

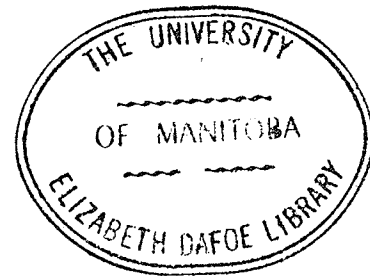
A FACTOR ANALYSIS OF MEASUREMENTS OF TIME PERCEPTION, TIME
PERSPECTIVE, EXTRAVERSION-INTROVERSION, NEED FOR
ACHIEVEMENT, AND OTHER TEMPERAMENTAL AND
MOTIVATIONAL DIMENSIONS

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ABSTRACT

Temperamental and motivational variables have been found to form relationships with specific aspects of temporal experience. To clarify the relationships among the various conceptualizations and measurements of temporal experience, and between these measurements and those of temperament and motivation, a more systematic analysis of the relationships is required. The purpose of the present study was to (1) investigate the relationships among the many measures of temporal experience, in order to narrow the diversity down to the smallest commonality; and (2) investigate the relationships between measurements of temporal experience and some temperamental and motivational measurements.

Ninety-six male students, randomly selected from the introductory psychology course, served as Ss. Each S was given a number of tests, which represented 47 variables; of which 39 were measures of temporal experience, and 8 were measures of motivation and temperament.

A matrix of intercorrelations was obtained and factor analyzed. Four third-order factors were extracted: Factor I: task involvement; estimation of duration and evaluation of boredom-interest of relatively long (one hour) task-filled intervals. Factor II: social adjustment - impersonal future; social adjustment (including social extraversion and restraint, high need achievement in a social context, low manifest anxiety), the connotative meaning of time as slow, relaxed, warm, and good, and the anticipation of non-personal events. Factor III: present

vs. future time orientation; estimation of duration of relatively short (15 seconds) intervals, time span of story productions, and the connotative meaning of time as strong and deep. Factor IV: Anticipation of personal events; orientation toward personal future events, the connotative meaning of time as slow, relaxed, warm, and good. It was concluded that: (1) temporal experience consists of many partially independent aspects; (2) within the limits of the measures used in the present study, temperamental and motivational measures do not correlate with many aspects of temporal experience, and for those that do the degree of covariation is small.

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CHAPTER I

INTRODUCTION

Time, one of the two basic parameters of the physical world to which man must relate and adapt, has been of considerable interest to psychologists. The subjective experience of time has been studied by focusing on such concepts as time perception, time conception, time perspective, time orientation, and time imagery. Research, as reviewed by Wallace and Rabin (1960) and Orme (1962), has typically centred on the development of time concepts, the experience of the passage or duration of time under various conditions, and, more recently, with the temperament correlates of measures of time perception and time perspective. The present study represents the latter type of research; that which investigates phenomena associated with temporal experience, specifically in terms of their relevance to and their relationship with temperament variables.

The Psychological Investigation of Time

The psychology of time has been considered from two viewpoints, the subjective and the objective. The subjective viewpoint focuses on time perspective, attitudes, orientations and concepts regarding time. The objective viewpoint centres on time perception, and the psychophysical aspects of time intervals. These viewpoints, although seemingly disparate, have been essentially measuring the same construct: time. However, consistency of methods and of measurements, as Bindra and

Waksberg (1956) point out, has been lacking, within and between viewpoints. The types of experiments performed which have investigated temporal phenomena have differed widely, and, as Spreen (1963) notes, the results obtained with each of these differing experimental conditions may vary as much as the technical aspects. Different sets of terminologies have been employed to describe results. As Wallace (1956) has indicated, "concepts such as time sense, time orientation, time perspective, and time perception are employed interchangeably, often in the same investigation, or are utilized in such a manner that no clear idea of the intended meaning is given, either in conceptual or operational terms."

Aspects and methods of the "subjective" viewpoint:

Future Time Perspective. Man's ability to handle his anticipations of conceptions of his future is an adaptation process of the highest significance (Hartmann, 1958, p. 43). As a subjective ego function, it is an important consideration for theoretical formulations and empirical studies of human behavior. The aspect of the timing and ordering of the future events is termed future time perspective (FTP) by Wallace (1956) and Barndt and Johnson (1955), who reported the development of methods and measurements of this aspect of temporal orientation.

Story Completion Test. This test, as originally reported by LeShan (1952), Barndt and Johnson (1955), and Wallace (1956), consists of four story-completion items, (story stems), in which S is asked to complete verbally a story which has been started by E. Structured or

unstructured temporal situations are involved. The timing of future events in the completed story, labelled extension, is the dependent variable, and refers to the length of the time span given by S in describing the duration of the action in each story. Other investigators (Bonier & Rokeach, 1960), have utilized the Thematic Apperception Test rather than a story stem.

Personal Events Test. This test, developed by Wallace (1956), requires the S to name ten events which may happen to him at any time during his life. Then, the S is required to estimate his projected age at the time of occurrence of each event. The dependent variable, extension, is the range of years included between S's present age and the age at the most distant event given by him.

Immediate-delay scale. This scale was modified by the present author from various self-report inventories which measured the choice between an immediate but smaller reward or a delayed but larger reward (Mischel, 1961a, 1961b; Mischel & Liebert, 1966; Lessing, 1968). Preference for delay of gratification, as an indicator of temporal orientation, has generally been studied using children as Ss.

The following self-report inventories are and have been an important technique in measuring behavior patterns consisting of beliefs, values and attitudes regarding FTP.

Inventory of attitudes toward FTP. Hooper's (1962) 100 item scale enables measurements to be obtained on scales of extension, density, directionality, coherence, and valence, which have been reported by Kastenbaum (1961) to be factors of FTP. Five degrees of agreement-

disagreement are provided for each item.

Impersonal past-future test. Thor's (1962) perspective questionnaire consists of twenty items, ten of which are related to anticipated future events and ten of which are related to historical events. The questionnaire involves the estimation of the number of years until, or since, an event will happen, or has happened.

Time Concept. Man's awareness of time manifests itself in various implicit attitudes which stem from a conceptual framework, of which time is a part. Evaluation of time per se is an important consideration in the study of this conceptual framework, as reported by Knapp and his co-workers.

Time metaphor test. This denotative meaning measurement technique was developed by Knapp and Garbutt (1958). A list of metaphors with poetic allusions to time are presented to the S with instructions to rate them on a seven point Q-sort, according to their aesthetic appropriateness and effectiveness. The poetic allusions to time are depicted by phrases of swift movement and phrases of slow movement.

Semantic differential. This denotative meaning measurement was developed by Knapp and Garbutt, (1965, as adapted from Osgood, 1952). This technique involves the rating of a word or concept on a series of continua defined by pairs of antithetical adjectives. Thirteen pairs of adjectives, including Osgood's basic three factors, good-bad, hard-soft, and active-passive, were used to evaluate the concept of time on a seven point scale.

Aspects and methods of the "objective" viewpoint:

Time Perception. Man's ability to make judgments about temporal durations, during various conditions, is another important aspect of temporal orientation. The objective study of time, labeled time perception, focuses on the psychophysical aspects of time. Reactions to actual periods of time, rather than reactions to questionnaires, regarding time, have become important in determining internal differences in responding to time so that abnormalities can be uncovered. Research, as reviewed by Fraisse (1963) has centred on short time intervals (one minute or less) and their characteristics, although longer durations of time are also conducive to research.

Psychophysical methods --judgment of short intervals. Empirical investigations of short time-interval estimations, under various conditions (empty or filled), have been carried out by using four methods, as reported by Bindra and Waksberg (1956) and by Wallace and Rabin (1960). These methods are: verbal estimation, in which E presents a standard interval and S estimates verbally his judgment of the duration of the intervals in appropriate temporal units; production, in which S produces an interval (the judgment) of a given length indicated verbally by E (the standard); reproduction, in which E presents a standard interval operationally and S reproduces his judgment of an interval of the same duration; and comparison, in which S is asked to judge which is longer of two intervals presented by E. Of these four methods, the method of reproduction most directly attacks the problem of time per-

ception, and at the same time encounters the fewest number of additional parameters (Richards, 1964). According to Richards, the methods of verbal estimation and production do not have adequate controls, and the results are dependent on personal time scales, which are unstable and easily distorted. Similarly, the method of comparison is fraught with many biasing factors which must be isolated before any analysis of the perceptual process can be made. On the other hand, Richards says, the method of reproduction is not influenced by most of these variables, and the results can be more easily interpreted. Also, the method permits reproduction of multiples of the standard interval, increasing the number of parameters which would be randomized and hence decreasing the possibility of differential bias. The dependent variable is the difference between the standard and the judgment in seconds. Greater accuracy in time estimation has been found using the reproduction method in comparison with the verbal estimation method (Ochberg, Pollack & Meyer, 1965). A variation of the reproduction method, the positive feedback method, which is applied by presenting to the S his last judgment as his new standard, will be discussed later.

Psychophysical methods -- judgments of longer durations. This refers to estimates of filled intervals of time when the S is unaware that he is required to estimate the duration, and is engaged in a task which is ostensibly the main purpose. In such cases, the S is asked to estimate the length of the time that the task covered. Such intervals are called filled intervals, such that the estimate refers to a duration of time along a continuum, rather than between two points, in which case

the S is estimating empty intervals. Research employing this method has been lacking, since the shorter intervals have been the focus of research on time perception.

A Review of the Literature

Much of the findings have been based on research which has utilized specialized populations, such as inmates, neurotics, schizophrenics, children, or others which have been especially conducive to manifesting temporal differences.

Findings of the "subjective" viewpoint:

Future Time Perspective. Research on FTP has generally centred around temperament correlates and social correlates.

The importance of FTP to researchers engaged in clinical psychology was demonstrated by Farber's (1951, 1953) findings that an individual's "mood" is more influenced by FTP than by the situation in which he currently finds himself. Stuart (1962), in an intercorrelational study, found indications that a hypothetical person with a restricted future outlook is depressed, has a poor self-concept, and is generally unhappy. Shybut's findings (1968) suggest an inverse relationship between severity of "psychological disturbance" and the length of FTP. Two independent dimensions of future orientation that relate to anxiety were uncovered by Lipman (1957) who reported that anxiety entails experiential components that are strongly future-oriented in nature. The two dimensions are "dismal unclarity" and "exaggerated goal frustration fears." Albers (1966) and Einstein (1964) found that high anxiety and

loss of self-integrity were characteristic of Ss whose temporal orientation indicated an extended FTP. The discrepancies in findings are notable.

Bonier and Rokeach (1960) and Zurcher et al (1967) report that Ss high in dogmatism, as measured by the Dogmatism scale, gave fewer present and significantly more future responses than Ss low in this variable. This finding is interpreted in the light of May's (1950) report that the dread of the future is the central feature of anxiety, so that attempts to cope with anxiety should involve a pre-occupation of the future. Krauss and Ruiz (1967), however, found high anxious individuals tend to perceive time events more in terms of the past than in terms of the present or future. The Bonier and Rokeach study also noted that closed-minded groups demonstrated greater anxiety than open-minded groups and felt more compelled to project into the future the outcome of events taking place in the present, since they are more anxious about the future. In this regard, Kahn (1966) found that projecting into the future was related to high organization.

Barndt and Johnson (1955) reported that delinquent boys revealed shorter spans of FTP and are more present-oriented than non-delinquents, using the Story Completion Technique. Stein et al (1968) found that non-delinquent boys achieved a greater extent of FTP, than delinquent boys (holding status constant), using the Personal Events test. LeShan (1952), using the Story Completion test, found evidence to support the hypothesis that the time perspectives of middle-class children are longer than those of lower-class children, although his findings have

been questioned with respect to generality by Greene and Roberts (1961) and with respect to reliability by Judson and Tuttle (1966). Craik (1966) showed that a social sample showed a more extensive personal perspective, more pleasant tone, and greater optimism than an asocial sample.

Mischel (1960, 1961a, 1961b) has reported that Trinidadian children who prefer delay of reinforcement to immediate reinforcement: (a) show greater need for achievement; (b) are non-delinquent; and (c) tend to show greater social responsibility. Doob's (1960) cross-cultural research has also indicated such trends. McClelland (1953, p. 250) reported that Ss with high need achievement (nAch) tend to use more "anticipatory tenses", that is, phrases indicating a forward orientation. They are concerned with the general management and measurement of time. Ricks and Epley (1960, reported in McClelland, 1961, p. 327) have demonstrated that Ss with high nAch have a longer time perspective on the future in the imaginative stories they write. Knapp and his co-workers have demonstrated relationships between aesthetic asceticism and achievement motivation, and aesthetic asceticism and time judgment. (Knapp & Green, 1961; Green & Knapp, 1959; Knapp, 1962; Knapp & Garbutt, 1958, 1965). There appears to be a fairly reliable pattern relating the tendency to recall past events as near the present, the tendency to anticipate future events before they occur, and a preference for the type of aesthetic asceticism known to correlate with high achievement motivation. Teahan (1958) and Davids and Parenti (1958) have reported a positive association between FTP and academic achievement, and note that expansion of the FTP may be one aspect of maturation.

Wallace's (1956) findings indicate that FTP is influenced by the schizophrenic process to such an extent that both the length (extension) and organization of contents (coherence), on the Personal Events test, are significantly reduced in patients as compared to normals. Smart (1967) found a similar trend in alcoholics in that they perceive a shorter and more disordered future in comparison with social drinkers.

Goodman (1967) reports a positive relationship between two time perspective variables (Time Value Orientation -- the value a person gives to living for the present relative to the future; Time Extension -- a cognitive dimension that refers to the length of the FTP span conceptualized by the individual) and their "personality" dimensions (Activity-passivity; effort-luck; trust). Individuals whose job roles required more abstract than concrete activities tended to have higher Time Extension scores than individuals in roles high in concrete activities.

A study by Lessing (1968) suggested that the length of FTP per se had a somewhat tenuous relationship with adjustment variables. She did, however, find a significant positive correlation between FTP and IQ on the Personal Events test, and on the unstructured story test (but not on the structured story test). There is small support that the length of FTP is related to academic achievement. LeShan's (1952) findings were supported by Lessing for the Story Completion test but not for the Personal Events test. Neither the Events test nor the Story Completion test which measured length of FTP yielded a statistically significant temperament correlate. The author suggests a multifactor instrument to

elicit "personality" correlates in relation to a personal future concept.

Kastenbaum (1961) reported a factor analytic study of four logically independent aspects of FTP, viz., density, extension, coherence and directionality (which are measurable on the Hooper scales) and three non-temporal variables, intelligence, need for freedom and personal rigidity. Four interpretable factors were found. General concern for future experiences was the provisional name given to Factor I, on which all FTP measures (excluding directionality) had substantial loadings. Factor II was interpreted as the effective socially channelled use of intelligence and the preference for directional, dynamic, time imagery. Factor III was regarded as density; comprising the number of events, roles and experiences an individual expects to populate his future. Factor IV was identified as the inclination to explore and organize future possibilities when the immediate situation is minimally structured. The author interprets his results as support for the relating of FTP to such a cognate variables as planning abilities, response inhibition, and personal pace.

Other variables have been related to FTP. Spotts (1965) and Ulmer (1965) report findings re IQ and FTP which are conflicting. Goldrich (1967) demonstrated a significant association between inefficiency in the attainment of an important future goal and extremes of avowed recall for details of the past; or, conversely, between moderate degree of such recall and efficiency in attainment of a future goal. Her findings suggest that one important component of the ability to pursue goals successively may be concrete awareness of the inter-related

steps which bridge the gap between present and future situations, that is, between formulation and attainment of a goal.

Time Concept. Relevant research regarding the time concept has, generally, been restricted to work done by Knapp and Garbutt, (1958, 1965). Using imaginative stories for obtaining nAch scores, they found that eight of the ten metaphors more preferred by Ss with high nAch were characterized by swift movement, whereas none of the ten metaphors most preferred by the Ss with low nAch suggested swift movement. High nAch was correlated positively with their cluster of swift, dynamic and hasty metaphors but negatively with slow, passive, static metaphors, which were employed as poetic allusions to time. Using adjective ratings on the semantic differential for the concept of "time", the authors obtained the same (but less incisive) result (1965). McClelland (1961, p. 327) reports a study by Cortes (1960) who found that individuals high in nAch reported their watches to be faster, significantly, than individuals low in nAch, so that time is almost literally moving faster.

Findings of the "objective" viewpoint:

Time Perception. Relevant research regarding time perception has not been lacking (See Fraisse, 1963). Differences have been found in measurements of duration of time as a function of temperament variables and social variables.

Robbins et al (1968) and Gay and Cole (1967) found that rural Ss consistently overestimate more than urban Ss. Thompson (1960) suggested that delayed goal gratification is related to an individual's

breadth of conception of time and that "a person who overestimates duration in relation to clock time may be less likely to be willing to wait than a person who underestimates duration relative to clock time." Goldstone et al (1963) reported that accuracy of estimation of time and social status are related. They suggested that the ability to calibrate accurately subjective time with social units of temporal magnitude is associated with more choices and fewer rejections for friendship and prestige.

The influence of stress has been found to have an effect on the estimation of time. Sattler's (1965) results are complementary to previous research (Falk & Bindra, 1954) that under stress conditions, time is overestimated. Cattell and Scheier (1961) reported small negative loadings on the anxiety factor for underestimation of time while working on a task. Greenberg and Kurz (1968) found that men under failure reduced their estimates of the passage of time significantly more than men in a condition of "pacing." Schiff and Taylor (1968) found that the condition of waiting for an event lengthens time judgments. However, a task which is dangerous resulted in a shorter estimation than tasks that were not dangerous (Langner, Wapner & Werner, 1961). As Fraisse (1963, p. 220) points out, it is our motivation which modifies subjective evaluations. When motivation is slight, attention is disturbed by outside incidents or by chance thoughts; however, when motivation is strong, the task becomes of immediate significance, and the passing of time is not of immediate importance. In this regard, some earlier findings have suggested that, generally, stress, unpleasantness

of circumstances, high motivation, and high abnormality are positively associated with overestimation of time intervals (Cutler, 1952; Gulliksen, 1927; Lhanon & Goldstone, 1956; Solomon, 1957; Filer & Meals, 1949; Burton, 1943, Schonbach, 1959). Irwin (1961) indicated that the more the S desired that an interval of time pass rapidly, the longer it will appear to be. Research by Hindle (1951) and Meade (1959, 1960a, 1960b, 1966) showed that the further the goal the greater the S's estimation of the elapsed time. In line with this is the cultural adage that time passes more swiftly when one is busy, although there is some doubt whether the activity level or the importance of time for the S is the crucial variable determining the subjective speed of time (Wallach & Green, 1961; Grossman & Hallenbeck, 1965). Meade's (1960ab) findings indicated that Ss who could foresee success estimated durations lower than Ss who had no indication of success and failure. Sattler (1965) also found that Ss with knowledge of their achievement gave higher estimates of time intervals than Ss without knowledge of their achievement on an examination paper.

A number of other studies have reported associations between time perception and temperament traits. Orme (1964) conducted a study using a clinical population. His results indicated that manic, psychopathic, and hysteric groups gave relatively large estimates but that anxiety states, neurotic depressives and melancholics tend to give relatively small estimates. Whyman and Moos (1967) found that clinical Ss with high anxiety demonstrated more distortions of time perception than patients with low anxiety. They stated that high anxiety Ss have a

faster internal tempo or a slower internal tempo (curvilinear) than low anxious Ss whose tempo is not as variant. High anxious Ss are thought to rely on internal stimuli more so than external stimuli as cues in estimating objective time, causing inaccuracy of estimates (Melges & Fougrousse, 1966). As Orme (1964) hypothesizes, if an individual's inner time units are relatively large, relatively small verbal estimates are likely to occur. If hysterics, psychopaths, and manics are characterized by small inner time units, this might explain quickness, shallowness, inability to plan effectively, in that they reach the end point in certain processes more quickly than controls (Orme, 1964).

Campos (1966) reported that high retentive Ss overestimated a duration of a task compared with low retentive personalities. Kahn (1966) found that overestimation of intervals was associated with low organization and underestimation with high organization.

Spreen (1963) conducted a factor analysis study on the relationship of "personality" variables to time estimation. Whereas Loehlin's (1956) study did not find any clear relationship between time estimation and "personality" variables in a similar study, Spreen found a slight relationship. Two estimates of time intervals, operational estimation of a ten second period, and verbal estimates of periods of ten and sixty seconds tapping, were used. The findings of this study indicate that the more correct time estimation correlates positively with intelligence test scores. Operational time estimation loaded on an intelligence factor, and verbal estimation of working time was found to load on an intelligence factor, on a mania-depressive factor, and on two other

performance factors. However, the two time estimation methods did not form a factor by themselves, nor did they load on the same factor. They were distributed over four of the sixteen factors. This is consistent with Loehlin's (1956) findings. The loading of verbal estimation of working time on the mania-depressive factor suggests that Ss on the extroverted-manic end of the dimension tended to make more correct estimates on the sixty second period, whereas Ss on the introversive-depressive end tended to overestimate. This is consistent with Mezey and Cohen (1961) and Solomon (1960) who had similar findings.

Some studies have indicated a relationship between extraversion - introversion (E-I) and time perception. Claridge (1960) found that extraverts in a psychiatric sample showed a greater tendency than introverts toward negative time errors (shorter reproduction than the standard) when reproducing short intervals of time. An independent study by Eysenck (1959) had produced similar findings. Spreen (1963) reported studies which have found that, as mentioned, introverted Ss tend to overestimate. In the Eysenck and Claridge studies, the S was given one trial of reproduction only, of various short intervals (ten to fifteen seconds). However, using the same one trial method of reproduction, Du Preez (1964, 1967) found conflicting (albeit tenable) results, wherein extraverts showed a greater tendency toward positive time error. In another study, Lynn (1961) found no significant differences on the first trial. However, using a technique developed by Llewellyn-Thomas (1959), Lynn extended his reproduction series to ten trials, and found significant differences on the eighth, ninth, and tenth trials. This was con-

sistent with Eysenck's (1959) and Claridge's (1960) findings, but only when taken beyond seven trials, at which point Lynn found that the introverts over-reproduced the interval, and the extraverts under-reproduced the interval. On the early trials, both extraverts and introverts under-reproduced, a finding consistent with general tendency reported elsewhere (Falk & Bindra, 1954; Robinson, 1963). The Llewellyn-Thomas technique is a positive feedback method whereby these errors can be maximized by simplifying S's error in reproduction, which is usually small and variable. This is accomplished by presenting the S's judgment of the previous trial. This becomes the standard for each successive trial, so that any tendency to err becomes cumulative. This was so in the Lynn study, where the differences began to emerge on the sixth trial and increased with each until the tenth (the terminal trial), having reached significance at the eighth. This finding clarified the inconsistent and conflicting results of previous studies. Further support is provided by Robinson (1963) who found that, over six blocks of five trials each of productions (not reproductions) the mean time estimations increased with number of blocks, especially beyond the tenth trial, when no knowledge of results is given to the S. However, White (1964) proposed that the increase or decrease in successive reproductions of time intervals when the judgments were used as the standards for each succeeding trial are based on differences in curve form which were an artifact of the plotting data. She also noted that the Ss showed judgment drifts, the tendency to give successively longer judgments as a function of repeated estimates.

Temporal Experience

Some researchers have integrated and incorporated various methods and aspects of time into one study. Some findings, hence, have indicated relationships between FTP and time perception. Zelkind and Spilka (1965) found that time perception overestimation is associated with positive and favorable future views. According to the authors, the overestimator looks to the future as a "better time", one which stretches out without a sharply defined end. Siegman (1961) and Geiwitz (1965) found a positive correlation between the range of S's FTP and the speed of S's internal clock as measured by a time estimation task. However, Siegman's results contradict those of Lessing (1968) in that there is no significant correlation between general intelligence and FTP. Siegman's results are consistent with the hypothesis that the range of the person's FTP is one of the variables which determines the speed of a person's internal clock, and consequently, his duration. The greater the FTP, the faster was the internal clock.

Zurcher et al (1967) found that subjects high in dogmatism and future orientation have greater variability of estimates, but tend to underestimate to a greater degree, than Ss low in dogmatism and future orientation.

Results obtained in the above study, and by Rokeach and Bonier (1960) and Roberts and Hermann (1961) have been interpreted, not in terms of a "faster internal clock" but in terms of a general disturbance of time perception, perhaps linked with anxiety, that stimulates some individuals scoring high on dogmatism and future orientation to

underestimate, the duration. (Zurcher et al, 1967).

Purpose of the Present Study

Research and discussions of individual differences in temperament has usually centred on commonly accepted variables such as need achievement, extraversion-introversion, manifest anxiety, dogmatism, and others. Temporal orientation has generally not been regarded as a "personality" variable, in and of itself, and has played only a small part in the findings regarding so-called "personality" traits. One reason for this is the diversity of temporal experiences available for research. It is the purpose of this study to attempt to derive the common components of the various temporal experiences in order to facilitate research on temporal experience as a "personality" variable, by reducing the number of temporal experiences available for study without losing too much information.

Studies have been done, some of which have been reviewed here, relating time perception, time perspective, and the time concept. Also, studies have been done which have obtained various factors within one aspect of temporal experience. Other studies have compared individual differences with one aspect of temporal differences. The findings of these studies lead to the hypothesis that a relationship does exist between the "internal clock" and other "personality" variables; between methods and measurements of the "objective" viewpoint, methods and measurements of the "subjective" viewpoint, and other methods and measurements of various variables of individual differences. No real attempt has been made to investigate the relationships among the

variables, or to relate the measures to any theoretical formulation. To understand better the relationships among the various conceptualizations and measurements of temporal experience, a more systematic analysis of these relationships is needed. It was the primary purpose of this thesis to carry out this analysis via a principal components method of factor analysis. The covariations among the measures of temporal experience, temperament and motivation will be studied so that:

- (a) the diversity of aspects and measurements of the temporal orientation phenomena can be narrowed down to the smallest set of commonalities; and
- (b) the relationships between the measures of temporal experience and the measures of temperament and motivation can be investigated.

