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Development and Validation of a Tool

to Measure Temporal Orientation

by

Yolanda Martins

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THESIS

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Abstract

Individuals are thought to differ in the extent to which their day-to-day thoughts, feelings, and fantasies focus on the past or future (i.e., temporal orientation). This thesis describes the continued development of a multidimensional measure of temporal orientation that includes the following four subscales: 1) negative future orientation, 2) positive future orientation, 3) negative past orientation, and 4) positive past orientation. Two studies were conducted. In study one, 921 introductory psychology students completed the thirty-item Temporal Orientation Scale (TOS). Based on analyses of the 30-item initial version of the scale, a refined 21-item version of the TOS was developed. In study two, the reliability and validity of the 21-item version of the TOS were assessed. Two hundred and forty-six introductory psychology students participated in study two. While results for the total scale indicated low levels of internal consistency, analysis of the individual subscales demonstrated adequate internal consistency and test-retest reliability over a five to seven week period. Convergent validation was obtained for the positive future orientation and negative past orientation subscales and discriminant validity evidence was obtained for the positive future and positive past orientation subscales. The results are discussed in terms of suggestions for continued scale development and validation.

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This thesis further develops and validates a measure of temporal orientation originally constructed by Hendley (1994). A definition of temporal orientation and its related components is presented as well as a brief literature review which serves to demonstrate the importance of this construct. Specifically, the research findings surrounding the correlates (e.g., age, sex, social class, anxiety, and achievement motivation) of temporal orientation are discussed. Following this discussion, the criteria that would need to be used in constructing an adequate measure of the construct are outlined. Existing measures designed to assess temporal orientation are then critically reviewed in relation to these criteria. This is followed by a discussion demonstrating the need for a new and better measure of temporal orientation.

The temporal orientation scale originally developed by Hendley (1994) is then presented. The development and validation of the original scale are summarized and the revisions necessary to Hendley's measure are discussed. The methodology to be used in further developing the scale are then discussed.

The Construct of Temporal Orientation

Temporal orientation is defined as "that aspect of individuals' time experience in which the events of their thoughts, fantasies, and feelings are predominantly focused" (Frederickson, 1988, p. 63). Temporal orientation can be

conceptualized as being divided into three areas: past orientation, present orientation, and future orientation (Schmidt, Lamm, & Trommsdorff, 1978). Individuals undoubtedly experience all forms of temporal orientation (i.e., past, present, and future). It is likely however, that they may be focused on one of these orientations more than the others. This does not mean that a person's temporal orientation does not change over his or her life span. In fact, it is quite likely that temporal orientation does change depending on which stage of the life span one is in (Schmidt et al., 1978).

Future Orientation and its Correlates

Early research on temporal orientation was predominantly focused on only one aspect of temporal orientation, namely, future orientation (Schmidt et al., 1978; Trommsdorff, 1983; Trommsdorff, Lamm, & Schmidt, 1979; Wallace, 1956). Future orientation can be defined as one's attitude and thoughts toward the future (Schmidt et al., 1978). Wallace (1956) argued that future orientation was a characteristic of a well developed personality. Trommsdorff (1983) asserted that a future temporal orientation allowed individuals to engage in activities such as delay of gratification, planning, problem solving, and achievement, that were valued by society.

Research on the construct of future orientation indicates that it is related to a wide range of

sociodemographic and psychological variables. A number of studies indicate, for example, that age, sex, and social class are all related to future orientation (Lamm, Schmidt, & Trommsdorff, 1976; O'Rand & Ellis, 1974; Schmidt et al., 1978; Trommsdorff et al., 1979).

It has been consistently found that future orientation increases from adolescence to young adulthood (Lamm et al., 1976; Trommsdorff et al., 1979). Research also reveals consistent differences between males and females, in that the future orientation of males is more preoccupied with their careers while the future orientation of females is more focused on the family sphere (Schmidt et al., 1978; Tismer, 1985) and that boys' (aged 11 through 17) orientation to the future is more extended than girls' (aged 11 through 17) (Tismer, 1985). That is, when boys think about the future they generally think further ahead than girls.

Research also demonstrates a relationship between future orientation and social class, indicating that middle class individuals have a more extended future orientation than their lower class counterparts (Agarwal & Tripathi, 1984; Lamm et al., 1976; Schmidt et al., 1978). Lamm et al., (1976) and Schmidt et al., (1978) maintain that lower-class persons have a less extended future orientation because of their lack of economic power and their belief in an externally controlled future. Conversely, middle-class

persons have greater economic power and believe that they
can influence and control future outcomes. Thus, middle-
class persons include more temporally distant events in
their future and therefore, adjust their behaviour to
realize their goals. Although it is generally assumed that
social status has an effect on the development of future
orientation (O'Rand & Ellis, 1974) these studies do not
provide evidence that would permit one to determine the
direction of causality in this relationship. It is possible
that class related differences in socialization practices
lead to differences in future orientation (Lamm et al.,
1976; Schmidt et al., 1978) or, as O'Rand and Ellis (1974)
argue, that the relationship between social status and
future orientation is mediated by several other factors.
They hypothesize that the four primary mediators of this
relationship are: sensory deprivation, social learning,
linguistic development, and expectancy levels. However,
further research needs to be carried out to accurately
assess this hypothesis.

Moreover, it has been demonstrated that temporal
orientation differs among cultural groups. Spadone (1992)
had participants from three cultural groups (Thai,
Cambodian, or white Americans) complete the Time Reference
Inventory, which provides an indication of how important an
individual perceives the past, present, and future. It was
found that the Thai group perceived the past as more

important than did the white Americans while the white
Americans perceived the present as more important than did
the Thai group. The Cambodian group did not significantly
differ from either the Thais or Americans on the measure of
temporal orientation. Thus, Spadone (1992) concluded that
cross-cultural differences do exist for temporal
orientation. Moreover, he also postulated that differences
in temporal orientation between the Thai and American groups
were real differences in belief since these two groups were
similar in demographic makeup.

Research has also found that temporal orientation is
related to a number of personality variables, including
anxiety and achievement motivation (Cottle, 1969; Deboer,
1985; Getsinger, 1975; Krauss & Ruiz, 1967; Sarason &
Stoops, 1978).

Research on anxiety and temporal orientation has
demonstrated that differences in anxiety level are reflected
in differences in temporal orientation. Krauss and Ruiz
(1967) hypothesized that highly anxious individuals may
attempt to lower their anxiety levels by perceiving time
more in terms of the past, and less in terms of the present
and the future. This process has been labelled "time
distortion" and is thought to be one of the techniques used
by individuals to lower their anxiety level. Krauss and Ruiz
found that highly anxious individuals spent more time
thinking about the past and less time thinking about the

present and the future. Research also suggests that anxiety is positively correlated with apprehension about future possibilities (Cottle, 1969).

It has also been shown that a relationship exists between temporal orientation and achievement motivation. Cottle (1969) found that valuing achievement is associated with a more extended future orientation (but only among women). Deboer (1985) found that women who were successful in their first college science course were more future oriented than women who did not achieve success in the course while for men, temporal orientation was not related to success in the course. In addition, Raynor (1970) demonstrated that future orientation is positively related to achievement motivation when the perceived outcome of a behaviour is thought to have both immediate and long term effects on future success.

Test Construction

Temporal orientation research is supported by a solid history and, as such, numerous measures exist to assess the extent to which individuals are past, present, or future oriented. However, these measures may not have been developed using the most rigorous test construction techniques. Sound measures usually follow a process of test construction beginning with an outline of the theory or construct to be tested and ending with appropriate validity and reliability testing. The steps involved in developing a

sound measure will be reviewed below.

What makes a good test?

Ideas for tests usually arise out of research involving both theoretical issues and practical problems (Annett, 1974). The construct to be measured should be well defined and the items in the measure should represent the content domain (Annett, 1974). This ensures content validity. A good test item will discriminate between different levels of performance; therefore, if most people answer a question in the same way it does not discriminate and thus, should not be used in the test (Annett, 1974). Additionally, the instructions for administration of the test should be clear and practical to apply to ensure that if different individuals administer the test the results will be equivalent (Nunnally, 1978).

Reliability of an instrument is also important. A measure must be reliable in order to ensure that similar results will be obtained each time it is used. The two most common forms of reliability are internal consistency and test-retest reliability. Cronbach's alpha is calculated to measure internal consistency. It provides evidence that the items in the measure sample a common domain. In the early stages of test development, Nunnally (1978) suggests that reliability coefficients of .70 are generally acceptable for both internal consistency and test-retest reliability. However, it should be noted that test-retest reliability

coefficients decrease as the interval of time between administrations increases (Nunnally, 1978). Thus, Robinson, Shaver, and Wrightsman (1991) indicate that over a 1-3 month interval between administrations, scales are considered to have moderate test-retest reliability if the scale scores correlate more than .30 across the two administrations.

Lastly, a good test should demonstrate validity, which is the extent to which the test is actually measuring what it is intended to measure. Construct validation involves performing studies of individual differences and/or controlled experiments to determine if the new measure correlates in expected ways with measures of other constructs (Nunnally, 1978). Normally, validity coefficients in the range of .30 - .40 are considered high (Kaplan & Saccuzzo, 1989).

Nunnally (1978) argues that the usefulness of a measure is determined by the reliability of the measure, the validity of the measure, and the extent to which the measure produces interesting relationships with other scientific measures. Nunnally also argues that objective measures that yield numerical results permit researchers to report the results of a study in finer detail than would be the case in personal judgements; they also permit the use of mathematical analyses (e.g., factor analysis, ANOVA).

The Test Construction Process

The first step in the test construction process is to

generate a detailed definition of the construct to be measured. From this, a list of behaviours representative of this construct can be developed. A large pool of potential items for the test should be generated from this list, to form an initial scale. The scale should then be edited to ensure that the items are not extreme in nature, double barrelled, repetitive, or unclear.

The initial scale should then be administered to a large sample of people (i.e., a good rule is to have at least 10 respondents per item; Nunnally, 1978). Psychometric analyses should be performed on this data set. Item analyses, including item-total correlations and inter-item correlations should be examined. Additionally, responses to the items should be scrutinized to ensure that response variability exists for each item. If an item is answered the same way by everyone to whom it was administered (e.g., everyone responds to the item using a "7") then response variability does not exist and the item should be discarded. Ideally, the distributions of the items should closely resemble the normal curve. The scale should also be checked for items that are double-barrelled, extreme in nature, and for items that are unclear or confusing to the respondents.

Exploratory factor analyses should also be performed on this data set to determine which items are most representative of each factor and how many identifiable factors the measure represents. Sometimes researchers

develop scales with a certain number of subscales in mind (usually based on an underlying theory) and exploratory factor analysis provides an indication of how many latent constructs the measure is actually assessing. Moreover, factor analysis provides researchers with an indication of how much variance the identifiable factors account for. Lastly, Cronbach's alpha should be calculated for the total scale score and any subscale scores the measure may possess. In the early stages of research alpha coefficients should be at least modest (i.e., .70 or higher; Nunnally, 1978).

After these analyses are completed a refined scale should be developed. This new scale should include only those items with moderate to high factor loadings (i.e., >.30; Nunnally, 1978) and good item-total correlations. Nunnally (1978) postulates that item-total correlations above .30 are considered good.

The new version of the scale should then be administered to a second large sample. From these data, scale norms (i.e., the mean, variance, and standard deviation) can be developed and confirmatory factor analyses can also be performed.

Furthermore, the validity and reliability of the instrument must be evaluated (Nunnally, 1978). To ensure the validity of a measure a series of steps, referred to as construct validation, must be followed. Construct validity can be divided into convergent, discriminant, and known

groups validity.

Convergent validity can be ascertained in one of two ways: 1) by demonstrating that the instrument correlates well with other tests that measure the same or related constructs (Kaplan & Saccuzzo, 1989) and/or 2) by demonstrating specific relationships that would be expected if the test is really measuring what it is supposed to measure (Kaplan & Saccuzzo, 1989). Thus, if previous research has demonstrated relationships between this construct and other variables (i.e., other constructs, personality variables, or sociodemographic variables), then the new test should also demonstrate these same relationships.

Discriminant validity is obtained when it can be shown that the new instrument measures something different from other tests (i.e., one must demonstrate the uniqueness of the test).

Lastly, known groups validation is obtained when the instrument has been administered to at least two groups which should theoretically differ on their scores and the results reveal that the groups do have different scores as expected.

In addition to validity, test-retest reliability and internal consistency reliability should also be checked. Test-retest reliability involves administering the test twice to a group of participants with a specified period of

time occurring between each administration. Test-retest

reliability can be assessed over a short period of time

(e.g., two weeks) or a long period of time (e.g., 16 weeks).

Test-retest reliability involves correlating the overall and

subscale scores from the first and second administration of

a test. In addition, Cronbach's alpha (a measure of internal

consistency) should be calculated for both the total scale

score and any subscale scores the measure may possess.

