# PREDICTING EDUCATIONAL OUTCOMES AND PSYCHOLOGICAL WELL-BEING IN ADOLESCENTS USING TIME ATTITUDE PROFILES

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Using cluster analysis of Adolescent Time Attitude Scale (ATAS) scores in a sample of 300 adolescents ($M$ age $=$ 16 years; $SD = 1.25$; 60% male; 41% European American; 25.3% Asian American; 11% African American; 10.3% Latino), the authors identified five time attitude profiles based on positive and negative attitudes toward the past, present, and future. Four of the profiles identified in the present study were conceptually similar to profiles that emerged in a study in a German sample. Adolescents with profiles characterized by higher positive attitudes than negative attitudes (i.e., Positive, Optimistic, and Balanced) reported more favorable educational and psychological outcomes than did adolescents with profiles marked by higher negative attitudes (i.e., Negative and Pessimistic). These findings provide support for the generalizability of time attitude profiles and the pattern of relationships between ATAS profiles and other constructs. © 2014 Wiley Periodicals, Inc.

Time attitudes consist of emotions and evaluative feelings toward the past, present, and future, and are the most frequently studied of the time perspective dimensions (Frank, 1939; Lewin, 1942; Mello, Worrell, & Andretta, 2009; Mello, Worrell, & Buhl, 2008; Nurmi, 1991; Seginer, 2008). Based on the hypothesis that attitudes about time affect functioning, researchers have shown relationships between time attitudes and other constructs, including educational outcomes, psychological well-being, and risky behavior (e.g., Adelabu, 2007; Keough, Zimbardo, & Boyd, 1999; Zimbardo & Boyd, 1999; Zimbardo, Keough, & Boyd, 1997). Although Zimbardo and Boyd (1999) hypothesized that there are profiles of time attitudes in the population, they did not test this hypothesis directly. To date, most studies of time attitudes, including those by Zimbardo and colleagues (e.g., Keough et al., 1999; Zimbardo et al., 1997) have focused on individual time attitudes and bivariate relationships between time attitudes and other constructs.

More recently, however, Buhl and Lindner (2009) classified German adolescents into groups based on time attitude profiles and showed that profiles predicted psychological constructs such as self-efficacy and life satisfaction, as well as attitudes toward school. In the current study, we examined similar research questions in a sample of adolescents in the United States. First, we used cluster analysis to determine whether American adolescents could be grouped into interpretable time attitude profiles based on positive and negative attitudes toward the past, present, and future.

Second, we examined whether adolescents with different time attitude profiles had meaningful and predictable differences in educational and psychological outcomes. Before articulating the research questions in greater detail, we provide a brief overview of the extant literature on variables that assess attitudes toward time.

<p style="text-align:center">ATTITUDES TOWARD TIME</p>

The literature on time attitudes can be classified into several broad categories. The first of these includes studies of attitudes toward the future (e.g., Nurmi, 1991; Scheier & Carver, 1985), which constitute a substantial proportion of the literature. A second grouping includes studies of attitudes toward multiple time periods, but with the onus on examining the relationships between individual attitudes toward a single time period and other constructs (e.g., Adelabu, 2007, 2008; Keough et al., 1999; Zimbardo & Boyd, 1999). The third category uses a multidimensional approach to studying time attitudes and involves grouping individuals on the basis of their positive and negative attitudes toward the past, present, and future. This approach, which is currently represented by a handful of studies (e.g., Boniwell, Osin, Linley, & Ivanchenko, 2010; Buhl & Lindner, 2009; Qin et al., 2012), is the category in which the current study belongs. In describing studies representing the three foci, we pay particular attention to the meaningfulness of the results, using effect sizes for interpretation.

*Attitudes Toward the Future*

There is a substantial body of research on attitudes toward the future. Scholarship in this area includes, but is not limited to, research on optimism (Scheier & Carver, 1985), hope (Snyder et al., 1996), and future orientation (Nurmi, 1991; Seginer, 2008). Generally, researchers have shown that positive attitudes toward the future are positively correlated to psychological well-being with at least medium effect sizes (i.e., $r \geq .30$; $d \geq .50$). For example, Scheier and Carver (1985) found that optimism was moderately correlated to self-esteem ($r = .48$), depression ($r = -.49$), and perceived stress ($r = -.55$) in a sizeable sample of university students. In another study, Wyman et al. (1992) found that stress-resilient sixth graders reported significantly higher expectations for the future than did stress-affected children ($d = .63$), and Worrell and Hale (2001) found that the belief that the future will work out distinguished between high school dropouts and graduates who were equally at risk with a 78% correct classification.

Snyder et al. (1996) used the State Hope Scale to examine positive attitudes toward the future in university students. Hope was shown to have meaningful relationships with self-esteem ($r = .68$), positive affect (i.e., pleasurable mood, $r = .65$), and negative affect ($r = -.47$). Several researchers have also examined the relationship between hope and grade point average (GPA). However, the size of these correlations was small, both in a sample of college freshmen ($r = .21$; Snyder et al., 2002) and in a sample of African American middle and high school students ($r = .20$; Adelabu, 2008).

*Attitudes Toward Multiple Time Periods*

Examinations of attitudes toward the past and the present were limited by the lack of instruments that assess the two time periods. In 1999, Zimbardo and Boyd published the Zimbardo Time Perspective Inventory (ZTPI), which measured five time attitudes: positive attitudes toward the past (Past Positive), negative attitudes toward the past (Past Negative), fatalistic attitudes toward the present (Present Fatalistic), hedonistic attitudes toward the present (Present Hedonistic), and positive, planful attitudes toward the future (Future). Studies using the ZTPI have also yielded low correlations between time attitudes and GPA (Adelabu, 2007, 2008; Mello & Worrell, 2006; Zimbardo & Boyd, 1999). However, as in other studies, ZTPI scores had more robust relationships with psychological constructs.

In a sample of young adults, Zimbardo and Boyd (1999) found that negative attitudes toward the past were positively correlated with depression ($r = .59$) and negatively correlated with emotional stability ($r = –.45$) and self-esteem ($r = –.48$). Zimbardo and Boyd also reported that Present Fatalistic attitudes were positively correlated with depression ($r = .37$) and anxiety ($r = .38$). Drake, Duncan, Sutherland, Abernethy, and Henry (2008) found that Past Negative attitudes were negatively correlated with happiness ($r = –.42$) and mindfulness ($r = –.50$). Finally, in a recent study in a substantial sample of Italian adolescents ($N = 3,700$), Laghi, Baiocco, D'Alessio, and Gurrieri (2009) reported that Past Negative ($r = .43$) and Present Fatalistic ($r = .31$) attitudes were significant and meaningful contributors to a discriminant function distinguishing between severe suicidal ideators and non-ideators.

## Time Attitude Profiles

In 2009, Buhl and Lindner examined time attitudes using a preliminary version of the Adolescent Time Attitude Scale: German (ATAS-G; Mello et al., 2008). The ATAS is a new scale that the authors have made available via the web (Mello & Worrell, 2010; Worrell et al., 2013). It was developed in response to data indicating that ZTPI scores were not always valid in adolescent samples (Worrell & Mello, 2007) and the absence of a subscale measuring negative attitudes toward the future on the ZTPI. The ATAS has six 5-item subscales—Past Positive, Past Negative, Present Positive, Present Negative, Future Positive, and Future Negative—and is scored using a 1 to 5 Likert scale with verbal anchors. The ATAS has been shown to have valid and reliable scores in both American ($N = 300$) and German ($N = 353$) adolescents (Worrell & Mello, 2009; Worrell et al., 2013).

In a sample of 1,691 German adolescents ($M$ age = 14 years; $SD = 1.78$; 51% female), Buhl and Lindner (2009) established the internal consistency ($.74 \leq \alpha \leq .88$) and structural validity (comparative fit index = .961) of ATAS-G scores and used latent class analysis to group adolescents based on the six subscale scores. Most participants were students in a Gymnasium (i.e., college preparatory school; 19%), a Realschulen (i.e., vocational preparatory; 8.9%), a Förderschulen (i.e., special education school; 3.1%), a Hauptschulen (i.e., least academic and comprehensive; 4.4%), or a combined Haupt-Real-Schulen (i.e., combined comprehensive and vocational; 24.8%) and Gesamtschulen (i.e., comprehensive and tracked; 39.4%) school.

