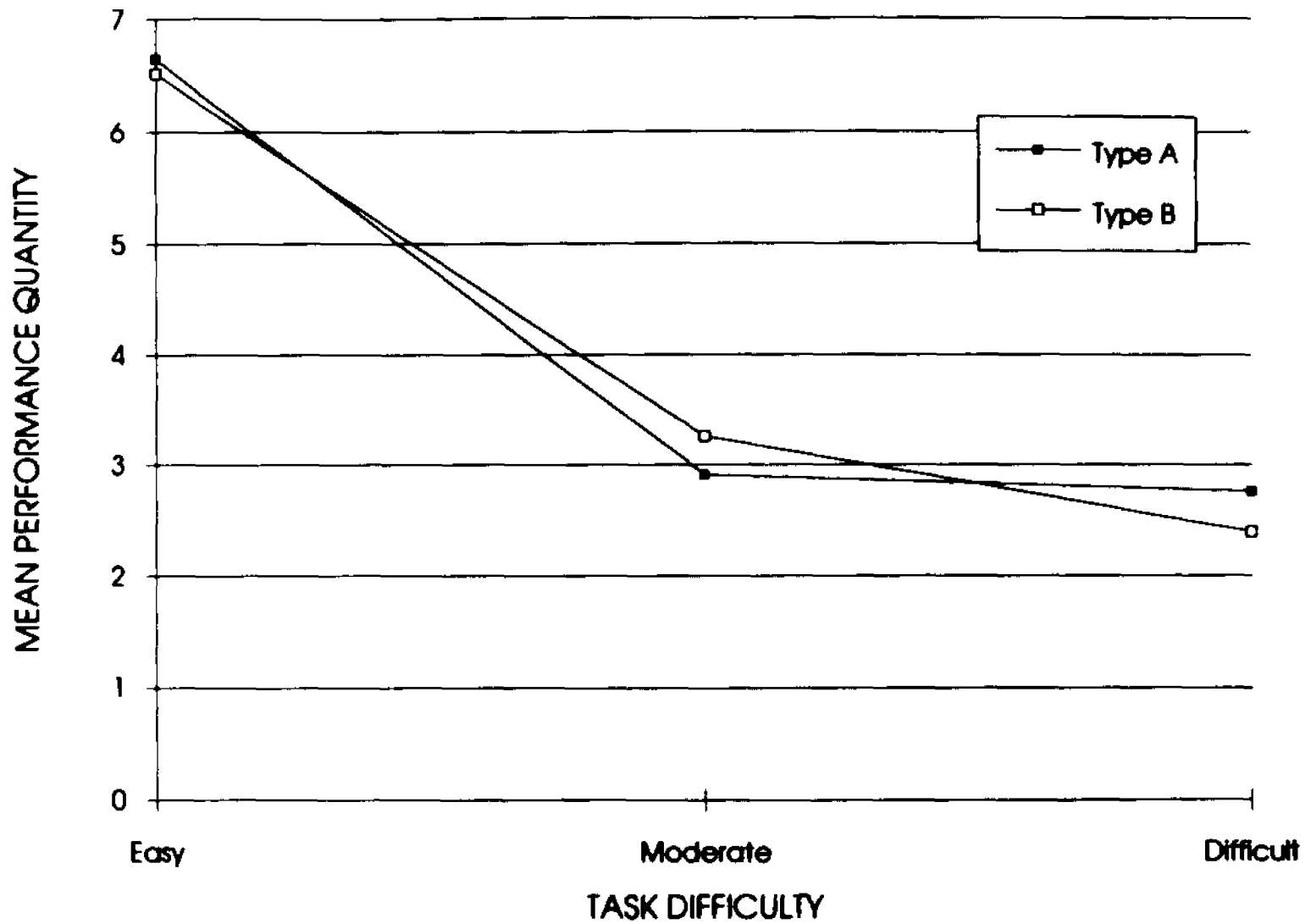


Figure 2. Mean performance quantity as a function of Type A/B behavior pattern and level of task difficulty.

versus task 3, effect size = 3.99,  $F(1,232) = 183.76$ ,  $p < .0001$ . The difference between task 2 versus task 3 also reached significance, effect size = 0.47,  $F(1,232) = 4.78$ ,  $p < .05$ . Additionally, a highly significant difference was found between task 1 versus tasks 2 and 3, effect size = 3.76,  $F(1,232) = 184.54$ ,  $p < .0001$ ; between task 2 versus tasks 1 and 3, effect size = 1.53,  $F(1,232) = 35.40$ ,  $p < .0001$ ; and between task 3 versus tasks 1 and 2, effect size = 2.23,  $F(1,232) = 99.43$ ,  $p < .0001$ . Thus, as was anticipated, all the three tasks (and their various combinations) differed significantly from each other with respect to performance quantity. (See Figure 2.)

Interaction Effect of TABP and Task Difficulty on Performance Quantity. Contrary to expectations, the MANCOVA results showed an interaction effect between TABP and task difficulty,  $F(2,230) = 3.27$ ,  $p < .05$ . That is, performance quantity scores varied for Type A's and Type B's as a function of task difficulty (see Figure 2). To determine on which task(s) the significant difference(s) existed, independent samples t-tests (two-tailed) were conducted. The findings failed to reveal any significant performance difference

between Type A's and Type B's on the three anagrams tasks: easy task, effect size = 0.13,  $t(240) = 0.49$ ,  $p > .05$ ; moderately difficult task, effect size = 0.35,  $t(240) = -0.98$ ,  $p > .05$ ; and difficult task, effect size = 0.363,  $t(240) = 1.68$ ,  $p > .05$ . The significant interaction obtained may be explained in the following manner (see Figure 2): It appeared that Type B's performed somewhat better than Type A's on the moderately difficult task. However, on the easy and difficult tasks, Type A's performed somewhat better than Type B's. Although this performance difference (interaction) occurred for the two groups across the various tasks, it did not show as a significant difference when the groups were compared.

Summary of Hypothesis 1A Findings. In general, support was obtained for Hypothesis 1A. Similar to past research (e.g., Grimm & Yarnold, 1984; Snow, 1984; Jamal, 1985; Ward & Eisler, 1987a; Kirschner et al., 1989), Type A's did not perform better quantitatively than Type B's. However, this result also contrasted with other laboratory studies that found Type A's to be better performers than Type B's (e.g., Fazio et al., 1981; Juszczak & Andreassi, 1987; Taylor et al., 1984;

Overarchyn et al., 1981; Lee et al., 1988; Blumenthal et al., 1980; Matthews et al., 1980; Taylor et al., 1984). This may be attributed to the fact that many of the laboratory studies had mainly used simple tasks (e.g., arithmetic problems, reaction time). This study differed from other studies in that it used not only an easy task, but also a moderately difficult and a difficult task. Field studies which generally used more difficult tasks than laboratory studies also found no evidence for a Type A - performance relationship (e.g., Lee and Gillen, 1989; Matteson et al., 1984).

Hypothesis 1B: Type A's are not superior to Type B's in the number of errors committed.

A MANOVA was performed to assess differences in number of errors committed by Type A's and Type B's across the three different anagram tasks. A MANOVA was used (rather than a MANCOVA), because none of the covariates were found to be significant. It was expected that there would be no Type A/B main effect on number of errors, nor an interaction effect. However, it was expected that there would be a main effect for task difficulty.

Effect of TABP on Number of Errors. In contrast

to predictions, there was a significant Type A/B main effect on number of errors, effect size = 0.36,  $F(1,240) = 5.40$ ,  $p < .05$ . In other words, Type A's were found to commit more errors on the anagram tasks than Type B's. Further independent samples t-tests showed no significant difference in the number of errors made between Type A's and Type B's on the 'easy' task, effect size = 0.18,  $t(240) = 1.58$ ,  $p > .05$ . However, number of errors for Type A's and Type B's differed on the 'moderately difficult' task, effect size = 0.47,  $t(240) = 2.30$ ,  $p < .05$ ; as well as on the 'difficult' task, effect size = 0.44,  $t(240) = 1.96$ ,  $p = .05$ . Thus support was not obtained for the first part of Hypothesis 1B, because Type A's did differ from Type B's in number of errors on two out of the three anagram tasks (See Figure 3.)

#### Effects of Task Difficulty on Number of Errors.

As postulated in this study, a highly significant main effect was observed for task difficulty,  $F(2,239) = 54.24$ ,  $p < .0001$ . To determine which tasks differed significantly from one another in error rate, univariate F-tests were conducted. A highly significant difference in number of errors was found

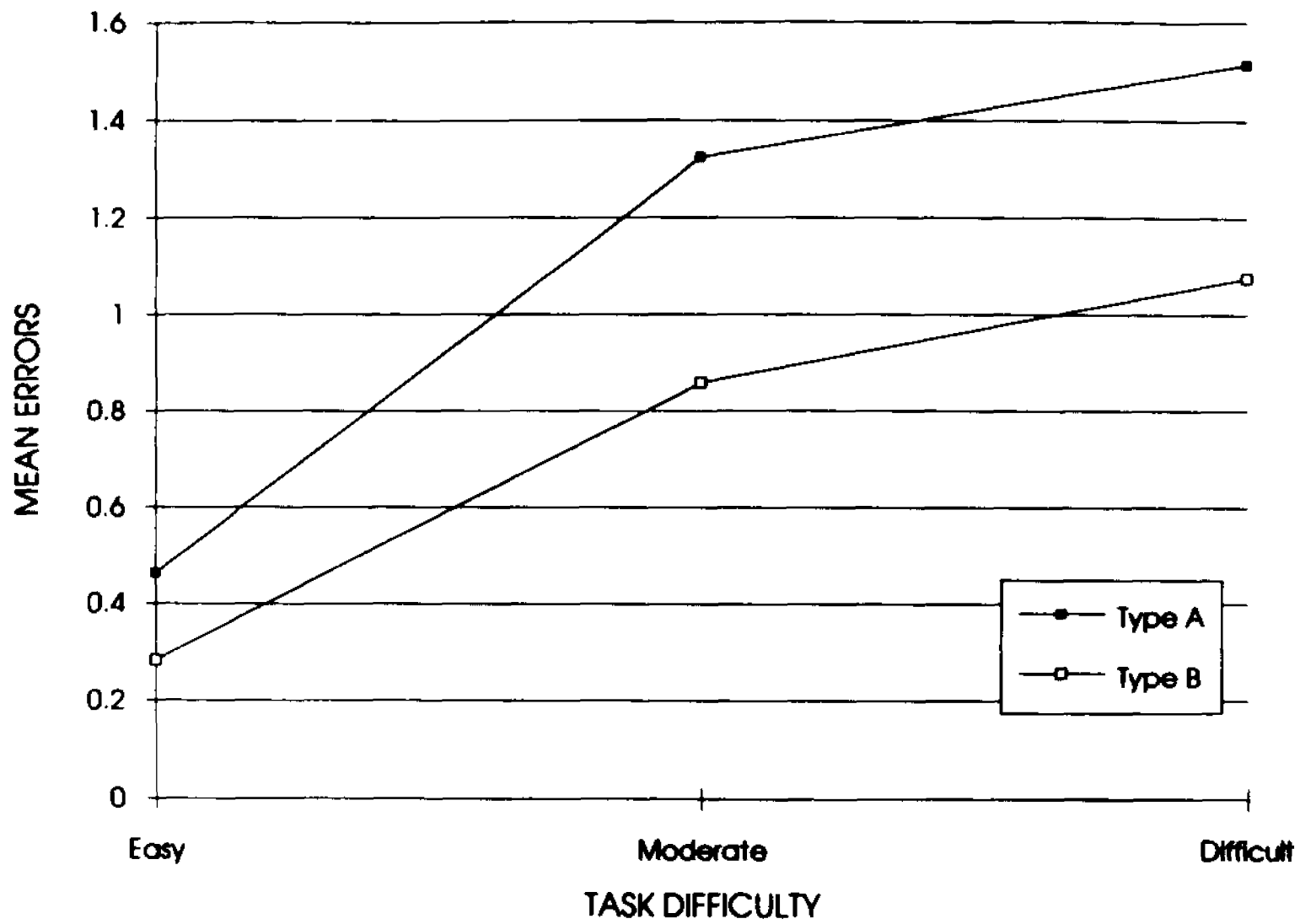


Figure 3. Mean errors as a function of Type A/B behavior pattern and level of task difficulty.

between task 1 versus task 2, effect size = 0.74,  $F(1,241) = 68.43$ ,  $p < .0001$ ; and between task 1 versus task 3, effect size = 0.94,  $F(1,241) = 105.14$ ,  $p < .0001$ . In addition, task 2 differed significantly from task 3, effect size = 0.20,  $F(1,241) = 5.79$ ,  $p < .05$ . Furthermore, the error rate was highly significantly different between task 1 versus tasks 2 and 3, effect size = 0.84,  $F(1,241) = 109.98$ ,  $p < .0001$ ; between task 2 versus tasks 1 and 3, effect size = 0.27,  $F(1,241) = 13.15$ ,  $p < .0001$ ; and between task 3 versus tasks 1 and 2, effect size = 0.57,  $F(1,241) = 56.56$ ,  $p < .0001$ . (See Figure 3.)

All in all, the data showed support for the second part of Hypothesis 1B. That is, each of the three anagram tasks showed distinct differences in number of errors committed. More specifically, as the difficulty level rose with each consecutive task, there was a concomitant increase in the number of errors committed on these tasks, with the easy task scoring the lowest ( $M = 0.384$ ), the difficult task, the highest ( $M = 1.322$ ), and the moderately difficult task scoring in between ( $M = 1.120$ ). (See Figure 3.)

#### Interaction Effect of TABP and Task Difficulty on

Number of Errors. As hypothesized, the results of the MANOVA test indicated an absence of a significant interaction between Type A/B behavior and level of task difficulty,  $F(1,239) = 1.46, p > .05$ . In other words, number of errors did not differ for Type A's and Type B's at different levels of task difficulty. (See Figure 3.)

Summary of Hypothesis 1B Findings. The findings indicated that, overall, partial support was obtained for Hypothesis 1B. Contrary to expectations, the quality of Type A's performance seemed to deteriorate over and beyond those of Type B's. In other words, Type A's appeared to commit more errors than Type B's on the anagram tasks. This finding corroborated with many laboratory and field studies (e.g., Bingham & Hailey, 1989; Strube et al., 1989; Lee & Gillen, 1989; Jamal, 1985; Taylor et al., 1984; Sutherland & Cooper, 1991), and seemed to be in contrast with a few (e.g., Lee et al., 1988). This finding was impressive given the fact that different research methods (i.e., surveys, experiments), performance criteria (e.g., number of errors, decision making, number of citations, supervisory ratings), and tasks (e.g., arithmetic

problems, reaction time, scientific work) had been used in the past in both laboratory and field studies to assess performance quality.

In line with expectations, the error rate continued to climb with each level of task difficulty. Lastly, contrary to expectations, the quality of Type As and Type Bs' work differed only when the task materials were 'moderately difficult' and 'difficult'. Number of errors was the same for both groups on the easy task.

Hypothesis 2. Hypothesis 2 states that Type A's set higher goals than Type B's on all tasks irrespective of their difficulty levels. However, Type A's will not perform quantitatively better than Type B's.

"Level of goal setting" is defined as the number of anagrams, out of a total of 10, a subject expects to solve correctly.

Hypothesis 2A: Type A's set higher goals than Type B's on all tasks irrespective of their difficulty levels.

More specifically, it was expected that there would be a main effect for Type A/B behavior, a main effect for task difficulty, and an absence of an interaction effect between TABP and task difficulty.

Partialling Out The Effects of Covariates from Goal Setting. A MANCOVA procedure was performed to determine of the effects of TABP, task difficulty, and TABP and task difficulty, while controlling for the effects of covariates. The results of this procedure revealed significant effects for the following covariates: 1) gender,  $t(229) = 3.111$ ,  $p < .01$ ; and 2) part-/full-time status,  $t(229) = 2.605$ ,  $p = .01$ ; 3) number of experiences,  $t(229) = 3.157$ ,  $p < .01$ ; 4) perceived task difficulty,  $t(229) = 6.691$ ;  $p < .0001$ ; 5) perceived success/failure,  $t(229) = 4.855$ ,  $p < .0001$ ; and 6) motivation to continue with the next task,  $t(229) = 5.923$ ,  $p < .0001$ . Thus, these six covariates found to account for the observed differences in goal level were partialled out by the MANCOVA procedure.