Despite the fact that appropriate test construction

techniques exist for researchers to use as guidelines when

developing tests, numerous temporal orientation instruments

have failed to meet these standards. These measures range

from the fairly objective (e.g., questionnaires) to the

fairly abstract (e.g., drawing circles). Developers of these

scales all claim to measure the same construct although

their definitions of past, present, and future orientation

vary widely.

Measures of Temporal Orientation

One of the most commonly used tests to measure temporal

orientation is Cottle's (1967) Circles Test (Cottle, 1969;

Getsinger, 1975; Getsinger & Leon, 1979; Koenig, 1979;

Koenig et al., 1980). In this test respondents are asked to

draw three circles - one denoting the past, one denoting the

present, and one representing the future. Specifically,

respondents are instructed to:

Think of the past, present, and future as being

in the shape of circles. Now arrange these circles

in a way you want that best sho᙮ s how you feel

about the relationship of the past, the present,

and the future. You may use different size circles.

When you have finished, label each circle to show

which one is the past, which one is the present and

which one is the future (Cottle, 1967, p. 60).

The Circles Test yields two different scores; one for

temporal dominance and one for temporal relatedness.

Temporal dominance is defined as the degree to which one

temporal sphere (past, present, or future) is more prevalent

in an individual's thoughts in comparison to the other two

temporal spheres. Temporal relatedness is defined as "...the

degree to which time zones are perceived as relating"

(Cottle, 1967, p. 60). The focus of the present paper is on

that aspect of temporal orientation referred to as temporal

dominance.

In the Circles Test, temporal dominance (a.k.a.

temporal orientation) is calculated by assigning four points

to the biggest circle, two points to the middle sized

circle, and zero points to the smallest circle (Getsinger &

Leon, 1979). The temporal sphere corresponding to the

biggest circle is regarded as the temporal sphere that is

dominant. In order to assess the validity of his measure

Cottle (1967) asked respondents to indicate what their

intentions were while drawing the circles. Cottle reports

that the most frequent response was "...that proximity of circles was in fact, intended to demonstrate relatedness and that size primarily stood for importance or salience..." (Cottle, 1967, p. 63).

Despite the prevalent use of the Circles Test as a measure of temporal orientation, it should be noted that there is a lack of information surrounding its validity and reliability; thus, researchers have no way of assessing the utility of this measure. The items (in this case circles) used to assess temporal orientation were not generated from thorough descriptions of past, present, and future orientation. In addition, no reliability information is presented in the original article (Cottle, 1967) or subsequent articles (Cottle, 1969; Getsinger, 1975; Getsinger & Leon, 1979; Koenig, 1979; Koenig Swanson, & Harter, 1980). Lastly, Nunnally (1978) argues that validity cannot be demonstrated by simply asking respondents what they intend to convey through their responses.

Another measure, developed by Roos and Albers (1965), is the Time Reference Inventory (TRI). The TRI is also a fairly popular measure of temporal orientation (Keller, 1980; Oakley, Kielhofner, & Barris, 1985; Spadone, 1992). Respondents are asked to read thirty statements about life events, 10 of which are pleasant, 10 of which are unpleasant, and 10 of which are neutral. An example of an item from the TRI is "The most troubled period of my life is

probably in the...". Respondents are then asked to indicate if the items refer to the past, present, or future and to identify the age they thought the event occurred or would occur. The TRI provides three scores: (1) age extension, which is the average of all the reported ages, (2) past extension, which is the average of all the ages of events determined to be in the past, and (3) future extension, which is the average of all the ages of future events. In addition, the TRI yields information on the number of positive, negative, and neutral items selected to refer to the past, present, and future.

Like the Circles Test, the Time Reference Inventory was not developed from a complete description of past, present, and future orientation. One of the best ways to ensure that a measure accurately captures the construct it is designed to measure is to generate items for the measure based on a thorough definition of the construct. It is uncertain whether this test is really representative of the construct of temporal orientation. This measure offers no reliability or validity coefficients either in the original paper or in subsequent articles (Keller, 1980; Oakley, Kielhofner, & Barris, 1985; Spadone, 1992) and it is uncertain whether the results from this test are stable over time.

Another tool used to determine temporal orientation is the Rappaport Time Line (Rappaport, Enrich, & Wilson, 1985). Participants are presented with a long (24 inch) horizontal

piece of paper and are asked to place significant life
events (that have occurred, are occurring, or will occur)and
the age of each event on the strip of paper. Participants
are then asked to indicate a "now" point and to mark certain
ages and time intervals on the strip of paper. To determine
an individual's temporal orientation the paper is divided
into five time zones: the distant past (beyond 3 years
past), near past (7 months through 3 years past), present (7
months past through 7 months in the future), near future (7
months through 3 years in the future), and distant future
(beyond 3 years in the future). The percentage of events in
each zone is calculated and an individual's temporal
orientation is the zone that has the greatest percentage of
events occurring in it.

Like the Circles Test and TRI, the Rappaport Time Line
was not developed from a thorough definition of past,
present, and future orientation. This measure offers no
reliability or validity information. Again, it is uncertain
whether this test adequately captures the construct of
temporal orientation.

Despite the prevalent use of this measure and the other
measures previously discussed these tests were not
constructed using appropriate test construction techniques.
None of the tests thoroughly defined the construct of
temporal orientation, including its various components of
past, present, and future orientation. Since the construct

is not well defined for any of these measures it is
uncertain as to whether or not these measures have adequate
content validity. Additionally, these measures may all be
assessing different things (although they all claim to
measure the same construct) since their definitions of
temporal orientation differ.

It is uncertain as to whether or not the items used on
these tests actually discriminate among individuals who
differ in their temporal orientation. None of the test
authors provides us with any evidence that these items do
have the ability to discriminate among individuals of
differing temporal orientation. A good test is comprised of
items that are representative of the domain to be assessed.
Thus, the final question is, "Are these items really
representative of the construct of temporal orientation?"

Despite the abundance of instruments purporting to
measure temporal orientation, few, if any, are truly
objective measures, and all have inadequate information
concerning their validity and reliability. None of these
measures adequately assesses content or construct validity.
All of these tests fail to report any convergent or
discriminant validity data. That is, relationships that are
expected between the construct of temporal orientation and
other personality constructs (i.e., convergent validity)
have not been demonstrated in the original development of
the measures although relationships between these measures

and other measures have since been demonstrated (Cottle, 1969; Spadone, 1992). In addition, the uniqueness of these measures has not been demonstrated (i.e., discriminant validity). Lastly, these measures have not been shown to differentiate between groups which are known to differ in terms of their temporal orientation.

The ability of these tests to adequately measure past, present, or future orientation is questionable. Clearly a more objective measure of temporal orientation (with appropriate validity and reliability studies) is needed.

Present Research

The present study will expand upon earlier research by Hendley (1994), who designed a questionnaire that measures individuals' temporal orientation (i.e., whether they are past, present, or future oriented) following more rigorous test development procedures.

Hendley (1994) began with Frederickson's (1988) definition of temporal orientation as "that aspect of individuals' time experiences in which the events of their thoughts, fantasies, and feelings are predominantly focused" (Frederickson, 1988, p. 63). She also provided more thorough descriptions of the features of past and future orientation.

Specifically, past oriented individuals are thought to "...dwell on past events; they believe that what will happen to them in the future is a matter of fate; they believe that most significant life events have already occurred; they

evaluate current outcomes by comparing them to past outcomes; they have no concrete plans for the future; and they consider old friends and family to be more important than possible relationships formed in the future..." (Hendley, 1994, pp. 8-9).

Conversely, future oriented individuals "...do not dwell too much upon events that occurred in the past; they believe future outcomes are controllable; they believe that most significant life events are yet to come; they think about the implications their present activities may have upon their future; they tend to have a future life plan; and they worry about what is going to happen in the future..." (Hendley, 1994, p. 9).

On the basis of her research and the previous definitions, Hendley (1994) generated possible items for past and future orientation. After more than 30 items had been developed each item was discussed and double barrelled or extreme statements were discarded. A pilot test was also carried out with this initial list. Volunteers were asked to complete the list and were then asked to discuss any problems or questions they had about each item. Based on this pilot test, an initial 24-item version of the Temporal Orientation Scale was derived and administered to 351 undergraduate students at Wilfrid Laurier University. Items were answered using a 9-point response format, with endpoints -4 (very strongly disagree) and +4 (very strongly

agree). Exploratory factor analysis revealed four factors
that were interpreted as relating to a positive future
orientation, a negative future orientation, a present
orientation, and a negative past orientation. A fifth factor
was also found; however, Hendley was unable to interpret
this factor. Hendley also generated item-total correlations
and Cronbach's alpha. The alpha level for the entire scale
was found to be poor ($\alpha = .51$).

On the basis of these analyses Hendley (1994) created a
22-item Likert-type scale (comprised of those items with the
highest item-total correlations and the highest factor
loadings) to assess temporal orientation, with higher
overall scores indicating higher levels of future
orientation. In addition, Hendley generated new items to
create a positive past subscale to ensure symmetry of the
overall scale since both positive and negative future
subscales were found in the exploratory factor analysis. The
revised scale consisted of the following five subscales:
positive future orientation, negative future orientation,
present orientation, positive past orientation, and negative
past orientation. Thus, individuals who are past or future
oriented are also further divided into those who regard the
past or future positively or negatively. No previous measure
of temporal orientation has attempted to divide past and
future orientation in this way.

Total scores on this scale were calculated by reversing

all of the responses for the past oriented items to their
numerical opposites, and then summing together all of the
item scores. It was postulated that reversing the scores on
the past items would yield scores that indicated greater
overall future orientation. Thus, when added to the future
and present subscale items the TOS would yield an overall
score that indicated greater overall future orientation.
Scores on this scale could range from 22 to 198, with higher
values indicating higher levels of future orientation.
Subscale scores were derived by adding together all the
items from each subscale. To assess the validity of the
revised measure, Hendley (1994) administered the Temporal
Orientation Scale to 23 senior citizens and 33 graduate
students from a variety of departments at Wilfrid Laurier
University. These groups were chosen because they were
thought to differ significantly in terms of temporal
orientation. As expected, Hendley found that, overall, the
group of graduate students had significantly higher total
scores on the scale ($\underline{M}$ = 124.21) than did the seniors' group
($\underline{M}$ = 106.65), indicating that the graduate students were
more future oriented than the seniors group. Upon
examination of the subscales, they found that the group of
elderly participants had significantly higher mean scores
for the positive past and present subscales than did the
group of graduate students.

In addition, the test-retest method was used to assess

the reliability of the measure. Twenty-five graduate
students completed the scale twice, with a two-week period
between each test session. The overall scale was found to
have a reliability of r = .78, p<.0001 (Hendley, 1994). In
addition, the subscales were found to have the following
test-retest reliabilities: positive future, r = .81;
negative future, r = .71; positive past, r = .85; negative
past, r = .84; present, r = .76, all p's < .001.

Although the Temporal Orientation Scale appears to be
reliable and valid, further developments are required.
Initially, the factor analysis of the original scale
revealed five factors which included: 1) a positive future
orientation subscale; 2) a negative future orientation
subscale; 3) a negative orientation to the past; and 4) a
desire to live in the present. However, Hendley (1994) was
unable to interpret the fifth factor because it did not have
a general theme underlying its items. Based on this
analysis, a refined scale was developed which included the
first four subscales. The refined scale also included a new
fifth subscale which was thought to be related to a positive
past orientation. This fifth subscale was comprised of some
new items as well as two items (items numbers 25 & 28, as
listed in Appendix A) that had originally loaded on the
first subscale (positive future orientation), but were
thought to be more related to a positive past orientation.
However, a factor analysis of the refined scale was never

performed so it is possible that the factor solution may not correspond to the five subscales Hendley intended.

In addition, the number of items in each of Hendley's subscales was relatively small (each subscale consists of either 4 or 5 items); thus, it is possible that there were not as many items representing each sub-area of temporal orientation as would be desired. In order to strengthen the factor structure that Hendley (1994) obtained it is necessary to expand the subscales. This should also increase the internal consistencies of the subscales and should strengthen the ability of each subscale to assess its domain more accurately, providing the additional questions are accurately measuring the appropriate domain. It should also be noted that Cronbach's alpha was not calculated for the refined scale. Hendley (1994) only demonstrated the validity of the Temporal Orientation Scale through the use of the known groups method. The scale was never correlated with other measures to assess either convergent or discriminant validity. Lastly, test-retest reliability was only carried out on a small sample, over a relatively short period of time. It would be useful to determine if the scale is stable over a longer period of time and to increase the sample size used for this analysis.

Purpose

The purpose of the present studies was to further develop and validate the measure of temporal orientation

originally constructed by Hendley (1994). Study 1 assessed
the psychometric properties of the TOS. Based on the results
of study 1 revisions were made to the Temporal Orientation
Scale. Study 2 was carried out to assess the validity and
reliability of a refined version of the TOS. Moreover,
test-retest reliability was assessed with larger samples,
and over a longer period of time than were used in Hendley's
original research.