Buhl and Lindner (2009) identified six time attitude profiles, which they labeled Balanced (37.3% of the sample), Optimistic (30.4%), Tendentially Pessimistic (15.3%), Past Pessimistic/Future Optimistic (8.6%), Ambivalent (5.7%), and Pessimistic (2.7%). The Balanced profile had moderately high positive attitudes toward all three time periods and moderately low negative attitudes toward all three time periods. Optimists had very high positive attitudes and very low negative attitudes, and Pessimists had the reverse profile, with very high negative attitudes and very low negative attitudes. The Ambivalent group had similar scores (≈3s) on both positive and negative attitudes, and the Tendentially Pessimistic group had low scores (≈2.5s) on both positive and negative attitudes. Finally, the Past Pessimistic/Future Optimistic group reported low Past Positive and moderate Past Negative scores as well as high Future Positive and low Future Negative scores.

In Buhl and Lindner's (2009) study, adolescents with the Optimistic, Balanced, and Ambivalent profiles reported significantly higher scores for life satisfaction, self-efficacy, perspective taking, trust in school, perceived support in school, and teacher/student relationships than adolescents with the Tendentially Pessimistic and Pessimistic profiles. The Pessimistic profile had the worst outcomes. The Past Pessimist/Future Optimist profile obtained scores on these variables that fell between the two extremes. Higher percentages of adolescents with Balanced and Optimistic profiles aspired to attend college. There are two important implications of this study. The first is that profiles may provide a more accurate representation of an individual's attitudes toward time than looking at individual subscales or attitudes toward single time periods. The second is that profiles, which are

person-focused rather than variable-focused, have the potential to predict differences in educational and psychological outcomes.

## THE PRESENT STUDY

Research indicates that attitudes toward time are related to several variables of consequence in adolescents (Buhl & Lindner, 2009; Worrell & Mello, 2009; Zimbardo & Boyd, 1999). However, to date, profiles in adolescents have only been examined in a German sample. In the present study, we examined whether American adolescents could be grouped into interpretable time attitude profiles based on positive and negative attitudes toward the past, present, and future. We hypothesized that we would find at least two types of profiles—positive-oriented profiles with high positive and low negative attitudes, and negative-oriented profiles with high negative and low positive attitudes. Using the time attitude profiles as independent variables, we also examined differences in educational and psychological variables. Educational outcomes included self-reported GPA and educational expectations, and psychological variables included perceived stress and self-esteem.

Based on previous research (Buhl & Lindner, 2009; Worrell & Mello, 2009; Zimbardo & Boyd, 1999), we hypothesized that adolescents with positive-oriented profiles would have significantly and substantially higher self-esteem and lower perceived stress scores than would adolescents with negative-oriented profiles. We also hypothesized that adolescents with positive-oriented profiles would report higher educational expectations than would other groups, based both on Buhl & Lindner's (2009) findings as well as on research linking optimism and hope to educational outcomes (e.g., Nes, Evans, & Segerstrom, 2009; Worrell & Hale, 2001). Finally, given the lack of substantial relationships between GPA and individual time attitudes in previous studies (e.g., Adelabu, 2007, 2008; Mello & Worrell, 2006; Zimbardo & Boyd, 1999), we did not know whether there would be meaningful GPA differences across time attitude profiles.

## METHOD

### Participants

The sample consisted of 300 adolescents (60% male) attending secondary schools in a Mountain state and a Western state in the United States. They included adolescents who identified themselves as American Indian ($n = 3$; 1%), African American ($n = 33$; 11%), Asian American ($n = 76$; 25.3%), European American ($n = 123$; 41%), Latino ($n = 31$; 10.3%), Multi-ethnic ($n = 28$; 9.3%), and Other racial/ethnic groups ($n = 6$; 2%). Participants ranged in age from 12 to 19 years ($M = 16$; $SD = 1.25$), attended Grades 6 to 12, and were recruited from four different settings: (a) a rural school district ($n = 125$; 41.7%), (b) two schools in two different urban school districts ($n = 58$; 19.3%), and (c) a summer program for academically talented youth at a research university ($n = 114$; 38%). The demographics of each subsample were similar to those of the settings in which the data were collected. The sample in this study was used to assess convergent and discriminant validity (Worrell & Mello, 2009) and structural validity (Worrell et al., 2013) of ATAS scores.

Participants reported a wide range of perceived social status backgrounds on a 1 to 7 Likert scale ($M = 4.2$, $SD = 1.29$): 1 = *poor* ($n = 6$, 2%), 2 = *working class* ($n = 31$, 10.4%), 3 = *lower middle class* ($n = 31$, 10.4%), 4 = *middle class* ($n = 104$, 35%), 5 = *upper middle class* ($n = 96$, 32%), 6 = *lower upper class* ($n = 12$, 4%), and 7 = *wealthy* ($n = 17$, 5.7%). Students in one of the urban schools ($M = 4.5$, $SD = 1.44$) and the summer program ($M = 4.5$, $SD = 1.06$) had significantly higher perceived social status scores than those from the rural district ($M = 3.9$, $SD = 1.25$) and the second urban school ($M = 3.9$, $SD = 1.82$). There were also significant perceived social status differences among the ethnic groups, $F(6, 296) = 3.89$, $p < .001$, $\eta^2 = .07$: African American ($M = 4.5$, $SD = 1.70$), American Indian ($M = 4.0$, $SD = 2.0$), Asian American

Table 1
*Correlations of ATAS Subscales with Continuous Variables*

|          | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |
|----------|------|------|------|------|------|------|------|------|------|
| 1. PSP   | —    |      |      |      |      |      |      |      |      |
| 2. PSN   | −.67* |     |      |      |      |      |      |      |      |
| 3. PRP   | *.40** | *−.39** |  |     |      |      |      |      |      |
| 4. PRN   | −.27* | *.42** | *−.67** |  |   |      |      |      |      |
| 5. FTP   | .22* | −.23* | *.39** | *−.30** |  |     |      |      |      |
| 6. FTN   | −.27* | *.47** | *−.33** | *−.31** | *−.57** |  |  |      |      |
| 7. GPA   | .20* | −.18* | .09  | −.04 | .05  | −.25* |   |      |      |
| 8. PSS   | −.27* | *.33** | *−.45** | *.56** | *−.30** | .23* | −.19* |  |  |
| 9. SLE   | *.36** | *−.41** | *.46** | *−.45** | *.41** | *−.46** | .24* | *−.52** |  |
| *M*      | 3.40 | 2.49 | 3.42 | 2.72 | 3.82 | 2.07 | 3.36 | 3.05 | 3.07 |
| *SD*     | .76  | .82  | .68  | .77  | .77  | .80  | .65  | 0.49 | 0.53 |
| *Skew*   | −.13 | .23  | −.40 | .38  | −.36 | .66  | −.80 | .39  | −.03 |
| *Kurtosis* | −.05 | −.31 | .50 | −.28 | −.12 | −.39 | .20 | .56  | −.83 |

*Note*. ATAS = Adolescent Time Attitude Scale; PSP = Past Positive; PSN = Past Negative; PRP = Present Positive; PRN = Present Negative; FTP = Future Positive; FTN = Future Negative; GPA = Grade Point Average; PSS = Perceived Stress; SLE = Self-Esteem. Correlations indicating at least a medium effect size are italicized.
*$p < .006$.

($M = 4.7$, $SD = 0.97$), Chicano/Latino ($M = 3.7$, $SD = 1.21$), European American ($M = 4.0$, $SD = 1.26$), Multi-Ethnic ($M = 4.0$, $SD = 1.32$), and Other ($M = 3.8$, $SD = 0.84$).

