1965


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AN OBJECTIVE TIME-DIMENSIONAL PERCEPTION MEASURE GROUPING PAST, PRESENT, AND FUTURE TIME CONCEPTS; AN EMPIRICAL EXISTENTIALIST INDEX OF PERSONALITY DIFFERENCES.

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1965
AN OBJECTIVE TIME-DIMENSIONAL PERCEPTION MEASURE
GROUPING PAST, PRESENT, AND FUTURE TIME CONCEPTS;
AN EMPIRICAL EXISTENTIALIST INDEX OF PERSONALITY DIFFERENCES

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in
The Department of Psychology

by
Raymond Arthur Ulmer
M.S., University of Chicago, 1949
May, 1965
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ABSTRACT

This is the report of an experiment to investigate past, present, and future time dimensional thoughts, and a time frame of reference for thoughts as significant aspects of personality functioning. Linguistic and data processing procedures were developed to analyze objectively the time content of Thematic Apperception Test (TAT) protocols. Other investigators have shown that time analyses of TAT stories were feasible. In this study six TAT cards were used, two in standard form, 12 BG, and 3 BM, and four with a clock or calendar drawn into them, 6 GF, 4, 6 BM, and 13 MF. The Ss were given these cards and the resulting protocols were first time analyzed for "Time-Obvious Concepts" (TOCs), direct mentions of time, then "Time Concepts" (TCs) for both direct and implied expressions of time.

The Ss used were white males, ages 18 to 35: Louisiana State University undergraduate psychology students, firemen who represent an occupational group with little constant time pressure, and institutionalized chronic schizophrenic patients at the East Louisiana State Hospital in Jackson, Louisiana. The student and firemen Ss were from middle socio-economic class. The schizophrenic patients, who had often been hospitalized since adolescence, appeared
classless at the time of testing.

Three hypotheses were tested: (1) that linguistic criteria and data processing procedures can be developed which will enable the objective, empirical, and reliable scoring of TOCs and TCs; (2) that introduction of time symbols into the TAT cards will increase the number of TOCs; and (3) that students are likely to show the highest numbers of TCs, firemen second, and schizophrenics the fewest.

All the three hypotheses were essentially supported by statistical analyses. It was found that time symbols drawn on the TAT cards increased the number of direct mentions of time (TOCs). The order of both direct and subtle mentions of time (TCs) was shown with the students highest, firemen a close second, and schizophrenics lowest. Perhaps, most significantly, the judges' scoring of both TOCs and TCs showed equally high reliability.

Further examination of the data suggested that intelligence might be related to TP. The order of I.Q. means was identical to that of TP scores (TPSs), and the three groups represented distinct universes of I.Q.s. Additionally, there was a slight positive relationship between I.Q. and TPSs. Statistically equating the three groups for I.Q. to determine the effect on TPSs revealed that there would have been little change in TPSs, and that intelligence contributes very little to TP.

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TP appears to be a basic aspect of personality functioning which can be empirically, objectively, and reliably measured. Differences in TP seem associated with level of occupational choice and deviant personality functioning; an interacting relationship between them is suggested.
INTRODUCTION

Statement of the problem

The primary purpose of this experiment was to investigate past, present, and future time-dimensional thoughts, and a time frame of reference for thoughts as significant aspects of personality functioning. Philosophers, cultural anthropologists, neurologists, and speech therapists have discussed time perception (TP)\(^1\) from many frames of reference, but essentially on an observational basis. Other psychologists have objectively examined various aspects of sensitivity towards time from particular viewpoints for small selected samples. This study represents an attempt to extend these approaches and findings into the valuation of larger aspects of TP.

Needs for this study

Man lives and adapts himself in a world in which past, present, and future time dimensions appear psychologically significant. In his adjustments to his world he frequently seems aware of himself as a consumer of time. In addition,

\(^1\) "Time perception" (TP) denotes a sensitivity to the past, present, and/or future independently of which dimensions are being considered. This should not be confused with "time duration" which is the awareness or concern for smaller units of time, usually seconds, minutes, or hours.
May (1958) believes that man's anxiety and his relationships to others are profoundly influenced by his individual perceptions of time. Other students of time, especially experimentally-oriented clinical psychologists such as Lhamon, Goldstone, and Goldfarb (1964), have expressed similar sentiments:

All behavior involves a temporal component; all behavior exists within a temporal context. The capacity of people to harness duration into increasingly refined communicable and measurable units of experience provides a background for interpersonal, cultural and scientific transactions of remarkable complexity. The taken-for-granted ability to conceptualize a yesterday, today, and tomorrow, and the capacity to compare temporal experiences with those of others, permits an otherwise impossible level of socialization. The experimental study of time judgment is of obvious interest to the student of ordered and disordered behavior.

Historical introduction

Time has been of considerable philosophical and scientific interest to western man since the days of the Ancient Greeks. Plato believed that time is the mobile image of eternity, revealing itself in a world governed by cycles of recurring change, (Jowett, 1937). Aristotle noted that time does not exist without changes, (Fraisse, 1963). The philosophical basis for the scientific study of time probably began with Condillac (1798) who suggested integral empiricism as the basis for the awareness of time. Hume (1874), too, emphasized the sequential nature of events as prerequisite to a conceptualization of time. Later philosophers followed
this consecutive viewpoint, and attempted to form relationships with objective science. Kant suggested that an integrated approach to TP was necessary to form a common root for the laws of science (Greene, 1957). He believed that TP was based upon learning through experience rather than being innate.

Laboratory studies of time began with the introspective approaches of Mach (1865), Munsterberg (1889), Wundt (1908), and led to the development of experimental methods since introspection seemed unable to conceptualize the basic aspects of judgment of time duration. This early experimentalism led directly to the behavioristic approaches of Pieron (1923) and Pierre Janet (1928) in the twentieth century.

Definitions of time.

Objective and operationally useful definitions of time were needed for the empirical investigation of TP in this study. For this reason, only nine of the 28 noun definitions of "time" noted by Webster's New World Dictionary (1950) were used. These nine definitions seemed to represent objective, quantifiable aspects of time, and seemed suitable to a study in which a concern for time was to be measured. These definitions denoted a general awareness of time in any amount, whether related to past, present, or future time dimensions.
Cultural anthropology

Patterns of culture are known to be important factors in Indian as well as western societies in determining whether a people orient their lives around temporal factors. Most Indian societies showed relatively slight concern with any abstract system of generalization, especially towards time (Honigman, 1949). Hilger (1939) describes the Chippewa as typical in showing slight need to know the exact time of day, for no one had to be at work or meet an appointment at a very exact time. Another tribe, the Unalaska Indians, showed accurate perceptions of the year; this period seemed to be important to them through being associated with their livelihood of hunting and fishing (Veniamonov, 1840). This same pattern was also reported by de Laguna (1940) for the Tlingit of Southern Alaska and British Columbia who also used time very flexibly.

