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The effect of goal setting and Type A-B behavior pattern on performance: A laboratory examination of person-situation interaction

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THE EFFECT OF GOAL SETTING AND TYPE A-B BEHAVIOR PATTERN ON PERFORMANCE: A LABORATORY EXAMINATION OF PERSON-SITUATION INTERACTION

by

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

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Abstract

THE EFFECT OF GOAL SETTING AND TYPE A-B BEHAVIOR PATTERN ON PERFORMANCE: A LABORATORY EXAMINATION OF PERSON-SITUATION INTERACTION

The effects of a situational and a personality variable on the performance of a laboratory task were examined. Goal setting was used to provide situational performance parameters while Type A-B behavior pattern provided a measure of individual differences. The contrasting predictions of each variable were integrated to form experimental hypotheses. The results indicate that personality variables may moderate the situation-performance relationship. Implications for research in person-situation interaction are discussed.
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Goal Setting Theory</td>
<td>1</td>
</tr>
<tr>
<td>Type A-B Behavior Pattern</td>
<td>5</td>
</tr>
<tr>
<td>Integrating Goal Setting and Behavior Pattern</td>
<td>10</td>
</tr>
<tr>
<td>Method</td>
<td>15</td>
</tr>
<tr>
<td>Subjects</td>
<td>15</td>
</tr>
<tr>
<td>Material</td>
<td>15</td>
</tr>
<tr>
<td>Design</td>
<td>15</td>
</tr>
<tr>
<td>Procedure</td>
<td>16</td>
</tr>
<tr>
<td>Results</td>
<td>17</td>
</tr>
<tr>
<td>Discussion</td>
<td>26</td>
</tr>
<tr>
<td>References</td>
<td>30</td>
</tr>
<tr>
<td>Appendix</td>
<td>34</td>
</tr>
<tr>
<td>Number</td>
<td>Name</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Goal Setting Model</td>
</tr>
<tr>
<td>2</td>
<td>Mean Simple Performance as a Function of Goal Condition, Behavior Pattern, and Session</td>
</tr>
<tr>
<td>Number</td>
<td>Name</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Correlations Among Selected Session Two Variables</td>
</tr>
<tr>
<td>2</td>
<td>Table of Sum of Squares for Repeated Measure ANOVA's on the Dependent Measure</td>
</tr>
<tr>
<td>3</td>
<td>Mean Performance by Goal and Session</td>
</tr>
<tr>
<td>4</td>
<td>Mean Performance by Session, Goal Condition, and Behavior Type</td>
</tr>
<tr>
<td>5</td>
<td>Mean Performance by Session, Goal and by Session, Goal, and Behavior Type for the &quot;do best&quot; Condition with a Known Time Limit</td>
</tr>
</tbody>
</table>
Introduction

The study of levels of performance and productivity on tasks has revolved around determining those factors that prevent or facilitate superior performance on the job. Many of these theories have involved either situational effects or individual differences. Rarely are both combined in theory or practice, especially in industrial psychology (Schneider, 1978). The attempt to explain performance effects by the application of two such theories will necessarily result in one being deemed more explanatory than another. Main-effect improvement generally occurs only when the situational effect is greater than the effect due to individual differences. Alternatively, individual differences can moderate the effects of the situation, rendering it effective only for certain segments of the population of interest.

This study proposes to integrate a situational and an individual difference approach to explain the effects of performance on a laboratory task. The situational theory is the goal setting theory of Locke (1968). The individual difference theory is the Type A-B behavior pattern (Friedman and Rosenman, 1974). A brief literature review of each theory is presented after which the contrasting predictions of each are integrated into experimental hypotheses.

Goal Setting Theory

Locke’s (1968) goal setting theory of motivation is one of the most robust theories within organizational psychology. A review by Locke, Shaw, Saari, and Latham (1981) reported that ninety percent of the studies conducted to test the theory within the period 1969 -1980 supported the hypotheses of goal setting theory. While the studies which have been conducted since 1968 have expanded and revised the theory, its current structure is remarkably similar to the original propositions.

Goal setting theory’s basic assumption "is that goals are immediate regulators of human action" (Locke et al., 1981, p. 126). Goals affect performance "by directing attention and action, mobilizing energy expenditure or effort, prolonging effort over time (persistence), and motivating the individual to develop relevant strategies" to achieve the goal (Locke et al., p. 145). The theoretical model was developed by Locke,
Cartledge, and Knerr (1970) and is diagrammed as follows (see Figure 1).

The model proposes that the motivation to change or establish a given set of behaviors is precipitated by a comparison of existents (e.g. rewards and other outcomes) with a desired state of the world (the process of cognition). The recognition of an actual-desired discrepancy leads to an affective state which can produce goal setting. Appropriate goals are those which, upon attainment, reduce this discrepancy. This model is conceptually similar to various models of cognitive consistency and social learning theory (Bandura, 1977). It is not the case, however, that any goal will affect performance. There are certain attributes of goals that determine how likely they are to lead to increased task performance. The attributes most relevant to this study are goal acceptance, goal specificity, and goal difficulty.

Goal acceptance is related to task performance for the obvious reason that goals rejected by an individual cannot be expected to motivate increases in performance. Failure to accept a goal implies that the individual either does not perceive the goal as capable of reducing the discrepancy between actual and desired states of affairs or does not perceive a discrepancy. Locke (1968) argues that studies which do not support goal setting theory often fail to ensure that goals were accepted by the subjects. Data reanalyzed by Locke (1968) show that goal setting hypotheses are supported for those individuals who indicate that the goals are acceptable. Locke contends that other data, if analyzed on the basis of goal acceptance instead of goal assignment, would support goal setting theory.

Erez and Zidon (1984) provided evidence for Locke's position. Subjects completed repeated trials of two tasks and rated their acceptance of the goals set for them by the experimenter. Goals were increased in difficulty as subjects completed each trial. It was thus possible to examine performance as a function of the extent to which subjects accepted the goal set for any given trial. Erez and Zidon found that goal acceptance decreased with increased goal difficulty. Performance increased linearly and significantly, with goals of increasing difficulty as long as goals were accepted. Performance decreased beyond the point at which subjects rejected the goals set for them. The authors also found that the standard deviation of acceptance
Figure 1

Existents: Cognition | Affective reactions | Goal setting | Action
incentives, persons, actions, outcomes, etc.
evaluation values emotions intentions
ratings for each level of goal difficulty increased as goal difficulty increased. The "small variance in acceptance within the positive zone suggests that subjects are more homogeneous in accepting attainable goals than in rejecting the most difficult ones" (p. 77).

A second attribute of goals is specificity. General or ambiguous goals are generally couched in statements such as, "Do your best" or the standard speed-accuracy task instruction, "Work as quickly and accurately as you can." While non-specific goals can be generally motivating they cannot enable the individual to determine how much the actual-desired discrepancy has been reduced. The more specific the goal the better able is the individual to perceive a reduction in discrepancy and the more likely the individual is to work to achieve the goal. Locke et al. (1981) "found that 99 out of 110 studies found that specific, hard goals produced better performance than medium, easy, do your best, or no goals" (p. 131).

The most important attribute of goal effectiveness may be difficulty. Locke has consistently maintained that difficult goals produce better performance than easy goals and his position has gained much support (Locke, 1968, 1982; Locke et al, 1981; Garland, 1982, 1983; Erez and Zidon, 1984; and Jackson and Zedeck, 1982). Difficult goals have not always led to higher performance than moderate goal levels, however (Garland, 1982; Locke, 1982). The inconsistent findings with regard to moderate goal levels may be due to definitional problems. While there appear to be accepted differences in hard (P(successful goal attainment) < 0.20) and easy (P(successful goal attainment) > 0.75) goals, there is no consensus regarding moderate goals. Related to this point are the characteristics of the tasks used in the goal setting literature. Non-linearities in the goal difficulty-performance function may be due to time or ceiling effects. Both Garland and Locke used a brainstorming/creativity task in which subjects had to list as many uses as could be make of an object or as many objects as could be described by a given adjective. In both studies, the experimenter limited the amount of time subjects had to complete the assigned tasks. It is conceivable that, given more time, subjects could have attained higher performance levels with the higher goals. Similarly, non-linear functions would result when the task performance function
reaches asymptote, whether due to task or operator characteristics. In this case the relation of moderate to difficult goals would depend on where along the function the goals were set. This refers back to the difficulty in operationally defining moderate goals noted above.

A third reason for the goal difficulty-performance inconsistency might be due to individual differences. It seems logical to predict that personality variables may limit the extent to which one will accept goals or the extent to which one will direct effort toward or persist in obtaining difficult goals. Similarly, there should be individual differences on the extent to which persons are oriented toward formulating specific goals. Locke et al. (1981), however, state that no reliable findings have resulted from studies which propose that the effect of goal setting is moderated by individual differences. The individual differences studied include education, race, need for achievement, need for independence, self-esteem, higher order need strength, and internal versus external locus of control (Locke et al. 1981; Beehr and Love, 1983). The inconsistency in findings may be due mainly to two factors. First, most goals were assigned in these studies. This effectively prevents the effects of individual differences from being manifested in performance. Second, most studies were designed primarily as studies of goal setting and were not specifically designed for a test of individual differences. Thus, differing or no clear theoretical rationales were offered for the inclusion of individual difference measures. As a result, differing or no interpretations were offered for findings, or the individual differences were not measured consistently across studies. While it is logical to think that individual differences will moderate the effect of goal setting on performance (which may be the reason so many studies have included them), it appears that no coherent findings will emerge until a methodological framework is developed to incorporate individual differences within goal setting. An individual difference model which might provide a more coherent framework is the Type A-B behavior pattern.

The Type A-B Behavior Pattern

The Type A behavior pattern was identified by Friedman and Rosenman (1974). They described the behavioral characteristics of a certain class of cardiac patients,
most especially those whose age was within the 40- lower 50 year range. The Type A pattern is typically described as an action-emotion complex characterized by "explosive, accelerated speech; a heightened pace of living; impatience with slowness" and "core elements of... extremes of aggressiveness, easily aroused hostility, a sense of time urgency, and competitive achievement striving" (Matthews, 1982). The Type A behavior pattern is a set of behavioral predispositions elicited by certain environments or interpersonal situations. These environments/situations are not well defined. They generally involve competition (against persons or time), an environment in which rewards are not contingent upon behavior (uncontrollability), or an environment that is consistently too challenging or not challenging enough. The Type B behavior pattern is rather vaguely defined as the absence of the Type A pattern. Studies involving Type B-prone subjects often use them only as a comparison for the evaluation of Type As. As a result, much cannot be said about persons prone to Type B behavior, except that they are less likely to develop coronary heart disease.

Much of the research concerning the Type A pattern has been conducted within the medical field. Efforts to create a taxonomy of physiological differences between Type As and Bs have been somewhat ineffective (see Matthews, 1982 for a comprehensive review). The most consistent findings indicate that stressors cause heightened sympathetic nervous system activity within Type As: a tendency to activate the neuroendocrine processes which lead to the release of the various hormones believed to predispose an individual to heart disease.