*Measures*

*Adolescent Time Attitude Scale.* The Adolescent Time Attitude Scale (ATAS), which is the attitude subsection of the Adolescent Time Inventory (Mello & Worrell, 2010), was used to measure adolescents' attitudes toward the past, present, and future. The ATAS consists of 30 items on 6 five-item subscales: (a) Past Positive ("I have happy thoughts about my past", $\alpha = .80$); (b) Past Negative ("I wish that I did not have the past that I had," $\alpha = .79$); (c) Present Positive ("Overall, I feel happy about what I am doing right now," $\alpha = .77$); (d) Present Negative ("I am not satisfied with my life right now," $\alpha = .77$); (e) Future Positive ("I am very optimistic about my future," $\alpha = .83$); and (f) Future Negative ("Thinking about my future makes me sad," $\alpha = .81$). As noted previously, the internal consistency estimates for scores in this sample were acceptable.

Participants respond to items using a 5-point Likert scale (1 = *Totally Disagree*, 5 = *Totally Agree*) and no items are reverse-scored. The structural validity of ATAS scores has been established in both German and U.S. samples using both exploratory and confirmatory factor analyses (Buhl & Lindner, 2009; Worrell et al., 2013). Moreover, using a U.S. sample, Worrell and Mello (2009) also reported convergent validity for ATAS scores with several other variables, including hope (Snyder et al., 1996), optimism (Scheier & Carver, 1985), and self-esteem (Rosenberg, 1965).

*Educational Outcomes.* Educational outcomes were measured with three items. The first item was self-reported GPA, and adolescents reported this using the 4.0 scale used in schools (see Table 1 for means and standard deviations). Although school records are ideal, adolescents have been shown to be reliable self-reporters of GPA in their absence (Crockett, Schulenberg, & Petersen, 1987). The second item assessed educational expectations. Participants responded to the question, "What kind of college do you plan on attending?" with one of three options: 1 (*Do not plan on attending college*), 2 (*Community/junior college*), and 3 (*Four-year college*). The third item—"How much

schooling do you expect to have by the time you are 30 years old?"—assessed expected educational attainment in the longer term. Participants chose one of six response options: 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*). Educational attainment and expectations are commonly assessed in this manner in adolescent research, including in national data sets (e.g., Mello, 2008).

*Perceived Stress Scale.*   The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) is a 14-item Likert scale with a 5-point response option, ranging from 1 (*often*) to 5 (*never*). The PSS assesses how stressful and unpredictable respondents perceived their lives to be in the last month. Cohen et al. (1983) 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 life-event scores (Lewinsohn & Talkington, 1979), social anxiety (Watson & Friend, 1969), and both depressive (Radloff, 1977) and physical symptomatology (Cohen & Hoberman, 1983). Although initially developed for use with college students, the scale has been used in several adolescent samples (e.g., Cartwright et al., 2003; Siqueira, Diab, Bodian, & Rolnitzky, 2000). Internal consistency for PSS scores in this sample was .71.

*Rosenberg Self-Esteem Scale.*   The Rosenberg Self-Esteem Scale (SLE; Rosenberg, 1965), a measure of global self-esteem, consists of 10 items rated on a 4-point Likert scale that ranges from 1 (*strongly disagree*) to 4 (*strongly agree*). Worrell and colleagues (e.g., Worrell 2000; Worrell, Latto, & Perlinski, 1999; Worrell, Roth, & Gabelko, 1998) reported reliability estimates ranging from .76 to .88 for SLE scores in samples of adolescents, and Robins and colleagues (e.g., Robins, Hendin, & Trzesniewski, 2001) reported reliability estimates ranging from .88 to .90 across six assessments of college students. Robins et al. (2001) also reported convergent validity evidence for SLE scores with optimism (Scheier & Carver, 1985), life satisfaction (Campbell, Converse, & Rodgers, 1976), depression (Radloff, 1977), and perceived stress (Cohen et al., 1983). In this sample, SLE scores yielded an internal consistency estimate of .83.

### Procedure

In the urban district, researchers either administered and collected survey packets in classrooms or made two visits to schools, one to distribute and one to collect survey packets. In the summer program, participants were solicited in their classrooms but completed the survey on their own time and returned it to the researchers. Data collection in the rural district was coordinated by school district personnel, and completed surveys were mailed to the researchers. Adolescents received $10 for participation. The study was approved by the institutional review board at the second author's institutions.

### RESULTS

Descriptive statistics for the major variables are provided in Table 1. Scores were not skewed or kurtotic, with values less than |1.0| for all of the variables. Mean scores for positive time attitudes were higher on average than were scores for negative time attitudes across the three time periods. Only correlations of .30 or higher—indicating a moderate effect size—were interpreted. Using this criterion, past and present negative attitudes were positively correlated with perceived stress, and present positive attitudes were negatively correlated with perceived stress. All six time attitudes were correlated with self-esteem, with correlations in keeping with the valence of the attitudes: positive attitudes had positive correlations with self-esteem and vice versa. None of the time attitudes had a meaningful correlation with GPA.

Relationships among educational outcome scores were examined using Spearman's rho correlation coefficients. As in previous studies, GPA had strong, positive relationships with both educational attainment, $r_s(264) = .65$, $p < .01$, and educational expectations, $r_s(262) = .53$, $p < .01$, indicating that these variables were functioning as expected. There was also a strong positive association observed between educational expectations and educational attainment, $r_s(282) = .61$, $p < .01$. Spearman's rho also indicated that perceived social status had very modest relationships with educational outcomes: $r_s = .22$ (educational attainment), $r_s = .19$ (educational outcomes), and $r_s = .22$ (GPA).

*Cluster Analyses of Time Attitudes*

Bergman, Magnusson, and El-Khouri (2003) described cluster analysis as a statistical procedure used to classify individuals based on a set of operating factors in a domain. The domain under investigation in the present study was *time attitudes*. Using the ATAS, Worrell et al. (2013) provided strong evidence in support of six time attitude factors. The authors of the present study clustered scores for each of the six time attitudes (i.e., ATAS factors) so that adolescents were as similar as possible *within* clusters and as dissimilar as possible *across* clusters (Clatworthy et al., 2005). Prior to clustering, ATAS scores were converted to $T$ scores ($M = 50$, $SD = 10$), so that all subscales had the same mean and standard deviation.

The cluster analysis was conducted in four stages. SPSS (IBM Corporation, 2012) software was used to develop Ward's hierarchical clustering, and k-means iterative partitioning was used to validate the Ward's solution (Bergman et al., 2003). A five-cluster solution was identified in the first two stages, and in Stage 3, the homogeneity of time attitudes *within* each cluster was examined using Bergman et al.'s (2003, p. 99) algorithm, $EV = 100 \times (Et - Ec)/Et$, and suggested cut-off score (i.e., $EV \geq 67$). In the fourth and final stage, 10 outliers—with scores more than 2.5 $SD$s greater than or less that the mean—were removed, and the cluster procedures were repeated without the outliers. The results were similar, and a five-cluster solution was accepted.

The five time attitude profiles are shown in Figure 1. Profile 1 ($EV = 84$, $n = 86$, 29%), consisted of adolescents with present and future attitudes that were similar to sample means and were slightly above average (.2 $SD$s) in past positive and below average (.4 $SD$s) in past negative attitudes. This profile was labeled Balanced. Profile 2 ($EV = 80$, $n = 69$, 23%), labeled Pessimists, had present attitudes similar to the sample mean, but substantially above-average past negative ($\approx$.7 $SD$s) and future negative attitudes ($\approx$1 SD) and substantially below-average future positive attitudes ($\approx$.7 SDs). The third profile ($EV = 84$, $n = 83$, 28%) was similar to the Optimistic profile in Buhl and Lindner's (2009) study. These adolescents had substantially above-average positive attitudes ($\approx$.7+ $SD$s) and substantially below-average negative attitudes ($\approx$.7+ $SD$s) toward all three time periods, and were labeled Positives. Unlike Buhl and Lindner, we labeled this profile as *Positive* rather than Optimistic, as the profile is based on attitudes toward all the time periods and not just the future.

