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Time Attitude Profiles in Adolescents: Predicting Differences in Educational Outcomes and Psychological Wellbeing

by

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A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Education

in the

Graduate Division

of the

University of California, Berkeley

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Spring 2010

Abstract

Time Attitude Profiles in Adolescents: Predicting Differences in Educational Outcomes and Psychological Wellbeing

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Professor Frank C. Worrell, Chair

The purpose of the present study was to examine two research questions. Are there interpretable time attitude profiles based on positive and negative attitudes toward the past, the present, and the future in adolescents? If so, do time attitude profiles predict concurrent differences in adolescents' educational outcomes and psychological wellbeing?

Results indicated that there are adolescent time attitude profiles. Adolescents (*M* age = 16; *N* = 300) were grouped into three clusters: (a) an Optimistic profile (*n* = 85, 28.3%), (b) a Tendentially Pessimistic profile (*n* = 69, 23%), and (c) a Balanced profile (*n* = 146, 48.7%). Adolescents with the Optimistic profile reported substantially higher positive time attitude scores and substantially lower negative time attitude scores than sample mean scores across Adolescent Time Perspective Inventory-Time Attitude subscales (ATPI-TA; Mello & Worrell, 2007). Tendentially Pessimistic adolescents reported similar scores for positive and negative attitudes toward all three time periods. Scores for negative time attitudes among Tendentially Pessimistic adolescents were substantially higher than sample mean scores, and scores for positive time attitudes among Tendentially Pessimistic adolescents were substantially lower than sample mean scores. The Balanced profile was characterized by more pronounced positive attitudes than negative attitudes toward all three time periods, and this cluster's scores were closest to the overall sample means across ATPI-TA subscales.

Differences in adolescent time attitude profiles predicted concurrent differences in educational outcomes and psychological wellbeing. Optimistic adolescents reported higher scores for college type, educational expectations, grade point average, considering the future, and self-esteem than adolescents with Balanced or Tendentially Pessimistic profiles. Optimistic adolescents also reported the lowest scores for perceived stress. In contrast, adolescents with the Tendentially Pessimistic profile reported lower scores for college type, educational expectations, grade point average, considering the future, and self-esteem than adolescents with Balanced or Optimistic profiles. Moreover, Tendentially Pessimistic adolescents reported the highest scores for perceived stress.

Time Attitude Profiles in Adolescents: Predicting Differences in Educational Outcomes and Psychological Wellbeing

Time attitudes refer to individuals' positive and negative dispositions toward the past, the present, and the future. Examinations of attitudes toward specific time periods have indicated relationships with psychological wellbeing, risky behaviors, and educational outcomes. For example, Drake, Duncan, Sutherland, Abernethy, and Henry (2008) reported a positive correlation between positive attitudes toward the past and happiness in participants aged 16 to 83. In another study, Keough, Zimbardo, and Boyd (1999) found a positive correlation between hedonistic and fatalistic attitudes toward the present and engaging in risky behaviors such as alcohol, tobacco, and drug use in students attending high schools, community colleges, and a four-year university. Moreover, positive attitudes toward the future have been shown to have a positive relationship with grade point average in both high school (e.g., Adelabu, 2007; Mello & Worrell, 2006) and college (Zimbardo & Boyd, 1999) students.

There are several questions about time attitudes that are not examined in the literature, two of which are addressed in the present study. First, most studies on time attitudes have been focused on attitudes toward the future alone. Consequently, there are few studies on attitudes toward the past or the present. Second, most researchers who included analyses of time attitudes in multiple time periods examined time attitudes separately. Therefore, little is known about the effect of multiple time attitudes. In this study, I examined whether there were interpretable time attitude profiles based on positive and negative attitudes toward the past, the present, and the future in a sample of adolescents. I also examined whether time attitude profiles predicted concurrent differences in adolescents' educational outcomes and psychological wellbeing. Educational outcomes and psychological wellbeing were chosen as they are arguably two of the most frequently studied and most important outcomes in adolescence and across the lifespan.

I begin with a discussion of time perspective, as time attitudes comprise a dimension of this broader psychological construct. I continue with a more in-depth discussion of time attitudes as these are the focus of the current study. Most of the extant knowledge about time attitudes has been derived from studies focused on attitudes toward the future alone. Thus, the review begins with a description of these studies. Studies that included analyses of attitudes in multiple time periods are reviewed next. Because I use cluster analysis to address my first research question, I describe cluster analysis and discuss the only study to date to include a cluster analysis of time attitudes in adolescents (i.e., Buhl & Lindner, 2009). The literature review ends with brief discussions of the outcome variables chosen for the present study.

Time Perspective

Frank (1939) and Lewin (1942) developed early conceptualizations of time perspective. They proposed that time perspective includes thoughts about, and attitudes toward all three time periods. Because time perspective is a broad psychological construct, the extant research on the subject is diverse. Research has shown relationships between many time perspective variables and other variables of consequence in education and psychology (e.g., Adelabu, 2007; Scheier & Carver, 1985). Therefore, Mello (2010) proposed a model of time perspective to organize the vast breadth of research into distinct dimensions.

Mello (2010) outlined five time perspective dimensions: (a) meaning, (b) orientation, (c) relation, (d) frequency, and (e) attitude. *Meaning* refers to the ways in which individuals define each time period. *Orientation* is the degree to which an individual prefers one of the three time periods, and *relation* refers to an individual's conceptualization of the relationships among the three time periods. The *frequency* with which someone thinks about each time period is the

fourth dimension of time perspective. The fifth dimension is comprised of time *attitudes*. These have been the most scrutinized aspect of time perspective in the literature and are discussed in greater detail in the next section.

Time Attitudes

Time attitudes refer to positive and negative dispositions toward time. Attitudes are a focal point of theory and research in psychology, as evidenced by the plethora of articles published on the subject (Ajzen, 2001). There is a consensus in the literature that attitudes are dispositions toward social objects (Ajzen, 2001; Chaiken & Stegnor, 1987; Greenwald & Banji, 1995). Social objects are constructs developed by individuals and their cultures, including physical objects (e.g., clocks) and psychological objects (e.g., the past). Examples of dispositions include positive or negative evaluations and emotional feelings (Krech, Crutchfield, & Ballachy, 1962). The evaluative features of attitudes are described in the literature "in such attribute dimensions as good-bad, harmful-beneficial, pleasant-unpleasant, and likable-dislikable" (Ajzen, 2001, p. 28).

Formation of time attitudes. Researchers have not accounted for time attitude formation specifically. However, research and theory on attitude formation more generally provide a theoretical framework for the present study. Katz (1960) argued that attitude formation is shaped by the function it serves to an individual. Scholars have shown that attitudes serve affective and cognitive functions, but there is some debate about the joint effects of cognition and affect on attitudes (Ajzen, 2001). Some scholars have argued that a difference in contribution between cognitive and affective functions is an artifact of motivation (Edwards, 1990).

Attitudes that are motivated by emotions (e.g., fear) serve affective functions. These attitudes serve to promote opportunities for reward, and diminish opportunities for punishment (Edwards, 1990). Affective contributions to attitude formation include "emotions, feelings, or drives" associated with a social object (Edwards, 1990, p. 203). In contrast, attitudes that are motivated by cognition develop through reason. These attitudes serve cognitive functions, including reality testing or a need to explain life events (Edwards, 1990). Cognitive contributions include "beliefs, judgments, or thoughts" about a social object (Edwards, 1990, p. 203). Therefore, beliefs and emotions are the organizing features of attitude development.

Beliefs and emotions have a cumulative effect on attitudes because they are experienced continuously. One way to organize the rapid accumulation of beliefs and emotions is to arrange them into time periods (Zimbardo & Boyd, 1999). This psychological process sets up dispositions toward each time period (Caspi, Bem, & Elder, 1989). An adolescent who experiences a lot of sadness and anger provides an example of this process because he is also likely to have negative beliefs (Dodge & Coie, 1987). If he categorizes his persistent experiences of negative emotions and beliefs in the past, he is likely to harbor negative attitudes toward the past. In fact, his attitudes will lead him to respond to new emotions and beliefs in ways that reinforce his negative attitudes toward the past (Roberts & Caspi, 2002). For instance, if the adolescent in my example is asked about his past, this question is likely to evoke negative emotions that confirm his negative beliefs, thereby reinforcing his negative attitudes toward the past.

Time attitudes and demographic variables. Although analyses of time attitudes by demographic subgroups is not the primary purpose of the present study, research on demographic differences in time attitudes is relevant to the goals of the present study in two ways. First, results of these studies provide insight into correlates of time attitudes in adolescents. Second, it is possible that demographic variables contribute to differences in time attitudes. In fact,

scholars have argued that differences in age (e.g., Nurmi, 1989), gender (e.g., Lamm, Schmidt, & Trommsdorff, 1976), racial/ethnic group (e.g., Andretta, Mello, & Worrell, 2010), and socioeconomic status (e.g., Poole & Cooney, 1987) are associated with differences in attitudes toward specific time periods. Therefore, the literature on demographic correlates of time attitudes is reviewed briefly.

Age. Scholars have argued that a developmental shift in focus from play in childhood to work in adolescence includes an increase in attitudes toward work-related constructs (Nurmi, 1989). Nurmi (1989) showed this phenomenon in a longitudinal study of 56 adolescents' future orientations. Adolescents were interviewed twice, at ages 11 and 15. Participants were asked to report on "what kind of goals and plans" they had, as well as their "hopes and dreams" for the future (p. 200). Nurmi et al. found that substantially fewer of the adolescents included positive attitudes toward future occupation and education in their responses at age 11 (53% and 18%) than at age 15 (71% and 77%). Participants were also asked to report on their fears of the future, but no differences were found between responses at age 11 and 15 with regard to occupation or education.

Gender. Some studies have indicated that domain-specific attitudes toward time vary between the genders. In one study, Lamm et al. (1976) examined differences in attitudes toward the future between male (n =50) and female (n = 50) adolescents. Participants, aged 14 to 16, listed 10 hopes and 10 fears with regard to the future. Lamm et al. also used a 30-item measure of optimism and pessimism toward the future in three domains: (a) family, (b) occupational, and (c) private life. Adolescent females listed significantly more attitudes toward the future than males regarding the *family* domain. Adolescent males listed significantly more attitudes toward the future than females in the *occupational* domain. Scores for optimism and pessimism were similar between the genders.