The westerner conceives of time very differently from the Indian (Hallowell, 1950). The westerner can transcend time intervals by abstract quantitative measures which enable him to think about time very differently than the Indian; however, a few westerners, particularly schizophrenic patients, have TP which is undifferentiated and similar to that of Indians. These significant variations in temporal orientation between western and Indian TPSs suggest that there may be cultural differences which act as major
determinants of TP. For these reasons, Hallowell (1955) suggests that western temporal orientation is a function of experiences in a cultural tradition with radically distinct patterns and historical roots which are separate from those of Indian culture. Hallowell's view seems supported by Cameron's (1955) report that Southern Salteaux Indians, who have accepted the periodicity of the week concept, are far more exacting in keeping appointments than Northern Salteaux Indians, who are not oriented to the week concept.

Cultural and subcultural factors are significant for time perspective (Hall, 1959). For example, "future" for the American is the coming months or years, but for the Asian the future may be the next hundred or five hundred years. The extensiveness of this time span is in direct contrast to that of Navajo culture where only the immediate present or the past has meaning, and the future of a few weeks or months does not merit concern.

**Perceptual, biological, speech, and other aspects of TP**

In addition to culture, TP appears directly relatable to personality and biological functioning, and a few of the more significant studies in each area seem to merit attention.

Changes in TP have been extensively studied in schizophrenic patients, normals under drugs, and patients given
insulin sub-shock treatment. The vast majority of these studies were carried out and reported by Hungarians. Schizophrenic processes and drugs have been shown to strongly influence TP (Drietomský, 1959). Huszek (1957), however, has argued that basic research is still needed to examine the underlying schizophrenic processes as well as the schizophrenic patient's reactions in the area of time perception. Other studies have shown that there are schizophrenic-like changes in TP using psychomimetic drugs, and that other psychotic conditions have been partially ameliorated with drugs. Iranyi (1957), among others has reported that lysergic acid diethylamide (LSD) administration has produced a model psychosis in which TP is severely impaired. Improvements in this model psychosis as well as in the natural form have been claimed by Kardos (1955). TP has also been shown by Vajda and Stobbe (1955) to improve with the administration of a modified insulin sub-shock treatment.

The role of psychiatry in treating TP and other disturbances has been detailed by Mousson-Kovacs (1956). He reports that the responsibilities of psychiatry in treating specific TP disturbances are closely related to the culture within which the patient must live. Mousson-Kovacs believes that each culture sets TP norms, and that TP and personality aberrations are usually associated.
A few significant studies have shown that TP changes can be associated with neurological impairment. Angyal (1958), to cite one researcher, has reported a case where there was a deterioration of TP and physiological changes of dementia. Simonyi (1959) specified the areas of neurological involvement associated with decreased TP as frontal lobe injuries. This is parallel to Sai-Hasz's (1955) finding that one-third of adult multiple sclerotics have been found to develop psychosis with reduced functioning of higher intellectual processes and loss or distortion of TP. Another investigator, Santha (1955), has shown that both aphasia and distorted TP were related to disturbances in specific areas of the brain. In other cases amnesia and deviant TP have been found following concussions (Gal, 1955). These observations are parallel to Nemeth's (1956) report that lobotomized and lobectomized patients are found to have impaired TP. When these conditions were improved by surgery or conditioning techniques, Pastor (1956), showed that TP may become less deviant.

Speech disorders and hallucinations in adults, and emotional difficulties in children have all been shown to be associated with impaired TP. Kornyey (1959) reports that when associational areas of the cortex are involved, both speech and TP are impaired. He cites a detailed case history of a 57 year old war-injured male to illustrate the specific
pre and post-injury functioning in each area. Another syndrome, alexia, or word blindness, has been related by Szecsdy (1959) to reduced TP. The "timelessness" nature of hallucinations has been related to TP by Iranyi (1959). Emotional disorders in children, especially deviance in TP, have been revealed through the study of children's drawings (Jakab, 1956).

Plan of this study

This experiment investigated TP as shown in time-related thoughts and sought to discover a time frame of reference for thoughts. Specifically, TP was considered a sensitivity or concern with the past, present, or future time, independently of which dimension was involved. Quantification of the amount of concern for time, and comparisons between Ss whose occupational and adjustment level seemed to reflect differing valuations of time was a basic aspect of this study. An experimental procedure was required which provided a large sample of each S's verbalizations which might then be evaluated for indications of interest and concern for temporal factors. Of necessity, the procedure needed had to be subtle and not obviously focused on the subject of time. Both these criteria appeared to dictate the choice of a projective test instrument; the Thematic Apperception Test (TAT) seemed to offer the ideal solution to
these problems.

This general procedure enabled the formulation of several questions in testable form which became the hypotheses of Studies I and II. First, do verbalizations of direct aspects of time increase when cultural symbols denoting time are added to standard projective test stimuli? Are these direct time referents objectively and reliably measurable? Lastly, are the more subtle aspects of TP measurable in an objective and reliable manner?

The hypotheses of this study were:

I. There will be an increase in the number of gross mentions of time when time objects—clocks, calendars—are introduced into a projective test.

II. There will be increasing deviances of TP shown with occupational and personality divergence from the norm.
METHOD

Before detailing the experimental procedures used, it was felt to be necessary to present an overview of these procedures. The methods employed in this study were directly dependent on the problem of objectively and reliably measuring TP. As previously noted, the TAT was the test instrument used, and for this reason the following sections offer the characteristics of the TAT, the rationale for its choice in this study, modifications made in the standardized TAT cards, and, finally, the experimental procedure of this study.

**Thematic Apperception Test (TAT): characteristics, applications, and scoring systems**

The TAT was the primary tool used to test the hypotheses of this study. A modification was made in the cards and new criteria were developed to analyze TAT protocols. Lindzey (1961) states that the TAT, in addition to being a projective test, is a perceptual instrument which is embedded in the linguistic structure of the society within which it is presented. Additionally, perception has been noted by Goldiamond (1962) to be an operant expression of behavior.
There have been previous modifications of the TAT for specific purposes. Caudill (1958) used a TAT-like test to study optimistic-pessimistic aspects of personality functioning with time symbols prominent in some pictures. Shneideman’s (1948) "Make-A-Picture Story Test" used TAT-like backgrounds and cut-outs of human figures. The resulting stories could be scored according to objective criteria. In neither modification did time aspects of personality functioning appear to be objectively measurable.

In contrast, the following experimenters have shown that specific time aspects of personality functioning could be objectively measured using standard TAT protocols. Eson (1944) used verb tenses as a measure of time orientation of Ss of different ages. Teahen (1958) studied academically superior children using verb tenses, and found his Ss to be future oriented. Older Ss, especially geriatric groups, have been shown to be past oriented (Fink, 1953). The relationship of time span, retrospective and prospective functioning, to specific aspects of personality were studied by Epley and Ricks (1963). Time-dimensional orientation in prisoners using verb tenses was examined by Laffey (1963) who has apparently made a very rigorous effort to measure "orientation" objectively.

Rationale for the choice of the TAT

Many considerations have led to the choice of the TAT
as a projective test which appeared likely to yield imagi­native productions for time analysis. A test was needed which was useful with those aspects of personality most closely related to a social context. The TAT has been re­ported by Lindzey (1961) to fulfill this requirement. Ad­ditionally, the projective material had to be objectively and reliably scorable for time aspects of personality functioning. This has been demonstrated by Eson (1944), Teahen (1958), and Fink (1953).