The fourth profile ($EV = 73$, $n = 31$, 10%), labeled Negatives, was the inverse of Cluster 3 and similar to the Pessimistic profile found by Buhl and Lindner (2009). These adolescents had substantially above-average negative attitudes ($\approx$.7+ $SD$s) and substantially below-average positive attitudes ($\approx$.6+ $SD$s) toward all three time periods. The fifth profile was labeled Optimistic ($EV = 79$, $n = 31$, 10%) and was characterized by very low past positive and high past negative scores ($\approx$1 $SD$), below-average present positive and above-average present negative scores ($\approx$.5 to .7 $SD$s), and substantially above-average future positive and below-average future negative scores ($\approx$.7 $SD$s). One-way analyses of variance (ANOVAs) were calculated to examine the differences in each of the time attitudes among clusters. All of the ANOVAs were significant with large effect sizes (see Table 2). For brevity and clarity, we use the profile names to refer to the clusters in the rest of the article.
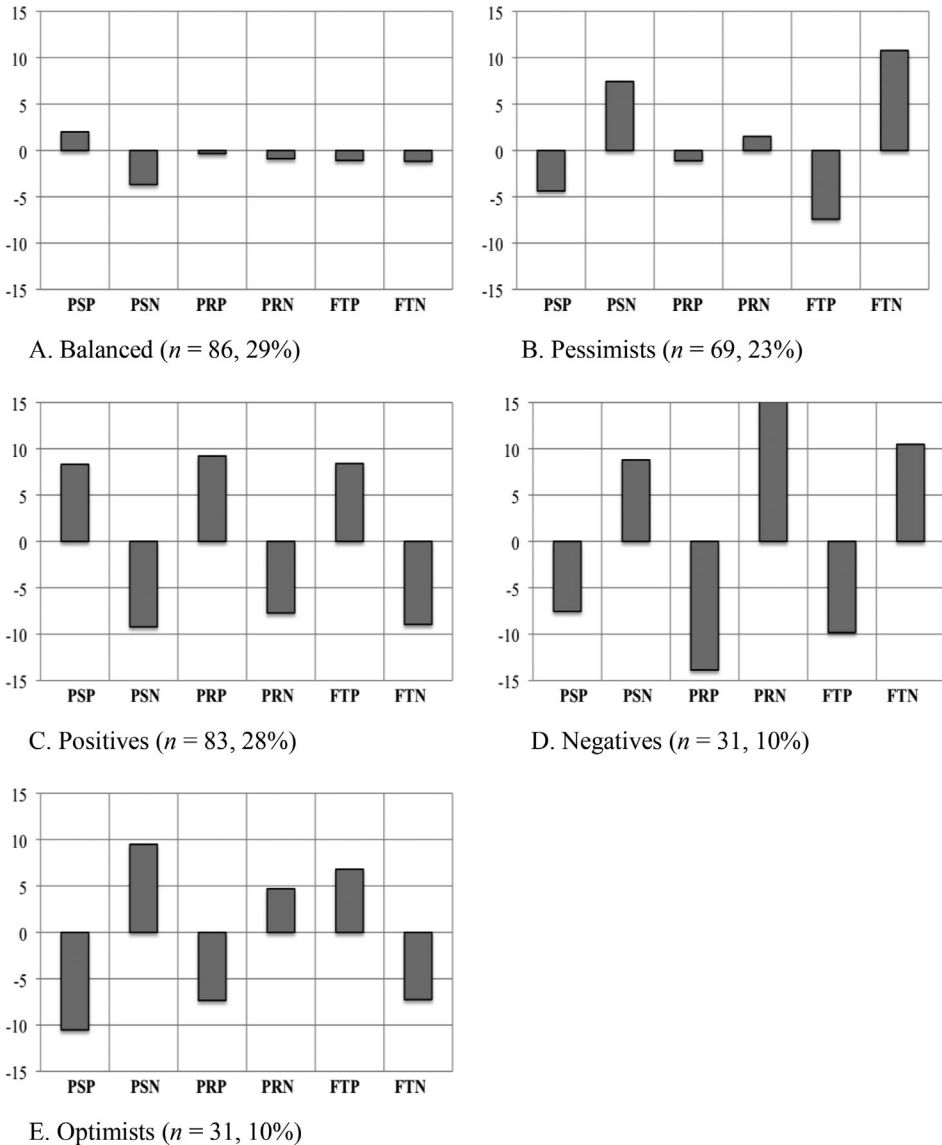
FIGURE 1. Time attitude profiles based on positive and negative attitudes toward the past, present, and future. Zero indicates *average* attitudes relative to the sample ($SD = 10$). Thus a score of 5 is half a standard deviation above the mean, and a score of –10 is a full standard deviation below the mean. PSP = Past Positive, PSN = Past Negative, PRP = Present Positive, PRN = Present Negative, FTP = Future Positive, FTN = Future Negative.

## Time Attitude Profiles and Demographic Variables

Although we did not articulate any hypotheses about demographic differences, we examined how cluster group membership was related to gender, age, and perceived social status. Analyses indicated that gender and time attitude profiles were not related, $\chi^2(4, N = 298) = .46, p > .05$, $V = .11$, and a one-way ANOVA yielded a similar result for age, $F(4, 294) = 1.25, p > .05, \eta^2 = .02$. As noted in the Method section, ethnic groups and school groups differed significantly by perceived

Table 2
*Means of Adolescent Time Attitude Scale Scores by Cluster*

|  | Past Positive M (SD) | Past Negative M (SD) | Present Positive M (SD) | Present Negative M (SD) | Future Positive M (SD) | Future Negative M (SD) |
|---|---|---|---|---|---|---|
| Balanced | 3.55 (0.55) | 2.19 (0.45) | 3.40 (0.46) | 2.65 (0.63) | 3.73 (0.56) | 1.97 (0.35) |
| Pessimists | 3.07 (0.57) | 3.11 (0.42) | 3.35 (0.53) | 2.83 (0.55) | 3.24 (0.54) | 2.93 (0.62) |
| Positives | 4.03 (0.55) | 1.73 (0.55) | 4.05 (0.42) | 2.12 (0.52) | 4.47 (0.49) | 1.35 (0.32) |
| Negatives | 2.83 (0.68) | 3.22 (0.73) | 2.48 (0.50) | 3.88 (0.49) | 3.06 (0.81) | 2.90 (0.69) |
| Optimists | 2.61 (0.63) | 3.28 (0.74) | 2.92 (0.61) | 3.08 (0.76) | 4.34 (0.50) | 1.49 (0.36) |
| $F(4, 299)$ | 53.73* | 100.20* | 72.29* | 56.14* | 66.75* | 145.58* |
| $\eta^2$ | 0.42 | 0.58 | 0.50 | 0.43 | 0.48 | 0.66 |

*Note.* $N = 295$.
*$p < .001$.

social status. Although cell sizes were too small to examine time attitude profiles by ethnicity and school, we felt that it was important to examine the direct correlation between perceived social status and time attitudes. Perceived social status had very low correlations with the six time attitude scores, ranging from –.10 with Past Negative attitudes to .16 with Past Positive attitudes, and a one-way ANOVA of perceived social status with time attitude profile as the independent variable was not significant, $F(4, 296) = .37$, $p > .05$, $\eta^2 = .01$.

### Differences in Educational Outcomes and Psychological Well-Being by Profile

We hypothesized that adolescents with positive-oriented profiles would report more favorable scores for psychological well-being and educational outcomes than adolescents with negative-oriented profiles (Buhl & Lindner, 2009; Zimbardo & Boyd, 1999). More specific hypotheses were generated after time attitude profiles were identified. We hypothesized that adolescents with Positive, Balanced, and Optimistic profiles would report substantially higher levels of educational expectations than Negatives and Pessimists, given Worrell and Hale's (2001) research showing that at-risk graduates have greater hope in the future than do at-risk dropouts. We also hypothesized that Positive, Balanced, and Optimistic adolescents would report both significantly higher scores for self-esteem and lower scores for perceived stress than would adolescents with Negative and Pessimistic profiles (Wyman et al., 1992).

*Educational Outcomes.* A one-way ANOVA indicated a significant difference for GPA across clusters, $F(4, 270) = 2.46$, $p < .01$, although the result was not practically significant, $\eta^2 = .04$. Although post-hoc analyses indicated that Positives had substantially higher GPAs than did Pessimists, $d = .56$, no other profile differences in GPA were statistically significant or meaningful.