Effect of TABP on Goal Setting. For the goal level dependent measure, there was a significant Type A/B main effect, effect size = 0.79,  $F(1,221) = 5.30$ ,  $p < .05$ . That is, Type A's set higher goals than Type B's. (See Figure 4.) Independent samples t-tests were performed, contrasting the mean goals of Type A's and Type B's for each task condition. A significant

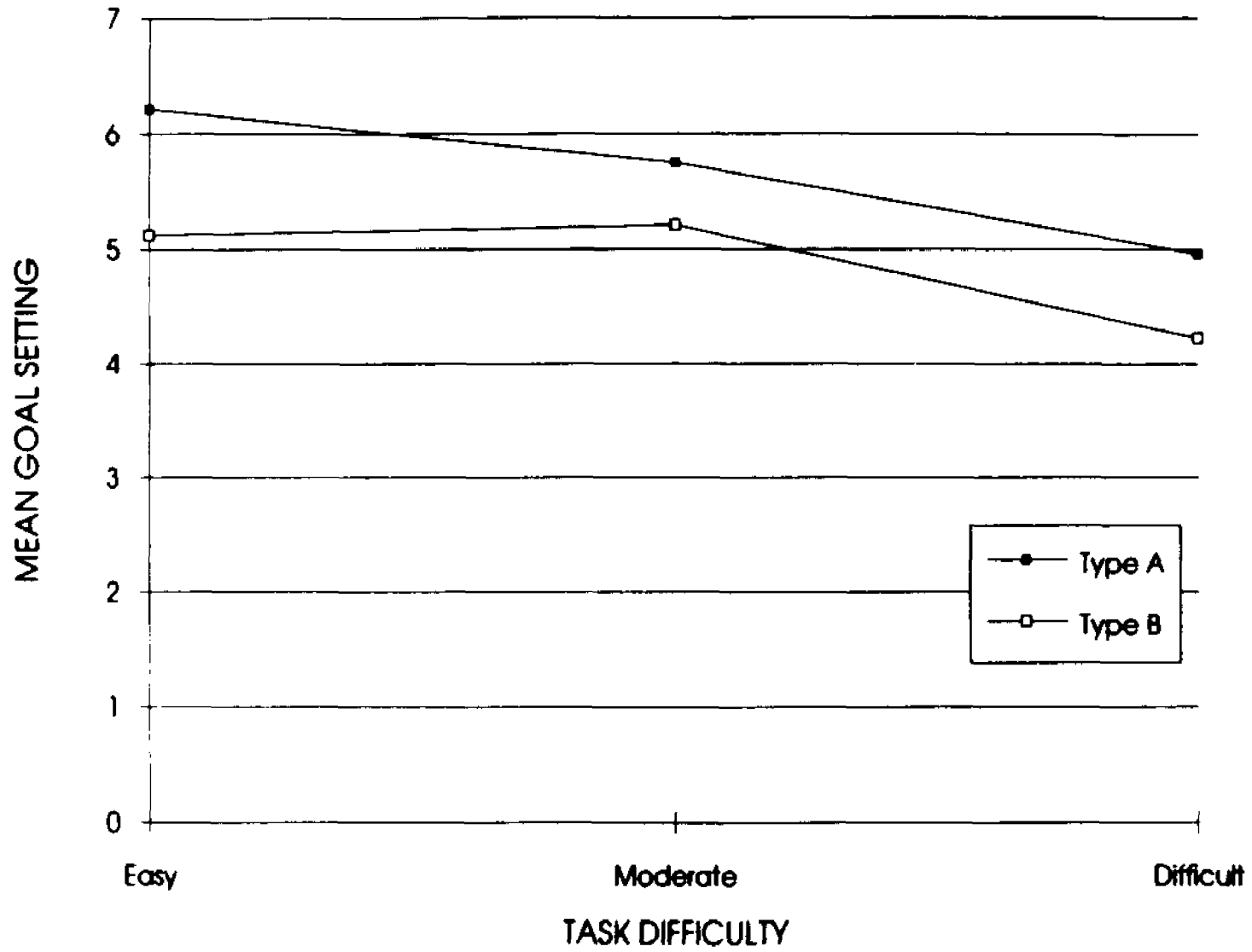


Figure 4. Mean goal setting as a function of Type A/B behavior pattern and level of task difficulty.

difference in goal level was observed between Type A's and Type B's on task 1 (i.e., the easy task), effect size = 1.04,  $t(238) = 3.13$ ,  $p < .01$ ; and on task 3 (i.e., the difficult task), effect size = 0.80,  $t(240) = 2.66$ ,  $p < .01$ . However, no significant difference in goal setting was observed between Type A's and Type B's on task 2 (i.e., the moderately difficult task), effect size = 0.59,  $t(239) = 1.91$ ,  $p > .05$ . (See Figure 4).

Thus, support was shown for the first part of Hypothesis 2A for two of the three tasks. Type A's set higher goals than Type B's on the easy and difficult tasks, but not on the moderately difficult task.

Effects of Task Difficulty on Goal Setting. A significant main effect was found for task on the goal setting measure,  $F(2,220) = 11.81$ ,  $p < .0001$ . Subsequent analyses were conducted to assess which of the three tasks differed significantly from one another with respect to goal setting. Univariate F-tests (contrasting goal setting scores on the three different tasks) revealed a highly significant difference in goal setting scores between tasks 1 and 2, effect size = 0.22,  $F(1,222) = 14.89$ ,  $p < .0001$ ; between tasks 1 and 3, effect size = 1.09,  $F(1,222) = 23.57$ ,  $p < .0001$ ; and

a significant difference between tasks 2 and 3, effect size = 0.87,  $F(1,222) = 6.86$ ,  $p < .01$ . In addition, a highly significant difference was observed between task 1 versus tasks 2 and 3, effect size = 0.66,  $F(1,222) = 22.85$ ,  $p < .0001$ ; and between task 3 versus tasks 1 and 2, effect size = 0.98,  $F(1,222) = 18.70$ ,  $p < .0001$ . However, a significant difference was not found between task 2 versus tasks 1 and 3, effect size = 0.33,  $F(1,222) = 1.04$ ,  $p > .05$ .

In general, level of goal setting differed significantly on the three tasks, with the highest goal being set on the easy task ( $M = 5.73$ ), a somewhat lower goal on the moderately difficult task ( $M = 5.51$ ), and an even lower goal on the difficult task ( $M = 4.63$ ). These findings again provided evidence that the three tasks were well-manipulated with respect to gradation of difficulty levels. (See Figure 4.)

Interaction Effect of TABP and Task Difficulty on Goal Setting. It was expected that an absence of an interaction effect between TABP and task difficulty would demonstrate support for third portion of Hypothesis 2A. The results of the MANCOVA procedure rejected this claim,  $F(2,220) = 3.65$ ,  $p < .05$ . In

other words, level of goal setting did differ among Type A's and Type B's as a function of task difficulty, with Type A's setting higher goals than Type B's on the 'easy' task, effect size = 1.04,  $t(238) = 3.13$ ,  $p < .01$ ; and the 'difficult' task, effect size = 0.80,  $t(240) = 2.66$ ,  $p < .01$ ; but not on the 'moderately difficult' task, effect size = 0.59,  $t(239) = 1.91$ ,  $p > .05$  (See Figure 4).

Summary of Hypothesis 2A Findings. The results partially supported Hypothesis 2A. The findings indicated that Type A's set higher goals than Type B's on two of the three tasks. As expected, goal setting differed significantly across the three tasks (except for one of the combinations of these tasks), with goal levels tapering off as the tasks became more difficult.

Further scrutiny of the data revealed that both Type A's and Type B's expected to solve between four to seven anagrams correctly on each of the three anagram tasks. Nevertheless, Type A's set significantly higher goals than Type B's on two out of the three tasks. Their generally higher level of goal setting compared to those of Type B's lead one to assume that Type A's may have unrealistic perceptions of what they could

actually accomplish<sup>9</sup>, given the various demands they faced in their environments (e.g., task difficulty, time pressure). For example, Type A's may believe that the more difficult (challenging) the goals, the harder they have to work to attain them, and the better will be their performance. However, it did not seem to be true in this study that Type A's performed better with challenging goals than Type B's. Future studies should look into this issue. (See also Suggestions for Future Research section.)

Lastly, it is important to distinguish between initial level of goal setting and subsequent level of goal setting. Type A's did not increase their goals systematically as the tasks got increasingly harder. In fact, they lowered their goals as the tasks became more difficult. Although both Type A's and Type B's adjusted their goals somewhat across the three tasks, it was not clear whether they adjusted their goals because of a previous success/failure or because of the

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<sup>9</sup>Some misconceptions of Type A's were eliminated from this study. They include the possibilities that Type A's may perceive all the three tasks to be easier than Type B's, and that Type A's may be more motivated than Type B's to work on anagram tasks. (Refer to Supplementary Analyses section.)

increasingly more complex tasks.

Hypothesis 2B: Type A's do not perform better than Type B's (on the performance quantity measure).

A MANCOVA was performed to assess differences in performance quantity scores among Type A's and Type B's across the three different tasks. The results of this procedure were presented above (refer to Hypothesis 1A). These findings showed support for Hypothesis 2B. (See Figure 2).

Hypothesis 3. Hypothesis 3 states that Type A's should have smaller "positive" achievement discrepancy scores than Type B's on the easy task, and greater "negative" achievement discrepancy scores than Type B's on the moderately difficult and difficult tasks.

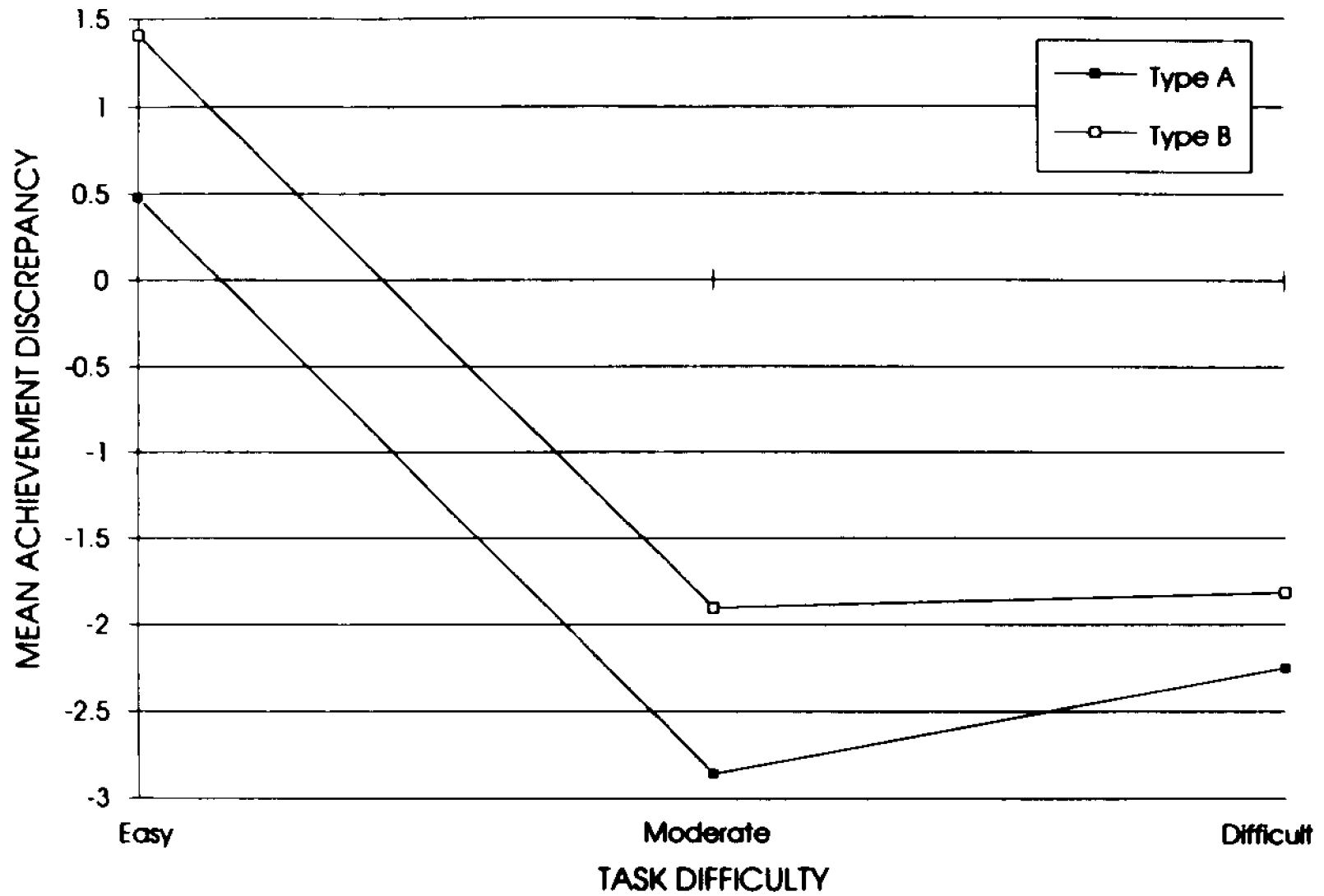
Recall that "achievement discrepancy" (or AD) is a subject's performance quantity score on a given anagram task minus the goal the subject sets on that anagram task. A positive AD score represents success in goal attainment. A negative AD score represents failure in goal attainment.

The presence of a TABP main effect on achievement discrepancy and a main effect for task difficulty demonstrate support for Hypothesis 3. More

specifically, under the easy task Type A's should score significantly lower than Type B's on "positive" achievement discrepancy (i.e., success in goal attainment). In addition, under the moderately difficult and difficult tasks, Type A's should score significantly higher than Type B's on "negative" achievement discrepancy (i.e., failure in goal attainment). Also, no significant interaction was expected between TABP and task difficulty on achievement discrepancy.

Partialling Out The Effects of Covariates from Achievement Discrepancy. Prior to partialling out the effects of covariates, significance testing of all the potential covariates was conducted. The results revealed a significant effect for 'perceived success/failure',  $t(238) = 12.50$ ,  $p < .0001$ ; and for 'motivation to continue with a subsequent anagram task',  $t(238) = 2.51$ ,  $p < .05$ . Thus, these covariates were partialled out by the MANCOVA procedure.

Effect of TABP on Achievement Discrepancy (i.e., Success or Failure in Goal Attainment). To assess Hypothesis 3, a MANCOVA was performed. As expected, there was a significant main effect for Type A/B



**Figure 5.** Mean achievement discrepancy (AD) as a function of Type A/B behavior pattern and level of task difficulty. (Positive AD scores = success in goal attainment; negative AD scores = failure in goal attainment.)

behavior, effect size = 0.77,  $F(1,231) = 8.64$ ,  $p < .01$  (See Figure 5). Follow-up testing showed that, in comparison to Type B's, Type A's generally scored lower on achievement discrepancy scores. More specifically, Type A's achieved significantly less than Type B's on task 1, effect size = -0.87,  $t(238) = 2.28$ ,  $p < .05$ . In addition, Type A's failed significantly more than Type B's on task 2, effect size = -0.88,  $t(239) = 2.59$ ,  $p < .05$ ; but not on task 3, effect size = -0.39,  $t(240) = 1.24$ ,  $p > .05$ .

It thus appeared that: 1) Type A's achieved less than Type B's on the easy task, 2) that they failed to a greater extent than Type B's on the moderately difficult task, and 3) that they failed to accomplish their goals to the same degree as Type B's on the difficult task. Hypothesis 3 which suggested that Type A's should have lower achievement discrepancy scores than Type B's across all three tasks was supported (for two of the three tasks).

Effects of Task Difficulty on Achievement Discrepancy. A highly significant main effect was observed for task,  $F(2,228) = 45.71$ ,  $p < .0001$ . Univariate F-tests indicated a highly significant

difference in achievement discrepancy scores between tasks 1 and 2, effect size =  $-3.32$ ,  $F(1,230) = 86.94$ ,  $p < .0001$ ; and between tasks 1 and 3, effect size =  $-2.9$ ,  $F(1,230) = 54.74$ ,  $p < .0001$ . However, no significant difference in achievement discrepancy scores was observed between tasks 2 and 3, effect size =  $0.38$ ,  $F(1,230) = 1.26$ ,  $p > .05$ . In addition, a highly significant difference was found between task 1 versus tasks 2 and 3, effect size =  $-3.13$ ,  $F(1,230) = 86.28$ ,  $p < .0001$ ; between task 2 versus tasks 1 and 3, effect size =  $-1.85$ ,  $F(1,230) = 41.99$ ,  $p < .0001$ ; and between task 3 versus tasks 1 and 2, effect size =  $-1.28$ ,  $F(1,230) = 15.62$ ,  $p < .0001$ .

Thus, success/failure in goal attainment differed significantly between each task, except for the difference between the second and third tasks. In other words, as the tasks became harder (i.e., after task 1), no significant difference in goal attainment was observed between the next two tasks (i.e., tasks 2 and 3). As illustrated in Figure 5, there was a sharp decline in achievement discrepancy scores from task 1 to task 2, but achievement discrepancy scores remained relatively constant from tasks 2 to 3.

Interaction Effect of TABP and Task Difficulty on Achievement Discrepancy. In contrast to expectations, an interaction effect was observed between Type A/B behavior and task difficulty,  $F(2,228) = 0.72, p < .05$ . In other words, success/failure in goal attainment among Type A's and Type B's was not consistent across the three task conditions (see Figure 5).

More specifically, both Type A's and Type B's achieved their goals on the easy task (i.e., task 1). However, as the tasks became more difficult (i.e., on tasks 2 and 3), both groups failed to attain their goals. Furthermore, in two out of three tasks (i.e., tasks 1 and 2), Type B's performed significantly better than Type A's. That is, Type B's accomplished more than Type A's on the easy task and failed less than Type A's on the moderately difficult task. However, on the difficult tasks, Type B's accomplished as much as Type A's.

Summary of Hypothesis 3 Findings. Support was obtained for Hypothesis 3. This study demonstrated that Type A's differed from Type B's in their goal attainment. In other words, the difference between goal setting and performance tended to be higher for

the Type A group than for the Type B group. This occurred primarily on the easy and moderately difficult tasks (but not on the difficult task). More specifically, Type B's were found to be more likely than Type A's to achieve their goals on the easy task, whereas Type A's were found to be more likely than Type B's to fail to achieve their goals on the moderately difficult task. Similar results were obtained by previous investigators (e.g., Snow, 1987; Ward & Eisler, 1987a,b).