Conceptualizing the pattern as a psychological variable has been relatively more successful. Much of the work of Glass describes the set of behaviors in the Type A pattern as an attempt to maintain control over a potentially uncontrollable environment and has been conducted within the learned helplessness paradigm developed by Seligman (1975). Krantz, Glass, and Snyder (1974) exposed subjects to a controllable or uncontrollable noise defined to produce high (107 dB) or moderate (78 dB) levels of stress. Subjects were asked to manipulate dials in an attempt to end the noise, regardless of whether the noise was controllable. All subjects were then exposed to controllable noise at the same stress level they experienced in the first phase. Under
moderate stress, Type As in the controllable and uncontrollable conditions performed a similar number of escape attempts. Type Bs in the uncontrollable noise condition performed significantly fewer escape attempts relative to Type Bs subjected to controllable noise. At high levels of noise, however, the pattern is reversed. Type Bs attempt to escape the noxious stimuli at the same rate, regardless of controllability, whereas Type As decrease their escape attempts when the noise is uncontrollable. Type As in this condition rated themselves as more helpless and more threatened by lack of control. Krantz et al. (1974) note that "...[Type] As appear threatened by perceived lack of control over intense environmental stressors and therefore give up efforts to maintain control" (p.299). Further studies by Glass (1977) suggest that the reactions of Type As can be distinguished from Type Bs only after an extremely salient failure to control a situation. Thus, to the extent that a failure is apparent to the Type A individual, and presumably to others, it will serve to elicit Type A behavior. Dembroski and MacDougall (1978) report that, under the threat of a stressful situation, Type As prefer to affiliate with others more than Type Bs, although the As tend to prefer working alone. This finding suggests that Type As use social comparison as a way of evaluating control concerns.

When Type As have no means of making social comparisons, they often blame themselves for failure. Brunson and Matthews (1981) created a stimulus discrimination task and gave to subjects highly or moderately salient feedback. Subjects were asked to verbalize their problem solving strategies throughout the task performance. After failure, As in the high salience condition shifted to less sophisticated strategies, as did Bs in the moderate salience condition. These findings are similar to those found by Krantz, Glass, and Snyder (1974) as noted above.

An analysis of the verbalized strategies of subjects revealed that, prior to failure, Type As verbalized more useful task strategies than did Type Bs. During failure, however, the high salience As stated more ineffectual strategies than moderate salience As. High salience As attributed their failure to personal lack of ability, while moderate salience Bs attributed it to increased task difficulty or chance. Thus, As seem to hold themselves more personally responsible for environmental occurrences than do
Bs.

Type As are also characterized by a tendency to suppress boredom (Friedman and Rosenman, 1974) and fatigue (Carver, Coleman, and Glass, 1976). Friedman and Rosenman note that Type As can attend to a boring task/situation while thinking about something else. Such polyphasic thinking is an indicator of Type A behavior (Friedman and Rosenman, 1974). Carver et al. (1976) compared the performance of Type As and Bs on a treadmill that provided increasing resistance throughout the experiment. Subjects walked at a brisk pace on the treadmill and indicated their level of fatigue at predetermined intervals. A comparison of the fatigue ratings showed that As expressed significantly less overall fatigue than Bs even though physiological data showed that the As had performed closer to their level of maximal endurance effort. Subjects were not given any time limit on performance, they simply signalled to the experimenter when they wished to end the experiment. Type As and Bs did not significantly differ with respect to time spent on the treadmill.

Results indicating a similar persistence on the part of Type As were obtained by Burnam, Pennebaker, and Glass (1975). Subjects classified by behavior pattern were asked to solve arithmetic problems and were either told or not told of a five minute time limit to the task. Subjects told of the deadline were given "do your best goals." In the "known deadline" condition, the number of problems completed by Type Bs did not significantly differ from the number completed by As. In the "unknown deadline" condition, however, Type As completed significantly more problems than Bs. Type Bs in the "known" condition significantly outperformed those in the "unknown" condition. There was no reliable difference in error rates between cells. These results were interpreted as indicating that Type As approach all tasks in a hard-driving manner, whereas Bs are able to distinguish cases in which maximal effort is necessary.

Glass and his colleagues also have studied time urgency as a component of the Type A pattern and have attempted to relate it to the control hypothesis (Glass, 1977). Burnam et al. (1975) asked Type As and Bs to sit quietly and estimate the passage of one minute. Type As significantly underestimated a one minute period while Type Bs significantly overestimated it. These results support the belief that Type As perceive
time passing quickly and, when combined with the control hypothesis, suggest that As are more likely than Bs to exert authority when they perceive a loss of control. Presumably, they sense time and opportunity slipping away and make immediate attempts to prevent it.

The concept of time urgency has been incorporated into a rival theoretical Type A-B framework by Matthews (Matthews, 1982; Matthews and Siegel, 1982), based on Ornstein's (1969) theory of time urgency and Festinger's cognitive dissonance theory (1954). According to Ornstein, a person's perception of time is dependent on the environment and the internal clock of the individual. Increases in the rate of movement of the biological clock cause the perception of an increasing rate of the movement of time. Ornstein proposes that an increase in the perceptual load generally entails greater complexity in processing, hence more neural activity. This increased demand on bodily processes creates the illusion that time is moving more quickly than is the actual case. Thus, ambiguous standards of excellence, which create greater processing demands on the individual, contribute to a sense of time passing quickly. Festinger's theory of cognitive dissonance states that individuals will be driven to evaluate themselves and reduce discrepancies when presented with data that contradicts some aspect of a person's self-perception.

Matthews and Siegel (1982) argue that ambiguous goals underlie the Type A behavior pattern. A lack of clear standards leads Type As to feel that time is passing quickly as they strive to reach goals that cannot be precisely stated, thus never achieved. Evaluation of their "poor" performance leads Type As to set even higher, though still ambiguous, goals ("I'll do better next time."). This pattern of setting and not achieving unclear performance standards may explain Friedman and Rosenman's (1974) observation that Type As tend to be dissatisfied with their lives and harbor a free-floating hostility.

It has been difficult, however, to distinguish between achievement striving and controlling (as defined by Glass, 1977). Much of the evidence presented to support one concept can be used to support the other. Fazio, Cooper, Dayson, and Johnson (1981) report the results of an experiment that seems to support the control hypothesis.
The study design was a 2 (behavior pattern) x 2 (single or multiple task) factorial. Subjects in the single task condition had to proofread a document; those by the multiple conditions had to proofread the same document and attend to an extraneous task at the experimenter's cue. Type Bs were adversely affected in the multiple task condition, whereas Type As remained consistent in or improved performance. Fazio et al. note that this data supports the control hypothesis. However, they also note that "the relatively stronger desire to achieve may have prompted Type As to respond more effectively to the multiple activity situation...[T]he present findings do not indicate which of these two [control or achievement] explanations may be the more appropriate" (p.101).

Integrating Goal Setting and Behavior Pattern

Goal setting and the Type A-B behavior pattern were constructed to explain different phenomena. Goal setting theory was constructed to explain motivation in the performance of jobs and tasks and is often contrasted with theories of achievement motivation. It is considered comparable to other cognitive models of performance, such as MBO (Miner, 1980), although the distinction between cognitive and behavioral models is blurred (Locke, 1980; Komaki, 1981). The behavior pattern typology attempts to explain differences in the tendency to develop coronary artery and heart disease. The Type A-B behavior pattern can be considered part of the more general person-environment fit model of stress (Harrison, 1985). Applications of goal setting and the behavior pattern, however, do overlap, and it is the purpose of this section to contrast the hypotheses of each with respect to task performance.

The above review of goal setting makes clear the theory's prediction that specific, hard, accepted goals lead to higher levels of performance than that achieved with goals that are easy, vague, or not accepted. Locke has found that performance on a lab task does not diminish even when subjects are given goals which could not possibly be attained, and individual differences do not seem to moderate the effect of goal difficulty. The research concerning behavior patterns, however, would suggest a moderating effect of Type A on the goal-performance function. Type As, during or after a salient failure, exhibit behaviors suggestive of learned helplessness and the
problem-solving strategies of Type As have been found to deteriorate during failure. Type As perform more poorly on tasks which require effort throughout prolonged periods of failure. When not exposed to salient or prolonged failure, Type As can be expected to attempt to outperform Type Bs and will actually do so when no specific time deadlines are set (Burnam et al, 1975). Thus, it may be that Type As, when placed under conditions of failure (the inability to achieve hared goals) will perform more poorly than Type Bs.

The only study which explicitly examined goal setting and behavior pattern was conducted by Snow (1978). Each subject was asked to complete five "connect the dot" puzzles and to estimate the "the number [of dots] he would try to reach in the allotted time" (p. 417). Subjects had fifteen seconds to look at a puzzle and sixty seconds to complete it for each of the five puzzles. Snow hypothesized that Type As would show a pattern of higher goal setting on the estimate measure and that Type Bs would aspire to more moderate performance levels. Although there was no difference in performance due to pattern, Type As set significantly higher goals on the first puzzle and their goals were higher (though not significantly) on subsequent puzzles. Since performance between type was relatively constant, Type As showed a significantly higher discrepancy between level of aspiration and actual performance than did Bs. Snow concludes that the hypotheses were supported and that "inordinately high goal striving [is] a behavioral manifestation of the Type A coronary prone pattern" (p. 416).

There are a number of difficulties with this conclusion. Snow (1978) used a task of very short duration (60 seconds), as have most lab studies of goal setting. Thus, the study could not have detected behavior pattern differences due to effects of prolonged failure, persistence, or most of the variables previously studied with regard to Type A. Additionally, subjects were asked to state the level of performance they aspired to without the benefit of task experience. Although no significance test is reported for the estimated compared to actual performance on the first puzzle for Bs, the discrepancy, as reported in the raw data, seems large. This is especially troublesome because only the discrepancy on the first puzzle was significant for As. Goal level dropped and remained virtually unchanged for the next four puzzles. Actual performance converged
with goal level by the fifth puzzle for the As and overshot it for the Bs. Whether this was due to learning or some end of task facilitation is not discussed.

While Snow's findings on aspiration levels are interesting, it remains to be seen if behavior type and goal levels will be associated with differences in performance on a difficult task of relatively long duration. The conceptual framework used to integrate the two theories is that of person-situation interaction. This relatively simple notion has surfaced recently in connection with research regarding validity generalization (Schmidt, Hunter, and Pearman, 1981) in personnel selection. Person-situation interaction is concerned mainly with personnel selection validation—the extent to which ability can be used to select for jobs considering that it may be moderated by situations (Schneider, 1978). Peters, O'Connor, and Rudolf (1980) designed "facilitating" or "inhibiting" work conditions on the basis of eight situational variables identified by businessmen through critical incidents. Poorer quality and quantity of output on a laboratory task were observed for the inhibiting condition when compared with the facilitating condition, irrespective of initial ability. Brown (1981) divided life insurance companies into those that used less (Group A) or more (Group B) effective personnel recruiting strategies and found that "Group B companies exhibited not only greater productivity for their agents but also a differential validity effect. This yields some circumstantial support for Schneider's (1978) hypothesis that employee behavior under organizational conditions that facilitate employees working up to their ability will be more predictable" (p. 668-669).

Peters et al. (1980) and Brown (1981) were concerned with predicting performance on the basis of ability tests. Person-situation interaction effects were found for personality evaluations by Turnage and Muchinsky (1982), who evaluated business people on eight traits in each of five situations in an assessment center. Although these studies provide an excellent beginning to the study of person-situation interaction, there remains the need to determine the effect of an independently manipulated situational variable on the emergence of measured personality differences on a laboratory task. The situation (goal setting) is presumed to be the main factor influencing performance and individual characteristics (behavior type) are
subsumed within it. Therefore, it is expected that findings related to goal level in this study will replicate those found previously.