Cross-tabulations indicated a weak association between time attitude profiles and educational expectations, $\chi^2(20, N = 292) = 34.23$, $p < .03$, $V = .17$, and the relationship between cluster membership and expected attainment was not significant, $\chi^2(8, N = 288) = 12.91$, $p < .12$, $V = .15$, although the effect size was similar. We suspect that these relationships were attenuated in part by very small numbers in several cells, as visual inspection of the graphs indicated a clear pattern of differences among the profiles (see Figure 2). With regard to educational expectations, greater percentages of the Positives (82%) and Optimists (81%) expected to attend a 4-year college than did Pessimists (64%), with the Balanced (72%) and Negatives (73%) falling in the middle. The pattern was similar for expected educational attainment by age 30. A larger number of Positives expected to have at least a 4-year or graduate degree (89%) than did other groups, with almost a
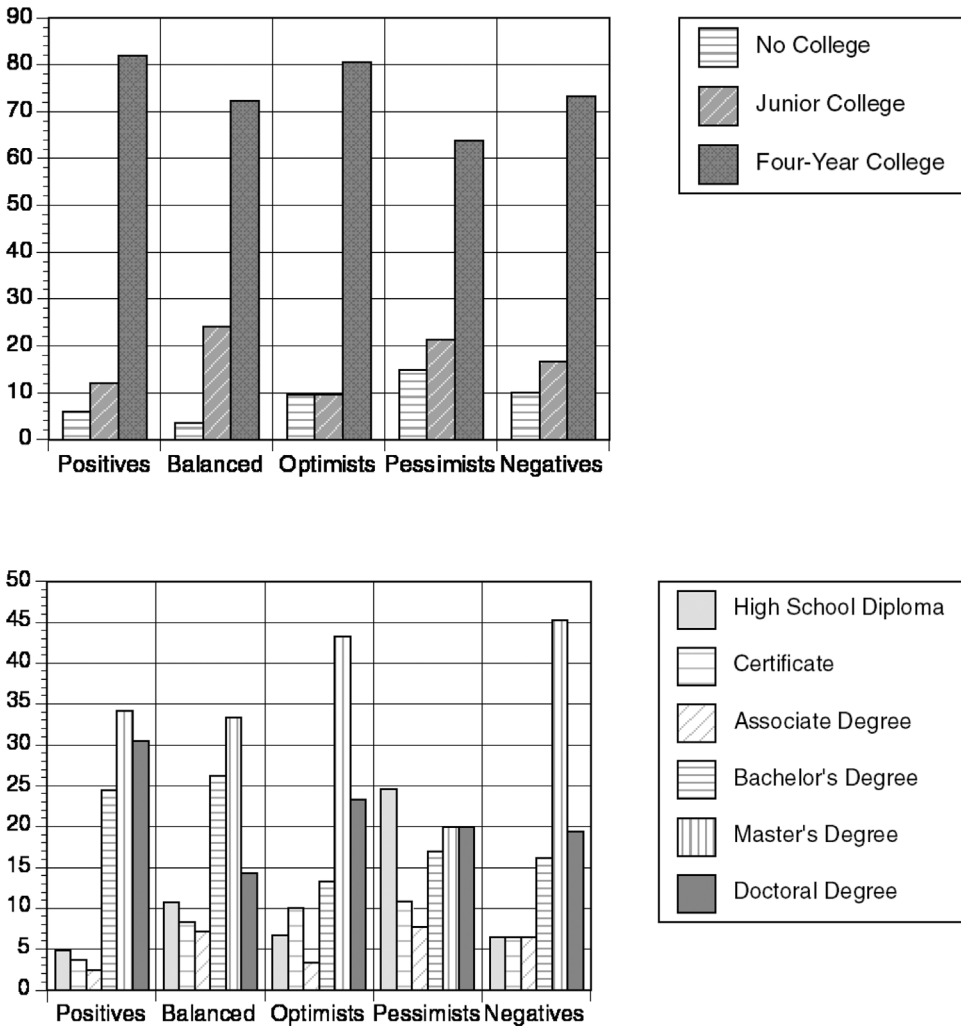
FIGURE 2. Percentages of adolescents reporting educational expectations (top) and expected educational attainment at age 30 (bottom) by cluster membership.

third expecting to complete a doctoral degree. Pessimists (57%) were at the bottom with regard to expected educational attainment, and the other three groups fell between these two extremes.

*Psychological Well-Being.* A one-way ANOVA revealed statistically and practically significant differences in perceived stress across time attitude profiles, $F(4, 293) = 19.01$, $p < .001$, $\eta^2 = .21$ (see Figure 3). As hypothesized, adolescents with positive time attitude profiles (i.e., Positives [$M = 2.81$, $SD = .45$], Balanced [$M = 3.01$, $SD = .44$], and Optimists [$M = 3.23$, $SD = .46$]) reported lower levels of perceived stress than did adolescents with negative time attitude profiles (i.e., Negatives [$M = 3.56$, $SD = .49$] and Pessimists [$M = 3.10$, $SD = .36$]). Post-hoc analyses (critical alpha $= .008$) indicated that Positives reported significantly and substantially lower levels of perceived stress than did Negatives ($d = 1.64$) and Pessimists ($d = .71$). Balanced and Optimistic adolescents also reported lower levels of perceived stress than did Negatives ($d = 1.22$ and $d = .71$,
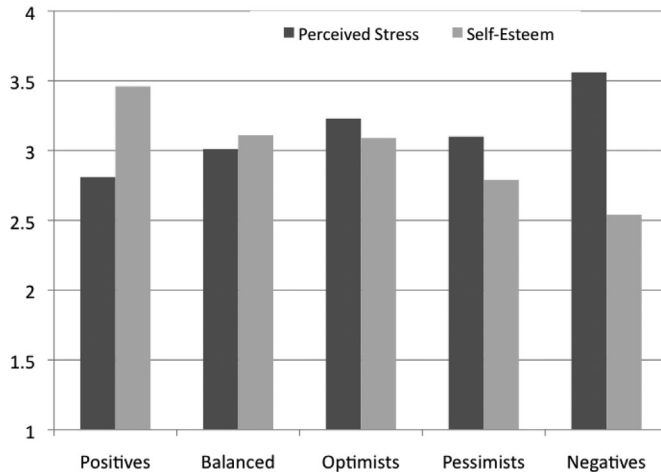
FIGURE 3. Means for perceived stress and self-esteem by cluster membership.

respectively). However, Optimists and Balanced adolescents' scores did not differ significantly ($p > .05$) from those reported by Pessimists ($d = .32$ and $d = .23$, respectively).

An ANOVA also indicated significant and meaningful differences in self-esteem among time attitude profiles, $F(4, 295) = 33.81$, $p < .001$, $\eta^2 = .31$. In line with our hypothesis (see Figure 3), adolescents with positive time attitude profiles (i.e., Positives [$M = 3.46$, $SD = .45$], Balanced [$M = 3.11$, $SD = .45$], and Optimists [$M = 3.09$, $SD = .40$]) reported substantially higher levels of self-esteem than did adolescents with negative time attitude profiles (i.e., Negatives [$M = 2.54$, $SD = .42$] and Pessimists [$M = 2.79$, $SD = .46$]). Positives reported higher self-esteem scores than both Negatives ($d = 2.10$) and Pessimists ($d = 1.48$). Balanced adolescents also reported substantially higher self-esteem scores than Negatives ($d = 1.29$) and Pessimists ($d = .70$). Finally, Optimists reported higher self-esteem scores than both Negatives ($d = 1.35$) and Pessimists ($d = .68$).