Methods of administration, as well as content, and quantity of responses were also considered important cri­teria for test selection. Both group and individual administration might be needed since large numbers of normal Ss as well as poorly motivated schizophrenic patients were to be tested. This experiment required that resulting proto­cols be independent of the method of administration; the TAT has been shown to fulfill this requirement by Murstein (1963), Lindzey and Silverman (1959), and Eron and Ritter (1951).

Content of responses was also important, since language was felt to be a more suitable response measure for the study of TP during this exploratory period than other aspects of ex­pressive behavior—e.g., posture, gestures, and facial ex­pressions. The latter measures have proven extremely difficult to quantify and relate to personality functioning. Additionally, the amount of response measure had to be
sufficient to permit time analysis. A language response measure tends to provide adequate material, and the TAT has been shown by Lindzey (1961) to elicit more responses with more content than other projective tests.

**Rationale for selection and sequence of specific TAT cards used.**

Characteristics of the time symbols introduced

This study has required special approaches because of the need for projective material which would permit objective analysis, and reflect molar aspects of personality functioning. Particular TAT cards were chosen which seemed to be associated with specific characteristics of this study, and which gave little suggestion of time. These could be used to form a baseline or operant level of TP. Other cards were needed which suggested time very strongly, and could be included in an experimental level of TP. Also, there was an attempt to control for the variables of size, dramatic significance, position, suitability for each TAT picture. Guidelines used for the choice and introduction of time symbols into the TAT cards were: wall clocks and calendars should be appropriate to the physical characteristics of the scenes represented by each card; time symbols should be noticeable without overshadowing the rest of the picture; symbols should be of relatively consistent size—about that of a dime; symbols should be placed for all figures about midway between the two figures, and towards the center of
The description of each card is taken from the "Thematic Apperception Test Manual" (Murray, 1943).

I. The two baseline or operant level cards consisted of the following:

<table>
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<th>Card Sequence</th>
<th>Card Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>12 BG</td>
<td>&quot;A rowboat is drawn up on the bank of a woodland stream. There are no human figures in this picture.&quot;</td>
</tr>
<tr>
<td>2</td>
<td>3 BM</td>
<td>&quot;On the floor against a couch is the huddled form of a boy with his head bowed on his right arm.&quot;</td>
</tr>
</tbody>
</table>

The first card was chosen for its neutral emotional tone since a pastoral scene without human figures might be especially effective in establishing rapport with schizophrenic patients who tend to be very suspicious of people. This card also seemed substantially timeless, and therefore appeared suitable for the base level of TP analysis.

The second card had an ambiguously cued figure which was expected to aid rapport. Many Ss have conflicts associated with either sex, and could perceive this figure as representing the opposite sex. This card also appeared timeless.

II. The four experimental level cards each had a single time symbol introduced into them. Both sexes were represented
in all subsequent cards to assist Ss to find a figure with whom he could identify. Additionally, having both a male and female figure might enable later researchers to use the same cards with female Ss who were not used in this study. The order of presentation was of increasing affect usually associated with stories chosen. A total of six cards was used for both levels because this seemed to provide a sample of enough different social situations to merit confidence in the resulting TP scores (TPSs) as an overall index of TP in many settings.

<table>
<thead>
<tr>
<th>Card Sequence</th>
<th>Card Number</th>
<th>Card Description</th>
<th>Time Symbol Introduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6GF</td>
<td>&quot;A young woman sitting on the edge of a sofa looks back over her shoulder at an older man with a pipe in his mouth who seems to be addressing her.&quot;</td>
<td>The time symbol used was a wall clock showing 5:00 as the time most likely to facilitate stories describing both work and after relationships in a scene often described as an office.</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>&quot;A woman is clutching the shoulders of a man whose face and body are averted as if he were trying to pull away from her.&quot;</td>
<td>A wall calendar showing &quot;1964&quot; was used to suggest the years spent together.</td>
</tr>
<tr>
<td>5</td>
<td>6 BM</td>
<td>&quot;A short stocky elderly woman stands with her back turned to a tall young man.&quot;</td>
<td>A wall calendar showing &quot;1964&quot; was used to suggest the years spent together.</td>
</tr>
</tbody>
</table>
Experimental procedure

Study I tested the introduction of time symbols into TAT cards 6 GF, 4, 6 BM, and 13 MF increased the number of "Time-Obvious Concepts" (TOCs). TOCs were defined as direct mentions of time—"clock," "hour," "day," etc. The specific criteria are noted in appendix C.

Two randomly chosen groups of white, male, LSU undergraduate psychology students, ages 18 to 35 were used. The control group, 10 Ss, was given the standard TAT cards and the experimental group, 15 Ss, was shown the same TAT cards, but with time symbols added. These latter cards were named the "Time Thematic Apperception Test" which will subsequently be referred to as the TTAT. Every S was given the complete six card sequence, but only the data from the last four cards—those noted above—were used in this study. All Ss were given the Shipley-Hartford to control for intellectual ability, and the Wechsler (1944) socio-economic criteria of appendix A were used to select for middle socio-economic class membership. All Ss were seen in the same large
classroom with the windows covered to prevent light from interfering with the image of the cards projected on a screen using an opaque projector. The order of testing was: (1) Shipley-Hartford; (2) TAT or TTAT cards; and (3) a short questionnaire asking them to identify themselves only by the number given them, and to describe the occupation, income, and education of their fathers.

The following instructions were read aloud to each group, and a copy was also given to each S. All Ss wrote their own stories without any help from the experimenter. Paper and ball point pens were supplied to each S.

**INSTRUCTION SHEET**

This is a test of your imagination to see how good you are at making up stories. You will be shown one picture at a time, and you are to write a story describing what happened just before the scene in the picture, and what the people in the story are doing and saying now, and what finally happens in the end.

Give each story a title, and put your number at the top of each page.

You will have only ten minutes for each story so write as quickly and as much as you can. Just write the first thing that comes to your mind. Don't worry about grammar, spelling or penmanship. Just write the first thing that comes to your mind.

If you have any questions, just raise your hand, and I will come over to you. Go ahead!!!!!!

Two judges\(^1\) independently scored these stories for

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\(^1\)The judges in Study I were Tama Luther, Ph.D., and Richard H. Rolston, M.A., clinical psychologists.
"Time-Obvious Concepts" (TOCs), using the criteria listed in appendix B. Subsequently, for each S, the judges completed the individual story record sheets of appendix C, and the individual record sheets of appendix F.

Study II tested whether "Time-Concepts" (TCs), which included both direct and subtle time referents, could be objectively and reliably scored. Also, the order of "Time Perception Scores" (TPSs) for groups of students, firemen, and schizophrenic patients were investigated.

All Ss were white males ages 18 to 35. The 18 student Ss were enrolled in an LSU undergraduate psychology course. They were selected for middle class membership using the same procedure as Study I. Order of test administration was: (1) Shipley-Hartford; (2) six card TAT or TTAT sequence; and (3) socio-economic questionnaire. The 21 firemen were tested in groups in large rooms at various fire stations of the Baton Rouge Fire Department. They were seen during working hours, using the opaque projector and a screen. Administration was identical to that for the student group, except that class membership was not tested. Firemen were considered middle class by occupational choice. The 15 schizophrenic patients were residents of East Louisiana State Hospital at Jackson, Louisiana. None were diagnosed as having organic brain damage, nor were any primarily diagnosed as intellectually deficit. Each patient was individually
tested in a small room on the patient's ward. He was given the instruction sheet, and this was read to him by the experimenter. In the case of the patients, each S dictated his story while the experimenter typed it. The Shipley-Hartford was also individually administered, often with the experimenter reading the items to the patient. Many patients had been hospitalized most of their adult lives, and appeared from their case histories to be essentially classless at the time of testing. The experimenter, alone, did all of the testing in both studies.