The typical measure of performance used in laboratory tasks in the Type A-B literature, however, will not be the only one employed in this study. Many studies have shown that Type As can suppress fatigue and boredom (Friedman and Rosenman, 1974; Carver et al, 1976), yet error rates between Type As and Bs did not significantly differ in the study reported by Burnam et al. (1975) and performance did not differ in the experiment conducted by Snow (1974). These dependent measures were of simple performance; measures based on a summation of number of items correct, incorrect, or completed. Use of finer measures of performance may be warranted. Penalizing a subject for incorrect responses results in a measure of net performance and is conceptually similar to penalizing for guesses in a signal detection task. It is possible to also use a measure of what will be termed efficiency to determine if subjects classified by behavior type are differentially efficient across goal conditions. Efficiency is defined here as a measure of the extent to which a subject performs correctly up to the highest point of completion of the task.

The difference between simple performance and efficiency can be illustrated in an example. Suppose two subjects are to perform some manipulation on items passing them on a conveyor belt, the speed of which they can control. Each subject correctly manipulates thirty of sixty items, therefore, their simple performance rates are equal. Subject One, however, manipulated thirty items of sixty that passed because he failed to properly set the speed of the belt as it moved items past him. Subject Two, on the other hand, manipulated thirty items of thirty that passed. Although the two subjects achieved equal simple performance (the number of correct items), Subject Two was far more efficient. (Note that the net performance of the two subjects differed. It is easy, however, to create examples in which the net performance of two subjects is equal while efficiency is not). The use of net performance and efficiency as dependent measures may reveal Type A-B differences not previously examined.

Hypothesis 1: Subjects given hard goals will exhibit higher scores on the simple performance, net performance, and efficiency measures than those given moderate
goals, who will similarly outperform those given "do best" goals.

It is expected, however, that behavior type will moderate the goal difficulty-performance function. Type As given hard goals will perform more poorly than Type Bs given hard goals—a prediction drawn from the research concerning the performance of Type As under failure. Type As not placed under conditions of failure (those with moderate and "do best" goals) will outperform Type Bs in similar goal conditions.

**Hypothesis 2**: Type As will outperform Type Bs in the "do best" and moderate goal conditions on the simple performance, net performance, and efficiency measures.

The performance of Bs will exceed that of As in the hard goal condition.

Based on previous studies (Burnam et al., 1975; Snow, 1974), there is reason to suspect that net performance may not differ between Type As and Bs. However, if Type As are more time conscious and hard-driving it may be the case that they are less likely to use time or resources inefficiently, hence, be more productive.

**Hypothesis 3**: Type As will show greater performance as measured by the efficiency, but not the net performance, measure.

Hypotheses can also be generated regarding goal acceptance. As noted above, Type As tend to outperform Type Bs when they perceive tasks to be controllable, even if the tasks require persistence through tedium. Erez and Zidon (1984) noted that the standard deviation of goal acceptance ratings increased as goal difficulty increased. As long as Type A subjects feel that the task is controllable it is logical to assume that they will continue to accept the goal as a reasonable performance level. Type Bs may be more willing to reject the experimenter's goal if it is considered unacceptable. Type Bs would, in this case, provide the increased variance in goal acceptance scores. If this is the case, it follows from Erez and Zidon (1984) that Type Bs would also provide greater variance in performance.

**Hypothesis 4**: Type Bs will show greater performance variance across goal conditions than Type As.

**Hypothesis 5**: Type Bs will show greater variance in goal acceptance ratings than Type As.
Method

**Subjects.** Subjects were 46 female and 51 male undergraduate students drawn from the Rice University subject pool and given one hour credit for their participation.

**Material.** Task materials consisted of two articles chosen from a literary magazine. Each was approximately nine pages long single-spaced and contained an average of thirty-five grammatical or typographical errors per page (see Appendices 1 and 2). Subjects were classed as Type A or Type B by a median split using the student version of the Jenkins Activity Survey (Krantz, Glass, and Snyder, 1974). Twenty-five males and 21 females were classified as Type As while twenty-four males and thirty-one females were classified as Type Bs. Also collected, and included in the correlation matrix presented in Table 1, are scores on the Manifest Anxiety Scale (MAS) (Taylor, 1953). The MAS scores were not otherwise analyzed for the purpose of this thesis.

**Design.** The presentation of task articles was counterbalanced over session. The three levels of goal conditions were a) hard (a fifty percent performance increase over baseline), b) moderate (a twenty percent increase over baseline), and c) "do best" instructions. It was thought that goals would be most effective if phrased in terms of hits (manuscript errors correctly identified). Feedback was given to subjects regarding the number of hits and false positives (false alarms) they achieved on the baseline task. Goals were thus multiples of the baseline number of hits. Subjects were also asked to reduce false alarms to zero.

The experiment was conducted over two one-half hour sessions. Session one was used to collect behavior pattern data and baseline performance on the task. Subjects also provided responses to manipulation checks designed to assess task difficulty and the level of interest in the task. These responses were collected with five-point Likert-type scales anchored at each point and ranging from very low (1) to very high (5). Subjects were randomly assigned to goal condition before session two. Session two involved the administration of the task to subjects under the goal manipulation. The two manipulation check measures were collected again. In addition, subjects were asked if they had accepted or rejected their goal. If they
accepted they were asked to rate the level of their acceptance on a scale ranging from very low acceptance (1) to very high acceptance (5).

There was a ten minute time limit on task performance in both sessions. In order to avoid the possible confound of subjects using a time limit as a goal condition the time limit was not told to subjects on session one, nor to subjects with "do best" goals in session two. The time limit was told to subjects in session two with hard and moderate goals.

The performance measures were defined as follows:

- **Simple performance** - the sum of hits and misses (manuscript errors not identified). Simple performance is an index of how far subjects progressed through the manuscript.

- **Net performance** - the number of hits minus misses minus false alarms.

- **Efficiency** - net performance divided by simple performance.

**Procedure.** In session one subjects were seated and asked to complete the Jenkins Activity Survey. They were then given one article and a highlighting pen and were instructed to identify as many typographical or grammatical errors as possible in the manuscript. They were also told that since some errors would be grammatical, it would be necessary to pay close attention to the text and not just look at the words for typographical errors. Subjects were instructed to work as quickly and accurately as possible until stopped by the experimenter. After the task subjects completed the manipulation checks and were dismissed. In session two subjects were assigned to goal conditions. Session two was similar to the first except that Jenkins Activity Scores scores were not collected. Subjects in the no goal condition repeated the steps outlined in session one. The instructions for subjects in the hard and moderate goal conditions were modified to include the statement, "In the first session you identified ___ errors correctly and ___ words as errors that weren't errors. In this session your goal is to identify ___ errors correctly and zero incorrect errors."
Results

Manipulation and task data. Mean ratings of difficulty and interest across proofreading articles and goal conditions were 2.81 and 3.38, respectively. One article was perceived to be more difficult (mean rating=3.16, SD=.79) than the other (mean rating=2.28, SD=.77). The mean number of hits did not significantly differ as a function of article, although the article perceived as easier had a reliably lower mean number of false alarms (6.2 v. 12.4) and a higher simple performance score (72 v. 61, indicating that subjects progressed farther through the easier article). However, the article rated less difficult had a reliably higher mean number of misses associated with it (13.8 v. 9.6). The articles were judged sufficiently similar to collapse the counterbalancing condition for all analyses.

Goal acceptance (mean rating=3.6) and interest in the task had no consistent relationship with the performance measures. Goal acceptance, however, correlated significantly with goal condition (r=-0.261). Subjects in the harder goal conditions were thus less likely to accept the goal set for them by the experimenter. Goal condition was significantly correlated with simple performance (r=.38, see Table 1), indicating that, as goals became more difficult, subjects completed more proofreading. Goal condition was highly and significantly related to hits (r=.48), misses (r=.53), and false alarms (r=-.20).

Across goal conditions simple performance correlated significantly with net performance (r=.26) while net performance correlated reliably with productivity (r=.87). Simple performance and productivity, however, were not significantly related. Hits were significantly correlated with misses (r=.38) and false alarms (r=-.29). The latter also correlated significantly (r=-.22) (see Table 1). Subjects apparently maintained a consistent strategy of identifying errors in text regardless of goal condition.

The simple performance measure showed acceptable variability (mean=77.3, SD=23.9), indicating large individual differences in the ability of subjects to proofread the materials. Large differences were not found for scores on the Jenkins Activity Survey (mean=11.39, SD=2.57, range 5-17).
The percentage of subjects who exceeded their goal was calculated to determine Table 1. Correlations among selected session two variables.

<table>
<thead>
<tr>
<th>Simple</th>
<th></th>
<th>Net performance</th>
<th>Efficiency</th>
<th>Hits</th>
<th>Misses</th>
<th>False alarms</th>
<th>Goal</th>
<th>JAS continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>performance</td>
<td>1.0</td>
<td>.29*</td>
<td>-.03</td>
<td>.82**</td>
<td>.70**</td>
<td>-.24*</td>
<td>.38**</td>
<td>.08</td>
</tr>
<tr>
<td>NP</td>
<td>1.0</td>
<td>.87**</td>
<td>.73**</td>
<td>-.41**</td>
<td>-.51**</td>
<td>.09</td>
<td>.02</td>
<td></td>
</tr>
<tr>
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<td>.41**</td>
<td>.57**</td>
<td>-.56**</td>
<td>.03</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hits</td>
<td>1.0</td>
<td>.17</td>
<td>-.23*</td>
<td>.26*</td>
<td>.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misses</td>
<td>1.0</td>
<td>-.13</td>
<td>.34**</td>
<td>.03</td>
<td>.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JAS</td>
<td>1.0</td>
<td>.24*</td>
<td>.06</td>
<td>.06</td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cont.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>JAS categorical</th>
<th>Difficulty</th>
<th>Interest</th>
<th>Acceptance</th>
<th>MAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>.16</td>
<td>-.22*</td>
<td>.10</td>
<td>-.06</td>
</tr>
<tr>
<td>NP</td>
<td>.02</td>
<td>-.07</td>
<td>.16</td>
<td>-.03</td>
</tr>
<tr>
<td>Effic.</td>
<td>-.07</td>
<td>.05</td>
<td>.10</td>
<td>.00</td>
</tr>
<tr>
<td>Hits</td>
<td>.12</td>
<td>-.17</td>
<td>.17</td>
<td>-.05</td>
</tr>
<tr>
<td>Misses</td>
<td>.12</td>
<td>-.17</td>
<td>-.05</td>
<td>-.05</td>
</tr>
<tr>
<td>FA</td>
<td>.00</td>
<td>.06</td>
<td>.01</td>
<td>.05</td>
</tr>
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<td>Goal</td>
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<td>-.20</td>
<td>.06</td>
<td>-.26*</td>
</tr>
<tr>
<td>JAS cont</td>
<td>.81**</td>
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<td>.16</td>
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<td>.15</td>
<td>-.04</td>
<td>.00</td>
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<tr>
<td>Difficulty</td>
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<td>-.19</td>
<td>-.28*</td>
<td>.00</td>
</tr>
<tr>
<td>Interest</td>
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</tr>
<tr>
<td>Acceptance</td>
<td>1.0</td>
<td></td>
<td>-.01</td>
<td></td>
</tr>
<tr>
<td>MAS</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<.05  ** p< .01
whether the actual probability of achieving a goal matched the intended probability. Forty-two percent of subjects in the moderate goal condition met or exceeded the goal, which was intended to have a probability of success of 0.50. Thirty-four percent of subjects with hard goals exceeded their goal, a somewhat higher success rate than the intended probability of success (0.20).