In another study, Seginer (1988) examined differences in attitudes toward the future between male and female high school seniors. The sample included Arab (67 males and 49 females) and Jewish (61 males and 51 females) adolescents. Seginer used the same questionnaire used in the Lamm et al. (1976) study. This questionnaire was published in 1982 under the title The Future Orientation Questionnaire (Trommsdorff, Burger, & Fuchsle,1982). Seginer analyzed Arab and Jewish responses separately using one-way multivariate analyses of variance (MANOVA). Gender explained a substantial percentage of variance in Jewish adolescents' fears (20%) and hopes (30%). Jewish males reported more hopes and fears regarding military service and occupation; Jewish females reported more hopes and fears regarding family life. Among Arab adolescents, males reported significantly more fears with regard to the future of Arab culture than Arab females. Arab females reported significantly more hopes and fears toward the future regarding education and personal life than Arab males with medium effect sizes.

Other studies on gender differences in time attitudes have not included domain-specific analyses. Instead, these researchers examined gender differences in the valence (i.e., positive and negative) of attitudes toward specific time periods. For example, Nuttin and Lens (1985) used the Time Attitude Scale (TAS) to examine differences in positive and negative time attitudes between the genders. The TAS is a multidimensional scale used to measure attitudes toward multiple time periods (Nuttin, 1972). Completing the TAS requires rating attitudes toward the past, the present, and the future on a 7-point scale with two bi-polar adjectives, such as "pleasant" and "unpleasant," as anchors (Nuttin & Lens, 1985, p. 74). In a study that included

the TAS, Nuttin and Lens showed that male and female university students ($N = 260$) reported similar scores for time attitudes.

In a more recent study, Andretta, Mello, and Worrell (2010) used the Adolescent Time Perspective Inventory-Time Attitude subscales (ATPI-TA; Mello & Worrell, 2007) to examine gender differences in time attitudes. The ATPI-TA is a measure of positive and negative attitudes toward the past, the present, and the future with six subscales: (a) Past Positive, (b) Past Negative, (c) Present Positive, (d) Present Negative, (e) Future Positive, and (f) Future Negative. See Table 1 for ATPI-TA example items. Males and female adolescents reported similar scores for time attitudes in three racial/ethnic groups: African Americans ($n = 33$), Asian Americans ($n = 76$), and European Americans ($n = 123$). However, Latino males ($n = 12$) reported higher scores for Present Negative attitudes than Latino females ($n = 18$) with a medium effect size ($d = .72$). Latino males also reported higher Future Negative scores when compared to Latino females with a medium effect size ($d = .66$). However, the small numbers of students in the racial/ethnic groups qualify the generalizability of these results.

Racial/ethnic group. Limited research has focused on comparing time attitudes across racial-ethnic groups. In one of the few studies of its kind, Poole and Cooney (1987) compared attitudes toward the future between adolescents with diverse socioeconomic backgrounds living in Singapore ($n = 162$) and Australia ($n = 440$). Poole and Cooney used the Life Possibilities Questionnaire (LPQ, Tyler, 1978) to assess adolescents' attitudes toward the future. The LPQ requires participants to list six events that will occur in the future regarding their personal life or society, and indicate whether they expect to perceive these events as either pleasant or unpleasant. MANOVA indicated that Singaporean adolescents reported significantly higher levels of optimism for their personal and societal futures than Australian adolescents.

In another study, Andretta et al. (2010) used the ATPI-TA to examine racial/ethnic differences in time attitudes among adolescents ($N = 300$). African Americans and Asian American adolescents reported lower scores for positive attitudes and higher scores for negative attitudes toward the past, the present, and the future than European Americans and Latino adolescents with small to large effect sizes. Latinos reported the most favorable scores toward the past and the future, with the highest scores for positive attitudes and the lowest scores for negative attitudes when compared to other racial ethnic groups. European Americans reported higher scores for positive attitudes and lower scores for negative attitudes toward the present than the other racial/ethnic groups with small to medium effect sizes.

Socioeconomic status (SES). Studies on differences in time attitudes among SES groups are scarce. The few studies to include an examination of time attitudes by SES group have been domain specific. For example, Lamm et al. (1976) reported that low SES adolescents, aged 14 to 16, reported more fears regarding their futures than high SES adolescents regarding future occupation. In contrast, low SES females reported significantly more positive attitudes toward the future than high SES females in the occupational domain. Poole and Cooney (1987) also reported differences in time attitudes between high and low SES groups. Results of their study indicated that significantly more high SES adolescents living in Australian and Singapore reported attitudes toward the future that pertained to education and travel than their low SES counterparts. Poole and Cooney also showed that more low SES adolescents reported attitudes toward the future regarding work than their high SES counterparts.

Summary. Researchers have shown that time attitudes differ between demographic groups. Some studies have shown differences in time attitudes between the genders (Seginer, 1988). Other studies indicate differences in time attitudes across racial/ethnic groups (e.g., Poole

& Cooney, 1987), and between high and low SES groups (e.g., Lamm et al., 1976). These findings suggest that demographic variables are correlates of time attitudes. Therefore, analyses of time attitudes in diverse samples should include scrutiny of demographic variables.

Time Attitudes and Other Constructs

Researchers have shown relationships between time attitudes and several constructs, including educational outcomes (Worrell, Latto, & Perlinski, 1999), psychological wellbeing (Laghi, Baiocco, D'Alessio, & Gurrieri, 2009), and risky behaviors (Keough et al., 1999). As most research on time attitudes has focused on attitudes toward the future, I begin with a discussion on the research related to this time period. Next, I turn to studies that examined attitudes toward multiple time periods. Finally, I discuss Buhl and Lindner's (2009) study, which included positive and negative attitudes toward all three time periods.

Attitudes toward the future. A plethora of constructs have been used to conceptualize attitudes toward the future, including future time perspective (Teahan, 1958), future outlook (Nuttin & Lens, 1985), future orientation (Nurmi, 1991), hope (Snyder et al., 1996), optimism (Scheier & Carver, 1985), and perceived life chances (Jessor, Donovan, & Costa, 1990).

Attitudes toward the future and educational outcomes. Numerous studies have included an examination of the relationship between attitudes toward the future and educational outcomes. In one study, Worrell et al. (1999) used the Measure of Perceived Life Chances (MPLC; Jessor et al., 1990) to examine high school adolescents' (N = 103) attitudes toward the future. The MPLC is a 10-item questionnaire. Respondents report on the likelihood of attaining a set of desirable future outcomes on a five-point Likert scale, the MPLC total score quantifies how positive the respondents perceive their future to be. Participants included high-achieving adolescents (n = 50) and adolescents at-risk for academic failure in a continuation school (n = 33) and in a mentoring program (n = 20). Analyses of variance (ANOVA) indicated that both the adolescents in the high-achieving and mentoring groups reported significantly higher scores for perceived life chances than adolescents attending the continuation school. However, perceived life chances and academic achievement were not correlated in this study.

In another study, Snyder et al. (2002) used the State Hope Scale (SHS; Snyder et al., 1996) to examine the relationship between academic achievement and hope in college students (N = 213). Hope was a good predictor of grade point average in college freshman ($\eta 2$ = .23), even controlling for entrance exam scores. A two-way contingency table also showed a significant relationship between hope scores at the beginning of freshman year and graduation status six years later with a small effect size. Students with high hope scores as freshman were more likely to have graduated than students with low hope scores. Moreover, students who reported low hope scores were more likely than students with high hope scores to have been dismissed from college due to poor grades.

Adelabu (2008) used the SHS to examine hope in African American (N = 661) adolescents in middle and high schools. There was a significant, positive correlation between adolescents' scores on the SHS and their grade point average (r = .2). Adelabu also used the Future subscale of Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999) to examine adolescents' future time perspective. The Future subscale of the ZTPI includes items that pull for positive attitudes toward the future and planning. Adelabu found a significant positive correlation (r = .12) between scores for future time perspective and grade point average in African American adolescents.

Attitudes toward the future and psychological wellbeing. Although there is a limited amount of research in this area, attitudes toward the future have also been shown to have a

positive association with psychological wellbeing. For instance, Scheier and Carver (1985) used the Life Orientation Test (LOT) to examine optimism in a sample of university students (N = 624). Correlation analysis indicated a substantial positive association between optimism and self-esteem (r = .48). Furthermore, optimism had large negative associations with depression (r = -.49) and perceived stress (r = -.55).

Wyman et al. (1992) also examined attitudes toward the future in adolescents. They used a six-item questionnaire to examine optimism in sixth graders (N = 2,069). In addition, multiple variables in psychological wellbeing were observed to determine if respondents were stress resilient or stress affected. Results of a MANCOVA indicated that stress-resilient children reported significantly higher scores for optimism than stress affected children.

In one of the few studies of its kind, Gard, Kring, Gard, Horan, & Green (2007) examined anticipatory pleasure in an adult control group (n = 12) and outpatients with schizophrenia (n = 10) or schizoaffective disorder (n = 5). Participants were asked to "predict the future experience of pleasure" and "report on their concurrent experience of pleasure knowing that a future activity is going to occur" (Gard et al., 2007, p. 254). Results of hierarchical linear modeling (HLM) indicated that outpatients reported significantly lower levels of anticipatory pleasure than controls. Results of a second study also indicated that outpatients with schizophrenia (n = 21) and schizoaffective disorder (n = 1) reported significantly lower levels of anticipatory pleasure than controls (n = 31). Moreover, differences in anticipatory pleasure were related to differences in other important constructs. In fact, Gard et al. reported positive correlations with large effect sizes between anticipatory pleasure and functioning in social (r = .51) and family (r = .5) networks among outpatients.

Attitudes toward the future and risky behavior. In contrast with psychological wellbeing, engaging in risky behaviors has a negative relationship with positive attitudes toward the future. For example, Robbins and Bryan (2004) examined the relationship between attitudes toward the future and risky behavior in a sample of probated adolescents (N = 300). Adolescents reported on the degree to which seven attitudes toward the future were true of them. Items were taken from a study by Whitaker, Miller, and Clark (2000) and included statements such as, "What happens to me in the future mostly depends on me," and "I have great faith in the future" (see Whitaker, Miller, & Clark, 2000, p. 112). Robbins and Bryan found negative correlations between positive attitudes toward the future and alcohol use, marijuana use, and sex while under the influence of alcohol.