That task 2 did not differ much from task 3 in terms of how successful subjects were in achieving their goals also emerged from this study. This showed that, regardless of whether a task was moderately difficult or difficult, subjects failed to the same extent on these two tasks.

Finally, an interaction between TABP and task difficulty further demonstrated that achievement discrepancy scores changed for Type A's and Type B's at different levels of task complexity.

Hypothesis 4. Hypothesis 4 states that both Type A's and Type B's should exhibit negative goal discrepancy scores on the moderately difficult task with no

significant difference expected between the two groups; however, Type A's should have larger positive goal discrepancy scores than Type B's on the difficult task.

"Goal discrepancy" (or GD) is defined as the goal a subject sets on a subsequent anagram task minus the performance quantity score on a previous anagram task. A positive GD score indicates a goal that is above the level of past performance. A negative GD score indicates a goal that is below previous performance.

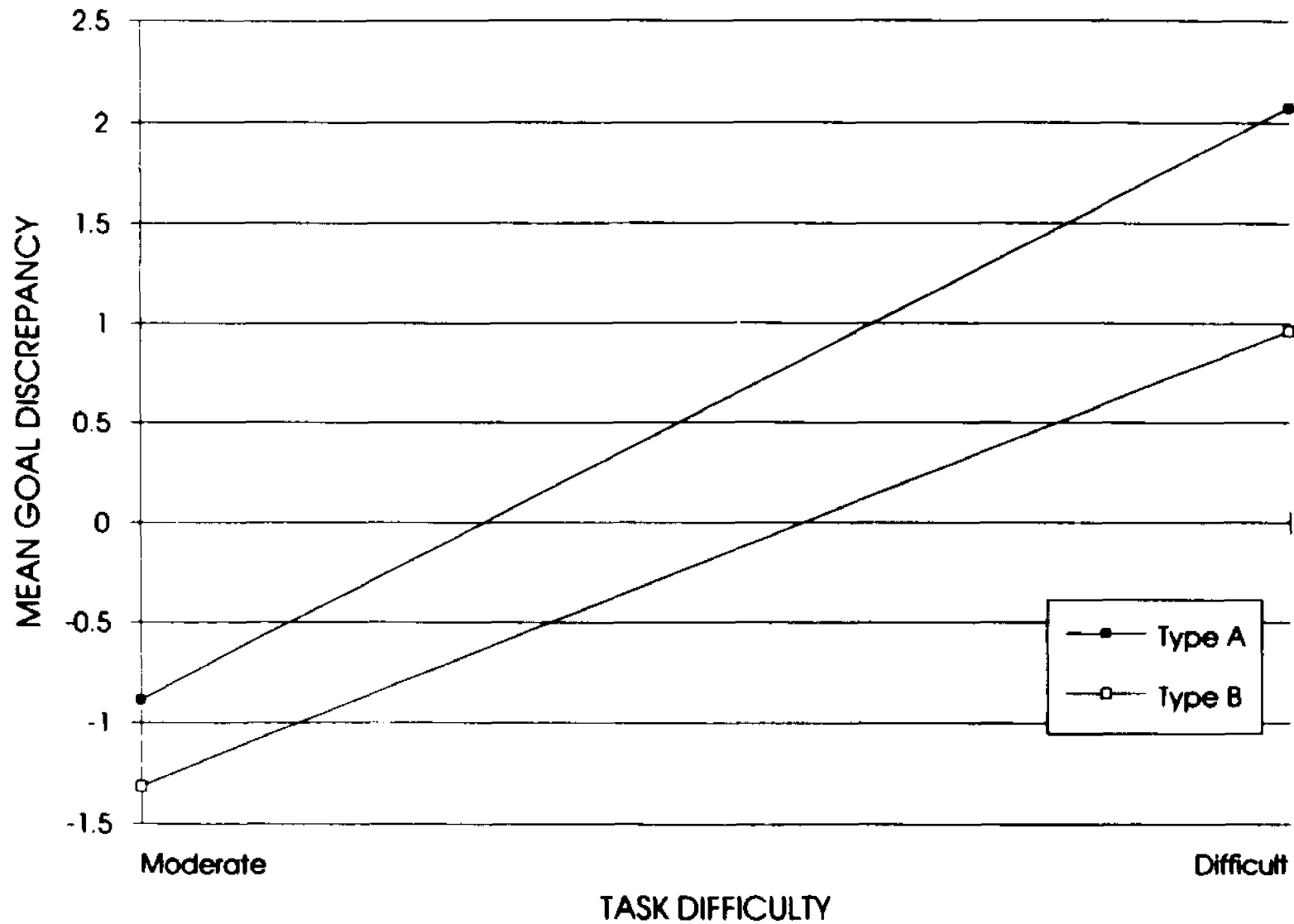
The presence of a main effect for Type A/B behavior and a main effect for task difficulty will demonstrate support for Hypothesis 4. More specifically, both Type A and Type B groups should score negatively on goal discrepancy scores on the moderately difficult task. On the difficult task, Type A's should score positively and significantly higher than Type B's on goal discrepancy. Furthermore, an interaction effect was expected between TABP and task difficulty.

Partiallying Out The Effects of Covariates from Goal Discrepancy. To assess Hypothesis 4, A MANCOVA was carried out with six potential covariates. Out of these six covariates, 'perceived success/failure',

$t(239) = 10.93$ ,  $p < .0001$ , and 'motivation to continue with a subsequent task',  $t(239) = 3.11$ ,  $p < .01$ , were found to be significant. Since these two covariates were found to significantly influence goal discrepancy scores (i.e., individuals' goal setting behavior in relation to their previous performance), they were retained in the MANCOVA procedure.

Effect of TABP on Goal Discrepancy. A main effect emerged for Type A/B behavior, effect size = 0.77,  $F(1,235) = 7.57$ ,  $p < .01$ . (See Figure 6.) Consistent with expectations, independent samples t-tests showed no significant difference in goal discrepancy scores between Type A's and Type B's on the moderately difficult task (i.e., task 2), effect size = 0.41,  $t(239) = 1.32$ ,  $p > .05$ . As expected, however, there was a significant difference between Type A's and Type B's' goal discrepancy scores on the difficult task (i.e., task 3), effect size = 1.10,  $t(240) = 3.52$ ,  $p < .01$ . The latter finding suggests that, in comparison to Type B's, Type A's set significantly higher goals on task 3 in relation to their previous performance (i.e., failure) on task 2.

Furthermore, it should be noted from Figure 6



**Figure 6.** Mean goal discrepancy (GD) as a function of Type A/B behavior pattern and task difficulty.  
 (Positive GD scores = goals above past performance; negative GD scores = goals below past performance.)

that, on task 2, Type A's seemed to score negatively and lower on goal discrepancy scores than Type B's. In other words, Type A's tended to lower their goals less than Type B's on the moderately difficult task (after a successful performance on the easy task). Type B's, on the other hand, tended to set an even lower goal than Type A's on the moderately difficult task (after their successful performance on the easy task). Type A's' goals averaged less than one anagram lower than their past performance, whereas Type B's' goals averaged about one anagram lower than their past performance. The difference between the two groups was not found to be significant, however.

On task 3, Type A's scored positively and higher on goal discrepancy scores than Type B's. This means that Type A's raised their goals far more than Type B's on the difficult task (after they failed to reach their performance targets on the moderately difficult task). Another way to interpret these findings is that Type A's set much more difficult goals for themselves on the difficult task (after failure on the moderately difficult task), while Type B's set somewhat less difficult goals for themselves on the same task (under

a similar performance experience). On the average, Type As' goals were about two anagrams above their previous performance, whereas Type Bs' goals were about one anagram above their previous performance.

Thus, the first portion of hypothesis 4 that there should be a significant Type A/B main effect on goal discrepancy was supported by the current findings.

Effects of Task Difficulty on Goal Discrepancy. A highly significant main effect was found for task, effect size = 2.66,  $F(1,235) = 124.60$ ,  $p < .0001$  (see Figure 6). More specifically, as the tasks changed in difficulty level from moderately difficult to difficult, subjects' goal discrepancy scores changed from negative to positive, respectively. In other words, on the moderately difficult task, subjects tended to set easy/low goals in comparison to their previous performance while, on the difficult task, they tended to set more difficult/higher goals in comparison to their previous performance. This finding conformed to the stated hypothesis.

Another important finding was that people lowered their goals after a successful experience and raised their goals after a failure experience. Similar

results were obtained by previous investigators (e.g., Lewin, Dembo, Festinger, & Gears, 1944; Campion & Lord, 1982; Bandura & Cervone, 1986; Ward & Eisler, 1987a,b; Bandura & Wood, 1989).

One explanation is that when people failed they generally raised their goals irrespective of how difficult the next task was, to compensate for their previous failure or to reduce their dissatisfaction with a previous task by redoubling their efforts (Campion & Lord, 1982; Bandura & Cervone, 1986). Conversely, when people succeeded in their tasks, they became complacent and reduced their personal goals.

A second explanation is that subjects perceived correctly that the third task was "very difficult" and were challenged to meet the task by setting difficult (challenging) goals, versus the second task which they perceived as "less difficult" or challenging.

A third explanation is that Type A's and Type B's felt more experienced with the anagram tasks after two tries than after one, that they were more confident and willing to set higher goals on the next task. Type A's then showed their true selves by raising their goals way above their past performance, whereas Type B's

showed their true selves by adjusting their goals just above their previous performance.

Further study on these issues is required to better understand the current findings.

Interaction Effect of TABP and Task Difficulty on Goal Discrepancy. As expected, a significant interaction effect was evidenced between TABP and task difficulty on goal discrepancy scores,  $F(1,235) = 4.79$ ,  $p < .05$ . Figure 6 showed a trend where the mean goal discrepancy scores for Type A's and Type B's seemed to converge under the moderately difficult task condition, but differed widely under the difficult task condition. Note that, as a result of the design, goal discrepancy scores could not be collected for the easy task.

Another interesting observation can be noted in Figure 6. Both Type A's and Type B's set goals on the moderately difficult task that were below their previous performance on the easy task. Type A's reduced their goals by 0.9 anagrams in comparison to their past performance, whereas Type B's reduced their goals by 1.3 anagrams. However, as the tasks became even harder on the difficult task, both Type A's and Type B's reversed their goal setting behavior by

setting goals that far surpassed their previous performance level on the moderately difficult task. Type A's then increased their goals by 2.1 anagrams in comparison to their previous performance, while Type B's increased their goals by 1.0 anagram. In other words, as the tasks became more difficult, the difference in the mean goal scores between Type A's and Type B's became larger.

Summary of Hypothesis 4 Findings. Hypothesis 4 was completely supported in this study. Both Type A's and Type B's set goals on the moderately difficult task which were below their previous performance on the easy task, with no significant difference observed between the two groups. Evidence also existed that Type A's set significantly higher goals on the 'difficult' task in relation to their previous performance on the moderately difficult task when compared to Type B's. It also appeared that Type A's, who failed more (on the moderately difficult task) than Type B's, raised their goals more drastically (on the difficult task). On the other hand, Type B's who achieved more than Type A's (on the easy and moderately difficult tasks) raised their goals less (on the difficult task). This

unrealistic goal setting in response to failure by Type A's was also reported by several other researchers (e.g., Snow, 1978; Ward & Eisler, 1978,a,b), and indirectly by Rime and Bonami (1976) with coronary and hypertensive patients. Thus, a spiral of failure and a greater expectation on the next task was more likely to be observed in the Type A group than in the Type B group. In addition, the goal discrepancy scores differed significantly between each task, thus providing evidence that the tasks were well-manipulated.

#### Supplemental Analyses

Perception of Task Difficulty: Type A's versus Type B's. One of the questions at the end of each experimental task was designed to assess Type As and Type Bs' perceptions of task difficulty. It was speculated in the literature (e.g., Yarnold, Mueser, & Lyons, 1988; Ortega & Pipal, 1984) that Type A's may have unrealistic low perceptions of task difficulty, since they set unreasonably high goals even on difficult tasks.

To test this assumption, a 2 (Type A/B) by 3 (easy, moderately difficult, and difficult tasks) multivariate

analysis of variance (MANOVA) was conducted to assess the effects of TABP and objective task difficulty on perceived task difficulty.

The results indicated no main effect for Type A/B behavior, effect size = .02,  $F(1,239) = .07$ ,  $p > .05$  (see Figure 7.) In addition, TABP did not interact with the three different task levels to influence subjects' perceptions of task difficulty,  $F(2,238) = 1.61$ ,  $p > .05$ . In other words, perception of task difficulty did not differ significantly for Type A's and Type B's across the three different experimental tasks.

Overall, the findings did not support what was postulated in the literature. More specifically, Type A's did not perceive each of the three anagram tasks as easier or Type A's did not underestimate the actual difficulty level of the anagram tasks relative to Type B's. This result is comparable to those of Yarnold, Mueser, & Lyons (1988). In fact, it was surprising to find that both groups had similar perceptions of task difficulty across the three different tasks. For example, the differences between the two groups on tasks 1, 2, and 3 were 0.07, 0.12, and 0.00 anagrams,

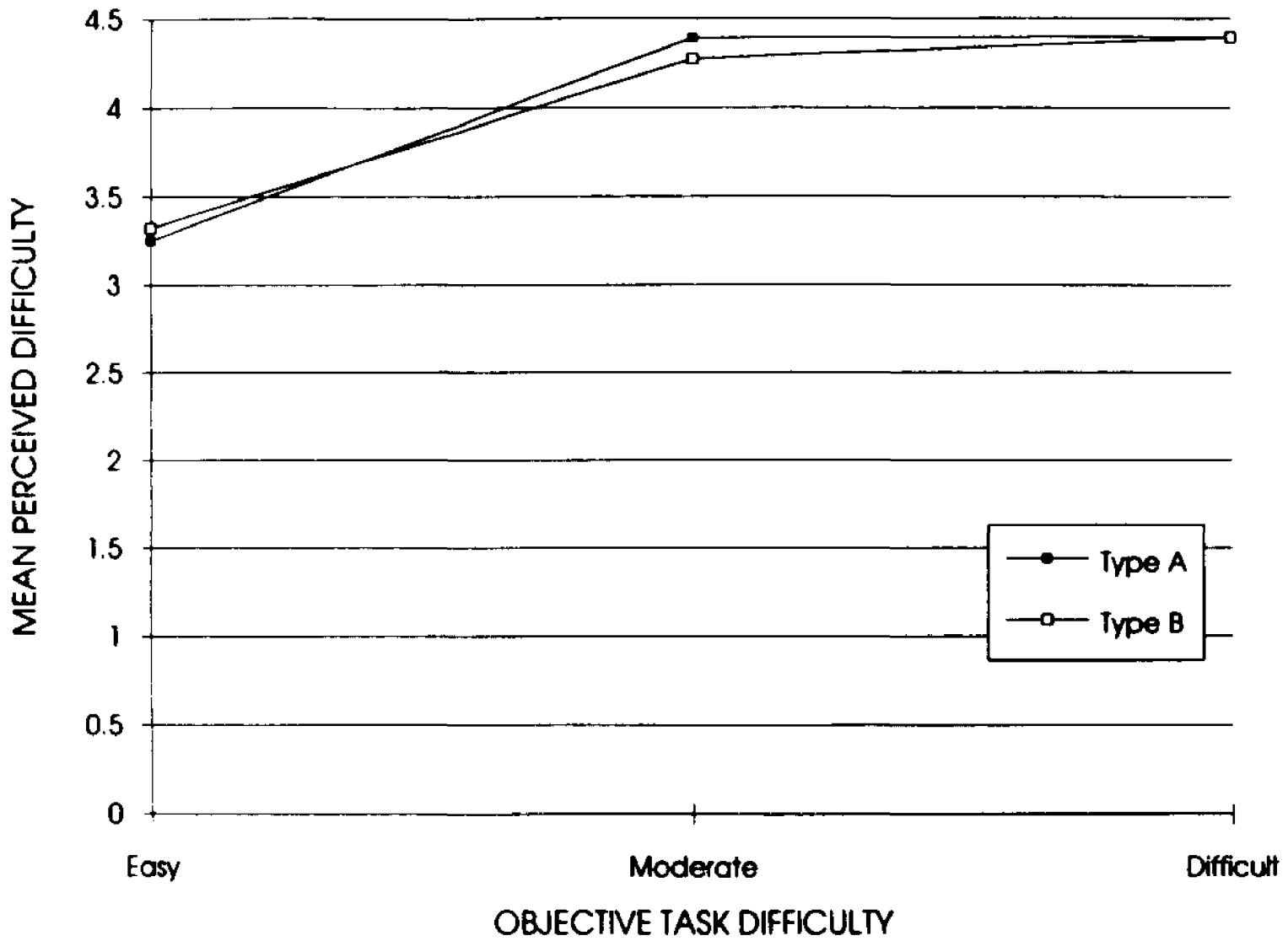


Figure 7. Mean perceived difficulty as a function of Type A/B behavior pattern and objective level of task difficulty.

respectively.