Tests of Hypotheses

Hypothesis 1: Subjects given hard goals will exhibit higher performance than those given moderate goals, who will outperform those in the "do best" goal condition.

Repeated measure ANOVA's were calculated for the three performance measures (see Table 2). For the simple performance measure, significant main effects were found for goal condition \[F(2,95)=6.27, p<.01\] and session \[F(1,95)=104.93, p<.01\]. Mean simple performance scores on session two for subjects with hard, moderate and "do best" goals were 95.28, 95.16, and 73.74, respectively. While subjects in all three goal conditions significantly improved simple performance from session one to session two (see Table 3), the performance of subjects with "do best" goals differed significantly from those with hard and moderate goals \[t(1,64)=4.07\] and \[t(1,68)=4.06, \text{p's < .01, respectively}\], whereas the latter two groups did not significantly differ.

For the net performance measure, significant main effects were found for goal \[F(2,95)=3.05, p=.05\] and session \[F(1,95)=9.29, p<.01\]. Significant simple main effects were not found for goal or session, however. No significant effects were found for the efficiency measure (see Table 3).

A trend analysis revealed significant linear \[F(1,98)=16.92, p<.01\] and quadratic \[F(1,98)=5.08, p<.05\] trends for the regression of goal condition on simple performance.

Hypothesis 2: Type As will outperform Bs in the "do best" and moderate goal conditons. The performance of Bs will exceed that of As in the hard goal condition.

A significant goal x type x trial interaction was found for the simple performance measure \[F(2,95)=6.29, p<.01\]. Type Bs with hard goals scored higher than Type As (means= 96 and 94, respectively), while Type As with moderate and "do best"
Table 2. Table of sum of squares for repeated measure ANOVA's on the dependent measures.

<table>
<thead>
<tr>
<th>Dependent Measure</th>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Performance</td>
<td>Goal</td>
<td>7644.63</td>
<td>2</td>
<td>6.27 **</td>
</tr>
<tr>
<td></td>
<td>Behavior Type</td>
<td>564.90</td>
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<td>.93</td>
</tr>
<tr>
<td></td>
<td>Goal x Type</td>
<td>532.04</td>
<td>2</td>
<td>.44</td>
</tr>
<tr>
<td>R = .46</td>
<td>Between Subjects Error</td>
<td>57935.99</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session</td>
<td>20111.97</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>104.93 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session x Goal</td>
<td>3592.89</td>
<td>2</td>
<td>9.37 **</td>
</tr>
<tr>
<td></td>
<td>Session x Type</td>
<td>15.27</td>
<td>1</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td>Session x Goal x Type</td>
<td>2411.79</td>
<td>2</td>
<td>6.29 **</td>
</tr>
<tr>
<td></td>
<td>Within Subjects Error</td>
<td>18208.35</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Net Performance</td>
<td>Goal</td>
<td>4675.86</td>
<td>2</td>
<td>3.06 *</td>
</tr>
<tr>
<td></td>
<td>Type</td>
<td>69.74</td>
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</tr>
<tr>
<td>R = .09</td>
<td>Goal x Type</td>
<td>481.23</td>
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<td>.31</td>
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<tr>
<td></td>
<td>Between Subjects Error</td>
<td>72569.99</td>
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</tr>
<tr>
<td></td>
<td>Session</td>
<td>1808.30</td>
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<td>9.29 **</td>
</tr>
<tr>
<td></td>
<td>Session x Goal</td>
<td>1.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session x Type</td>
<td>27.88</td>
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<td></td>
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<td></td>
<td></td>
<td>.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session x Goal x Type</td>
<td>93.33</td>
<td>2</td>
<td>.24</td>
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<tr>
<td></td>
<td>Within Subjects Error</td>
<td>18493.78</td>
<td>95</td>
<td></td>
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<tr>
<td>Efficiency</td>
<td>Goal</td>
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<td>1.11</td>
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<td></td>
<td>Type</td>
<td>.01662</td>
<td>1</td>
<td>.11</td>
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<td>R = .03</td>
<td>Goal x Type</td>
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<td>.17</td>
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<td>Between Subjects Error</td>
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<td></td>
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<tr>
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<td>Session</td>
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<td>1</td>
<td>.04</td>
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<td>Session x Goal</td>
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<td>.48</td>
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<tr>
<td></td>
<td>Session x Type</td>
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<td>1</td>
<td>.75</td>
</tr>
<tr>
<td></td>
<td>Session x Goal x Type</td>
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<td>.12</td>
</tr>
<tr>
<td></td>
<td>Within Subjects Error</td>
<td>6.11353</td>
<td>95</td>
<td></td>
</tr>
</tbody>
</table>

** p < .01  
* p = .05
Figure 2. Mean simple performance scores as a function of goal condition, behavior type, and session.
Table 3. Mean performance by goal condition and session.

<table>
<thead>
<tr>
<th>dependent measure</th>
<th>session</th>
<th>&quot;do best&quot; goal</th>
<th>moderate goal</th>
<th>hard goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>simple performance</td>
<td>1</td>
<td>63.2 *</td>
<td>73.8 **</td>
<td>64.2 ***</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>73.7 a</td>
<td>95.1 b</td>
<td>95.3 b</td>
</tr>
<tr>
<td>net performance</td>
<td>1</td>
<td>32.4</td>
<td>41.8</td>
<td>28.9</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>36</td>
<td>46.9</td>
<td>39.7</td>
</tr>
<tr>
<td>efficiency</td>
<td>1</td>
<td>.51</td>
<td>.54</td>
<td>.40</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>.48</td>
<td>.49</td>
<td>.44</td>
</tr>
</tbody>
</table>

across session: *t(1,68)=2.21, p<.05
**t(1,60)=4.22, p<.01
***t(1,68)=6.3, p<.01

Session two means with common letters do not differ significantly under simple comparisons.
Table 4. Mean performance by session, goal condition, and behavior type.

<table>
<thead>
<tr>
<th>dependent measure</th>
<th>session</th>
<th>behavior type</th>
<th><em>do best</em> goal</th>
<th>moderate goal</th>
<th>hard goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>1</td>
<td>B</td>
<td>64</td>
<td>76</td>
<td>54 *</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>B</td>
<td>72</td>
<td>89</td>
<td>96</td>
</tr>
<tr>
<td>NP</td>
<td>1</td>
<td>B</td>
<td>33</td>
<td>44</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>B</td>
<td>38</td>
<td>48</td>
<td>39</td>
</tr>
<tr>
<td>E</td>
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<td>B</td>
<td>.50</td>
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<td>SP</td>
<td>1</td>
<td>A</td>
<td>61</td>
<td>72 **</td>
<td>72 ***</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>A</td>
<td>75</td>
<td>98</td>
<td>94</td>
</tr>
<tr>
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<tr>
<td></td>
<td>2</td>
<td>A</td>
<td>.42</td>
<td>.45</td>
<td>.42</td>
</tr>
</tbody>
</table>

* $t(1,30)=5.95$, $p<.01$  
** $t(1,40)=4.03$, $p<.01$  
*** $t(1,36)=3.39$, $p<.01$

SP = simple performance  
NP = net performance  
E = efficiency
Table 5. Mean performance by session, goal and by session, goal, and behavior type for the *do best condition with a known time limit.

<table>
<thead>
<tr>
<th>dependent measure</th>
<th>session</th>
<th>score</th>
<th>session</th>
<th>type</th>
<th>score</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>1</td>
<td>62</td>
<td>2</td>
<td>B</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>75</td>
<td>1</td>
<td>A</td>
<td>51</td>
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<td>2</td>
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<td>61</td>
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<tr>
<td>NP</td>
<td>1</td>
<td>32</td>
<td>2</td>
<td>B</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>40</td>
<td>1</td>
<td>A</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>A</td>
<td>33</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
<td>.51</td>
<td>2</td>
<td>B</td>
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<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>A</td>
<td>.50</td>
</tr>
</tbody>
</table>
goals (means = 98 and 75) outscored Type Bs with similar goals (means = 89 and 72) (see Figure 2). None of these simple effects, however, were significant. **Hypothesis 3**: Type As will show greater performance as measured by the efficiency, but not the net performance measure. Behavior type failed to show a significant main effect for either performance measure. **Hypothesis 4**: Type Bs will show greater performance variance by goal conditions than Type As.

The F' (folded) statistic was computed to test for equality of variances by goal conditions. The only significant finding [F'(11, 22) = 2.69, p < .05] was for the simple performance measure in the "do best" condition in which the performance variance of As (SD = 28.37) was greater than that of Bs (SD = 17.3). **Hypothesis 5**: Type Bs will show greater variance in goal acceptance than Type As.

Type Bs demonstrated significantly more variance in goal acceptance than Type As in the "do best" (means = 1.25 and .7, respectively) [F'(11, 20) = 10.34, p < .01] and moderate (means = .93 and .29) [F'(9, 18) = 3.23, p < .05] goal conditions. There was no significant difference between variances for those subjects with hard goals.
Discussion

It is apparent that goal setting is an effective method for manipulating task progress and performance. Subjects with moderate and hard goals significantly outperformed those with "do best" goals. This study not only lends further support to Locke's body of work encompassing the creativity/brainstorming tasks (Locke, Cartledge, and Knerr, 1970; Locke, 1982; Garland, 1982, 1983), it corroborates recent attempts to use more varied and demanding tasks in goal setting research (LaPorte and Nath, 1976; Rothkopf and Kaplan, 1972; Bavelas and Lee, 1978). Even more impressive is the fact that the goal and goal x trial effects accounted for 14.8 percent of the variance in simple performance (total variance explained = 0.46, see Table 2).

No significant effects were discovered for the efficiency measure. The high correlation between hits, misses, and false alarms across goal conditions suggests that, in the attempt to meet a more difficult goal, subjects were able to increase their rate of progress through the manuscript while maintaining constant hit and error rates. Contrary to the findings of Bavelas and Lee (1978), who used a judgement task, there seems to have been no attempt by subjects to sacrifice quality for quantity when faced with a harder goal. However, it is difficult to determine if the quality/quantity distinction is the same for a proofreading task as for a judgement task.

Type Bs showed no greater performance variance by goal condition than As. Type Bs did, however, demonstrate greater variance in goal acceptance in the "do best" and moderate goal conditions while As and Bs with hard goals did not significantly differ. Type Bs apparently sharpened their attention and effort to the task at hand when hard goals and time limits were set, but not when vague or moderate goals were established. It should be noted that this finding does not violate the homoscedasticity requirement of an analysis of variance. Variances did not differ significantly as a function of goal condition. The folded statistic testing equality of variance was computed to determine if a class of subjects, identified on the basis of a measured variable, could be predicted to fall within certain segments of the distribution of acceptance scores by goal condition.

Perhaps the most interesting finding is the significant goal x type x trial interaction
for the simple performance measure. Type Bs outperformed Type As under an objectively more difficult (hard goal) condition while As outperformed Bs at lower (moderate and "do best") levels of difficulty (post hoc tests on the session two comparisons, however, showed no significant effects). More detailed follow-up analyses testing performance by session, behavior type, and goal did reveal significant improvement in simple performance over session for Type As and Bs with hard goals and Type As with moderate goals (see Table 4).