## DISCUSSION

Attitudes toward time have generated a substantial research base in adolescent and adult populations (see Zimbardo & Boyd, 2008, for a comprehensive review), with much of this research focused on attitudes toward the future (e.g., Nurmi, 1991; Seginer, 2008). In 1999, introducing the ZTPI, Zimbardo and Boyd made several claims that are particularly relevant to this study. These researchers criticized other instruments in the extant literature as literally one-dimensional and pointed out that none accounted for attitudes toward the past. Zimbardo and Boyd (1999) proposed that instruments should account for the multidimensional nature of time by incorporating the past, present, and future. They also criticized the assumption that high scores on a scale assessing future attitudes are equivalent to or imply low scores on present attitudes or vice versa. These sentiments provide both a cogent summary of the rationale for this study, and our findings support Zimbardo and Boyd's (1999, 2008) contention that temporal profiles exist.

Since the publication of the ZTPI (Zimbardo & Boyd, 1999), there has been a growing interest in attitudes toward the past and present, in addition to attitudes toward the future. However, much of the extant research has used bivariate correlations to establish the relationship of time attitudes to other constructs. In this study, we replicated Buhl and Lindner's (2009) study with German adolescents and developed multivariate profiles of time attitudes based on positive and negative attitudes toward all

three time periods. Our results indicate that American adolescents can be grouped into interpretable time attitude profiles and that adolescents with different profiles report significant and meaningful differences in educational and psychological outcomes. In the following sections, we discuss the relationship of time attitudes to other constructs, the importance of using profiles in the study of time attitudes, the predictive validity of time attitude profiles, and the implications of this study for future research in this area.

### Time Attitudes in Relation to Other Constructs

We concur with Zimbardo and Boyd (1999, 2008) that a comprehensive study of attitudes toward time should include the past, present, and future. However, the ZTPI (Zimbardo & Boyd, 1999) assesses *positive* and *negative* attitudes toward the past, *fatalistic* and *hedonistic* attitudes toward the present, and *planful, goal-oriented* attitudes toward the future. As the items and titles of these scales indicate, the present and future subscales on the ZTPI consist of multiple constructs (Worrell et al., 2013). Thus, it is difficult to know if the risky behaviors associated with Present Hedonistic attitudes are related to a *present* orientation or a *hedonistic* mindset (Keough et al., 1999; Zimbardo et al., 1997). Similarly, are anxiety, depression, and suicidal ideation related to attitudes toward the present or to fatalism, and is conscientiousness related to attitudes toward the future or to the goal-orientation items on the ZTPI's Future subscale (Laghi et al., 2009; Zimbardo & Boyd, 1999)? Indeed, in some studies, the Present Hedonistic subscale has split into Present and Hedonistic factors (Crockett, Weinman, Hankins, & Marteau, 2009) and the Future subscale has split into Future and Planning factors (e.g., Crockett et al., 2009; Worrell & Mello, 2007).

To avoid these construct concerns, the scale used in this study—the ATAS (Mello & Worrell, 2010)—assesses positive and negative attitudes toward the past, present, and future without additional constructs, such as hedonism, fatalism, or goal orientation. Nonetheless, the relationships between ATAS subscale scores and GPA are similar to those reported in other studies of time attitudes, including ones using the ZTPI (Adelabu, 2008; Snyder et al., 2002; Worrell & Mello, 2007), and are equally modest. Relationships with self-esteem and perceived stress are more robust and in keeping with theoretical predictions. Moreover, all six ATAS subscales had meaningful relationships with self-esteem (|.36| to |.46|), in contrast with the ZTPI, in which only the Past Negative subscale is related to self-esteem ($r = -.48$; Zimbardo & Boyd, 1999). Finally, time attitudes had no relationship to perceived social status in this sample, a finding that should be examined in future studies with other measures of socioeconomic status (SES) and samples that have larger numbers of individuals from the lower and upper levels of SES.

### Time Attitude Profiles

*Profiles Defined by Multiple Rather than Single Attitudes.*   The time attitude profiles represent one of the most intriguing contributions of this study. Although Zimbardo and Boyd (1999) suggested that individuals have different time attitude profiles, they classified individuals as having a particular time profile on the basis of responses above the 95th percentile on a *single* ZTPI subscale score. Zimbardo and Boyd (1999, p. 1999) identified five time profiles corresponding to the five *individual* ZTPI subscales, although they acknowledged "some participants were also relatively high on some of the other four factors (but less than 95%)." Thus, Buhl and Lindner's (2009) results are the first time attitude profiles that are actually based on past and present attitudes toward all three time periods, and the current study is the second such piece in adolescents.

The current results correspond in several ways to those reported by Buhl and Lindner (2009). Three of the five profiles found in this study (Positives, Optimists, Negatives) were very similar to profiles found by Buhl and Lindner, and one was somewhat similar (Balanced), providing a robust

replication of the earlier study, especially given the substantially smaller sample in the current study. Moreover, each of the profiles represents too substantial a proportion of the sample (10% to 29%) to be dismissed. Although we identified only two negatively oriented profiles, they made up a larger proportion of the current sample (33%) than did the three negative groups in the Buhl and Lindner study (23.7%). Of course, the question about whether a greater percentage of American adolescents have negative time attitude profiles than do German adolescents will need further investigation in samples that are more representative of the respective countries.

*Labeling the Profiles.* We deliberated about the choice of names for some time before deciding to change some of the labels used by Buhl and Lindner (2009). The names of the German and American profiles are as follows, with the American name first and the German name in italics: Positives – *Optimistic*, Balanced – *Balanced*, Optimists – *Past Pessimist/Future Optimist*, and Negatives – *Pessimists*. There is no German equivalent for the profile that we labeled Pessimists, and there are no American equivalents for the German *Ambivalent* and *Tendentially Pessimistic* profiles. The starting place for our discussion was the contention that both optimism and pessimism are forward-looking constructs; the former carries an expectation of hope and positive outcomes and the latter carries an expectation of the worst outcomes.

Thus, we decided to label the profile with high positive attitudes and low negative attitudes toward all three time periods *Positives* rather than Optimists and to use the *Optimist* label for the profile with high negative attitudes and low positive attitudes toward the past, alongside high positive attitudes and low negative attitudes toward the future. Similarly, we labeled the profile defined by high negative attitudes and low positive attitudes toward all three time periods *Negatives* and assigned the *Pessimists* label to the profile with average positive and negative attitudes to the present and high negative and low positive attitudes toward the future. The *Balanced* profile had generally average attitudes—none more than .4 SDs different from the mean—and positive attitudes were higher than negative attitudes, especially with regard to past attitudes, which were almost .4 SDs different. Buhl and Lindner (2009) gave the same name to a similar profile, although in their case, the differences between positive and negative attitudes was similar to the difference found in the past attitudes in the present study.

### Time Attitude Profiles and Outcomes

The differences among profiles on educational and psychological outcomes are also of tremendous interest. In Figures 2 and 3, we ordered the profiles—Positives, Balanced, Optimists, Pessimists, and Negatives—based both on our interpretation of the profiles and on the current literature. Positives and Negatives were chosen as the first and fifth profiles, respectively, because they clearly represent the positive and negative poles of time attitude profiles. The Balanced profile was placed second, as Zimbardo and Boyd (1999) hypothesized that this time profile is ideal. Optimists, with negative views of the past and present, but positive views of the future, were placed third, and Pessimists, who had average time attitudes in the present but negative views of the past, were placed fourth. We now discuss how these groups differed on a variety of outcomes.

*Educational Outcomes.* Previous research has indicated that attitudes toward specific time periods were not predictive of GPA, and this finding was replicated in this study. Thus, the finding that Positives and Pessimists differed on GPA with a moderate effect size was unexpected and certainly warrants additional research. The finding suggests that clusters of time attitudes may be predictive of academic achievement for some adolescents, even if individual subscales are not, highlighting the utility of a person-centered as opposed to a variable-centered approach.

Previous research has indicated that dropouts report less hope in the future than do graduates (Worrell & Hale, 2001), and Worrell et al. (1999) found that students who were not at-risk and resilient at-risk students reported higher perceived life chances than non-resilient at-risk students did. These findings suggest that time attitude profiles may be related to positive expectations for the future in education and other domains. Although statistical analyses did not indicate that time profiles have a strong association with educational expectations and expected educational attainment, visual inspection did suggest that adolescents with different time profiles had meaningful differences on these variables.