The TC scoring criteria of Study II, appendix F, may be the most significant aspect of this study, and its development merits description. Two pages of scoring criteria were included in the original prospectus suggesting this study. These criteria were applied by the experimenter and one of the committee members or judges of Study II to the time analysis of the same TAT stories. In each case, the experimenter compared his scores on specific stories to those of the other person acting as a judge. When there were differences in scoring, the rationale the judge had used was discussed at length. This would lead to the exploration of various approaches, the modification of existing criteria, and the addition of new ones. In most cases, a new "rule" would be formulated which might enable different judges to arrive at identical scores for a given concept. New examples
were added to increase the comprehensiveness and reliability of scoring. Convenience and consistency were considered when the criteria were reorganized into logical and linguistic criteria. This procedure lasted for several months until the 14 page "final form" of the scoring criteria and scoring procedures and sheets were developed. No further changes were made while the data of this study were collected.

Two different judges\(^2\) independently scored these stories for TCs using the criteria listed in appendix F. Subsequently the judges completed for each S the individual story record sheets shown in appendix G, and the individual S record sheets of appendix H.

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\(^2\)The judges in Study II were Bernard Benstock, Ph.D., Assistant Professor of English, Louisiana State University, and Mrs. Sue Ann Kennedy, M.S., clinical social worker.
RESULTS

The hypotheses were essentially confirmed. In general, Study I demonstrated that TOCs were reliably scored by the judges. The introduction of time symbols into the TAT cards resulted in an increase in TOCs. Study II showed that TCs also were reliably scored by the judges, and that the ordering of groups was: students highest, firemen second, and schizophrenics lowest.

High reliability of judges' scoring of TOCs, direct mentions of time, was found in Study I. This was shown by a .85 Pearson Product-Moment Correlation with a $p < .01$ for 23 df. Findings of Study I also show that time symbols introduced into the TAT increases the number of TOCs. Of the two student groups, the 10 (TAT) control Ss produced a total of 40 stories, and the 15 (TTAT) experimental Ss wrote a total of 60 stories. The increase of "Time-Obvious Concepts" (TOCs) was revealed by a TAT mean of .11 and a TTAT mean of .19, a difference of .08 ($p < .01$, 23 df). The $t$ was 2.28 which yields a $p$ of .02.

In Study II there was again found a high reliability of judges' scoring of TCs, direct and implicit mentions of time. This was shown in a Spearman rho between the judges of .81 with a $p$ substantially less than .01 and $t$ of 6.7 for 52 df.
The decreasing order of TCs was shown by mean scores of 48.16 for the students, 46.65 for the firemen, and 37.39 for the schizophrenics. Each S wrote 6 stories; consequently, the 18 students produced a total of 108 stories, the 21 firemen a total of 126 stories, and the schizophrenic patients created a total of 90 stories. A difference between the groups was indicated by an analysis of variance as shown by an F of 7.22 with a p of less than .01. These data are reported in Table 1.

Further examination using t tests revealed the following TC data. A comparison of students and firemen groups showed a t of .94 with 37 df; this was not significant. This finding suggested that the samples did not represent separate universes of time perceivers. The student and schizophrenic groups were shown to be significantly different as shown by a t of 3.2 with 31 df and a p of less than .01. Thus, they appeared to represent distinct populations. The firemen and schizophrenic patient groups also had a t of 3.2 with 34 df and a p of less than .01. Consequently, they appear to be distinct TP groups.

Order of TCs noted suggested that TP differences between groups might be due to intellectual distinctions between them. This information was available from Shipley-Hartford scores of all Ss. The mean IQ of the students was 112.61, for firemen, 103.57, and for schizophrenic patients, 88.33. Scores
TABLE 1
ANALYSIS OF VARIANCE OF TIME CONCEPT SCORES (TCSs) BETWEEN GROUPS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>995.6</td>
<td>2</td>
<td>497.82</td>
<td>7.22</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3,514.54</td>
<td>51</td>
<td>68.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>4,510.19</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ranged from 65 to 129 with distinct universes of intellectual ability for the three groups. Differences between groups was shown with an F of 19.05 and a p < .01 with 33 or more df. Furthermore, there was a mild positive relationship between intellectual ability and TP. This was shown in a Spearman rho of .24 with a p = .05.

This suggested statistically equating the Ss of the three groups for intellectual ability to determine the effect on TP. This was a "realistic" as well as a statistically meaningful question, since some firemen and some schizophrenics were known to have equivalent I.Q.s to those of this student group. This was tested by using analysis of covariance to control for intellectual ability, and revealed that there would be little change in TPSs if I.Q. was held constant, as reported in Table 2. These results were consistent with the Spearman rho of .24 between I.Q. and TPSs, which suggested that intellectual ability contributed very little to TP.
### TABLE 2

**ANALYSIS OF COVARIANCE OF EFFECT OF I.Q. CHANGES ON TCSs FOR STUDENTS, FIREMEN, AND SCHIZOPHRENIC GROUPS**

<table>
<thead>
<tr>
<th></th>
<th>$\Sigma x^2$</th>
<th>$\Sigma y^2$</th>
<th>$\Sigma xy$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>766.28</td>
<td>913.40</td>
<td>-109.33</td>
</tr>
<tr>
<td>Firemen</td>
<td>958.14</td>
<td>2,933.92</td>
<td>-159.51</td>
</tr>
<tr>
<td>Schizophrenics</td>
<td>3,499.33</td>
<td>2,541.68</td>
<td>+145.13</td>
</tr>
<tr>
<td>Within Groups</td>
<td>5,223.75</td>
<td>6,389.00</td>
<td>-123.71</td>
</tr>
<tr>
<td>Between Groups</td>
<td>4,873.57</td>
<td>995.65</td>
<td>2,121.26</td>
</tr>
<tr>
<td>Total</td>
<td>10,097.32</td>
<td>7,384.65</td>
<td>1,997.55</td>
</tr>
</tbody>
</table>
DISCUSSION

Results of testing essentially supported the hypotheses of this experiment. The meaning of this support may be of considerable interest. For this reason, this section will be focused on a discussion of suggested relationships between TP and other facets and approaches to the understanding of human behavior; general personality functioning and psychodiagnostic testing; age-biological factors; cultural anthropology; and the possible perceptual orientation of current and future psychological research.

Findings of this investigation may be interpreted to suggest that TP is a basic aspect of personality functioning which can be measured with relative ease. To be specific, TP may be a significant, molar aspect of personality functioning since individuals of differing intellectual ability appear to conceptualize their lives--past, present, and planned--in a time frame of reference. Western man seems to see himself and others, values, and objects that are important to him in the context of time dimensions. Important events of his past and his goals may have meaning to him only in a time frame of reference.

The basic purpose of this experiment was to supplement these observational and theoretical comments by demonstrating
that this molar significant aspect of human thought could be studied at a laboratory level of control. This being established, then time-dimensional approaches appear to be applicable in many settings.