As expected, there was a main effect for task,  $F(2,238) = 159.54$ ,  $p < .0001$  (see Figure 7.) Further univariate F-tests contrasting the three different tasks revealed a highly significant difference between task 1 versus task 2, effect size = 1.06,  $F(1,240) = 318.70$ ,  $p < .0001$ ; and between task 1 versus task 3, effect size = 1.12,  $F(1,240) = 219.20$ ,  $p < .0001$ . No significant difference was observed between task 2 versus task 3, effect size = 0.06,  $F(1,240) = 1.13$ ,  $p > .05$ . However, a highly significant difference existed between task 1 versus tasks 2 and 3, effect size = 1.09,  $F(1,240) = 307.00$ ,  $p < .0001$ ; between task 2 versus tasks 1 and 3, effect size = 0.50,  $F(1,240) = 136.42$ ,  $p < .0001$ ; and between task 3 versus tasks 1 and 2, effect size = 0.59,  $F(1,240) = 99.61$ ,  $p < .0001$ . Generally, the three tasks (as well as their various combinations) differed significantly from one another with respect to perceived task difficulty. The exception was the contrast between the second and the third task, where subjects found it more difficult to distinguish between the moderately difficult and the difficult tasks.

It is also worth noting that two of three tasks were perceived as more difficult than anticipated. For example, on a Likert scale of one to five, the 'easy' task was perceived as 'moderately difficult' (Mean = 3.28) and the 'moderately difficult' task, as somewhat difficult (Mean = 4.34). Only the 'difficult' task was perceived as 'difficult', as expected (Mean = 4.40). Although individuals generally perceived the tasks (2 of 3) to be more difficult than expected; nevertheless, it can be assumed that as the objective difficulty level of the tasks increased, perception of task difficulty also increased (irrespective of the TABP). Because perceived changes were observed for two out of the three tasks, partial support was obtained for the task hypothesis.

Motivation Level: Type A's versus Type B's.

Another question at the end of each experimental task asked subjects to rate their willingness or motivation to continue with a subsequent anagram task after they believed they have succeeded or failed on a previous task. It was not clear whether Type A's would be more or less motivated than Type B's after success or failure. The question posed was, "How willing are you

to continue with the next anagram task? Rate your level of willingness to continue on the 5-point Likert scale provided."

Tables 7a-c showed the results of three 2 x 2 analyses of variance (ANOVA's) for the easy, moderately difficult, and difficult anagram tasks, respectively. The numbers entered in the cells represent mean motivational levels.

On the 'easy' task (see Table 7a), there was no significant main effect for TABP, effect size = 0.01,  $F(1,236) = 0.08$ ,  $p > .05$ . That is, Type A's were not more (or less) motivated to continue with the moderately difficult task (i.e., task 2) than Type B's. Nor was there a significant main effect for success/failure, effect size = 0.14,  $F(1,236) = 1.55$ ,  $p > .05$ . Thus, perception of success/failure did not influence subjects' motivation to continue with task 2. In addition, there was no significant interaction between TABP and success/failure,  $F(1,236) = 0.07$ ,  $p > .05$ . In other words, Type A's were as willing to continue with task 2 as Type B's regardless of whether they perceived they had succeeded or failed on their previous task.

Table 7  
Three 2 x 2 ANOVA'S for Motivation to Continue with A  
Subsequent Anagram Task as A Function of Type A/B  
Behavior Pattern and Success/Failure

- a. Easy Task: Motivation to Continue with The Moderately Difficult Task as A Function of Type A/B Behavior Pattern and Success/Failure on The Easy Task, with Interest in Solving The Easy Task as A Covariate.

	Success	Failure	$\bar{X}$ row	N row
Type A	4.15 N=87	3.98 N=48	4.09	N=135
Type B	4.14 N=72	4.03 N=33	4.10	N=105
$\bar{X}$ col	4.14	4.00		
N col	N=159	N=81		

- b. Moderately Difficult Task: Motivation to Continue with The Difficult Task as A Function of Type A/B Behavior Pattern and Success/Failure on The Moderately Difficulty Task with Motivation to Continue and Interest in The Moderately Difficult Task as Covariates.

	Success	Failure	$\bar{X}$ row	N row
Type A	3.78 N= 92	3.82 N=103	3.81	N=135
Type B	3.56 N=32	3.95 N=73	3.83	N=105
$\bar{X}$ col	3.67	3.87		
N col	N=64	N=176		

Table 7 (cont'd)  
Three 2 x 2 ANOVA'S for Motivation to Continue with A  
Subsequent Anagram Task as A Function of Type A/B  
Behavior Pattern and Success/Failure

- c. Difficult Task: Motivation to Continue with Task 4 (A Hypothetical Task) as A Function of Type A/B Behavior Pattern and Success/Failure on The Difficult Task, with Motivation to Continue with The Moderately Difficult Task and Interest in Solving The Difficult Task as Covariates.

	Success	Failure	$\bar{X}$ row	N row
Type A	3.37 N=35	3.53 N=98	3.49	N=133
Type B	3.53 N=30	3.51 N=75	3.51	N=105
$\bar{X}$ col	3.45	3.52		
N col	N=65	N=173		

Similar results were obtained on tasks 2 and 3. For the 'moderately difficult' task (see Table 7b), again, no significant main effect was found for TABP, effect size = 0.02,  $F(1,236) = 0.06$ ,  $p > .05$ . No significant main effect was found either for success/failure, effect size = 0.20,  $F(1,236) = 1.70$ ,  $p > .05$ . There was also an absence of an interaction between TABP and success/failure,  $F(1,236) = 1.28$ ,  $p > .05$ .

On the 'difficult' task (see Table 7c), no significant main effect was found for TABP, effect size = 0.02,  $F(1,234) = 0.03$ ,  $p > 0.05$ . Nor was there a significant main effect for success/failure, effect size = 0.07,  $F(1,234) = 0.16$ ,  $p > .05$ . There was also an absence of an interaction effect between TABP and success/failure,  $F(1,234) = 0.25$ ,  $p > .05$ .

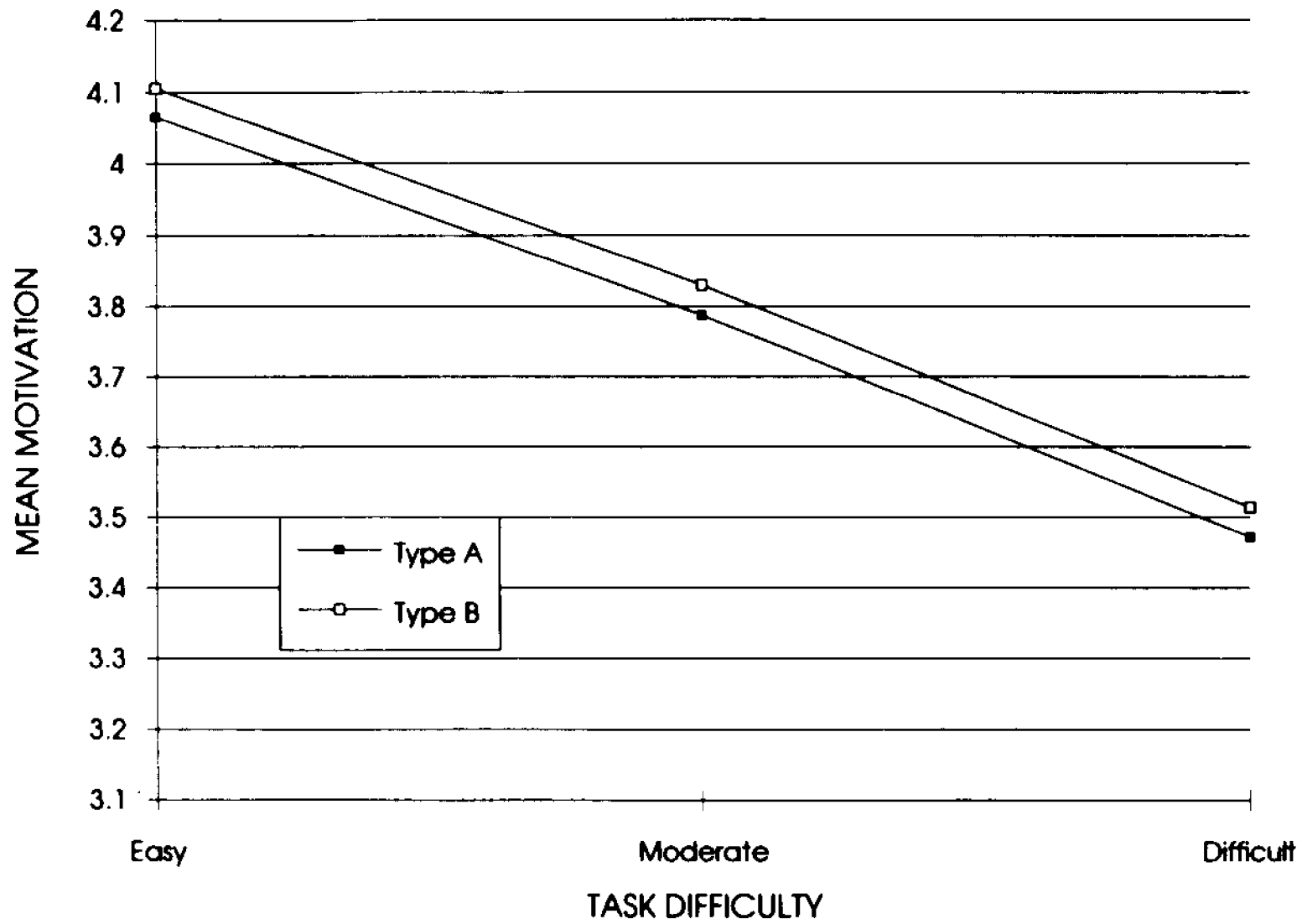
With the use an ANOVA, it was difficult to determine whether significant differences existed in motivational levels between the three different tasks. In addition, motivational level may be influenced by variables other than prior success/failure.

As a result, motivation was re-analyzed using a 2 (Type A/B) x 3 (easy, moderately difficult, difficult

task) MANOVA (See Figure 8).

Again, the results indicated no significant Type A/B main effect,  $F(1,239) = 0.13, p > .05$ . Nor was there a significant interaction effect between Type A/B and task difficulty,  $F(2,238) = .001, p > .05$ . However, a significant main effect occurred for task difficulty,  $F(2,238) = 28.34, p < .0001$ . Post-hoc analyses showed that task 1 differed significantly from task 2, effect size = 0.28,  $F(1,240) = 19.75, p < .0001$ ; task 1 differed significantly from task 3, effect size = 0.59,  $F(1,240) = 58.16, p < .0001$ ; and task 2 differed significantly from task 3,  $F(1,240) = 22.29, p < .0001$ . Furthermore, task 1 differed significantly from tasks 2 and 3, effect size = 0.44,  $F(1,240) = 49.07, p < .0001$ ; and task 3 differed significantly from tasks 1 and 2, effect size = 0.14,  $F(1,240) = 48.24, p < .0001$ . No significant difference was observed between task 2 and tasks 1 and 3, effect size = 0.02,  $F(1,240) = 0.13, p > .05$ .

In general, Type A's were not more (or less) willing than Type B's to continue with a subsequent anagram task after they believed they had succeeded or failed on a previous anagram task. Irrespective of the



**Figure 8.** Mean motivation to continue with a subsequent anagram task as a function of Type A/B behavior pattern and level of task difficulty.

TABP, motivational level decreased significantly from the easy task (Mean = 4.08) to the moderately difficult task (Mean = 3.81) to the difficult task (Mean = 3.49). In other words, as the tasks got increasingly harder, subjects were less and less willing to work on subsequent anagram tasks.

## CHAPTER IV

### LIMITATIONS OF THE STUDY

Several limitations of the present study should be emphasized. First, although the structured interview (or SI) is currently the best method for Type A assessment, the Jenkins Activity Survey (or JAS) was used instead. It should be recalled that the JAS was specifically developed to discriminate between SI-defined Type A's and Type B's. Since the SI procedure is time-consuming (to carry out and to interpret the results), expensive (requires video recording equipment and specialized training for interviewers and assessors), complex (relies on interviewers' skills), and unsuitable for large-scale

use, the JAS was used for practicality, and since the JAS is a self-report measure it may be vulnerable to distortions by the respondents.

A second limitation was that the anagram tasks may be confounded with time pressure. As previous investigators had found, Type A's are better performers than Type B's in the absence of an imposed deadline. In the presence of a deadline, Type B's perform equally well as Type A's (Burnam et al., 1975; Matthews & Volkin, 1981). The latter finding was again supported in the current study. Like some laboratory studies (e.g., Bingham & Hailey, 1989), this study also demonstrated that Type A's made significantly more errors than Type B's on anagram tasks that involved deadlines.

The third limitation dealt with order effects. The order of administering the three tasks was essentially the same for each subject in this study. That is, each subject worked on the easy anagrams first, followed by the moderately difficult anagrams, and then the difficult anagrams. The assumption was that, in multiple task trials, goal setting on a task is related to one's performance on a previous task

which, in turn, is associated with one's goal setting on that (previous) task. If counterbalancing had been used, each person would have goal discrepancy scores that depended on the assigned order of the tasks. This leads to goal discrepancy scores that are uninterpretable. One way to overcome this problem is to avoid studying goal setting behavior as a function of prior performance (in a multiple task trials experiment), and to focus only on goal setting and performance within the context of each task.

The fourth limitation concerned threats to external validity. For example, this study was carried out in a laboratory setting using college students. In addition, the tasks that were employed (i.e., anagrams) may not be generalizable to other types of tasks (e.g., heuristic or more creative tasks). Also, the selection of the colleges in one geographical area may not be representative of other colleges in the same or other geographical location(s). Despite these weaknesses, however, the use of a laboratory setting and anagram tasks made it possible to systematically manipulate different levels of task complexity over repeated trials and to obtain objective measures of performance.

The absence of such controls in past research may have attenuated the effects of TABP and goal setting on performance.

A fifth limitation was that informal feedback may have moderated the goal setting-performance relationship. Even when no formal feedback was provided, subjects may have used indirect feedback cues in setting their subsequent goals. For example, subjects could have counted how many anagrams they have completed or how many anagrams they have yet to complete on their answer sheets. Or they could have traced their progress (i.e., how well they were doing in relation to their goals) in their heads. Although subjects were not specifically instructed to set goals relative to their past performance, one might also assume that they could have compared their present performance to their past performance or have used their past performance as a reference, especially when more than one performance trials were used.

These feedback cues would not necessarily be limitations if they were what subjects needed to set future goals. The problem, however, was when perception of success/failure was inaccurate which may

have adversely impacted subsequent levels of goal setting. As Locke and Latham (1990) had indicated, "internal cues are often quite inaccurate" (p. 191) and may play a role in subsequent goal setting behavior. In the future, formal feedback (regarding one's progress toward one's goal) may be provided at the end of each experimental trial so that its effects on subsequent goal setting and performance can be monitored (e.g., Erez, 1977; Cummings, Schwab, & Rosen, 1971).

A sixth limitation has to do with the particular type of goal setting used in this study. Self-set or personal goal setting may not be the most effective motivational tool for all organizations. Other types of goal setting (e.g., group and assigned goal setting) may be more appropriate depending on the organizational structure (e.g., matrix and mechanistic) and the kinds of tasks to be performed. For example, in team projects, group goals may be more important than individual goals.

But even if personal goal setting were feasible and encouraged in organizations (e.g., Research and Development, Management), it raised the question of

whether employees do indeed have complete control over the goals they establish. For instance, personal goal setting may very well be tied to the rewards of an organization or the position level of the individual. Furthermore, employees may not always prefer to set their own goals, and may even work better by having superiors establish work standards for them.

Therefore, managers/supervisors need to consider the needs of the organization, the needs and abilities of the workers, and the particular job/task in question before allowing individuals to set and pursue their own performance goals.

## CHAPTER V

### CONCLUSIONS

Dweck (1992) stated that "the study of goals has given us a new and useful way of understanding personality and individual differences and of conceptualizing and studying the interaction of personality and situation." In keeping with Dweck's optimistic view, the purpose of this study was to

integrate two research areas in the field of psychology: Type A/B behavior pattern and goal setting. By integrating these two domains into one study, it was hoped that we would come to a better understanding of: (1) whether Type A's perform differently from Type B's in terms of quantity and quality of production; (2) whether the Type A/B behavior pattern interacts with level of task difficulty to differentially affect initial and subsequent levels of goal setting and performance; (3) whether (and to what extent) Type A's achieve/fail to achieve their goals in comparison to Type B's on tasks of various difficulty levels; and (4) whether Type A's set a higher/lower goal than Type B's after success/failure, and to what degree they differ from one another.

This study differed from previous studies in that it systematically manipulated three levels of task difficulty. Previous goal setting studies (except for Campbell & Ilgen, 1976; Garland, 1984; and Wood et al., 1987) had generally neglected to study this particular variable which may very well be confounded with level of goal setting. Similarly, the Type A literature had

failed to incorporate task complexity in the study of the Type A-performance relationship. This study also differed from previous research in that it involved three repeated cycles of tasks, goals, and performance. This paper attempted to show that individuals who set higher goals did not necessarily perform better than those who set lower goals. The reasons were that individual differences (i.e., the TABP), situational characteristics (i.e., task difficulty), and prior experience (i.e., previous success/failure) may have acted as moderating variables in the goal setting - performance relationship.