Attitudes toward multiple time periods. Although research on future time attitudes has yielded important findings, this focus on the future rests, in part, on the assumption that attitudes toward the past and the present are not important. Examining the past and the present may also be limited by the lack of instruments that assess the three time periods. The publication of the Zimbardo Time Perspective Inventory (ZTPI, Zimbardo & Boyd, 1999) provided an instrument that assessed all three time periods, and I provide a brief description of the ZTPI as a prelude to the discussion of this literature.

ZTPI. Zimbardo and Boyd (1999) theorized that individuals develop attitudes toward time through a psychological process that includes organizing personal and social experiences into one of three time-oriented categories: (a) the past, (b) the present, or (c) the future. Zimbardo and Boyd developed the ZTPI to examine attitudes toward all three time periods. The ZTPI is a multidimensional measure of time attitudes that consists of five subscales: (a) Past Positive, (b) Past Negative, (c) Present Fatalistic, (d) Present Hedonistic, and (e) Future. Examples of items from each subscale are provided in Table 1.

Despite the growing popularity of the ZPTI in the research literature, studies of ZTPI scores indicate potential construct concerns. For example, several factor analyses of ZTPI scores (e.g., Apostolidis & Fieulaine, 2004; Diaz-Morales, 2006; Worrell & Mello, 2007) indicated that a five-factor solution accounted for a limited amount variance. In terms of construct concerns, the ZTPI includes items that do not assess time related constructs. For example, "I do things impulsively," "Taking risks keeps my life from becoming boring," and "When listening to my favorite music, I often lose all track of time" (Zimbardo & Boyd, 1999, p. 1287) are not examples of specific thoughts about, or attitudes toward time. Instead, these items seem to be pulling for other constructs, such as impulsivity, risky behavior, and attitudes toward music. Moreover, the ZTPI does not assess positive and negative attitudes toward the present or the future.

Attitudes toward time and educational outcomes. The majority of research on attitudes toward multiple time periods has used the ZPTI. For instance, Zimbardo and Boyd (1999) used the ZTPI to examine the relationship between time attitudes and educational outcomes in young adults (N = 566). Analyses indicated a small positive correlation between scores on the Future subscale and grade point average (r = .21) and a moderate correlation with hours spent studying (r = .28). Correlations between educational outcomes and scores on the other four ZTPI subscales were smaller (.01 < r < -.15).

Mello and Worrell (2006) also used the ZTPI in their analysis of time attitudes in a sample of academically talented adolescents (N = 807). Results of a multiple linear regression (MLR) indicated that Present Fatalistic attitudes were negatively associated with grade point average and Future attitudes were positively associated with grade point average, but both findings had small effect sizes.

In a third study with the ZTPI, Adelabu (2007) investigated time attitudes in urban, African American adolescents (N = 232). Adelabu used a shortened of the ZTPI, which included only the Future subscale and a combined Present Fatalistic/Hedonistic subscale. Adelabu also measured academic achievement using respondents' "cumulative grade point averages in history, math, science, and English" (p. 529). Correlation analyses indicated that scores for Present subscale scores were negatively and moderately associated with academic achievement (r = -.31), and Future subscale scores were positively but modestly associated with academic achievement *(*r = .12).

In a study that included the ATPI-TA, Andretta et al. (2010) examined the association between time attitudes and educational outcomes in adolescents. Latino adolescents' scores for positive attitudes toward the past, the present, and the future were all positively associated with grade point average and scores for negative attitudes toward the past, the present, and the future were all negatively associated with grade point average with medium to large effect sizes. In contrast, only future positive attitudes were positively associated with grade point average for African American and Asian American adolescents with medium effect sizes. Among European Americans, scores for positive attitudes toward the past were positively associated with grade point average with a medium effect size; negative attitudes toward the past were negatively associated with grade point average in this group with a medium effect size.

Multiple time periods and psychological wellbeing. Researchers have also investigated the association between psychological wellbeing and attitudes toward multiple time periods. In a study that included the TAS, Leyssen (1974) examined time attitudes between mentally ill adults and control groups. The mentally ill adults included psychiatric patients (n = 77) and neurotic soldiers (n = 50). The control groups included physically sick soldiers (n = 50) and university

students (n = 260). ANOVA indicated that mentally ill adults reported significantly higher negative attitudes toward the past, the present, and the future than physically sick soldiers and university students.

Studies that included the ZTPI have also indicated associations between attitudes toward specific time periods and psychological wellbeing. In a study conducted by Zimbardo and Boyd (1999), young adult's negative attitudes toward the past were positively correlated with depression with a large effect size, and negatively correlated with emotional stability and self-esteem with medium and large effect sizes. Zimbardo and Boyd also reported that Present Fatalistic attitudes were positively correlated with depression and anxiety with medium effect sizes.

Drake, Duncan, Sutherland, Abernethy, and Henry (2008) also used the ZTPI. They examined correlations among time attitudes, happiness, and mindfulness in a sample of 260 participants aged 16 to 83. Drake et al. used the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999, p. 152; "Some people are generally very happy"), and the Mindfulness Attention Awareness Scale (Brown & Ryan, 2003, p. 826; "I could be experiencing some emotion and not be conscious of it until some time later"). Results indicated that positive attitudes toward the past had a positive correlation with happiness with a small effect size. Drake et al. also showed that negative attitudes toward the past had a negative correlation with happiness with a medium effect size. Moreover, negative attitudes toward the past and fatalistic attitudes toward the present had negative relationships with mindfulness with large and small effect sizes, respectively. Attitudes toward the future were not meaningfully correlated with happiness or mindfulness.

Research that included the ATPI-TA (Mello & Worrell, 2007) has also indicated a relationship between multiple time attitudes and psychological wellbeing in adolescents. In a study by Worrell and Mello (2009), correlation analyses indicated that adolescents' (N = 300) positive attitudes toward each of the three time periods were positively correlated with self-esteem and negatively correlated with perceived stress with medium to large effect sizes. Furthermore, negative attitudes toward each of the three time periods were negatively correlated with self-esteem and positively correlated with perceived stress with medium to large effect sizes.

Laghi et al. (2009) conducted one of the few multivariate analyses of scores across ZTPI subscales. They investigated the association between multiple time attitudes and suicidal ideation in Italian secondary students (N = 2,700). Suicidal ideation was measured with two questions that pulled for the degree to which respondents suffered from thoughts of ending their life, death, and dying over a two-week period. Discriminant function analysis was used to determine time attitude correlates in which suicidal ideators and non-ideators differed. Results indicated that Past Negative and Present Fatalistic attitudes best separated suicidal ideators and non-ideators. Suicidal ideators reported higher scores for Past Negative and Present Fatalistic attitudes.

Summary. In summary, results of studies on attitudes toward multiple time periods indicated that attitudes toward the past are associated with several aspects of psychological wellbeing, including depression, suicidal ideation, self esteem, happiness, and mindfulness, and perceived stress. Attitudes toward the present were also shown to have associations with several psychological wellbeing variables, including depression, anxiety, suicidal ideation, mindfulness, and perceived stress. In general, positive time attitudes have been shown to have positive relationships with psychological wellbeing. In contrast, negative and fatalistic time attitudes

have been shown to be have negative relationships with psychological wellbeing. However, only two studies have indicated that attitudes toward the future are associated with psychological wellbeing (i.e., Nuttin & Lens, 1985; Worrell & Mello, 2009). In addition, the only study to include a multivariate analyses of time attitudes showed that the combination of Past Negative and Present Fatalistic attitudes was associated with meaningful differences in psychological wellbeing.

Attitudes toward multiple time periods and risky behavior. Researchers of time attitudes have also examined associations between risky behavior and attitudes toward specific time periods. For instance, Roos and Albers' (1965) used the Time Reference Inventory (TRI) to examine attitudes toward multiple time periods in adults suffering from alcoholism (n = 35) and an adult control group (n = 27). The TRI includes positive (e.g., "I believe the happiest time in my life is in the…"), negative (e.g., "My period of greatest worrying is probably in the…"), and neutral (e.g., "Most of my fantasies are about the…") attitudes (Roos & Albers, 1965, p. 34). Respondents indicate if each attitude refers to their past, present, or future. Roos and Albers reported that alcoholic adults had significantly more positive attitudes to the past and significantly fewer positive and neutral attitudes to the present than controls. Alcoholics also had significantly more negative attitudes to the present. No differences were found between groups in attitudes toward the future.

In another study that included the TRI, Landau (1976) investigated time attitudes in young adults between the ages of 17 and 21. Landau used Duncan's new multiple range test to examine differences in time attitudes between delinquents (n = 96) and non-delinquents (n = 68). Results indicated that delinquents perceived the past and the present as negative, and the future as extremely positive when compared to non-delinquents. Non-delinquents reported a balance among positive and negative attitudes toward the past, the present, and the future.

Researchers who used the ZTPI have also reported associations between attitudes toward multiple time periods and risky behaviors. For instance, Zimbardo, Keough, and Boyd (1997) conducted two studies using a shortened version of the ZTPI that included Present Time Perspective and Future Time Perspective subscales. The Present Time Perspective subscale included items that pulled for hedonistic and fatalistic attitudes toward the present. The Future Time Perspective subscale pulled for positive attitude toward the future and planning. Zimbardo et al. measured risky driving with five items related to driving behaviors on the Health and Risk Questionnaire. Results indicted that scores for Present Time Perspective were positively correlated with risky driving with a medium effect size, while scores for Future Time Perspective were negatively correlated with risky driving with a small effect size.

In the second study, Zimbardo et al. examined time attitudes, risky driving, and sensation seeking in high school (n = 210) and college students (n = 606). Sensation seeking was measured using the Sensation Seeking Scale (Zuckerman, 1994). Correlational analyses indicated a positive association between Present Time Perspective scores and both risky driving and sensation seeking with medium effect sizes. Future Time Perspective scores were negatively correlated with both risky driving and sensation seeking with small effect sizes.