A specific example may illustrate this position. Psychodiagnostic testing is used to describe major aspects of the past, current, and probable future personality functioning in specific areas of interest. Typical areas in this field may require examination of a S's conflicts, blocks, and ability to relate to people. Since many authorities agree that TP is an important aspect of personality functioning, then psychological test reports, which focus on personality, may be expected to consider TP. Yet, usually only when TP is so grossly and obviously distorted that psychological testing is unnecessary to reveal this fact is there a discussion of how a given S perceives time. This also seems related to the current status of psychiatric examination, since Stevenson and Sheppe (1959) report that the psychiatric mental status examination routinely uses only very gross aspects of TP such as inquiring into the patient's recognition of the current day, month, and year.

Parallels might also be drawn from the psychiatric examination to psychological testing. The current situation in psychodiagnostic testing appears due to the lack of adequate tests and criteria for the objective evaluation of TP.
The standard psychological test battery provides little material enabling the clinical psychologist to evaluate TP. Neither Rorschach, TAT, Wechsler protocols, nor Bender-Gestalt drawings appear to provide the material necessary for the clinical psychologist to discuss accurately his S's TP. Furthermore, the addition of a TTAT alone, or any instrument providing more time-oriented material, would not really help the clinician. This would still require considerable subjective evaluation. The psychologist would then be in the same position as if he wished to describe intellectual ability, and had Wechsler Test scores, but without norms.

The problem of objective identification of TP may be remedied by including the TTAT and scoring criteria in projective batteries; or by simply using the criteria to time analyze the TAT or Rorschach protocols, both of which have standardized administrative procedures.

Other facets of TP seem to merit attention. For example, the relationship of TP to personality and occupational choice may be of interest. TP seems influenced by personality on the one hand, and occupation on the other. Further, culture, as previously noted, is a major determinant of TP, but an "age-biology" factor also seems to be important. Children normally change their conception of time, and ability to span time as they grow older (Piaget, 1937). The changes in
TP associated with culture and the transition noted through developmental stages may be conceptualized into a single framework, though admittedly, a grossly oversimplified one. As man assimilates his culture he appears to become increasingly aware of rewards and hazards present in his world. During adolescence and adulthood he seems to make plans to exploit these opportunities. As he approaches middle age, he may become increasingly aware of reality restrictions within his culture and especially his individual limitations. Concurrently, he may decrease his focus on his future, and increase his interest in past gratifications and his current satisfactions and fears. These hypotheses are diagrammed in Figure 1.

This illustration is cited to indicate only one possible theoretical use of TP. Another illustration, an applied use, might explore the political effectiveness of our information services throughout the world. Specifically, Hallowell (1955) noted that "future" for the Asian may be the next hundred or five hundred years. This contrasts with the American focus on the coming days, weeks or months as the future. Perhaps, our communication with Asians and other peoples is hampered by discrepancies between our TP and theirs.

Finally, TP appears a specification and quantification of the post-war emphasis on perception in psychology, and may enable the empirical testing of many hypotheses which
Fig. 1. Suggested Changes in Time Orientation Emphasis During Life.
have previously only been considered from a theoretical viewpoint. The applications noted represent only a few of the many areas of molar human behavior which may become better understood through the addition of TP techniques, and this may develop into a theoretical basis for a perceptual psychology of the 1970s which emphasizes an objective use of TP.
SUMMARY

Findings of this experiment have shown that: (1) Both obvious and subtle expressions of time can be objectively and reliably measured using linguistic criteria and data processing procedures of this study; (2) introduction of time symbols into standard TAT cards increases the number of TCs; and (3) there is a hierarchy of TPs with students highest, firemen slightly lower, and schizophrenic patients substantially below them. TP is influenced by many factors including personality, culture, occupational choice, and age-biology.
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APPENDICES
APPENDIX A

*Occupational Criteria to Determine Socio-economic Class Membership of Student Ss in Studies I and II

Lower Socio-economic Classes

<table>
<thead>
<tr>
<th>Group Code</th>
<th>Occupation</th>
</tr>
</thead>
</table>

UPPER SOCIO-ECONOMIC GROUPS

I. Professional, Technical and Kindred Workers

Physicians, nurses, excluding practical nurses, and medical technicians, including pharmacists and veterinarians.

Teachers.

Entertainers, artists and writers.

Religious, social and recreation workers. Personnel and public relations workers.

Communications workers.

Surveyors, professional engineers, draftsmen and architects.

Physical, social and natural scientists.

II. Managers, Officials and Proprietors, except Farm Owners

Salaried or self-employed managers.

Buyers and purchasing agents.

Administrators, officials and inspectors, employed by government units.

*Abstracted from Wechsler (1944).
Salaried officials of lodges, societies and unions.

Floor managers and credit officials in stores.

Officers of merchant ships.

MIDDLE SOCIO-ECONOMIC GROUPS

III. Clerical, Sales and Kindred Workers

Clerical workers in offices.

Agents, except purchasing agents, such as ticket, express, insurance and real estate agents.

Salesmen, demonstrators and sales clerks.

IV. Craftsmen, Foremen and Kindred Workers

Skilled workers of raw or finished materials.

Skilled workers of machinery.

Foremen, except farm.

Electricians, plumbers and repairmen.

Inspectors, graders and scalerers, except government officials.

Decorators, window dressers, painters and plasterers.

V. Operatives and Kindred Workers

Semi-skilled workers in manufacturing.

Semi-skilled checkers and examiners.

Vehicle drivers.

Laundry workers and butchers.

Mine operatives and laborers.
VI. Service Workers, including Private Household

Cleaning women and baby sitters.
Bartenders, waiters, countermen and cooks.
Barbers and beauticians.
Hospital, building, and other institutional attendants.
Protective service workers, such as FIREMEN, policemen, sheriffs and watchmen.

VII. Farmers and Farm Managers, Owners and Tenants

LOWER SOCIO-ECONOMIC GROUPS

VIII. Farm laborers and foremen

Unskilled workers in some phases of manufacturing.
APPENDIX B

Study I. Criteria for Time-Obvious Concepts (TOCs)

I. The purpose of this section is to determine whether Ss perceive the time objects, clocks and calendars, that have been introduced into the drawings. This first order of evidence or abstraction appears preliminary to the analysis of the higher levels of abstractions associated with the study of time conceptualization in these same stories.

For this reason, there should be a set of explicit criteria for the noting of TOCs. These will then be applied by two judges who will follow a parallel procedure as is used for the Time Concepts (TCs).

Word counting will use the following procedure: All numbers, dates, contractions, hyphenated words, etc., will be considered as the equivalent of the number of words that they would be if they were spelled out. Misspelled words are to be accepted, but not neologisms, even if the context makes their meaning clear. Foreign words and phrases will be accepted if they are listed in Webster's Dictionary without the symbol +.