Study 1

Participants in study 1 completed, in a mass testing
session, the 30-item Temporal Orientation Scale as well as
various measures from other research projects in the
psychology department at Wilfrid Laurier University. The
data obtained from study 1 were used to verify the factor
structure that theoretically underlies the Temporal
Orientation Scale. In addition, item analyses were carried
out on the data from this sample to determine what revisions
were necessary in order to further develop the scale (e.g.,
which items should be retained and which items should be
eliminated from the scale).

Method

Construction of the Temporal Orientation Scale

Hendley's (1994) Temporal Orientation Scale contained
22 items. Eight new items were added to the TOS in an
attempt to strengthen and expand each of the five subscales,
creating a 30-item measure, with 6 items in each of the

subscales. Two of these items (numbers 4 & 20, as listed in Appendix A) were reverse scored con-trait items. The eight new items were generated based on Hendley's (1994) definitions of past and future orientation (outlined above). Items were checked to ensure that they were not leading, double barrelled, or extreme in nature. The new 30-item Temporal Orientation Scale can be found in Appendix A.

Participants

Participants were 921 introductory psychology students (535 females, 382 males, and 4 who did not indicate their sex) from Wilfrid Laurier University. Completion of the study was voluntary and participants received one-half bonus credit worth .25%, towards their grade in psychology for their participation.

Procedure

The administration of the scale occurred during regularly scheduled introductory psychology classes approximately 4 to 6 weeks after the beginning of the school year. All introductory psychology classes (5 in total) were asked to complete a questionnaire package. If students chose to participate they were administered the 30-item Temporal Orientation Scale as part of a larger questionnaire package that included other measures relating to constructs such as religiosity and right-wing authoritarianism from various other research projects in the psychology department. Participants were told that the questionnaire contained

measures concerning their religious beliefs and how they
view their lives. Participants were also informed that
completion of the questionnaire was completely voluntary,
that they could omit any questions they did not wish to
answer, that they could withdraw their participation at any
time, and that their answers would be kept completely
confidential. Completion of the questionnaire took
approximately 45 minutes. Participants who completed the
questionnaire received one-half bonus credit for their
participation.

Results

Exploratory Factor Analyses

Exploratory principal components analyses of the
Temporal Orientation Scale using varimax rotation revealed a
seven factor solution (i.e., seven factors were obtained
with eigenvalues greater than 1). However, on the basis of
the factor scree plot (see Figure 1) the analysis was
constrained to a 4 factor solution and carried out again.
A factor loading of .40 was selected as the cutoff point and
only items that had loadings ≥ .40 were considered to be
part of a factor. Nunnally (1978) postulates that factor
loadings greater than .30 are generally considered good.
However, it was felt that this criterion was too lenient and
thus, a higher cutoff point was selected.

This analysis revealed that the first factor accounted
for 17.6% of the total scale variance and consisted of the 6

items (numbers 19, 20, 21, 22, 23, & 24, as listed in Appendix A) that comprised the negative past orientation subscale and 4 items (numbers 1, 2, 3, & 6, as listed in Appendix A) that comprised the negative future orientation subscale.

Theoretically, the negative past orientation subscales and negative future orientation subscales were thought to be assessing different constructs and thus, should have loaded on separate factors. Since this research was primarily driven by theoretical considerations it was decided that a higher-order factor analysis would be carried out on factor 1 to determine if the two subscales were actually measuring different latent constructs. In addition, closer examination of the factor loadings revealed that all of the negative past orientation items loaded more highly on factor 1 than did the negative future orientation items. Lastly, prior research by Hendley (1994) had demonstrated that the negative past and negative future subscales loaded on separate factors. Thus, a higher-order factor analysis was performed on the items that comprised factor 1. Higher order factor analysis of these items revealed a 2-factor solution with all but one of the negative past orientation items loading on factor 1a. Factor 1b consisted of all the items that comprised the negative future orientation subscale and one item from the negative past orientation subscale.

The second factor, which accounted for 12.1% of the

total scale variance embodied 6 items (numbers 7, 8, 9, 10, 11, & 12, as listed in Appendix A) from the positive future orientation subscale, and one item (number 30, as listed in Appendix A) from the positive past subscale. This factor was therefore interpreted to represent positive future orientation.

Factor 3 accounted for 8.0% of the total scale variance and contained 4 items (numbers 25, 27, 28, 29, as listed in Appendix A) that formed the positive past orientation subscale. Consequently, this factor was thought to represent positive past orientation.

Lastly, factor 4 accounted for 4.6% of the total scale variance. This factor consisted of 4 of the 6 items (numbers 13, 14, 15, & 16, as listed in Appendix A) constituting the present orientation subscale and the reverse scored negative future orientation item (number 4, as listed in Appendix A). Thus, this factor was thought to represent present orientation. Items 5, 17, 18, and 26 did not have factor loadings ≥.40 on any factor. Table 1 presents each of the original items divided into their theoretically appropriate subscales along with the factor loadings on each of the four factors.

Item Analyses

Total scale scores were calculated in the way that Hendley (1994) computed them, by reverse scoring all of the past items and adding them to the scores on the present and

future items. Possible total scale scores ranged from 30 to 270, with higher scores indicating a greater orientation toward the future in general (i.e., independent of being positively or negatively oriented toward the future). In addition, the means, standard deviations, and corrected item-total correlations were also derived. Cronbach's alpha for the entire scale was .22, and ranged from .56 to .80 for the subscales.

Since the results of the factor analysis suggested that the TOS was multidimensional in nature, and the overall alpha level for the entire scale was low, revisions made to the TOS were based entirely on the subscales. Items were deleted if: 1) deleting them increased their subscale alpha coefficients by .04 or more and 2) they had low item-subscale correlations (i.e., r < .25). Only one item (item number 27) met this criterion. Items 4 and 20 were also eliminated from the TOS because of errors.[1] In addition, all of the items that comprised the present subscale were deleted since the internal consistency of this subscale was low, α = .57, suggesting that these items were not measuring the same underlying dimension. In total, 9 items (including the present subscale items) were deleted from the scale. Table 2 presents the means, standard deviations, item-total correlations (for each subscale as well as the entire scale), as well as Cronbach's alpha for the total and subscale scores.

Conclusions

The results of the item analyses demonstrated that the overall score on the Temporal Orientation Scale was poor. This suggested that an overall scale score was not assessing a common domain; consequently, the focus of the present research shifted to the subscales of the TOS. With this in mind, revisions to the 30-item TOS were based solely on the item analyses for each of the subscales.

The revised version of the TOS contained 21 items across four subscales: negative future orientation, positive future orientation, negative past orientation, and positive past orientation. The negative future orientation subscale was comprised of 5 items (numbers 1, 2, 3, 5, & 6, as listed in Appendix A) that were theoretically thought to assess negative future orientation. Item 5 was retained despite the fact that it did not load on any of the factors because it was found to have a good item-subscale correlation and elimination of this item would have produced a decrease in the alpha coefficient of the negative future orientation subscale.

The positive future orientation subscale was comprised of 6 items (numbers 7 through 12, as listed in Appendix A). Results of the factor analysis suggested that item 30 (from the positive past orientation subscale) was also part of the positive future orientation subscale. However, this item was eliminated along with the rest of the present orientation

subscale because its internal consistency coefficient was too low.

The negative past orientation subscale was comprised of 5 items (numbers 19, 21, 22, 23, & 24, as listed in Appendix A) and the positive past orientation subscale contained 5 items (numbers 25, 26, 28, 29, & 30, as listed in Appendix A). However, the results of the factor analysis indicated that item 30 loaded on another factor and that item 26 did not load on any factor. Item 27 was eliminated from the positive past orientation subscale despite the results of the factor analysis since it had a low item-subscale correlation (r = .22) and its elimination contributed to an increase in its subscale alpha coefficient. Items 26 and 30 were retained despite the results of the factor analysis because they had reasonable item-subscale correlations (r = .27 and r = .39, respectively) and their eliminations would have produced a decrease in their subscale alpha coefficient.

Thus, the revised Temporal Orientation Scale consisted of 21 items and four subscales. In order to determine the usefulness of this measure future research needs to be carried out to assess the psychometric properties of this scale. This was the purpose of study 2.

Study 2

Study 2 assessed the validity and reliability of the revised Temporal Orientation Scale and its subscales. The

TOS was validated by correlating total and subscale scores with other measures that were theoretically thought to be related (e.g., optimism-pessimism, life satisfaction) or theoretically thought to be unrelated (e.g., social desirability). Participants in this sample completed the revised 21-item Temporal Orientation Scale, the Life Orientation Test (Scheier & Carver, 1985), the Consideration for Future Consequences Scale (Strathman, Gleicher, Boninger, & Edward, 1994), the Life Satisfaction Index (Neugarten, Havighurst, & Tobin, 1961), and the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964). In addition, the TOS was validated through the use of two open-ended questions that asked participants about their pasts and futures. Since some of the participants in study 2 had taken part in the study 1 mass testing session, their data were used to assess the test-retest reliability of the Temporal Orientation Scale.

Method

Participants

Participants were 246 introductory psychology students (142 females, 99 males, and 5 who did not indicate their sex) from Wilfrid Laurier University. Of these 246 participants, 210 were in first year, 11 were in second year, 5 were in third year, 2 were in their fourth year, and 3 were in their fifth year. Fifteen participants did not indicate what year they were in. Of these 246 participants

113 were in the arts faculty, 9 students belonged to the science faculty, 74 students were in business, 7 students were in human economics, 15 students were in kinesiology, and 28 students indicated either "other" faculty or did not indicate which faculty they belonged to. Participants ranged in age from 17 to 44 with a mean age of 20.14. Two hundred and nineteen of these participants had previously completed the 30-item Temporal Orientation Scale during the study 1 administration five to seven weeks earlier. Completion of the study was voluntary and participants received one-half bonus credit, worth .25% towards their grade in psychology for their participation.

Measures

The Life Orientation Test. The Life Orientation Test (Scheier & Carver, 1985) measures individual differences in global optimism. Optimism is defined in terms of the favorability of the individual's generalized outcome expectancies. The test consists of eight items which are answered on a 9-point response format from -4 (very strongly disagree) to +4 (very strongly agree). An example of an item from this test is: "I always look on the bright side of things." Higher scores indicate greater optimism. The Life Orientation Test has a Cronbach's alpha of .76 and a test-retest reliability of (over a 4-week period) .79 (Scheier & Carver, 1985; Scheier et al., 1989).

It was expected that scores on the Life Orientation

Test would be positively related to scores on the positive
future orientation subscale and negatively related to scores
on the negative future orientation subscale. This
expectation was based on the idea that individuals who have
a positive outlook toward their future should also be
optimistic about their future and their ability to achieve
their future goals whereas individuals who have a negative
outlook toward their future should also be pessimistic about
their future and their ability to achieve their future goals
(Teahan, 1958). Moreover, previous research suggests that
high achievers are more optimistic and demonstrate a greater
concern for future goals (Gough, 1953; as cited in Teahan,
1958). Recent studies have also demonstrated a positive
relationship between high achievement motivation and future
orientation (Cottle, 1969; Deboer, 1985; Raynor, 1970).
Based on these findings, it was hypothesized that a positive
relationship would be found between optimism and future
orientation (Teahan, 1958).

Consideration for Future Consequences. The
Consideration for Future Consequences (CFC) scale
(Strathman et al., 1994) consists of twelve items which are
measured on a response format ranging from 1 (extremely
uncharacteristic) to 5 (extremely characteristic). The CFC
assesses the extent to which people consider distant versus
immediate consequences of potential behaviours. An example
of an item from this scale is: "I often engage in a

behaviour in order to achieve outcomes that may not result for many years." The CFC has a test-retest reliability of .76 (over a 5-week period) and it has been shown to be positively related to constructs such as delay of gratification and locus of control (Strathman et al., 1994).

Strathman et al. (1994), suggest that the CFC measures an aspect of future orientation. Presumably, individuals who weigh the outcomes of their behaviours are concerned with their future and are likely to be future oriented (Strathman et al., 1994). Furthermore, individuals who engage in behaviours designed to achieve future goals likely believe that their future goals are obtainable. These individuals probably have a positive future orientation whereas individuals who view their future goals as unattainable probably have a negative outlook on their future and are likely not to engage in behaviours designed to achieve their future goals. Accordingly, it was expected that the CFC would be positively correlated with the positive future orientation subscale and negatively correlated with the negative future orientation subscale. Previous research has demonstrated that the scores on the CFC are positively correlated with the future orientation items from the Stanford Time Perspective Inventory (Strathman et al., 1994).