Keough et al. (1999) also used the shortened version of the ZTPI to examine time attitudes and risky behaviors in two studies. The first study included an examination of time attitudes and substance abuse in high school (n = 210), college students (n = 2,627), and adults in an offender traffic school (n = 102). Keough et al. used 37 items from the Health and Risk Questionnaire and the Drinking Habits Questionnaire to measure substance abuse, including drug, cigarette, and alcohol use. Across groups, Present Time Perspective scores were positively

correlated with substance abuse with medium effect sizes. Although effect sizes were small, scores for Future Time Perspective were negatively correlated with substance abuse across groups. Keough et al. also conducted simultaneous multiple regressions with Future Time Perspective, Present Time Perspective, and interactions between Future Time Perspective and Present Time Perspective as predictors of substance use. Both subscales and the interaction term had small effects in line with the correlational analyses. In the second study,with students attending a community college ($N = 206$) as participants. Keough et al. (1999) examined several risky behaviors. Analyses indicated that Present Time Perspective scores were moderately correlated with substance abuse ($r = .37$), novelty seeking ($r = .47$), and sensaton seeking ($r = .45$), and Future scores had modest negative associations with all three variables ($-.19 < r < -.32$).

In a study that included all five ZTPI subscales, Zimbardo and Boyd (1999) examined the association between time attitudes and risky behaviors in young adults. Correlation analyses indicated positive associations between aggression and scores for Past Negative ($r = .49$), Present Hedonistic ($r = .29$), and Present Fatalistic ($r = .39$) attitudes with medium to large effect sizes. Present Hedonistic attitudes were also positively correlated with sensation seeking with a large effect size ($r = .57$). Future scores were negatively correlated with sensation seeking ($r = -.31$) with a medium effect size.

More recently, Aposotolidis et al. (2006) used the ZTPI and examined the relationship between time attitudes and substance use in university students ($N = 198$). They used a multiple regression that included all five subscales as predictors of substance use. Scores on the Future and Present Hedonistic subscales were significant predictors of substance use. Scores on the Future subscale were negatively associated with tobacco, alcohol, and cannabis use. In contrast, scores for Present Hedonistic attitudes were positively related to alcohol consumption and cannabis use.

Summary. Studies that included bivariate analyses of time attitude scores and other constructs have revealed relationships between attitudes toward each time period and several variables. Generally, correlational analyses indicate that positive attitudes toward the past and the future are associated with positive outcomes and less risky behavior. In contrast, negative attitudes toward the past and both fatalistic and hedonistic attitudes toward the present have been shown to be associated with less favorable outcomes and more risky behavior. Multivariate analyses of time attitudes are few, but generally yield results similar to those found using bivariate correlations.

Creating Profiles Using Attitudes Toward the Past, Present, and Future

In this section, I describe the only study that has examined time attitude profiles to date (i.e., Buhl & Lindner, 2009). To set the stage for the study, I begin with a description of cluster analysis, which will also be used in the current study. Researchers have employed cluster analysis methods to group individuals according to score profiles using several variables, including behavior (e.g., Houston et al., 1992; Huberty, DiStefano, & Kampaus, 1997), personality (e.g., Ellis et al., 1999), and racial identity (e.g., Worrell, Vandiver, Schaefer, Cross, & Fagan-Smith, 2006). Cluster analysis is a class of multivariate methods similar to factor analysis. However, whereas factor analyses group items, cluster analyses group individuals based on similarity of score profiles. According to Clatworthy, Buick, Hankins, Weinman, and Horne (2005, p. 330), the purpose of a cluster analysis is,

> To group entities on the basis of their similarity with respect to selected variables, so that members of the resulting groups are as similar as possible to others within their group and as different as possible to those in other groups.

Thus, cluster analysis is a particularly useful technique when one is interested in looking at participants using multiple variables for classification.

Worrell et al. (2006) argued that the examination of score profiles is based on two assumptions, which I describe in the context of time attitude profiles. The first assumption is that interpretable time attitude profiles exist, and are at least somewhat stable. This first assumption is of practical importance for research on time attitudes. If interpretable time attitude profiles are stable and generalizable, individuals' time attitude profiles provide the field with a measure of individual difference. However, if time attitude profiles are not stable and generalizable, then examining individuals' time attitude profiles does not have any additional utility beyond scientific empiricism (Worrell et al., 2006). The second assumption outlined by Worrell et al. for examining score profiles is that there are meaningful differences in functioning among groups with different profiles. For example, it is possible that adolescents with high scores for positive time attitudes and low scores for negative time attitudes behave differently than adolescents with low scores for positive time attitudes and high scores for negative time attitudes in adolescents.

Only one set of researchers has examined time attitude profiles. Buhl and Lindner (2009) used a German translation (Mello, Worrell, & Buhl, 2009) of the ATPI-TA (Mello & Worrell, 2007) to test the hypotheses that (a) time attitude profiles would emerge in a sample of German adolescents, and (b) these time attitude profiles would be associated with meaningful differences in educational aspirations and psychological wellbeing. Their sample consisted of 1,691 German adolescents with an average age of 14 years. Females constituted 51% of the sample. Buhl and Lindner conducted Latent Class Analysis (LCA), a type of clustering procedure, to group adolescents based on their scores for positive and negative attitudes toward the past, the present, and the future.

Buhl and Lindner identified six time attitude profiles or clusters, which they labeled as (a) Balanced (37.3%), (b) Optimistic (30.4%), (c) Tendentially Pessimistic (15.3%), (d) Past-Pessimistic/Future-Optimistic (8.6%), (e) Ambivalent (5.7%), and (f) Pessimistic (2.7%). Approximately one-third of the sample reported balanced time attitudes. The Balanced profile was characterized by more pronounced positive attitudes than negative attitudes toward all three time periods, and this cluster's scores were closest to the overall sample means on the six ATPI-TA subscales. The Optimistic profile included another third of the sample, and was characterized by substantially higher positive attitudes and substantially lower negative attitudes when compared to mean scores of the sample across ATPI-TA subscales.

The four other time attitude profiles included the remaining third of adolescent participants (Buhl & Lindner, 2009). Adolescents with the Tendentially Pessimistic profile reported similar scores for positive and negative attitudes across time periods, but reported higher negative attitude scores and lower positive attitudes scores than sample mean scores. The Past-Pessimistic/Future-Optimistic profile described adolescents who reported comparatively positive attitudes toward the future, but comparatively negative attitudes toward the past and the present when compared to mean scores of the sample. The Ambivalent profile was characteristic of adolescents with higher than average positive and negative scores across all subscales. Last, the Pessimistic profile was indicative of a small group that reported substantially higher negative attitudes scores and substantially lower positive attitudes scores than sample mean scores. Pessimistic adolescents' negative attitudes scores were substantially higher than their positive attitudes scores across time periods.

Buhl and Lindner (2009) compared the students with different profiles on a variety of variables. They found that adolescents with higher academic aspirations were well represented in the Optimistic cluster but substantially less represented in the Pessimistic cluster. Furthermore, adolescents with the Pessimistic profile reported lower scores for life satisfaction, self-efficacy, and value of school experience than peers with other time attitude profiles. Adolescents with the Optimistic profile reported higher scores for life satisfaction, self-efficacy, and value of school experience than adolescents with other time attitude profiles. Ambivalent adolescents also reported comparatively high scores for value of school experience compared to clusters other than the Optimists, suggesting that their relatively high positive attitudes outweighed their relatively high negative attitudes. Future research will determine whether the time attitude profiles described in Buhl and Lindner's (2009) study are stable and generalizable. The current study extends the examination of time profiles to a sample of American adolescents.

Educational Outcomes and Psychological Wellbeing in Adolescents

Educational outcomes and psychological wellbeing are the outcomes of interest in this study as these variables are important aspects of adolescent functioning. In the following section, I provide a brief overview of the role these variables play in adolescents is provided.

Educational outcomes. There is a copious literature on the relationship of academic outcomes to a wide range of developmental outcomes and life circumstances. Mensch and Kandel (1988) used the National Longitudinal Survey of Young Adults to examine the association between dropping out of high school and substance abuse behaviors. Results indicated that high school dropouts reported more use of cigarettes and drugs than high school graduates. In another study, Crum, Ensminger, and McCord (1996) showed that poor academic achievement in the first grade, low rates of homework completion during school age years, and dropping out of high school were all significant predictors of alcohol abuse and dependence later in life.

Psychological wellbeing. As noted earlier, psychological wellbeing is a broad category of functioning. Two factors in psychological wellbeing have emerged in the literature as particularly important individual difference variables: perceived stress and self-esteem (Courtney, Gamboz, & Johnson, 2008; Nguyen-Rodriguez, Chou, Unger, & Spruijt-Metz, 2008). Additionally, the consideration of future consequences, a time oriented construct, has emerged as a salient correlate of psychological wellbeing in adolescents. Brief reviews of the research on each of these three variables in psychological wellbeing are provided.

Perceived stress. Cohen, Kamarck, and Mermelstein (1983) described perceived stress as the degree to which people appraise situations as stressful. In adult samples, researchers have reported positive associations between perceived stress and exposure to violence (Besser, Neria, & Haynes, 2009). Researchers have also shown that perceived stress is a salient predictor of post-traumatic brain injury fatigue in adults (Bay & Xie, 2009). Other studies have indicated positive relationships between perceived stress and problematic behaviors or unfavorable outcomes in adolescents, including emotional eating (Nguyen-Rodriguez et al., 2008), suicide risk (Peltzer, Kleintjes, Van Wyk, Thompson, & Mashego, 2008), smoking (Finkelstein, Kubzansky, & Goodman, 2006), anxiety (Mahon, Yarcheski, Yarcheski, & Hanks, 2007), and depression (Mahon et al., 2007). Moreover, researchers have found negative associations between perceived stress and favorable outcomes in adolescents, including general self-efficacy (Moeini, Shafi, Hidarnia, Babaii, Birashk, & Allahverdipour, 2008) and emotional intelligence (Extremera, Duran, & Ray, 2007).

Self-esteem. Rosenberg (1965) described self-esteem as an individual's feelings of self-acceptance, self-respect, and general positivity of self-evaluation (Rosenberg, Schooler, & Schoenbach, 1989). Researchers have shown self-esteem to be an important individual difference variable. Studies have indicated a negative relationship between self-esteem and depression in both adults (Orth, Robins, & Meier, 2009) and adolescents (Courtney et al., 2008; Martyn-Nemeth, Penckofer, Gulanick, Velsor-Friedrich, & Bryant, 2009; Orth, Robins, & Roberts, 2008). Examinations of self-esteem in adolescent samples have indicated negative relationships between self-esteem and substance abuse (Zamboanga, Schwartz, Jarvis, & Van Tyne, 2009), smoking (Veselska et al., 2009), marijuana use (Veselska et al., 2009), eating disorders (Courtney et al., 2008; Martyn-Nemeth et al., 2009), and interpersonal conflict (de Man, Harvey, Ward, & Benoit, 2008). Researchers have also shown a positive association between self-esteem and academic achievement in adolescents (Whitesell, Mitchell, Spicer, & The Voices of Indian Teens Project Team, 2009).