It appears that hypothesis two is well supported. Although the simple effects on session two comparisons were not significant, the three way interaction was significant with all means in the predicted direction. Additionally, Type As were more likely to attain significant improvement under specific (moderate and hard) goal conditions than Type Bs. A warning, however, is in order. The lack of variance evidenced on the Jenkins Activity Survey requires that the conclusions drawn for effects due to behavior type be treated as preliminary, despite the statistical significance of the interaction. The restricted range of scores resulted in the creation of a false experimental dichotomy. Although it is encouraging that conclusions could be drawn for behavior type it would be speculative to assume that the effects would have remained as strong had the standard deviation of JAS scores been larger. A second difficulty may result from the levels of objective task difficulty of goal conditions. Although the differences between them were still rather large, the moderate goal was more difficult than expected while the hard goal was somewhat easier. The significant quadratic trend indicates that goals may not have had equal intervals on a goal difficulty continuum—that is, the objective increase in difficulty in moving from "do best" to moderate goals may have been greater than that of moving from moderate to hard goals. Greater precision in the calibration of goal difficulty may be attained in the future by more closely matching the ability of the subject using computer branching programs that would adjust task difficulty or the method used by Sales (1970) of overloading or underloading a subject relative to his/her immediate performance level at various times during the experimental period.

A third difficulty with this study is the fact that mean performance in all three goal
conditions improved significantly as a function of session. Clearer results may have been obtained if the goal manipulation had been introduced after performance had reached asymptote.

A fourth possible difficulty may be the confounding of goals with task time limits. Goals generally include a time limit that adds to the perceived difficulty of the goal. Indeed, research on goal setting and Parkinson's law (Bryan and Locke, 1967; Latham and Locke, 1975) shows that the time available to complete a task affects the goals set by subjects. The greater the amount of time available to perform a task, the easier the goal set by the subject and the longer it took to complete the task (Bryan and Locke, 1967).

In order to examine the effects of time as a goal level a small post hoc study was conducted. A second "do best" goal condition—in which subjects knew of the ten minute time limit—was compared to the other three goal conditions. The simple performance scores of subjects in this group (mean = 75.78, SD = 18.95) did not significantly differ from those in the "do best" goal condition who were not aware of a time limit, but did differ reliably from subjects with moderate (t(1.38) = 2.62, p < .02) and hard (t(1.32) = 2.63, p < .02) goals. An analysis of goal condition, behavior type, and session, however, reveals a significant difference between simple performance scores for Type As, but not Bs (see Table 5), unlike the findings of Burnam et al. (1975). Caution should be used in interpreting these findings, due mainly to the small number of subjects (9) in this goal condition.

Should the above findings be replicated, the implications for training, work design, and career counseling are numerous. Tailoring the work environment to the needs of the individual through the selective choice of goal levels (either in regulating work flow or through an MBO program) has the potential of increasing output and, as it is used in the economic sense, productivity. It has been demonstrated that goal setting is an effective method of raising performance in field settings (Latham and Baldes, 1975). The results of this article indicate that it may be possible to increase this gain by attending to individual differences.

The implications of these findings for future studies attempting to integrate
personality and situation theories may be of even greater significance. There has been a decided "lack of studies addressing situational influences on ability-performance relationships...underlying relationships [are] not a focus of research in industrial-organizational psychology. Our science is a main-effect science and...our main-effect orientation has limited our ability to conceptualize the simultaneous impact of multiple levels of phenomena" (Schneider, 1978, p.284). Locke et al. (1981) note that "the only consistent thing about the studies of individual differences in goal setting is their inconsistency" (p.142). Prior studies of personality variables and goal setting, according to Locke et al., did not specifically examine the effects of individual differences. When individual differences were analyzed, no theoretical framework was offered to interpret the results. The goal x type x trial interaction suggests that integrating an individual differences with a situational theory may eliminate some of these shortcomings. The use of the person situation interaction framework in this study to generate the hypothesis that individual differences (behavior pattern) would be manifest within the situation (assigned goal) may indicate a method for resolving the often contradictory findings involving individual differences and reduce the within cell variance in situational experiments. There is a need to begin defining goal setting and personality variables in terms of the context within which the subject (be it a lab or field setting) is placed. A theoretical attempt at defining a person-work environment interaction model for behavior pattern (Ivancevich and Matteson, 1984) has already been made and warrants further research.

A necessary part of future investigations of person-situation integration is the specification of the characteristics of the tasks used in these studies. The lack of a method for defining or comparing tasks in terms of difficulty, stress, and other characteristics has hindered progress in behavior pattern research and has only recently been addressed in goal setting (Bavelas and Lee, 1978). "The need for a theory or taxonomy of situation or dimensions of environments has been recognized" (Tenopyr, 1982, p. 598-599). Such a taxonomy or comparative analysis of the tasks used in these two areas of research would be a superb beginning to the integration of person and situation/environment effects on behavior.
REFERENCES


Appendix 1a: A session one proofreading task.
Appendix 1b: A session two proofreading task.
Appendix 1a

NAME:
PLEASE STOP! DO NOT CONTINUE UNTIL THE EXPERIMENTER TELLS YOU TO DO SO.
PLEASE STOP! DO NOT CONTINUE UNTIL THE EXPERIMENTER TELLS YOU TO DO SO.
Even in her last years, when she had become the garandee
dane of English letters, Rebecca West still spoke with with
the eager voice of a young girl, full of excited curiosity.
Her long life extended from the final decade of Queen
Victoria's reign, through social upheavals, revolutions, and
two world wars that destroyed European hegemony and
undermined confidence in the values of Western
civilization. She lived to see esteem for the written word
replaced by the mindlessness and inclemency of so-called
mass culture. Imbued with the lofty ideal of art proclaimed
by Henry James, the subject of her first literary study,
she met Hardy, Conrad, Virginia Woolf, and was one of the
first to recognize the genius of D.H. Lawrence. She
survived to worst Marshall McLuhan, then at the crest of the
modish wave, in a dazzling defense of literature, her
presidential address to the English Association in 1969.

At the core of all her varied work in different genres-
social and political journalism, literary criticism,
bioygraphy, stories, novels, and her great historico-cultural
epic on Yugoslavia, Black Lamb and Grey Falcon—there was an
immense desire for knowledge, a quest for understanding.
For her, as for Fielding, art meant "discovery or finding
out." Yet together with her openness and readiness to
learn, there coexisted themes and attitudes that would
remain constant. These enduring responses of hers were
imposed by the extremely bitter experiences of her early
life.

The name she made famous was not, of course, her own.
She was born Cicely Isabel Fairfield in London in 1892, the
youngest of three sisters, and was largely educated in
Edinburgh. Her father, gifted but unstable, came of Anglo-
Irish stock. He left the army for journalism, where his
brilliance was such that some even regarded him as George
Bernard Shaw's equal in controversy. Unfortunately,
however, Mr. Fairfield was an inveterate gambler, bent on
self-destruction; money did not stay with him long. As for
her mother, the daughter and sister of Scottish composers,
she had given up the prospect of a professional career as a
pianist when they married. Theirs was a cultivated home,
where insistence on clear thinking and right judgement, as
well as talk about politics, literature, painting, and
music, prevailed.

Then Mr. Fairfield abandoned his wife and daughters,
leaving them in straitened circumstances. He died alone in
a Liverpool boardinghouse when Rebecca West was about ten
years old. Mrs. Fairfield found work as a music teacher,
but her health broke down. The girl was deeply distressed
by the changes that illness wrought in her mother, to whom
she was devoted. Like her sisters, she herself contracted
tuberculosis and continued to be vulnerable to sickness in
later life.

"We never came across anybody who was as poor as we were," Rebecca West would write years afterward with pardonable exaggeration, for before 1914 there must have been many unhappier even than the Fairfields. Compared with the utterly downtrodden, though, morose and daughters had the expectatations and tastes of the educated middle class without the wherewithal to pursue them. It was only natural that, as a teenage girl, Rebecca West should csre that she had no decent clothes—hence the arked pleasure shown in dresses and hats in her later books. She had the pride and the sense of superiority imparted by the assumptions of talented parents, yet was obliged to suffer slights in Edwardian society where rank and money gave status. If the Fairfields did not fir into any recognizable slot, neither would Rebecca West as a writer. Already somewhat abrasive in character, with strong likes and dislikes, she acquired few friends at school.

Her father's reaction of the wife and children who loved him left a mark that could never be erased. Here was a betrayal of so large and ultimately so incomprehensible a nature that the recollection of it haunted her throughout her life. How to grasp what had happened? Much of her work would be engatwed with the mutual incomprehension of intimates and with the mystery of betrayal in various guises, whether private and sexual of public and politicial.

So there existed men who could value ambition, power, a "cause," or, in some cases in her fiction, another "inferior" woman—anything, in short, rat than the truly devoted love they were offered. This devotion they chose to cast aside with humiliating indifference. Top believe oneself loved and yet suddenly to be unfairly rejected and betrayed by the person one most admires and adores—what could be more wounding to the sensitive young psyche? And to this charming but self-centered man her beloved mother had sacrificed her own opportunity for self-fulfillment as an artist a had been forced into a life of penurious struggle. Rebecca West's dark view of the universe, which doubtless owes something to the ambience of Scottish-Augustinian Calvinism as well as to the current of Darwinian determinism, springs from this cruel initiation into life.

She had to earn a living, and at first she aimed at becoming an actress. At the Royal Academy of Dramatic Art in London she was soon given to understand that her gifts did not lie in that quarter, and her efforts on the stage met with no success (always a painful recollection, recreated in the young Cordelia's persevering by futile attempts to become a violinist, in the novel The Fountain Overflow). Instead, then eighteen years old, she tried her father's profession, journalism, submitting articles in 1911 to the
newly founded feminist paper, The Freewoman. She took the apt pseudonym "Rebecca West," after the ambitious, emancipated heroine of Ibsen's story, a character then thought to be wildly daring. Her bold attack on the formidable anti-suffragist, Mrs. Humphry Ward, noted proponent of the Victorian concept of woman's self-sacrificing role (an aspect of Mrs. Fairfield's fate that her daughter particularly loathed), made the young journalist's reputation.

Rebecca West's debut and rise to fame coincided with the increasingly stormy militant agitation for women's suffrage in the years immediately before the First World War. Fueled by her mother's wrongs, she had been involved in the feminist movement at least since the age of fourteen and had performed various menial jobs (later given to Ellen Helville, the intelligent seventeen-year-old typist in the novel The Judge). She frequently met with hostility, and on one occasion when she addressed a meeting at Leith docks, a striker threw a herring at her.

While she admired the martyred heroines of the suffrage movement who went to prison and endured the cruelty of being forcibly fed, she herself tended to deplore violent militancy, preferring to fight with the pen, by means of hard reasoning, angry ridicule, and wit. She attacked poverty, injustice, and cant; spoiled, "parasite," well-to-do women as compared with the unfortunate sisters who deserved equal pay for equal work; and above all, "the impudence sex privilege may engender in the most insignificant male." For her, the prime sin of women was their readiness to surrender their personality. The vote was essential, but it was not enough.

Soon, she was claiming to be a socialist, following such nineteenth century predecessors as George Sand who expected socialism to solve the woman problem along with all the others. Though critical of the rising Labour party and of the insularity of the trade unions, young Rebecca West believed in "the magic of socialism," which, like so many writers, she mistakenly imagined would be good for art. Together with the ideal of emancipation went the dream of sexual freedom, then a subject of ardent discussion not only in the Bloomsbury circle but in the Fabian Society. Among the Fabians, as Beatrice Webb put it, H.G. Wells was irresponsibly "gambling with the idea of free love."