Statement of the Problem

On the basis of previous findings, which suggested interrelationships among various measures of the temporal phenomena and between these measures and other measures of individual differences, a set of variables was compiled which included the temperamental variables of extraversion-introversion, the motivational variables of need achievement and manifest anxiety, the socio-economic variable of social class, and a variable comprised of a scale rating "interesting-boring." Also, a number of various measurements of time, that is, temporal orientation, was included. By factor analysis of the variables, it was the principal concern of the experiment to "resolve the set of variables...in terms of

a small number of categories or "factors"...which convey all the essential information of the original set of variables." (Harman, 1960, p. 4).

CHAPTER II

METHOD

Subjects: Ninety-six males were selected at random from those introductory psychology sections which had completed the R, S, and T scales of the Guilford-Zimmerman Temperament Survey (GZTS), and the Manifest Scale (MAS). Predominantly, the Ss were first-year students.

Permutations: The first half of the experiment consisted of four parts, Part A, Part B, Part C, and Part D. In order to control for the serial position effect, the fatigue effect, the time of day effect (as reported by Thor, 1962), and other extraneous variables, these parts were counter-balanced and arranged into 24 permutations (ABCD, ABDC, ... DCBA). One permutation was administered, on a random basis, to each of four Ss, so that 96 Ss received 24 permutations. The tests which constituted the various parts are enumerated below, and presented in the appendices.

Measuring Instruments. The following apparatus and measuring instruments, as reviewed in the introduction, were employed:

Part A. The psychophysical apparatus. (Appendices C and D). The psychophysical apparatus (see Fig. 1) was employed to facilitate reproduction of short, sound-filled intervals. A muffled buzzer was used as the sound stimulus for time reproduction. This buzzer, composed of a metal armature and an electromagnet, was completely enclosed in a metal capsule which, in turn, was enclosed in a small wooden box. The buzzer was screwed tightly to the floor of the wooden box, and the metal capsule was placed over the buzzer and screwed onto the bottom of

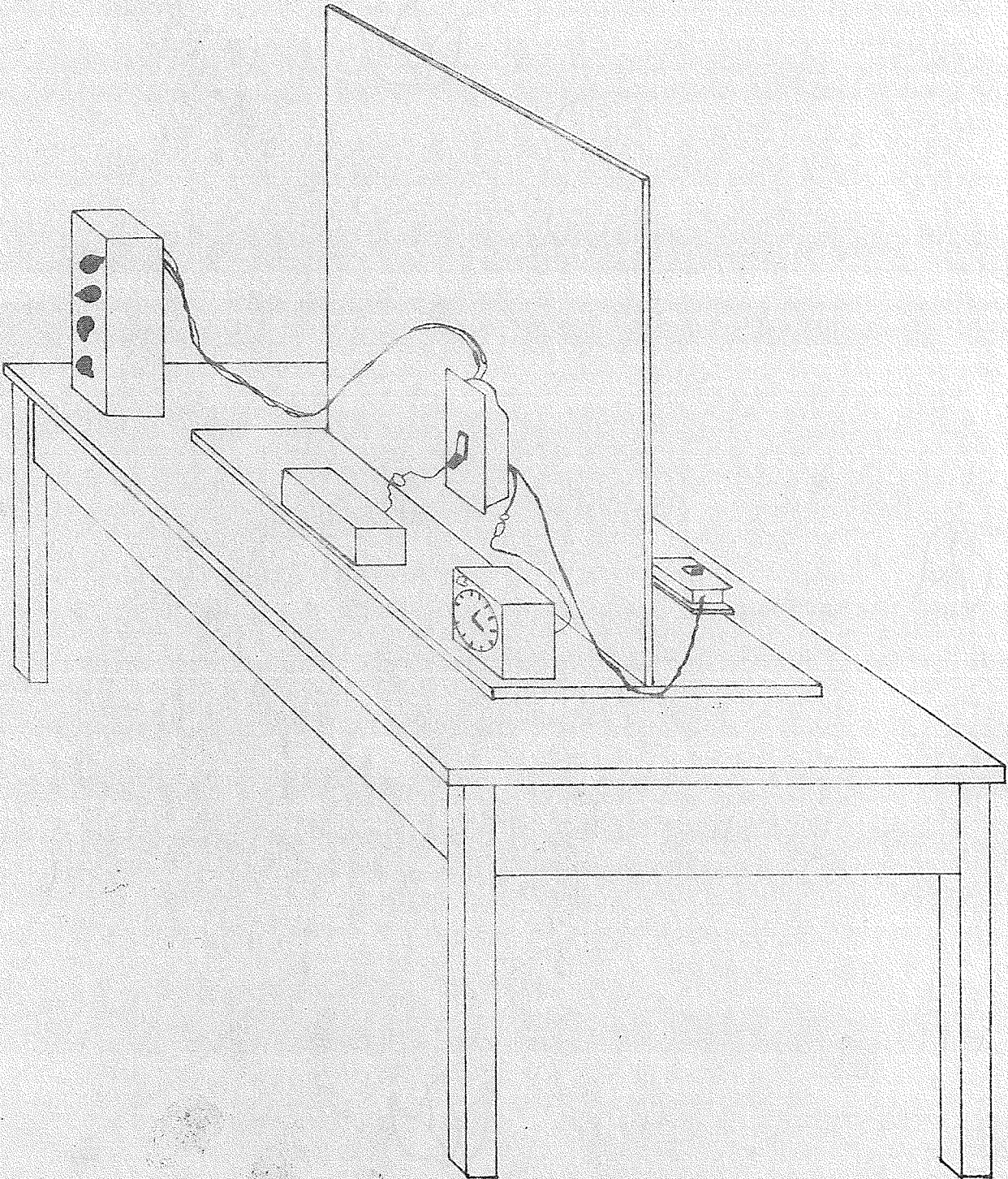


Figure 1. Psychophysical apparatus

the box. The box was screwed tightly to the platform of the apparatus, in order to reduce vibrating noise. The box was lined with sound resistant material. A cover was screwed tightly to the top of the box. The buzzer produced a constant, low and distinct buzz. S and E were seated at a table and separated by a wooden screen. A regular household switch was provided for S and for E so that onset and cessation of the sound occurred when S or E closed or opened the switch. On E's side, the switch was connected to the buzzer, to an automatic Clockcounter, and to a standard Electric Timer. The Clockcounter, which was provided to ensure an accurate standard stimulus, automatically shut off the buzzer after the duration of the time period desired by E. (The Clockcounter reading was not accurate unless a constant was added. For example, a constant of 1.8 seconds, added to 15 seconds, that is, a setting of 16.8 seconds, was necessary to produce a 15 second standard). It was situated to the left of the buzzer, so that its rear portion was visible to the S. The buzzer, inside the wooden box, which was not visible to S, was placed next to the Clockcounter and behind the screen. A switch was placed on the screen in a vertical position, and an electric Timer, also behind the screen, was used to measure the S's reproduction. On S's side of the screen, the switch was presented, placed horizontally and laterally, on the platform in front of the screen.

(1) Reproduction of a standard stimulus. This consisted of ten trials of reproduction of a constant sound stimulus of 15 seconds. This standard duration was presented by E as the stimulus on each trial and

the same duration was reproduced by S, as closely as possible, by using the switch and buzzer. The duration between trials was two to five seconds. The subject was naive; he was not informed of the duration of the stimulus sound at any time, nor was he informed of his performance accuracy or error in reproduction of the interval (unless requested at the end of the entire experiment).

(2) Reproduction of successive feedbacks. This consisted of ten trials of the positive feedback method. On the first trial, the sound stimulus which was presented to S was of 15 seconds duration. Thereafter, the stimulus standard on each trial was the same duration as the reproduction judgment made by S on the previous trial. The other conditions were identical to (1). By using this method, S's error (underestimation or overestimation) was magnified.

Parts (1) and (2) were counterbalanced, so that half of the Ss received (1) before (2) and half received (2) before (1). For all trials, the S's reproduction time, as indicated by the standard timer, the Clockcounter reading, and the actual stimulus interval, were recorded. S's score was the time of his reproduction as indicated by the timer.

Part B. The Story Completion test. (Appendices E and F). This test was employed in order to evaluate length of future time perspective (FTP). In all cases, story completion items were given verbally to the S, and he was asked to elaborate upon and complete a story stem verbally. The measure used was that of extension, that is, the length of the time span which was conceptualized by S in the events of his story. Four

story-telling items were presented to the S. Different degrees of ambiguity existed. The first two stories presented structured situations and the second two story stems presented unstructured situations. In the structured stories, temporal situations are presented, whereas in the unstructured stories, the situation contains no reference to time.

(1) Structured stories. This item was one in which E presented two temporally structured but ambiguous story stems which the S was asked to complete, after the stories were presented by E. The stories were as follows:

"I want to see what kind of a story you can tell. I'll start one for you, and then let you finish it any way you wish. I'll start it now. 'At 3 o'clock one bright sunny afternoon in May, two men were walking near the edge of town...' Now you start there and finish the story for me." (Barndt & Johnson, 1955).

"Now I'll begin another story for you which, as before, you may finish any way you want to. Here it is: 'At 10 o'clock one morning Al met his friend Jerry near the center of town...' Now you start there and finish it for me." (Wallace, 1956).

(2) Unstructured stories. This item was one in which E presented two unstructured and ambiguous stories, without any specific temporal references, for S to complete, after the stories were started by E. The stories were as follows:

"Now here is the start of another story which you may again finish in any way you wish: 'Joe is having a cup of coffee in a restaurant. He's thinking of the time to come when...' Now you start there and finish it for me."

"Here is the last story. I want you to finish it any way you wish, just like you did the other stories. Here is is: 'After awakening, Bill began to think about his future. In general, he expected to...' Now you start there and finish it for me."

If no reference to the interval of time involved in the story

was involved, the S was asked, after completion of all four stories, "How long a time was involved in this story, not in telling it, but in the action described?" S's score was his estimated time length of action that was involved in the story, in appropriate time units.

Parts (1) and (2) were not counterbalanced -- all Ss received structured stories first, and unstructured stories next.

Part C. The Time Metaphor Test. (Appendices G and H). This test was one in which words or phrases which have some symbolic allusion to time were presented to the S for evaluation. This test consists of 25 phrases, or metaphors representative of time. This test was used as a measure of "time imagery" in which preference was made for metaphors involving swift movement, or for metaphors involving slow, static movement. These metaphors, or images, were described by the authors (Knapp & Garbutt, 1958) as "controversial", although they were not used if pre-rated as extremely appropriate and extremely inappropriate in the original study. Knapp and Garbutt found that the 25 metaphors formed a pattern of three clusters. The metaphors, and the clusters into which they fall, are presented here:

"Dynamic-hasty" cluster:

- a dashing waterfall
- a speeding train
- a fast-moving shuttle
- a galloping horseman
- a fleeing thief
- a space ship in flight
- a whirligig

"Naturalistic-passive" cluster:

- a vast expanse of sky
- a quiet, motionless ocean
- a road leading over a hill

drifting clouds
 wind-driven sands
 the Rock of Gibraltar
 budding leaves

"Humanistic" cluster:
 a string of beads
 a winding spool
 a burning candle
 an old woman spinning
 an old man with a staff
 a devouring monster
 a tedious song
 a large revolving wheel

Three metaphors do not fall into any identifiable cluster:
 a bird in flight
 marching feet
 a stairway leading upward

These metaphors were typed, in lower case letters, centred on a white, 3" x 5" filing card, one to a card. The 25 cards were shuffled and presented to the S in a random order. Instructions were given to the S to evaluate these metaphors "for their capacity to evoke for you an effective image of the nature of time" (Knapp & Lapuc, 1965). A seven-point Q-sort (with the frequency 1, 3, 5, 7, 5, 3, 1) was employed for rating of the metaphors.

A form board was used for the Q-sort procedure (see Fig. 2). This form board was fabricated of plywood. It was approximately 24" x 8". On one side of the board, seven "boxes", that is, rectangles, were painted. The cards were placed into these boxes by the S in the process of sorting. Each rectangle was 3" x 5", the size of the card. The continuum 1 to 7 was represented by the words "Box 1", "Box 2", ... "Box 7", which were painted inside the rectangles. Above the rectangles were painted the numbers 1, 3, 5, 7, 5, 3, 1 as an indication of the

number of cards to be placed into each "box." Under the figure 1 above Box 1 was printed "least effective" and under the figure 1 above Box 7 was printed "most effective."

S's score was derived by subtracting the sum of the numbers of the boxes into which the seven "passive-naturalistic" metaphors were placed from the sum of the numbers of the boxes into which the seven "dynamic-hasty" metaphors were placed. The "humanistic" metaphors and the three unidentifiable metaphors did not enter into the data analysis.

Part D. Various paper-and-pencil tests and questionnaires.

(1) The semantic differential. (Appendices I and J). This scale was used to measure the connotative meaning of time, along thirteen seven-point, opposite-adjective scales. The S was asked to judge time on each of these scales in response to the statement "I consider time to be..." The direction of the continuum toward which S placed an "X" was regarded to be indicative of his judgment of time for that adjectival polarity. The paired-adjective continua were arranged so that each pair was separated by a seven-point scale, with intermediary points from one extreme to the other. The scales which were used are as follows: active-passive; empty-full; young-old; soothing-irritating; dull-sharp; happy-sad; clear-hazy; cold-warm; bad-good; fast-slow; shallow-deep; strong-weak; tense-relaxed. Three of the opposite-adjective pairs (active-passive, bad-good, and strong-weak), represented the three factors of Activity, Evaluation, and Potency obtained by Osgood, Suci and Tannenbaum (1957). The polarities have been revised slightly from the original study by

1 LEAST EFFECTIVE	3	5	7	5	3	1 MOST EFFECTIVE
BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7

Figure 2. Form Board for Q-Sort Procedure

Knapp and Garbutt (1965) in which they were first employed. Also, the ends of the continua had been counterbalanced according to the results of a pilot study which was conducted on graduate students in psychology at the University of Manitoba. This was done in order to minimize possible response bias which might occur if there exists a tendency to respond to one side of the continuum. These thirteen scales were presented on a regular 8½" x 11" sheet. A digit was assigned to each of the seven points of each scale, from 1 to 7 or from 7 to 1, so that the S's score on a particular scale is the digit corresponding to the scale position he checked. Counterbalancing was used, in order to reduce bias from the serial position effect. This was done in the following manner: The thirteen scales were divided into three sections. The first four polarities in the above list, the next five, and the final four formed three separate sections, each of which included one of Osgood's basic three factors. These three sections were counterbalanced, so that one of six permutations (abc, acb, ... cba) was administered to 16 Ss on a random basis. This was done independently of the other tests of the experiment.

(2) Non-Personal Past-Future test. (Appendix K). This questionnaire, which was constructed by Thor (1962), was used to measure both impersonal, or non-personal, past and future time perspective. The questionnaire contained twenty items all of which are fairly ambiguous (that is, no specific answer is immediately available). Some of the items had been revised to accommodate Canadians. Ten of the items re-

late to non-personal historical events, and ten relate to non-personal future events. For the 'past' items, the S was required to estimate how many years ago an event occurred, and for the 'future' items the S was required to estimate how far into the future the events will occur.

The items are as follows:

past items	Discovery of penicillin
	First observance of Mother's Day
	First atomic explosion
	Einstein's introduction of the theory of relativity
	Conquest of Montreal by the English
	Invention of the telephone
	Completion of the Panama Canal
	Harvey's discovery of the circulation of blood
	Mussolini's founding of the Italian Fascist Party
	First expedition to the North Pole
future items	Man on the moon
	A cure for cancer
	Irrigation of the Sahara Desert
	Average human life span reaches 80 years
	Automobiles run by atomic power
	Population of Canada reaches 30 million
	Population of Canada reaches 100 million
	End of Cold War
	Average working week reaches 20 hours
	When you will have attained most of the things you want

(3) Personal Events test. (Appendix L). This item was an extension test of future events in one's lifetime (Wallace, 1956). The S was instructed to "tell me ten events that refer to things that may happen to you during the rest of your life." After the ten responses were given, verbally, the S was asked what his age might be at the time of each event. The measure of extension was the range of years included between S's actual age and the most distant age given by him. Also, a measure of the range of years included was between S's actual age and the mean

age of the ten ages given by the S for the ten events. Each event was recorded verbatim, with the age.

(4) Immediate-Delay Gratification Scale. (Appendix M). This scale was constructed by the present author for this study. On the basis of items used in previous studies of delayed gratification (Mischel, 1961a, 1961b; Fraisse, 1963, p. 176), nine items were formulated. They were constructed so that the S was required to state the maximum period of time he would wait to receive an amount of money (\$1000, \$500, or \$100) in preference to receiving a smaller amount of money (\$50, \$10, or \$1) immediately. These values were arranged into nine different pairings of the larger three amounts with the smaller three amounts. The test was verbal. The order of the nine items was consistent across Ss; they were not counterbalanced.

Parts (1), (2), (3), and (4) of Part D were counterbalanced, in that one of 24 permutations (1234, 1243, ... 4321) was administered to each of four Ss on a random basis. The counterbalancing was independent of the other Parts of the experiment.

Other tests constituted the second half of the experiment, and were not included in the permutations.

Paper-and-pencil tests. A number of self-report inventories were completed by the S. These are paper-and-pencil tests which were given to the S in order to measure differences on some dimensions of future time perspective, as well as differences in extraversion-introversion, need for achievement, and manifest anxiety.

(1) Future time perspective attitude inventory. (Appendix P).

This inventory, which was devised by Hooper (1962) on the basis of the findings in Kastenbaum's (1961) study, was employed. This inventory incorporated five scales of FTP dimensions. Each scale contained twenty items, and the items from all five scales were randomly intermixed into an 100 item questionnaire. The inventory was arranged so that for each item, five degrees of agreement were provided, in response to the stimulus "Future time for me is perceived as..." This five-point scale ranged from "not at all" to "very much." The five scales of FTP which were incorporated into the inventory are:

- future time extension -- designed to assess S's attitude toward the duration and range of the foreseeable future, a high score denotes a long range view which is regarded as a positive tendency.
- future time density -- a high score on this scale indicates the degree to which the future is seen as eventful, productive, active and hence positive.
- future time directionality -- a high score suggests that the future is viewed as possessing direction and purposefulness and is thus positive.
- future time coherence -- the future's organization, predictability, and controlability are assessed here with a high score suggesting these positive qualities.
- future time valence -- a high score denotes that S is both positive and willing to move into the future.

(2) The Guilford-Zimmerman Temperament Survey (GZTS); Factors R, S, T. This inventory contained ninety items used to measure Restraint vs. Rhathymia (Factor R); Sociability (Factor S); and Thoughtfulness (Factor T). These factors, as stated by Guilford (1959, p. 183), may be regarded as three varieties of extraversion-introversion. Scoring keys were changed where necessary, so that a high score on all three scales indicated extraversion, and a low score indicated introversion.

This inventory was administered, during a regular session of introductory psychology, to three randomly selected sections of males and females. This administration was approximately four weeks prior to the testing period. Three scores were obtained for each S on the E-I dimension, i.e., R, S, and T.

(3) The California Psychology Inventory. (Appendix Q). This inventory was employed to measure two aspects of nAch. Two scales were administered, during the second half of the experiment; the Ac (nAch via conformance) and the Ai (nAch via independence) scales. The Ac scale contains 38 items and purports "to identify those factors of interest and motivation which facilitate achievement in any setting where conformance is a positive behavior. Its trait equivalent is adaptive achievement -- indicating someone with a strong need for achievement, and who is at his best in situations having definite rules and structures." The Ai scale contains 32 items and purports "to identify those factors of interest and motivation which facilitate achievement in any setting where autonomy and independence are positive behaviors. Its trait equivalent is independent achievement -- indicating the kind of person who has a strong need for achievement, and who is at his best where he must work on his own and without external guidance." (Gough, 1957). One score was obtained for each S on each dimension of nAch: Ai and Ac.

(4) The Manifest Anxiety Scale. This scale contains 50 items from the Minnesota Multiphasic Personality Inventory (Taylor, 1951; 1953) which were used to measure manifest anxiety. The definition of the variable is "the presence of persistently heightened skeletal and

visceral tensions, which disturb a person's habitual rhythms of living and predispose him generally to give exaggerated and inappropriate responses on relatively slight provocation (Cameron, 1947, in Byrne, 1966, p. 351). The administration of this test was approximately four weeks prior to the testing period. One score was obtained for each S.

(5) Miscellaneous tests.

(5a) A scale to measure the interest in the experiment was given to the S. (Appendix O). This was a 25-point scale, ranging from most interesting to most boring. The scale consisted of 25 typewritten periods, as follows:

most most
interesting boring

The S's score was determined on the basis of the period he circled. His score is the digit, from 1 to 25, corresponding to the period he circled.

(5b) A forced choice questionnaire was administered to each S to measure his social class. (Appendix O). He was asked to indicate whether his father was a blue collar worker or a white collar worker.

(5c) A questionnaire designed to estimate the duration of the experiment was administered to each S at the completion of the first half. (Appendix N). The actual duration was obtained from a wrist watch, and compared with S's estimate. The absolute error, that is, the actual estimate minus the actual duration, is regarded as S's score.

Procedure. At the beginning of each experimental session, the S was informed, in instructions read aloud by E, (Appendix B) that he was taking part in an experiment designed to study the "psychology of time."

The full cooperation of all Ss was elicited when it was known, albeit vaguely, what the purpose of the experiment was. In addition, the S was asked to remove his watch on this basis. This was done, of course, in order that the interval reproduction and the duration estimation tests be valid.

The 24 permutations (ABCD, ABDC ... DCBA) were listed in random order prior to the beginning of the testing. (Appendix A). Each permutation was included four times. Each S was assigned to a permutation on the basis of this random order. The first S to be tested received the permutation which was listed first in the random order, the second S received the permutation which was listed second, and so on, until the 96th S received the permutation which was listed 96th. Included in each permutation were the 24 permutations for Part D, the 6 permutations for Part D (1), and the two parts, (1) and (2), of Part A. For example, the 60th S received the permutation which was listed 60th, B D (2) (1d) (3) (4) C A (2). This indicates that (for the first half of the experiment) this S received Part B, the Story Completion Test, first. Secondly, he received Part D, in the following order: (2) The Non-Personal Past-Future test, (1 d) Permutation d (cab) of the Semantic Differential test, (3) the Personal Events test, and (4) the Delayed Gratification test. Thirdly, he received Part C, the Time Metaphor test. Fourthly, he received Part A, the reproduction test, but received the positive feedback reproduction series of trials (2) before the standard series (1).

For the second half of the experiment, each S received the following tests, in constant order: First, the estimation of duration question-

naire was administered, in which he was asked to estimate the length of the first half of the experiment. His watch was then returned to him. Next, the S was taken to another room and administered the FTP attitude inventory, and the Ac and Ai scales for need achievement from the California Personality Inventory. When the S had finished these, he was given the boring-interesting questionnaire, and the social class questionnaire. The Guilford-Zimmerman Temperament Survey and the Manifest Anxiety Scale had been administered four weeks previously, as part of class participation.