Life Satisfaction Index A. The shortened form of the Life Satisfaction Index A (LSIA; Neugarten et al., 1961)

assesses the degree to which individuals are satisfied with their lives. Respondents are asked to answer 13 questions on an agree-disagree basis. Scores on this test range from 0 (lowest satisfaction) to 13 (highest satisfaction). An example of an item from the LSIA is: "As I look back on my life, I am fairly well satisfied." The Life Satisfaction Index A has been demonstrated to be related to the Life Satisfaction Rating Scale, r = .55, and to the Life Satisfaction Index B, r = .73. No test-retest reliability or internal consistency reliability have been reported for this measure (Robinson, Shaver, & Wrightsman, 1991).

It was expected that scores on the shortened form of the Life Satisfaction Index A would correlate positively with scores on the positive past subscale and correlate negatively with scores on the negative past subscale of the Temporal Orientation Scale. This expectation is based on the idea that individuals who are satisfied with their lives thus far will also view their pasts more positively than individuals who are not satisfied with their lives.

Marlowe-Crowne Social Desirability Scale. The Marlowe-Crowne Social Desirability Scale (MCSD; Crowne & Marlowe, 1964) assesses the extent to which individuals try to portray themselves in a positive manner. Respondents are asked to indicate if each item on the scale is true or false, as it pertains to them. An example of an item from this scale is: "I have almost never felt the urge to tell

someone off." Higher scores indicate greater portrayal of one's self in a positive manner. The alpha coefficient of this measure is .88 and test-retest reliability is reported at .88 over a 1-month period (Crowne & Marlowe, 1964). Validation studies have demonstrated that high scorers (as compared to low scorers) on the Social Desirability Scale are more responsive to social influence and social reinforcement, and are more likely to inhibit aggression (Crowne & Marlowe, 1964).

It was expected that the scores on the Marlowe-Crowne Social Desirability Scale would have low correlations with all of the subscales from the Temporal Orientation Scale. Since the Social Desirability Scale assesses a different construct than Temporal Orientation, it was hypothesized that these two measures would be unrelated.

Open-ended questions. In addition to responding to these scales, participants were asked to write a short paragraph about what they thought their life would be like after university and what their life was like before entering university. It should be noted that similar procedures have been used before to measure temporal orientation (Krauss & Ruiz, 1967). These paragraphs were rated in two ways by the experimenter (who was blind to the participants' scores on the Temporal Orientation Scale); the number of words (hyphenated words and numbers were counted as one word each) and the number of sentences provided about

the future and the past were counted for each of the respective paragraphs. In addition, each statement was coded as either positive, negative, positive and negative, or neutral.

It was expected that participants who were future oriented would have longer future paragraphs (as assessed by the number of words) and would provide more details about their future (as assessed by the number of sentences given) than participants who were past oriented. Thus, positive correlations were expected between the scores from the future paragraph and the scores on the future subscales. This expectation was based on the idea that future oriented individuals spend more time thinking about, and planning their life than individuals who are present or past oriented. It was also thought that participants with high scores on the negative future subscale would have a greater number of sentences coded as negative (for the future paragraph), whereas participants with high scores on the positive future subscale would have a greater number of sentences coded as positive in the future paragraph.

In addition, it was expected that past oriented individuals would have longer and more detailed past paragraphs since presumably, past oriented individuals spend more time thinking about and reflecting on their past. It was expected that the number of words and number of details provided would correlate positively with scores on the past

subscales. Furthermore, it was predicted that scores on the negative past subscale would correlate positively with the number of sentences coded as negative and the scores on the positive past subscale would correlate positively with the number of sentences coded positively. In order to ensure inter-rater reliability, 25% of these paragraphs were also coded by an independent rater as well as the experimenter. For the future paragraph, the percent agreement between raters, of sentences coded positively, negatively, neutral, or positive/negative were 86.49%, 76.47%, 72.60%, and 100%, respectively. For the past paragraph, the percent agreement between raters of sentences coded positively, negatively, neutral, or positive/negative were 72.22%, 60.46%, 80.77%, and 100%, respectively. The overall percent agreement amongst the raters across all types of codings for both paragraphs was found to be 76%.

All scales for the present research were answered using a 9 point Likert-type response format ranging from -4 (very strongly disagree) to +4 (very strongly agree).

Procedure

The second administration of the questionnaire occurred during mass testing sessions during introductory psychology classes approximately five to seven weeks after the initial administration of the scale. All participants completed the refined 21-item Temporal Orientation Scale along with the following scales: the Life Orientation Test

(LOT; Scheier & Carver, 1985), the Consideration for Future
Consequences Scale (CFC; Strathman, et al., 1994), a scale
assessing false memories (from other research in the
psychology department), the Marlowe-Crowne Social
Desirability Scale (Crowne & Marlowe, 1964), the shortened
form of the Life Satisfaction Index A (LSIA; Neugarten et
al., 1961), and a scale assessing the motivations underlying
food choices (from other research in the psychology
department). The LOT, CFC, and LSIA were used to assess
convergent validity since it is plausible that these three
constructs are related to temporal orientation. Discriminant
validity was assessed using the social desirability measure.

In addition, participants were asked to write two short
paragraphs on what they thought their life would be like
after university and what their life was like before
university. The entire questionnaire that was used in the
second mass testing session can be found in Appendix B.
Participants were told that the questionnaire contained
measures concerning how they view their lives. Again,
participants were informed that completion of the
questionnaire was completely voluntary, that they could omit
any questions they did not wish to answer, that they could
withdraw their participation at any time, and that their
answers would be kept completely confidential. Completion of
the questionnaire took approximately one hour. Students who
completed the questionnaire received one-half bonus credit

for their participation.

<div align="center">Results</div>

Item Analyses

Table 2 presents the means, standard deviations, item-total correlations (for both the subscales and the total scale) and alpha coefficients (for both the subscales and total scale) for each of the 21 retained items on the Temporal Orientation Scale (TOS). Total scale scores were derived by reversing the scores on all of the past items and adding them to scores on the future items. These analyses indicated that the four subscales possess a good degree of internal consistency, with Cronbach's alpha ranging from .6950 to .82. However, the alpha coefficient for the total scale is poor, (α = .20) suggesting that the items are not measuring a unidimensional construct.

Correlations Among Subscales

Table 3 presents the intercorrelations among the four subscales of the TOS. As expected, the negative past subscale was found to correlate positively with the positive past subscale. Although a significant positive relationship was found between the negative future orientation and positive future orientation subscale, this correlation was low. Unexpectedly, the results revealed a substantial positive correlation between the NFO and NPO subscales (r = .64) and between the PFO and PPO subscales (r = .40) suggesting a considerable amount of shared

variance between subscales measuring the same type of affect.

Test-Retest Reliability

Two hundred and nineteen (130 female, 87 male, and 2 individuals who did not indicate their gender) of the 246 participants in study 2 had also completed the 30-item Temporal Orientation Scale in study 1 (with 5 to 7 weeks between administrations). The results of the 5-7 week test-retest analysis indicated participants' scores on the refined 21-item TOS and its subscales to be moderately stable over time (test-retest reliability was .57 for the total score on the refined 21-item TOS, and .59 to .74 for the subscales). Table 4 presents the correlations between the first and second administration of the scale for each of the four subscales as well as for the entire scale.

Relations of the TOS to Other Scales

We examined the relationship between the TOS and a number of scales measuring similar constructs in order to begin assessing its convergent validity. All participants from study 2 completed the Life Orientation Test (Scheier & Carver, 1985), the Consideration for Future Consequences scale (Strathman et al., 1994), and the shortened form of the Life Satisfaction Index A (Neugarten et al., 1961). The Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964) was administered to assess the discriminant validity of the Temporal Orientation Scale.

Correlations of the TOS and its subscales with the four scales noted above are presented in Table 5 and are described below.

Life Orientation Test. The Life Orientation Test (LOT) (Scheier & Carver, 1985) assesses individual differences in global optimism. Higher scores on this test indicate greater optimism. The LOT was found to have an internal consistency reliability coefficient of .82 in this study. It was expected that scores on the LOT would be positively related to scores on the positive future orientation (PFO) subscale and negatively related to scores on the negative future orientation (NFO) subscale. As hypothesized the relation between the LOT and the PFO subscale was positive and significant, r = .28, p < .001, while the relation between the LOT and NFO subscale was negative and significant, r = -.35, p < .001.

Consideration for Future Consequences. The Consideration for Future Consequences (CFC) scale (Strathman et al., 1994) evaluates the extent to which people consider distant versus immediate consequences of potential behaviours. Higher scores indicate greater consideration of distant behaviours. The CFC was found to have a Cronbach's alpha of .82 in this study. It was expected that the CFC would be positively related to both the positive and negative future orientation subscales. There was a significant positive correlation between the CFC

and the PFO subscale, r = .36, p < .001, but there was no
relationship between the CFC and the NFO subscale, r = .00,
n.s..

Life Satisfaction Index A. The shortened form of the
Life Satisfaction Index A (LSIA; Neugarten et al., 1961)
assesses the extent to which individuals are satisfied with
their lives. The LSIA was found to have good internal
consistency reliability in this study (α = .77). It was
expected that scores on the shortened form of the LSIA would
correlate positively with scores on the positive past
orientation (PPO) subscale and correlate negatively with
scores on the negative past orientation (NPO) subscale. The
relationship between the LSIA and the PPO was found to be
non-significant, r = .04, n.s., suggesting that the two
constructs are unrelated or that the PPO subscale may not
really be tapping the dimension of positive past
orientation. The results did, however, demonstrate a
negative relationship between the LSIA and the negative past
orientation (NPO) subscale, r = -.39, p < .001, which was as
predicted.

Marlowe-Crowne Social Desirability Scale. The Marlowe-
Crowne Social Desirability Scale (MCSD; Crowne & Marlowe,
1964) evaluates the extent to which individuals try to
represent themselves in a positive manner. Higher scores
indicate greater portrayal of one's self in a positive
manner. Analyses indicated that the MCSD had a Cronbach's

alpha of .78. It was expected that scores on the MCSD would have low correlations with all of the subscales of the TOS. The correlations between the Marlowe-Crowne Social Desirability Scale and the subscales are presented in Table 5. Unexpectedly, the MCSD was found to have significant negative correlations with the NFO and NPO subscales (see Table 5).

Open-ended Questions

Correlational analyses were carried out on the ratio of sentences coded positively, negatively, neutral, positive and negative, the number of sentences provided, and the number of words with each of the subscale scores from the TOS as well as the overall score on the Temporal Orientation Scale. Analyses were performed separately for the future and past paragraphs. These analyses yielded no significant effects. The results of these analyses can be found in Table 6.

Gender Differences

Overall, men did not significantly differ from women on the positive future orientation subscale, or the negative past orientation subscale. However, women obtained slightly higher scores on the negative future orientation and positive past orientation subscales than did men, indicating that women are more negatively oriented toward their future and more positively oriented toward their past than men. Table 7 presents the means, t-values, and p-values for each

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of these t-tests.

General Discussion

Dimensionality of the Temporal Orientation Scale

Initially, the Temporal Orientation Scale was conceptualized as a unidimensional measure with higher scores indicating greater future orientation. Factor analysis of such a unidimensional measure should yield a one-factor solution. However, the results of the factor analysis yielded a four factor solution indicating that there is more than one dimension underlying the TOS.

Further evidence that the TOS was not a unidimensional measure was provided by the internal consistency reliability coefficient of the 21-item scale. The alpha level for the scale was extremely low ($\alpha = .22$), indicating that the items in the scale were not all evaluating the same underlying domain. One of the assumptions of using Cronbach's alpha is that the scale that is being assessed is a unidimensional measure (Nunnally, 1978) and the apparent violation of this assumption may account for the low alpha coefficient that was obtained. Moreover, items that had high item-total correlations with the overall scale scores were not necessarily items that had high item-total correlations with their respective subscale scores.

These results lead to the conceptualization of the temporal orientation scale as a multidimensional measure containing four relatively distinct subscales: negative

future orientation, positive future orientation, negative

past orientation, and positive past orientation. Thus, the

subscales will serve as the focus in this Discussion

section.

Since four of the original subscales were retained on

the basis of study 1, the reliability and validity of each

of these subscales was assessed. The results of the item

analyses of each of the subscales indicate that the

subscales demonstrate reasonable internal consistency and

test-retest reliability. In addition, the convergent and

discriminant validity of each of the subscales was

evaluated. Although there is no hard and fast rule

concerning what correlations provide convergent and

discriminant evidence it is generally found in the

literature that significant correlations between .30 and

.40 (or higher, but correlations greater than .60 are rare)

are taken as evidence for convergent validity (Kaplan &

Saccuzzo, 1989) and that correlations less than .30 (whether

significant or non-significant) are taken as evidence for

discriminant validity (Jarvis & Petty, 1996; Scheier &

Carver, 1985; Strathman et al., 1994). However, for the

present research it was thought that the criterion of

correlations less than .30 as evidence for discriminant

validity was too lenient and instead, a criterion of

correlations less than .25 was adopted. Each subscale will

now be considered separately.