Rebecca West's spirited review of Wells' novel Marriage led to an invitation to his home in Essex. They were drawn to each other. At nineteen, with her fleshy dark good looks, she was eager for life and experience. H.G. Wells appeared then, at forty-six, the most controversial and exciting figure on the literary scene. He himself had struggled from deprivations to eminence. But behind the apparently
respectable front of his second marriage, he was a
determined womanizer. His liaison with Dorothy Richardson,
who pioneered the "stream of consciousness" technique in
reaction to Wells's "realist" method, had ended after she
lost his child through miscarriage. Other women followed,
and he was still enmeshed with Countess von Arnim when he
decided to break off the association with Rebecca West. The
girl was shattered. Reminded of her father's humiliating
rejection, she wrote to Wells: "You can't conceive a person
resenting the humiliation of an emotional failure so
much that they twice tried to kill themselves." After these
attempts at suicide, she said that "it would have been a
miracle they had succeeded, although I meant them to." She
was not destined to follow her namesake into the willrace.

By the end of 1913 they were lovers; in conversation and
correspondence she was rapturously Panther, he Jaguar. On
the day war was declared in 1914 their son Anthony was
born. This largely "back street" love affair had its
advantages for the young woman who had idealized sexual
freedom. There were long intervals of waiting for Wells's
visits; lies to suspicious landladies; attempts at blackmail
by servants who discovered the truth about "Mrs. West's
position-in short, a series of humiliations to counter her
joy in his company. Nowhere would her feelings about unmarried
motherhood be made more explicit than in her novel The Judge,
where, forsaken and pregnant, Marion Yaverland is stoned
through the village. Since Weddles had no intention of
leaving his wife, Rebecca West saw herself as the "sexual"
woman who was being sacrificed to the "non-sexual" woman, a
theme to which she often reverted. The idea of marriage
itself she had excoriated in her rather overwrought short
story "Indissoluble Matrimony," published in the first issue
of the magazine Blast.

To Rebecca West it seemed that men and women were
ineluctably at war, in spite of mutual need. After a
while, it became plain that she differed from Wells on the
subject of sex, which he was tending to subordinate
increasingly to didactic ends. While she was at work on her
study of Henry James, her companion was attacking James, the
high priest of sex, in his book entitled Boom. Her somewhat
stilted first novel, The Return of the Soldier (1918)—in
which three women confront the shell-shocked amnesiac
soldier-hero, the best of them being one whose poverty has
not destroyed her quiet goodness—doubled less to Wells
the writer than to James, D.H. Lawrence, and the
distinguished novelist, still underrated today, Ford Madox
Ford (whom she met as one of the contributors to Blast).
However, she allows her fictional love a a Thames-side idyll
of the kind she herself had enjoyed with Wells.

By the time Rebecca West eventually broke free from
Wells, ten years had passed and she was thirty. Wells could
be neglectful when she was ill, and, worse, was unfaithful to her. When they were in Spain together in 1922, he made scenes in public, and she hated scenes (an echo of these dramas can be found in her novel The Thinking Reed, in the unpleasant conduct of the heroine's lover, Andre de Verviers).

Her misery can be deduced from that long cry of despair, The Judge (1922), with its diurnal epigraph taken from the body of the work: "Every mother is a judge who sentences the children for the sins of the father." The book was dedicated to her mother, who died in 1920. Ellen, the attractive young protagonist of the early semi-autobiographical Edinburgh scenes, who witnesses her deserted mother's death, yields in the second part to the long-suffering Marion Yaverland, with whose illegitimate adventurer son, Richard, Ellen is in love. Marion's second and legitimate son, the luckless Roger, is the offspring of a rape by a despised husband who had promised not to consummate the marriage. In an ending worthy of a Gothic novel, and very revealing of the author's state of mind, Marion commits suicide, Richard kills Roger, while Ellen prepares to have Richard's illegitimate child and thus repeat the gloomy pattern of modern womanhood. Over fifty years later, when Rebecca West, in her essay "And They All Lived Unhappily Ever After," criticized such novelists as Doris Lessing and Margaret Drabble for insisting on the sexual humiliation of women, she must have forgotten The Judge. Wells spoke of it as "an ill-conceived sprawl of a book with a faked hero and a faked climax," and it cannot be said that he was entirely wrong. Rebecca West was never at her most powerful in imaginative invention.

Ever since 1914, through an invitation from Walter Lippmann, she had been contributing to periodicals in the United States, where, in 1923, she made two separate lecture tours. She longed to begin a new life in New York, among such new friends as Fannie Hurst, Alexander Woolcott, and the F. Scott Fitzgeral'ds. But while her warmly sympathtetic connection with the United States would endure, through lecturing and journalism, and would be mirrored (not always convincingly) in later short stories, such as "Life Sentence" and "There Is No Conversation," she could not feel quite at home. An affair with an American who was separated from his wife did not turn out happily.

In the mid-1920's, she spent her time in London, New York, and Paris, and her summers in Porvidence. The repercussions of the affair with Wells were still being felt. He made difficulties when she was advised to adopt their son Anthony, in order to elude showing the boy's birth certificate with its stigma of illegitimacy. All the same, through tough resilience and hard effort, she was succeeding in shaping an independent life; she could savor the pleasures
of autumnal walks in Paris, "the best of all cities," and visits to her Parisian dressmaker and milliner; she could cultivate a taste for French cuisine as well as for Proust and Valery. Art was important to her and, no less than love, enabled her to go on living, she proclaims in the essays of The Strange Necessity (1928). There, she expressed her passion for life, but with surprise, "considering that life has treated me as all the children of man like a dog from the day I was born."

With her nove Harriet Hume: A London Fantasy (1929), she tried to lighten the tone of her writing. Its somewhat forced gaiety lies at the opposite extreme to the scarcely adulterated goom of The Judge. There is something of Wells in the self-made shady politician Condorex, who betrays his better self by repeatedly rejecting his lover, the dazzling, sensual pianist and white witch, Harriet, in order to further his career. Condorex and Harriet are seen as total opposites. Only after death is their mystical "real and infrangible union" consecrated in a fantastic denouement. The novel reflects the prociosity of th day, which really suited her very little.

After 1930, Rebecca West mellowed somewhat. In that year, the feminist critic of matrimony married the banker, Henry Maxwell Andrews. It has been said that he was dull and that they were ill-matched. But he had wide interests: he spoke German perfectly, having spent part of his boyhood in Hamburg; and he had studied philosophy at Oxford. They shared a country home in Buckinghamshire, and friends would later comment on her fine taste in furniture and pictures. By the end of the thirties who had traveled extensively, visiting nearly every country in Europe. Her novel, The Thinking Reed (1936), with its Pascalian title, was dedicated to her husband.

This novel is about the growth of understanding in a marriage, viewed against the background of the fashionable international set. The beautiful heroine, an American of French descent called Isabelle (after the author's second name), camarrises on the rebound an unprepossessing, hoodhearted, wealthy, French-Jewish industrialist. She craved "moral riches," and though not basically averse to the other kind, she despised most of the rich people among whom she now vamases—feeling all to clearly shared by the author, to the book's detriment. Isabelle's hauband fails her by gambling (shades of Mr. Fairfield!) and by neglecting to come to her aid when she is having a miscarriage. Ultimately, they are reconciled when Isabelle realizes that she too has been at fault and has betrayed "the trust which is the real point of marriage." Their reunion, in its acknowledgment of moral as well as sexual compatibility, is very fine. Despite the feeling that the author is manipulating her characters at self-indulgent length, The
Thinking Reed marks a considerable advance on Rebecca West's earlier fiction.

The early thirties also saw the publication of her biography of Saint Augustine. This work allowed her to portray a son's relationship with a dominant mother, a situation she knew at first hand through the bond with her son, Anthony, and the tensions that bond created. She also revealed there the enduring influence of her moralistic Scottish education, rooted in Augustinian Calvinism, as well as her reaction against it. She agreed with Saint Augustine: "If we examine ourselves carefully we cannot claim to have free will." To him she attributed that hefualk preference for what is "diasagreeable," that will to death (known to her when she tried to commit suicide), that doctrine of atonement through suffering which, she felt, had poisoned much of European culture. Without him and his commanding influence, she implies, western civilization might have been much more life oriented—a rather dubious proposition. However, her book on the author of The City of God does give an intensive resume of her world view.

A direct line runs from the ideas expressed in the biography of Saint Augustine to a major work published some nine years later, Black Lamb and Grey Falcon (1942). Subtitled The Record of a Journey Through Yugoslavia in 1937, these two mighty volumes offer far more than that: besides being an incomparable guide to the cities, churches, and landscape of Yugoslavia, they attempt to capture the soul of its people through its star-cursed heistyo, its neglected are and literature, its fierce blood stained political conflicts. They display a gift of empathy with a number of remarkable spirits, from the Serbian-Jewish poet whom she calls Constantine, to the ill-fated old Montenegrin woman who addressed the heavens with the unanswerable query: "If I had to live, why should my life have been like this?" Rebecca West has caught the ferment among South Slav intellectuals, the sense of life being consciously lived, as well as what she aptly designated the "lack of psychological staying-power." Perhaps in conception the work owes something to Havelock Ellis's The Soul of Spain, which she had reviewed and admired long before, but it is far richer than its predecessor. Forty years later, Black Lamb and Grey Falcon has lost none of its power or its importance. It is a book about life and about conflicting attitudes to living.

Rebecca West had first visited Yugoslavia in 1936 on a lecture tour (for which she was awarded the Order of Saint Sava) and had succumbed to its beauty. A year later, she returned with her husband, who receives a nice tribute on the last page of the book and who plays an important part in the narrative as loyal support. It is he, too, who stated or confirmed the author's opinions—for instance, in the long
disquisition on "process"—or who is provoked int speaking
his mid to Constantine’s racialist German wife, Gerda (though
we are left with the strong impression that in reality
Rebecca West herself would have squashed the obnoxious
woman). One of the book’s many themes evokes the author’s
married contentment and suggests an ideal matrimonial
partnership.

There is a tradition in English travel writing that
exalts the merits of a foreign country in order to expose
the deficiencies of British life and the shortcomings of
doomed Western civilization in urgent need of replacement by
something more "primitive" or "natural." Rebecca West does
not follow that path. For her, the history of the the South
Slavs does not point to the end of Western civilization but
rather to the ever-progressive need to defend it. The South
Slavs bore the brunt of the battle and saved the rest of
Europe from the blight of Turkish dominatin.

She was writing the book from 1938 onward, into the
precarious years of the Second World War, and it is
naturally governed by her distaste for anti-Semitism (a
distaste manifest in her youthful journalism) and her hatred
of Nazism, shared by her husband who had bravely tried to
help various liberals and Jews when visiting Germany on
business. Her early socialism had been left behind, and in
the book she repudiated pacifism, not least the leftist
variety, speaking of the betrayal by "Left Wing people
among whom I had lived all my life." She also rejected the
Gandhian notion of passive resistance and any hint of
appeasement. While she loathed war, in the past she had
shown little sympathy for Siegried Sassoon’s anti-war
poetry, rooted though it was in his terrible experiences in
the trenches, because she valued great soldiers and the
soldierly virtue of fortitude. The fact is that by nature
she was a fighter.