Variables and Scoring. The forty-seven variables and the methods of scoring for each are summarized below:

- Variable 1. R Scale of Guilford-Zimmerman Temperament Survey
(Rhythymia vs. Restraint)
Raw score, scored on IBM computer.
High score - rathymia
- Variable 2. S Scale of Guilford-Zimmerman Temperament Survey
(Sociability)
Raw score, scored on IBM computer.
High score - sociability
- Variable 3. T Scale of Guilford-Zimmerman Temperament Survey
(Thoughtfulness)
Raw score, scored on IBM computer
High score - thoughtlessness
- Variable 4. Ac Scale of California Personality Inventory
(Achievement via conformance)
Raw score, scored on IBM computer
High score - high need achievement via conformance
- Variable 5. Ai Scale of California Personality Inventory
(Achievement via independence)
Raw score, scored on IBM computer
High score - high need achievement via independence

- Variable 6. Manifest Anxiety Scale
Raw score, scored on IBM computer
High score - high manifest anxiety
- Variable 7. Extension scale of Inventory of attitudes toward future time
Raw score, scored on IBM computer
High score - high extension of FTP
- Variable 8. Density scale of Inventory of attitudes toward future time
Raw score, scored on IBM computer
High score - high density of FTP
- Variable 9. Directionality scale of Inventory of attitudes toward future time
Raw score, scored on IBM computer
High score - high directionality of FTP
- Variable 10. Coherence scale of Inventory of attitudes toward future time
Raw score, scored on IBM computer
High score - high coherence of FTP
- Variable 11. Valence scale of Inventory of attitudes toward future time
Raw score, scored on IBM computer
High score - high valence of FTP
- Variable 12. Estimation of duration of first half of experiment
Estimation of duration minus actual duration, plus constant to eliminate negative scores (K = 36)
High score - overestimation of duration
- Variable 13. Boring-Interesting Scale for Rating of Experiment
(25 point scale from "very interesting" to "very boring")
A digit was assigned, in ascending order, from 1 to 25, to each of the 25 points, so that the raw score is the digit corresponding to the scale position circled.
To correct for positive skewness, the raw scores were scaled as follows:
Raw score -- 1, 2 Scaled score -- 1.
Raw score -- 3, 4 Scaled score -- 2.
Raw score -- 5, 6, 7 Scaled score -- 3.
Raw score -- 8, 9, 10 Scaled score -- 4.
Raw score -- 11-16 incl. ... Scaled score -- 5.
Raw score -- 17-25 incl. ... Scaled score -- 6.
High scaled score - boredom

- Variable 14. Social Class Rating
 1 -- White-collar class
 2 -- Blue-collar class
- Variable 15. Time Metaphor Test
 (Seven-point Q-sort)
 Sum of box numbers into which seven "fast" metaphors were placed minus sum of box numbers into which seven "slow" metaphors were placed, plus constant which was added to eliminate negative scores. (K = 22)
 High score - preference for fast metaphors
- Variable 16. Active-passive opposite-adjective polarity
 (semantic differential)
 (Seven point scale from "passive" to "active")
 A digit was assigned, in ascending order, from 1 to 7, to each of the seven points, so that the score is the digit corresponding to the scale position circled.
 High score - "active"
- Variable 17. Empty-full opposite-adjective polarity
 (semantic differential)
 (Seven point scale from "empty" to "full")
 Scoring same as for variable 16
 High score - "full"
- Variable 18. Young-old opposite-adjective polarity
 (semantic differential)
 (Seven point scale from "old" to "young")
 Scoring same as for variable 16
 High score - "young"
- Variable 19. Soothing-irritating opposite-adjective polarity
 (semantic differential)
 (Seven point scale from "soothing" to "irritating")
 Scoring same as for variable 16
 High score - "irritating"
- Variable 20. Dull-sharp opposite-adjective polarity
 (semantic differential)
 (Seven point scale from "dull" to "sharp")
 Scoring same as for variable 16
 High score - "sharp"
- Variable 21. Happy-sad opposite-adjective polarity
 (semantic differential)
 (Seven point scale from "sad" to "happy")
 Scoring same as for variable 16
 High score - "happy"

- Variable 22. Clear-hazy opposite-adjective polarity
(semantic differential)
(Seven point scale from "hazy" to "clear")
Scoring same as for variable 16
High score - "clear"
- Variable 23. Cold-warm opposite-adjective polarity
(semantic differential)
(Seven point scale from "cold" to "warm")
Scoring same as for variable 16
High score - "warm"
- Variable 24. Bad-good opposite-adjective polarity
(semantic differential)
(Seven point scale from "bad" to "good")
Scoring same as for variable 16
High score - "good"
- Variable 25. Fast-slow opposite-adjective polarity
(semantic differential)
(Seven point scale from "slow" to "fast")
Scoring same as for variable 16
High score - "fast"
- Variable 26. Shallow-deep opposite-adjective polarity
(semantic differential)
(Seven point scale from "deep" to "shallow")
Scoring same as for variable 16
High score - "shallow"
- Variable 27. Strong-weak opposite-adjective polarity
(semantic differential)
(Seven point scale from "weak" to "strong")
Scoring same as for variable 16
High score - "strong"
- Variable 28. Tense-relaxed opposite-adjective polarity
(semantic differential)
(Seven point scale from "relaxed" to "tense")
Scoring same as for variable 16
High score - "tense"
- Variable 29. Immediate-delay scale
Sum of ranks of individual item raw scores across Ss
of nine items of this scale
High score - preference for delayed reward

- Variable 30. Non-personal past scale
Sum of ranks of individual item raw scores across Ss
of ten items of this scale
High score - high past perspective (non-personal)
- Variable 31. Non-personal future scale
Sum of ranks of individual item raw scores across Ss
of ten items of this scale
High score - high future perspective (non-personal)
- Variable 32. Personal Events Test (mean age)
Difference between mean age which was given for the
ages at occurrence of ten future events and present
age to nearest birthday.
High score - high future perspective (personal)
- Variable 33. Personal Events Test (distant age)
Difference between most distant age of ages given at
the occurrence of ten future items and present age
to nearest birthday
High score - high future perspective (personal)
- Variable 34. High structure story stem of Story Completion Test
Sum of ranks of individual item scores of time span
covered in a high structure story, for two stories
High score - high time span
- Variable 35. Low structure story stem of Story Completion Test
Sum of ranks of individual item scores of time span
covered in a low structure story, for two stories
High score - high time span
- Variable 36. Total Absolute Standard Reproduction
Sum of scores of ten trials of reproduction of a 15
second interval for each trial
High score - over-reproduction
- Variable 37. Total Absolute Feedback Reproduction
Sum of scores of ten trials of reproduction of a 15
second interval for the first trial and of an interval
equal to the reproduction on the previous trial for
the following nine trials
High score - over-reproduction
- Variable 38. Trial one and two of standard reproduction series
Average reproduction score (mean) for combination of
two trials, divided by standard stimulus of fifteen
seconds, so that

Score greater than one - over-reproduction
 Score equal to one - exact reproduction
 Score smaller than one - under-reproduction

- Variable 39. Trial three and four of standard reproduction series
 Scoring identical to variable 38
- Variable 40. Trial five and six of standard reproduction series
 Scoring identical to variable 38.
- Variable 41. Trial seven and eight of standard reproduction series
 Scoring identical to variable 38.
- Variable 42. Trial nine and ten of standard reproduction series
 Scoring identical to variable 38
- Variable 43. Trial one and two of feedback reproduction series
 Average reproduction score (mean) for the combination
 of two trials, divided by the mean standard stimulus
 for the two trials, so that
 Score greater than one - over-reproduction
 Score equal to one - exact reproduction
 Score smaller than one - under-reproduction
- Variable 44. Trials three and four of feedback reproduction series
 Scoring identical to variable 43
- Variable 45. Trials five and six of feedback reproduction series
 Scoring identical to variable 43
- Variable 46. Trials seven and eight of feedback reproduction series
 Scoring identical to variable 43
- Variable 47. Trials nine and ten of feedback reproduction series
 Scoring identical to variable 43

Data Analysis. Factor analysis was the statistical technique used in determining the interrelationships among the 47 variables which were used to measure temperamental and motivational orientation, of which temporal orientation was focused upon.

Using an IBM 360 computer, the set of data for the 47 variables was subjected to the following analysis: Means and standard

deviations were computed for each of the 47 variables. The scores of all variables were intercorrelated, and the resulting 47 x 47 correlational matrix was factor analyzed using Hotelling's (1933) principal components method with unity in the diagonals. The purpose of this procedure was to establish the number of significant factors according to Kaiser's (1960) criterion of retaining those factors with eigenvalues of one or greater. To obtain relatively independent factors, Kaiser's normal varimax method (1958) was used to rotate the obtained principal components factor matrix. The varimax solution ensures independent factors. In addition to this orthogonal solution, an oblique solution was derived using the promax rotation method (Hendrickson & White, 1964). The significant factors were then interpreted according to those variables which loaded highly on each factor.

CHAPTER III

RESULTS

First-Order Factor Analysis

The means, standard deviations, and communalities for each variable are presented in Table I, which also shows the intercorrelation matrix. Most of the inter-test correlations were small, having a range between $-.20$ and $.20$. The higher correlations were, generally, test-specific; that is, they were between tests which measure similar aspects of behavior. For example, the psychophysical tests, which involved reproduction of a standard interval of sound, had the highest intercorrelations. Also, tests which differentially measure one trait, such as the three tests which measure extraversion-introversion, or the five tests which measure attitudes toward future, had relatively high correlations. Generally, all variables had good distribution characteristics.

Tables II and III present the results of the factor analysis. The 47-variable inter-correlational matrix was factored by Hotelling's principle components method (Table II), with rotation to the varimax criterion so that an orthogonal solution was obtained. The oblique solution which was derived using the promax rotation method on the varimax solution was raised to the eighth power, to give the loadings added strength. This constitutes Table III. The factor structure shows that 15 first-order factors were retained after rotation. They are presented below, with an interpretation and description of each, and summarized in Table IV.

TABLE I

Product-Moment Correlational Matrix; Means; Standard Deviations;
of Variables (decimals omitted)

	1	2	3	4	5	6	7	8	9	10
1. GZR										
2. GZS	443									
3. GZT	488	204								
4. Ac	-218	315	096							
5. Ai	-353	-115	-195	346						
6. MAS	-084	-385	-165	-531	-284					
7. Ext	169	-019	150	057	-177	-053				
8. Den	037	-092	054	040	-123	186	174			
9. Dir	007	-143	-125	-052	-075	127	318	389		
10. Coh	078	-040	070	-101	-115	296	350	519	503	
11. Val	177	-086	-001	-103	-256	126	465	312	655	341
12. Dur	-054	109	034	-021	-142	071	158	251	134	235
13. B-I	101	-090	132	-196	011	108	172	-080	069	011
14. SC1	-265	-072	-211	-075	-104	058	032	002	095	171
15. Met	-038	122	123	-076	-048	-010	-229	155	-002	016
16. A-P	082	236	088	052	116	027	-209	-011	-042	-015
17. E-F	021	110	073	-010	172	-148	-053	-053	016	054
18. Y-O	041	264	-001	041	058	001	035	023	-167	-090
19. S-I	-049	-048	046	-052	-050	094	-140	148	-113	014
20. D-S	-307	-081	-201	032	242	177	-208	031	-179	017
21. H-S	211	241	281	099	006	-160	147	106	069	184
22. C-H	153	227	262	-010	024	-192	072	116	-095	147
23. C-W	119	074	119	120	088	-075	231	017	032	056
24. B-G	145	107	226	141	058	-095	024	-031	-109	-050
25. F-S	-054	164	-003	-004	-076	017	-095	030	-018	-015
26. S-D	190	083	095	-125	-173	126	260	075	158	083
27. S-W	-095	106	-155	088	100	-031	-143	041	-005	185
28. T-R	-149	-023	-017	-063	-029	258	-197	175	072	286
29. I-D	-072	-222	-068	051	-065	056	070	174	090	173
30. PIm	015	-095	-073	036	072	105	035	023	026	-039
31. FIm	-012	-007	-085	-070	-133	-035	075	-118	-062	-010
32. PEM	-028	045	-169	085	129	-164	028	-027	142	-005
33. PED	063	123	-100	133	073	-131	031	083	138	014
34. HiS	096	001	-008	-032	010	021	014	060	057	000
35. LoS	103	005	-117	005	-042	020	093	060	197	159
36. TAS	016	019	-073	081	059	-182	191	-044	153	002
37. TAF	123	087	029	037	015	-175	335	015	270	075
38. S12	002	-115	-107	019	075	-028	162	072	256	000
39. S34	-024	017	-096	051	-005	-151	131	-077	107	-037
40. S56	056	028	-001	011	010	-166	232	-027	111	069
41. S78	-009	075	-101	173	126	-197	083	-128	002	-016
42. S90	047	085	007	092	062	-239	190	-033	151	-011
43. F12	164	120	067	012	003	-185	296	-027	123	062
44. F34	086	207	106	213	042	-181	202	022	069	-015
45. F56	-007	-103	088	030	035	012	106	-001	248	206
46. F78	-019	-184	-106	-148	-050	125	-008	023	199	-006
47. F90	191	019	031	-074	-019	-039	109	093	221	133

unity was assumed for the diagonals

$p < .05$; $r = .205$ $p < .01$; $r = .267$

TABLE I
(continued)

	11	12	13	14	15	16	17	18	19	20
1. GZR										
2. GZS										
3. GZT										
4. Ac										
5. Ai										
6. MAS										
7. Ext										
8. Den										
9. Dir										
10. Coh										
11. Val										
12. Dur	140									
13. B-I	049	-083								
14. SC1	125	046	023							
15. Met	-072	142	009	132						
16. A-P	-224	005	103	018	240					
17. E-F	-018	-022	172	158	175	412				
18. Y-O	005	071	006	066	117	222	290			
19. S-I	-079	-054	-028	-023	139	027	-118	-154		
20. D-S	-127	128	-148	133	213	231	070	236	-069	
21. H-S	022	001	021	-019	063	062	295	147	-326	082
22. C-H	-179	203	-033	-148	073	053	067	168	004	-052
23. C-W	138	-136	019	106	-051	087	294	092	-269	064
24. B-G	-137	-060	-058	-198	-080	045	208	000	-278	186
25. F-S	-146	021	035	173	264	351	139	073	-066	199
26. S-D	254	-009	096	063	134	110	069	147	058	-121
27. S-W	-275	116	-079	-034	047	054	-116	-291	-067	173
28. T-R	-033	069	-019	306	315	253	029	-039	345	225
29. I-D	114	078	-077	029	-096	-236	-273	-156	056	033
30. PIm	076	-051	104	-073	006	-038	017	-047	072	-042
31. FIm	-039	-089	002	004	-077	-094	051	-160	005	-009
32. PEM	030	032	-059	044	-069	085	093	042	-120	-059
33. PED	104	254	-008	012	-098	156	131	197	-154	-017
34. HiS	139	-005	045	068	-018	027	167	171	094	-018
35. LoS	195	052	037	-007	-176	-093	085	-016	037	-141
36. TAS	132	-135	185	068	-125	-057	-040	-062	-089	-031
37. TAF	221	-096	166	121	021	-090	-075	104	-104	-087
38. S12	310	-051	198	048	-166	-138	-049	-021	-119	-099
39. S34	041	-186	160	034	-142	-066	-047	-102	-044	-095
40. S56	101	-044	156	086	-006	049	025	-084	-043	-055
41. S78	-005	-227	157	075	-155	-049	-092	-123	-023	-002
42. S90	087	-066	112	026	-043	006	024	073	-136	104
43. F12	127	-053	189	091	008	-004	-046	152	-092	-047
44. F34	020	-049	129	107	-064	-084	-006	019	-042	-142
45. F56	088	-149	-092	115	061	002	-022	-041	-070	036
46. F78	251	-074	058	032	090	-082	-076	059	-072	-044
47. F90	207	162	-049	-004	-092	-150	-142	011	-126	-100

TABLE I
(continued)

	21	22	23	24	25	26	27	28	29	30
1. GZR										
2. GZS										
3. GZT										
4. Ac										
5. Ai										
6. MAS										
7. Ext										
8. Den										
9. Dir										
10. Coh										
11. Val										
12. Dur										
13. B-I										
14. SCl										
15. Met										
16. A-P										
17. E-F										
18. Y-O										
19. S-I										
20. D-S										
21. H-S										
22. C-H	329									
23. C-W	407	-004								
24. B-G	376	120	452							
25. F-S	053	-112	-145	-123						
26. S-D	156	-083	002	-138	059					
27. S-W	073	066	-183	043	227	-338				
28. T-R	-154	-060	-220	-190	281	165	024			
29. I-D	-008	114	-155	037	-170	-134	011	018		
30. PIm	-040	-105	098	025	-005	-083	104	022	064	
31. FIm	-050	-128	-114	-038	340	-150	203	-033	024	054
32. PEM	027	093	-066	-104	140	017	008	-065	-072	098
33. PED	092	039	018	-061	117	042	-024	-097	-049	075
34. HiS	036	099	115	-086	-050	041	-327	-006	090	004
35. LoS	-133	-118	-031	-139	-116	020	-211	-068	116	123
36. TAS	014	-169	099	-028	077	-002	-021	-256	-045	-109
37. TAF	041	008	190	-063	033	058	-088	-222	-132	-102
38. S12	-018	-117	069	-063	-079	116	-140	-174	-031	-119
39. S34	-016	-161	046	-058	120	-034	053	-279	-053	-041
40. S56	040	-111	048	017	134	066	036	-191	-024	-091
41. S78	-034	-229	106	-047	-012	-114	036	-195	025	-067
42. S90	130	-075	158	062	145	008	-054	-234	-103	-091
43. F12	015	019	204	-038	004	049	-066	-140	-145	-080
44. F34	064	-015	011	-037	058	-016	008	-175	-118	-153
45. F56	005	-048	147	107	070	-066	-003	-028	067	097
46. F78	-070	-267	-051	-131	109	056	-067	-104	046	142
47. F90	075	-012	008	-138	-059	107	-064	-277	094	-009

TABLE I
(continued)

	31	32	33	34	35	36	37	38	39	40
1. GZR										
2. GZS										
3. GZT										
4. Ac										
5. Ai										
6. MAS										
7. Ext										
8. Den										
9. Dir										
10. Coh										
11. Val										
12. Dur										
13. B-I										
14. SCl										
15. Met										
16. A-P										
17. E-F										
18. Y-O										
19. S-I										
20. D-S										
21. H-S										
22. C-H										
23. C-W										
24. B-G										
25. F-S										
26. S-D										
27. S-W										
28. T-R										
29. I-D										
30. PIm										
31. FIm										
32. PEM	076									
33. PED	-097	762								
34. HiS	-134	133	106							
35. LoS	113	114	202	322						
36. TAS	084	018	049	049	183					
37. TAF	028	-002	-011	134	230	717				
38. S12	-078	109	127	123	069	736	575			
39. S34	171	046	048	019	185	865	539	572		
40. S56	117	-066	036	-063	164	846	589	459	701	
41. S78	-018	-043	-029	092	209	803	562	459	617	621
42. S90	146	029	019	030	148	837	651	484	664	707
43. F12	-026	-065	-021	080	155	605	869	507	426	495
44. F34	069	-074	-077	162	223	608	709	508	451	475
45. F56	128	085	-067	-024	161	387	493	143	363	309
46. F78	090	064	113	091	242	412	401	331	338	398
47. F90	-005	256	277	082	165	273	339	285	257	196

TABLE I
(continued)

	41	42	43	44	45	46	Mean	Std. Dev.
1. GZR							14.844	5.139
2. GZS							18.875	6.361
3. Ac							12.042	4.978
4. Ac							22.781	3.867
5. Ai							16.375	3.394
6. MAS							14.479	7.289
7. Ext							50.250	10.140
8. Den							59.417	6.403
9. Dir							53.083	6.128
10. Coh							59.260	6.568
11. Val							51.500	6.743
12. Dur							29.052	14.231
13. B-I							3.583	1.359
14. SCl							1.437	0.499
15. Met							19.667	9.747
16. A-P							5.177	1.812
17. E-F							5.510	1.414
18. Y-O							3.958	1.846
19. S-I							3.750	1.369
20. D-S							4.573	1.263
21. H-S							4.792	1.368
22. C-H							4.667	1.715
23. C-W							3.844	1.510
24. B-G							4.750	1.330
25. F-S							5.198	1.303
26. S-D							3.031	1.559
27. S-W							5.385	1.341
28. T-R							4.312	1.439
29. I-D							436.510	221.088
30. PIm							483.167	128.624
31. FIm							486.021	152.388
32. PEM							9.550	5.400
33. PED							35.792	20.486
34. HiS							98.187	44.177
35. LoS							96.427	48.487
36. TAS							131.240	21.900
37. TAF							93.542	60.001
38. S12							0.866	0.194
39. S34							0.869	0.179
40. S56							0.873	0.177
41. S78							0.874	0.177
42. S90	590						0.894	0.170
43. F12	471	550					0.869	0.157
44. F34	549	507	511				0.865	0.137
45. F56	343	435	312	287			0.899	0.141
46. F78	274	352	247	233	229		0.931	0.144
47. F90	116	275	210	238	167	276	0.944	0.104

TABLE II

Unrotated Factor Loadings: Principle Components
Solution

Variable	1	2	3	4	5	6	7	8
1. GZR	.120	-.043	.551	.255	.308	.206	.307	.254
2. GZS	.055	.391	.474	-.083	.083	.067	-.458	-.079
3. GZT	-.008	.118	.515	.188	.434	-.014	-.193	.002
4. Ac	.087	.404	.102	.065	-.321	-.244	-.095	-.391
5. Ai	.021	.400	-.153	-.096	-.400	-.102	.276	-.288
6. MAS	-.210	-.538	-.210	-.181	.225	.026	.265	.214
7. Ext	.349	-.351	.379	.212	.041	-.153	.045	.050
8. Den	-.004	-.495	.241	-.184	-.003	-.349	-.080	-.249
9. Dir	.286	-.627	.175	-.130	-.170	-.223	.051	.044
10. Coh	.077	-.562	.264	-.219	.063	-.484	-.039	-.058
11. Val	.275	-.679	.263	.052	-.073	.015	.152	.041
12. Dur	-.120	-.262	.256	-.172	-.172	-.226	-.278	-.163
13. B-I	.204	-.052	.053	-.050	.225	.245	.134	.199
14. SCl	.091	-.172	-.100	-.448	.007	-.020	.186	-.103
15. Met	-.141	.037	.092	-.541	.286	-.015	-.098	-.120
16. A-P	-.112	.291	.213	-.591	.074	.134	-.007	.070
17. E-F	-.029	.242	.387	-.402	-.064	.152	.311	.166
18. Y-O	-.001	.163	.378	-.309	-.090	.317	.179	-.175
19. S-I	-.164	-.161	-.280	-.062	.280	.182	-.248	-.362
20. D-S	-.135	.198	-.128	-.485	-.077	-.297	.308	-.103
21. H-S	.069	.185	.632	-.044	-.006	-.313	.132	.145
22. C-H	-.143	.138	.457	.089	.011	-.186	-.237	-.270
23. C-W	.185	.177	.448	.061	-.008	-.139	.585	.121
24. B-G	-.034	.362	.345	.195	.046	-.372	.368	.204
25. F-S	.034	.149	-.064	-.630	.074	-.037	-.305	.337
26. S-D	.060	-.290	.307	-.174	.207	.368	.023	.011
27. S-W	-.092	.190	-.225	-.134	-.059	-.597	-.353	.212
28. T-R	-.328	-.233	-.140	-.568	.254	-.035	-.065	-.219
29. I-D	-.059	-.306	-.136	.241	-.128	-.324	-.014	-.193
30. PIm	-.077	-.103	-.067	.028	-.179	-.014	.107	.275
31. FIm	.089	.047	-.235	-.046	.036	-.140	-.256	.514
32. PEM	.064	-.025	.134	-.182	-.725	.182	-.249	.185
33. PED	.088	-.053	.278	-.207	-.728	.204	-.231	.125
34. HiS	.124	-.137	.188	-.053	-.150	.371	.155	-.302
35. LoS	.300	-.275	-.000	.049	-.237	.222	-.049	-.041
36. TAS	.936	.115	-.170	-.052	.034	-.034	-.007	-.007
37. TAF	.870	-.007	.074	-.062	.124	.010	-.004	-.145
38. S12	.713	-.115	-.065	.022	-.089	.107	.103	-.122
39. S34	.785	.120	-.230	-.013	-.001	.019	-.081	.129
40. S56	.784	.091	-.106	-.120	.139	-.090	-.080	.081
41. S78	.739	.208	-.253	.028	.042	-.041	.033	-.132
42. S90	.814	.185	-.015	-.130	.039	-.095	.007	.043
43. F12	.727	.064	.111	-.062	.192	.044	.013	-.165
44. F34	.702	.141	.015	.000	.139	.000	-.153	-.236
45. F56	.475	-.038	-.058	-.128	.049	-.275	.097	.083
46. F78	.477	-.226	-.202	-.143	-.078	.154	.041	.204
47. F90	.397	-.237	.144	.090	-.295	.046	-.225	.053

TABLE II
(continued)

Variable	9	10	11	12	13	14	15	h^2
1. GZR	.095	.200	.052	-.084	-.107	-.021	-.226	.802
2. GZS	.068	-.074	-.216	-.046	-.146	-.218	-.225	.793
3. GZT	.154	.112	.112	-.153	.042	.146	.179	.667
4. Ac	.312	-.294	-.142	-.248	-.115	-.177	.138	.839
5. Ai	.144	-.075	.313	-.064	.186	-.017	.044	.688
6. MAS	-.191	.257	.140	.078	-.091	-.092	-.236	.778
7. Ext	.034	-.340	-.126	.160	.133	-.172	.182	.702
8. Den	.065	.069	.169	-.114	-.149	-.115	.053	.617
9. Dir	.136	-.225	.111	-.132	.051	.058	-.110	.722
10. Coh	.156	-.016	.103	.175	-.027	.062	-.206	.796
11. Val	.033	-.204	-.144	-.164	-.058	-.129	.059	.752
12. Dur	-.336	.064	-.009	.171	-.049	-.312	.102	.619
13. B-I	.089	-.157	.499	.369	.161	-.176	.224	.742
14. SCl	-.016	-.242	-.392	.255	.114	.236	-.026	.641
15. Met	-.030	.155	.014	-.292	.225	.027	.248	.652
16. A-P	.143	.028	.264	-.042	-.168	-.010	-.176	.672
17. E-F	.268	-.058	.064	.264	-.046	.057	.089	.684
18. Y-O	-.269	.188	-.217	.033	.108	-.278	.074	.686
19. S-I	.355	.091	.152	-.059	-.062	.050	.077	.612
20. D-S	-.259	.262	-.099	-.026	-.153	-.157	.003	.703
21. H-S	-.093	.041	.031	.058	-.102	.143	.187	.656
22. C-H	-.108	.252	.187	.321	.270	.208	.116	.763
23. C-W	.136	-.034	-.104	-.074	.008	.014	-.148	.704
24. B-G	.039	.181	.025	-.089	-.206	.027	-.017	.693
25. F-S	.021	-.064	-.142	.005	-.045	-.005	.157	.689
26. S-D	-.111	-.284	-.005	-.259	-.156	.119	.161	.615
27. S-W	-.036	-.042	.195	.102	.094	-.173	-.210	.778
28. T-R	.229	-.092	.009	-.045	-.046	.098	-.057	.700
29. I-D	.081	.312	-.078	.109	-.197	.126	.375	.650
30. PIm	.434	.191	.131	-.212	.291	-.420	.142	.710
31. FIm	.203	.003	.363	.264	.046	-.010	.222	.713
32. PEM	.062	-.027	.084	-.013	.134	.303	-.038	.833
33. PED	-.049	.008	.148	-.028	-.091	.030	-.038	.807
34. HiS	.235	.350	-.087	.286	-.118	.070	.024	.634
35. LoS	.423	.283	-.178	.224	-.161	-.196	-.125	.699
36. TAS	-.054	-.013	.111	.016	-.177	.032	.047	.973
37. TAF	-.045	.054	-.081	-.013	.319	-.035	-.109	.929
38. S12	-.221	-.133	.244	-.010	-.084	.049	.015	.707
39. S34	.006	-.004	.096	.040	-.175	.080	.064	.759
40. S56	-.026	-.012	.109	.017	-.198	.001	.152	.764
41. S78	.129	.004	.056	.051	-.198	-.018	-.118	.752
42. S90	-.066	.086	-.032	-.050	-.082	.016	.108	.760
43. F12	-.088	.013	-.022	.040	.319	-.137	-.163	.772
44. F34	.047	-.012	-.083	.141	.065	-.079	-.068	.656
45. F56	.262	.271	-.176	-.218	.282	.300	-.133	.748
46. F78	-.066	.312	-.017	-.277	.033	-.124	.197	.646
47. F90	-.256	.238	-.003	-.166	.084	.146	-.043	.565

TABLE III

Rotated Factor Loadings: Oblique Solution
(Promax) (8th power) (decimals omitted)