Considering the future. Strathman, Gleicher, Boninger, and Edwards (1994) described the consideration of future consequences as "the extent to which individuals are likely to consider distant outcomes in choosing present behavior" (p. 742). Researchers have shown positive relationships between consideration of future consequences and inter-group cooperation (Cohen & Insko, 2008; Insko et al., 2001), pro-environmental behavior (Joireman & Lasane, 2001; Peters, Joireman, & Ridgway, 2005), fiscal responsibility (Joireman, Sprott, & Spangenberg, 2005), self-control (Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008), college grade-point averages (e.g., Peters et al., 2005), and college test scores (Joireman, 1999). Furthermore, positive relationships have been shown between consideration of future consequences and health-related decisions such as the use of sunscreen in young adults (Orbell & Kyriakaki, 2008) and participation in screening for diabetes in adults (Crocket, Weinman, Hankins, & Marteau, 2009; Orbell & Hager, 2006). Healthy sleep habits in young adults (Peters et al., 2005) and healthy levels of body mass in adults (Adams & Nettle, 2009) are also positively related to consideration of future consequences. Additionally, considering the future has been shown to have negative relationships with aggression (Joireman, Anderson, & Strathman, 2003), aggressive driving (Moore & Dahlen, 2008), and procrastination (Siros, 2004) in young adults.

The Present Study

Research indicates that attitudes toward time have meaningful relationships with several other variables of consequence to adolescents, including educational outcomes and psychological wellbeing (e.g., Nuttin & Lens, 1985; Teahan, 1958; Zimbardo, Keough, & Boyd, 1997). Although there have been some studies examining individual time attitudes in relationship to these variables, only one study (Buhl & Lindner, 2009) examined how profiles of time attitude predict functioning. These researchers found that time attitude profiles predicted differences in academic aspirations and psychological wellbeing in a sample of German adolescents. The present study examines two questions in a sample of American adolescents. First, can American adolescents be grouped into interpretable time attitude clusters based on positive and negative attitudes toward the past, the present, and the future in adolescents? Second, do adolescents' time attitude profiles predict concurrent differences in educational outcomes and psychological wellbeing?

Time attitude profiles in adolescents. The present study includes a test of the hypothesis that interpretable time attitude profiles, similar to those reported by Buhl and Lindner (2009), can be indentified in a sample of American adolescents. The Balanced and Optimistic profiles accounted for two-thirds of the German sample; therefore, I hypothesize that these

profiles will also emerge in an American sample of adolescents. Because research has shown adolescents to have higher scores on positive rather than negative attitudes toward time (e.g., Buhl & Lindner, 2009; Nurmi, 1989), I also hypothesize that few American adolescents will have a time attitude profile best described as Pessimistic.

Differences in educational outcomes and psychological wellbeing. The second question in the current study relates to interpretable differences in adolescents' educational outcomes and psychological wellbeing based on their time attitude profiles. I chose four variables that have well-established bivariate relationships to time attitudes in adolescents to include in the analyses: (a) educational outcomes, (b) consideration of future consequences, (c) perceived stress, and (d) self-esteem. I hypothesize that adolescents with profiles that are higher in positive than negative attitudes will have higher educational outcome scores, higher scores for consideration of future consequences, higher scores for self-esteem, and lower scores for perceived stress than students with profiles that are higher in negative attitudes than positive attitudes.

Method

Participants

Participants were a convenience sample of 300 adolescents attending secondary schools in a Mountain or Western state. Participants included adolescents who identified themselves as American Indian (*n* = 3), African American (*n* = 33), Asian American (*n* = 76), European American (*n* = 123), Latino (*n* = 31), Multi-ethnic (*n* = 28), and Other (*n* = 6). Participants' ages ranged from 12 to 19 (*M = 16*; *SD* = 1.25); grade levels ranged from 6 to 12. The sample was 60% male (*n* = 180). Participants were recruited from three different settings, including (a) a rural school district (*n* = 125), (b) an urban school district (*n* = 58), and (c) a summer program for academically talented youth at a research university (*n* = 114).

Measures

Adolescent Time Perspective Inventory-Time Attitudes Subscales (ATPI-TA). The ATPI-TA (Mello & Worrell, 2007) was used to measure adolescents' attitudes toward the past, the present, and the future. The ATPI-TA includes 30 items that contribute to 6 five-item subscales (a) Past Positive (α = .80), (b) Past Negative (α = .79), (c) Present Positive (α = .77), (d) Present Negative (α = .77), (e) Future Positive (α = .83), and (f) Future Negative (α = .73).. A sample item from each subscale is included in Table 1. Participants indicate, on a 5-point Likert scale that ranged from 1 (*Totally Disagree*) to 5 (*Totally Agree*), the extent to which they endorse the items. Worrell and Mello (2009) reported moderate internal consistency estimates for scores on all the subscales.

Structural validity evidence in support of the six-factor structure for ATPI-TA scores has been provided in two studies (Buhl & Lindner, 2009; Worrell, Mello, & Buhl, 2009). Worrell and Mello (2009) also reported convergent validity for ATPI-TA scores with several other variables, including hope (Snyder et al., 1997), optimism (Scheier & Carver, 1985), and self-esteem (Rosenberg, 1965), and discriminant validity with age.

Educational outcomes. Educational outcomes were measured with three items. The first item was self-reported grade point average (GPA). The second item was a measure of educational aspirations: "What kind of college do you plan on attending?" There were three options to endorse that were scores from one to three: 1 *Do not plan on attending college*, 2 (*Community/Junior College*), and 3 *Four-year College*. The third item assessed expected educational attainment: "How much schooling do you expect to have by the time you are 30 years old." Participants endorse one of six response options that range in score from one to six: 1 (*High School Diploma*), 2 (*Certificate/License*), 3 (*Associate's degree*), 4 (*Bachelor's degree*), 5 (*Master's degree*), and 6 (*Doctorate or Professional Degree*).

Consideration of Future Consequences Scale (CFCS). The CFCS (Strathman et al., 1994) consists of 12-items, and participants indicate the degree to which they consider the future when making decisions in the present by endorsing each item as characteristic of themselves on a five-point Likert scale ranging from *extremely uncharacteristic* (1) to *extremely characteristic* (5). A sample item is provided in Table 1. Strathman et al. conducted a confirmatory factor analysis of data from college students and reported that CFCS scores make up a single factor. Strathman et al. also reported internal consistency scores in the moderate range in seven samples of college students (.78 < $\propto$ < .86, *Mdn* = .82).

Perceived Stress Scale (PSS). The PSS (Cohen et al., 1983) is a 14-item scale rated on a five-point Likert scale ranging from 1 (*often*) to 5 (*never*). See Table 1 for a sample item. Cohen et al. reported internal consistency estimates for PSS scores in the moderate range in two samples of college students, and one sample of adults in a smoking cessation program (.84, .85,

and .86, respectively). Cohen et al. also reported convergent validity evidence for PSS scores with several other variables, including life-event scores (Lewinsohn & Talkington, 1979), social anxiety (Watson & Friend, 1969), and both depressive (Radloff, 1977) and physical symptomatology (Cohen & Hoberman, 1983).

Rosenberg Self-esteem Scale (RSES). The RSES (Rosenberg, 1965) consists of 10-items rated on a four-point Likert scale that ranges from 1 (*strongly disagree*) to 5 (*strongly agree*). See Table 1 for a sample item. Worrell et al. (1999) reported reliability estimates of .78 for RSES scores in a sample of adolescents, and Robins, Hendin, and Trzesniewski (2001) reported reliability estimates ranging from .88 to .90 across six assessments of college students. Robins et al. also reported convergent validity evidence for RSES scores with several other variables, including optimism (Scheier & Carver, 1985), life satisfaction (Campbell et al., 1976), depression (Radloff, 1977), and perceived stress (Cohen et al., 1983).

Socioeconomic status (SES). SES was measured with one item: "How would you describe your family's socioeconomic status?" Participants indicate their family's SES by selecting an option from a 7-point Likert scale that ranged from 1 (*poor*) to 7 (*wealthy*).

Procedure

Participation in the study required adolescents to complete a survey that took approximately 45 minutes to fill out. Data collection in the Western state was carried out in two ways; researchers either administered and collected survey packets in classrooms, or made two visits to schools to distribute and collect survey packets. Data collection in the Mountain state was coordinated by colleagues in the school district, and completed surveys were mailed to the researchers. Adolescents received $10 for participation.

Results

Means and standard deviations of ATPI-TA subscale scores are provided in Table 2. ATPI-TA subscale scores were not skewed or kurtotic. Mean scores for positive time attitudes were meaningfully higher than scores for negative time attitudes across all three time periods. As shown in Table 3, there were significant and substantial correlations between Past Positive and Past Negative scores, Present Positive and Present Negative scores, and Future Positive and Future Negative scores. Significant correlations with medium effect sizes were found among the positive time attitude subscales, and among the negative time attitude subscales.

Table 3 presents intecorrelations between the ATPI-TA subscales and measures of educational outcome and psychological well being. ATPI-TA subscales were not strongly correlated with scores for measures of educational outcomes or consideration of future consequences. Self-esteem was positively correlated with all three positive time attitude subscales with medium effect sizes, and negatively correlated with the negative time attitude subscales with medium effect sizes. Perceived stress was negatively correlated with the positive time attitude subscales with small to medium effect sizes, and positively correlated with negative time attitude subscales with small to large effect sizes.

Cluster Analysis of Time Attitudes

Ward's method was used to cluster adolescents based on similarities among their positive and negative attitudes toward the past, the present, and the future. The Ward clustering algorithm is an agglomerative, hierarchical method of cluster analysis (Bergman, Magnusson, & El-Khouri, 2003). Therefore, each case (i.e., adolescent participant) is considered a single cluster to start. Cases are added to clusters in order to minimize variance (i.e., error sum-of squares [ESS] of ATPI-TA subscale scores) within clusters and maximize the variance between clusters (Bergman et al., 2003). However, in cluster solutions using Ward's method, once assigned to a cluster, cases cannot be subsequently reassigned to another cluster (Huberty, Di Stefano, & Kamphaus, 1997). To control for this limitation, the k-means method was used to supplement and validate the Ward's cluster solution.