Negative Future Orientation

The negative future orientation subscale was found to
have a moderately high level of internal consistency
(α = .7827) and was found to be the most stable subscale
over a 5 to 7 week interval between administrations
(r = .74). This indicates that the items on this subscale
are all measuring, to some extent, the same underlying
construct and that participants' responses on this subscale
were reasonably consistent over time.

The results of study 2 also provided some evidence of
convergent validity for the negative future orientation
subscale. It was hypothesized that scores on the NFO
subscale would be negatively related to scores on the Life
Orientation Test (LOT) and the Consideration for Future
Consequences Scale (CFC). As predicted, the NFO subscale was
found to have a negative relationship with the LOT
(r = -.35), signifying that participants who scored high on
the NFO subscale were less optimistic in general. Contrary
to predictions, however, no relationship was found between
the NFO and CFC (r = .00). However, the CFC was designed to
assess the extent to which individuals engage in behaviours
to achieve distant versus immediate goals. It is plausible
then, that contrary to our initial hypothesis, individuals
who view their futures negatively see no reason to engage in
behaviours designed to achieve any goals since they may not
believe their goals are attainable.

Convergent validity was also evaluated by correlating scores on the NFO subscale with participants' responses to an open-ended question pertaining to their future. It was thought that participants who had higher scores on the NFO subscale would display a greater number of negative thoughts about their future and would provide more details about their future on the open ended question. The results however, did not support these hypotheses. No significant relationship was found between participants' scores on the NFO subscale and the number of negative thoughts they had about their futures or the number of details they provided about their future.

Assessment of the subscale's discriminant validity indicated substantial overlap between social desirability and negative future orientation. It was hypothesized that the NFO subscale would have a low correlation with the Marlowe-Crowne Social Desirability Scale. Unexpectedly, the NFO was found to have a significant negative relationship with the MCSD (r = -.30). This correlation indicates that individuals high in social desirability are less likely to have high scores on the negative future orientation subscale.

In summary, the negative future orientation subscale was found to possess both reasonable internal consistency and test-retest reliability. Some evidence was obtained for the convergent validity of this subscale, but assessment of

the subscale's discriminant validity indicated an unexpectedly large amount of overlap with social desirability.

Positive Future Orientation

The positive future orientation subscale was found to have a moderate Cronbach's alpha (α = .6950) and modest test-retest reliability (r = .59), suggesting that the questions in this subscale basically tap the same underlying dimension which is thought to be positive future orientation. The results of the test-retest reliability analysis indicate that the scores on this subscale are relatively stable over a 5 to 7 week interval.

The positive future orientation scale was found to have a moderate degree of convergent validity. It was hypothesized that the PFO subscale would be positively correlated to both the LOT and the CFC. As anticipated, the PFO subscale was found to be positively correlated with the LOT (r = .28) indicating that as scores on the PFO subscale increased (higher scores indicate greater positive future orientation) so did scores on the LOT. Although this correlation is relatively small and does not meet the selected criterion, it is in the predicted direction and extremely close to the chosen criterion level. Thus, it provides some evidence that positive future orientation and optimism are related. As expected, the PFO was also found to correlate positively with the CFC scale (r = .36). This

result indicates that individuals who are positively oriented toward the future were also more likely to engage in behaviours designed to achieve their future goals.

In addition, it was also hypothesized that individuals who had high scores on the PFO subscale would also have longer paragraphs on the future open-ended question and have a greater number of positive thoughts about their futures than individuals who had low scores on this subscale. These analyses however, failed to yield any significant relationships and did not provide further evidence of convergent validity.

Results were also obtained which provided evidence for the discriminant validity of the positive future orientation subscale. While the correlation between the PFO subscale and the Marlowe-Crowne Social Desirability Scale (r = .18) was significant, the overall size of the correlation suggested that participants were not responding to this subscale in a socially desirable manner.

Accordingly, the positive future orientation subscale was thought to possess a reasonable degree of internal consistency and test-retest reliability. In addition, the results of study 2 provided some support for the convergent and discriminant validity of this subscale.

Negative Past Orientation

The negative past orientation subscale demonstrated a good degree of internal consistency reliability (α = .8189).

This subscale also proved to be moderately stable over time as evidenced by the test-retest reliability coefficient (r = .68). The items in the NPO subscale appear to be measuring, to some extent, the same latent construct and participants' responses to this subscale were relatively unchanged over time.

The negative past orientation subscale was found to possess a good degree of convergent validity. As hypothesized, the LSIA and NPO subscale were negatively correlated (r = -.39) suggesting that individuals who view their pasts negatively are less satisfied with their lives overall. Analyses also revealed that the NPO subscale correlated negatively with the LOT (r = -.46) which supports the idea that there is a strong affective component to the Temporal Orientation Scale. This relationship suggests that individuals who view their pasts negatively also display more generalized dispositional pessimism. Taken together these results demonstrate that the negative past orientation subscale possesses a good degree of convergent validity.

Analyses of the open-ended questions revealed no significant correlations between participants' scores on the NPO subscale and the ratio of negative thoughts they had about their pasts or the number of details they provided about their pasts.

Discriminant validity was evaluated by correlating the scores on the NPO subscale with scores on the Marlowe-Crowne

Social Desirability Scale. Unexpectedly, a significant negative correlation was found between these two measures (r = -.38), suggesting a considerable amount of shared variance between negative past orientation and social desirability.

In summary, the negative past orientation subscale was found to have a good degree of internal consistency and moderate test-retest reliability. Results provided evidence for the convergent validity of this subscale. Discriminant validity, as assessed by means of correlations with the Marlowe-Crowne Social Desirability Scale, was poor.

Positive Past Orientation

The positive past orientation subscale demonstrated a reasonable degree of internal consistency reliability (α = .7646) and a reasonable degree of test-retest reliability (r = .64). This provides support for the idea that the items comprising the PPO appear to be measuring a similar domain and that scores on this scale are reasonably stable over time.

No evidence was obtained in the present study to indicate that the positive past orientation subscale possessed a good degree of convergent validity. It was predicted that scores on the PPO subscale would positively correlate with scores on the LSIA and it was also thought that individuals with high scores on the PPO subscale would provide more details about their pasts and have a greater

number of positive sentences in their past paragraphs. Contrary to expectations, however, no relationship was found between the PPO subscale and the LSIA (r = .04) which causes the convergent validity of this subscale to be questioned. Furthermore, no significant correlations were found between scores on the positive past orientation subscale and the number of positive thoughts participants' had about their pasts or the length of the past paragraphs.

Although the present study provided little evidence of the validity of the PPO subscale it should be noted that Hendley (1994) did find some evidence of the validity of this subscale through the use of the known groups method. Hendley (1994) administered the TOS to two groups of individuals (elderly participants and graduate students) who were thought to differ significantly on the construct of temporal orientation. She found that the elderly participants had significantly higher mean scores on the positive past subscale (M = 30.44) than did the group of graduate students (M = 26.18), t(54) = 3.06, p < .05. This finding suggested that elderly participants were more positively past oriented than the group of graduate students and provided validation for the positive past orientation subscale. However, another plausible explanation for this difference may be the fact that elderly participants are older and simply have more past to think about and this difference may be reflected in the results of the t-test

reported above.

The positive past orientation subscale was found, however, to possess discriminant validity. As expected, the PPO subscale did not significantly correlate with the Marlowe-Crowne Social Desirability Scale, suggesting that the two constructs are unique and unrelated.

Although the positive past orientation was found to possess a moderate degree of internal consistency and test-retest reliability no evidence of convergent validity was found. The results of study 2 did however, provide evidence for the discriminant validity of this subscale.

Correlations of Subscale Scores with Open-Ended Responses

Results of the present study did not find any significant relationships between the TOS subscales and the codes from the open-ended questions. While this may suggest low validity for the subscale scores, it may also indicate that the open-ended responses provided an inadequate standard against which to assess subscale validity. Participants may not have had enough time to adequately reflect on their futures or their pasts before responding to the questions, which may have affected their responses. Furthermore, in this stage of their lives when they are experiencing the transition from high school to university they may be more focused on the present and may not have spent time thinking about their pasts or their futures. It is also possible that participants did not have enough

time to write down all their thoughts about their pasts and
futures.

Social Desirability and Discriminant Validity

The results of the present study indicate that the
negative future orientation and negative past orientation
subscales are related to the Marlowe-Crowne Social
Desirability Scale. Initially, it was expected that temporal
orientation would not be related to social desirability. The
present results, however, suggest that there may indeed be a
social desirability component to negative future and
negative past orientation. Individuals high in the need to
portray themselves in a socially desirable manner may also
try to portray themselves as having a less negative
orientation toward the future or the past because they may
feel that it is not socially acceptable for them to have or
to admit to having a negative outlook for the future.

Furthermore, research conducted by Crowne and Marlowe
(1964) suggests that the MCSD is actually tapping a more
general motive, which they have termed an "avoidance of
disapproval" (Crowne, 1979). Thus, respondents may feel that
others would disapprove of them if they admit to having a
negative orientation toward the past or the future. In order
to avoid the disapproval of others, individuals may respond
to the NFO and NPO in a less negative manner in an attempt
to portray themselves as being more positively oriented
toward the future and the past, respectively. Thus, the

Marlowe-Crowne Social Desirability Scale may not have been
the best measure to use to assess discriminant validity.

Relationship Among Subscales

Results of the factor analysis indicated that the
construct of temporal orientation was not a unidimensional
continuum, with past orientation and future orientation at
the extremes. Results indicated instead that the constructs
of past orientation and future orientation are relatively
distinct. Results suggested, moreover, that individuals can
be not only past and future oriented, but they also regard
these orientations positively and/or negatively.

Analyses revealed that the negative future orientation
and positive future orientation subscales were significantly
positively correlated (r = .17). Although the obtained
correlation was significant, the low correlation suggests
that the PFO and NFO subscales are relatively unrelated. A
significant positive relationship was also found between the
negative past orientation subscale and the positive past
orientation subscale (r = .45). This relationship was
relatively strong suggesting that individuals who think
about their pasts negatively also think about their pasts
positively. A general orientation toward the past may
account for this finding.

Correlations among the subscale scores suggest that
there is a strong affective component to the TOS. The
results showed that individuals who were negatively oriented

to the past also tended to be negatively oriented to the future. A strong positive correlation was also found between positive past and positive future orientation (r = .40). These results suggest that an individual's affective disposition (either positive or negative) affects their general outlook towards both their past and their future. Additionally, the results of the factor analysis implied that the various subscales of the TOS measured not only temporal orientation, but also components relating to the kind of affect associated with thoughts about the past and future. The fact that all of the negative past orientation items and all but one of the negative future orientation items loaded on the first factor suggested that this factor may be tapping a negative affect dimension.

Limitations of the Present Research

Originally, the Temporal Orientation Scale was conceptualized as a unidimensional measure. Analyses however, indicated that both the 30-item original version of the TOS and the 21-item refined version of the TOS had poor internal consistency reliability coefficients (α = .22 and α = .20, respectively) indicating that the items in the TOS were not all measuring one common domain. Additionally, the results of the exploratory factor analysis revealed a four factor solution providing further evidence that the TOS is not a unidimensional measure, but rather a multidimensional measure.

Correlations among the subscales suggested that there may be a strong affective component to the Temporal Orientation Scale. Analyses revealed a strong correlation between the negative future and negative past orientation subscales (r = .64) and between the positive future and positive past orientation subscales (r = .40). This suggests that there is a considerable amount of shared variance between the negative future and negative past subscales and between the positive future and positive past subscales. This shared variance may be accounted for by negative and positive affect, respectively. Further investigation is needed to determine if the affective component of the scale overshadows the temporal orientation component of the scale.

Scale Construction. Although the results of the present study indicate that the Temporal Orientation Scale may possess somewhat reliable and valid subscales, further improvements in the scale are necessary. The construct of temporal orientation is an ambiguous, hard-to-define construct. A review of the literature reveals that definitions of temporal orientation and future orientation vary widely across studies (Agarwal & Tripathi, 1984; Cottle, 1967; Frederickson, 1988; Getsinger, 1975; Keller, 1980; Koenig, 1979; Krauss & Ruiz, 1967; Lamm et al., 1976).

Hendley's (1994) definitions of past and future orientation are based upon a review of this literature. However, since definitions of temporal orientation and its

related constructs vary within the literature, this considerably weakens her definitions of past and future orientation. For example, Hendley (1994) maintains that past oriented individuals tend to think that the most significant events in their lives have already occurred. This definition makes it difficult for children to be <u>classified</u> as past oriented, but that does not mean that they cannot <u>be</u> past oriented.