For Rebecca West, man’s nature is essentially evil; that
is, symbolized by the grisly ritual sacrifice of the black
lamb, the human urge to gain what it wants by shedding
blood. But man is also secretly tempted to yield to his
destroyer, in a kind of self-betrayal and moral suicide, by
heeding the evil counsel of the grey falcon in the Slav epic
poem. Both lamb and falcon stand for anti-life, the latter—
despite sweet words—being just as inimical to human destiny
as the former. For, as she urgently points out, there were
certain disasters in history from which it was impossible
ever to recover fully. The moral of Black Lamb and Grey
Falcon was a moral for 1942, when her Yugoslav friends were
dead or lay under the Nazi boot. Then the fate of Western
democracy and freedom hung in the balance. It is no less
a moral for today.
Please indicate the level of difficulty of the manuscript and the proofreading:

1---------2---------3---------4---------5
very     easy       neither      easy nor  difficult
        easy       easy         difficult      difficult

To what extent did you find the proofreading to be interesting?

1---------2---------3---------4---------5
very    uninteresting     neither    interesting
        uninteresting     interesting    interesting
        nor                nor

uninteresting        uninteresting

To what extent were you committed to performing the proofreading well?

1---------2---------3---------4---------5
very    uncommitted        neither    committed
        uncommitted        committed     committed
This task will involve proofreading a manuscript, as did the previous task you completed. In the first session you identified ___ errors correctly and ___ words as errors that were not errors. In this session your goal is to identify ___ errors correctly and zero incorrect errors.
PLEASE STOP! DO NOT CONTINUE UNTIL THE EXPERIMENTER TELLS YOU TO DO SO.
PLEASE STOP! DO NOT CONTINUE UNTIL THE EXPERIMENTER
TELLS YOU TO DO SO...
In 1948, my sophomore year at Harvard, I decided that, no matter what I might do in life, differential calculus would come in handy. So I dutifully enrolled in Mathematics I, a giant course that was taught in small sections. As it happened, I had a friend who was also taking the course, and one day he showed me his corrected homework. His section man, a graduate student, had made some remarkably funny comments on the paper, and my friend told me that this was characteristic. I asked what the name of the section man was, and my friend told me that it was Tom Lehrer. At the time I made this inquiry, my friend and I were both eighteen. Although I did not know it then, Lehrer was nineteen and was already in his third year of graduate school, having entered Harvard in 1943 at the age of fourteen and having finished in three years.

I did not get to meet Lehrer until a few years later, when I began taking graduate courses in mathematics. Lehrer was still a graduate student, a status he happily retained, on and off, until 1963. By the time I met him, he had already acquired a sizable reputation around Harvard both for his singing and for several inspired pranks. In 1951, shortly after the completion of the new graduate center designed by Walter Gropius, with its Richard Lippold "world tree"—a stainless-steel statue that vaguely resembles a tree-Lehrer and a small band of associated organized two ceremonies in honor of the "tree." The first occurred on the vernal equinox, during which some of the group, a few dressed up as bulls and several others as "virgins," were sacrificed. This was followed by an Arbor Day ceremony, during which "world seeds" (ball bearings) were planted under the tree and a metal "world bird" was placed in its branches.

I graduated from Harvard that year and was in charge of the entertainment for our senior dinner at Eliot House. I managed to engage the late Al Capp, the creator of L'il Abner and a family friend, and Tom Lehrer. Capp was so impressed by Lehrer's songs that he hired him, more or less on the spot, for a television engagement on a weekly satire program that Capp then had in the Boston area. As it happened, the program only lasted for four weeks, but it was the first time that Lehrer has been let loose on the general public. Incidentally, Lehrer sang a song about television on the program, which had, as I recall, the line, "On Tuesday nights we choose between Milton Berle and Fulton Sheen."

I left Harvard in 1957 and lost personal contact with Lehrer, although, like most people of my generation, I did follow his extraordinary career. Then in 1965 he disappeared, and from that day to this, except for a few fund-raising appearances, mainly for liberal political candidates, he has never again performed in public. Indeed, I often wondered if he was still among the living. But in the summer of 1980, I came across an item in a local Colorado newspaper that had the headline "Tom Lehrer Makes
London Encore." Upon closer examination I discovered the item referred to a a retrospective musical called Tomfoolery, which consisted entirely of Lehrer songs sung by a cast of three men and a woman. Lehrer did not sing, and the London show's master of ceremonies noted that "he's fiftys-two now but so fears old age that he prefers to think of himself as eleven centigrade." Lehrer did make a brief curtain call, but he said nothing.

When it became clear the Tomfoolery was heading for this country, I thought it might be a good excuse to renew my ancient contact with Lehrer and to find out what he had been up to and, indeed, why he had, more or less, vanished from the public scene. I managed to track Lehrer down in Cambridge, where he lives for half the year (the other half he spends in California). He said he would be coming to New York, and we decided to get together. At the appointed hour, early in the afternoon, Lehrer appeared at my apartment. The first thing I noticed was that, for all intents and purposes, he looks exactly as he did when I last saw him some twenty years ago. Whatever else he has been up to, he seems to have found some way of defeating the aging process, perhaps by remaining a bachelor. As it turned out, he had not eaten and neither had I, so we went to a nearby delicatessen and brought back two tuna fish sandwiches and a couple of apples and settled in for an afternoon of conversation.

I thought it might be a good idea to start at the beginning, since it was never entirely clear to me how Lehrer got started in his singing career at Harvard. "As you know," he said, "I majored as an undergraduate in mathematics. I was good at it, but I was also very lazy, which is probably why I majored in it. It had the least requirements. I was going to be an English or a chemistry major, but when I looked at the list of requirements, I said 'forget it.' The mathematics department required taking a few courses—and that was that. I had entered Harvard at fourteen, so I guess I was a semi-prodigy. The New York public schools at that time believed in allowing students to skip grades, which is why I graduated so young. But everyone in college was young then because of the war, and everyone who was not young was in the army. We had three terms a year then, so I was accelerated and got out of Harvard in three years. I began teaching in my first year in graduate school because they were so desperate for teachers.

"As a kid I took piano lessons, which, at the time, meant classical piano. I never really liked that, and I spent my spare time picking up popular songs on the piano. My parents, that is, haven't, instead of forcing me to continue doing something I didn't want to do, found me a popular-music piano teacher, which was rare at that time. Today it is quite common to study popular music, but in those days the usual thing was to study classical music and then to pick up popular music on your own. Having a popular-music
teacher worked out very well for me. I began writing tunes when I was about seven or eight. But I was in college when I began writing parodies of popular songs—for any occasion. The only one of those songs that eventually made its way into my repertory was "Fight Fiercely, Harvard" which was written in 1945 and shows it. The Harvard band still plays it."

When I was an undergraduate nearly everyone had memorized: "Fight fiercely, Harvard, fight, fight, fight! Demonstrate to them our skill. Albeit they possess the might, nonetheless we have the will."

"I started singing those songs at parties," Lehrer continued, "but never with the intention of their becoming commercial. That is why when somebody comes to me and says, 'I write songs and how can I get started in the business? What can I do?' there's no way I can give them any advice, because I did not set out to do it myself. I just assumed that no one would like my songs, except a few of my friends. My performing career began in 1950. The Harvard Law School, for some reason, had a quartet contest—any four people could get together and sing. I entered with four other people. We were a quintet, but that didn't matter since we were the only contestants. A representative of the Harvard freshman smoker, an annual event that featured entertainment, was at the contest. The smoker committee was always looking for free local entertainment, and so we did the Harvard freshman smoker, sharing the bill with Sally Rand, who was appearing at the Old Howard in Boston. It was a memorable night."

The original members of the group were: Lewis Branscomb, who was then a graduate teaching fellow in physics and who later became the director of the national Bureau of Standards and is now a vice-president and the director of scientific research for the IBM Corporation; David Robinson, now the executive vice-president of the Carnegie Corporation; Robert Welker, now a professor of American civilization at Case Western Reserve; and Munro Edmonson, who is now a professor of anthropology at Tulane. Branscomb had the inspired idea of having the quintet give the last "lecture" in his freshman physics course. It was entitled "The Physical Review," in honor of our professional physics journal, and was given in the large lecture hall in the Jefferson Laboratory—a gala occasion, which I attended. Among other things, the group sang Lehrer's song on the elements, which begins: "There's antimony, arsenic, aluminum, selenium and hydrogen and oxygen and nitrogen and rhenium..." and after a breathtaking recitation of all the elements, the song ends: "These are the only ones of which the news has come to Harvard and there may be many others, but they haven't been discovered."

It was not long afterward that the group made its "world tree" appearance, for which Lehrer wrote the parody "Trees." This was published in the Harvard Crimson—the first verses of Lehrer's that found their way into print. The item was
pickled up by Time magazine in a story about Gropius; the verses were given, but without attribution. When Lehrer wrote to Time to complain, he was told to settle matters with the Crimson.

"The Physical Review" was repeated the following year. "The members of the group got their degrees, and most of them scattered to the hills," Lehrer noted. "But people began asking me to sing at dance intermissions and smokers and things like that, which I did for minimal pay. After about two years of this, I got tired of it—tired of singing the same songs. Then I thought, 'Hey, I've got these songs. I'll make a record.' It was a case of the right technology at the right time. By then there were LPs that you could ship yourself. With the old 78s this would have been impossible. I figured that if I made a record, I could sell three hundred of them. A lot of calculation went into that. Each time I sang somewhere I asked for a show of hands as to how many people would buy a record. Adding up those people plus my relatives came to three hundred. I figured out how many I could order so that I could break even at three hundred, and that turned out to be four hundred."

At this point Lehrer munched on his apple and recalled, "I looked in the Yellow Pages under 'Recording.' There were two places listed where you could record—'I'm Sorry, Mother' or anything else. I went to both of them. One was polite to me and one was rude, so I chose the polite one. A couple of years ago, when I was going through my basement, I came across the bill for the original recording session. The total cost of everything—studio, tape, engineer, microphone, piano, everything—was fifteen dollars. Well, anyway, I ordered four hundred records, and they sold out very fast. I had a friend design the album cover according to my instructions, and I wrote the liner notes and took the whole thing to the printer who printed up the jackets. Then they shipped them to the presser who made the records. I got the cardboard sleeves and envelopes and handled all the mail orders myself, at least for the first few months. In fact, for awhile I sold most of the records in the local Harvard dining halls or in record stores in Harvard Square. But then I began to get a whole bunch of orders from San Francisco. It turned out that the music critic of the San Francisco Chronicle had devoted a whole column to the record and not only had praised it to the skies but had given the price and the box number where you could write for it."

Lehrer's original record sold for $3.50, and a slightly later version, which I have, sold for $3.95. It was a ten-inch affair and on the cover sits a fabulous Lehrer at a grand piano. The liner explains, "Tom Lehrer, long time exponent of the derriere-garde in American music, is an entirely mythical figure, a figment of his parent's imagination. He was raised by all yak by whom he was always treated as one of the family, and ever since he was old enough to eat with the grownups he has been merely the front for a vast international syndicate of ne'er-do-
wells." Ultimately the record sold some three hundred and fifty thousand copies and, needless to say was no longer sold out of Lehrer's home. Eventually it was distributed by RCA, which took the orders from the original recording firm.

It was now 1953 and the Korean War was on. Lehrer was of draft age and not eager to take part in the hostilities, so he took a job at a firm called Baird-Atomic in Cambridge, which specialized in electronics and optics, work that was considered essential for the war effort. He remained at Baird for a year until he thought that "nobody was going to shoot me and I wouldn't be called upon to lobby anybody else," and then he surrendered to the draft board. Of his army experience he once commented, "I think it paid off... America is free today.