As shown in Figure 2, Pessimists reported lower expectations than did all the other groups. Looking at educational expectations specifically (Figure 2, top), there seem to be three clear groupings. Group 1 consists of Positives and Optimists, 80% of whom expect to attend a 4-year college, and Group 2 consists of the Balanced and Negatives, 70% of whom expect to attend a 4-year college. The Pessimists make up Group 3, with less than 50% expecting to attend a 4-year college. The pattern is equally clear for expected educational attainment by age 30 (Figure 2, bottom). Although more Optimists and Negatives report expecting to earn a master's degree than do Positives, more Positives report expecting to earn a PhD than do the other five groups. Moreover, if the bachelor's, master's, and doctoral degrees are combined, a similar pattern emerges, with Positives (89%) as the highest tier, Negatives (80%), Optimists (79%), and Balanced (73%) adolescents in the middle, and Pessimists (57%) at the bottom.

Buhl and Lindner (2009) reported that more Optimists (i.e., our Positives; 62%) and Balanced (55%) had expectations of attending college than did the other groups, with their Ambivalent (31%) group having the lowest expectations. The other three groups, Tendentially Pessimistic (40%) and Pessimistic (our Negatives; 42%), and Past Pessimistic/Future Optimistic (46%), fell in the middle. The lower percentages in the German data may reflect actual differences between the United States and Germany in college attendance. In both studies, however, Positives emerge as the highest group on all educational outcomes.

*Psychological Outcomes.*   Time attitude profile differences in psychological outcomes were also intriguing, especially in view of the differences found in educational outcomes. Whereas Positives had the best adjustment outcomes on these variables, paralleling the findings with educational outcomes, Negatives rather than Pessimists had the worst adjustment outcomes on both self-esteem and perceived stress, perhaps because Pessimists have poor expectations of the future, whereas Negatives have more global negative expectations encompassing the past, present, and future. It can also be argued that perceived stress and self-esteem are both *present*-focused variables. Indeed, although Positive, Balanced, and Optimistic adolescents reported lower levels of stress than did Negative adolescents, only Positive adolescents reported stress levels lower than Pessimists; Optimistic and Balanced adolescents had perceived stress levels similar to Pessimists.

The findings were similar for self-esteem—the three positive groups all reported substantially higher self-esteem than did the two negative groups—with Positives reporting the highest self-esteem and Negatives the lowest. Buhl and Lindner's (2009) findings are similar: their Optimists (our Positives) and Pessimists (our Negatives) also reported the highest and lowest scores, respectively, on some psychological variables, including life satisfaction and self-efficacy. The results of these two studies suggest that time attitude profiles may have differential relationships to educational and psychological outcomes, with Pessimists having the lowest educational expectations (a future-oriented variable) and Negatives having poorer psychological functioning (a present-oriented variable). These findings also suggest that the Balanced profile may not be the profile with the most optimal outcomes as theorized (Zimbardo & Boyd, 1999, 2008) and reported in studies using the ZTPI (e.g., Boniwell et al., 2010; Qin et al., 2012). Unfortunately, one cannot obtain Positive and

Negative profiles with the ZTPI, as it does not measure positive and negative attitudes toward all three time periods.

*Broader Implications of the Study*

The current study has several broader implications. First, the results suggest that our understanding of the relationship between time attitudes and other constructs based on bivariate correlations with single time periods may be incomplete or misleading. Second, if supported, these findings have implications for educational interventions. Oyserman, Terry, and Bybee (2002) conducted a study in which researchers encouraged urban African American middle school students to develop positive thoughts and attitudes toward the future. Over the course of one school year, adolescents in the intervention group manifested an increase in school engagement and a decrease in problematic behavior. This study's findings suggest that positive time attitude profiles may be particularly important for educational outcomes. Potentially, time attitude profiles can be used to identify students who may benefit from an intervention of this type, although the present study's findings also suggest that interventions including a focus on attitudes toward the past and the present may also be fruitful, especially for psychological outcomes, as Positives had better outcomes than did Optimists. However, these ideas are speculative and need to be addressed directly in future research.

Third, Hall (1904) referred to adolescence as the developmental period marked by *storm and stress*. Results of both the Buhl and Lindner (2009) study and the present study contribute to the substantial body of evidence countering the claim that adolescence is a universal period of distress (Larson & Ham, 1999). On the contrary, 67% of the adolescents in this sample and 76% in the Buhl and Lindner sample had positive time attitude profiles that were associated with favorable states of psychological well-being. Finally, these data suggest that gender, age, and perceived social status are not related to time attitude profiles, findings supported in part by Buhl and Lindner, with regard to age and gender, and by Wyman et al. (1992) with regard to poverty.

*Limitations and Future Research*

Nonetheless, this study had several limitations. First, the sample size was relatively small, which may have limited the number of clusters that emerged. Second, a majority of the sample was European American, which prevented separate examinations of time attitude profiles by racial/ethnic group. However, given the social context of the United States, it is probable that racial/ethnic groups differ on their attitudes toward time, and this hypothesis should be examined in future studies. Third, the perceived social status and educational outcome variables were self-reported, and it will be important for future research to replicate these findings using both self-report data and data from other sources, such as teachers and achievement data from school records. Fourth, the perceived social status and educational expectation variables used in the present study included options that might not be well known or understood in middle-schoolers (e.g., upper middle class, associate's degree). It will also be important to examine whether the differences in educational expectations by time attitudes are attenuated or enhanced after controlling for SES and using more robust measures of expectations and SES. All of these concerns have implications for the generalizability and interpretation of the findings and highlight the need for further research with larger samples using both the ATAS and time attitude clusters.

Because all the data in the present study were self-reported, some might argue that common method variance (CMV) confounded the analyses. Said another way, it is possible that variance in measured variables are explained by mono-informant bias and not the constructs the authors intended to assess. Although some authors have argued that CMV is a relatively common source of measurement error (e.g., Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), other researchers have

contended that CMV has been over stated in the literature (e.g., Spector, 2006). In fact, Spector (2006) went as far as to report that CMV had reached levels of "methodological urban legend" and provided ample data to support the theory that CMV, including mono-informant bias, does not categorically confound analyses (p. 222). In regard to the present study, large correlations between theoretically similar variables (e.g., positive and negative attitudes toward the past) and small correlations between theoretically unrelated variables (e.g., age and time attitude) suggest that CMV did not confound results, but the impact of CMV should be ascertained in future studies.

In addition to addressing the limitations mentioned, there are several potential avenues for future research. Because a substantial amount of the research on time attitudes uses the ZTPI, one important place to start is to include both the ZTPI and the ATAS in the same study and examine the relationships among the subscales and with other constructs, such as risky behavior, psychological well-being, and educational outcomes, as well as the predictive utility of the profiles that can be obtained with both measures. Such a study would allow us to determine, for example, whether risky behavior and psychopathology are related to a present orientation or to hedonism and fatalism. Other unknowns include the temporal stability of time attitude profiles, the relationship of adolescents' time attitude profiles to the profiles of their parents, and the degree to which the profiles are related to psychological and educational risk. Finally, it will be important to examine the relationship of time attitude profiles to temperament. As Wyman et al. (1992) showed, positive attitudes toward the future are part of the psychological make-up of resilient children exposed to major life stresses. It will be important to ascertain via longitudinal studies whether these positive attitudes are related to temperament or to other protective factors in a child's environment.

## CONCLUSION

In this study, we examined positive and negative attitudes toward the past, present, and future in a sample of adolescents. Five profiles were identified in the present study, four of which were conceptually similar to profiles that emerged in Buhl and Lindner's (2009) study with German adolescents. These findings provide support for the generalizability of time attitude profiles in adolescents and the patterns of relationships between ATAS profiles and the educational and psychological variables examined in this study. Time attitude profiles characterized by high positive time attitudes and low negative time attitudes are associated with the most favorable educational and psychological outcomes. In contrast, time attitude profiles characterized by the inverse pattern are associated with less favorable outcomes. Both of these findings are important and provide a window into an additional psychological construct—that is, time attitude profiles—that affects adolescent functioning, one that could be potentially useful as a universal screener if the findings of the current study are replicated widely. At the very least, these results suggest that this area of research will benefit from further study.