II. Stories 3, 4, 5, and 6, whether of the TAT or TTAT series, will be scored.

III. Criteria to be used are:

A. Stories 3 and 6 (Cards 6 GF and 13 MF, where a clock is inserted showing 5:00 in Card 6 and 4:00 in Card 13):

1. A score will be given for a report of the obvious time symbol of the picture:

a. noting the general category of clock, a wall clock, an electric clock;

b. noting of 5:00 or 12:25 for Card 6 GF, or of 4:00 or 12:20 for Card 13 MF; and

c. the repetition of the TOC in another context or with the use of a synonym.
2. A score will not be given for:
   a. an inaccurate report of the clock, such as dresser clock or Big Ben, etc.;
   b. noting of the incorrect time (any time other than 5:00 or 12:25 for Card 6 GF or 4:00 or 12:20 for Card 13 MF); or
   c. simple repetition of the TOC, or in the same context, or without the use of a synonymous form.

B. Stories 4 and 5 (Cards 4 and 6 BM, where a calendar showing 1964 is shown for each card):

1. A score will be given for a report of the obvious time symbol of the picture:
   a. noting of a calendar, wall calendar or the general category "calendar";
      and
   b. noting of the year "1964."

2. A score will not be given for:
   a. noting of a desk or other specified form of calendar than wall calendar;
   b. noting of any other year than "1964"; or
   c. noting of the general category year, month, week, season, or day without direct reference to 1964.
APPENDIX C

Study I. TOCs Scoring Procedure for Individual Story Record

I. Note the following on the INDIVIDUAL STORY RECORD:

1. Fill in the story number, subject number, judge, and date of testing section;

2. Note the line number and the key word identifying each time concept;

3. Sum the total number of TOCs or time percepts as noted on the story record;

4. Count the number of words in the story (using the procedure for word counting given in Appendix B);

5. Divide the number of TCs/number of words in the story.

6. Multiply by 100.
APPENDIX D

Individual Story and Subject Record Sheet. Study I

TIME-OBVIOUS CONCEPTS (TOCs). INDIVIDUAL STORY RECORD

<table>
<thead>
<tr>
<th>Story No.</th>
<th>No. of Words in Story</th>
<th>Subject No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

Date of Testing ______________    Judge ______________

Line No.    Key Word Identifying TOC

<table>
<thead>
<tr>
<th>Line No.</th>
<th>Key Word</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Total No. of TOCs =</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of TOCs per story</td>
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</tbody>
</table>
| = 100 \[
| \text{Total No. of TOCs} \rightleftharpoons \frac{\text{No. of words in story}}{100} \left(\frac{\text{Total No. of TOCs}}{\text{No. of words in story}}\right) = 100 \frac{\text{Total No. of TOCs}}{\text{No. of words in story}} = 100 | |

TOC STORY INDEX = 

TIME-OBVIOUS CONCEPTS (TOCs). INDIVIDUAL SUBJECT RECORD

<table>
<thead>
<tr>
<th>Subject No.</th>
<th>Date of Testing</th>
<th>Judge</th>
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<tbody>
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</table>

Cards    TOC Story Index

3.
4.
5.
6.

Sum of TOCs = 

TOC SUBJECT INDEX = \[\frac{\text{Sum of TOCs}}{4} = \frac{50}{4} = 12.5\]

50
APPENDIX E

Study I. Judges' Record Sheet for All Ss

TIME-OBVIOUS CONCEPT (TOC) SCORES

<table>
<thead>
<tr>
<th>JUDGE</th>
<th>TOC Subject</th>
<th>S. No.</th>
<th>Date of Testing</th>
<th>No. of TOCs/Story</th>
<th>Index</th>
<th>I.Q.</th>
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</table>

51
APPENDIX F

Study II. Scoring Criteria for Time Concepts (TCs)

OUTLINE OF SCORING CRITERIA FOR TCs

I. Goals (p. 53).

II. Independence of TCs (p. 53):
   A. distinctness (p. 53);
   B. duration (p. 54); and
   C. reality-orientation (p. 54).

III. Scoring of Verbs (p. 55).

IV. Scoring of Titles (p. 55):
   A. the story as context of the title (p. 55);
   B. titles in verb or gerund form (p. 55); and
   C. use of human, animal, or inanimate objects (p. 55).

V. Explicit TCs (p. 55):
   A. time units (p. 56);
   B. time-associated events (p. 56);
   C. scorable idiomatic expressions (p. 56); and
   D. non-scorable idiomatic expressions (p. 57).

VI. Implicit TCs (p. 57):
   A. common TCs (p. 57);
   B. contextually scorable TCs (p. 58);
   C. scoring of living organisms (p. 60);
   D. inanimate objects (p. 61);
   E. natural or artificial processes (p. 61); and
   F. grammatically incorrect or unidiomatic usage of words or phrases (p. 61).

VII. Human Experiences and Events (p. 62):
   A. event vs. person emphasis (p. 62);
   B. portions of experiences (p. 62); and
   C. series (p. 63).

VIII. Foreign words, misspellings, and neologisms (p. 63):
   A. foreign terms (p. 63);
   B. misspelled words (p. 63); and
   C. neologisms (p. 63).
SCORING CRITERIA

I. The goals of the scoring procedure are:

A. To measure the time perceptions of Ss as suggested by their imaginative productions.

B. To be as comprehensive, specific, and detailed as possible to achieve consistency of scoring between different judges.

C. To be reliable, independent of the professional orientation of the judges.

D. To provide standardized procedures where the borderline cases can be decided by the use of:

1. The context of the sentence or the whole story;
2. Webster's New International Dictionary, 1962 edition; and

II. Each "independent" time concept (TC) is to be scored by being given a " + ."

A. Independent refers to a distinct time concept.

1. The specification of a given moment in time does not merit additional scoring; e.g.,

   "Monday, January 12, 1947" is considered only a single TC, since the specific details of the day, month, and year only define more exactly the instant in time being considered.

2. When there are two or more adjoining explicit TCs, the following procedure will be followed to determine whether one or two TCs should be scored for the combination:

   a. If either one can be left out and the sense of the sentence remains the same, then a single TC will be scored, since the two appear redundant in providing essentially the same information.
b. If both scores are needed, and with one only the sense is entirely different, then two scores should be given. E.G., "Yesterday, when I saw her . . .," could be considered either "Yesterday I saw her," or "When I saw her . . ." Noteworthy is the entirely different meanings in the two sentences, indicating that each represents an independent TC. Therefore,

+ +

"Yesterday, when I saw her . . ." receives two scores.

3. "Forever and ever," "forever and a day," "all the while before," etc.--only a single score is given since these expressions mean a single very long period of time, e.g., eternity, rather than more than one time.

4. Repetitions for dramatic purposes or emphasis are to be given only a single score:

+ "I will never, never, never, never do that."

5. Dialogues in which the exact same words are repeated by different individuals in the same context are to be given only a single score:

+ JOHN: "Now?"

MAY: "Now!!"

JOHN: "Now."

B. Each TC is to be given a single score independently of the duration of the interval; e.g.,

+ +

"seconds, milleniums," etc.

C. Each TC is to be scored independently of the appropriateness, reality-orientation or bizarreness of the TC or the context; e.g.,

"Yesterday, he drove his red elephant down Main Street."
III. Verbs alone are not to be scored, although they may indicate the passage of time; e.g., "grown on," "growing," etc. Other verb forms such as gerunds, participles, and infinitives should not be scored. TCs are practically always shown in non-verb parts of speech, so that few percepts will be lost by this procedure. Additionally, verbs would be extremely difficult to evaluate for TCs, and their consistent exclusion by all judges should have little effect on either the reliability or the objectivity of scoring.