Variable	1	2	3	4	5	6	7	8
1. GZR	-010	-075	817	079	-023	044	153	-120
2. GZS	013	031	472	-123	-029	-101	009	-075
3. GZT	-012	012	429	-161	137	186	160	072
4. Ac	066	021	-225	-023	-017	001	081	029
5. Ai	062	043	-417	-010	-199	-153	078	045
6. MAS	-087	-258	122	-044	176	-088	038	-078
7. Ext	-014	-258	-087	257	159	086	060	075
8. Den	046	-550	035	-213	039	-044	012	-048
9. Dir	023	-656	-017	-056	-217	006	047	084
10. Coh	-006	-829	092	-139	-015	-265	117	-086
11. Val	-048	-354	005	106	023	311	065	-020
12. Dur	-072	-186	-076	-002	-019	-199	-198	-007
13. B-I	219	-010	-026	-008	067	-024	-122	-007
14. SC1	-043	-175	-403	-243	-010	141	-071	-082
15. Met	-056	052	-047	-707	064	138	-129	178
16. A-P	-002	-030	153	054	-125	-061	101	-036
17. E-F	012	-067	-004	-259	-190	125	352	-258
18. Y-O	-130	300	-049	-105	023	210	050	-204
19. S-I	020	-041	072	-338	135	115	-432	-224
20. D-S	118	027	-281	-266	150	-153	267	-015
21. H-S	099	-133	093	-020	-069	057	539	083
22. C-H	-148	-075	049	039	-118	-178	-046	-084
23. C-W	-037	-146	073	161	100	104	733	-041
24. B-G	069	-022	175	172	158	-076	768	046
25. F-S	177	029	002	-601	-169	-081	-128	127
26. S-D	057	-012	125	-266	-048	602	-048	137
27. S-W	062	-294	004	-071	-045	-780	-056	328
28. T-R	-112	-336	-072	-647	059	050	-215	-053
29. I-D	057	-063	-232	142	106	059	-003	-253
30. PIm	-280	-001	028	-052	-018	-198	047	-071
31. FIm	022	129	-045	-061	010	-196	-082	-040
32. PEM	-103	-081	-028	-024	-889	-015	-138	-071
33. PED	014	-093	074	018	-785	-003	-075	-140
34. HiS	023	019	057	044	-112	271	-010	-721
35. LoS	065	-135	202	158	-102	-021	-074	-699
36. TAS	852	-000	-022	029	005	008	021	-013
37. TAF	407	-070	022	014	077	-043	-065	-015
38. S12	599	-061	-112	158	-096	141	-065	062
39. S34	743	038	011	033	-069	-029	-010	-010
40. S56	782	-015	021	-102	055	006	022	035
41. S78	687	-022	010	084	096	-088	041	-153
42. S90	683	059	-008	-069	018	021	128	007
43. F12	331	-046	054	029	153	-097	-069	009
44. F34	464	-016	041	038	137	-082	-132	-137
45. F56	135	-227	052	-200	-067	-097	232	-024
46. F78	312	163	007	-128	-067	145	-073	-043
47. F90	139	-033	152	152	-374	038	-091	010

TABLE III

(continued)

Variable	9	10	11	12	13	14	15	h^2
1. GZR	-035	205	-019	-019	032	077	-190	807
2. GZS	009	-303	-211	085	-058	-198	-296	530
3. GZT	-024	-058	078	-032	277	136	080	407
4. Ac	-065	-866	-232	-127	-155	-047	092	922
5. Ai	-301	-311	147	-196	105	104	-060	524
6. MAS	-124	638	093	-016	-159	-069	-080	605
7. Ext	217	-172	205	-095	050	-208	072	361
8. Den	-216	-110	-026	-070	056	-282	201	545
9. Dir	-109	-024	-000	-080	-111	042	-060	527
10. Coh	-043	130	014	066	154	-112	056	869
11. Val	-011	-084	-047	-111	-270	-108	050	350
12. Dur	004	-024	025	026	207	-708	147	692
13. B-I	055	256	826	-233	173	-031	-134	923
14. SCl	222	045	-106	296	-002	039	-033	438
15. Met	-050	-024	008	-149	132	-075	-037	629
16. A-P	-105	056	109	005	-024	013	-210	129
17. E-F	102	022	318	-053	048	108	-117	456
18. Y-O	-104	011	-002	-064	068	-416	-131	419
19. S-I	-116	-102	068	-053	042	154	133	464
20. D-S	-098	050	-174	032	-086	-297	073	426
21. H-S	059	-038	038	114	250	-099	150	459
22. C-H	-056	095	153	143	801	-226	212	880
23. C-W	-113	-054	-063	-073	-127	220	-149	725
24. B-G	-046	-035	-104	-030	-021	123	111	731
25. F-S	402	004	040	-023	-123	-085	-106	658
26. S-D	-152	-019	034	164	-214	062	-116	590
27. S-W	145	015	046	-109	081	-178	-148	912
28. T-R	-081	-011	-024	071	-081	086	-085	638
29. I-D	185	-102	-120	022	230	-143	750	855
30. PIm	156	-126	242	-818	-165	023	-029	925
31. FIm	806	025	049	-139	-052	021	194	782
32. PEM	055	-029	-062	-000	140	102	-068	875
33. PED	-083	-071	-021	-030	015	-171	-076	705
34. HiS	-060	075	031	047	187	-027	234	715
35. LoS	168	-021	-033	-204	-117	-049	146	702
36. TAS	-011	-027	079	117	-085	046	038	759
37. TAF	-045	027	008	-045	130	-015	-180	238
38. S12	-257	046	147	161	-028	-022	-037	556
39. S34	113	007	082	087	-092	112	066	613
40. S56	096	-026	135	069	-071	-005	085	673
41. S78	-064	-111	-007	090	-139	138	-009	585
42. S90	077	-056	-012	038	-032	-011	058	507
43. F12	-109	055	090	-049	130	-081	-282	281
44. F34	023	-121	025	075	109	-075	-060	323
45. F56	104	059	-285	-126	068	387	016	447
46. F78	085	129	-010	-306	-193	-051	107	342
47. F90	-077	143	-214	053	149	-109	073	331

Interpretation and Description of Fifteen First-Order Factors:

Factor 1. This factor shows high positive loadings for the psychophysical tests (variables 36 to 47 incl.), which involved reproduction of short (15 second) sound-filled intervals under standard and positive feedback conditions. Substantial positive loadings* were reported for the standard reproduction condition, but not for the feedback reproduction condition. There was a substantial positive loading (.852) for the total absolute standard variable (36), but only a moderate positive loading (.407) for the total absolute feedback variable. For the variables which consisted of a coupling of every two trials of reproduction, the standard condition had four variables (39, 40, 41, 42) (trials 3 to 10 incl.) which had a substantial positive loading (.743, .782, .687, .683 resp.) and one variable (38) (trials 1 and 2) which had a moderate positive loading (.599); whereas the feedback condition had one variable (44) (trials 3 and 4) which had a moderate positive loading (.464) and two variables (43, 46) (trials 1 and 2, 7 and 8) which had only small positive loadings (.331, .312 resp.). In addition, for the feedback condition, variables 45 and 47 (trials 5 and 6, 9 and 10) had

* To facilitate interpretation of the factor structure, any positive or negative loading with a magnitude which is equal to or greater than .65 is regarded as a substantial loading. A moderate loading is considered to be any positive or negative loading between .35 and .649, and a small loading is deemed to be any positive or negative loading with a magnitude between .20 and .349. Small loadings are not considered to be important as an aid to interpretation. Any other loading is below this arbitrary significance level.

very low loadings, below .20, on this factor (.135, .139). The Thor Past variable (30) had a small negative loading (-.280), and the boring polarity of the boring-interesting variable (13) had a small loading on this factor (.219).

Factor 1 is determined by a common component underlying the psychophysical variables, although the greater portion of this commonality underlaid the variables which constituted the standard condition of reproduction. The smaller loadings for the variables which made up the feedback condition indicated that the contribution by these variables toward the common component of this factor was of considerably smaller magnitude. In fact, two of these variables (45, 47) had larger loadings on other, non-psychophysical, factors. The correlation coefficient between the total absolute standard and the total absolute feedback variables (36, 37) ($r = .717$) (Table I), indicated that only 51% of the variance can be accounted for by the relationship between the standard and the feedback conditions. It can also be pointed out, with reference to Table I, that the total absolute feedback condition (37) ($\bar{X} = 93.5$; S.D. = 60) had greater variance than the total absolute standard condition (36) ($\bar{X} = 131$; S.D. = 20), thereby facilitating higher correlations among the standard trials than among the feedback trials. This is reflected in the factor loadings for this factor.

With reference to the standard reproduction condition, it is noted that, of the series of every two successive trials of reproduction, the middle two trials (5 and 6) (variable 40) had the greatest loading (.782) and that the loadings of all five combinations of successive trials on

factor 1 form an inverted U-curve on which trials 5 and 6 had the highest loading.

This factor is defined primarily by over-reproduction of short (15 second) sound-filled intervals, when the interval which is presented as a stimulus for reproduction remains constant over trials. That is, in a series of trials of reproduction of a fifteen second, sound-filled interval, sixteen to nineteen seconds is given as the reproduction. Other minor defining features are: over-reproduction of short (1 to 30 second) sound-filled intervals, when the interval which is presented as a stimulus for reproduction varies over trials as a function of the reproduction on the previous trial; restriction of non-personal past; and boredom.

This factor is not conducive to elaboration of interpretation. It can be interpreted as over-reproduction of short-term durations.^{*} Short intervals seem to pass by slowly -- that is, slower than the external clock.

Factor 2. This factor shows negative loadings for the five subtests which constitute Hooper's (1965) FTP attitude inventory (variables 7 to 11). Two of the five FTP variables, coherence and directionality (10, 9) had substantial negative loadings (-.829, -.656) on this factor. Two others, density and valence (8, 11) had moderate negative loadings (-.550, -.354), while extension (7) had only a small negative loading

* Labels given to factors serve as aids to quick identification and are not necessarily descriptive of the entire factor dimension.

(-.258). The Manifest Anxiety Scale (variable 6) showed only a small negative loading (-.227). Three of the opposite-adjective (semantic differential) pairs had small loadings on this factor; the "tense-relaxed" variable (28) had a small loading on the "relaxed" polarity (-.336); the "young-old" variable (18) had a small loading on the "young" polarity (.300); the "strong-weak" variable (27) had a small loading on the "weak" polarity (-.294).

Factor 2 consists of a common component which underlaid the FTP attitude inventory which was devised by Hooper (1965). The greater portion of this component underlaid the variables of coherence (10), directionality (9), and density (8) of FTP. Also, the smaller loadings for the other variables, including extension and valence (7, 11), indicated that the contribution by these variables toward the common component of this factor was minimal.

The five variables which constitute Hooper's inventory had high positive correlation coefficients ($r \geq .300$), with the exception of the coefficient between density and extension ($r = .174$) which was below the significance level. Directionality and valence had the highest coefficient ($r = .655$). It is noteworthy that coherence, which had the highest negative loading on this factor, had significant positive correlation coefficients with MAS, duration, and the "tense-relaxed" variables. Of these, MAS and "tense" also had negative loadings on this factor.

It is noteworthy that other FTP variables, such as the immediate-delay scale, and the Thor Future Test, did not contribute to this factor (-.063, .129), nor did either measure of the Personal Events Test

(-.081, -.093). This indicates that this is not a general "future" factor.

This factor is defined primarily by disorganization and unpredictability of future events, lack of speed or continuity into the future, and an inactive, uneventful future. Items from the Hooper tests which would be suggestive of the dimension indicated by this factor are:

"Future time for me is perceived as - 'non-purposeful' - 'a long uneventful road to travel' - 'a foggy indistinct road ahead' - 'rather chaotic'." Other minor defining features are: lack of hope for the future (unattractive), a short-range view into the future, low manifest anxiety, and views which regard time to be young, weak and relaxed.

This factor is interpreted as pessimism - inactivity. The negative loadings on the Hooper variables provide evidence for pessimism regarding the future (disorganized, uneventful), and for inactivity regarding the future (undynamic, lack of speed). Inactivity towards the future is not equivalent to passivity regarding time per se (the "active-passive" variable did not load on this factor). This factor can be interpreted only with reference to attitudes regarding future time. The future, generally, is seen as disorganized, uncontrollable, incoherent, inactive, uneventful, and moving slowly. There is an implication inherent in this factor of a kind of satisfaction and relaxation with the present, and a form of doubt, suspicion, or fear of what is regarded to be an unknown future, but perhaps an awareness that the personal future is inevitable.

Factor 3. This factor shows positive loadings for the three sub-tests which constitute the extraversion-introversion part of the Guilford-Zimmerman Temperament Survey (variables one to three). The R (rhythymia-restraint) variable (1) had a substantial positive loading (.817) on this factor, and the S (sociability) and T (thoughtfulness) variables (2, 3) showed moderate positive loadings (.412, .429 respectively). The Ai sub-test of Gough's (1957) California Personality Inventory, which measures the achievement via independence variable (5) had a moderate negative loading (-.417) on this factor. The social class variable (14) had a moderate loading (-.403) for the white-collar class. Small loadings were demonstrated for other variables: the Ac sub-test of the CPI, which measures the achievement via conformance variable (4), had a small negative loading (-.225); the "dull-sharp" variable (20) had a small loading on the "dull" polarity (-.281). The immediate-delay scale (29) had a small loading for immediate gratification (-.232).

Factor 3 is determined by a common component, which primarily underlaid the rhythymia-restraint sub-test of the GZTS (1), but also underlaid the sociability and thoughtfulness sub-tests of the GZTS (2, 3), the need achievement via independence sub-test of the CPI (5), and the social class variable (14).

A possible relationship between low need achievement and extraversion was indicated by this factor. The loadings which were of greatest magnitude on this factor are, respectively, restraint-rhythymia (.817), and achievement via independence (-.417) ($r = -.353$) and

sociability (.472) and achievement via conformance (-.225) ($r = .315$). Achievement via independence had a higher loading on this factor than on any other factor. The restraint-rhathymia variable had relatively high correlation coefficients with the other extraversion variables, sociability and thoughtfulness (.443, .488), which, however, had a correlation coefficient which is barely significant at the five percent level (.204). From this, it is apparent that the R variable had a greater contribution to the common component of the three extraversion-introversion variables.

The T variable and the S variable are not distinguished from the need achievement via independence variable and the social class variable in regard to the magnitude of their separate contributions to the component which is common to this factor. The importance of this finding becomes apparent in that the common component of this factor is not defined by equal loadings of the three sub-tests of the extraversion-introversion scale. That is, since this factor has only one primary defining variable, high rhathymia, and because high sociability and high thoughtfulness are only secondary defining features, it is inappropriate to interpret this factor as extraversion. Items of the rhathymia sub-test which would be indicative of this factor are "I am a carefree individual" - "I often act on the first thought that comes into my head" - "I often crave excitement." Other minor defining features are: low achievement via independence and conformance, white-collar class membership, preference for immediate gratification, and a view which regards time to be "dull."

Generally, the dimension is one of high impulsivity and high extraversive tendencies. The factor is interpreted as rhathymia. There is an orientation to the present in which pleasure-loving, thrilling activities are preferred, based on immediate, "spur of the moment" decisions. The future is irrelevant -- there is a desire to enjoy the pleasures of life immediately rather than wait for the future. A day-to-day existence seems to be suggested. The loading on this factor for white-collar class may reflect a tendency among male college students to enjoy pleasure-loving, thrilling activities condoned by the white-collar class.

Factor 4. This factor had a substantial negative loading (-.707) for the Time Metaphor Test (15). Two opposite-adjective variables showed moderate loadings on this factor: the "fast-slow" variable (25) showed a moderate loading (-.601) on the "slow" polarity, and the "tense-relaxed" variable (28) showed a moderate loading (-.647) on the "relaxed" polarity. Small loadings are shown for the "soothing" polarity of the "soothing-irritating" variable (19) (-.338), the "dull" polarity of the "sharp-dull" variable (20) (-.266), the "empty" polarity of the "empty-full" variable (17) (-.259), and the "deep" polarity of the "shallow-deep" variable (26) (-.266). Small loadings on this factor are also seen for two variables from Hooper's FTP test: extension (7) (.257) and density (8) (-.213), both of which have negative loadings on the pessimism - inactivity factor.

This factor consists of a common component, the greater portion of which underlies the Time Metaphor Test and the "fast-slow" and

"tense-relaxed" variables. Smaller contributions toward this component were made by other variables, including "soothing-irritating", which had smaller loadings. The intercorrelation coefficients provide further evidence for the moderately strong positive relationship among the three variables which made up the commonality of this factor. The Time Metaphor Test correlated .264 with the "fast-slow" variable, and .315 with the "tense-relaxed" variable. The "tense-relaxed" variable correlated .281 with the "fast-slow" variable, and .345 with the "soothing-irritating" variable, which had a small loading on this factor.

Since a high score on the Time Metaphor Test indicated preference for dynamic imagery, the negative loading for this test indicated that this factor is defined by a preference for passive-naturalistic imagery. Passive, static metaphors which were indicative of this factor are -- "a quiet, motionless ocean" - "a road leading over a hill" - "the Rock of Gibraltar." This factor is also defined such judgments of time as slow, relaxed, empty, soothing, dull, and deep. Other minor defining features are: white-collar class membership, and an orientation which regards the future as distant and long-ranging, but uneventful, inactive, and unproductive.

This factor is interpreted as slowness-leisureliness. It may be described, generally, as slowness, sluggishness, inertness, naturalism, relaxation and comfort. There is a suggestion of an attitude that the future is far, far away, and is unorganized, such that it is not worth moving into. This is consistent with the view that time is slow. The loading of the social class variable is uninterpretable.

Factor 5. This factor had substantial negative loadings for both variables which constituted the Personal Events Test. The distance from the age at the most distant event to S's present age (variable 33) loaded $-.785$ on this factor, and the distance from the average age to S's present age (variable 32) loaded $-.889$ (the highest loading on the factor matrix). A moderate negative loading ($-.374$) was reported for two successive trials (9 and 10) of the feedback condition of reproduction (47). A small negative loading ($-.217$) was reported for the directionality variable (9) of the Hooper FTP attitude inventory.

The common component of the factor underlaid the Personal Events Test, and, to a very small extent, the final two trials in the feedback condition of reproduction. This was the extent of the commonality of this factor.

The strong positive relationship between the two variables on the Personal Events Test ($r = .762$), the high loadings for both variables, and the absence of other moderate or substantial loadings on this factor, indicated that this factor is virtually exclusive to the Personal Events Test, which did not contribute to the common component of any other factor.

This factor is defined by a low extension score, that is, naming a personal event which is estimated to occur in a few weeks or months time. For this factor, events such as "watch TV," "play hockey," "write final exams," "have a holiday" were named; and the time period which is conceptualized as the amount of time expected to pass until the event occurs ranged from one day to about two months. Events which were

expected to occur in the distant future, such as "retire," "get a pension" are not characteristic of this factor. A minor defining feature is under-reproduction of very short (one to three second) sound-filled intervals.

This factor is interpreted as short-range personal anticipation. This is a dimension wherein personal future is restricted in length. The orientation is toward personal events which are expected to occur soon. Interpretation of the moderate loading for the psychophysical variable is difficult.

Factor 6. This factor had a substantial loading (-.780) for the "weak" polarity of the "strong-weak" opposite-adjective variable (27). Also, a moderate loading (.602) for the "shallow" polarity of the "shallow-deep" variable (26) was noted. Small loadings were reported for two variables from Hooper's FTP scale, valence (11) (.311) and coherence (10) (-.265), as well as "young" of the "young-old" opposite-adjective variable (18) (.210), and high structure of the Story Completion test (34) (.271).

The common component of this factor underlaid the "strong-weak" and "shallow-deep" variables, as well as the other variables which had small loadings. The moderate negative relationship between the "strong-weak" and "shallow-deep" variables ($r = -.338$) accounted for most of the commonality of this factor. The negative relationship, which is apparent from high loadings in opposite directions, for these two variables on this factor, was not noted on any other factor (these two variables did have small loadings on other factors, although not on the same factor).

It is notable that the high structure Story Completion variable had a small contribution to the commonality of this factor, whereas the low structure Story Completion variable did not.

This factor is defined by views which regard time to be shallow and weak. Other minor defining features are: lack of coherence and organization in the future, but a willingness to move into the future, a view which regards time to be young, and high future orientation in story-telling.

This factor can be interpreted as impotency. It can be described as an attitude which attributes to "time" per se the "characteristics" of unimportance, irrelevance, superficiality, triviality, or insubstantiveness. Time is not a barrier, it can be easily overcome, because it is impotent. The future is regarded as incoherent, and disorganized, perhaps because time is regarded as inconsequential. This may account for a willingness to move into the future, in the sense that there is nothing in the future to lose, or that there are no insurmountable, or foreseen barriers.

Factor 7. Substantial loadings were noted on this factor for the "warm" polarity of the "cold-warm" opposite-adjective variable (23) (.733), and for the "good" polarity of the "bad-good" opposite-adjective variable (24) (.768). The "soothing" polarity of the bipolar variable "soothing-irritating" (19), the "full" polarity of the "empty-full" variable (17), and the "happy" polarity of the "happy-sad" variable (21) had moderate loadings on this factor (-.432, .352, .539 respectively). The "sharp" polarity of the "dull-sharp" variable (20) had a small

loading (.267) as did the "relaxed" polarity of the "tense-relaxed" variable (28) (-.215). Also two consecutive trials (5 and 6) of the feedback method of reproduction (variable 45) had a small loading on this factor (.232).

With one minor exception (the psychophysical variable), the common component of this factor consisted only of opposite-adjective variables. Seven of the thirteen opposite-adjective variables formed the commonality. The major determinants of this common component were the "cold-warm" and the "bad-good" variables, which had a positive relationship ($r = .452$). The "happy-sad" variable, which is a minor determinant of the commonality of this factor, also had a positive relationship with the "cold-warm" variable ($r = .407$) and with the "bad-good" variable ($r = .376$). There were no moderate or substantial loadings for the "happy-sad", "bad-good", or "cold-warm" variables on other factors.

Considering the "soothing-irritating" and "dull-sharp" variables, for this factor, the "soothing" and "sharp" polarities had small loadings, but for the slowness-leisureliness factor, (factor 4), the "soothing" and "dull" polarities had small loadings. A very minor negative relationship is indicated for these two variables ($r = -.069$).

This factor is defined by judgments which regard time to be full, soothing, sharp, happy, warm, good, and relaxed. A minor defining point is over-reproduction of short intervals.

This factor is interpreted as positive evaluation, in that "time" is judged to have merit and worth. This seems to indicate a dimension

wherein "time" per se is regarded to be beneficial and helpful. It is to be used constructively, and is not overpowering. It is a "friend." Interpretation of the psychophysical variable which loads on this factor is difficult.

Factor 8. This factor showed substantial negative loadings for the two variables which constituted the Story Completion test -- the high structure variable (34) (-.721) and the low structure variable (35) (-.699). Small loadings were noted on this factor for immediate gratification (29) (-.253), the "strong" polarity of the "strong-weak" variable (27) (.328), the "empty" polarity of the "empty-full" variable (17) (-.258), the "soothing" polarity of the "soothing-irritating" variable (19) (-.224), and the "old" polarity of the "young-old" variable (18) (-.204).

This factor was determined by a common component which primarily underlaid the Story Completion Test, as well as other variables, which had small loadings. The low structure and high structure variables had approximately identical loadings on this factor. A moderate positive relationship existed between high structure and low structure ($r = .322$). A moderate inverse relationship between the high structure variable and the "strong-weak" variable was indicated by their loadings on this factor. Both variables also contributed to the impotency factor (factor 6). However, the low structure variable did not contribute to the impotency factor. The inverse relationship between the low structure variable and the "strong-weak" variable ($r = -.211$) was weaker than the inverse relationship between the high structure and the "strong-

weak" variables ($r = -.327$). A slight distinction between high and low structure was evident in this regard.

This factor is defined by a low score for extension of future, that is, a short time period (3 to 5 minutes) given as description of the duration of action in stories which were made up, completed, on the basis of high structured or low structured story stems which were presented as stimuli. Other minor defining features are: preference for immediate gratification, and views which regard time to be strong, soothing, old, and empty.

This factor is interpreted as intensive imaginative elaboration. There is a limited future time span, that is, a narrow future orientation, in spontaneously created actions and events which constitute a completed story. The events occur in a brief, but intense period of time, three to five minutes, and the story is concluded. This is indicative of a dimension of short, concentrated time periods of intense action. Time seems to be potent and powerful for the few, fleeting moments that the action takes. As soon as gratification is received, the intensity of time subsides and it becomes soothing.

Factor 9. This factor had a substantial positive loading (.806) for the Thor Future Test (31). The "fast" polarity of the "fast-slow" variable (25) had a moderate loading on this factor (.402). Small loadings were reported for the achievement via independence variable (5) (-.301), and the extension (7) and density (8) variables of Hooper's FTP scale (.217, -.216 respectively), the social class variable (14) (.222), and two successive trials (one and two) of the standard condition

of reproduction (38) (-.257).

The common component of this factor was primarily composed of the Thor Future Test, although other variables, such as "fast-slow", had small contributions to the commonality. The Thor Future test did not have any relevant contributions to any other factor. Although a moderate positive relationship existed between the Thor Future variable and the "fast-slow" variable ($r = .340$), both of which loaded on this factor, the "fast-slow" variable also loaded on the slowness-leisureliness factor (factor 4). Also, the extension and density variables of Hooper's FTP attitude inventory, which had negative loadings on the pessimism-inactivity factor (factor 2), had small positive and negative loadings respectively on this factor, as well as the slowness-leisureliness factor.

This factor is defined by a large estimate of the number of years that will pass before an impersonal event will occur. An example of items which would be indicative of this factor is "Irrigation of Sahara, 100 years from now" - "End of cold war, 200 years from now." Also, there are minor defining points: a view which regards time to be "fast," blue-collar class membership, low need of achievement via independence, extension of future time, which is seen as uneventful and unproductive, and under-reproduction of short intervals.

This factor is interpreted as long-range impersonal anticipation. The dimension is one of a broad future orientation, or a far-reaching future time span, for non-personal events. Because time is seen as fast, and the future is seen as uneventful, it may be interpreted that,

because the events of the future are seen as being far away, they are deemed to be irrelevant. The relevant events are those that happen now, but because time moves fast, these tasks cannot be completed. This seems to imply some pessimism. Another possible interpretation of this factor centres on speed of present time as a determinant of the future impersonal time span. That is, future time is seen as farther away as a function of speed of "time" per se. If "time" is regarded as fast, twenty years, for example, is not regarded as a long time, but if "time" is regarded as slow, a period of five years is regarded as a long time. The length of time is a function of speed times distance.