K-means is an iterative partitioning method of cluster analysis in which cases are assigned to a specified number of clusters (Aldenderfer & Blashfield, 1984). Because the Ward's method indicated a three-cluster solution, three clusters were specified. Three cases were chosen at random to initiate each cluster, and all the other cases were subsequently assigned to the cluster with the nearest centroid. A centroid is the average point in the multidimensional space defined by ATPI-TA subscale score clusters (Huberty et al., 1997). After initial case assignments are made, the k-means procedure uses a series of procedures to finalize the clusters: (a) cluster centroids are recalculated, (b) Euclidean distances are calculated between all cases and the three cluster centroids, and (c) reassignment of cases are made based on changes in the dissimilarity of cluster centroids (i.e., Euclidean distance; Bergman et al., 2003).

Time attitude cluster solution. Cluster breaks in the Ward's cluster solution were identified using the dendogram in Figure 1. Next, differences in succeeding coefficients were examined in an agglomeration schedule to validate the visualized clusters. Similar to factor analysis techniques, cluster breaks were identified where a substantial increase, or decrease, in ESS (i.e., the optimizing function) was identified in the agglomerative schedule (Bergman et al., 2003). Although this process is somewhat subjective, the results were validated by the k-means cluster analysis; the Ward's and k-means cluster solutions were 87% similar. Additional criteria for identifying clusters included consideration of previous findings (i.e., Buhl & Lindner, 2009), comparison of mean ATPI-TA subscale scores among clusters, and examinations of the

percentage of the total ESS of ATPI-TA subscale scores explained by the Ward's cluster solution for each cluster (i.e., homogeneity; Bergman et al., 2003).

Homogeneity of time attitudes within clusters. Ward's clustering includes assignment of cases based on the average squared Euclidean distance (i.e., measure of dissimilarity) among value profiles of interval scaled variables Bergman et al., 2003). Therefore, cluster homogeneity is computed by measuring the percentage of the total ESS explained by the clustering procedure (Bergman et al., 2003). Bergman et al. provided an algorithm for calculating cluster homogeneity, EV = 100 x (Et – Ec) / Et, where *EV* is the explained ESS, *Ec* is ESS within clusters, and *Et* is the total ESS for the whole sample. According to Bergman et al. (p. 99), an *EV* score "in the range of" 67 indicates an acceptable level of homogeneity. An *EV* of 100 indicates that all cases within a cluster are identical (i.e., 100% homogeneity), and a score of 0 indicates the absence of cluster homogeneity. In the present study, *EV* scores were in the acceptable range for the first (*EV* = 65; 62 ≤ *EV* ≤ 88), second (*EV* = 67; 56 ≤ *EV* ≤ 89), and third cluster (*EV* = 67; 63 ≤ *EV* ≤ 92). Homogeneity scores within clusters by ATPI-TA subscale are provided in Table 6.

A four-cluster solution. The dendogram in Figure 1 illustrates that a four-cluster solution may also be a good fit for the data. However, examination of the four cluster solution indicated that assigning cases to four clusters using the Ward's method was only 78% percent similar to the k-means clustering set to a four cluster solution. Moreover, only three of the four clusters in the four cluster solution emerged with an acceptable homogeneity coefficient: (a) the first cluster (*EV* = 80), (b) the second cluster (*EV* = 78), and (c) the third cluster (*EV* = 64). The fourth cluster (*EV* = 56) had an unacceptable homogeneity coefficient.

Cluster labels and descriptions. When appropriate, label assignments for profiles were guided by the labels given to the time attitude profiles identified by Buhl and Lindner (2009). Decisions regarding the labeling of clusters were guided by comparing within cluster mean scores to sample mean scores across ATPI-TA subscales, and comparing levels of negative attitude scores with levels of positive attitude scores (i.e., the shape of each time attitude profile; see Figures 2 to 4). All participants were assigned to a cluster. Mean ATPI-TA subscale scores for each profile are listed in Table 4.

Adolescents in the first cluster, labeled the Optimistic profile (*n* = 85, 28.3%), reported higher scores for positive attitudes toward the past (*d* = .75), the present (*d* = .90), and the future (*d* = .77) than sample mean scores. Optimistic adolescents also reported lower scores for negative attitudes toward the past (*d* = -.87), the present (*d* = -.66), and the future (*d* = -.84) than sample mean scores. Furthermore, Optimistic adolescents reported higher scores for positive attitudes toward the past, the present, and the future than negative attitudes toward all three time periods , respectively, with medium effect sizes (*d* = 3.0, *d* = 3.0, *d* = 5.2).

Adolescents in the second cluster, labeled the Tendentially Pessimistic profile (*n* = 69, 23%), reported lower scores for positive attitudes toward the past (*d* = -.40), the present (*d* = -.60), and the future (*d* = -.93) than sample mean scores. Tendentially Pessimistic adolescents also reported higher scores for negative attitudes toward the past (*d* = .79), the present (*d* = .44), and the future (*d* = 1.43) than sample mean scores. Small effect sizes indicated that Tendentially Pessimistic adolescents reported similar scores for positive and negative attitudes toward the past, the present, and the future (*d* = .02, *d* = .04, *d* = .04).

Adolescents in the third cluster, labeled the Balanced profile (*n* = 146, 48.7%), reported similar scores for positive attitudes toward the past (*d* = .23), the present (*d* = .24), and the future (*d* = .01) when compared to sample mean scores. Balanced adolescents also reported similar

scores for negative attitudes toward the past (d = .13), the present (d = .18), and the future (d = .2) when compared to sample mean scores. However, Balanced adolescents reported higher scores for positive attitudes toward the past, the present, and the future than negative attitudes toward all three time periods with medium to large effect sizes (d = .89, d = .68, d = 3.36).

Mean ATPI-TA subscale scores for each profile are listed in Table 4. Analysis of variance (ANOVA) indicated that attitudes toward the past, the present, and the future varied among time attitude profiles with small to large effect sizes.

Demographic comparisons among clusters. Crosstabulations was used to examine the relationship between gender and time attitude clusters. Gender membership did not differ across time attitude clusters (*Cramer's V* = .04, $p < .78$). ANOVA indicated that time attitude clusters did not differ significantly in socioeconomic status, $F(2, 294) = .064$, $p < .94$.. ….. Sample sizes were too small to warrant analysis of the association between racial/ethnic group and time attitude clusters.

Cluster Differences on Educational Outcomes and Psychological Wellbeing

Educational outcomes and time attitude profiles. ANOVAs indicated that Optimistic adolescents reported higher GPAs than Tendentially Pessimistic and Balanced adolescents with medium and small effect sizes (see Table 5). Balanced adolescents reported higher GPAs than Tendentially Pessimistic adolescents with a small effect size. Time attitude clusters had a moderate association with educational expectations (*Cramer's V* = .20) and a weak association with college type (*Cramer's V* = .04).

The Optimistic adolescents reported expecting to attend a four-year college (n = 67; 80%) and earn a graduate degree (n = 30; 63%) in substantial numbers. Similar to the Optimistic profile, most Balanced adolescents reported expecting to attend a four-year college (n = 109; 77%) and earning at least a Bachelors degree (n = 110; 77%), and 53% (n = 76) of Balanced adolescents reported that they plan to attain a graduate degree. A majority, albeit smaller number, of Tendentially Pessimistic adolescents reported expecting to attend a four-year college (n = 38; 61%), and a larger percentage of this cluster reported they would not attain a Bachelor's degree (n = 25; 39%).

Psychological wellbeing and time attitude profiles. ANOVAs indicated that Optimistic adolescents reported higher scores for self-esteem than Tendentially Pessimistic and Balanced adolescents with large effect sizes (see Table 5). Optimistic adolescents also reported lower scores for perceived stress than Tendentially Pessimistic and Balanced adolescents with large and medium effect sizes. Balanced adolescents reported higher scores for self-esteem and lower scores for perceived stress than Tendentially Pessimistic adolescents with medium effect sizes.

Adolescents with an Optimistic profile reported higher scores for consideration of future consequences than Tendentially Pessimistic and Balanced adolescents with medium effect sizes. Balanced adolescents reported higher scores for consideration of future consequences than Tendentially Pessimistic adolescents with a medium effect size.

Discussion

The primary goal of the present study was to examine two research questions. Are there interpretable time attitude profiles based on positive and negative attitudes toward the past, the present, and the future in adolescents? If so, are time attitude profiles associated with adolescents' educational outcomes and psychological wellbeing? Results indicated that adolescents could be grouped into three interpretable time attitude profiles—Optimistic, Tendentially Pessimistic, and Balanced—and adolescents with different profiles differed significantly on educational and psychological outcomes. These findings are discussed below.

Adolescent Time Attitude Profiles

Optimistic profile. Optimistic adolescents reported higher scores for positive time attitudes and lower scores for negative time attitudes when compared to Tendentially Pessimistic and Balanced adolescents. Optimistic adolescents reported higher GPAs than adolescents in the other clusters and most Optimistic adolescents expected to attend a four-year college and earn a graduate degree. Optimistic adolescents also reported low levels of perceived stress and strongly considering the future when making decisions in the present. High self-esteem scores among Optimistic adolescents also suggest well-developed feelings of self-acceptance, self-respect, and general positivity of self-evaluation in this group (Rosenberg et al., 1989).

Tendentially Pessimistic profile. The Tendentially Pessimistic profile was characterized by low scores for positive time attitudes and high scores for negative time attitudes relative tot their peers. A majority of Tendentially Pessimistic adolescents expected to attend a four-year college or a community college. However, a substantial minority of Tendentially Pessimistic adolescents reported that they did not expect to earn a Bachelor's degrees, and a few reported that they did not expect to attend college at all. Nonetheless, Tendentially Pessimistic adolescents reported GPAs that are adequate for college admission, suggesting that their outlook rather than their academic achievement is coloring their academic expectations. Further research is needed to examine the discrepancy between achievement and educational expectations in this group.

Tendentially Pessimistic adolescents were also less likely to consider the future when making decisions and these adolescents reported high levels of perceived stress relative to Optimistic and Balanced peers. Lower scores for self-esteem among Tendentially Pessimistic adolescents suggest that they may be at greater risk for depression (Courtney et al., 2008), substance abuse (Veselska et al., 2009), and interpersonal conflict (de Man et al., 2008).