Most researchers agree that the first step in scale construction is to have a <u>good</u>, <u>thorough</u>, definition of the construct(s) to be measured (Annett, 1974; Kaplan & Saccuzzo, 1989; Nunnally, 1978). Thus, the constructs of past and future orientation need to better defined, as indicated above. In addition, these definitions should take into account the affective component of the various subscales which is something Hendley's definitions failed to do. For example, a thorough definition of the negative future orientation construct should be able to answer the question: "What does it mean to be negatively oriented toward the future?" People who are negatively oriented toward the future can be thought of as individuals who have a pessimistic outlook about their future. These individuals may not believe their future goals are achievable, may worry about what the future will bring, and may be concerned about their lifestyle in the future. Conversely, positive future orientation entails an optimistic outlook toward the future.

For example, these individuals believe that their future goals are achievable; they believe they can overcome any challenges they may have to face, and in general they think that they will have, for the most part, a good life and a reasonable standard of living.

A person who is negatively oriented toward the past can be viewed as an individual who is disappointed with her/his past. These individuals have regrets about their pasts, would do things differently if given another chance, feel that they did not accomplish as much as they could have, and in general, feel that they did not always get what they wanted in the past. Conversely, individuals who are positively past oriented are satisfied with what they've accomplished in their lives thus far, fondly remember experiences they've had, and believe, for the most part, that their past was good.

These definitions are not all encompassing and are written only as suggestions for the starting point of new and better definitions. These definitions still need to be expanded upon to ensure that the domain that is being assessed is thoroughly described. From these new definitions, a new list of possible items measuring these subscales should be generated. It is possible that items that are more representative of these subscales may be selected if improvements were made to the definitions of these constructs.

In addition, although the present orientation subscale was eliminated from the TOS it is likely that the items that comprised this subscale were just inadequate. It is likely that individuals can be positively and/or negatively oriented toward the present just as much as they can be positively and/or negatively oriented toward the past or future. In its present form the TOS fails to identify individuals who are present oriented. Thus, an attempt should be made to define the constructs of positive present orientation and negative present orientation. Items should then be generated for these constructs and these subscales should become part of the TOS.

Another limitation of the TOS is that no attempt has been made to avoid response set. Response set refers to the tendency of individuals to respond to attitude statements for reasons other than the content of the statements (Robinson, Shaver, & Wrightsman, 1991). For example, on a 9-point Likert-type scale individuals may choose alternatives solely on the basis of where they appear. In order to reduce or altogether avoid response set, both pro- and con-trait items should be included in scales. It is sometimes difficult however, to derive negatively worded items. In cases where the scale contains no negatively worded items the endpoints of the response format could sometimes be reversed. For example, in a 9-point Likert-type scale where 1 is "very strongly disagree" and 9 is "very strongly agree"

some items should be presented so that 1 is "very strongly
agree" and 9 is "very strongly disagree" (Robinson, Shaver,
& Wrightsman, 1991). The TOS needs to employ one of these
suggestions in order to reduce the possibility that
individuals are responding to the items for reasons other
than the contents of the items.

Reliability. In the early stages of research internal
consistency coefficients greater than .70 are generally
considered to be good. However, Nunnally (1978) argues that
once the development of a scale is over alpha coefficients
should be greater than .80. Although the results of the
present study indicate that each of the subscales appears to
have moderate internal consistency, the alpha coefficients
could be higher. In particular, the internal consistency
coefficients of the negative future, positive future, and
positive past orientation subscales should be increased.

The results of the exploratory factor analysis
suggested that some items may belong on a subscale other
than the one for which they were intended. However, since
the present research was driven primarily by theoretical
concerns, the results of the factor analysis were not used
in constructing the subscales. It is possible that if the
results of the factor analysis had been used to develop the
subscales the internal consistency coefficients may have
been higher. Another way to increase the alpha coefficients
of these subscales would be to add more items (assuming that

the additional items have been shown to be good measures of the appropriate subscales).

As noted earlier, the alpha coefficient for the overall score on the TOS is extremely low and suggests that the items are not measuring one common domain. The way in which the overall scale score was calculated may account for this finding. As previously mentioned, overall scale scores were calculated by reverse scoring the past items and adding these scores to the present items (in study 1 only) and future items. Hendley (1994) hypothesized that this scoring system would reflect future orientation, with higher scores indicating greater future orientation. However, reverse scoring the past items does not mean that these scores now reflect future orientation and they should not be treated as such. One of the more stable findings of the present study was support for the idea that temporal orientation is a multidimensional construct. Thus, the TOS should not be thought of as a unidimensional measure that produces an overall score, but rather as a multidimensional set of four relatively independent but theoretically related subscales.

Validity. Although not often addressed, face validity of the items in a scale is always important. Examination of the items that comprise the subscales of the TOS makes this component of validity seem questionable. Some of the items in the scale (from the original 30-item version, most notably numbers 6, 9, 10, 19, 20, 21) do not seem to reflect

the affective dimension which they were intended to reflect. In fact, these items all seem to <u>lack</u> an affective component. This situation can easily be remedied by changing the wording of the items slightly. For example item number 6 could be changed to "I often wonder if my life will be bad five or ten years from now." Additionally, 4 of the 6 items that comprised the present orientation subscale (from study 1) involved the future and it is unclear whether these items assess present orientation or future orientation.

Moreover, only two of the subscales (PFO and NPO) demonstrated convergent validity well. The negative future orientation subscale demonstrated some convergent validity, and the positive past orientation subscale was lacking in convergent validation. One possible way to validate the PPO subscale is to ask individuals to respond to the following questions "How satisfied are you with what you've accomplished in the past?" (rated on a 7-point Likert-type scale with endpoints 1 (<u>not at all satisfied</u>) to 7 (<u>extremely satisfied</u>). Respondents should then be asked to explain (in a short paragraph) why they made the response they did. It should be noted that first the researcher would have to define what period of time the term "past" refers to. The sentences obtained from the paragraph data could be coded as either positive, negative, neutral, or positive/negative. Presumably, individuals with high scores on the positive past orientation subscale would also

indicate that they are satisfied with lives and a significant positive correlation should be found between these two measures. In addition, it would be expected that a significant positive correlation would be found between scores on the positive past orientation subscale and the number of sentences coded positively in the paragraph data. Conversely, a negative correlation should be found between scores on the negative past orientation subscale and the Likert-type question noted above. In addition, scores on the negative past orientation subscale should positively correlate with the number of sentences coded negatively from the paragraph data. This study should be carried out on a middle aged sample simply because they have both past and future to think about and this would reduce the chance of a possible confound with age which may affect the results.

Additionally, since the NFO and NPO subscales have been shown to lack discriminant validity regarding the MCSD, discriminant validation of these subscales still needs to be obtained. Scores on these subscales could be correlated with scores on the MMPI Lie (L) Scale. The MMPI Lie Scale was originally constructed to identify socially desirable responding to questions on the MMPI (Robinson, Shaver, & Wrightsman, 1991). The MMPI Lie scale is a well validated scale (Robinson, Shaver, & Wrightsman, 1991) and is a better behavioral measure of social desirability rather than a personality measure. That is, the MMPI Lie scale assesses

whether or not respondents are answering questions (in their current situation) in a socially desirable manner rather than assessing whether or not an individual has a need for approval (as does the MCSD). If the scores on the NFO and NPO subscale were found to be positively correlated with the L scale this would provide additional evidence that individuals are responding to these subscales in a socially desirable manner. If that is the case, the effects of social desirability would have to be partialled out of the scores on these two subscales before these scores were used in further analyses.

Sample. Another problem with this study is the sample. Most of the participants were first year students who are dealing with much change in their lives (e.g., living away from home for the first time, just out of high school, coping with the transition to university). This is likely to affect an individual's temporal orientation. Study 1 took place just after university classes had started (approximately 1 month into term) and participants were probably still adjusting to university life. Study 2 took place approximately 5-7 weeks after that, just before Christmas exams took place. Future research needs to be carried out on a sample with a wider age range in order to assess temporal orientation over the life span.

Implications of the Present Research

The research on the construct of temporal orientation

has conceptualized temporal orientation as a continuum with past orientation and future orientation being at opposing ends (Lamm et al., 1976; Schmidt et al., 1978; Trommsdorff, 1983). Thus, these studies postulated that individuals were either past or future oriented, but not both. Based on the results of the present study temporal orientation should not be viewed as a continuum but rather should be thought of as having two components: past orientation and future orientation. Furthermore, it is reasonable to postulate that individuals can view these orientations either positively or negatively. It is also possible that individuals think just as much about their past as they do their future.

Directions for Future Research

The present research provided evidence that individuals' temporal orientation can and does have an affective component. This is the first scale to assess temporal orientation that takes into account differences in affective outlook within the construct of temporal orientation. Several researchers (Lamm et al., 1978; O'Rand & Ellis, 1974; Schmidt et al., 1978; Trommsdorff, 1983) have maintained that the affective component of temporal orientation is an important element within this domain and warrants investigation. However, no research to date has attempted to combine the affective dimension with temporal orientation in one measure.

As evidenced by the present research, combining the two

constructs makes the results difficult to interpret. Upon

examination of the items from the four subscales in the TOS

it is unclear as to whether the items measure temporal

orientation, positive/negative affect or a combination of

the two constructs, as was intended. Combining the two

constructs makes it difficult to determine if the scale is

measuring one of its components (i.e., temporal orientation

and affectivity) more than the other.

Future research should correlate the subscales of the

TOS with the Affect Scales (Bradburn, 1969; as cited in

Robinson, Shaver, & Wrightsman, 1991), measures assessing

depression, and the Stanford Time Perspective Inventory

(Zimbardo, 1990; as cited in Strathman et al., 1994). The

Affect Scales consists of three scales measuring positive

affect, negative affect, and affect balance and the Stanford

Time Perspective Inventory assesses past, present, and

future orientation. If high correlations (i.e., r>.85) were

found between scores on either of these measures and scores

on the appropriate subscales of the TOS it would suggest

that the TOS was actually tapping the same dimension as the

measure to which it was highly correlated. Thus, to provide

support for the hypothesis that the subscales of the TOS

measure a combination of temporal orientation and

affectivity correlations between the subscales of the TOS

and the measures discussed above should fall within the

range normally acceptable for convergent validity (.30 to

.60).

Conclusions

In summary, the Temporal Orientation Scale has been shown to have somewhat reliable and valid subscales. Results of the present study suggested that the construct of temporal orientation is multidimensional in nature instead of unidimensional, as was previously thought. In addition, it was found that the subscales of the TOS contain a strong affective component. Future research needs to focus on further developing and validating the subscales of the TOS. In addition, future research should investigate the strength of the affective component of the subscales in the TOS.

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Endnotes

[1]Due to computer and computational errors two items (numbers four and twenty as listed in Appendix A) were eliminated in error based on the results of sample 1. However, the elimination of these items did not adversely affect the internal consistency of the subscales they were originally a part of (Negative Future Orientation and Negative Past Orientation, respectively).

Table 1

Factor Loadings from Exploratory Factor Analysis

for initial 30-item scale

Item	Factor1	Factor2	Factor3	Factor4
Negative Future Orientation				
1	.5543	-.0918	.4049	-.3052
2	.4285	-.0181	.3800	-.1424
3	.5163	-.2267	.4479	-.1588
4	.4096	-.0750	.2415	-.5574
5*	.3439	-.0311	.2294	-.1323
6	.4092	.2287	.3356	-.1699
Positive Future Orientation				
7	.0500	.5897	-.1219	.0304
8	-.0033	.6227	.2115	-.0035
9	-.0519	.5265	.2110	-.2232
10	-.2192	.5729	.1818	-.2682
11	-.0099	.5384	.1167	.1111
12	-.3258	.5706	-.0528	.0313
Present Orientation				
13	-.2111	.0989	.1304	.6071
14	-.0772	-.0313	-.0194	.7517
15	-.1371	.0940	.1674	.6334
16	.0777	-.2932	.0111	.5601
17*	-.0381	-.3604	.2378	.0890
18*	.3035	-.2804	-.0224	.3961

(table continues)

Negative Past Orientation

19	.6632	.1638	.1259	-.0190
20	.5598	-.0596	-.0001	-.1982
21	.6710	-.0419	.2739	.0178
22	.7455	.0376	-.0362	.0119
23	.7300	-.0518	-.0776	.0548
24	.6669	-.1901	-.0996	-.0304

Positive Past Orientation

25	.0211	.2898	.4543	.0081
26*	.2578	.3679	.2346	.1315
27	-.0244	-.1115	.5179	.0895
28	.1643	.2628	.7075	.0714
29	.2083	.1976	.6755	.0725
30	-.0231	.4358	.4231	.0385
Eigenvalues	5.281	3.624	2.407	1.384
% of Variance Accounted For	17.6	12.1	8.0	4.6

Note. Numbers under the "item" column correspond to the order of the items in Appendix A.