The major findings of this study can be summed up as following:

- Type A's were not superior to Type B's on quantity produced.
- Type A's differed from Type B's on performance quality, with Type A's committing more errors than Type B's.
- Type A's set higher goals than Type B's on two of the three tasks; still, they did not perform quantitatively better than Type B's.
- Both Type A's and Type B's achieved their goals on

the easy task, but Type B's achieved more than Type A's.

- On the moderately difficult and difficult tasks, both Type A's and Type B's failed to achieve their goals, but Type A's failed to a greater extent than Type B's.
- After success (on the easy task) both Type A's and Type B's lowered their goals (on the moderately difficult task), but there was no significant difference in the level of goal setting between the two groups.
- After failure (on the moderately difficult task), both Type A's and Type B's raised their goals (on the difficult task), but Type A's raised their goals more than Type B's.

Thus, contrary to what Locke et al. (1981) and Locke and Latham (1990) had concluded about individual differences not determining goal setting/performance, the TABP as an individual difference does affect goals as well as performance on tasks of different difficulty levels. The results of this study provide additional support for past Type A research through the study of goal setting and task complexity.

## CHAPTER VI

## IMPLICATIONS FOR ORGANIZATIONS

Effects of Task Difficulty. As illustrated in this study, difficult tasks have deleterious effects on performance. By their very nature, they are less attainable. Thus, employees who seek challenging (difficult) tasks especially when they do not have the appropriate knowledge, skills, abilities, and experience may represent a dilemma for organizations. For example, should organizations allow their employees (especially Type A employees) to take on difficult/complex tasks as they desire, knowing that they may not succeed, and thus benefit from their increased motivation/effort while many may also experience failure with implications for psychological and physical health? Campbell & Ilgen (1976) suggested that the detrimental effects of "psychological failure" may be overcome by the increased knowledge of the task, which may enhance later performance on tasks that require similar skills learned in an earlier setting. Thus, to the extent that increased learning occurs on a

challenging and complex task, Campbell and Ilgen argued that concern for possible increases in number of failures may be unwarranted.

On the other hand, should organizations (employers/managers) allow their employees to assume only tasks that fit their capabilities? Common sense suggests that organizations (employers/managers) would probably consider the latter either as early in the selection process as possible by attempting to fit employees to tasks/jobs, or through on-the-job training or retraining of their employees to help them develop the appropriate knowledge, skills, and abilities for a particular job/task.

Effects of (High) Goal Setting. To the extent that difficult goals minimize the chances of goal attainment (especially on complex tasks), they can have potential negative consequences for both employees and organizations. Difficult goals (especially when selected by Type A employees) have a greater likelihood of resulting in performance failures. Such performance levels may be considered as failures in the eyes of the employees (and/or organizations) if they fall short of the intended goal. In addition, repeated failures may

have deleterious effects on both employees (e.g., low performance, negative performance appraisals; lack of promotion; increased absenteeism and job dissatisfaction; increased stress/coronary heart disease; low self-esteem/self-confidence) and organizations (e.g., turnover; increased health care costs; decreased profits; loss of company reputation; penalty for late delivery of services, failure in meeting deadlines). Furthermore, the selection of high goals and failure to achieve these goals may lead employees to reduce their future efforts which, in turn, may lead to performance deficits on future tasks (Greenberg, 1985). For example, studies have shown that people reduce their effort and performance on a task after experiencing failure on unsolvable problems or after experiencing non-contingent failure (Frankel & Snyder, 1978; Griffith, 1977; Brunson & Matthews, 1981).

In the end, "Should organizations reward their employees for assuming very difficult goals even if they did not completely accomplish them?" The answer is "no". They should only reward employees for goals that are specific, measurable, attainable, and

realistic. A goal setting statement should contain both short- and long-term goals, the necessary steps to accomplish these goals, and target dates of goal attainment.

#### Effects of Achievement and Goal Discrepancies.

Campion & Lord (1982) and Ashford & Cummings (1983) suggested that an alternative to increasing performance after failure to reach a goal is to lower the goal itself which, in turn, should increase the likelihood of future success. In addition, setting higher goals after success leads to the attainment of further success. It should be noted that these strategies proposed by the above investigators were not employed by the subjects in the current study. This may in part be due to the TABP, or to the fact that the tasks got increasingly harder (See Figure 9).

#### Effects of Type A Behavior Pattern (TABP).

Another implication is that even if personal goal setting is feasible in a particular job or organization (in contrast to assigned or participative goal setting), it may not be the most effective motivational tool for all employees because the TABP has been shown to act as a potential moderator of the goal setting-

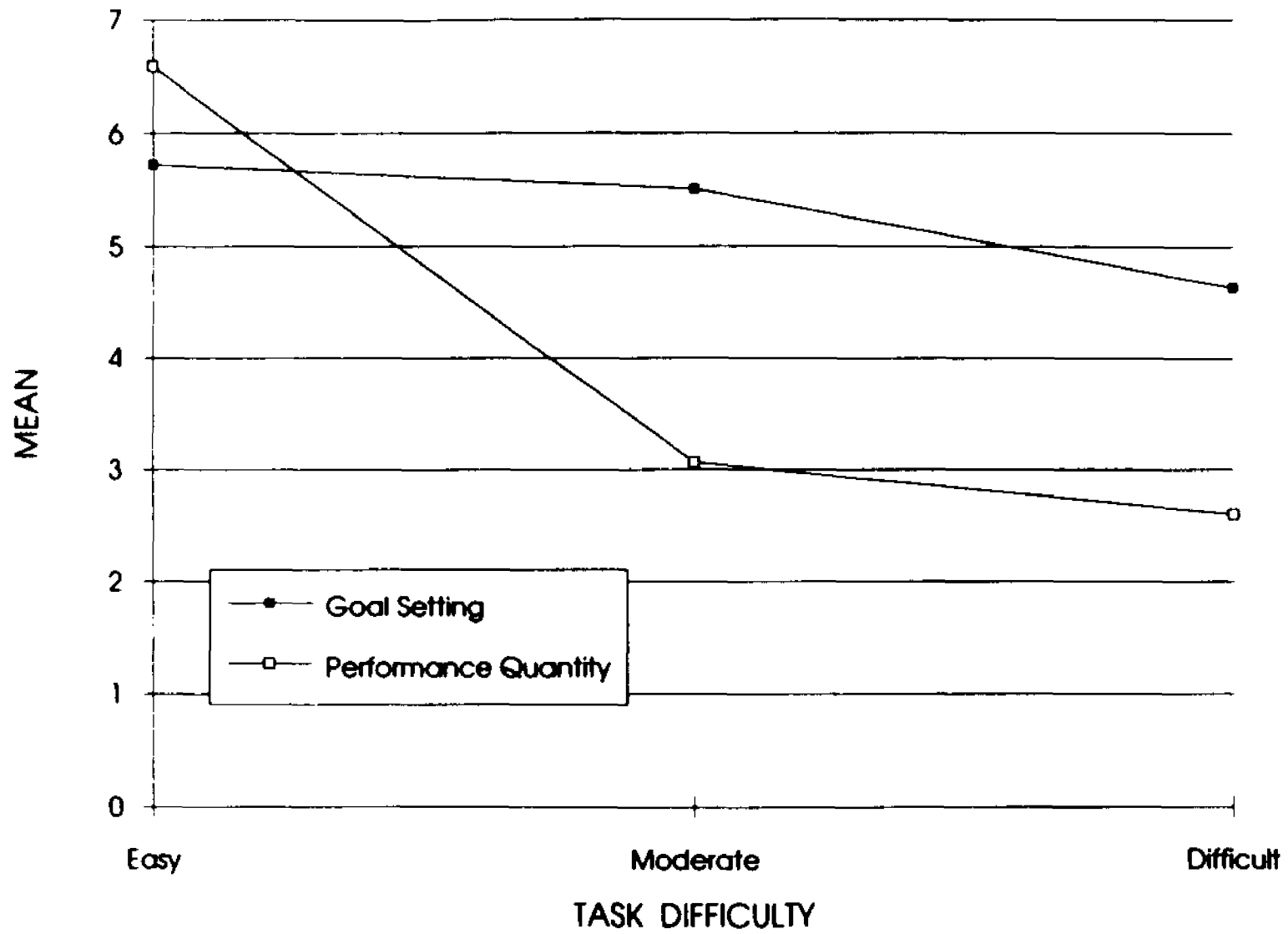


Figure 9. Mean goal setting and performance quantity as a function of level of task difficulty.

performance relationship. Previous studies have indicated that Type A's tended to set higher goals for themselves and experience frequent performance failures, while Type B's are more likely to choose goals that fit more closely with their performance potential and thus experience fewer failures (Snow, 1978; Ward & Eisler, 1987a,b). In addition, this study found that Type A's set higher goals in relation to their previous performance while Type B's set goals that were closer related to their past performance. It may be suggested that Type A's strive toward what Lewin et al. (1944) called "ideal" goals, whereas Type B's strive toward the successful attainment of "realistic goals". Or it may be that Type A's were not closely monitoring their goals, while Type B's appeared to monitor their goals more closely. Consequently, Type A's who set higher goals enhanced their sense of failure, whereas Type B's who set lower goals lessened their sense of failure. It is therefore suggested that goals adopted by employees (and especially by Type A employees) should not be uncritically accepted by supervisors or peers without considering the individual's abilities and the task involved.

Training. One way to alter the high goal setting behavior of Type A employees (as indicated in this as well as other studies) would be to supply them with training in: (a) goal/strategy development (e.g., teaching them to set goals that are challenging, yet attainable); (b) time management (i.e., training them to set priorities for their work activities, where there is a limited scope of objectives compatible with their capabilities, energies, and timeframe); (c) cognitive skills or increased awareness of their actions. That is, Type A's should be made aware of the distinction between healthy ambition and maladaptive achievement strivings. Healthy ambition is characterized by an evaluation of achievements that use standards congruent with one's ability and performance potential; and (d) self-monitoring/self-management. For example, Type A's may want to learn to observe their own behaviors, to compare their behaviors with the goals they set, and to self-administer rewards and punishment contingent on the degree to which their behaviors approximate their goals. Such self-management training programs are available, although not originally designed for Type A's (e.g., Kanfer,

1970, 1975, 1980).

It is not only the employee who needs training on how to attain goals in order for goal setting to be effective, it may also be the manager who needs training in setting goals. Thus, managers/supervisors need to learn to institute and reinforce realistic performance goals, which are compatible with their employees' knowledge, abilities, skills, and experience, as well as the nature of the tasks. Moreover, managers/supervisors should put emphasis on proper selection procedures. In addition, they should ask employees to formulate action plans for reaching their goals, as in Management by Objectives (MBO). Furthermore, they should plan ahead -- if at all possible -- for deadlines on future tasks and projects. And, finally, organizations need to redesign the work environment if it creates and/or exacerbates the TABP. For example, too much responsibility and job overload have been found to be associated with Type A (e.g. Caplan & Jones, 1975). (Note: Of course, there are factors that are beyond an organization or manager's control.)

If it is at all possible, managers and their

employees should also be provided training in Type A counseling and stress management (which may include progressive muscle relaxation, autogenic training, biofeedback, breathing for relaxation, imagery training, exercise, and/or meditation). A cafeteria style package which offers a variety of programs may be made available to employees so that they can choose among the programs they wish to participate in. Although it is understandable that in-house training programs are more often available and affordable in large organizations than in smaller ones, the latter may still profit from consulting firms which offer such programs on a short-time basis with the same level of expertise as in-house personnel.

Finally, additional approaches to modifying the TABP include community awareness projects and coronary rehabilitation counseling.

## CHAPTER VII

### SUGGESTIONS FOR FUTURE RESEARCH

To gain a better understanding of the Type A/B

behavior pattern, additional research is necessary in the following areas:

1. Identification of The Situational Characteristics That Elicit or Exacerbate The TABP. They include challenge, competition, complex tasks, uncontrollable events, endurance, slow and careful work, broad focus of attention, and work overload. For example, students' Type A scores were found to be higher at the end of the semester (i.e., a time of increased academic pressure and performance demands) than at the beginning of the semester (Waldron, Hickey, McPherson, Butensky, Gruss, Overall, Schmader & Wohlmuth, 1980).

2. Documentation of The Effects and Interactions of Person, Task, and Situational Characteristics on Performance Quantity, Quality, and Goal setting (e.g., importance of success, interest in a task, motivation level, satisfaction with performance, task difficulty). For example, the TABP may be so embedded in, and reinforced by, one's occupational milieu that it would be very unlikely to change. This may lead to the suggestion that efforts aimed at performance of Type A's should not only focus on modifying the Type A

behavior pattern but also on modifying the situations (e.g., through job redesign).

3. Examination of Possible Individual Differences in The Cognitive-Perceptual and Affective Processes between Type A's and Type B's. For example, the reasons why Type A's continue to set higher goals than Type B's, even after failure in attaining their goals, may be due to psychological factors not being tapped in the current study. These may include goal-performance discrepancy appraisals, social-/self-expectations, self-esteem or self-efficacy, need for achievement, goal importance, lack of internal standards of excellence/rigid performance standards, and intrinsic/extrinsic satisfaction with the task.

A crucial question that needs to be addressed is whether these psychological variables are associated with goal setting and performance, and if so, whether they overlap with or are independent of the TABP. Obtaining the answer to this question is important for further improving the predictive and construct validities of the Type A concept.

This study focused mainly on behavior rather than on cognition and affect. We still have a lot more to

learn about how Type A's think in the context of goals (i.e., why they continued to set high goals even when they had failed), and how they feel about it (e.g., satisfied, dissatisfied). Future research may be able to develop ways to foster more adaptive patterns by changing individuals' goal strategies as well as by manipulating the goal contexts.

4. Understanding How Type A Employees May Affect and Be Affected by Others. For example, to the extent that a Type A person choose a difficult goal, a supervisor/manager may expect increased job performance. Also, Type A's may be modeling the high performance standards/expectations of their co-workers and superiors, and be rewarded for behaving in a similar fashion. Type B's, on the other hand, may resist the attempts of Type A managers to set difficult goals and may actually prefer more moderate goal setting.

5. Inclusion of All Ethnic Groups in Future Type A studies. An interesting finding emerged from the present study indicating a significant relationship between TABP and ethnicity. More specifically, Whites were more likely to be Type A's than Type B's and,

conversely, Asians were more likely to be Type B's than Type A's. The result for Whites was not surprising for it had been replicated in numerous studies in the past (e.g., Sprafka, Folsom, Burke, Hahn, et al., 1990; Manning, Balson, Hunter, Berenson, et al. 1987; Murray & Bruhn, 1983; Wolf, Hunter, Webber, & Berenson, 1981). However, the results for Asians was unexpected and would require further replications before any firm conclusion can be made. Thus, the need to include Asians in future research studies is important. This finding may have psychometric implications for the norms used to select Type A's and Type B's as well as for the validities of the JAS for non-Whites.

6. Treating The Type A Pattern as A Multi-Faceted Construct. The non-significant findings between the global Type A pattern and performance quantity may be a function of treating the Type A pattern as a global construct rather than separating it into components. Future research should examine the various components of the Type A construct separately to observe whether these various dimensions are differentially related to performance quantity. Past research has found support for this notion (e.g., Bluen, Barling, & Burns, 1990;

Juszczak & Andreassi, 1987).

7. Inclusion of The Hostility Component in Future Type A and Goal Setting Studies. Hostility (anger, aggression) is an important factor that has recently been implicated as the most important component of Type A behavior. This factor was not included in the JAS, however. In the future, a measure of hostility should be incorporated.

8. Focusing on The Dynamic Processes by Which Type A Affects Goal Setting and Performance. Much of the research on TABP involved single trials. By incorporating multiple trials, it is possible to study temporal interdependencies and cumulative effects. A path analysis may be helpful in developing an integrated model of Type A, goal setting, and performance, which includes specific performance feedback, goal adjustments, strategies used, amount of effort expended, appraisals made, and satisfaction/dissatisfaction with task performance as likely consequences of the goal-performance (or performance-goal) discrepancies.

9. Separating The Independent and Interaction Effects on Performance. Future research should examine

the extent to which the Type A pattern, level of goal setting, and level of task difficulty independently contribute to performance, as well as the extent to which they are confounded with each other. Because it was not the purpose of this study, this investigator was not able to gather evidence to test Locke's theory that goals were linearly related to performance. In the future, correlational analyses or multiple regression analyses may be conducted to determine how well goal setting predicts performance.

10. Determining The Relationship between Type A Pattern and DSM-III Categories. Future researchers may want to investigate how the TABP fits into DSM-III categories. It appears that certain features of the narcissistic personality disorder (APA, 1987, 1980) are prevalent in the Type A pattern. They include an unrealistic overestimation of one's abilities, unrealistic goals driven by a lack of pleasure and unsatisfied ambition, occupational functioning impeded by interpersonal difficulties or the pursuit of unrealistic goals, preoccupation of how well one is doing and how well one is regarded by others, and hypersensitivity to the evaluations of others (APA,

1987, 1980). If a fit is found between the TABP and a DSM-III category (for example, the narcissistic personality disorder), treatments that were once used for this disorder may also be used (or modified) to treat the TABP.