Factor 10. A substantial negative loading (-.866) was observed on this factor for the Ac scale of Gough's (1957) California Personality Inventory, which is a measure of the achievement via conformance variable (10). A moderate positive loading (.638) was reported for the Manifest Anxiety Scale (variable 6). Small loadings were reported for achievement via independence (5) (-.311), restraint-rhathymia (1) (.205), sociability (2) (.303), and the "boring" polarity of the "boring-interesting" variable (13) (.256).

This factor was determined by a common component which underlaid the achievement via conformance test and the Manifest Anxiety Scale, and other variables with small loadings on this factor, including the achievement via independence variable. The Ac variable had a stronger relationship with the MAS variable ($r = -.531$) than with the Ai variable ($r = .346$). There was no other factor on which any relationship was

noted for the Ac and MAS variables, but there were three other factors, 2, 3, 11, on which these two variables were independent. The contributions by the Ac and Ai variables to the commonality of this factor were differentiated to the extent that the unequal loadings implied an independence between these variables. There was no other factor on which a strong interdependence was noted for these variables [although they did form part of the common component of the rhathymia factor (factor 3)], and their independence was evident on two other factors, 9 and 11. A moderate relationship between the sociability variable and the Ac variable ($r = .315$) was reflected in that they contributed to the commonality of this factor, as well as to that of two other factors, 3, 11. A unique inverse relationship was indicated between rhathymia and sociability, which loaded in different directions on this factor.

This factor is defined by low need achievement via conformance, and high manifest anxiety (which also indicates low social desirability and high sensitization). Items which are indicative of this factor are "I often get disgusted with myself" - "I don't seem to care what happens to me" - "I have often felt that difficulties were piling up so high that I could not overcome them" - "I shrink from facing a crisis or difficulty." Other smaller defining features of this factor are: high rhathymia, low sociability, low achievement via independence, and high boredom.

This factor is interpreted as negative achievement -anxiety. The high anxiety and low achievement need via conformance indicate a dimension of social anxiety, a feeling of uselessness, and fear of achievement.

Generally, the factor is descriptive of antisocialization, in that there is no desire to achieve, to conform, or to socialize. There is also a dimension of sensitization, or willingness to tell the truth, which can be deemed from the high manifest anxiety and high boredom scores, and which may indicate honesty, or more relevantly, a fear of dishonesty. The fear implicit in this factor -- a fear of achievement, social interaction, conformity, reprimand for lying, may indicate meekness, anti- or under-socialization.

The remaining five factors were specific to one variable, and were deemed to be specific factors.

Factor 11. A substantial loading (.826) was noted on this factor for the "boring" polarity of the "boring-interesting" variable (13). There were a number of small loadings for other variables on this factor: sociability (2) (-.211), achievement via conformance (4) (-.232), extension of future time perspective (7) (.205), the "full" polarity of the "empty-full" variable (17) (.318), the Thor Past variable (30) (.242), and trials 5 and 6 (variable 45) and trials 9 and 10 (variable 47) of the feedback series of trials of reproduction (-.285, -.214 respectively).

The commonality of this factor primarily underlaid the boring-interesting variable, although the variables with small loadings on this factor made secondary contributions toward the common component.

This factor was a singlet; that is, the "boring-interesting" variable accounted for most of the variance. This factor is defined primarily by high boredom during a long-term (one hour) task-filled interval, and secondly, by low sociability, low achievement via confor-

mance, high extension of non-personal past time, a view which regards time to be "full", and under-reproduction of small (one to five second) sound-filled intervals.

This factor is interpreted as boredom. Further elaboration of this factor is difficult, other than that long, task-filled intervals are regarded to be boring, since time is full and important. Time should be used constructively and enjoyed, "now" and at all times -- it should not be wasted by serving in unimportant, menial, long tasks.

Factor 12. This factor showed a substantial negative loading (-.818) for the Thor Past variable (30). Small loadings were observed for other variables: the "boring" polarity of the "boring-interesting" scale (13) (-.233); blue-collar class (14) (.296); low structure of the Story Completion Test (35) (-.204); and two consecutive trials (7 and 8) of the feedback condition of reproduction (46) (-.306).

The commonality of this factor seemed to consist primarily of the Thor Past variable, with small contributions by other variables which had small loadings. The absence of a relevant loading for high structure on this factor (.047), and the small loading for low structure indicated a small differentiation between these two variables.

This factor is defined essentially be a low score for extension of past, for non-personal events, that is, a short time period (relative to the specific item), or a short number of years ago that a non-personal but ambiguous historical event occurred. An example of items which are descriptive of this factor follows: "First observance of Mother's Day, 8 years ago" - "Harvey's discovery of the circulation of blood, 60 years

ago." There are other minor defining features: under-reproduction of two feedback trials of an interval, short (intensive) imaginative elaboration, high interest during a task-filled interval, and blue-collar class membership.

This factor is interpreted as recency, that is, low extension of non-personal past time. The dimension indicated by this factor can be described in that a conception of events in the past is restricted to the recent past rather than to the distant past. No historical perspective is indicated. Orientation is focused on enjoyment of present activities.

Factor 13. On this factor, a substantial loading (.801) was observed for the "clear" polarity of the "clear-hazy" opposite-adjective variable (22). Other variables had small loadings on this factor: thoughtfulness (3) (.277), valence of future time perspective (11) (-.270), and estimation of a long (one-hour) activity-filled duration (12) (.207).

This factor was determined by a common component which primarily underlaid the "clear-hazy" opposite-adjective variable, and secondarily underlaid the other variables with small loadings. This was the only retained factor for which the common component consisted primarily of one opposite-adjective variable, rather than of more than one opposite-adjective variable [such as the impotency factor (factor 6)]. That is, this is the only factor which was specific to one opposite-adjective variable.

This factor is defined primarily by a view which regards time to

be clear, rather than hazy. Minor defining features are: high thoughtfulness, low valence of future time perspective, and overestimation of a long, task-filled duration.

This factor is interpreted as clarity. A dimension is indicated wherein "time" per se is clear, that is, always present, distinct, and obvious. Time is not vague or hazy -- it is there, and it is to be dealt with. It is definite.

Factor 14. On this factor, a substantial loading (-.708) was observed for the long-term (one hour), task-filled duration variable (12). A moderate loading on this factor was noted for the "old" polarity of the "young-old" variable (18) (-.416), and two successive trials (5 and 6) of the feedback condition of reproduction (45) (.387). Other variables had small loadings on this factor: extension of future time perspective (7) (-.208), density of future time perspective (8) (-.282), the "dull" polarity of the "dull-sharp" opposite-adjective variable (20) (-.297), the "hazy" polarity of the "clear-hazy" variable (22) (-.226), the "warm" polarity of the "cold-warm" variable (23) (.220).

The common component of this factor primarily underlaid the long-term (one hour), task-filled duration estimation variable, and secondarily underlaid the "old" polarity of the "young-old" variable, and trials 5 and 6 of feedback reproduction of an interval, as well as other variables with small loadings. It is noteworthy that this was the largest loading for variable 45, and that the common component seemed to comprise largely of estimation-duration.

This factor is defined primarily by underestimation by from one

to twenty minutes of a time period of approximately sixty minutes during which the various tasks of the experiment were performed. It is also defined by over-reproduction of a short interval (5 to 8 seconds) (when it is the fifth and sixth trials of feedback reproduction in a series of ten trials), and by views which regard "time" per se to be old, dull, hazy, and warm.

This factor is interpreted as underestimation of long-term duration. It is a dimension which can be described as "time goes faster than you think when you are busy," or, "time flies," and which is especially true for longer durations. The underestimation of the activity filled long duration, and the over-reproduction of a short interval are indicative of a slow clock (although there is no immediate explanation for the observation that only two trials of reproduction loaded on this factor). Time is regarded to be decadent, drab, and dim, but goes fast, especially during activities, when attention to passing time is not made.

Factor 15. A substantial loading (.750) was reported on this factor for the "delay" polarity of the immediate-delay variable (29). Other variables had small loadings on this factor: the sociability variable (2) (-.296), the density of future time perspective variable (8) (.201), the "passive" polarity of the "active-passive" variable (16) (-.210), the "clear" polarity of the "clear-hazy" variable (22) (.212), the high structure story variable (34) (.234), and two successive trials (1 and 2) of the feedback reproduction trials (43) (-.282).

The common component of this factor primarily underlaid the

immediate-delay scale, and secondarily underlaid other variables with small loadings.

This factor is primarily defined by a long period of time (over five years) in contrast to a short period of time (under two years) that represents a waiting period until the most distant point in the future to receive a larger monetary reward in preference to receiving a small but immediate monetary reward. Minor defining features of this factor are: low sociability, an eventful and productive future, extensive imaginative elaboration for high structured story stems, under-reproduction of the first two trials in the feedback condition, and a view which regards time to be passive and clear.

This factor is interpreted as gratification postponement. The dimension which is indicated by this factor is one of a positive view of time and the future, which makes waiting for reinforcement a desirable characteristic. Waiting for, and planning for, future events which entail monetary rewards or reinforcement upon the occurrence of that event, such as a raise, is descriptive of this factor.

A short summary of the 15 first-order factor descriptions and interpretations is presented in Table IV.

Second-Order Factor Analysis

The fifteen factors which were retained were largely test-specific. In an attempt to uncover an underlying system, in the first order factor matrix, a higher-order factor analysis was performed. This allowed for determination of any common components and interrelationships among the

TABLE IV

Summary of First-order Factors
and Interpretations

- | | |
|------------|---------------------------------------------------------------------------------------|
| Factor 1. | Over-reproduction of short-term durations.
Short intervals pass quickly |
| Factor 2. | Pessimism-inactivity.
Avoid unorganized and irrelevant future |
| Factor 3. | Rhathymia.
High impulsive and extraversive tendencies |
| Factor 4. | Slowness-leisureliness.
Evaluation of time as slow and relaxing |
| Factor 5. | Short-range personal anticipation.
Personal future is restricted in length |
| Factor 6. | Impotency.
Evaluation of time as shallow and weak |
| Factor 7. | Positive evaluation.
Evaluation of time as good and warm; beneficial |
| Factor 8. | Intensive imaginative elaboration.
Narrow future orientation; brief action periods |
| Factor 9. | Long-range impersonal anticipation
Broad non-personal future orientation |
| Factor 10. | Negative achievement - anxiety
Antisocialization; social anxiety |
| Factor 11. | Boredom
Long tasks are boring |
| Factor 12. | Recency.
Past events are recent; history restricted in perspective |
| Factor 13. | Clarity.
Evaluation of time as clear |
| Factor 14. | Underestimation of long-term duration.
Time goes fast during long tasks |
| Factor 15. | Gratification postponement.
Waiting for monetary reinforcement |

test-specific first-order factors. A higher-order solution in a hierarchical factor structure would elicit some associations between and within temporal variables and other temperament variables and facilitate some broad interpretations.

Table V presents the intercorrelational matrix for the oblique first-order factors. The correlation coefficients were small, having a range of $-.30$ to $.31$. The factoring of the matrix, with unity in the diagonals, produced the principal components solution (Table VI) which was rotated to the varimax criterion. An oblique solution which was derived by promax rotation of the varimax solution was raised to the sixth power. The results of this second-order factor analysis, that is, the loadings of the first-order primary factors on the rotated, oblique, second-order factors are presented in Table VII. Eight second-order factors were retained, as presented below, and summarized in Table VIII.

Interpretation and Description of Eight Second-Order Factors:

Factor A. This second-order factor consisted of a substantial negative loading ($-.764$) for the clarity factor (13) and a substantial positive loading ($.683$) for the underestimation of long-term duration factor (14). These first-order factors had a moderate negative relationship ($r = -.254$). Many other first-order factors had small loadings on this second-order factor: slowness-leisureliness (4) ($-.247$); impotency (6) ($.247$); positive evaluation of time (7) ($.244$); long-range non-personal anticipation (9) ($.260$); boredom (11) ($-.257$); recency (12) ($-.202$) and gratification postponement (15) ($-.298$). It became apparent, then,

TABLE V

Product-Moment Correlational Matrix; Means; Standard Deviations;
of First-Order Factors (decimals omitted)

1																
2	233															
3	-080	-016														
4	185	013	129													
5	152	013	010	-059												
6	-006	221	065	-083	008											
7	-058	-046	150	289	168	025										
8	112	-093	-113	-219	081	-235	097									
9	-007	171	-057	-072	016	-222	-099	-023								
10	-015	-134	252	-023	042	-027	-042	-082	035							
11	086	072	-052	049	102	-022	-149	042	054	297						
12	311	-094	-002	-012	-021	207	-009	023	-171	117	-264					
13	-199	-012	037	091	-097	-202	-073	-059	-080	125	179	225				
14	199	046	137	-058	-032	197	251	-018	036	006	000	-072	-254			
15	-000	-040	-274	174	117	076	-009	-300	236	-117	-174	045	271	-161		
Mean	132	-095	028	-067	-041	-004	038	-053	011	-018	028	-032	026	-041	010	
Std. Dev.	268	199	198	203	206	192	215	177	177	190	168	164	176	175	170	

unity is assumed in the diagonals

$p < .05$; $r = .287$ $p < .01$; $r = .372$

TABLE VI

Unrotated Factor Loadings: Principle Components
Solution (decimals omitted)

First-Order Factor	A	B	C	D	E	F	G	H
1	359	-231	-211	168	-570	460	-211	-174
2	189	-186	-371	464	-208	-144	-290	130
3	306	072	613	203	181	-114	-001	-245
4	-048	-404	301	326	248	455	-432	097
5	139	-002	-111	143	-085	458	689	290
6	378	-468	042	087	-208	-517	236	299
7	385	-216	252	-052	492	442	111	108
8	188	501	-178	-454	-155	408	-062	031
9	-210	129	-453	414	160	067	150	-597
10	-041	296	557	344	-288	-019	303	-262
11	-081	475	092	580	-286	095	038	381
12	009	-437	295	-377	-606	100	058	-278
13	-640	-061	399	047	-176	100	-107	083
14	664	-044	-026	178	124	-061	043	-249
15	-534	-590	-212	146	112	134	305	-061

TABLE VII

Rotated Factor Loadings; Oblique Solution (Promax)
(6th power) (decimals omitted)

First-Order Factor	A	B	C	D	E	F	G	H
1	183	219	-016	097	-895	221	086	-105
2	187	-282	-214	314	-260	123	-123	-070
3	185	-183	571	-024	091	183	-151	-010
4	-247	-091	-077	106	-195	898	-125	109
5	092	057	111	256	-076	-082	904	007
6	247	-688	-017	-003	018	-208	135	356
7	254	072	-039	-182	060	501	290	156
8	093	798	-171	018	-204	-162	125	110
9	260	019	172	-095	-053	-144	-006	-902
10	-137	-096	851	292	-072	-141	152	167
11	-257	036	272	887	007	062	223	094
12	-202	006	208	-378	-617	-080	-034	163
13	-764	-058	186	183	020	212	-092	142
14	683	-101	168	-137	-151	017	-002	-182
15	-298	-382	-147	-221	008	130	258	-292

that these factors shared a common component.

This second-order factor is defined, basically, by a view which regards time to be unclear, or hazy, and by underestimation of a long-term (one hour) activity-filled interval.

This factor is indicative of a dimension of apparent disregard of or inattentiveness to the passage of time during long (one hour) time periods, when engaged in activity. Under these circumstances, time is hazy, indistinct, indefinite, and, as a result, the passage of time during the task is underestimated, so that it seems that "time flies." This second-order factor is interpreted as quick task-completion.

Factor B. This second-order factor consisted of a substantial negative loading (-.682) for the impotency factor (6) and a substantial positive loading (.798) for the intensive imaginative elaboration factor (8). A moderate negative loading (-.383) was noted for the gratification postponement factor (15). Two other first-order factors had small loadings on this second-order factor: pessimism-inactivity (2) (-.282); and over-reproduction of short-term duration (1) (.219). These factors shared a common component.

This second-order factor is defined, basically, by views which regard time to be deep and strong (potent), and by a brief time span in stories.

This factor is indicative of a dimension of importance of a brief period of time (five to twenty minutes), during which events of a story transpired. Time is conceptualized as short, isolated, action-filled periods during which the presence of time enters awareness and becomes

intense. An orientation toward the present is indicated, and gratification is received by reaching and passing a "deadline" or barrier at which point the intensity of time subsides and it becomes soothing. Future time is forceful and profound, and provides an immediate barrier. This second-order factor is interpreted as future avoidance - present orientation.

Factor C. This second-order factor consisted of a substantial positive loading (.851) for the negative achievement -anxiety factor (10). A moderate positive loading (.571) was noted for the rhathymia factor (3). Three other first-order factors had small loadings on this second-order factor: pessimism-inactivity (2) (-.214); boredom (11) (.272); and recency (12) (.207). These factors shared a common component.

This second-order factor is defined, basically, by low need achievement via conformance, and high manifest anxiety.

This factor is indicative of a dimension of low socialization and social anxiety. Lack of confidence regarding the future (which is regarded as purposeful) is apparent; there is no indication of proposed personal actions to overcome a bleak outlook on present circumstances. Symptoms of withdrawal from social interaction are noted, in the form of an irresponsible, impulsive attitude. A low educational level can be inferred. This factor is interpreted as social maladjustment.

Factor D. This second-order factor consisted of a substantial positive loading (.888) for the boredom factor (11). A moderate negative loading (-.378) was noted for the recency factor (12). Other first-

order factors had small loadings on this second-order factor: pessimism-inactivity (2) (.314); short-range personal anticipation (5) (.256); negative achievement -anxiety (10) (.292); and gratification postponement (15) (-.221).

This second-order factor is defined, basically, by high boredom during a long-term (one hour), task-filled interval.

This factor is indicative of a dimension of boredom with long tasks. Further interpretation of this second-order factor, beyond the level of the first-order boredom factor, is difficult. Time is full, and is not to be wasted on unimportant boring tasks which last over an hour. This is interpreted as the boredom factor.

Factor E. This second-order factor consisted of a substantial negative loading (-.896) for over-reproduction of short-term durations (1). A moderate negative loading (-.617) was noted for the recency factor (12). Two other first-order factors had small loadings on this second-order factor: intensive imaginative elaboration (8) (-.204) and pessimism-inactivity (2) (-.260). These factors shared the common component for this second-order factor.

This second-order factor is defined, basically, by under-reproduction of short-term, fifteen second, filled intervals.

This factor is indicative of a dimension wherein short intervals pass slowly. Related to this is extension of non-personal past and extension of personal future, as well as a positive attitude toward the future. Although this indicates a generally high perspective score for past and future, interpretation of the relationship between this and

under-reproduction is difficult. The existence of the past and future, as separate from the present, which moves slowly, and is regarded as always here, is postulated. This factor is interpreted as under-reproduction of short-term durations - high time span.

Factor F. This second-order factor consisted of a substantial positive loading (.898) for slowness-leisureliness factor (4). A moderate positive loading (.501) was noted for positive evaluation (7). Three other first-order factors had small loadings on this second-order factor: over-reproduction of short-term durations (1) (.221), impotency (6) (-.208), and clarity (13) (.212). These first-order factors shared the common component of this second-order factor.

This second-order factor is defined, basically, by a preference for passive-naturalistic, static, imagery.

This factor is indicative of a dimension wherein time is regarded to be relaxing and comforting. Time, which is slow, is positively evaluated. The future is not worth moving into -- it is distant, and therefore is irrelevant. Time is strong, clear, and soothing, and, if used properly, is beneficial. Time, which is regarded to be slow, allows for happiness, rest, peace and comfort. This is interpreted as the comfort factor.

Factor G. This second-order factor consisted of a substantial positive loading (.904) for short-range personal anticipation (5). Small loadings were reported on this factor for three first-order factors: positive evaluation (7) (.290), boredom (11) (.224), and gratification postponement (15) (.258). These factors shared a common component.

This second-order factor is defined, basically, by a low future extension score for personal events, that is, by an orientation toward events which occur in the near future.

This factor is indicative of a dimension of orientation toward future personal events which are expected to occur soon. Further interpretation of this factor, beyond the level of the first-order factor, is difficult. This second-order factor is interpreted as the short-range personal anticipation factor.

Factor H. This second-order factor consisted of a substantial negative loading (-.902) for long-range impersonal anticipation (9). A moderate positive loading (.356) was noted for the impotency factor (6). A small negative loading (-.292) was noted for the gratification postponement factor (15). These three first-order factors shared a common component.

This second-order factor is defined, basically, by a short estimate of the number of years that will pass before an impersonal event will occur.

This factor is indicative of a dimension of narrow future orientation, or a short time span, for non-personal events. Time is impotent, and can not be assumed to extend far into the future. This dimension indicates present orientation, and a "distrust" in the distant future. Hopefulness, optimism, and pregnability of non-personal time is indicated, in that the immediate future is seen as eventful and productive. This factor is interpreted as short-range impersonal anticipation.

A short summary of the 8 (eight) second-order factors, with description and interpretation, is presented in Table VIII.

TABLE VIII

Summary of Second-Order Factors
and Interpretations

- Factor A. Quick task-completion.
Inattentiveness to long time periods, resulting
in underestimation, during a task
- Factor B. Future avoidance - present orientation.
Importance of present time which is intense
because of immediate barrier in future
- Factor C. Social maladjustment.
Social anxiety, social withdrawal, and lack of
confidence regarding the attractive future
- Factor D. Boredom.
Boredom with tasks which last long and are
unimportant
- Factor E. Under-reproduction of short-term durations - high time span.
The present moves slowly and is separate from
the future and the past
- Factor F. Comfort.
Time is regarded to be slow and comforting
- Factor G. Short-range personal anticipation
Orientation toward near personal future events
- Factor H. Short-range, impersonal anticipation.
Optimism regarding immediate future; Pessimism
regarding distant future, for impersonal events

Third-Order Factor Analysis

An underlying system of broad temporal types, that is, the relationships between temporal orientation and other general traits of individual differences, has not been uncovered by the second-order factor analysis. To obtain factors which are more inclusive, it was decided to perform a third-order factor analysis. This was performed, in order to elicit some broad temporal types to be uncovered in an underlying system of the second-order factor matrix.

Table IX presents the intercorrelational matrix for the oblique second-order factors. The factoring of the matrix, with unity in the diagonals, produced the principal components solution (Table X) which was rotated to the varimax criterion. An oblique solution which was derived by promax rotation of the varimax solution was raised to the sixth power. The results of this third-order factor analysis, that is, the loadings of the second-order factors on the rotated, oblique third-order factors, are presented in Table XI. Four third-order factors were retained, as described below and summarized in Table XII.

Interpretation and Description of Four Third-Order Factors:

Factor I. This third-order factor had a substantial positive loading (.732) for quick-task completion (A), a substantial negative loading (-.743) for boredom (D), and a moderate negative loading (-.462) for social maladjustment (C). Short-range, impersonal anticipation (H) had a small negative loading (-.247).

This factor is defined primarily by a view which regards time to

TABLE IX

Product-Moment Correlational Matrix; Means; Standard
Deviations; for Second-Order Factors
(decimals omitted)

	A	B	C	D	E	F	G	H
A								
B	011							
C	-102	-092						
D	-265	066	202					
E	-088	0317	212	170				
F	-220	-029	-259	-010	-014			
G	068	125	-060	183	158	-253		
H	-235	-047	-132	141	-018	207	068	
Mean	019	-046	124	074	-155	102	109	-039
St. Dev.	342	319	286	300	270	291	263	291

unity was assumed in the diagonals

$p < .05$; $r = .514$. $p < .01$; $r = .641$

TABLE X

Unrotated Factor Loadings: Principle Components
Solution (decimals omitted)

Second-Order Factor	I	II	III	IV
A	508	-534	-072	319
B	315	008	714	-386
C	-524	-410	-195	-525
D	-663	083	406	-193
E	-652	-183	-314	374
F	069	-774	-203	041
G	-247	-324	622	526
H	-241	598	240	303

TABLE XI

Rotated Factor Loadings; Oblique Solution (Promax)
 (2nd power) (decimals omitted)

Second-Order Factor	I	II	III	IV
A	732	-179	-031	247
B	-169	-059	844	166
C	-462	-733	-141	-152
D	-743	-087	061	267
E	-157	-082	-754	238
F	-113	624	-044	-442
G	-015	088	-029	908
H	-297	645	-062	146

be hazy, by underestimation of long-term (one hour) activity-filled intervals, and by high interest during a long-term (one hour) activity-filled interval. Secondary defining features of this factor are: a future which is regarded to be organized, predictable, dynamic, and attractive; personal events which are planned far into the future; a non-personal past which is limited to recent events; high need achievement via conformance; low thoughtfulness; low rhythmia; high sociability; low manifest anxiety; and over-reproduction of short (one to ten seconds) intervals.

This factor is indicative of a dimension of task-involvement, fast time (slow internal tempo), and ambition. Primarily, a high score on this factor indicates a dimension wherein time moves fast during relatively long periods which are taken up by involvement in an interesting task. When this activity is attended to, awareness of the passage of time is hazy or unclear, because of involvement, until the conclusion of the task, when the estimate of the time period which has elapsed is lower than the actual time period.

A low score on this factor indicates a dimension in which time moves slowly during relatively long periods which are taken up by non-involvement in a boring task. Because of an absence of task-involvement, the activity is not attended to, and the passing of time enters awareness, so that at the conclusion of the task, the estimate of the time period which has elapsed is higher than that of the actual period.

Further interpretation of the dimension of this factor can be made on the basis of the minor defining features. Involvement with an

interesting activity and fast time seem to extend into the distant future, toward which there is a positive personal attitude. Ambition and confidence regarding the eventual attainment of a life-long goal is indicated.

Conversely, non-involvement with a boring activity and slow time seem to extend only into the near future, toward which there is a negative personal attitude. Pessimism regarding the importance of a life-time goal seems to be indicated.