*Indicates items not loading >.40 on any of the factors

Table 2

Item Means, Standard Deviations, and
Item-Total Correlations

	Study 1				Study 2			
Item	Mean	SD	ITC (Subscale)	ITC (Total)	Mean	SD	ITC (Subscale)	ITC (Total)
Negative Future Orientation								
	α = .7674				α = .7827			
1	5.97	2.34	.631	-.260	5.84	2.15	.673	-.301
2	6.64	2.12	.523	-.076	6.63	1.89	.565	-.100
3	5.78	2.31	.595	-.192	5.98	2.06	.617	-.345
4	5.91	2.09	.519	-.274	----	---	---	----
5	4.85	2.43	.371	-.084	4.62	2.25	.392	-.183
6	7.03	1.57	.410	-.084	7.00	1.69	.580	-.117
Positive Future Orientation								
	α = .6791				α = .6950			
7	8.41	1.06	.364	.030	8.07	1.11	.369	.127

(table continues)

8	8.53	.910	.459	.050	8.34	1.12	.456	.111
9	7.21	1.32	.428	-.022	7.10	1.36	.533	.217
10	7.18	1.44	.493	.025	7.15	1.40	.526	.127
11	7.83	1.32	.348	.079	7.55	1.61	.276	-.038
12	7.63	1.57	.410	.076	7.62	1.43	.444	.219
Present Orientation								
	α = .5686							
13	5.32	2.18	.325	.179	---	---	---	---
14	4.41	2.16	.476	.128	---	---	---	---
15	5.93	1.96	.366	.140	---	---	---	---
16	3.49	2.15	.414	.073	---	---	---	---
17	3.73	2.31	.104	-.006	---	---	---	---
18	4.80	2.59	.221	-.047	---	---	---	---
Negative Past Orientation								
	α = .8016				α = .8189			
19	7.40	1.88	.525	.255	3.20	1.87	.590	.232
20	5.22	2.30	.450	.244	---	---	---	---

(table continues)

Item		Study 1				Study 2		
21	6.17	2.23	.539	.147	3.83	2.03	.627	.194
22	5.64	2.41	.641	.271	4.33	2.14	.679	.322
23	4.60	2.43	.627	.287	5.38	2.20	.574	.233
24	3.80	2.17	.571	.286	5.95	2.36	.596	.250

Positive Past Orientation

$\alpha = .6637$ $\alpha = .7646$

Item		Study 1				Study 2		
25	8.51	.945	.371	.019	1.75	.928	.545	.105
26	7.28	1.70	.265	-.003	3.43	1.68	.347	.054
27	5.61	2.14	.220	-.022	---	---	---	---
28	6.83	1.71	.657	.124	3.29	1.69	.681	.114
29	6.64	1.76	.586	.148	3.47	1.69	.660	.100
30	6.83	1.63	.389	-.031	3.30	1.45	.535	.046

Cronbach's Alpha for Total Scale

Study 1: $\alpha = .2189$

Study 2: $\alpha = .2003$

Note. Numbers under the "item" column correspond to the order of the items in Appendix A.

ITC = Item-total correlation

Table 3

Intercorrelations Between Subscales for Study 2

Subscale	NFO	PFO	NPO	PPO
Negative Future (NFO)	---	.17**	.64**	.53**
Positive Future (PFO)		---	.04	.40**
Negative Past (NPO)			---	.45**
Positive Past (PPO)				---

**p<.01

Table 4

Test-Retest Reliability of the Temporal Orientation Scale

and its Subscales

Scale	Correlation of Study 1 & Study 2
Total Scale Score	.57**
Negative Future Orientation	.74**
Positive Future Orientation	.59**
Negative Past Orientation	.68**
Positive Past Orientation	.64**

**p<.001   N=219

Table 5

Correlations Between the TOS and Other Scales

| Scale | TOS | Correlations With: | | | |
		NFO	PFO	NPO	PPO
Life Orientation Test	.33**	-.35**	.28**	-.46**	-.07
Considerations for Future Consequences	.30**	.00	.36**	-.13*	.09
Social Desirability	.25**	-.30**	.18*	-.38**	-.08
Life Satisfaction Index	.32**	-.24**	.32**	-.39**	.04

*p<.05 **p<.001

Note. TOS=Temporal Orientation Scale

NFO=Negative Future Orientation Subscale

PFO=Positive Future Orientation Subscale

NPO=Negative Past Orientation Subscale

PPO=Positive Past Orientation Subscale

Table 6

Correlations Between the Temporal Orientation Scale and

Future and Past Paragraphs

Coding	NFO	PFO	NPO	PPO	TOS
Future					
Positive[a]	.00	.03	-.02	.08	.00
Negative[a]	.00	-.06	.04	-.11	.00
Neutral[a]	.03	.02	-.01	-.03	.06
Pos/Neg[a]	.00	.00	.06	.02	-.07
Sentences[b]	-.05	.05	-.07	-.01	.04
Words[b]	-.06	.03	-.02	.02	-.02
Past					
Positive[a]	.02	.00	-.09	-.02	.09
Negative[a]	.07	.00	.12	.02	-.07
Neutral[a]	-.09	-.02	-.03	-.01	-.05
Pos/Neg[a]	-.07	.01	.05	.07	-.07
Sentences[b]	-.05	.08	-.04	.05	-.01
Words[b]	-.03	.04	.00	.05	-.04

Note. NFO=Negative Future Orientation
      PFO=Positive Future Orientation
      NPO=Negative Past Orientation
      PPO=Positive Past Orientation
      Pos/Neg=Positive and Negative

[a]Ratio of sentences coded this way
Ratios were calculated by dividing the total number of
sentences that received a particular coding (in the
future and past paragraphs, respectively) by the total
number of sentences overall

[b]Number of words or sentences

Table 7

Comparison of Females and Males on the Temporal Orientation

Scale and its Subscales

| Scale | Females | | Males | | $df^{\dagger}$ | t-value | p-value |
	Mean	SD	Mean	SD			
TOS	114.38	8.50	113.30	9.82	184	.88	.380
NFO	31.30	6.58	28.31	8.13	179	3.02	.003
PFO	46.34	4.27	45.18	6.04	160	1.63	.104
NPO	27.51	7.83	27.03	8.60	198	.44	.659
PPO	35.70	4.98	33.46	5.80	190	3.11	.002

$\dagger$Indicates that df have been adjusted due to unequal sample sizes

Note. TOS = total scale score

NFO = negative future orientation subscale

PFO = positive future orientation subscale

NPO = negative past orientation subscale

PPO = positive past orientation subscale

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

1.0   4.5 2.8 2.5
      5.0
      5.6 3.2 2.2
           3.6
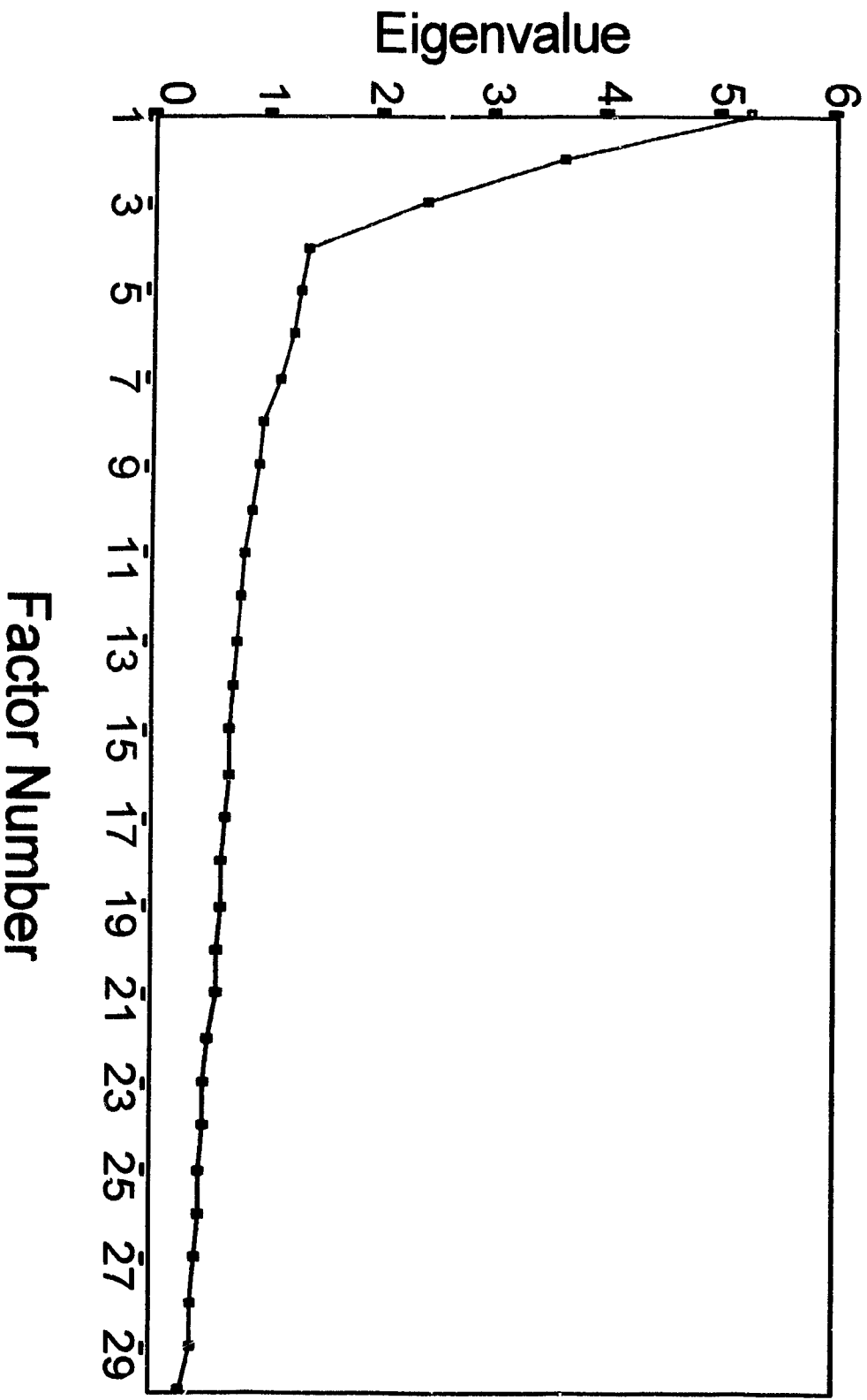   4.0 2.0

1.1   1.8

1.25 1.4 1.6
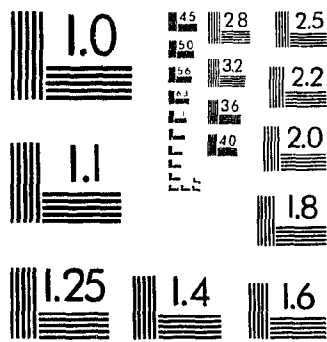
PRECISION℠ RESOLUTION TARGETS

Figure Caption

Figure 1. Screeplot from study 1 of the 30-item

Temporal Orientation Scale.

Factor Scree Plot

Appendix A

Temporal Orientation Scale

N.B. Items are grouped according to their corresponding subscale.

Negative Future Orientation

1. I spend a lot of time worrying about what will happen to me in the future.

*2. I think a lot about whether or not I will have enough money to maintain a comfortable lifestyle.

3. I often worry about whether or not I will be able to fulfill my goals for the future.

4. I don't worry a lot about what the future holds.   (R)

*5. I am often concerned about the possibility of developing health problems in the future.

6. I often wonder what my life will be like five or ten years from now.

Positive Future Orientation

*7. I think that some of the best times of my life are yet to come.

8. I like to look forward to happy occasions.

9. I try to prepare myself for challenges that I face.

10. I take active steps in the present in order to reach my future goals.

11. I look forward to making new friends.

12. I'm confident that my future goals are reachable.

Present Orientation

13. I live one day at a time.

14. I'm the kind of person who lets the future take care of itself.

*15. I like to enjoy the moment, without worrying what the future may bring.

16. I think that it's pointless to try to plan one's life.

17. People's personalities don't really change too much after they've reached the age of twenty.

18. I have no idea what I'll be doing five years from now.

Negative Past Orientation

19. I often wonder what would have happened if I'd done things a little differently.

20. I don't dwell too much on things that have happened in the past.   (R)

*21. I often wonder if the choices I've made in my life have been the right ones.

22. I often wish I could change things that I've done in the past.

*23. I have a lot of regrets about some of the things I've done with my life.

24. I spend a lot of time reliving past mistakes.

Positive Past Orientation

25. I enjoy getting together with old friends and talking about the good times we've had.

*26. I often wonder what's become of some of the friends I had when I was younger.

*27. Old friends are the best friends.