APPENDIX A

INSTRUCTIONS TO SUBJECTS

Subjects were given the following instructions prior to the first anagram task:

"Please read the information on the Consent Form. If you agree to participate in this experiment, sign your name on the two Consent Forms and date them as well. You may tear the first one off and keep it for yourself. Leave the other one attached to the questionnaire. You may then proceed by completing the Biographical Data Form and the Survey Questionnaire. After completing the last question (Q. #52) of the Survey Questionnaire, please stop to wait for further instructions. The actual experiment will begin when everybody is ready."

(When everybody is ready...) "This experiment will consist of three separate anagram tasks. First, you will be given some sample items to complete. This will help you to familiarize yourself with the types of items that you will encounter in the First Anagram Task. After completing the sample items on page 10, answer the question below that page, "Out of a maximum of 10, how many anagrams similar to the ones you have just completed above do you believe you can solve correctly in 5 minutes? Circle only one number (from 1

to 10). For example, if you think you can answer all items correct, circle the number 10. If you think you can answer 7 correct, circle the number 7.

(Wait till everybody is ready...) You will have 5 minutes to work on the First Anagram Task. When you are done with the First Anagram Task, you may review your work on that task only but you may not work ahead on the other anagram tasks or on an earlier task.

(These instructions were repeated, again, for the second and third anagram tasks...)

APPENDIX B

THE EXPERIMENT

**SUBJECT CONSENT FORM**

Baruch College  
City University of New York

Investigator: Karina Hui  
Project : Individual Differences in Anagram Performance

I hereby acknowledge that on \_\_\_\_\_ 1993,  
I was informed by Karina Hui of a research project titled:

I was informed that the purpose(s) of the experiment  
was (were) \_\_\_\_\_

The independent and dependent variables and the  
procedure involved will be explained to me at the end of the  
experiment in enough detail so that I can write a brief  
report about the experiment.

I was told of the possible risks involved and the  
expected benefits to me as a subject.

I understand that I may withdraw my participation in  
this research at any time.

I also agree not to reveal any aspect(s) of this study  
to those who have yet to participate in this study.

I further acknowledge that I have received a full copy  
of this consent form.

I agree with full knowledge and awareness of all the  
foregoing to participate in said project.

Dated: New York \_\_\_\_\_ Signature: \_\_\_\_\_

Witnessed by: \_\_\_\_\_ Printed Name: \_\_\_\_\_

**BIOGRAPHICAL DATA FORM**

1. First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

2. Gender: Male \_\_\_\_\_ Female \_\_\_\_\_

3. Are you a native-English speaker? Yes \_\_\_\_\_ No \_\_\_\_\_

(A native-English speaker refers to an individual for whom English is his/her first language, or an individual who most often speaks English at home.)

4. Are you working now (or have you worked in the past)?  
Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, check one: Part-time \_\_\_\_\_ Full-time \_\_\_\_\_

5. Ethnicity:  
White, Non-Hispanic \_\_\_\_\_ Black, Non-Hispanic \_\_\_\_\_  
Hispanic \_\_\_\_\_ Asian or Pacific Islander \_\_\_\_\_  
American Indian or Native Alaskan \_\_\_\_\_ Other \_\_\_\_\_  
Please specify: \_\_\_\_\_

6. Have you had experience before in solving anagrams (or word puzzles)?  
Yes \_\_\_\_\_ Anagrams \_\_\_\_\_ Word Puzzles \_\_\_\_\_ Both \_\_\_\_\_  
No \_\_\_\_\_

If yes, rate the number of times in the past year that you spent on solving anagrams and/or word puzzles, on the Likert scale provided below. Circle only one number.

1	2	3	4	5
never	1-2 times	3-4 times	5-6 times	7 or more

**SURVEY QUESTIONNAIRE**

Please answer the questions on the following pages by marking the answers that are true for you. Each person is different, so there are no "right" or "wrong" answers. Do not ask anyone else about how to reply to the items. It is your personal opinion that I want.

---

**For each of the following items, please circle the one best answer:**

1. Do you ever have trouble finding time to get your hair cut or styled?
  - a. Never.
  - b. Occasionally.
  - c. Almost always.
  
2. How often does your job "stir you into action"?
  - a. Less often than most people's jobs.
  - b. About average.
  - c. More than most people's jobs.
  
3. Is your everyday life filled mostly by
  - a. problems needing a solution?
  - b. challenges needing to be met?
  - c. a rather predictable routine of events?
  - d. not enough things to keep me interested or busy?
  
4. Some people live a calm, predictable life. Others often find themselves facing unexpected changes, frequent interruptions, inconveniences, or "things going wrong". How often are you faced with these minor (or major) annoyances or frustrations?
  - a. Several times a day.
  - b. About once a day.
  - c. A few times a week.
  - d. Once a week.
  - e. Once a month or less.
  
5. When you are under pressure or stress, what do you usually do?
  - a. Do something about it immediately.
  - b. Plan carefully before taking any action.
  
6. Ordinarily, how rapidly do you eat?
  - a. I'm usually the first one finished.
  - b. I eat a little faster than average.
  - c. I eat at about the same speed as most people.
  - d. I eat more slowly than most people.

7. Has your spouse or a friend ever told you that you eat too fast?
  - a. Yes often.
  - b. Yes, once or twice.
  - c. No, never.
  
8. How often do you find yourself doing more than one thing at a time, such as working while eating, reading while dressing, or figuring out problems while driving?
  - a. I do two things at once whenever practical.
  - b. I do this only when I'm short of time.
  - c. I rarely or never do more than one thing at a time.
  
9. When you listen to someone talking, and this person takes **too long** to come to the point, how often do you **feel** like hurrying the person along?
  - a. Frequently.
  - b. Occasionally.
  - c. Almost never.
  
10. How often do you actually "put words in the person's mouth" in order to speed things up?
  - a. Frequently.
  - b. Occasionally.
  - c. Almost never.
  
11. If you tell your spouse or a friend that you will meet somewhere at a definite time, how often do you arrive late?
  - a. Once in a while.
  - b. Rarely.
  - c. I am never late.
  
12. How often do you find yourself hurrying to get to places even when there is plenty of time?
  - a. Frequently.
  - b. Occasionally.
  - c. Almost never.
  
13. Suppose you are to meet someone at a public place (street corner, building lobby, restaurant) and the other person is already 10 minutes late. What will you do?
  - a. Sit and wait.
  - b. Walk about while waiting.
  - c. Usually carry some reading matter or writing paper so I can get something done while waiting.

14. When you have to "wait in line" at a restaurant, a store, or the post office, what do you do?
  - a. Accept it calmly.
  - b. Feel impatient but not show it.
  - c. Feel so impatient that someone watching can tell I am restless.
  - d. Refuse to wait in line, and find ways to avoid such delays.
  
15. When you play games with young children about 10 years old (or when you did so in past years), how often do you purposely let them win?
  - a. Most of the time.
  - b. Half the time.
  - c. Only occasionally.
  - d. Never.
  
16. When you were younger, did most people consider you to be
  - a. definitely hard-driving and competitive?
  - b. probably hard-driving and competitive?
  - c. probably more relaxed and easy going?
  - d. definitely more relaxed and easy going?
  
17. Nowadays, do you consider yourself to be
  - a. definitely hard-driving and competitive?
  - b. probably hard-driving and competitive?
  - c. probably more relaxed and easy going?
  - d. definitely more relaxed and easy going?
  
18. Would your spouse (or closest friend) rate you as
  - a. definitely hard-driving and competitive?
  - b. probably hard-driving and competitive?
  - c. probably relaxed and easy going?
  - d. definitely relaxed and easy going?
  
19. Would your spouse (or closest friend) rate your general level of activity as
  - a. too slow - should be more active?
  - b. about average - busy much of the time?
  - c. too active - should slow down?
  
20. Would people you know well agree that you take your work too seriously?
  - a. Definitely yes.
  - b. Probably yes.
  - c. Probably no.
  - d. Definitely no.

21. Would people you know well agree that you have less energy than most people?
  - a. Definitely yes.
  - b. Probably yes.
  - c. Probably no.
  - d. Definitely no.
  
22. Would people you know you well agree that you tend to get irritated easily?
  - a. Definitely yes.
  - b. Probably yes.
  - c. Probably no.
  - d. Definitely no.
  
23. Would people who know you well agree that you tend to do most things in a hurry?
  - a. Definitely yes.
  - b. Probably yes.
  - c. Probably no.
  - d. Definitely no.
  
24. Would people who know you well agree that you enjoy a "contest" (competition) and try hard to win?
  - a. Definitely yes.
  - b. Probably yes.
  - c. Probably no.
  - d. Definitely no.
  
25. How was your temper when you were younger?
  - a. Fiery and hard to control.
  - b. Strong but controllable.
  - c. No problem.
  - d. I almost never got angry.
  
26. How is your temper nowadays?
  - a. Fiery and hard to control.
  - b. Strong but controllable.
  - c. No problem.
  - d. I almost never get angry.
  
27. When you are in the midst of doing a job and someone (not your boss) interrupts you, how do you usually feel inside?
  - a. I feel O.K. because I work better after an occasional break.
  - b. I feel only mildly annoyed.
  - c. I really feel irritated because most such interruptions are unnecessary.

28. How often are there deadlines on your job?
- Daily or more often.
  - Weekly.
  - Monthly or less often.
  - Never.
29. These deadlines usually carry
- minor pressure because of their routine nature.
  - considerable pressure, since delay would upset my entire work group.
  - Deadlines never occur on my job.
30. Do you ever set deadlines or quotas for yourself at work or at home?
- No.
  - Yes, but only occasionally.
  - Yes, once a week or more.
31. When you have to work against a deadline, what is the quality of your work?
- Better.
  - Worse.
  - The same. (Pressure makes no difference.)
32. At work, do you ever keep two jobs moving forward at the same time by shifting back and forth rapidly from one to the other?
- No, never.
  - Yes, but only in emergencies.
  - Yes, regularly.
33. Are you content to remain at your present job level for the next five years?
- Yes.
  - No, I want to advance.
  - Definitely no; I strive to advance and would be dissatisfied if not promoted in that length of time.
34. If you had your choice, which would you rather get?
- A small increase in pay **without** a promotion to a higher level job.
  - A promotion to a higher level job **without** an increase in pay.
35. In the past three years, have you ever taken less than your allotted number of vacation days?
- Yes.
  - No.
  - My type of job does not provide regular vacations.

36. In the last three years, how has your personal yearly income changed?
- It has remained the same or gone down.
  - It has gone up slightly (as the result of cost-of-living increases or automatic raises based on years of service).
  - It has gone up considerably.
37. How often do you bring your work home with you at night, or study materials related to your job?
- Rarely or never.
  - Once a week or less.
  - More than once a week.
38. How often do you go to your place of work when you are not expected to be there (such as nights or weekends)?
- It is not possible on my job.
  - Rarely or never.
  - Occasionally (less than once a week).
  - Once a week or more.
39. When you find yourself getting tired on the job, what do you usually do?
- Slow down for a while until my strength comes back.
  - Keep pushing myself at the same pace in spite of the tiredness.
40. When you are in a group, how often do the other people look to you for leadership?
- Rarely.
  - About as often as they look to others.
  - More often than they look to others.
41. How often do you make yourself written lists to help you remember what needs to be done?
- Never.
  - Occasionally.
  - Frequently.

For questions 42-46, compare yourself with the average worker in your present occupation, and mark the most accurate description.

42. In amount of effort put forth, I give
- much more effort.
  - a little more effort.
  - a little less effort.
  - much less effort.

43. In sense of responsibility, I am
- a. much more responsible.
  - b. a little more responsible.
  - c. a little less responsible.
  - d. much less responsible.
44. I find it necessary to hurry
- a. much more of the time.
  - b. a little more of the time.
  - c. a little less of the time.
  - d. much less of the time.
45. In being precise (careful about detail), I am
- a. much more precise.
  - b. a little more precise.
  - c. a little less precise.
  - d. much less precise.
46. I approach life in general
- a. much more seriously.
  - b. a little more seriously.
  - c. a little less seriously.
  - d. much less seriously.

For questions 47-49, compare your present work with your work setting of five years ago. If you have not been working for five years, compare your present job with your first job.

47. I work more hours per week
- a. at my present job.
  - b. five years ago.
  - c. Cannot decide.
48. I carry more responsibility
- a. at my present job.
  - b. five years ago.
  - c. Cannot decide.
49. I am considered to be at a higher level (in prestige or social position)
- a. at my present job.
  - b. five years ago.
  - c. Cannot decide.

50. How many different job titles have you held in the last 10 years? (Be sure to count shifts in kinds of work, shifts to new employers, and shifts up and down within a firm.)
- a. 0-1
  - b. 2
  - c. 3
  - d. 4
  - e. 5 or more
51. How much schooling did you receive?
- a. 0-4 years
  - b. 5-8 years
  - c. Some high school
  - d. Graduated from high school
  - e. Trade school or business college
  - f. Some college (including junior college)
  - g. Graduated from a four-year college
  - h. Post-graduate work at a college or university
52. When you were in school, were you an officer of any group, such as a student council, glee club, 4-H club, sorority or fraternity, or captain of an athletic team?
- a. No.
  - b. Yes, I held one such position.
  - c. Yes, I held two or more such positions.

**PLEASE STOP HERE FOR FURTHER INSTRUCTIONS**

**SAMPLE ITEMS AND QUESTIONS  
PRIOR TO  
THE FIRST ANAGRAM TASK**

**SAMPLE ITEMS:**

The following two items are sample anagrams representative of those that you will get on the First Anagram Task. Take your time to complete these items to make sure you understand them.

1. MHNUA \_\_\_\_\_
2. LRUFO \_\_\_\_\_

The answers are provided at the bottom of the page.

-----

**QUESTIONS:**

1. Out of a maximum of 10 anagrams, how many similar to the ones you have just completed above do you believe you can solve correctly in 5 minutes? Circle only one number.

1      2      3      4      5      6      7      8      9      10

2. Is there any other reason why you picked the number of anagrams in Question #1? Please check **all** that apply to you.

\_\_\_\_\_ It serves as a source of motivation for me to accomplish as much as I could.

\_\_\_\_\_ I know what I want and strive to get it no matter what.

\_\_\_\_\_ I seek to reduce the difference between my objective and my performance (on task 1).

\_\_\_\_\_ Other. Please explain: \_\_\_\_\_

\_\_\_\_\_

3. Do you have an effective action plan (or plans) for reaching your objective? No \_\_\_\_\_ Yes \_\_\_\_\_ If yes, please explain: \_\_\_\_\_

DO NOT GO TO NEXT THE PAGE  
UNTIL YOU ARE ASKED TO DO SO

**FIRST ANAGRAM TASK**Instructions:

The first anagram task contains 10 five letters anagrams. Your task is to rearrange each of the anagrams to form a meaningful word (as you have done in the sample items above). You will have exactly 5 minutes.

Please work on each anagram in the appropriate spaces provided. You may not work on any other paper.

1. NRDKI \_\_\_\_\_
2. OHTNM \_\_\_\_\_
3. NRTDE \_\_\_\_\_
4. IUFTR \_\_\_\_\_
5. OHYTU \_\_\_\_\_
6. OEWRP \_\_\_\_\_
7. RHTIB \_\_\_\_\_
8. AEUVL \_\_\_\_\_
9. ELCSA \_\_\_\_\_
10. EUCNL \_\_\_\_\_

PLEASE WAIT UNTIL YOU ARE ASKED TO  
ANSWER THE QUESTIONS ON THE NEXT PAGE

### QUESTIONS

1. How difficult do you think the **First Anagram Task** was? Rate the level of difficulty on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
_____	_____	_____	_____	_____
extremely easy	somewhat easy	neither nor difficult	somewhat difficult	extremely difficult

2. How interesting was the **First Anagram Task**? Rate your level of interest on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
_____	_____	_____	_____	_____
extremely uninterest- ing	somewhat uninterest- ing	neither interesting nor uninteresting	somewhat interesting	extremely interesting

3. How important was it for you to succeed on the **First Anagram Task**? Rate the level of importance on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
_____	_____	_____	_____	_____
very unimportant	somewhat unimportant	neither important nor unimportant	somewhat important	very important

4. How many anagrams do you believe you have solved correctly on the **First Anagram Task**? \_\_\_\_\_
5. Do you think that you have succeeded in obtaining your goal on the **First Anagram Task** (i.e., the number of anagrams that you have expected to solve correctly in 5 minutes)? Yes \_\_\_\_\_ No \_\_\_\_\_

6. What do you attribute your success or failure to?

\_\_\_\_\_ task is easy or (too) difficult

\_\_\_\_\_ too little time

\_\_\_\_\_ luck

\_\_\_\_\_ knowledge, ability, skills

\_\_\_\_\_ other. Please explain: \_\_\_\_\_

7. How satisfied are you with your performance level on the **First Anagram Task**? Rate your satisfaction level on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
very	somewhat	neither	somewhat	very
unsatisfied	unsatisfied	satisfied	satisfied	satisfied
		nor unsatisfied		

8. Please choose only one of the following:

\_\_\_\_\_ I am dissatisfied with my performance on the **First Anagram Task** and have no desire to improve on the next task.

\_\_\_\_\_ I am dissatisfied with my performance on the **First Anagram Task** and would like to do better on the next task.

\_\_\_\_\_ I am satisfied with my performance on the **First Anagram Task** and want to maintain that performance level on the next task.

\_\_\_\_\_ I am satisfied with my performance on the **First Anagram Task** and would like to do better on the next task.