Balanced profile. Adolescents with a Balanced profile reported similar scores to sample means scores across ATPI-TA subscales, with notably higher scores for positive time attitudes than negative time attitudes. Similar to the Optimistic profile, most Balanced adolescents reported to expect to attend a four-year college and to achieve at least a Bachelors degree. Furthermore, a substantial percentage reported that they plan to attain a graduate degree. Balanced adolescents also reported taking the future into account when making decisions. However, Balanced adolescents reported experiencing more stress than Optimistic adolescents, and lower self-esteem scores. These findings suggest that this group may be more at risk for poor outcomes in psychological wellbeing than Optimistic adolescents.

Clusters not found in this study. In the only other study to examine time attitude profiles, Buhl and Lindner (2009) reported six distinct clusters in a German sample: (a) Balanced, (b) Optimistic, (c) Tendentially Pessimistic, (d) Past-Pessimistic/Future-Optimistic, (e) Ambivalent, and (f) Pessimistic. It is likely that more clusters emerged in the German sample than the present study because of the difference in sample size between these studies. Moreover,

the three time attitude profiles that did not emerge in the present study accounted for only a small percentage of the German sample. Therefore, these profiles may be less common in adolescents.

Implications of Time Attitude Profiles

Results of univariate analyses in the present study did not indicate strong associations between attitudes toward specific time periods and educational outcomes or the consideration of future consequences. In contrast, clusters of adolescents based on all ATPI-TA subscale scores differed significantly on educational expectations, GPA, self-esteem, perceived stress, and consideration of future consequences. These results indicate the importance of using multidimensional approaches when studying time attitudes.

Previous studies have shown that positive attitudes toward the past, the present, and the future are associated with favorable scores on measures of other important constructs, and that negative attitudes toward all three time periods are associated with unfavorable scores for other important constructs (e.g., Zimbardo & Boyd, 1999; Worrell & Mello, 2009). The favorable educational outcomes and sense of psychological wellbeing among Optimistic adolescents, and relatively unfavorable educational outcomes and psychological wellbeing among Tendentially Pessimistic adolescents provide support for these findings, but also highlight the variability within the adolescent population.

Interventions in schools. Oyserman, Terry, and Bybee (2002) conducted a study in which researchers helped urban African American middle-school students develop positive thoughts and attitudes toward the future. Over the course of one school year, adolescents in the intervention group showed an increase in school involvement and a decrease in problematic behavior (Oyserman et al., 2002). This study's results suggest that APTI-TA scores can be used to identify students who may benefit from an intervention of this type. Furthermore, interventions that include a focus on adolescents' attitudes toward the past and the present may also be fruitful.

Storm and Stress in Adolescence

Hall (1904) referred to adolescence as the developmental period marked by *storm and stress*. Many studies have focused on adolescence since Hall's seminal work. Arnett (1999) reviewed the literature on this subject and argued that adolescence is a focal point of theory and research because scholars have conceptualized this period of life as particularly difficult. Although studies have shown that conflict with parents, mood disruptions, and risk behavior occur in adolescence, research has also shown considerable variability in these factors (Arnett, 1999). Moreover, the general consensus in the field is that most adolescents do not experience storm and stress as Hall hypothesized.

Results of both the Buhl and Lindner (2009) study and the present study contribute to growing body of evidence against the claim that adolescence is a universal period of unrest (Larson & Ham, 1999). On the contrary, the majority of adolescents reported positive attitudes that corresponded with favorable states of psychological wellbeing, and were in clusters described as optimistic and balanced.

Limitations and Future Research

This study had several limitations. First, the sample size was relatively small, which may have limited the number of clusters that emerged. Moreover, the majority of the sample was European American, which prevented examinations of time attitude profiles by racial/ethnic group. These concerns about the sample also have implications for the generalizability of the findings. Another potential limitation centered on the high correlations between time attitudes in

the same time period. High intercorrelations among the subscales can obscure differences among adolescents and result in fewer clusters being identified.

Additionally, the present study included only a few variables to compare across time attitude profiles. Given research with the ZTPI, the extent to which adolescents with different profiles differ on hours spent studying (Zimbardo & Boyd, 1999), substance use (Aposotolidis et al., 2006), risky driving (Zimbardo et al., 1997), suicidal ideation (Laghi et al., 2009), and happiness (Drake et al., 2008) may be fruitful avenues of research on time attitude profiles.

Future research is needed to develop a baseline for ATPI-TA score profiles in adolescents. A baseline for score profiles will allow researchers to compare time attitude profiles in a sample with typical score profiles in adolescents. More research is also needed to determine whether the time attitude profiles identified in the present study are stable and generalizable.

Time attitude formation is another area of research that has not been accounted for in the literature. Research suggests that examining the function attitudes serve individuals provides insight into their formation (Katz, 1960). Scholars have argued that the function of attitudes is shaped by cognitive and affective factors (Edwards, 1990). Therefore, research is needed to examine how beliefs and emotions shape attitudes toward time. Examining time attitude function may also lead to potentially salient interventions focused on time attitude change.

Conclusion

In this study, I examined positive and negative attitudes toward the past, the present, and the future in a sample of adolescents. Three profiles were identified in the present study and they were conceptually similar to profiles that emerged in the Buhl and Lindner (2009) study with German adolescents. These findings provide support for the generalizability of time attitude profiles. Patterns of relationships between ATPI-TA score profiles and other constructs were consistent with the extant literature. Time attitude profiles characterized by high scores for positive time attitudes and low scores for negative time attitudes were associated with positive educational outcomes and psychological wellbeing. In contrast, time attitude profiles characterized by the opposite profile were associated with less favorable outcomes. At the very least, the results suggest that this area of research will benefit from further study.

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Table 1
Sample Items

Adolescent Time Perspective Inventory-Time Attitudes Subscales (Mello & Worrell, 2007)
- Past Positive: I have happy thoughts about my past.
- Past Negative: I wish that I did not have the past that I had.
- Present Positive: Overall, I feel happy about what I am doing right now.
- Present Negative: I am not satisfied with my life right now.
- Future Positive: I am very Optimistic about my future.
- Future Negative: Thinking about my future makes me sad.

Consideration of Future Consequences (Strathman, Gleicher, Boninger, & Edwards, 1994)
- Often I engage in a particular behavior in order to achieve outcomes that may not result for many years.

Perceived Stress Scales (Cohen, Kamarck, & Mermelstein, 1983)
- In the last month, how often have you felt nervous and "stressed"?

Rosenberg Self-Esteem Scale (Rosenberg, 1965)
- I feel that I have a number of good qualities.

Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999)
- Past Positive: I enjoy stories about how things used to be in the 'good old times.'
- Past Negative: I often think of things what I should have done differently in my life.
- Present Hedonistic: Taking risks keeps my life from becoming boring.
- Present Fatalistic: Often luck pays off better than hard work.
- Future: I am able to resist temptations when I know that there is work to be done.

Table 2
Means and Standard Deviations of ATPI-TA Subscales and Measures of Educational Outcomes and Psychological Wellbeing

Variable	*M*	*SD*	*Skewness*	*Kurtosis*
PSP	3.40	0.76	-.13	-.05
PSN	2.49	0.82	.23	-.31
PRP	3.42	0.68	-.40	.50
PRN	2.72	0.77	.38	-.28
FTP	3.82	0.77	-.36	-.12
FTN	2.07	0.80	.66	-.39
GPA	3.36	0.65	-.80	.20
CFC	3.32	0.45	.43	-.14
RSES	3.07	0.53	-.03	-.83
PSS	2.95	0.47	.13	.34

Note. PSP = Past Positive; PSN = Past Negative; PRP = Present Positive; PRN = Present Negative; FTP = Future Positive; FTN = Future Negative; GPA = Grade Point Average; EDE = Educational Expectations; CLTP; College Type; CFC = Consideration of Future Consequences; PSS = Perceived Stress Scale; RSSES = Rosenberg Self-esteem Scale; SES = Socioeconomic Status.

Table 3
Correlations of ATPI-TA Subscales with Measures of Educational Outcomes and Psychological Wellbeing

	1	2	3	4	5	6	7	8	9
1. PSP	--								
2. PSN	-.67*	--							
3. PRP	.40*	-.40*	--						
4. PRN	-.27*	.42*	-.64*	--					
5. FTP	.22*	-.23*	.39*	-.30*	--				
6. FTN	-.27*	.47*	-.33*	.31*	-.57*	--			
7. GPA	.20	-.18	.09	-.04	.05	-.25*	--		
8. CFC	.12	-.12	.05	.02	.27*	-.28 *	.38*	--	
9. RSES	.36*	-.41*	.46*	-.45*	.41*	-.46 *	.24 *	.24*	--
10. PSS	-.24*	.34*	-.49*	.59*	-.30*	.27 *	-.10	-.05	-.52*

Note. *$p < .001$. PSP = Past Positive; PSN = Past Negative; PRP = Present Positive; PRN = Present Negative; FTP = Future Positive; FTN = Future Negative; GPA = Grade Point Average; EDE = Educational Expectations; CLTP; College Type; CFC = Consideration of Future Consequences; PSS = Perceived Stress Scale; RSSES = Rosenberg Self-esteem Scale; SES = Socioeconomic Status.

Table 4
Between-Group Differences for Positive and Negative Attitudes Toward the Past, the Present, and the Future

	Group 1 Optimistic (n = 85, 28.3%)		*Group 2 T-Pessimistic (n = 69, 23%)*		*Group 3 Balanced (n = 146, 48.7%)*			
Attitude	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F(2,297)*	*η2*
PSP	3.95	.71	3.10	.59	3.23	.69	39.45*	.21
PSN	1.81	.69	3.10	.51	2.60	.73	73.4*	.33
PRP	4.00	.54	3.02	.67	3.27	.53	67.93*	.31
PRN	2.22	.66	3.05	.66	2.84	.72	31.05*	.17
FTP	4.39	.61	3.12	.63	3.81	.63	77.16*	.34
FTN	1.44	.52	3.14	.51	1.93	.48	233.68*	.61

Note. *$p < .003$. PSP = Past Positive; PSN = Past Negative; PRP = Present Positive; PRN = Present Negative; FTP = Future; Positive; FTN = Future Negative.