28. I spend a lot of time thinking about good times I've had with friends and family.

29. I spend a lot of time thinking about the happy occasions from my past.

30. I like to look back on my life and think about the accomplishments I've made.

Note. *indicates items which are new
(R) indicates items which are reverse scored

Appendix B

Completion of this survey is completely voluntary. All responses will be kept completely confidential. If you have any questions about this survey please contact Dr. Keith Horton (884-1970, ext. 3340) or Dr. Mark Pancer (884-1970, ext. 3149). Please do not make any marks on this questionnaire. Please place all answers on the computer bubble sheet (make sure you fill in the ovals completely and erase any errors thoroughly). Please be sure to answer the questions printed on the back of the computer sheet.

Life Views Survey

The following questions have to do with the way in which people view their lives, and how they think about things that have happened to them in the past, or might happen to them in the future. Please indicate using the following scale the degree to which you agree or disagree with the following statements:

-4 = very strongly disagree   +4 = very strongly agree
-3 = strongly disagree   +3 = strongly agree
-2 = moderately disagree   +2 = moderately agree
-1 = slightly disagree   +1 = slightly agree
**   0 = neither agree or disagree**

1. I enjoy getting together with old friends and talking about the good times we've had.

2. I think that some of the best times of my life are yet to come.

3. I often wonder what would have happened if I'd done things a little differently.

4. I spend a lot of time worrying about what will happen to me in the future.

5. I'm confident that my future goals are reachable.

6. I like to look forward to happy occasions.

7. I often wonder what's become of some of the friends I had when I was younger.

8. I think a lot about whether or not I will have enough money to maintain a comfortable lifestyle.

9. I often wonder if the choices I've made in my life have been the right ones.

10. I often worry about whether or not I will be able to fulfill my goals for the future.

11. I spend a lot of time thinking about good times I've had with friends and family.

12. I often wish I could change things that I've done in the past.

13. I try to prepare myself for challenges that I face.

14. I spend a lot of time thinking about the happy occasions from my past.

15. I take active steps in the present in order to reach my future goals.

16. I like to look back on my life and think about the accomplishments I've made.

17. I have a lot of regrets about some of the things I've done with my life.

18. I am often concerned about the possibility of developing health problems in the future.

19. I look forward to making new friends.

20. I spend a lot of time reliving past mistakes.

21. I often wonder what my life will be like five or ten years from now.

The questions in this section address your attitudes about, and ways of coping with, day to day events. Please answer these questions using the same scale as above.

22. In uncertain times, I usually expect the best.

23. If something can go wrong for me, it usually will.

24. I always look on the bright side of things.

25. I am always optimistic about my future.

26. I hardly ever expect things to go my way.

27. Things never work out the way I want them to.

28. I'm a believer in the idea that every cloud has a silver lining.

29. I rarely count on good things happening to me.

Each of the following questions is designed to determine your beliefs about human memory functioning. Because it is a study of your beliefs about memory, there are no right or wrong answers. Please respond to each of the questions as accurately and as honestly as you can. Please respond to these questions using the same scale as above.

30. A memory is formed for every event that a person is exposed to.

31. Memories of events are <u>permanent</u>, in the sense that they always exist in our minds, even though we may not always be able to consciously remember them.

32. Memories of events are very accurate descriptions of the events.

33. The amount of attention a person pays to an event will determine how accurately they remember it.

34. A memory for an event can be altered by information a person receives after the event.

35. It is possible to "create" a memory of an entire event simply by suggesting to a person that the event happened, when it actually did not happen.

36. It would be relatively easy for a person in a position of authority, or a person who is respected for their training and knowledge, to create in a person's mind a memory for an event simply by suggesting to the person that the event happened.

37. A person who receives a suggestion that an event happened, as in the previous question, may genuinely believe later that the event really did happen.

38. A person can accurately distinguish a memory for an event they actually experienced from a memory for an event that someone told them about or suggested.

39. A 5-year old child has as accurate a memory for an event that happened yesterday as a 25-year old adult.

40. A 12-year old has as accurate a memory for an event that happened yesterday as a 25-year old adult.

41. Important events are remembered very accurately, when the event is one that affects the person directly.

42. Important events are remembered very accurately, even when the event does not affect the person directly.

43. Traumatic or painful events are remembered very well, when the event is one that affects the person directly.

44. There are circumstances in which a person can forget a particular event for 2 or 3 decades and then "recover" the memory.

45. There are circumstances in which a person can forget an event that happened many times and then "recover" the memory 2 or 3 decades later.

46. If a person has forgotten an event for 2 or 3 decades, they might be able to recover the memory for the event by viewing a film or reading a story depicting a very similar event.

47. If a person has forgotten an event for 2 or 3 decades, they might be able to recover the memory for the event by doing something that is very similar to the original event.

48. If a person has forgotten an event for 2 or 3 decades and then recovers the memory for the event, their memory for the details of the event will be very accurate.

49. If a person has forgotten an event for 2 or 3 decades and then recovers the memory for the event, they will recover the memory a bit at a time, rather than all at once.

50. Consider a person who has forgotten an event for 2 or 3 decades and then recovers the memory for the event. Their memory for the details of that event will be more accurate if the event involved a traumatic or painful experience than if the event involved a non-traumatic experience.

51. If a person remembers an event that happened 2 or 3 decades ago and has **not** forgotten that event during the intervening 2 or 3 decades, their memory for the details of the event will be very accurate.

52. Consider a person who has remembered an event that happened 2 or 3 decades ago and has **not** forgotten that event during the intervening 2 or 3 decades. Their memory for the details of that event will be more accurate if the event involved a traumatic or painful experience than if the event involved a non-traumatic experience.

53. The amount of confidence a person has in the accuracy of a particular memory is a good indication of the actual accuracy of that memory.

54. Hypnosis is an effective way of helping a person recover "forgotten" memories.

55. Hypnosis is a more effective way of helping a person recover "forgotten" memories if those memories are traumatic or painful ones than if they are not traumatic.

56. "Truth serum" (known as sodium amytal) is an effective way of helping a person recover "forgotten" memories.

57. Truth serum is a more effective way of helping a person recover "forgotten" memories if those memories are traumatic or painful ones than if they are not traumatic.

58. A lie detector test (known as a polygraph) is an effective way of determining whether a person is telling the truth about an event.

59. Consider a person who is 30 years old and having some personal problems (e.g., depression). They choose to see a counsellor or a psychotherapist for help. The person was not sexually abused as a child. It is possible for the counsellor or psychotherapist to "create" a memory of childhood sexual abuse that the person would believe actually happened.

60. A jury would convict a person of a sexual assault that happened a few weeks previously, based on only the testimony of the 30-year old victim.

61. Using the same situation as described in the previous question, a jury **should** convict a person of the crime, based on only the testimony of the 30-year old victim.

62. A jury would convict a person of a sexual assault that happened 2 decades previously, based on only the testimony of the 30-year old victim who recently recovered their memory for the event.

63. Using the same situation as described in the previous question, a jury **should** convict a person of the crime, based on only the testimony of the 30-year old victim who recently recovered their memory for the event.

64. An "expert" in human memory can help a jury decide whether a person's memory of an event is accurate.

65. An expert in human memory can help a jury decide whether a memory that has been recovered after 2 or 3 decades of being forgotten is in fact a genuine memory.

PLEASE ANSWER THE NEXT 3 QUESTIONS ON THE COMPUTER CARD USING THE SCALE PROVIDED IN THE QUESTION.

66. Approximately what percentage of children do you think experience physical abuse at least once between the ages of 5 and 15?

| Fewer | | | | 50% | | | | More |
| than 10% | | | | | | | | than 90% |

| -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |

67. Approximately what percentage of children do you think experience sexual abuse at least once between the ages of 5 and 15?

Fewer				50%				More
than 10%								than 90%
-4	-3	-2	-1	0	1	2	3	4

68. Have you heard, through radio, television, or newspaper reports, of any situations in which people have remembered traumatic events after years of "forgetting" them?

<div align="center">

1 = Yes   2 = No

</div>

The statements below concern personal attitudes and traits. Indicate the extent to which you agree or disagree with each statement as it pertains to you personally. Please respond to these questions using the -4 to +4 scale provided at the beginning of the questionnaire.

69. I never hesitate to go out of my way to help someone in trouble.

70. It is sometimes hard for me to go on with my work if I am not encouraged.

71. I have never intensely disliked anyone.

72. On occasion I have had doubts about my ability to succeed in life.

73. I sometimes feel resentful when I don't get my way.

74. My table manners at home are as good as when I eat out in restaurant.

75. If I could get into a movie without paying for it and be sure I was not seen, I would probably do it.

76. I like to gossip at times.

77. No matter who I'm talking to, I'm always a good listener.

78. I can remember "playing sick" to get out of something.

79. There have been occasions when I took advantage of someone.

80. I'm always willing to admit it when I make a mistake.

81. I always try to practice what I preach.

82. I don't find it particularly difficult to get along with loud mouthed, obnoxious people.

83. I sometimes try to get even, rather than forgive and forget.

84. When I don't know something I don't at all mind admitting it.

85. I am always courteous, even to people who are disagreeable.

86. There have been occasions when I felt like smashing things.

87. I would never think of letting someone else be punished for my wrongdoings.

88. I have never been irked when people expressed ideas very different from my own.

89. There have been times when I have been quite jealous of the good fortune of others.

90. I have almost never felt the urge to tell someone off.

91. I am sometimes irritated by people who ask favors of me.

92. I have never felt that I was punished without cause.

93. I sometimes think when people have a misfortune they only got what they deserved.

94. I have never deliberately said something that hurt someone's feelings.

The following questions are concerned with how you view your future. For each of the statements below, please indicate the extent to which you agree or disagree with each statement using the same scale as above.

95. I consider how things might be in the future, and try to influence those things with my day to day behaviour.

96. Often I engage in a particular behaviour in order to achieve outcomes that may not result for many years.

97. I only act to satisfy immediate concerns, figuring the future will take care of itself.

98. My behaviour is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions.

99. My convenience is a big factor in the decisions I make or the actions I take.

100. I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.

101. I think it is important to take warnings about negative outcomes seriously even if the negative outcome will not occur for many years.

102. I think it is more important to perform a behaviour with important distant consequences than a behaviour with less-important immediate consequences.

103. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.

104. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time.

105. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.

106. Since my day to day work has specific outcomes, it is more important to me than behaviour that has distant outcomes.

Here are some statements about life in general that people feel differently about. Would you read each statement on the list, and indicate the extent to which you agree or disagree with each statement using the scale provided at the beginning of the questionnaire.

107. As I grow older, things seem better that I thought they would be.

108. I have gotten more of the breaks in life than most of the people I know.

109. This is the dreariest time of my life.

110. I am just as happy as when I was younger.

111. These are the best years of my life.

112. Most of the things that I do are boring or monotonous.

113. The things I do are as interesting to me now as they ever were.

114. As I look back on my life, I am fairly well satisfied.

115. I have made plans for things I'll be doing a month or a year from now.

116. When I think back over my life, I didn't get most of the important things I wanted.

117. Compared to other people, I get down in the dumps too often.

118. I've gotten pretty much what I expected out of life.

119. In spite of what people say the lot of the average man is getting worse, not better.

Section 2
Please answer these questions on Section 2
of the computer answer sheet

There are many different reasons why people choose to eat/drink the particular foods/beverages that they do, and people differ greatly in which reasons are important to them. Furthermore, for the same person, different reasons may be important at different times. We are interested in understanding the reasons underlying food/beverage selection. We would like to complete the questionnaire below to tell us what factors motivate your food/beverage choices. Please answer the questions using a scale ranging from "1" to "7", with "1" meaning "not at all true of me" and "7" meaning "extremely true of me. The more important an item is, the higher the number you should select. The "stem" immediately below goes with each phrase further below.

Remember: "1"= not at all true of me.
        "7"= extremely true of me.

WHEN YOU SELECT FOODS/BEVERAGES, HOW IMPORTANT IS IT TO YOU THAT THEY.....

1. ...are low in cholesterol.

2. ...are easy to prepare.

3. ...have been recommended by health experts.

4. ...are exotic.

5. ...are low in fat.

6. ...don't require preparation.

7. ...are affordable.

8. ...will make you appear more mature.

9. ...are socially desirable.

10. ...will reduce your risk of cancer.

11. ...have a good flavor.

12. ...taste good.

13. ...will make you appear more sophisticated.

14. ...are new and different.

15. ...are what you have been brought up to eat.

16. ...are high in fiber.

17. ...from your ethnic background.

18. ...are inexpensive.

19. ...will make you appear more exciting.

20. ...are what you're used to eating.

21. ...are tasty.

22. ...are high in important vitamins.

23. ...cheer you up.

24. ...are novel.

25. ...are cheap.

26. ...are easy to get.

27. ...are like those that are/were served in your home.

28. ...have lots of flavor.

29. ...relax you.

30. ...improve your mood.

31. ...relieve your stress.

32. ...are unusual.

Please write a short paragraph about what you think your life will be like after you finish university.

Please write a short paragraph about what your life was like before you came to university.

Name:_____

Student#:_____

Age:_____