IV. The title of the story is to be considered part of the protocol.

A. Where there is a question of a title being a TC, the whole story may be used as a context to determine the meaning.

"The End"

"Slowly the boat drifted down the turgid slowly moving stream . . . as the course of the day slowly spread itself . . . ."

The context of the story indicates that "The End" refers to the termination of a time sequence, rather than an event(s).

B. If the title is expressed only in verb or gerund form, it should not be scored.

"Growing."

C. The title is given a time score, when appropriate, whether the subject is human, animal, or an inanimate object.

"The Tree."

V. Each independent explicit TC is to be scored.

A. The noting of a time unit which is usually considered related to time will be scored.

E.g., "nine o'clock" "1931," "a year," "fall," "afternoon."
B. The noting of an event which is usually directly associated with time will be scored.

+ + + +
+ + + +
"craze," "mode," "vogue," "all the cry," "con-
+ +
"vention."

C. The following are sample idiomatic expressions which include the word "time," whose content, according to Webster's Dictionary, is directly related to TCs. In those cases where an idiomatic expression is not listed here, Webster's and the context of the story should indicate if a TC is involved.

+ 1. "abreast of the times" - up to date; modern in ideas, dress, etc., informed about current matters;
+ 2. "against time" - trying to finish in a given time; as fast as possible;
+ 3. "at one time" - 1) simultaneously;
   2) formerly;
+ 4. "ahead of time" - sooner than due; early;
+ 5. "behind the times" - out-of-date; old fashioned;
+ 6. "behind time" - late;
+ 7. "for the time being" - for the present; temporarily;
+ 8. "gain time" - 1) to go too fast—said of a timepiece;
   2) to prolong a situation until a desired occurrence can take place;
+ 9. "in good time" - 1) at the proper time;
   2) in a creditably short time; quickly;
+ 10. "in no time" 1) almost instantly;
    2) very quickly
11. "in time" - 1) in the course of time;
   2) before it is too late;
   3) keeping the set rhythm,
       tempo, pace, etc.;

12. "lost time" - 1) to go too slow--said of a
       timepiece;
   2) to let time go by without
       advancing one's objectives;

13. "your time has come," "your hour has come,"
    "moment of truth."

D. The following are sample idiomatic expressions which
   include "time" but whose content, according to Web­
   ster's, includes frequency or other non-TCs, and
   should not be scored.

1. "at times" means "on occasion";
2. "between times" means "now and then";
3. "time after time" may mean often, or continually;
4. "pass the time of day" means to exchange greet­
   ings and is independent of any given portion of
   a day;
5. "time of one's life" means an unusually pleas­
   ant experience;
6. "times" means "to multiply," although in other
   contexts it may refer to a given period--e.g.,
   "modern times."

VI. Each independent implicit TC is to be scored.

A. The following sample terms represent common implicit
   TCs which are practically always used to indicate
   awareness of time, and are to be scored when used
   appropriately in the context of a given story.

1. Terms forming generalized concepts of TC:
   e.g., "never," "nevermore," "always," "constant,"
   "as," "after," "constant," "post-date," "on,"
   "upon," etc.
2. Terms more specifically suggesting TC, but which must be contextually considered:

   e.g., "graduate school," "pre-law," "prison sentence," "re-enlistment period," "college," "Pearl Harbor," "Dunkerque," "Korea," etc.

B. Other terms may not be used as TCs and must be judged in the context of a given story.

1. "Head start" when used to mean early beginning in a competitive situation;

2. "Since," "then," etc., when used to suggest either an earlier or later time sense, rather than causality;

3. "Scheduled," "plan," "schedules," "time tables," "program," "agenda," etc., when used to suggest events, projected operations, arriving or departing vehicles; a timed plan for a procedure or project—"5-year plan"; to appoint of plan for a certain time or date. ("Schedule" will not be given a score when used in the sense of a list, catalogue, or inventory of details, often as an explanatory supplement to a will, bill of sale, deed, etc.)

4. Score "so far" when used to mean until the present.

5. Score "on the way," "all the way here," etc. when used in a context which suggests time rather than frequency or action; e.g.,

   "We talked about it all the way here."

   "All the way here" refers to the period of time during which the individual was traveling.

6. Score "as" when used to mean contemporary, but not when referring only to manner.

   + E.G., "He shaved as he dressed."

   "He shaves as well as a professional barber."
7. Score "just" when used to mean a very short period of time, or contemporary with another action or time period, but not when used to mean right, fair, simply, true, precisely, etc.  
+  
E.G., "He just left the house."

"It's just as simple as that."

8. Score "right" when signifying immediately, but not when used to mean correct, fair, direction, etc.
+  
E.G., "Do that right away."

"It's only right."

9. Score "on" or "upon" when signifying at a given time, but not when used to suggest position.
+  
E.G., "On entering the house . . . ."

"On top of Old Smoky . . . ."

10. Score "still" when used to indicate past, present or future time, but not when suggesting tranquility.

11. Score "suddenly" when used to indicate a very short time interval, but not for a rapid change of behavior.
+  
E.G., "Suddenly, it was over," but not "He suddenly left."

12. Score "life," "living," "existence," etc. only when indicating a period of time, but not for the discrimination between vital and deceased organisms, or for living matter in comparison to non-living organisms.
+  
E.G., "In his lifetime he . . . .," but not for "He was alive."

13. Score "spell" when used to indicate a period of time, but not to suggest the signalling of letters.
+  
E.g., "Dizzy spells," but not "Spell your name."
14. Score "slow" when used to indicate a longer period of time, but not for a low rate of action.
   +
   E.g., "A slow afternoon," but not "He is slow."

15. Score "deathbed" when referring to the last hours of life rather than a bed itself.
   +
   E.g., "He believed this would be his deathbed," not "This was George Washington's deathbed."

16. Score "Take it from the top," in a movie story indicating the retaking of a movie from the beginning.

17. Score "at last" when suggesting the finality of some act, sequence, event, etc.

C. When living organisms, human or infra-human, are identified in even relatively rough rubrics associated with a given time period or period of history, a score will be given.

Human examples:
   + + + +
   "wife and children," "grandfather," "modern man,"
   + + +
   "Young Charles," "old man," "apprentice," etc.

The following will only be given scores when the context suggests that a TC is involved: "mother," "father," "son," "daughter," etc.

Infra-human examples:
   + +
   "bear and its cubs," "pre-historic animal," etc.

1. Each subsequent identification of that individual is not scored. A score is given when the identification or the context suggests that a different usage of time is involved.
   +
   "This 27 year old man . . . . This 27 year old man . . . .
   +
   He . . . ." . . . "27 year old man . . . . This young man."
2. When relatively general terms are used, the context must clearly indicate time if a score is to be given. The following would not be scored unless the context indicated that a score should be given:

**Human examples:** human, male, female, son, daughter.

E.G., "The lady was a very shy girl." "Lady" and "girl" would not be scored alone, but this context indicates that two separate phases of life are clearly indicated, so that two scores should be given.

"They had no children." No score is given because the age of offspring is not indicated, but rather the lack of progeny.

D. A score will be given for inanimate objects whose age is clearly indicated, or whose age is an important and significant discriminating characteristic that is well known.


E. A score will not be given for natural or artificial processes which may require considerable time or very little time, unless the time is an integral part of the term.