Table 5
ANOVA Contrasts for Educational Outcomes and Psychological Wellbeing Variables Between Optimistic (O), Tendentially Pessimistic (TP), and Balanced (B) Adolescents

Variable	Contrast	M (SD)	M (SD)	t	df	Cohen's *d*
GPA	TP v B	3.11 (0.69)	3.37 (0.62)	-2.58	268	.42
	O v TP	3.51 (0.62)	3.11 (.69)	3.58*	268	.65
	O v B	3.51 (0.62)	3.37 (0.62)	1.51	268	.25
CFC	TP v B	7.58 (0.97)	7.98 (1.02)	-2.55	291	.35
	O v TP	8.29 (1.21)	7.58 (0.97)	4.01*	291	.62
	O v B	8.29 (1.21)	7.98 (1.02)	2.06	291	.33
RSES	TP v B	5.39 (0.87)	6.08 (0.94)	-5.00*	295	.75
	O v TP	6.85 (0.97)	5.39 (0.87)	9.62*	295	1.57
	O v B	6.85 (0.97)	6.08 (0.94)	6.07	295	.85
PSS	TP v B	8.83 (1.28)	8.38 (1.14)	2.65	297	.37
	O v TP	7.56 (1.34)	8.83 (1.28)	-6.55*	297	.91
	O v B	7.56 (1.34)	8.38 (1.14)	-4.92*	297	.66

Note. *$p < .003$. GPA = Grade Point Average; EDE = Educational Expectations; CLTP; College Type; CFC = Consideration of Future Consequences; PSS = Perceived Stress Scale; RSSES = Rosenberg; Self-esteem Scale; SES = Socioeconomic Status.

Table 6
Cluster Homogeneity by ATPI-TA Subscale

	Cluster 1 *EV*	*Cluster 2* *EV*	*Cluster 3* *EV*
Past Positive	62	74	64
Past Negative	68	83	64
Present Positive	72	56	72
Present Negative	71	66	63
Future Positive	77	76	80
Future Negative	88	89	92

Note. EV = The percentage of the total error sum of squares explained by the clustering procedure.

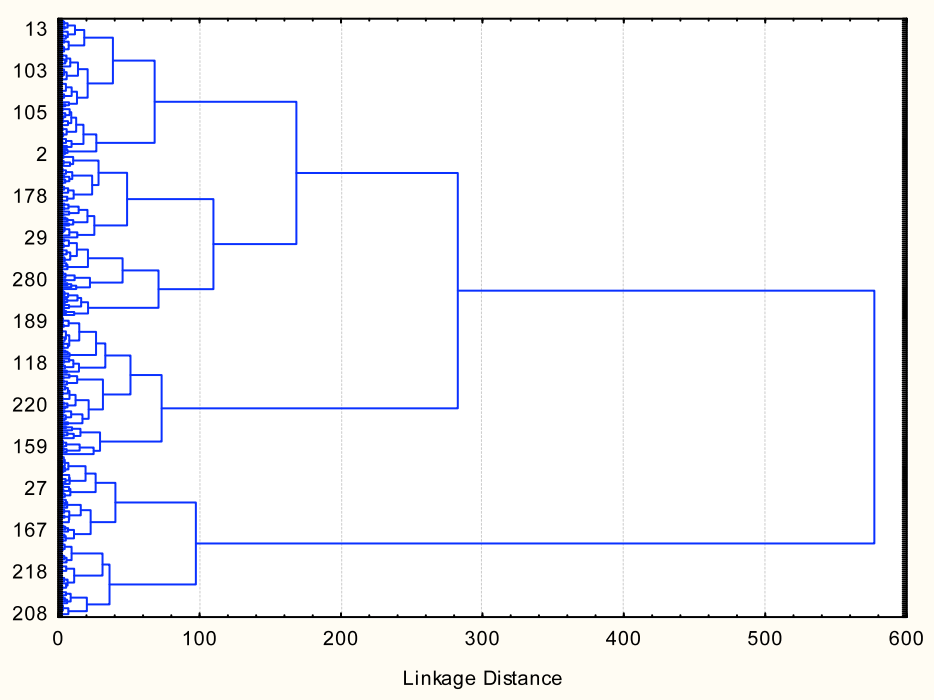


Figure 1. Dendogram: Adolescent Time Attitude Clusters.

The dendogram is the result of hierarchical cluster analysis. The cases formed three major clusters. From the top, Cluster 1 includes cases from 13 to just before 189, Cluster 2 includes cases from 189 to just before case 159, and Cluster 3 includes cases from 159 to 208.

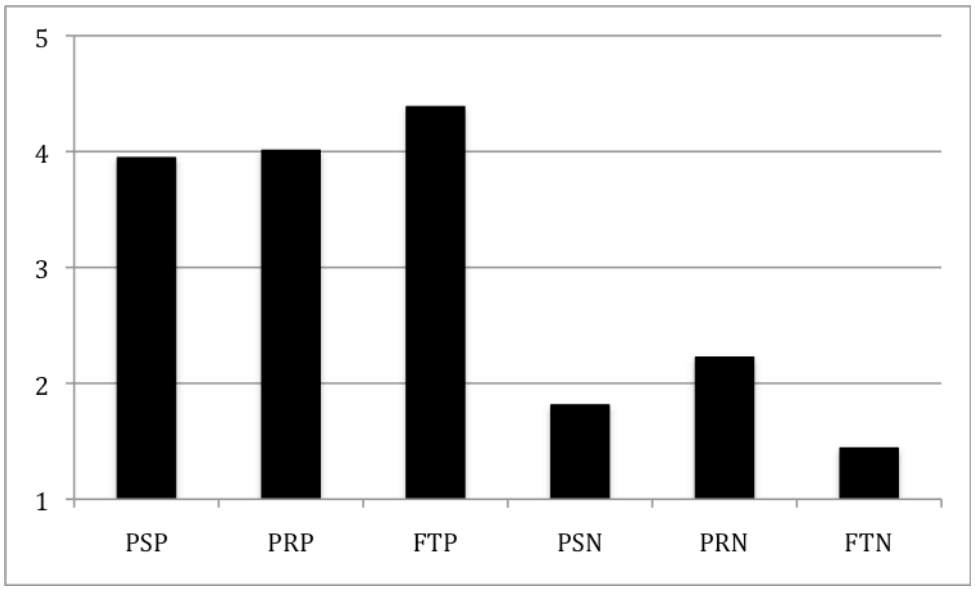


Figure 2. Cluster 1: Optimistic Profile.

PSP = Past Positive, PRP = Present Positive, FTP = Future Positive, Past Negative = PSN, Present Negative = PRN, and Future Negative = FTN.

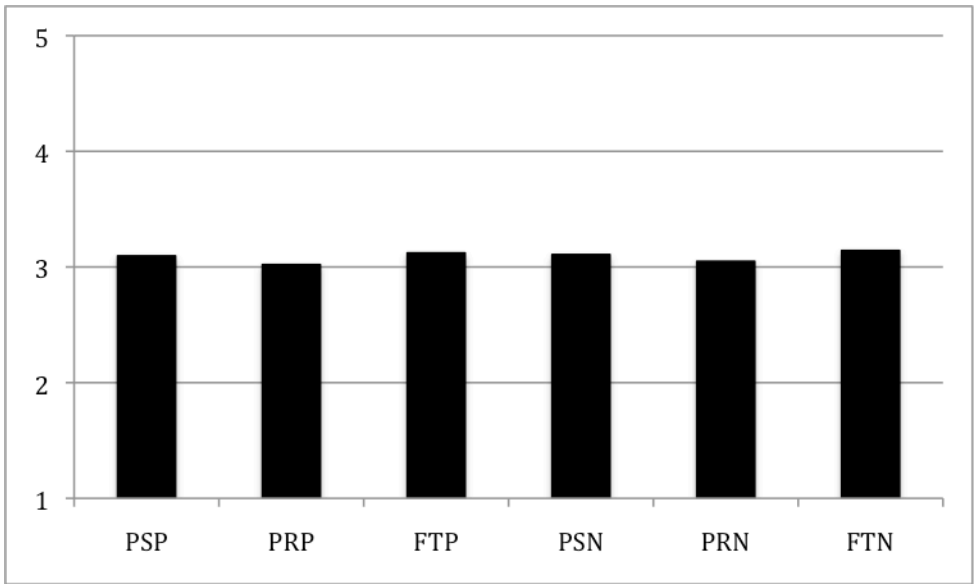


Figure 3. Cluster 2: Tendentially Pessimistic Profile.

PSP = Past Positive, PRP = Present Positive, FTP = Future Positive, Past Negative = PSN, Present Negative = PRN, and Future Negative = FTN.

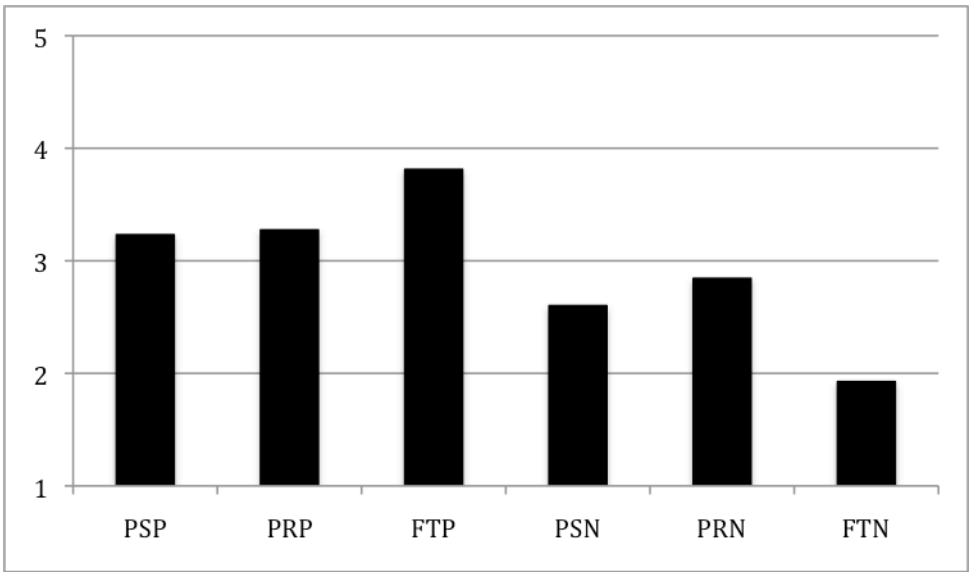


Figure 4. Cluster 3: Balanced Profile.

PSP = Past Positive, PRP = Present Positive, FTP = Future Positive, Past Negative = PSN, Present Negative = PRN, and Future Negative = FTN.