9. How much effort did you put in the **First Anagram Task**? Rate the level of effort you have exerted on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
far too	less than	as much as	more than	far too
little	I should	I should	I should	much

10. How willing are you to continue with the next anagram task? Rate your level of willingness to continue on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
_____	_____	_____	_____	_____
extremely	somewhat	neither	somewhat	extremely
unwilling	unwilling	willing	willing	willing
		nor		
		unwilling		

DO NOT GO TO NEXT THE PAGE  
UNTIL YOU ARE TOLD TO DO SO

**SAMPLE ITEMS AND QUESTIONS  
PRIOR TO  
THE SECOND ANAGRAM TASK**

**SAMPLE ITEMS:**

The following two items are sample anagrams representative of those that you will get on the Second Anagram Task. Take your time to complete these items to make sure you understand them.

1. ACOHV \_\_\_\_\_

2. RECKL \_\_\_\_\_

The answers are provided at the bottom of the page.

-----

**QUESTIONS:**

1. Out of a maximum of 10 anagrams, how many similar to the ones you have just completed above do you believe you can solve correctly in 5 minutes? Circle only one number.

1      2      3      4      5      6      7      8      9      10

2. Is there any other reason why you picked the number of anagrams in Question #1? Please check all that apply to you.

\_\_\_\_\_ It serves as a source of motivation for me to accomplish as much as I could.

\_\_\_\_\_ I know what I want and strive to get it no matter what.

\_\_\_\_\_ I want to make up for my past failure by raising my objective above my previous performance (on task 1).

\_\_\_\_\_ I seek to reduce the difference between my objective (on task 2) and my previous performance (on task 1).

\_\_\_\_\_ Other. Please explain: \_\_\_\_\_

\_\_\_\_\_

3. Do you have an effective action plan (or plans) for reaching your objective? No \_\_\_\_\_ Yes \_\_\_\_\_ If yes, please explain: \_\_\_\_\_

DO NOT GO TO THE NEXT PAGE  
UNTIL YOU ARE ASKED TO DO SO

**SECOND ANAGRAM TASK**Instructions:

The second anagram task contains 10 anagrams. Again, your task is to rearrange each anagram to form a meaningful word. You will have exactly 5 minutes.

Please work on each anagram in the appropriate spaces provided. You may not work on any other paper that is not given to you.

1. TTNUA \_\_\_\_\_
2. OCBNA \_\_\_\_\_
3. ARDTI \_\_\_\_\_
4. ANTIR \_\_\_\_\_
5. SSOIA \_\_\_\_\_
6. OAPNR \_\_\_\_\_
7. LATUF \_\_\_\_\_
8. SPEUA \_\_\_\_\_
9. PMUOI \_\_\_\_\_
10. NITGA \_\_\_\_\_

PLEASE WAIT UNTIL YOU ARE ASKED TO  
COMPLETE THE QUESTIONS ON THE NEXT PAGE

### QUESTIONS

1. How difficult do you think the **Second Anagram Task** was? Rate the level of difficulty on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
_____	_____	_____	_____	_____
extremely easy	somewhat easy	neither nor difficult	somewhat difficult	extremely difficult

2. How interesting was the **Second Anagram Task**? Rate your level of interest on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
_____	_____	_____	_____	_____
extremely uninterest- ing	somewhat uninterest- ing	neither interesting nor uninteresting	somewhat interest- ing	extremely interest- ing

3. How important was it for you to succeed on the **Second Anagram Task**? Rate the level of importance on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
_____	_____	_____	_____	_____
very unimportant	somewhat unimportant	neither important nor unimportant	somewhat important	very important

4. How many anagrams do you believe you have solved correctly on the **Second Anagram Task**? \_\_\_\_\_
5. Do you think that you have succeeded in obtaining your goal on the **Second Anagram Task** (i.e., the number of anagrams that you have expected to solve correctly in 5 minutes)? Yes \_\_\_\_\_ No \_\_\_\_\_

6. What do you attribute your success or failure to?  
 \_\_\_\_\_ task is easy or (too) difficult  
 \_\_\_\_\_ too little time  
 \_\_\_\_\_ luck  
 \_\_\_\_\_ knowledge, ability, skills  
 \_\_\_\_\_ other. Please explain: \_\_\_\_\_

7. How satisfied are you with your performance level on the **Second Anagram Task**? Rate your satisfaction level on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
very	somewhat	neither	somewhat	very
unsatisfied	unsatisfied	satisfied	satisfied	satisfied
		nor		
		unsatisfied		

8. Please choose only one of the following:

- \_\_\_\_\_ I am dissatisfied with my performance on the **Second Anagram Task** and have no desire to improve on the next task.
- \_\_\_\_\_ I am dissatisfied with my performance on the **Second Anagram Task** and would like to do better on the next task.
- \_\_\_\_\_ I am satisfied with my performance on the **Second Anagram Task** and want to maintain that performance level on the next task.
- \_\_\_\_\_ I am satisfied with my performance on the **Second Anagram Task** and would like to do better on the next task.

9. How much effort did you put in the **Second Anagram Task**? Rate the level of effort you have exerted on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
far too	less than	as much as	more than	far too
little	I should	I should	I should	much

10. How willing are you to continue with the next anagram task? Rate your level of willingness to continue on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
_____	_____	_____	_____	_____
extremely	somewhat	neither	somewhat	extremely
unwilling	unwilling	willing	willing	willing
		nor		
		unwilling		

DO NOT GO TO NEXT THE PAGE  
UNTIL YOU ARE ASKED TO DO SO

SAMPLE ITEMS AND QUESTIONS  
PRIOR TO  
THE THIRD ANAGRAM TASK

**SAMPLE ITEMS:**

The following two items are sample anagrams representative of those that you will get on the Third Anagram Task. Take your time to complete these items to make sure you understand them.

1. AHTER \_\_\_\_\_

2. AROLB \_\_\_\_\_

The answers are provided at the bottom of the page.

-----

**QUESTIONS:**

1. Out of a maximum of 10 anagrams, how many similar to the ones you have just completed above do you believe you can solve correctly in 5 minutes? Circle only one number.

1      2      3      4      5      6      7      8      9      10

2. Is there any other reason why you picked the number of anagrams in Question #1? Please check **all** that apply to you.

\_\_\_\_\_ It serves as a source of motivation for me to accomplish as much as I could.

\_\_\_\_\_ I know what I want and strive to get it no matter what.

\_\_\_\_\_ I want to make up for my past failure by raising my objective above my previous performance (on task 2).

\_\_\_\_\_ I seek to reduce the difference between my objective (on task 3) and my previous performance (on task 2).

\_\_\_\_\_ Other. Please explain: \_\_\_\_\_

\_\_\_\_\_

3. Do you have an effective action plan (or plans) for reaching your objective? No \_\_\_\_\_ Yes \_\_\_\_\_ If yes, please explain: \_\_\_\_\_

DO NOT GO TO THE NEXT PAGE  
UNTIL YOU ARE ASKED TO DO SO

**THIRD ANAGRAM TASK**Instructions:

The third anagram task also contains 10 anagrams. Your task is to rearrange each of the anagrams to form a meaningful word. You will have exactly 5 minutes.

Please work on each anagram in the appropriate spaces provided. Again, you may not use any other paper that is not provided to you.

1. GSRUA \_\_\_\_\_
2. OLDME \_\_\_\_\_
3. TBOAN \_\_\_\_\_
4. EODNW \_\_\_\_\_
5. OARLB \_\_\_\_\_
6. MNAAI \_\_\_\_\_
7. AITOP \_\_\_\_\_
8. TRAIL \_\_\_\_\_
9. RDCEI \_\_\_\_\_
10. AEBRL \_\_\_\_\_

PLEASE WAIT UNTIL YOU ARE ASKED TO  
COMPLETE THE QUESTIONS ON THE NEXT PAGE

### QUESTIONS

1. How difficult do you think the **Third Anagram Task** was? Rate the level of difficulty on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
-----	-----	-----	-----	-----
extremely	somewhat	neither	somewhat	extremely
easy	easy	nor	difficult	difficult
		difficult		

2. How interesting was the **Third Anagram Task**? Rate your level of interest on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
-----	-----	-----	-----	-----
extremely	somewhat	neither	somewhat	extremely
uninterest-	uninterest-	interesting	interest-	interest-
ing	ing	nor	ing	ing
		uninteresting		

3. How important was it for you to succeed on the **Third Anagram Task**? Rate the level of importance on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
-----	-----	-----	-----	-----
very	somewhat	neither	somewhat	very
unimportant	unimportant	important	important	important
		nor unimportant		

4. How many anagrams do you believe you have solved correctly on the **Third Anagram Task**? \_\_\_\_\_
5. Do you think that you have succeeded in obtaining your goal on the **Third Anagram Task** (i.e., the number of anagrams that you have expected to solve correctly in 5 minutes)? Yes \_\_\_\_\_ No \_\_\_\_\_

6. What do you attribute your success or failure to?

\_\_\_\_\_ task is easy or (too) difficult

\_\_\_\_\_ too little time

\_\_\_\_\_ luck

\_\_\_\_\_ knowledge, ability, skills

\_\_\_\_\_ other. Please explain: \_\_\_\_\_

7. How satisfied are you with your performance level on the **Third Anagram Task**? Rate your satisfaction level on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
very	somewhat	neither	somewhat	very
unsatisfied	unsatisfied	satisfied	satisfied	satisfied
		nor unsatisfied		

8. Please choose only one of the following:

\_\_\_\_\_ I am dissatisfied with my performance on the **Third Anagram Task** and have no desire to improve on the next task.

\_\_\_\_\_ I am dissatisfied with my performance on the **Third Anagram Task** and would like to do better on the next task.

\_\_\_\_\_ I am satisfied with my performance on the **Third Anagram Task** and want to maintain that performance level on the next task.

\_\_\_\_\_ I am satisfied with my performance on the **Third Anagram Task** and would like to do better on the next task.

9. How much effort did you put in on the **Third Anagram Task**? Rate the level of effort you have exerted on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
far too	less than	as much as	more than	far too
little	I should	I should	I should	much

10. How willing are you to continue with the next anagram task? Rate your level of willingness to continue on the 5-point Likert scale provided below. Circle only one number.

1	2	3	4	5
extremely unwilling	somewhat unwilling	neither willing nor unwilling	somewhat willing	extremely willing

**THANK YOU FOR YOUR PARTICIPATION!!!**

## DEBRIEFING

You have participated in a study investigating how Type A and Type B individuals set goals on tasks of various difficulty and how they perform on these tasks. Type A individuals are those who continuously struggle to achieve more and more things in less and less time, and in doing so, against other people and things. Type B individuals are those who are characterized by a relative lack of the above characteristics (Friedman & Rosenman, 1974). The literature has generally found that although Type A's set higher goals than Type B's, they do not necessarily perform better than Type B's (e.g., Grimm & Yarnold, 1984). This study is an attempt to replicate and extend this general finding. The data will be compiled and analyzed, and only group means will be made available. If you are interested in the group results of this study, leave your name and address or write to: Karina Hui, Psychology Department -- Box 512, Baruch College, 17 Lexington Avenue, New York, N. Y. 10010. Tel: (212) 387-1540 or (212) 387-1530 (Secretary).

## References

- Friedman, M., & Rosenman, R. H. (1974). Type A Behaviour and Your Heart. New York: Alfred Knopf.
- Glass, D. C. (1977). Behavior Patterns, Stress and Coronary Disease. Hillsdale, NJ: Erlbaum.
- Grimm, L. G., & Yarnold, P. R. (1984). Performance standards and the Type A behavior pattern. Cognitive Therapy and Research, 8 (1), 59-66.
- Tresselt, M. E., & Mayzner, M. S. (1966). Normative solution times for a sample of 134 solution words and 378 associated anagrams. Psychonomic Monograph Supplements, 1, 293-298.

**ANSWERS AND MEDIAN SOLUTION TIMES FOR  
THE SAMPLE ITEMS FOR THE FIRST ANAGRAM TASK  
AND  
THE FIRST ANAGRAM TASK**

**SAMPLE ITEMS:**

1. human (15.0)
2. flour (23.0)

**FIRST ANAGRAM TASK:**

1. drink ( 7.0)
2. month (13.0)
3. trend (14.0)
4. fruit (15.0)
5. youth (18.0)
6. power (22.0)
7. birth (28.5)
8. value (46.0)
9. scale (60.0)
10. uncle (72.0)

**ANSWERS AND MEDIAN SOLUTION TIMES FOR  
THE SAMPLE ITEMS FOR THE SECOND ANAGRAM TASK  
AND  
THE SECOND ANAGRAM TASK**

**SAMPLE ITEMS:**

1. havoc ( 86.5)
2. clerk ( 91.5)

**SECOND ANAGRAM TASK:**

1. taunt ( 86.5)
2. bacon ( 92.5)
3. triad (103.0)
4. train (118.5)
5. oasis (131.0)
6. apron (132.0)
7. fault (136.5)
8. pause (143.0)
9. opium (149.5)
10. giant (154.0)

**ANSWERS AND MEDIAN SOLUTION TIMES FOR  
THE SAMPLE ITEMS FOR THE THIRD ANAGRAM TASK  
AND  
THE THIRD ANAGRAM TASK**

**SAMPLE ITEMS:**

1. heart (168.5)  
earth (240.0)
2. labor (201.0)

**THIRD ANAGRAM TASK:**

1. sugar (182.5)
2. model (191.5)
3. baton (194.0)
4. endow (202.5)
5. labor (210.0)
6. mania (217.5)
7. patio (218.0)
8. trial (218.0)
9. cider (223.5)
10. blare (224.5)

## APPENDIX C

## CHOOSING BETWEEN MANOVA AND ANOVA

When the same experimental unit is measured on several different occasions, it is a repeated measures design. There are two ways of setting up the data for a repeated measures design, commonly referred to as the univariate and multivariate approaches (SPSS, 1988a,b).

While one can use either approach, the multivariate approach is preferable because the univariate approach has certain drawbacks (SPSS, 1988a,b). First, the multivariate approach produces univariate results in addition to multivariate results. Second, the multivariate approach is much simpler to specify. Specification of the DESIGN subcommand in the univariate mixed-model can be very complicated. Third, the data are actually entered differently for the univariate and multivariate approaches. In the multivariate setup, all of a subject's scores across occasions are specified on the same case. In the univariate setup, a subject's scores across occasions are spread out over many cases. Fourth, the univariate setup is computationally inefficient, in the sense that

it takes much more memory and processing time (by the case) than the equivalent multivariate setup. Fifth, the univariate setup implies that one is using a mixed-model ANOVA approach to the data. That is, subject is a random effect nested under between-subjects factors, when the latter are present. In this approach, certain symmetry conditions must be met, and in practice these conditions are quite restrictive.

There are a few situations, however, where one might resort to the univariate setup (SPSS, 1988a,b): (1) when assumptions are met, the univariate approach has greater power; (2) the univariate mixed-model makes fuller use of the data when the number of subjects in the model is too small, when values are missing for some of the repeated measures, or when certain designs are being imposed on the repeated measures, such as latin square order.

Given the above reasons, a multivariate analysis of variance (MANOVA) design is the choice of this study, with task difficulty serving as the repeated measure.

## BIBLIOGRAPHY

- American Psychological Association (1987). Diagnostic and Statistical Manual of Mental Disorders (Third Edition-Revised). Washington, DC: American Psychiatric Association.
- American Psychological Association (1980). Diagnostic and Statistical Manual of Mental Disorders (Third Edition). Washington, DC: American Psychiatric Association.
- Ashford, S. J., & Cummings, L. L. (1983). Feedback as an individual resource: Personal strategies of creating information. Organizational Behavior and Human Performance, 32 (3), 370-398.
- Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. Journal of Personality and Social Psychology, 45 (5), 1017-1028.
- Bandura, A., & Cervone, D. (1986). Differential engagement of self-reactive influences in cognitive motivation. Organizational Behavior and Human Decision Processes, 38, 92-113.
- Bandura, A., & Jourden, F. J. (1991). Self-regulatory mechanisms governing the impact of social comparison on complex decision making. Journal of Personality and Social Psychology, 60 (6), 941-951.
- Bandura, A., & Wood, R. (1989). Effects of perceived controllability and performance standards on self-regulation of complex decision making. Journal of Personality and Social Psychology, 56 (5), 805-814.
- Bingham, D., & Hailey, B. J. (1989). The time-urgency component of the type A behavior pattern: Time pressure and performance. Journal of Applied Social Psychology, 19 (5), 425-432.

- Bluen, S. D., Barling, J., & Burns, W (1990). Predicting sales performance, job satisfaction, and depression by using the achievement strivings and impatience-irritability dimensions of Type A behavior. Journal of Applied Psychology, 75 (2), 212-216.
- Blumenthal, J. A., McKee, D. C., Haney, T., & Williams, R. B. (1980). Task incentives, type A behavior pattern, and verbal problem solving performance. Journal of Applied Social Psychology, 10 (2), 101-114.
- Blumenthal, J. A., McKee, D. C., Haney, T., & Williams, R. B. (1981). Assessment of conceptual tempo in Type A (coronary prone) behavior pattern. Journal of Personality Assessment, 45 (1), 44-51.
- Brunson, B. I., & Matthews, K. A. (1981). The Type A coronary-prone behavior pattern and reactions to uncontrollable events: An analysis of learned helplessness. Journal of Personality and Social Psychology, 40, 906-918.
- Burnam, M. A., Pennebaker, J. W., & Glass, D. C. (1975). Time consciousness, achievement striving, and the Type A coronary-prone behavior pattern. Journal of Abnormal Psychology, 84 (1), 76-79.
- Campbell, D. J., & Ilgen, D. R. (1976). Additive effects of task difficulty and goal setting on subsequent task performance. Journal of Applied Psychology, 61 (3), 319-324.
- Caplan, R. D., & Jones, K. W. (1975). Effects of workload, role ambiguity, and Type A personality on anxiety, depression, and heart rate. Journal of Applied Psychology, 60 (6), 713-719.
- Carver, C. S., Coleman, E., & Glass, D. C. (1976). The coronary-prone behavior pattern and the suppression of fatigue on a treadmill test. Journal of Personality and Social Psychology, 33 (4), 460-466.