"I didn't diet on," Lehrer told me as we were finishing lunch, "that I had any entertainment abilities, because I figured they'd put me into special services and send me off to Alaska or someplace to entertain the troops." In fact, he spent two years in Washington in the National Security Agency doing top secret work that made use of his mathematics. Just before going into the army, Lehrer had made his first nightclub appearance, at the Blue Angel in New York. "They hired me for the Christmas show," Lehrer noted, "figuring that I'd attract the college kids home for vacation. I was on the bill with Orson Bean, among others. There was a reviewer from The New Yorker who, I was told, didn't like me at all. But he had the kindness not to mention me when he reviewed the rest of the show. When I got out of the army, popular concerts were just starting. There was no real concert circuit; the Kingston Trio started all that. If you said that you were going to do a concert, people assumed that you were going to play the piano or something. The only honorous concerts then were given by Anna Russell or Victor Borge. The idea of a George Carlin or a David Steinberg giving a concert just didn't exist. I did my first concert in 1957 at Hunter College in New York."

After his Hunter College concert, Lehrer spent three years touring much of the English-speaking world doing concerts. In 1959 he put out a second record, a concert recording entitled An Evening Wasted with Tom Lehrer, which sold more than 200,000 copies here and abroad. "I didn't want to put the record out until I was ready to retire from performing. I figured that if the record was out, who would want to come and hear me. I would just be dling my whole act on record. Doing comedy is not like being a pop singer, where audiences want to hear what they've already heard a thousand times on the record--they want to hear Sophie Tucker in person sing -Some of These Days.' So I put the second record out--it was recorded at Harvard as a farewell. I went back to graduate school and did five more years at the Harvard Graduate School.

Altogether Lehrer spent eleven years in graduate school, ten at Harvard, and one at Columbia. This, in itself, is a
rare achievement, especially in scientific fields, where students are pushed out the door as rapidly as decency will allow. In my day at the Harvard Graduate School in physics, it was considered extremely bad form if one spent more than four years there. I asked Lehrer about it. "I'm not really a mathematician," he explained. "I'm a teacher of mathematics. I have been teaching it for as long as I can remember. Everyone seems to have a certain level in mathematics. I know a lot of people who do wonderfully in high school, but when they go to calculus, they find that it is a whole other ball game and they're lost. I think that is true for almost everybody at a certain level. For some people it's subtraction. I did hang on with it. When I was about halfway through, I switched to statistics because that was more my style. I could handle that better. But I got to a certain level and found that, although I was doing it, I could do it—I didn't internalize it. This is something that is difficult to explain to a non-mathematician. I think that the graduate school would have been happier if I had gotten through; but I wasn't taking up any space particularly, so they didn't mind.

"Of course, by the time I went back in 1960, I was the same age as the junior faculty—so I wasn't exactly a kid anymore. It was a more friendly, treated-like-equals kind of situation. I was mostly auditing courses, since I had satisfied all of my requirements for a Ph.D., written the minor thesis, and even started on my dissertation. Finally, in 1965, I decided that I wasn't going to make it. It wasn't something I wanted. I kept saying to myself that if I ever get this dissertation written, I will never have to do any research again. Then I realized that I must be telling myself something, so I decided enough is enough. There was a lot of guilt in all that—although those years invested—so to deal with that, I began teaching at M.I.T. I taught quantitative courses in the political science department—statistics and mathematical models—from 1962 to 1971. That's another reason why I can't say that I am a mathematician. I've never held an appointment in a mathematics department. I have been in the Harvard Business School, where I taught calculus in 1961; in the Harvard Education School, where I taught geometry for high school mathematics teachers from 1963 to 1965; and in the psychology department at Wellesley, where I taught statistics in 1965. In fact, in 1965 I had three appointments simultaneously—at Harvard, Wellesley, and M.I.T."

In 1964 NBC imported the British television program "That Was the Week That Was," which had been a great success in England. "I didn't think that the American version was very good," Lehrer went on, "but it was the only game of its kind in town. They seemed to be using material from everywhere, so I sent in some songs, which they used. Some of them werer good and some of them weren't, but by 1965, when the show ended, I realized that I had enough songs to make a record. I particularly wanted to do it because
somewho they had managed to take out the best line in each of my songs and replaced it with something vapid. I wanted some sort of record of how the songs were supposed to be. My earlier songs were mainly takeoffs on popular song forms, there wasn't much political content in them. There was one called 'The Wild West Is Where I Want to Be' that was inspired by a summer I had spent at Los Alamos in 1952. It was about the atmospheric testing of atomic bombs, but it was really intended to be a 'Home on the Range,' jokey kind of send-up. But in 'That Was the Week That Was,' there were specific topics in the news each week that I wrote about.

"I didn't sing on the program. Most of the songs were sung by a woman named Nancy Ames. I had the fantasy that she was a gorgeous robot who had been programmed to pronounce English correctly—that is, phonetically. She had marvelous diction, but she didn't quite understand, as far as I could tell, what the joke was. It was better when they were sung by a comedian like Steve Allen or Buck Henry. That was another reason why I wanted to do them myself. So I called a club in San Francisco, where I had appeared a couple of times in the fifties, and asked if I could do a coupoe of weeks there to try the songs out and to polish them up for recording. I wanted to see if the laughs really were there.

So I did two weeks, and then a third when Dick Gregory couldn't appear. (He was picketing somewhere.) Warner Bros. offered to do the record, and I signed a contract with them and did a fourth week a month later to make the record. At the end of it I was finally convinced that I had no desire to be a performer. When I went back in 1965, after not having performed for five years, various people said to me that maybe I would like it and want to begin to perform again—that people would start applauding and that would make me want to resume my career. But after the second week, I realized that I was not cut out to be a performer. It requires more than the ability to do it. You have to have the desire."

With a few rare exceptions, most of them abroad, that was the last time Lehrer appeared in public. He did not write any new songs until 1970, when he was contacted by the Children's Television Workshop, which was in the process of producing "The Electric Company" for public television. "It was the first time," Lehrer continued, "that anybody had asked me to write songs other than the kinds of songs that I had already written. These new songs were just for kiddies. They weren't supposed to be satirical or political or anything like that. They were just meant to teach reading."

"Before that, every once in a while, somebody would come up with some idea for a satirical song he wanted me to do. But it was always the same thing over again. I remember that one lady called me up and said that she loved my songs. She told me that she thought the main problem in America was materialism and that I should write a song making fun of materialism. I told her that of course I would do it—if she
paid me enough money. I couldn't resist saying that, but she was very serious and didn't think it was as funny as I thought it was.

"When The Electric Company writers contacted me, it was the first time that somebody had wanted me to use my craft rather than just repeat what I had already done. I thought it was a great idea, and I managed to write ten songs for them. One of them is called Silent E's, and it tries to teach kids about silent E's. It still appears on reruns of The Electric Company. I was amazed by how many college students, who were kids in 1970 and 1971, when the song first appeared, know it without knowing that I had anything to do with it. I didn't get any credit on the show. It was my voice, but I didn't get any particular credit. Nor did I want any. It was just fun, and The Electric Company songs are the last songs I have written.

By 1971, Lehrer had been teaching at M.I.T. for nine years. "It began to be less fun," he remarked, "and I decided that I was too old to have fun. So I tried to think of a place where I could continue to teach, in a different kind of atmosphere. They had begun to take it all very seriously at M.I.T., and then they made my course compulsory for graduate students. That was the last straw. In compulsory courses you get those people who are just sitting there, and you know they would rather be somewhere else—anywhere else. That's not how I want to teach. M.I.T. was taking it much too seriously. There were a lot of people there who seemed to think that political science is, in fact, a science, and therefore one should pay attention to quantitative approaches to it. I don't have anything against any of them personally. Personally, they were fine. But it just became less fun, and, furthermore, they moved us to a new building on the M.I.T. campus. That destroyed all communication whatsoever. So I started looking around. I had heard of Santa Cruz through magazine articles, and it sounded like the kind of place I would like to try. I write them out of the blue, just getting names out of their catalogue, to see if I could teach my math course there. They said OK, so I gave a year's notice to M.I.T., and went out there to try it. I loved it, and this will be my fifteenth year there."

At first Lehrer went out to California for only the three months in the winter quarter. "I had decided that, not only was I too old not to have fun, but that I never want to shovel snow again. I didn't want to be very cold. That's a sign of old age, but that's fair enough. In Cambridge I had been a member of a play reading group. We would read plays once a week for mutual entertainment. Then someone got the idea that we should do a musical. That caught on so well that each year we did a musical. So when I got to Santa Cruz and saw that there was a play reading course, I thought that we could have a musical reading course too. A number of students were interested in musicals, but there was no outlet for them. So I proposed
my course, and it was accepted. Now I teach my math course for one quarter and the course on musicals for the other. I am there for six months."

The idea for doing Tomfoolery also came to Lehrer out of the blue from Cameron Mackintosh, who had co-produced the show Side by Side by Sondheim, a very successful retrospective of Stephen Sondheim songs. "I had been approached by other people before," Lehrer said, "by a record, who had such a definite plan and the idea for a first-class production." It took almost two years from the time Mackintosh first contacted Lehrer in 1978 until the show first opened in London on June 5, 1980, at the Criterion Theatre. It ran for a year. A Canadian production began touring Canada in November 1980, and there have also been productions in South Africa, Australia, Ireland, and Hong Kong. Two American productions ran in 1981, and Pantheon Books brought out Too Many Songs by Tom Lehrer with Not Enough Pictures by Ronald Searle, which is, as one might imagine, an illustrated songbook containing most of the Lehrer classics.

"I went over to London in the spring of 1980," Lehrer told me, "and spent a few weeks in the rehearsals and tryouts in Brighton and went to the opening in London. It was delightful, and I was very pleased with the whole idea. I think that ten years ago that kind of humor would not have worked the way it seems to now. People were too serious then. I rewrote a few things for the London performance to de-Americanize them. One thing I had to rewrite really surprised me. You may remember that in "Poisoning Pigeons in the Park," there is a line that goes — and maybe we'll do in a squirrel or two. Here, in this country, there was always a laugh there, but in London, there was nothing. I couldn't figure out why. I kept if I was pronouncing squirrel right, and if they knew what a squirrel was. Everyone said I was and they did. Finally I figured out they don't have squirrels in their parks. Squirrels, to them, are like foxes and belong in forests. So I changed squirrel to sparrow and got the old laugh back again."

Just before Lehrer left my apartment, I asked him if he had written any songs in recent years. "No," he replied, with no apparent regret, "except for a few I have done for birthdays or special occasions— but not for public consumption."

"Do you ever have any urges in that direction?" I asked him. "No. No, I don't. In the old days the ideas would just come to me, and the next time I was at a piano I would work them out. Now the ideas don't particularly come. Maybe it's because I don't find the time as funny as I used to. Maybe it's the times themselves, or maybe it's senility. I never thought of myself as a composer anyway. I am amazed by how nice the songs sound when they are played by a five-piece orchestra, like the one we had in Tomfoolery. Now I see that I am often referred to as the late Tom Lehrer. I have a small file of clippings like"
that, which I cherish, because people assume that I am dead. At the time, in the fifties and sixties, when I was writing the songs, I was not really aware of the idea that they would be presented to an audience—at least not in the beginning. So I wasn't self-conscious about them. That's what happens when you are young. You do things like a kid without going through all those layers of self-censorship. I was just saying in those songs what I was thinking. Now if I wrote a song I would think, 'How will this go over with an audience?' I couldn't help thinking that. When I first wrote them, they were for my own amusement, and it turned out, much to my delight, that not only did they sell, but they are still selling—something that was totally unforeseen. Who at the time would have thought that thirty years later people would still be interested in them?"

And he says, putting on his coat, "I don't know what it means, but it's probably not good."
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