Generally, this third-order factor can be described with reference to the present flow of time, which is fast under conditions of interest. Relatively long periods, of about one hour in duration, are especially applicable to this description, in that an interesting task during this period will result in an unclear awareness of time duration, and, as a consequence, an underestimate of the length of this duration. This is exemplified by the common saying "lost track of time" which is pertinent upon the discovery that time has passed faster than anticipated. This is also true, to a smaller extent, for the distant future, such that an interesting task which takes place over a period of years will result in an unclear awareness of time duration, and, as a consequence, an underestimate of the length of duration. This is exemplified by the common saying "how time flies." This description is especially relevant under conditions of thoughtfulness, restraint, and sociability, as well as need for achievement and low manifest anxiety, which appear to contribute to the involvement construct.

The converse of the factor description is one in which the present flow of time is slow under conditions of boredom. A boring task will result in a clear awareness of the time duration and, as a consequence, an overestimate of the length of this duration. This is relevant particularly to periods of one hour, but also to the near future, so that life can be regarded as "a drag!" This description is especially relevant under conditions of thoughtlessness, rathymia, low sociability, low achievement need, and anxiety.

This factor is interpreted as task involvement. Basically this factor emphasizes the duration of the present flow of time, which, under conditions of interest, i.e., involvement, is underestimated.

Factor II. This third-order factor has a substantial negative loading (-.733) for social maladjustment (C), and moderate positive loadings (.624 and .645 respectively) for comfort and short-range, impersonal anticipation (F, H).

This factor is defined primarily by high need achievement via conformance, by low manifest anxiety, by a preference for passive-naturalistic imagery, and by a short estimate of the number of years that will pass before a non-personal event occurs. Secondary defining features of this factor are: low rathymia and low extraversion; low boredom during a long-term (one hour) task-filled interval; a non-purposeful, uneventful, and unproductive distant future; an eventful and productive near future; a high score for extension of past for non-personal events; a view of time as warm and good, but slow and relaxed; high need achievement via independence. This factor is indica-

tive of a dimension of control, confidence and immediacy of future.

Primarily, a high score on this factor indicates a dimension of calmness, confidence, and independence regarding attainment of short-term goals. Since time is slow and relaxing, the near future is conceptualized to be "distant" enough to allow for manipulations which are necessary to effect control of the many events which are expected to occur at that time, enabling personal attainment of short-term goals. The distant future is regarded to be irrelevant because it is uneventful and unproductive, and is extremely "distant" conceptually. (These goals are not defined by needs which are exclusively personal but by needs which are "other-oriented", that is, common to many individuals, viz. social, economic or political needs).

A low score on this factor indicates a dimension in which there is doubt, uneasiness, and dependence regarding personal attainment of long-term, non-personal goals. Since time is fast and discomforting, the distant future is conceptualized to be too "close" to allow for manipulations which are necessary to effect control of the many events expected to occur at that time which would enable attainment of the distant goals. The near future is regarded to be relevant because it is eventful and productive, and is extremely "close" conceptually.

Further interpretation of the dimension of this factor can be made on the basis of the minor defining features. Control of the "distant" near future can be facilitated by restraint and introversive tendencies (since time is slow), and by interest during slow tasks.

Conversely, control of the "close" distant future can be

facilitated by rathymia and extraversive tendencies (since time is fast), and by boredom during long tasks.

Generally, this third-order factor can be described with reference to non-personal future time, which, under conditions of confident restraint, is visualized to be close to the present time. A calm and composed optimism outlook regarding personal control of the immediate non-personal future is expressed. Because time is conceptualized to be slow, there seems to be an abundance of time until the immediate future arrives. Therefore, the important need to accomplish important common needs can be satisfied by utilizing this time. Time is regarded as a "friend" and is used beneficially to satisfy others' needs within a short space of time.

The converse of this factor description is one in which the future, under conditions of sceptical impulsiveness, is visualized to be distant from the present time, and beyond control. Because time is conceptualized to be fast, there is a shortage of time until the immediate future, and therefore there is no need to accomplish needs by this time. In this regard, time is not regarded as a friend.

This factor is interpreted as social adjustment-impersonal future. Basically this factor emphasized social adjustment, slow time, and optimism regarding attainment of a non-personal goal. To further illustrate this factor, the example used to describe the first-order factor long-range impersonal anticipation (comparing five and twenty years conceptually) can be referred to.

Factor III. This third-order factor had a substantial positive loading (.844) for future-avoidance - present orientation (B), and a substantial negative loading (-.754) for under-reproduction of short-term durations - high time span (E).

This factor is defined primarily by views which regard time to be deep and strong, a brief time span in stories, over-reproduction of short (15 second) durations. Secondary defining features of this factor are: restriction of non-personal past; boredom with long tasks; inorganization of an inactive, unattractive, undynamic future; preference for immediate gratification; views which regard time to be soothing, old and empty. This factor is indicative of a dimension of present orientation and over-reproduction.

Primarily, a high score on this factor indicates a dimension of restriction of future and past time perspective and tenseness and swiftness of short intervals. The frame of reference for the conceptual location of the place of events along a time continuum is restricted, so that events are conceived to occur, in past and future time, close to the present. Short time intervals pass by quickly, placing additional stress on the present activity of immediate time awareness.

A low score on this factor indicates a dimension of extension of future and past time perspective, and softness and slowness of short intervals. Events are conceived to occur, in past and future time, at some distance from the present. Short time intervals pass by slowly and do not place pressure on the activity.

Further interpretation of this factor can be made on the basis

of other defining features. The orientation toward present time is strengthened in that long tasks are regarded to be boring, and immediate gratification is preferred.

Conversely, orientation toward distant time is strengthened in that long tasks are regarded to be interesting and delayed gratification is preferred.

Generally, this third-order factor can be described with reference to an orientation toward the present. The future and the past are merged into the present, so that the distance between "now" and "then" is reduced, and everything is seen to happen with reference to "now." There is confidence in the present only, and fear of the future, which is regarded as a dangerous barrier. The present is conceptualized as moving quickly, in fast, short intervals. Time runs in a kind of rhythmic movement, in which hectic events take place, and then subside, within minutes, as a pulse.

The converse of this factor description is one in which there is an orientation toward the future, which, along with the past, is distinctly separated from the present. Confidence is placed in the future but not the present. Time runs in a slow, rhythmic movement.

This factor is interpreted as present vs future-time orientation. Basically, this factor emphasizes the presence of present time, which is regarded as fast and conceptualized in short intervals.

Factor IV. This third-order factor had a substantial positive loading (.908) for short-range personal anticipation (G), and a moderate negative loading (-.442) for comfort (F). Small loadings were reported

on this factor for three second-order factors: boredom (D) (.267); under-reproduction of short-term duration - high time span (E) (.238) and quick task completion (A) (.247).

This factor is defined primarily by a low future extension score for personal events. Secondary defining features of this factor are: under-reproduction of short intervals; preference for dynamic-hasty imagery; views which regard time to be fast, tense, full, irritating, sharp, shallow, cold and bad; high boredom during a long task.

Primarily, a high score on this factor is indicative of a dimension of orientation toward future events which are expected to occur soon. Primarily, the high loadings for this factor indicate a dimension of immediate personal future orientation.

A low score on this factor indicates a dimension of distant personal future orientation.

Further interpretation of this factor can be made on the basis of the minor defining features. Preference for speed of time contributes to the immediate future orientation, such that there is a desire for an event to occur as soon as possible. Time is negatively evaluated, also, as it is a "boring drag."

Conversely, preference for slowness of time contributes to a distant future orientation, such that there is an attitude that the future is too far away.

Generally, this third-order factor is a "maverick", in that it is comprised by one test which made up two variables. This test is completely unrelated to others. At all levels it formed factors which

were virtually independent.

This third-order factor can be described with reference to an orientation toward the personal future time, which is visualized to be close to the present time. This limited length of time span for personal events in the future can be regarded as an indication of lack of planning, or lack of thought regarding the future, but not necessarily a negative attitude toward the future.

Conversely, the extended length of time span for personal events in the future can be regarded as an indication of planning for the future.

This factor is interpreted as anticipation of personal events. It is independent and in no apparent manner is related to other measures of immediate future anticipation.

A short summary of the four third-order factors, with description and interpretation, is presented in Table XII.

TABLE XII

Summary of Third-Order Factors
and Interpretations

- Factor I. Task involvement.
Estimation of duration and evaluation of boredom-interest of relatively long (one hour) task filled intervals.
- Factor II. Social adjustment - impersonal future.
Social adjustment (including social extraversion and restraint, high need achievement in a social context, low manifest anxiety); the connotative meaning of time as slow, relaxed, warm, and good; and the close anticipation of non-personal (historical) events.
- Factor III. Present vs. Future Time orientation.
Estimation of duration of relatively short (15 sec.) intervals; time span in story productions; the connotative meaning of time as strong and deep.
- Factor IV. Anticipation of personal events.
Orientation toward personal future events; the connotative meaning of time as slow, relaxed, warm, and good.

CHAPTER IV

DISCUSSION

The results of the third-order factor analysis indicate that four distinguishable factors were retained at the third order. Examination of these factors would disclose that, on the basis of the variables used in this experiment to measure various aspects of temporal orientation, the experience of time consists of two distinct measurable entities: time perception and future time perspective. The first and third factors, task-involvement and present vs. future time orientation respectively are basically dimensions of time perception, that is, perception of the duration of the flow of present time. The second and fourth factors, social adjustment - impersonal future and anticipation of personal events respectively are basically dimensions of future time perspective. Furthermore, these differentiations are noted to be in line with the differentiations of the "objective" viewpoint and the "subjective" viewpoint. Each of the two entities is distinguishable by the nature of each third-order factor, however, so that although there are two entities, each of the four factors is different from the other. Time perception is differentiated in accordance with the length of the duration which is being perceived. Perception of the length of longer durations (Factor I) is a unique ability, and perception of the length of shorter durations (Factor III) is a unique ability. Future time perspective is differentiated in accordance to the degree of the personalization of the future. Non-personal, or impersonal future

perspective (Factor II) is a unique trait, and personal future perspective (Factor IV) is a unique trait. The other possible differentiations of these factors which can be pointed out will be discussed at a later point.

Discussion of the third-order factors

In order to avoid repetitions in later discussions, it is convenient to discuss each factor separately at this point. When comparing the factors at a further point, reference can be made to discussion of the factors, individually.

It must be pointed out that the factors which were obtained are subject to verification by a properly controlled experiment. The factors, as they now stand, can not be taken as pure fact until this verification is obtained. In this light, comparison of the factors with results obtained in previous studies should be restricted as qualified, until further verification is obtained.

Factor I. Task involvement. This factor provides some empirical evidence for the common belief that time goes faster when an individual is pre-occupied with an interesting task. This is especially relevant for hour-long periods when time is regarded as hazy.

The description and interpretation of the loadings which comprise the major part of the commonality of this third-order factor, as described in the above paragraph, are basically useless since they offer no new information except that haziness of time is an important variable. Meaningful information can be gleaned from the secondary defining

features, which provide an indication of the relationship of temperamental and motivational variables to "task-involvement - fast time." Associated with the major part of the commonality (underestimation, i.e., fast objective time; task interest; and haziness of time over an hour-long period) are minor defining features such as social adjustment, that is, high achievement need via conformance, low manifest anxiety, restraint; and a positive attitude toward the future, personal planning into the future, and a recent non-personal past. That is, interest in a task, and underestimation of elapsed time which is not regarded to be clear, is especially relevant during the flow of present time, although it is also extended into the distant future which is evaluated positively. This is characteristic of high need achievers who are relatively calm and confident regarding their ability to obtain socially approved goals by conforming. A tendency to see the past as part of the present (low extension of past time perspective) also seems to be implicit in the commonality. Generally, this factor is indicative of a positive outlook toward life in general, its goals and tasks, and an apparent disregard of time, which is unclear and hazy. Although the main dimension of this factor seems to be that subjective speed of time is slow (fast external time) under task-involvement, the specific variables accounting for the speed of subjective time are difficult to determine.

Wallach and Green's (1961) finding that the importance of time for the individual, rather than the activity level is related to the

subjective speed of time, is not confirmed by the results of this experiment. Grossman and Hallenbeck (1965) also concluded that the importance of time is not directly related to its subjective speed. In our results, no loading was noted for the concept of importance of time, as measured by the "bad-good", "cold-warm", "strong-weak" and other variables. The activity level hypothesis seems to have more relevance for the dimension of this factor. Task-involvement, or interest, would seem to be more relevant to the activity level hypothesis since an interesting and involving task could be hypothesized to take more activity than a boring and uninvolved task. An important intervening variable, amount of attention paid to the passage of the interval, can be postulated on the basis of the loading for haziness of time. That is, less attention to the passage of time would result as a consequence of a high activity level for interesting, involving tasks, and more attention to the passage of time would result as a consequence of a low activity level for boring tasks. If this is true (further research is required), it is presumed that, on the basis of our findings, the estimate of duration of time over a long period is a function of the awareness of the passing of time, so that overawareness would result in an overestimate (slow objective time), and underawareness would result in an underestimate (fast objective time). (A negative relationship was found to exist between underestimation of time elapsed during a long task and boredom with the task; $r = -.265$).

It would seem that the importance of the differentiation between

intervals which are "filled" with an activity or a continuous sound or tone, and intervals which are "unfilled" (although strictly speaking mental activity fills every interval), that is, "empty space" between two stimulus points, is relevant to the discussion of awareness of passage of an interval. It appears that unfilled intervals would be more attention-attracting than filled intervals. Usually, research has reported that unfilled intervals are claimed to seem longer than filled intervals of the same length, using both estimation and production methods (Gulliksen, 1927; Fraisse & Oileron, 1951; Roelofs & Zeeman, 1951; Dobson, 1954, all reported in Orme, 1962). This would tend to confirm our prediction that overawareness results in slow objective time, although further research is required. Clausen (1950, reported in Wallace & Rabin, 1960), found no differences. Lindworsky (1931) reported that when attention is paid to the passage of time, unfilled intervals seem shorter. This is inconsistent with our results regarding filled intervals, when boring intervals seemed longer. The existence and the effect of this hypothetical construct require empirical evidential support, and of course it is difficult to define operationally attention, or awareness, paid to the passage of an interval.

Loehlin (1959, as reported in Orme, 1962), in a factor analytic study, found a factor which is virtually identical to this factor -- "an 'interest versus boring' factor where the most bored subjects gave the longest time estimates." Loehlin claimed that larger time estimates were made by bored subjects who were most "active" (that is, active as a temperamental trait, rather than active, or involved, in a task).

The factor which was found in this third-order analysis limited this activity to social activity (sociability).

Postman (1944, reported in Wallace & Rabin, 1960) found a tendency to overestimate actual intervals (3, 5, or 7 minutes) during activities such as addition, cancellation, and completion, without any effect of kind of task. This, however, is open to question, in that these tasks do not seem, intuitively, to hold much interest (although empirical evidence is, of course, required). Also, this conflicting result with Factor I can be questioned since the intervals were not as long as those of this study.

The discovery of a commonality between fast objective time (slow subjective time) as measured by verbal estimation and a positive future outlook, although not too large, appears to be in conflict with previous findings that time overestimation and a fast internal clock is associated with positive future (Zelkind & Spilka, 1965; Siegman, 1961; Geiwitz, 1965). This conflict can be explained in that the previous results were obtained using shorter (.1 to 200 seconds), empty intervals, and that the subjects were aware of the time estimation task; whereas the results of the present experiment, Factor I, were obtained using longer (35 to 70 minutes) intervals which were filled with a task and required that the subject not be aware of the time estimation requirement until the task was completed.

The importance of length of interval in the perceptual process cannot be questioned. As early as 1868, Vierodt found that long

periods were underestimated and short periods were overestimated. The differentiation between long durations and short durations is noted in this third-order factor structure. The importance of the length of interval and the relationship to FTP is noted in the following studies: Siegman (1961) found that the more extended the FTP, the greater is Ss overestimation, for short intervals of 12 to 20 seconds; Geiwitz (1965) found no comparison between estimation and FTP for longer intervals of 2 to 3 minutes; and the present study found a commonality between underestimation of longer intervals of 40 to 70 minutes and extended FTP. Of course, the comparison of these studies would be of greater validity if a study were undertaken which would control all extraneous variables, which were probably not equally controlled in all three studies.

A finding by Padres (1965) that extraverts tend to report more boredom when presented with repetitive, monotonous tasks, was found to be supported in Factor I of the present study for rathymia and high thoughtfulness (that is, thoughtlessness), but not for high sociability.

The negative loading by the social maladjustment second-order factor on this third-order factor lends some support to Orme's (1962) findings that psychopaths estimated 30-minute and 20-minute filled intervals to be higher.

This factor seems similar to findings by researchers that high need achievement is associated with a positive regard for the future (McClelland, 1953; Ricks & Epley, 1960). However, this factor limits this need achievement to the conformance type, in which socially

approved goals and methods of attainment are utilized, and emphasizes the importance of the utilization of the present time in achieving the goals of the future.

Factor II. Social adjustment - impersonal future. This third-order factor is indicative of control by self of the short-range future of others. The commonality of this factor includes loadings by measurements of time concept, future time perspective, and temperamental and motivational variables. A common component can be assumed to exist for preference for speed of time (slow, leisurely), the evaluation of time (good, warm, important), future time perspective (short-range, impersonal), temperament (restraint) and motivation (high need achievement via conformance and low manifest anxiety).

The description of this factor as one of a calm and composed outlook of optimism regarding personal control of the near non-personal future has presumably not been referred to, specifically, or discussed in any previously reported research.

The negative relationship ($r = -.259$) between preference for good and slow time, interpreted as preference for comforting time, and low need achievement via conformance, high manifest anxiety, and rathymia, interpreted as social maladjustment is not, intuitively, surprising. Social maladjustment, because it has negative connotations, would be predicted to have a negative relationship with a concept such as comfort which is positively regarded. Also, it seems that calmness, as indicated by lack of anxiety and by restraint, would include a preference for

a "comforting" dimension of time, since calmness and comfort can be postulated to be conceptualized similarly; that is, are compatible. Intuitively, if one is comfortable, one is usually calm. However, this is arbitrary, as it is based on interpretation and labelling of factors, which is always tenable.

However, the presence of the short-range, impersonal anticipation factor in the commonality of this third-order factor, is especially revealing. Insofar as the social maladjustment factor consists largely of a low achievement need (via conformance), it appears surprising that it would have a negative relationship with short-range impersonal anticipation. Usually, research has demonstrated that low need achievers have a short anticipation range (McClelland, 1953; Ricks & Epley, 1960; Mischel, 1960a, 1960b). The commonality of this factor indicates the possibility of a relationship wherein need achievers have a short anticipation range for impersonal events.

Research which has demonstrated that individuals who make high nAch scores tend to be "time-driven" and tend to perceive events as being in rapid motion (McClelland et al., 1953; Knapp & Garbutt, 1958, 1965), has apparently not been supported by the findings indicated by the commonality of this factor, where high need achievers were found to judge "time" to be slow. However, the measurement of the speed of time in these studies has not been consistent. In this study, the slowness-leisureliness evaluation of time is subjective. In this case, objective time would presumably pass by more quickly, and events would then be

perceived to be in rapid motion. This presumption could be considered as support for McClelland's notion that high need achievers tend to perceive events to be in rapid motion. Meade's results (1966) also support McClelland's contention that high need achievers have a basic concern with getting things done.

However, McClelland's contention that high need achievers tend to be time-driven, which is supported by Knapp and Garbutt (1958, 1965) is refuted by the description of the commonality of this factor. Knapp and Garbutt (1958) found that high need achievers evaluate rapid and hasty images to be descriptive of time, using the Time Metaphor Test. However, the commonality of the factor under discussion, (Factor II) indicates a relationship between high need achievement and evaluation of slow, static images as representative of the nature of time on the Time Metaphor Test. The Knapp and Garbutt (1965) study, using the semantic differential and thirteen opposite-adjective pairs which were virtually identical to those used in this study, provides an interesting conflict in findings (although it must be noted that in the present case, we are dealing with the whole of the commonality, and the conflict in question seems not to focus on the whole). They found high nAch "factorially proximate" to active, sharp, fast, tense, clear, hot (warm), happy, full, irritating and shallow. However, in this study, the commonality of this factor includes contributions by slow, relaxed, warm (hot), good, weak, and shallow, as well as the loading by nAch. Differences, especially with regard to the "slow-fast" and "tense-

relaxed" variables are noticeable. That is, whereas fast and tense are factorially proximate to nAch in the Knapp and Garbutt study, slow and relaxed are factorially proximate to nAch in Factor II of the present study. The differences may be due to the additional loadings on the present factor by such variables as restraint and manifest anxiety, which were absent in the Knapp and Garbutt study, or also due to the fact that only the conformance type of need achievement loaded on this factor, whereas need achievement in the Knapp and Garbutt study was not specified as to type.

Kastenbaum's study (1961) also tended to indicate a relationship between preference for images of time that suggest a definite movement toward the valued future and "middle-class interest in future achievements." Our finding indicates that this is not so when low manifest anxiety, restraint (calm confidence) and high need achievement via conformance are included. Such a dimension seems to be associated with a preference for "comforting" time descriptions and images.

This finding seems to contradict, also, the findings of a number of early clinical studies (reported in Wallace & Rabin, 1960) that psychopathological groups were characterized by limited time perspectives.

Stein's (1968) study reported that delinquents did not have an extended FTP. The present findings of this factor interpretation, namely that social adjustment and short range impersonal anticipation had a positive relationship in the commonality of this factor, can be regarded as evidence conflicting with Stein's, given a similarity between "delinquency" as defined by Stein and the accuracy of the inter-

pretation of the social maladjustment second-order factor which loads on this factor. This similarity is, however, doubtful, and the dissimilarity is the proposed explanation for the conflict.

The findings reported by Lipman (1957), Albers (1966) and Einstein (1964) that high anxiety Ss are strongly future-oriented tends to be supported by the interpretation of the commonality of this factor. This interpretation seems to provide evidence that low anxiety Ss are restricted in future outlook. The postulate that the central feature of anxiety is a dread of the future (May, 1950) seems to be supported in this factor. Comfort and social adjustment form a commonality with short-range anticipation, not with long-range anticipation. It is presumed that long-range anticipation would result in more anxiety. Therefore, confidence can only be restricted to short-term future.

Some of the discrepancies may be explained with a reference to a study by Bendig (1964), in which nAch was factor analyzed. Two factors were found in Bendig's study, personal need achievement (PNA) and social need achievement (SNA). To the extent that these factors can be compared with need achievement via independence and need achievement via conformance respectively, it seems that SNA, or Ac, is relevant to the commonality of this factor. The study by Meade (1966), which supports McClelland's contention, was with reference to personal achievement. The studies by Knapp and Garbutt, which measured nAch with the Thematic Apperception Test, did not take the SNA and the PNA factors into account. This difference is relevant in discussions of

the nAch - speed of time relationship in that time seems to be a cooperative force for high social need achievers in this factor, whereas in studies by Knapp and Garbutt (1958, 1965) and McClelland (1953) time seems to be a competitive force. Bendig's results are of further interest in this discussion since he indicated that SNA should correlate more highly with social E-I and PNA should correlate with restraint. The commonality between Ac and restraint in the social maladjustment factor is unexplainable in Bendig's terms, except for the possible differentiation between SNA and Ac. In this regard, the correlations between Ac and Soc ($r = .315$), Ac and Res ($r = -.218$), Ai and Res ($r = -.417$) at the first-order level, i.e., between variable scores, tends to support Bendig's contention. A possible explanation is that, for this factor, a unique relationship exists between social-conformance need achievement and restraint.

The "social" aspect of this third-order factor is strengthened by the third-order commonality between need achievement via conformance and short-range impersonal anticipation ($r = -.070$, variables). This similarity indicates a definite type of social aspiration, or social climbing to achieve immediate goals which are assumedly not directly personal in nature. A good example of this description would be the political candidate two weeks before an election.

The differences in FTP may also explain some of the discrepancies. Stein's study (1968) for example, utilized the Personal Events Test when discussing the relationship between delinquency and FTP, whereas

this factor relates social maladjustment and impersonal FTP. Another example is the study by Ricks and Epley (1960) who did not differentiate FTP. These discrepancies between findings for the relationships discussed above can be accounted for by the makeup of the commonality of the social maladjustment second-order factor. Whereas research which was referred to isolated need achievement, or manifest anxiety, this factor did not do so.

The interaction between need achievement and manifest anxiety holds some importance when studying the relationship with time. There seems to be an effect, which can only be studied by control and manipulation of variables, wherein the interaction between nAch and MAS seems to produce a different effect than either variable alone or than the sum of the two variables. The difference seems to be that high need achievers who are concerned with getting things done, and who show a general preference for swiftly moving events and ideas and are impatient with slow activities, are more anxious, and see the possibility of not reaching their goals. Therefore, they feel that they will require an abundance of time to avoid the failure of reaching the goal. Consequently they have an extended FTP. Those who have less anxiety, are confident, and do not foresee the possibility of not reaching their goals, generally prefer slow time. Therefore, they do not need an overabundance of time, and have a more restricted FTP.

With regard to the extraversion-introversion variables, or more specifically, restraint, which contributes to the commonality of this

factor, it is intuitively not surprising that restraint is positively associated with judgment of "time" to be slow. Also, research by Lynn (1961), Eysenck (1959) and Claridge (1960) reported that extraverts under-reproduced an interval and introverts over-reproduced an interval. The over-reproduction by introverts is an indication of slow subjective time (fast objective time). In this regard, the finding of the commonality of this factor, which included evaluation of time as slow and good on the Time Metaphor test and the semantic differential, supports the findings reported by the above researchers. However, on the basis of our findings, it is questioned whether the reported association between extraversion-introversion and fast-slow subjective time is not, in effect, an association between the rathymia-restraint component of extraversion-introversion and fast-slow subjective time.

Also, the absence of a loading by the time perception variables of reproduction on the same factor as restraint raises a question regarding the proper measurement, or interpretation, of subjective time experience. Tests used to measure this are of necessity indirect, but include such diverse measurements as Time Concept or reproduction tests. This question is only valid insofar as the reproduction and restraint tests would be assumed to be measuring the same trait.

As has been stressed, proper proof of some assumptions suggested above would emanate from a study manipulating anxiety, need achievement via conformance, and need achievement via independence, (and perhaps extraversion-introversion variables, depending on the purpose of the

study), in order to measure both impersonal and personal future anticipation, as well as preference for speed of time, and perception of time. From the factor analytic point of view, however, this factor has apparently, never been reported in any previously related research.