E.G., "fermented alcohol" in comparison to "aged liquor"; "rotten boat" vs. "old boat."

Despite the obviousness of time considerations in some terms, in the majority of cases there would be great difficulty determining whether TCs were involved.

F. Grammatically incorrect or unidiomatic usage of words or phrases should be scored when the context clearly indicates that TCs are involved.
1. "Here" may be used to mean "now" or "then."
   "... the story is changed, here she draws a revolver."

   When "here" is used to suggest a given situation, no score will be given.

VII. The scoring of an experience, the portion of an experience, or the position in a sequence will require special consideration.

A. A score will be given when the emphasis is on the event or the person executing an act.
   1. "That was my first experience...," "new town," "new car," "new house."
   2. "New town," "new car," "new house," etc., when suggesting S's first contact with the object, rather than the age of the object.

B. A score will be given for the statement of some portion of an experience which is usually associated with a TC.
   1. "... the end of an affair";
   2. "... the beginning of his education";
   3. "... all through college";
   4. "... went to college";
   5. "... first thing";
   6. "... first aid"--is defined as before regular medical care is given;
   7. "first born," "first child," etc., before others;
   8. "last word," "last train," etc., since there are none following in time;
   9. "last straw," when used to indicate none following.
C. A score will not be given when an event is one of a series suggesting a frequency rather than a TC.

1. "This happened to him many times," in contrast to "This happened to him every day."

   This is consistent with the idiomatic usage of "next time" to mean coming event, independently of any time dimension.

2. "Busy" is usually an activity concept rather than a TC, although a given context may indicate that a score is indicated.

VIII. Foreign words, misspellings, and neologisms.

A. Foreign terms must be listed in Webster's Dictionary to be used in this study, but those terms which have are not to be included in this study. Webster's definition of these terms is to be considered the meaning for the purposes of this study.

B. Misspelled words are to be used in this study, and considered to have the meaning of the correctly spelled original words.

C. Neologisms and other words which are not defined by Webster's are not to be scored, even if context clearly indicates their meaning.
APPENDIX G

Study II. TC Scoring Procedure. Individual Subject Record (ISR)

I. Fill in the following:
1. Subject No.
2. Date of testing
3. Judge
4. No. of TCs for each story for each of the six cards

II. Compute the following:
1. On the Individual Subject Record fill in the "No. of Time-Percept Scores per Story"—TC Story Index.
2. Sum the total number of TCs for the whole group of six stories.
   (Note: Words will be counted by considering all numbers, dates, contractions, hyphenated words, etc. as the equivalent of the number of words that they would normally be.)
3. Double the total number of Time-Percept Scores for Cards 1 + 2 and subtract from them the total number of Time-Percept Scores for Cards 3 + 4 + 5 + 6.
   Doubling the scores for Cards 1 + 2 helps control for the fact that there are twice as many cards in the experimental as in the operant level.
4. This difference between groups of scores is the "Time-Percept Index," or the "Time-Percept Score" (TPS).
APPENDIX H

Study II. Individual Story Record and Individual Subject Record. TC

INDIVIDUAL STORY RECORD

<table>
<thead>
<tr>
<th>Story No.</th>
<th>No. of Words in Story</th>
<th>Subject No.</th>
<th>Judge</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date of Testing ____________________________

Line No.  Key word identifying score

Total No. of Time Percepts =

\[
\text{No. of Time Percepts per story} = 100 \frac{\text{Total no. of time percepts}}{\text{No. of words in story}} = 100 = 100 \text{ ( ) .} =
\]

TC Story Index

INDIVIDUAL SUBJECT RECORD

<table>
<thead>
<tr>
<th>Subject No.</th>
<th>Date of Testing</th>
<th>Judge</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sequence of Cards  No. of Time-Percept Scores per Story

1.  
2.  
3.  
4.  
5.  
6.  

Sum of Time-Percept Scores =

TC S Index

Time Percept Index(per S) = 2(Time-Percept Scores Cards 1+2) - (Scores Cards 3+4+5+6) =

= 2( + ) - ( + + + ) =

= 2( ) - ( ) =

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APPENDIX I

Study II. Judges' Record Sheet for All Ss.

TIME PERCEPT (TC) STORY SCORES

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Date</th>
<th>No. of Time-Percept Scores Per Story</th>
<th>Time-Percept Index</th>
<th>I.Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. 2. 3. 4. 5. 6.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


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VITA

Raymond Arthur Ulmer was born in Chicago, Illinois on November 15, 1923. He attended Wright Junior College for one year before World War II. During the war he served as a cryptographer in the Army Airways Communication System of the United States Air Forces, including a year in India and China. After the war Mr. Ulmer studied at the University of Chicago, where he was granted the M.S. degree in 1949. He then obtained specialized psychological training at the University of California, Los Angeles (UCLA) and Claremont Graduate School. In 1961 he began graduate psychological study in the Department of Psychology at Louisiana State University.

Mr. Ulmer's clinical experience has been varied. He served as a psychiatric attendant at Sawtelle, V.A. Neuropsychiatric Hospital at Los Angeles, California in 1949. Then from 1950 to 1953 he served as psychologist interne at the Reiss-Davis Clinic for Child Guidance in Los Angeles. From 1957 to 1959 Mr. Ulmer was staff psychologist on a part-time basis for Executives Unlimited in Los Angeles. From 1957 to 1961 he was staff psychologist for Jewish Vocational Service in that same city. From 1961 to 1964 he was a psychologist graduate assistant in the LSU Speech and Hearing
Clinic. In 1964 Mr. Ulmer taught in the LSU Department of Psychology.

Mr. Ulmer's current professional activities are varied. He is acting assistant professor of speech pathology at UCLA. He is a psychological consultant to the California State Department of Rehabilitation, California State Disability Commission, and Jewish Big Brothers. He has served as a volunteer member of the California State Personnel Board, and is a staff member of the Psychological Center.

Mr. Ulmer's professional accreditation is as follows: member of the American Psychological Association, Western Psychological Association, and Los Angeles County Psychological Association. Mr. Ulmer was certified as a psychologist by the State of California in 1959. He is listed as a psychologist in the 1964 edition of "Who's Who in the West."

Mr. Ulmer's research, either completed or in progress at this time, includes the following: with Edwin O. Timmons, Louisiana State University, "The Minimal Social Behavior Scale (MSBS): A Short, Objective, Reliable Measure of Personality Functioning," presented at APA, Los Angeles, 1964; with Edwin O. Timmons, "An Application of the Minimal Social Behavior Scale," submitted to J. of Consulting Psychology; with Edwin O. Timmons, "An Application and Modification of the Minimal Social Behavior Scale," submitted to J. of Consulting Psychology; with Saul C. Kupferman, "An
EXAMINATION AND THESIS REPORT

Candidate: Raymond Authur Ulmer

Major Field: Psychology

Title of Thesis: AN OBJECTIVE TIME-DIMENSIONAL PERCEPTION MEASURE GROUPING PAST, PRESENT, AND FUTURE TIME CONCEPTS; AN EMPIRICAL EXISTENTIALIST INDEX OF PERSONALITY DIFFERENCES

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Felicia A. Bryer

William G. Haag

Roland L. Fry

Joseph G. Dawson

Date of Examination:

May 13, 1965