- Cummings, L. L., Schwab, D. P., & Rosen, M. (1971). Performance and knowledge of results as determinants of goal setting. Journal of Applied Psychology, 55 (6), 526-530.
- Daniel, W. W. (1990). Applied NonParametric Statistics (2nd ed.). Boston, MA: RWS Kent Publishing.
- Dembroski, T. M., Weiss, S. M., Shields, J. L., Haynes, S. G., & Feinleib, M. (1978). Coronary-Prone Behavior. New York: Springer-Verlag.
- Dweck, C. S. (1992). The study of goals in psychology. Psychological Science, 3 (3), 165-167.
- Early, P. C., Lee, C., & Hanson, L. A. (1990). Joint moderating effects of job experience and task component complexity: Relations among goal setting, task strategies, and performance. Journal of Organizational Behavior, 11, 3-15.
- Erez, M. (1977). Feedback: A necessary condition for the goal setting-performance relationship. Journal of Applied Psychology, 62, 624-627.
- Erez, M., Gopher, D., & Arzi, N. (1990). Effects of goal difficulty, self-set goals, and monetary rewards on dual task performance. Organizational Behavior and Human Decision Processes, 47, 247-269.
- Erez, M., & Kanfer, F. H. (1983). The role of goal acceptance in goal setting and task performance. Academy of Management Review, 8, 454-463.
- Fazio, R. H., Cooper, M., Dayson, K., & Johnson, M. (1981). Control and the coronary-prone behavior pattern: Responses to multiple situational demands. Personality and Social Psychology Bulletin, 7 (1), 97-102.
- Frankel, A., & Snyder, M. L. (1978). Poor performance following unsolvable problems: Learned helplessness or egotism? Journal of Personality and Social Psychology, 36 (12), 1415-1423.

- Frese, M., Stewart, J., & Hannover, B. (1987). Goal orientation and planfulness: Action styles as personality concepts. Journal of Personality and Social Psychology, 52 (6), 1182-1194.
- Friedman, M., & Rosenman, R. H. (1959). Association of specific overt behavior pattern with blood and cardiovascular findings: Blood cholesterol level, blood clotting time, incidence of arcus senilis, and clinical coronary disease. Journal of American Medical Association, 169 (12), 1286-1296.
- Friedman, M., & Rosenman, R. A. (1974). Type A Behavior and Your Heart. New York: Alfred A. Knopf.
- Friedman, M., & Ulmer, D. (1984). Treating Type A behavior and your heart. New York: Knopf.
- Garland, H. (1984). Relations of effort performance expectancy to performance in goal setting experiments. Journal of Applied Psychology, 69, 79-85.
- Gastorf, J. W., & Teevan, R. C. (1980). Type A coronary-prone behavior pattern and social facilitation. Journal of Personality and Social Psychology, 38, 773-780.
- Glass, D. C. (1977). Behavior Patterns, Stress and Coronary Disease. Hillsdale, N. J.: Erlbaum.
- Greenberg, J. (1985). Unattainable goal choice as a self-handicapping strategy. Journal of Applied Social Psychology, 15 (2) 140-152.
- Griffith, M. (1977). Effects of noncontingent success and failure on mood and performance. Journal of Personality, 45 (3), 442-457.
- Grimm, L. G., & Yarnold, P. R. (1984). Performance standards and the Type A behavior pattern. Cognitive Therapy and Research, 8 (1), 59-66.

- Hollenbeck, J. R., & Brief, A. P. (1987). The effects of individual differences and goal origin on goal setting and performance. Organizational Behavior and Human Decision Processes, 40, 392-414.
- Hom, H. L., Jr., & Murphy, M. D. (1985). Low need achievers' performance: The positive impact of a self-determined goal. Personality and Social Psychology Bulletin, 11 (3), 275-285.
- Howard, J. H., Cunningham, D. A., & Rechnitzer, P. A. (1977). Work patterns associated with Type A behavior: A managerial population. Human Relations, 30, 825-836.
- Hui, L. K. (1992). Personal Goal Setting and Task Performance as A Function of Type A/B Behavior Pattern and Task Difficulty. Unpublished manuscript. Baruch College, New York, USA.
- Ivancevich, J. M., & Matteson, M. T. (1988). Type A behaviour and the healthy individual. Special issue: Stress and health. British Journal of Medical Psychology, 61 (1), 37-56.
- Jamal, M. (1985). Type A behavior and job performance: Some suggestive findings. Journal of Human Stress, 11, 60-68.
- Jenkins, C. D. (1975). The coronary-prone personality. In W. D. Gentry & R. B. Williams, Jr. (Eds.). Psychological Aspects of Myocardial Infarction and Coronary Care. St. Louis: Mosby.
- Jenkins, C. D. (1978). Behavioral risk factors in coronary artery disease. Annual Review of Medicine, 29, 543-562.
- Jenkins, C. D., Rosenman, R. H., & Zyzanski, S. J. (1974). Prediction of clinical coronary heart disease by a test for the coronary-prone behavior pattern. The New England Journal of Medicine, 290 (23), 1271-1275.

- Jenkins, C. D., Zyzanski, S. J., & Rosenman, R. H. (1971). Progress toward validation of a computer-scored test for the Type A coronary-prone behavior pattern. Psychosomatic Medicine, 33, 193-202.
- Jenkins, C. D., Zyzanski, S. J., & Rosenman, R. H. (1979). Jenkins Activity Survey. New York: The Psychological Corporation.
- Juszczak, N. M., & Andreassi, J. L. (1987). Performance and physiological responses of Type A and Type B individuals during a cognitive and perceptual-motor task. International Journal of Psychophysiology, 5, 81-89.
- Kanfer, F. H. (1970). Self-regulation: Research issues and speculations. In C. Neuringer & J. Michael (Eds.), Behavior Modification in Clinical Psychology. New York: Appleton-Century-Crofts.
- Kanfer, F. H. (1975). Self-management methods. In F. H. Kanfer (Ed.), Helping People Change. New York: Wiley.
- Kanfer, F. H. (1980). Self-management methods. In F. H. Kanfer & A.P. Goldstein (Eds.), Helping People Change: A textbook of Methods. New York: Pergamon Press.
- Kirschner, C., Allbright, G. L., & Andreassi, J. L. (1989). Personality and performance: An examination of Type A and Type B constructs. Perceptual and Motor Skills, 68, 1107-1114.
- Krantz, D. S., Glass, D. C., & Snyder, M. L. (1974). Helplessness, stress level, and the coronary-prone behavior pattern. Journal of Experimental Social Psychology, 10 (3), 284-300.
- Latham, G. P. & Yukl, G. A. (1975). A review on the application of goal setting in organizations. Academy of Management Journal, 18 (4), 824-845.
- Lee, C., Early, P. C., & Hanson, L. A. (1988). Are type As better performers? Journal of Organizational Behavior, 9, 263-269.

- Lee, C., & Gillen, D. J. (1989). Relationship of type A behavior pattern, and self-efficacy perceptions on sales performance. Journal of Organizational Behavior, 10, 75-81.
- Lewin, K. (1958). Psychology of success and failure. In C. L. Stacey & M. F. DeMartino (Eds.), Understanding Human Motivation. Cleveland, OH: Howard Allen.
- Lewin, K., Dembo, T., Festinger, L., & Gears, P. S. (1944). Level of Aspiration. In J. McUtlunt (Ed.), Personality and The Behavior Disorders (Vol 1). New York: Ronald.
- Locke, E. A. (1968). Toward a theory of task motivation and incentives. Organizational Behavior and Human Performance, 3, 157-189.
- Locke, E. A. (1982). Relation of goal level to performance with a short work period and multiple goal levels. Journal of Applied Psychology, 67 (4), 512-514.
- Locke, E. A., Frederick, E., Lee, C., & Bobko, P. (1984). Effect of self-efficacy, goals, and task strategies on task performance. Journal of Applied Psychology, 69, 241-251.
- Locke, E. A., & Latham, G. P. (1990). A Theory of Goal Setting and Performance. Englewood Cliffs, NJ: Prentice Hall.
- Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981). Goal setting and task performance: 1969 - 1980. Psychological Bulletin, 90, 125-152.
- MacDougall, J. M., Dembroski, T. M., & Musante, L. (1979). The structured interview and questionnaire methods of assessing coronary-prone behavior in male and female college students. Journal of Behavioral Medicine, 2, 71-83.

- Manning, D. T., Balson, P. M., Hunter, S. M., Berenson, G. S., et al. (1987). Comparison of the prevalence of Type A behavior in boys and girls from two contrasting socioeconomic status groups. Journal of Human Stress, 13 (3), 116-120.
- Matherly, T. A. (1986). Effects of prior success or failure on performance under varying goal conditions. Journal of Social Behavior and Personality, 1 (2), 267-277.
- Matteson, M. T., Ivancevich, J. M., & Smith, S. V. (1984). Relation of type A behavior to performance and satisfaction among sales personnel. Journal of Vocational Behavior, 25, 203-214.
- Matthews, K. A. (1982). Psychological perspectives on the Type A behavior pattern. Psychological Bulletin, 91 (2), 293-323.
- Matthews, K. A., Helmreich, R. L., Beane, W. E., & Lucker, G. W. (1980). Pattern A, achievement striving, and scientific merit: Does pattern A help or hinder? Journal of Personality and Social Psychology, 39 (5), 962-967.
- Matthews, K. A., & Siegel, J. M. (1983). Type A behaviors for children, social comparison, and standards for self-evaluation. Developmental Psychology, 19 (1), 135-140.
- Matthews, K. A., & Volkin, J. I. (1981). Efforts to excel and the Type A behavior pattern in children. Child Development, 52, 1283-1289.
- Mento, A. J., Steel, R. P., & Karren, R. J. (1987). A meta-analytic study of the effects of goal setting on task performance: 1966-1984. Organizational Behavior and Human Decision Processes, 39 (1), 52-83.
- Mettlin, C. (1976). Occupational careers and the prevention of coronary-prone behavior. Social Science and Medicine, 10 (7-8), 367-372.

- Murray, J. L., & Bruhn, J. G. (1983). Reliability of the MYTH scale in assessing Type A behavior in preschool children. Journal of Human Stress, 9 (4), 23-28.
- Musante, L., MacDougall, J. M., & Dembroski, T. M. (1984). The Type A behavior pattern and attributions for success and failure. Personality and Social Psychology Bulletin, 10 (4), 544-553.
- Ortega, D. F., & Pipal, J. E. (1984). Challenge seeking and the Type A coronary-prone behavior pattern. Journal of Personality and Social Psychology, 46 (6), 1328-1334.
- Overarchyn, C. A., Johnson, H. H., & Pretzel, T. P. (1981). Type A behavior, academic aspirations, and academic success. Journal of Personality, 49 (3), 248-256.
- Pervin, L. A. (1992). The rational mind and the problem of volition. Psychological Science, 3 (3), 162-164.
- Price, V. A. (1982). Type A Behavior Pattern: A Model for Research and Practice. New York: Academic Press.
- Racicot, B. M., Day, D. V., & Lord, R. G. (1991). Type A behavior pattern and goal setting under different conditions of choice. Motivation and Emotion, 15 (1), 67-79.
- Raynor, J. O., & Smith, C. P. (1966). Achievement-related motives and risk-taking in games of skill and chance. Journal of Personality, 34, 176-198.
- Rime, B., & Bonami, M. (1976). Goal setting and coronary heart disease. British Journal of Social and Clinical Psychology, 15, 287-293.
- Smith, T. W., & Anderson, N. B. (1986). Models of personality and disease: An interactional approach to Type A behavior and cardiovascular risk. Journal of Personality and Social Psychology, 50 (6), 1166-1173.

- Snow, B. (1978). Level of aspiration in coronary prone and noncoronary prone adults. Personality and Social Psychology Bulletin, 4 (3), 416-419.
- Sprafka, J. M., Folsom, A. R., Burke, G. L., Hahn, L. P. et al. (1990). Type A behavior and its association with cardiovascular disease prevalence in Blacks and Whites: The Minnesota Heart Survey. Journal of Behavioral Medicine, 13 (1), 1-13.
- SPSS Inc. (1988a). SPSS-X Introductory Statistics Guide for SPSS-X Release 3. Chicago, Il: SPSS Inc.
- SPSS Inc. (Ed.). (1988b). SPSS-X User's Guide. Chicago, Il: SPSS Inc.
- Steers, R. M., & Porter, L. W. (1974). The role of task-goal attributes in employee performance. Psychological Bulletin, 81 (7), 434-452.
- Strube, M. J., & Boland, S. M. (1986). Past performance attributions and task persistence among Type A and B individuals: A clarification. Journal of Personality and Social Psychology, 50 (2), 413-420.
- Strube, M. J., Keller, N. R., Oxenberg, J., & Ladipot, D. (1989). Actual and perceived group performance as a function of group composition: The moderating role of the Type A and B Behavior patterns. Journal of Applied Social Psychology, 19, 140-158.
- Suls, J., Becker, M. A., & Mullen, B. (1981). Coronary-prone behavior, social insecurity and stress among college-aged adults. Journal of Human Stress, 7 (3), 27-34.
- Sutherland, V. J., & Cooper, C. L. (1991). Personality, stress, and accident involvement in the offshore oil and gas industry. Personality and Individual Differences, 12 (2), 195-204.

- Tang, T. L. P., & Liu, H. (1989). Effects of Type A behavior and task label on goal setting. The Journal of Psychology, 23 (1), 79-89.
- Tang, T. L. P., Liu, H., & Vermillion, W. H., Jr. (1987). Effects of self-esteem and task labels (difficult vs. easy) on intrinsic motivation, goal setting, and task performance. Journal of General Psychology, 114 (3), 249-262.
- Taylor, M. S., Locke, E. A., Lee, C., & Gist, M. E. (1984). Type A behavior and faculty productivity: What are the mechanisms? Organizational Behavior and Human Performance, 34, 402-418.
- Tresselt, M. E., & Mayzner, M. S. (1966). Normative solution times for a sample of 134 solution words and 378 associated anagrams. Psychonomic Monograph Supplements, 1, 293-298.
- Tubbs, M. E. (1986). Goal setting: A meta-analytic examination of the empirical evidence. Journal of Applied Psychology, 71 (3), 474-483.
- Vance, R. J., & Colella, (1990). Effects of two types of feedback on goal acceptance and personal goals. Journal of Applied Psychology, 75 (1), 68-76.
- Waldron, I., Hickey, A., McPherson, C., Butensky, A., Gruss, L., Overall, K., Schmader, A., & Wohlmuth, D. (1980). Relationship to variation in blood pressure, parental characteristics, and academic and social activities of students. Journal of Human Stress, 6 (1), 16-27.
- Ward, C. H., & Eisler, R. M. (1987a). Type A achievement striving and failure to achieve personal goals. Cognitive Therapy and Research, 11, 463-471.
- Ward, C. H., & Eisler, R. M. (1987b). Type A behavior, achievement striving, and a dysfunctional self-evaluation system. Journal of Personality and Social Psychology, 53 (2), 318-326.

- Weidner, G. (1980). Self-handicapping following learned helplessness treatment and the Type A coronary-prone behavior pattern. Journal of Psychosomatic Research, 24, 319-325.
- White, S., Mitchell, T., & Bell, C. (1977). Goal setting, evaluation apprehension, and social cues as determinants of job performance and job satisfaction in a simulated organization. Journal of Applied Psychology, 62, 665-673.
- Wolf, T. M., Hunter, S. M., Webber, L. S., Berenson, G. S. (1981). Self-concept, locus of control, goal blockage, and coronary-prone behavior pattern in children and adolescents: Bogalusa Heart Study. Journal of General Psychology, 105 (1), 13-26.
- Wood, R. E., Mento, A. J., & Locke, E. A. (1987). Task complexity as a moderator of goal effects: A meta-analysis. Journal of Applied Psychology, 72 (3), 416-425.
- Wright, P. M. (1990). Operationalization of goal difficulty as a moderator of the goal difficulty-performance relationship. Journal of Applied Psychology, 75 (3), 227-234.
- Yarnold, P. R., Mueser, K. T., & Lyons, J. S. (1988). Type A behavior, accountability, and work rate in small groups. Journal of Research in Personality, 22, 353-360.
- Zander, A., & Newcomb, T. (1967). Group levels of aspiration in United Fund campaigns. Journal of Personality and Social Psychology, 6, 157-162.
- Zander, A., Forward, J., & Albert, R. (1969). Adaptation of board members to repeated failure or success by their organization. Organizational Behavior and Human Performance, 4, 56-76.

## AUTOBIOGRAPHICAL STATEMENT

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