Factor III. Present vs. future time orientation. This third-order factor is indicative of an orientation to the present, avoidance of the future, and perception of short intervals as passing quickly. Interpretation of the loadings of this factor indicate that time is restricted in perspective, and the temporal framework focuses on the present. In addition, it appears that time is a powerful but restricted dimension. Everything happens with reference to the present. A "boundary" on either side of the present-oriented framework prevents an extended conception of the past or of the future. Also, time is conceived as passing quickly.

The major commonality of this factor does not contain any non-temporal variables. This is strictly a "time" factor. However the description of the factor is such that a number of temperamental or motivational aspects have been found, in previous studies, to be related to such a temporal dimension. The lack of any such relationship on this factor is perhaps the result of a failure to include additional non-temporal variables in the experimental design. Because there were three times as many temporal variables as non-temporal variables, the relationship between them would have to be quite strong to obtain more than one "time-personality" factor, at the third-order level. The lack of any

"personality" loadings on this factor is similar to the finding by Lessing (1968) that neither the Personal Events Test nor the Story Completion Test yielded any statistically significant personality correlates.

Previous research has reported that people who are emotionally disturbed and/or socially delinquent have a defective, limited future orientation (Federn, 1952, Fenichel, 1951), but there was no indication of this (by a loading by sociability or manifest anxiety) in the commonality of the present factor. Possibly, content analysis on the stories would elicit a delinquency theme which may be positively correlated with a short future span, but this was not undertaken in the present study.

With reference to a previous discussion (Factor II) regarding high need achievement, in which findings cited previously reported an association between high need achievement and preference for fast time, it would appear that need achievement would be expected to load positively on this factor. However, it would also appear that need achievement would be expected to load negatively on this factor, because of the loading for a restricted future orientation. Therefore, it can be seen that the absence of a loading for need achievement is not surprising, since such a loading would be inconsistent with other loadings, based on previous findings. Actually, a factor with loadings for high need achievement, evaluation of and perception of time as fast, and an attractive and extended future, could have been predicted; but such a factor did not appear to have been obtained (unless Factor II may be interpreted

as such).

Stein et al. (1968) found that the more socialized youth is capable of facing rather than avoiding the unpleasant realities in the future. There was no negative loading for the sociability variable on this factor, although this may be due to the possibility of a discrepancy between sociability and socialization.

On the basis of research by Eysenck (1959), Claridge (1960), and Lynn (1961), which reported an association between reproduction of short intervals and extraversion-introversion, it would seem that E-I would be expected to load on this factor. Intuitively it would appear that rhythmia would have a positive correlation with fast time and therefore contribute to the commonality of this factor. This was not the case, however. Given that the absence of these findings is not contradictory to the intuitive prediction, this absence may be explained in that these traits are not related to the entire factor structure.

According to Eson (1951), the child of eight years is primarily concerned with the present and projects into the future only when he is stimulated to anticipate a future event. His conception of the past is also fairly restricted. This description seems to fit the general pattern of this factor (although Eson did not study the speed of time). In this sense, this factor is similar to temporal behavior at an early developmental stage (latency).

Relationships between various temporal measures were indicated by the commonality of this factor.

The commonality of future time perspective (as defined in this factor by Delay of Gratification Scale and Story Completion Test) and time perception (as defined by the reproduction test) is of some importance and relevance for our discussion. The finding reported by Zelkind and Spilka (1965) that overestimation is associated with positive and favorable future views is directly relevant to the interpretation of this factor. Factor III, presently the subject of discussion, has loadings in opposite directions for future avoidance - present orientation and under-reproduction of short term intervals - high time span (which correlate $-.317$, second-order factor correlations). From this, it can be deemed that over-reproducers have a fear of the future and under-reproducers have confidence in the future. This is similar to Zelkind and Spilka's (1965) findings, although measurements of time perception vary between studies. Since overestimation is indicative of fast subjective time (slow objective time) (Bindra & Waksberg, 1956), it can be assumed that fast subjective time is associated with a positive future. Also, since overestimation and under-reproduction correlate positively, and since during over-reproduction, subjective time is slower than objective time, this factor indicates that fast subjective time (slow objective time) (under-reproduction) is negatively associated with a negatively connotated future and an orientation to the present. That is, when time is perceived as passing slowly, the future is regarded as distant and favorable. (This seems similar to Factor II, where time is slow and relaxing and there is an indication of confidence regarding attainment of short-term goals). Siegman (1961) and Geiwitz (1965) also found that

the greater the range of the FTP, the faster the subjective time and the slower the objective passing of time. It appears, then, that the general description and interpretation of this third-order factor is consistent with previous research. The commonality between fast time - present orientation and slow time - future orientation may be explained in the following hypothetical postulative manner. When subjective time is slow, and objective time is fast, the objective world, in a sense, is ahead of the individual. There is, therefore, a need to "keep up" with the objective world, by focusing on the duration of the present time, to prevent falling behind. However, when subjective time is fast, and objective time is slow, the objective world is, in a sense, behind the individual. The individual has forged ahead, into the future, so that there is a need to "stay ahead" of the objective world, by focusing on the future.

There is a slight tendency for recency, or a low perspective for non-personal past time, to contribute to the commonality of this factor. There is some consistency evident here, in that past perspective and future perspective contribute to the commonality of this factor in the same direction -- toward the present. A general concept of short time span, both past and future, can be postulated, since high past perspective loads negatively and low future perspective loads positively on this factor.

The finding by Wallach and Green (1961) that the importance which time has for the individual is the crucial determinant of the subjective

speed of time can be deemed to have relevance for this factor. Although no variable measuring importance of time was included in the experimental design, evaluations of time as weak, shallow, old, and empty seem to indicate that time, per se, is not important (although this is subject to empirical proof). On the other hand, it would appear that the primary and secondary defining features of this factor indicate an overconcern with present time, and a fear of the future, so that on an intuitive basis, the concept of "now" seems important (rather than the concept of "time" per se). This, if true, may account for the speed of short intervals, since Wallach and Green found that when time is highly valued, it is described as passing quickly. In addition, it should be noted that the importance of time hypothesis was rejected for Factor I, a dimension of longer, activity-filled intervals.

There is no contribution by the Personal Events Test to the commonality of this factor. The future aspect of the commonality was composed of loadings by the Story Completion Test and the Immediate Delay Scale. These tests seem to be less realistic and more fantasy-like than the Personal Events Test. Also, the PET and the SCT are differentiated in regard to the length of FTP measured. This factor dimension describes short-term FTP, that is, a few minutes (10 to 30); whereas the short-term FTP for the PET is described as a few days (1 to 7). In this regard, the commonality of the factor emphasizes concern with present time, and ignorance, or avoidance, of the future.

It is notable that both high structure and low structure stories

contributed to this factor. Whereas Lessing (1968) found that these two variables were differentiated, basically they are the same, as indicated by the commonality of this factor. They both measure the same trait. The correlation, however, between the high and low structure is .322 (first-order level or correlation of variables), indicating that there is some difference between the stems assuming .322 is greater than the reliability coefficient. This is indicated by the difference in magnitudes of loadings on three first-order factors: 3, 6, and 12. The differentiation was found by Lessing to be such that low structure stories elicited a further time span than high structure stories, which included a reference to time at an early hour and thus presumably elicited a time span restricted to one day. In our study, no differentiation was found for low structure stories.

The commonality of this third-order factor includes loadings for potency of time and for fast time. This would seem to lead to the conclusion that there is a positive association between potent time and fast time. However, this cannot be assumed since the entire commonality must be examined at this level, and single variables or lower-order factors within a third-order factor cannot be isolated for discussion. Potency of time and fast time are, in fact, not associated ($r = -.006$, first-order factor correlations). However, from the factor structure, it would seem that time potency, intensiveness of time, fast time, and present orientation are inter-associated.

Factor IV. Anticipation of personal events. This third-order

factor is indicative of a short-range personal anticipation.

This factor is a "maverick", that is, it is surprisingly defined primarily by only one test, the Personal Events Test (Wallace, 1956) from which were derived two variables. Both variables were a measure of extension of future time. From this, the indication is that the PET, as employed in the present experiment, is more independent of the other "future" variables employed, viz. Hooper's (1962) five scales of attitudes toward the future, the Story Completion Test, the Delay of Gratification Test, and the Non-personal Future Scale. More meaning can be gleaned by use of the PET, because there are many aspect of the future measured by this test which are not measured by the other "future" tests. The PET is obviously more personal than the other future variables. That is, the events given by the S in response to the stimulus item of the PET refer to actual personal events which S predicts have a possibility of occurring sometime during his life-time. The other tests are more hypothetical, and somewhat more depersonalized than the PET. That is, the S is removed from the situation, and is not directly involved. Or, in the case of the Delay of Gratification Scale, the test may be too absurd or fantastical. These are probably the major reasons for the loadings of this factor. Another plausible explanation for the greater portion of the commonality consisting of a single test is the mode of response to that test. The PET allows for an unstructured response; it is open-ended. Also, as was explained in the discussion for Factor III, the length of FTP is a determinant. The scores which were obtained

ranged from days to decades, but for this factor, the loading is for the short end, for which the scores are in terms of days or weeks. Scores for the other tests also had distant future estimates, so the importance of this aspect is assumed to be minor.

On the basis of the number of "future" variables included in the experiment, it could be postulated that if an almost pure future factor were to be retained, it would be that test which consisted of the greatest number of variables, viz., the FTP attitude inventory (since presumably all scales of the inventory, although factor analyzed, have a commonality). Or, an FTP extension factor consisting of loadings by the extension scale of the Hooper, as well as the PET, could have been expected. However, such factors were not discovered. It appears therefore, that the other tests are interdependent and to a certain extent are measuring the same trait whereas the PET is measuring an independent trait.

The negative loading by the comfort dimension on this factor seems to indicate that time is very uncomfortable for short-range personal anticipation. That is, it goes too fast, it is too tense and cold, and it is bad because it exerts pressure of a sort to reach that point of anticipation indicated by the commonality of the factor.

Similarities and Differences of the Third-Order Factors

As was discussed previously, on the basis of the variables used in the experimental design to measure various aspects of temporal orien-

tation, the experience of time was found to consist of two distinctly measurable entities: time perception and future time perspective. Factors I and III are basically dimensions of time perception, and Factors II and IV are basically dimensions of future time perspective.

However, upon further examination of the components of the commonalities of each factor, it becomes apparent that future time perspective, in addition to Factors II and IV, also composed part of the commonality, albeit a minor part, of Factors I and III. Factor I contains a small loading (-.330) by the second-order factor H (short-range impersonal anticipation) and Factor III contains a loading which implies fear of the future, the second-order factor B (future avoidance-present orientation) (.837). This finding, wherein a future dimension contributes to the commonality of all the factors, is evidence of the importance of the future dimension as an aspect of temporal orientation. This finding is strengthened by the discovery that time perception does not have even a minor contribution to the commonality of the two third-order factors on which it does not form the basic dimensions.

This finding indicates that future time perspective is more important than time perception in that it is a contributing component to many various aspects of temporal orientation, as indicated by the factors, whereas time perception is a contributing component only to specific aspects of temporal orientation. That is, time perception contributes only to the factor defined basically by itself, and does not form even a minor aspect of a non-time perception factor.

These differences, in that future time perspective was found to be more heterogeneous than time perception, may be accounted for by the heterogeneity of future time perspective variables, as compared with the more homogeneous time perception variables. That is, although there were originally twelve future perspective variables and thirteen time perception variables, the future time perspective variables were basically measuring different aspects of future time perspective, whereas the time perception variables were measuring basically one aspect of time perception: reproduction. That is, the separation of trials into variables did not differentiate the feedback or standard reproduction variables to an adequate level. To do this, different methods of time perception, such as estimation, comparison, and production should also have been utilized to measure perception of shorter intervals. If this were the case, the conclusion regarding the importance of FTP compared to time perception would be substantiated to a greater extent.

Another aspect of temporal orientation, time concept, also has contributions to the commonalities of all four third-order factors. In this sense, that it is a contributing component to many various aspects of temporal orientation, that is, the four factors, time concept is also an important aspect of temporal orientation. However, the three Osgood factors -- evaluation, potency, and activity -- do not emerge clearly from the analysis. Good-bad, the pivotal scale for the evaluative factor (Osgood et al., 1957, p. 52) loads on Factors II

and IV. Strong-weak, the pivotal scale for the potency factor, loads on Factors II and III. However, the pivotal scale for activity, active-passive, does not contribute to the commonality of any factor at the third-order level.

Time concept seems intrinsically different from time perception or from future time perspective, which focus on time along a specific point in a temporal continuum, i.e., present or future respectively. Time concept seems to refer to time per se, that is, the entire continuum. It is on this basis that the four third-order factors were differentiated, i.e., on the basis of the specific point on the continuum.

Further comparison of the third-order factors and the interpretations of the loadings which comprise their commonalities can be made at this juncture.

Factors I and II. These two third-order factors are similar in that they are both defined by, among others, second-order factor C (social maladjustment) and second-order factor H (short-range impersonal anticipation) ($r = -.132$). Of these, factor C loads negatively on both factors, and factor H loads negatively on Factor I and positively on Factor II. Notwithstanding the differences between magnitudes for the loadings, and considering the other second-order factors which contribute to the commonalities of the third-order factors, (boredom and quick task-completion to Factor I; and comfort to Factor II), some interesting hypotheses can be derived. For the socially adjusted (or more specifically, for individuals with high Ac, low T, low R, high S, and

low MAS), it is comfortable (or more specifically, "time" is judged to be slow) to plan for the short-range impersonal future. However, for the same population, the distant impersonal future is planned for, or at least oriented towards, under conditions of involvement (high interest) and quick task-completion (perception of long time as passing quickly while performing tasks). From this, a slight relationship between boredom and comfort ($r = -.010$) can be postulated wherein for the socially maladjusted boredom and slow time is uncomfortable but for the socially adjusted involvement and fast time is comfortable. Perhaps social maladjustment could be separated into its components, viz., Ac, R, S, T, and MAS, and similar relationships could be postulated between any one or combination of these and comfort, boredom and distance of planning for short-term impersonal future.

From this discussion, it appears that research along this line could assist in determining whether involvement is comforting and whether boredom is a contributing factor to non-comfort and social maladjustment.

Factors I and III. These two third-order factors appear to be completely dissimilar. In fact, they are almost conceptually opposite. Whereas Factor I describes a distant non-personal future, Factor III is defined by fear of the future. Factor III implies, in its commonality, overconcern with present time, and Factor I seems to imply underconcern with present time. From this, a negative relationship can be postulated between concern for passing of present time and concern for the future.

Factors I and IV. These third-order factors seem to contain some similarities and some differences. However, as is true of comparison of most of the factors, these are at a secondary level. The non-personal future is anticipated to be distant, as interpreted by a small loading on Factor I. However, the personal future is anticipated to be close, as interpreted by the loading on Factor IV. Both factors contain a positive loading for quick task-completion and boredom loads differentially on these factors (negative on I) (positive on IV). Notwithstanding the differences between magnitudes for the loadings on these factors, an hypothesis can be postulated wherein, for quick task-completion (underestimation of long-term duration), under conditions of interest, the non-personal future is conceived to be distant but under conditions of boredom the personal future is conceived to be short. Personalization of future, in this case, would be an added variable which would have to be manipulated. The prognosis for any significant findings from this hypothesis would appear to be poor. Basically, they seem to be dissimilar.

Factors II and III. These two factors appear to be basically dissimilar. However, fear of the future, which has been interpreted to constitute part of Factor III, seems to be implied in the description of the commonality for Factor II as well. In both factors, the distant future is regarded negatively. However, for Factor III, this seems to apply to the entire future, including the short-term future. For Factor II, the short-term impersonal future is deemed to be eventful and productive, and is the focus of orientation. However, for Factor III,

the orientation is toward the present, toward "now", and any aspect of the future is avoided.

A minor point is that for Factor II, a secondary defining point is interest but for Factor III boredom is a secondary defining point. From this, it can be hypothesized that a positive future is a characteristic of interesting tasks but a negative future is a characteristic of boring tasks. That is, when an individual constantly finds himself confronted with boring or with interesting tasks, his future is negative or positive respectively, according to his conceptualization.

Factors II and IV. These two third-order factors are similar in that they are both defined by, among others, second-order factor F (comfort), which loads positively on Factor II and negatively on Factor IV. Also, the primary loading on Factor IV is by second-order factor G (short-range personal anticipation) and a prime loading on Factor II is by second-order factor H (short-range impersonal anticipation). Insofar as we can consider second-order factors G and H to be conceptually belonging to two independent dimensions, (not at opposite ends of a bipolar dimension, but constituting independent dimensions) ($r = .068$), but identical except for the personalization aspect, some interesting hypotheses can be postulated. There seems to be an important difference between these two third-order factors, in that orientation to others' short-range future is more comforting (specifically, time passes slowly and is favorably regarded) ($r = .207$) but orientation to one's own short-range future is uncomfortable (specifically, time

passes quickly and is not regarded favorably) ($r = -.253$). In this sense, if this hypothesis is true, there seems to be an indication that, if time passes quickly when oriented toward one's personal future, time will pass slowly when oriented toward the future of others, or of society in general. This would enable non-personal goals in the short-range future to be reached to the exclusion of one's own personal goals. Of course, the differentiation between "personal" and "non-personal" is difficult. The non-personal events, as used in the experimental design, are beyond one's personal manipulation. Therefore, the hypothesis can be stated such that when one is personally oriented toward his own life events, time moves fast and is negatively regarded; but that when one is oriented toward non-personal events, which are beyond personal manipulation, time seems to go slow, making the short-range future reachable. This can be interpreted in the sense that if worrying about one's own short-range future is not comforting, worrying about others' short-range future is comforting.

Factors III and IV. These two third-order factors appear to be slightly similar. Basically they are independent, but there are some minor similarities. Second-order factor E (under-reproduction of short-term durations - high time span) which loads negatively ($-.774$) on Factor III, has a slight positive loading on Factor IV. Boredom is a secondary defining point of both third-order factors.

There is a slight inherent difference for future orientation, also. For Factor IV, there is an orientation toward the short-range

personal future, but for Factor III, the orientation is toward the present and away from even the short future. From this, an hypothesis can be postulated, such that time goes fast, under boredom, when the present is the focus of orientation, but that time goes slow, under boredom, when the short-range personal future is the focus of orientation. Because of the small loadings for Factor IV, prognosis for confirmation of this hypothesis is poor.

Comments

The variables which were selected for factor analysis were chosen on the basis of previous studies which reported findings of research on temporal experience. Because the tests and measurements used by researchers were diverse, it became necessary to include many different tests in the design of the experiment. One of the purposes of this experiment was to determine which of these tests were superfluous. That is, by factor analysis it was hoped to narrow down the many diverse tests to a small number of tests which measure the same traits as the original number of tests. In short, parsimony would be reached. But this was not found to be the case. Of the original 47 variables which were administered to the subjects as derived from 15 tests, 15 factors were found at the first-order level. That is, the 47 variables were narrowed down to 15 traits, or groups of performances; all of which correlate highly with each other and all of which are distinct from performances that do not belong to the group. Thus, it appears that there is a great amount of diversity in the original 47 variables. On

this basis, it can be concluded that temporal experience consists of many aspects which are more or less independent of each other.

More specifically, the psychophysical tests used in the design, i.e., reproduction of an interval of sound, formed a separate factor and did not seem to have important contributions to any other factor. The PET and SCT also form separate factors at the first-order level. The general diversity of temporal relationships exists not only between different aspects, such as future time perspective and time perception, but within future time perspective as well. Of course, one disadvantage of the present experimental design is the lack of other tests of time perception beyond the reproduction trials and the one estimation test of the duration of the experiment. Nevertheless, it seems that these too would be independent at the first-order level.

The "personality" variables which were incorporated into the design, more specifically, restraint-rhathymia, sociability, thoughtfulness, achievement via conformance, achievement via independence and manifest anxiety generally did not form a strong relationship with time. The boring variable, however, did contribute to Factor I. It appears that, in order to generate some additional "time - personality" relationships, which did not appear to be too strong, even in the third-order factor structure, that further non-temporal variables should have been included in the study. Variables which may have proven of benefit in eliciting the desired relationship are dogmatism, I.Q., locus of control (external or internal), neuroticism, perceptual and cognitive

organization, age, and others.

The measurement of the variable of social class would have greater validity, it seems, if such relevant aspects as educational status, occupational status, residential status, and financial status were taken into account in determining the score. It is recommended that further psychological research employing the variables of social class utilize a socioeconomic index of occupations as a measurement. Such an index has been derived by Blishen (1967), wherein, for Canadians, 320 occupations were placed in rank order on the basis of the socioeconomic index for each occupation. Possibly, a social delinquency variable could have been added.

Perhaps the administration of a single personality inventory, ostensibly covering a large number of temperamental, motivational, and ability traits would be beneficial. However, the utilization of these recommendations would not guarantee further "time-personality" relationships. Previous research utilizing the factor analytic design to study this relationship (Loehlin, 1959; Spreen, 1963) has been only partially successful. The relationship requires further study. The time concept variables seem to be of greater use than other temporal variables in this area. According to the results obtained in the present study, seems that there are relationships between extraversion-introversion and time concept (as measured by the semantic differential), that is, the evaluation of time per se; whereas relationships between E-I and a preference for or perception of any particular direction of time are

lacking. For example, time is evaluated to be dull by high rathymics ($r = -.307$). Individuals high in sociability tend to regard time as "fun." This interpretation is based on significant correlations between sociability and evaluations of time as young, clear, active and happy. Individuals high in thoughtfulness seem to evaluate time positively, but not as "fun." Significant correlations are between this variable and dull, happy, clear, and good. Correlations between the achievement variables and time concept variables do not reach significance, but, interestingly enough, the Manifest Anxiety Scale is significantly related ($r = .258$) to the "tense-relaxed" variable, such that individuals high in MAS tend to evaluate time as tense. However, further empirical proof of these tendencies is required, before acceptance of the relationships can be made.

Because of the tenability of these results, and because there is only one factor at the third-order level which consists of a large loading for both "time" and "personality", it seems that although a "time-personality" relationship exists, that it is neither strong nor stable. That is, within the limits of the measurements used in the present study, temperament and motivation do not correlate significantly with many aspects of temporal experience, and for the correlations that are significant, the degree of covariation is small. This finding does not rule out the possibility that temporal experience may be a unique and independent temperamental trait on the basis of which individuals may be classified.

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APPENDIX A

Permutations

PERMUTATION SHEET: PLEASE RETURN TO DR. BECKER IN PSYCHOLOGY DEPARTMENT

<u>S</u>	<u>S</u>	<u>S</u>	<u>S</u>
1. <u>D1e243A1BC</u>	25. <u>BA2D31e24C</u>	49. <u>BA2CD241d3</u>	73. <u>D2341bA1CB</u>
2. <u>CA2BD1b432</u>	26. <u>D321f4BCA1</u>	50. <u>BD2341eCA1</u>	74. <u>CBD21c34A1</u>
3. <u>CBA1D431c2</u>	27. <u>A2CD1c234B</u>	51. <u>BCD421e3A1</u>	75. <u>CA2D431a2B</u>
4. <u>D431a2CA1B</u>	28. <u>A2BD1a243C</u>	52. <u>CBD2431fA2</u>	76. <u>D41e23CBA1</u>
5. <u>D31b24A1CB</u>	29. <u>CBD4231fA1</u>	53. <u>CD1a234BA1</u>	77. <u>BA1D321c4C</u>
6. <u>CD431a2BA1</u>	30. <u>BD341a2A1C</u>	54. <u>A1CD1c432B</u>	78. <u>A2D41a23BC</u>
7. <u>BD3421eA2C</u>	31. <u>D31f42BA1C</u>	55. <u>CA1D41b32B</u>	79. <u>D421e3CA2B</u>
8. <u>A1BCD341e2</u>	32. <u>BCA1D1e234</u>	56. <u>A2BCD31f24</u>	80. <u>A1BD3421eC</u>
9. <u>D3421dCA2B</u>	33. <u>CBA1D3241d</u>	57. <u>D341f2A2CB</u>	81. <u>A1CD31f42B</u>
10. <u>BCA2D1a423</u>	34. <u>A2BD1b342C</u>	58. <u>CD1d324A2B</u>	82. <u>D4231fBA2C</u>
11. <u>A1BD231d4C</u>	35. <u>A2CBD2431d</u>	59. <u>D1a234CA1B</u>	83. <u>CBD1a423A2</u>
12. <u>A1D21c43CB</u>	36. <u>CA2BD1c243</u>	60. <u>BD21d34CA2</u>	84. <u>BA1CD1c234</u>
13. <u>D1e423A2CB</u>	37. <u>D3241dA2BC</u>	61. <u>D241d3CBA2</u>	85. <u>A2D4321bCB</u>
14. <u>CD1c423BA2</u>	38. <u>A1D3241dCB</u>	62. <u>CA2D341d2B</u>	86. <u>A1BCD231a4</u>
15. <u>BA1CD3421e</u>	39. <u>CBA2D2341f</u>	63. <u>A1CBD4231e</u>	87. <u>BCA1D1c342</u>
16. <u>BD4231eA2C</u>	40. <u>BA1D1a324C</u>	64. <u>CD1f432BA2</u>	88. <u>BA2CD41b32</u>
17. <u>CD31d42A1B</u>	41. <u>D21a43A1BC</u>	65. <u>D1b432BCA2</u>	89. <u>BCA2D31f42</u>
18. <u>D1c324BCA2</u>	42. <u>BCD 41b23A1</u>	66. <u>BD321f4A1C</u>	90. <u>D231c4BA1C</u>
19. <u>BCD4321bA2</u>	43. <u>CD2431cA2B</u>	67. <u>A2D41c32CB</u>	91. <u>A2D421b3BC</u>
20. <u>A1D1f342BC</u>	44. <u>D41d32A2BC</u>	68. <u>D21c34CBA2</u>	92. <u>A1CBD4321f</u>
21. <u>CBA2D21d34</u>	45. <u>A2CBD421b3</u>	69. <u>BCD2341eA2</u>	93. <u>BD31b24CA2</u>
22. <u>D1b342BA2C</u>	46. <u>A1D1f243BC</u>	70. <u>CA1D241f3B</u>	94. <u>A2CD21d43B</u>
23. <u>CA1BD21a34</u>	47. <u>BD241e3CA1</u>	71. <u>A2BCD41b23</u>	95. <u>CA1BD321a4</u>
24. <u>D4321aBCA1</u>	48. <u>CD231b4A1B</u>	72. <u>BA2D3241dC</u>	96. <u>D2431cCBA1</u>

APPENDIX B

Introduction to Experiment

(verbal instructions)

INTRODUCTION TO EXPERIMENT

This experiment is designed to study the psychology of time. It consists of two parts. The first part of the experiment will take place in this room. When we have finished the first part, I shall take you to another room for the second part.

We shall use most of the equipment that you see here. There are a number of tasks which I shall ask you to do. For each task, please be sure that you understand the instructions before you begin. If you do not understand, do not hesitate to ask questions. Work conscientiously and try your best on all tasks.

It will be necessary to remove your watch for the first part of this experiment. Will you kindly take it off and hand it to me? I shall give it back to you when I take you to the next room for the second part of the experiment.

Now we are ready to begin the first task.

(Set clock to time duration of experiment).

** **

APPENDIX C

Instructions for Reproduction of Short Intervals
(verbal instructions)

TO BE READ BY EXPERIMENTER

You will now be asked to estimate time intervals. This will be done without the use of a time-piece and without benefit from counting to yourself.

In front of you there is a switch, that can be turned on and off. When it is on, a buzzing sound is produced. When it is off, the buzzing sound is terminated. Try it for practice -- switch it on and off to produce and terminate the buzzing sound. (Wait for S to make practice runs).

On the other side of the partition is another switch that I can control. This switch will also produce the same buzzing sound when turned on. Now we are ready to start. I will sound the buzzer for a period of time, and then I will turn it off. After I have turned it off on my side, you will turn it back on, on your side, for the same period of time that I had it on. Remember to be prompt and attentive -- turn your switch off immediately to terminate the buzzing sound when you think it has sounded for just as long as it sounded when I had it on. You may find this difficult, but try your best. Please do not attempt to count off the seconds, either silently or out loud. We shall do this a number of times. I shall say "Ready?" just before we start each time.

If there are no questions, we can begin. (Wait for a few seconds and then say "Ready?")

** **

APPENDIX D

Score Sheet for Reproduction of Short Intervals

(scored by experimenter)

NAME _____

1. STANDARD

Trial	standard	K	set	production	S's reproduction	absolute	proportional
1	15 sec.						
2	15 sec.						
3	15 sec.						
4	15 sec.						
5	15 sec.						
6	15 sec.						
7	15 sec.						
8	15 sec.						
9	15 sec.						
10	15 sec.						

2. FEEDBACK

Trial	standard	K	set	production	S's reproduction	absolute	proportional
1	15 sec.						
2							
3							
4							
5							
6							
7							
8							
9							
10							

** ** * * * * *

APPENDIX E

Instructions for Story Completion Test

(verbal instructions)

Note: Scores analyzed for first four stories only.

You will now be asked to make up some stories. To do this, it will be helpful to imagine that you are an author who is writing a "short-short" story. In such a case, of course, the author would include a plot, with characters and events. Try your best to do this when telling your stories. Make sure there is a conclusion in every story. Two to four minutes for each story will be adequate. If you go over four minutes, I'll interrupt and ask you to finish the story in a minute or so. Make sure that none of the stories are identical.

1. First, I'll start one for you, and then let you finish it any way you wish. I'll start it now. "At three o'clock one bright sunny afternoon in May, two men were walking near the edge of town..." Now you start there and finish the story for me.
2. That was fine. Now I'll begin another story for you which, as before, you may finish any way you want to. Here it is: "At ten o'clock one morning, Al met his friend Jerry near the center of town..." Now you start there and finish it for me.
3. That was pretty good. Now here is the start of another story which you may again finish in any way you wish. "Joe is having a cup of coffee in a restaurant. He's thinking of the time to come when..." Now you start there and finish it for me.
4. Here is another story. I want you to finish it any way you wish, just like you did the other stories. Here it is: "After awakening, Bill began to think about his future. In general he expected to..." Now you start there and finish it for me.
5. This time, just tell me a story.

Now let's go back to each of the stories you've just told me.

1. The one with (main theme), it started with (beginning). This was at three o'clock in the afternoon. It ended with (conclusion). Now when was that? (hour, day, month, year). That means that ___ (hours, days, months, years) elapsed during the course of the story, right?
2. The story with (main theme), it started with (beginning). This was at ten o'clock in the morning. It ended with (conclusion). When was that? (hour, day, month, year). That means that ___ (hours, days, months, years) elapsed during the course of the story, right?
3. The third story, the one with (main theme), started with (beginning). Now when was this (hour, day, month, year). It ended with (conclusion). When was that? (hour, day, month, year). That means that ___ (hours, days, months, years) elapsed during the course of the story, right?
4. The fourth story, with (main theme), started with (beginning). Now when was this (hour, day, month, year). It ended with (conclusion). When was that? (hour, day, month, year). That means that ___ (hours, days months, years) elapsed during the course of the story, right?
5. The last story, the one with (main theme), started with (beginning). Now when was this (hour, day, month, year). It ended with (conclusion). When was that? (hour, day, month, year). That means that ___ (hours, days, months, years) elapsed during the course of the story, right?

APPENDIX F

Score Sheet for Story Completion Test

(scored by experimenter)

NAME _____

STORY PRODUCTION

Story I Beginning _____

End _____

Theme _____

Story II Beginning _____

End _____

Theme _____

Story III Beginning _____

End _____

Theme _____

Story IV Beginning _____

End _____

Theme _____

Story V Beginning _____

End _____

Theme _____

EXTENSION

time span	under 1 hr	1 hr to 4 hr	5 hr to 11 hr	12 hr to 6 days	1 wk to 2 mos	over 3 months
Story I	1	2	3	4	5	6
Story II	1	2	3	4	5	6
Story III	1	2	3	4	5	6
Story IV	1	2	3	4	5	6
Story V	1	2	3	4	5	6

APPENDIX G

Instructions for Time Metaphor Test

(read by subject)

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

You will now be given 25 cards. On each card there is a phrase which might be used by a poet or a writer to symbolize the nature of time.

In front of you is a form board. You will be asked to use this form board and evaluate the cards for their capacity to evoke what is, in your opinion, an effective image of the nature of time.

Here is what to do: (DO NOT START UNTIL YOU HAVE FINISHED READING THIS PARAGRAPH). Read over all 25 cards carefully, keeping in mind that you will have to evaluate the cards for their capacity to evoke what is, in your opinion, an effective image of the nature of time. After you have read over all 25 cards, look at the form board. You will notice that there are seven numbered boxes appearing in consecutive order. Above Box 1 is printed the words "least effective". Select the one card which you feel evokes the least effective image of the nature of time. Place that card in Box 1. Above Box 7 is printed the words "most effective." Select the one card which you feel evokes the most effective image of the nature of time, and place that card in Box 7. Boxes 1 and 7 indicate the extreme positions of the scale. The other Boxes, 2 to 6, indicate different degrees of effectiveness, arranged in a continuum from one extreme to the other. That is, Box 7 indicates a greater degree of effectiveness than Box 6 which, in turn, indicates a greater degree of effectiveness than Box 5. At the other end of the continuum, Box 1 indicates a lesser degree of effectiveness than Box 2, which, in turn, indicates a lesser degree of effectiveness than Box 3. Next, select the three cards which you feel should be placed in Box 2, that is, the three cards that you feel evoke the next least effective image of the nature of time (a little more effective than the card you placed in Box 1). Then select the three cards which you feel should be placed in Box 6, that is, the three cards that you feel evoke the next most effective image of the nature of time (a little less effective than the one you placed in Box 7). Then choose five cards which you feel should be placed in Box 3. Then choose five cards which you feel should be placed in Box 5. You should then have seven cards left over. Place these in Box 4.

If there are no questions, pick up the deck and proceed. Do this now before reading the next paragraph.

* * * * *

Now, as a check, count the number of cards in each pile to make sure that the number of cards matches the figure above each box, for example, that there is one card in Box 1, three cards in Box 2, five cards in Box 3, and so on.

** ** * * * * *

APPENDIX H

Score Sheet for Time Metaphor Test

(scored by experimenter)

Name _____

TIME METAPHOR TEST

FAST METAPHORS	score	SLOW METAPHORS	score
a dashing waterfall	_____	a vast expanse of sky	_____
a speeding train	_____	a quiet, motionless ocean	_____
a fast-moving shuttle	_____	a road leading over a hill	_____
a galloping horseman	_____	drifting clouds	_____
a fleeing thief	_____	wind-driven sand	_____
a space ship in flight	_____	the Rock of Gibraltar	_____
a whirligig	_____	budding leaves	_____
TOTAL	_____	TOTAL	_____

FAST TOTAL _____ minus SLOW TOTAL _____

SCORE _____

** ** * * * * * * * *

APPENDIX I

Instructions for Semantic Differential

(read by subject)

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

You will now be asked to judge "time" on a number of descriptive scales. These descriptive scales are opposite-adjective pairs. One example of a descriptive scale is the opposite-adjective pair, "hard-soft." In this example, you are asked to judge "time" as hard or soft. At first, it may be difficult for you to do this. It will be helpful to think along the following lines. These adjectives are used descriptively in common sayings such as "hard luck", "hard feelings", "soft life", and "soft heart" although they are not hard or soft in the sense that they can be touched. Similarly, "time" can be judged to be hard or soft, in the same manner that you would judge "luck" or "life" to be hard or soft.

Look at the example presented below: The "hard-soft" descriptive scale.

If you judge "time" to be extremely hard, then place an 'X' on the space on the extreme left. If you judge it to be extremely soft, then place an 'X' on the extreme right. If you judge "time" to be neither hard nor soft, or to be equally hard and soft, then place an 'X' in the space marked neutral. If you consider it as moderately hard or moderately soft, then place an 'X' in the appropriate space. Similarly, if you consider "time" to be slightly hard or soft, then place an 'X' in that space. Make sure you place an 'X' in only one of the seven possible choices.

If there are no questions, fill in the example presented below, for practice. Do this now before reading the next paragraph.

I CONSIDER TIME TO BE

hard	:	:	:	:	:	:	:	soft
extremely		moderately	slightly	neutral	slightly	moderately	extremely	
hard		hard	hard		soft	soft	soft	

AFTER DOING THE PRACTICE ITEM....

Now that you have had some practice on the hard-soft scale, you are ready to do the rest of the descriptive scales on the next page. Do these in the same way, and again in response to "I consider time to be"

APPENDIX J

Permutation a of Semantic Differential

I CONSIDER TIME TO BE:

active _____:_____:_____:_____:_____:_____:_____ passive
 empty _____:_____:_____:_____:_____:_____:_____ full
 young _____:_____:_____:_____:_____:_____:_____ old
 soothing _____:_____:_____:_____:_____:_____:_____ irritating
 dull _____:_____:_____:_____:_____:_____:_____ sharp
 happy _____:_____:_____:_____:_____:_____:_____ sad
 clear _____:_____:_____:_____:_____:_____:_____ hazy
 cold _____:_____:_____:_____:_____:_____:_____ warm
 bad _____:_____:_____:_____:_____:_____:_____ good
 fast _____:_____:_____:_____:_____:_____:_____ slow
 shallow _____:_____:_____:_____:_____:_____:_____ deep
 strong _____:_____:_____:_____:_____:_____:_____ weak
 tense _____:_____:_____:_____:_____:_____:_____ relaxed

APPENDIX K

Non-Personal Past Perspective

and

Non-Personal Future Perspective Tests

(completed by subject)

PAST AND FUTURE TIME PERSPECTIVE QUESTIONNAIRE

PART I: PAST ITEMS

Please indicate approximately how many years ago the following events took place. Answer as quickly and at the same time as accurately as possible in the blank in the right-hand column.

- . Discovery of penicillin _____ years ago
- . First observance of Mother's Day _____ years ago
- . First atomic explosion _____ years ago
- . Einstein's introduction of the Theory of Relativity _____ years ago
- . Conquest of Montreal by the English _____ years ago
- . Invention of the telephone _____ years ago
- . Completion of the Panama Canal _____ years ago
- . Harvey's discovery of the circulation of blood _____ years ago
- . Mussolini's founding of the Italian Fascist Party _____ years ago
- . First expedition to the North Pole _____ years ago

PART II: FUTURE ITEMS

Please indicate approximately how many years in the future you expect the following events to occur. Again, answer as quickly and as accurately as possible in the blank in the right-hand column.

- Man on the moon _____ years from now
- A cure for cancer _____ years from now
- Irrigation of the Sahara Desert _____ years from now
- Average human life span reaches 80 years _____ years from now
- Automobiles run by atomic power _____ years from now
- Population of Canada reaches 30 million _____ years from now
- Population of Canada reaches 100 million _____ years from now
- End of Cold War _____ years from now
- Average working week reaches 20 hours _____ years from now
- When you will have attained most of the things you want _____ years from now

APPENDIX L

Personal Events Test

(verbal instructions; scored by experimenter)

III

Name _____

TO BE READ BY EXPERIMENTER

WALLACE I

Now I'd like you to tell me any ten events that refer to things that may happen to you during the rest of your life.

How old might you be when that happens?

EVENT	AGE
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

A Mean age _____

B Most distant age _____

C S's age (nearest birthday) _____

Extension Score 1 Difference A-C _____

Extension Score 2 Difference B-C _____

APPENDIX M

Immediate-Delay Gratification Scale

(verbal instructions; scored by experimenter)

Name _____

IMMEDIATE-DELAY EQUIVALENCE SCALE

Suppose you were offered a choice of getting \$10 right now or \$100 tomorrow. You'd probably choose to wait until tomorrow. However, if you were offered a choice of getting \$10 right now or \$100 thirty years from now, you would probably choose to receive the \$10 right now. There must be some period of time somewhere between tomorrow and thirty years from now that the choice between receiving \$100 then and \$10 now would make you stop and think twice. In other words, receiving \$10 now might be thought of as being equivalent to waiting for some future date to receive \$100. Is this clear? (pause) Now,

	Time to Wait	Transfer Scale
1. How long would you be willing to wait to receive \$100 in preference to the alternative of receiving \$10 now?	_____	_____
2. How long would you be willing to wait to receive \$500 in preference to the alternative of receiving \$1 now?	_____	_____
3. How long would you be willing to wait to receive \$1,000 in preference to the alternative of receiving \$50 now?	_____	_____
4. How long would you be willing to wait to receive \$1,000 in preference to the alternative of receiving \$10 now?	_____	_____
5. How long would you wait to receive \$100 in preference to the alternative of receiving \$1 now?	_____	_____
6. How long would you wait to receive \$500 in preference to the alternative of receiving \$50 now?	_____	_____
7. How long would you wait to receive \$100 in preference to the alternative of receiving \$50 now?	_____	_____
8. How long would you wait to receive \$1,000 in preference to the alternative of receiving \$1 now?	_____	_____
9. How long would you wait to receive \$500 in preference to the alternative of receiving \$10 now?	_____	_____

** ** ** ** ** ** ** ** ** ** ** ** ** ** **

APPENDIX N

Instructions and Score Sheet for Verbal Estimation
of Duration of Experiment

(verbal instructions; scored by experimenter)

END-I + END-II

Name _____

TO BE READ BY EXPERIMENTER

Now I'd like to ask you to estimate exactly how many minutes have passed since you walked through the door and sat down.

S's estimate _____

Clock duration _____

Difference _____

That was the last task in the first part of the experiment. Now I shall take you to another room for the second part of the experiment. Here is your watch.

The second part of the experiment consists of two questionnaires which I want you to complete. For each questionnaire, there is a question sheet and an answer sheet. Please do not mark the question sheet. Please do this one first -- the one with the "I" marked on it. After you have finished it, go on and do the second one, with the "II" marked on it.

I have to come back to this room for the next subject, so you will be alone for the second part of the experiment. You will have plenty of time to complete the questionnaires. After you have finished the questionnaires, you probably will have to wait for 15 or 20 minutes until I return to sign your credit sheet, and check your answer sheet. You may find it helpful to take out a book to read while you wait for me to return.

** ** * * * * *

APPENDIX O

Boring-Interesting Scale

and

Social Class Test

(completed by subject)

END-III

Name _____

Now there are two final items before you leave.

First, please be very frank and let us know just how interesting the various tasks were, in general. Indicate this by circling the dot below that represents the correct distance between the two extremes of MOST INTERESTING and MOST BORING.

MOST INTERESTING. MOST BORING

Second, we would like to know whether your father is a blue-collar worker, or a white-collar worker. Please check the appropriate space below:

Blue-collar worker _____

White-collar worker _____

If there is a special condition that makes answering one way or the other difficult, please explain

Before you go, please put down phone number where we can get in touch with you if the need arises.

Phone number _____

APPENDIX P

Inventory of Attitudes Toward Future Time

INVENTORY OF ATTITUDES TOWARDS FUTURE TIME

Please do not write or mark on this booklet. Your answers to the items in this inventory are to be recorded on the separate answer sheet provided with the special pencil provided.

Print your name and sex in the blanks provided for this on the answer sheet. After you have finished filling in the blanks, continue reading the instructions.

This inventory represents a means of studying people's attitudes about their own future. On the following pages are 100 statements, each one beginning with "Future time for me is perceived as..." Indicate in the alternatives on the answer sheet, representing the five degrees of agreement-disagreement associated with each statement, the degree to which you agree or disagree with each statement.

Here is an example:

Future time for me is perceived as...

...something seemingly standing still, representing eternity.

1	2	3	4	5
Not at all		Somewhat		Very much so

If for you future time is perceived very much as in the above statement, you would darken alternative 5 on the answer sheet; if for you future time is perceived somewhat as in the above statement, you would darken either alternative 2, 3, or 4 depending on how much so; if for you future time is perceived not at all as in the above statement, you would darken alternative 1 on the answer sheet.

Remember, there are no right or wrong answers. Whether you agree or disagree with any statement, you can be sure that many other people feel the same as you.

If you have no questions please turn to the statements on the following pages.

** ** * * * * *

Future time for me is perceived as...

1. something seemingly standing still, representing eternity.
2. events which can be anticipated up to 70 years hence.
3. offering time enough for everything one must do with his life
4. " . . . a river of passing events . . . a rushing torrent".
5. moving too fast.
6. guided by one's lodestar, or having a purpose.
7. an unreal dimension of one's life (hard to believe one will be the same person then).
8. chiefly the process of becoming.
9. a joyous route to a promised land.
10. best dealt with by following the adage, "Eat, drink and be merry".
11. that which will never come to pass.
12. something separate from and having no connection with the present
13. lying heavily on one's hands.
14. a vehicle for one's journey of change and growth.
15. bearing little relation to the present.
16. given direction by one's "life-style".
17. so complicated it leaves one bewildered.
18. God's way, unfathomable to oneself.
19. an opportunity giving one time to prepare for the end.
20. only the remorseless ticking of the clock.
21. a continuation of one's past and present.
22. foreseeable in terms of a number of months ahead.
23. proving that the busy person always has the most time to get something done.
24. a prison--place where time ceases.
25. moving one toward one's desired destiny.

Future time for me is perceived as...

26. non-purposeful.
27. something clearly influenced by the sequence of past and present events.
28. well-organized (for ones's purpose).
29. a roseate dream.
30. one today is worth two tomorrows.
31. foreseeable in terms of a number of decades to come.
32. foreseeable in terms of a number of years to come.
33. demonstrating the proverb: "Time enough always proves little enough".
34. a time of diminishing productivity and fruitfulness for oneself.
35. an inexplicable moving from "here" to "there".
36. almost marking time, so slowly does it move.
37. largely influenced by the spin of the wheel of fortune.
38. something so nebulous one can't picture it.
39. something which one is eager to have arrive.
40. the right time to be living is the time one lives.
41. limitless, infinite in scope.
42. events which can be anticipated up to 50 years hence (to about A.D. 2018).
43. possessing frequent, important happenings.
44. a long, uneventful road to travel.
45. restricted or closed to opportunity for oneself to reach goals.
46. going somewhere in terms of one's goals.
47. carrying one along helplessly.
48. indeterminant yet reasonably comprehensible.
49. heavy, heavy lie one's future years.
50. a welcome change from now.

Future time for me is perceived as...

51. clearly perceived, near horizon.
52. lasting only as long as oneself.
53. that which will be even busier than now.
54. kind of dull and uneventful.
55. static, unchanging.
56. the past flowing into future through the present.
57. something one can make long-range plans for.
58. rather chaotic.
59. the surest poison.
60. something one cannot decide whether it will contain more advantages than now or disadvantages.
61. events which can be anticipated up to 10 years hence (to about 1978).
62. extending to when one has been able to realize most life-goals.
63. not barren of significant events.
64. reason for feeling heightened excitement and anticipation.
65. open-ended possibilities.
66. a directionless map.
67. full of accident and uncertainty.
68. something one must try to control.
69. unacceptable, as things have been going.
70. best handled by rolling with the punches from Father Time.
71. events which can be anticipated up to 30 years hence (about 1992).
72. extending only as far as one can foresee the next big step in life (e.g., job, marriage).
73. never a drag, a bore.
74. something standing still, an eternity of sameness.
75. offering a chance to retrace steps made in error.

Future time for me is perceived as...

76. unchartered waters for oneself.
77. part of an orderly process.
78. a time for which preparation will be an advantage.
79. something one must accept as containing both good and bad.
80. something to avoid looking toward whenever possible.
81. a clearly visible, distant horizon.
82. something blocked, dammed up by the immediate future.
83. vehicle for a great deal of activity to come.
84. full of change for oneself.
85. thin, rapid-flowing course of events, like a mountain brook.
86. thick-flowing like syrup.
87. fashioned largely by oneself.
88. increase in the complexity of one's life.
89. an enemy.
90. full of despair for oneself.
91. only that which immediately follows the here and now.
92. a foggy, indistinct view ahead.
93. more productive than the present.
94. something here and gone almost before one knows it.
95. erratic, jumpy, discontinuous stages.
96. periodic or cyclic repetition of one's past experiences.
97. under one's control generally.
98. predictable from the present.
99. a friend.
100. full of hope.

APPENDIX Q
California Psychological Inventory
(Factors Ai and Ac only)

THE CALIFORNIA PSYCHOLOGICAL INVENTORY
FACTORS Ac-Ai

Do not write in this booklet

INSTRUCTIONS:

In this booklet you will find a number of statements. Read each statement carefully. If the statement seems to be true, or if you agree with it, mark "True" on your answer sheet. If the statement is more false than true, or if you disagree with it, mark "False". If it is difficult to choose between "True" and "False", put down the one that seems ever so slightly more characteristic of the statement. DO NOT LEAVE ANY BLANKS.

There are no "right" or "wrong" answers and the purpose of the Survey will best be served if you describe yourself and state your opinions as accurately as possible. You may begin.

1. I have a very strong desire to be a success in the world.
2. I looked up to my father as an ideal man.
3. I liked "Alice in Wonderland" by Lewis Carroll.
4. Our thinking would be a lot better off if we would just forget about words like "probably", "approximately", and "perhaps."
5. I usually go to the movies more than once a week.
6. I have very few fears compared to my friends.
7. I have had very peculiar and strange experiences.
8. For most questions there is just one right answer, once a person is able to get all the facts.
9. I am often said to be hotheaded.
10. I seem to be about as capable and smart as most others around me.
11. When I was going to school I played hooky quite often.
12. I usually take an active part in the entertainment at parties.
13. I think I would like the work of a school teacher.
14. The trouble with many people is that they don't take things seriously enough.
15. When someone does me a wrong I feel I should pay him back if I can, just for the principle of the thing.
16. It is always a good thing to be frank.
17. Planning one's activities in advance is very likely to take most of the fun out of life.
18. It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes.
19. I was a slow learner at school.
20. I don't blame anyone for trying to grab all he can get in this world.
21. There is something wrong with a person who can't take orders without getting angry or resentful.
22. I like poetry.
23. I wake up fresh and rested most mornings.
24. Sometimes without any reason or even when things are going wrong I feel excitedly happy, "on top of the world."
25. I have a tendency to give up easily when I meet difficult problems.
26. It is all right to get around the law if you don't actually break it.
27. I certainly feel useless at times.
28. Parents are much too easy on their children nowadays.
29. I have the wanderlust and am never happy unless I am roaming or traveling about.
30. Teachers often expect too much work from the students.
31. I am sometimes cross and grouchy without any good reason.
32. I think I would like to fight in a boxing match sometime.
33. My parents have often disapproved of my friends.

34. I like to plan a home study schedule and then follow it.
35. My way of doing things is apt to be misunderstood by others.
36. I have often found people jealous of my good ideas, just because they had not thought of them first.
37. I have had blank spells in which my activities were interrupted and I did not know what was going on around me.
38. People pretend to care more about one another than they really do.
39. I like to keep people guessing what I'm going to do next.
40. The future is too uncertain for a person to make serious plans.
41. If given the chance I would make a good leader of people.
42. The man who provides temptation by leaving valuable property unprotected is about as much to blame for its theft as the one who steals it.
43. In school I was sometimes sent to the principal for cutting up.
44. I sometimes feel that I am a burden to others.
45. I like to read about history.
46. Only a fool would try to change our Canadian way of life.
47. I am so touchy on some subjects that I can't talk about them.
48. Lawbreakers are almost always caught and punished.
49. I like to talk before groups of people.
50. I dread the thought of an earthquake.
51. I am often bothered by useless thoughts which keep running through my mind.
52. I am bothered by people outside, on streetcars, in stores, etc., watching me.
53. I like to plan out my activities in advance.
54. I feel that I have often been punished without cause.
55. I must admit I find it very hard to work under strict rules and regulations.
56. I like large, noisy parties.
57. I always try to do at least a little better than what is expected of me.
58. I would be very unhappy if I was not successful at something I had seriously started to do.
59. I often lose my temper.
60. My parents were always very strict and stern with me.
61. I often get disgusted with myself.
62. Society owes a lot more to the businessman and the manufacturer than it does to the artist and the professor.
63. I think I would like to belong to a motorcycle club.
64. I used to like it very much when one of my papers was read to the class in school.
65. I don't seem to care what happens to me.

* * * * *