## REFERENCES

Adelabu, D. H. (2007). Time perspective and school membership as correlates to academic achievement among African American adolescents. Adolescence, 42, 525–538.

Adelabu, D. H. (2008). Future time perspective, hope, and ethnic identity among African American adolescents. Urban Education, 43, 347–360.

Bergman, L. R., Magnusson, D., & El-Khouri, B. M. (2003). Studying individual development in an interindividual context: A person-oriented approach. Mahwah, NJ: Lawrence Erlbaum Associates.

Boniwell I., Osin E., Linley P. A., & Ivanchenko, G. V. (2010). A question of balance: Time perspective and well-being in British and Russian samples. The Journal of Positive Psychology, 5, 24–40.

Buhl, M., & Lindner, D. (2009). Time perspectives in adolescence: Measurement, profiles, and links with personality characteristics and scholastic experience. Diskurs Kindheits- und Jungendforschung, 2, 197–216.

Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). The quality of American life: Perceptions, evaluations, and satisfactions. New York, NY: Russell Sage.

Cartwright, M., Wardle, J., Steggles, N., Simon, A. E., Croker, H., & Jarvis, M. J. (2003). Stress and dietary practices in adolescents. Health Psychology, 22, 362–369.

Clatworthy, J., Buick, D., Hankins, M., Weinman, J., & Horne, R. (2005). The use and reporting of cluster analysis in health psychology: A review. British Journal of Health Psychology, 10, 329–358.

Cohen, S., & Hoberman, H. (1983). Positive events and social supports as buffers of life change stress. Journal of Applied Psychology, 13, 99–125.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 386–396.

Crockett, L. J., Schulenberg, J. E., & Petersen, A. C. (1987). Congruence between objective and self-report data in a sample of young adolescents. Journal of Adolescent Research, 2, 383–392.

Crockett, R. A., Weinman, J., Hankins, M., & Marteau, T. (2009). Time orientation and health-related behavior: Measurement in general population samples. Psychology and Health, 24, 333–350.

Drake, L., Duncan, E., Sutherland, F., Abernethy, C., & Henry, C. (2008). Time perspective and correlates of wellbeing. Time and Society, 17, 47–61.

Frank, L. K. (1939). Time perspectives. Journal of Social Philosophy, 4, 293–312.

Hall, G. S. (1904). Adolescence: Its psychology and its relation to physiology, anthropology, sociology, sex, crime, religion, and education (Vol. 1 & 2). Englewood Cliffs, NJ: Prentice-Hall.

IBM Corporation. (2012). IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: Author.

Keough, K. A., Zimbardo, P. G., & Boyd, J. N. (1999). Who's smoking, drinking, and using drugs? Time perspective as a predictor of substance use. Basic and Applied Psychology, 21, 149–164.

Laghi, F., Baiocco, R., D'Alessio M. D., & Gurrieri, G. (2009). Suicidal ideation and time perspective in high school students. European Psychiatry, 24, 41–46.

Larson, R., & Ham, M. (1993). Stress and "storm and stress" in early adolescence: The relationship of negative events with dysphoric affect. Developmental Psychology, 29, 130–140.

Lewin, K. (1942). Time perspective and morale. In G. Watson (Ed.), Civilian morale (pp. 48–70). Oxford, UK: Houghton Mifflin.

Lewinsohn, P. M., & Talkington, J. (1979). Studies on the measurement of unpleasant events and relations with depression. Applied Psychological Measurement, 3, 83–101.

Mello, Z. R. (2008). Gender variation in developmental trajectories of educational and occupational expectations and attainment from adolescence to adulthood. Developmental Psychology, 44, 1069–1080.

Mello, Z. R., Bhadare, D. K., Fearn, E. J., Galaviz, M., Hartmann, E. S., & Worrell, F. C. (2008). The window, the river, and the novel: Examining adolescents' conceptualizations of the past, the present, and the future. Adolescence, 44, 539–556.

Mello, Z. R., & Worrell, F. C. (2006). The relationship of time perspective to age, gender, and academic achievement among academically talented adolescents. Journal for the Education of the Gifted, 29, 271–289.

Mello, Z. R., & Worrell, F. C. (2010). The Adolescent Time Inventory-English. Berkeley, CA: Author. Retrieved from www.uccs.edu/~faculty/zmello/ATI/ATIforweb.pdf

Mello, Z. R., Worrell, F. C, & Andretta, J. R. (2009). Variation in how frequently adolescents think about the past, the present, and the future in relation to academic achievement. Diskurs Kindheits- und Jungendforschung, 2, 173–183.

Mello, Z. R., Worrell, F. C., & Buhl, M. (2008). The Adolescent Time Inventory – German. German Institute for International Educational Research, University of Frankfurt/Main, and the University of California, Berkeley. Retrieved from http://www.uccs.edu/zmello/ati.html

Nes, L. S., Evans, D. R., & Segerstrom, S. C. (2009). Optimism and college retention: Mediation by motivation, performance, and adjustment. Journal of Applied Social Psychology, 39, 1887–1912.

Nurmi, J. E. (1991). How do adolescents see their future? A review of the development of future orientation and planning. Developmental Review, 11, 1–59.

Oyserman, D., Terry, K., & Bybee, D. (2002). A possible selves intervention to enhance school involvement. Journal of Adolescence, 25, 313–326.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88, 879–903.

Qin, J., Guo, X., Jia, Y., Williamson, L. M., Naemi, P., & Meyers, L. S. (2012). Time perspective and psychological wellbeing in Chinese and US samples. Burlingame, CA: Paper presented at the annual meeting of the Western Psychological Association.

Radloff, L. (1977). The CES-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement, 1, 385–405.

Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. Personality and Social Psychology Bulletin, 27, 151–161.

Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, NJ: Princeton University Press.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. Health Psychology, 4, 219–247.

Seginer, R. (2008). Future orientation in times of threat and challenge: How resilient adolescents construct their future. International Journal of Behavioral Development, 32, 272–282.

Siqueira, L., Diab, M., Bodian, C., & Rolnitzky, L. (2000). Adolescents becoming smokers: Roles of stress and coping methods. Journal of Adolescent Health, 27, 399–408.

Snyder, C. R., Shorey, H. S., Cheavens, J., Pulvers, K. M., Adams, V. H., & Wiklund, C. (2002). Hope and academic success in college. Journal of Educational Psychology, 94, 820–826.

Snyder, C. R., Sympson, S. C., Ybasco, F. C., Borders, T. F., Babyak, M. A., & Higgins, R. L. (1996). The development and validation of the Stage Hope Scale. Journal of Personality and Social Psychology, 2, 321–335.

Spector, P. E. (2006). Method variance in organization research: Truth or urban legend? Organizational Research Methods, 9, 221–232.

Watson, D., & Friend, F. (1969). Measurement of social-evaluative anxiety. Journal of Consulting and Clinical Psychology, 33, 448–457.

Worrell, F. C. (2000). The reliability and utility of self-concept instruments with at-risk populations. The Journal of At-Risk Issues, 7(1), 31–41.

Worrell, F. C., & Hale, R. L. (2001). The relationship of hope in the future and perceived school climate to school completion. School Psychology Quarterly, 16, 370–388.

Worrell, F. C., Latto, I. K., & Perlinski, M. A. (1999). The relationship of risk status to self-esteem and perceived life chances. The Journal of At-Risk Issues, 5, 33–38.

Worrell, F. C., & Mello, Z. R. (2007). Reliability and validity of Zimbardo Time Perspective Inventory scores in academically talented adolescents. Educational and Psychological Measurement, 67, 487–504.

Worrell, F. C., & Mello, Z. R. (2009). Convergent and discriminant validity of time attitude scores on the Adolescent Time Perspective Inventory. Diskurs Kindheits- und Jungendforschung, 2, 185–196.

Worrell, F. C., Mello, Z. R., & Buhl, M. (2013). Introducing the English and German versions of an Adolescent Time Attitude Scale. Assessment, 4, 496–510.

Worrell, F. C., Roth, D. A., & Gabelko, N. H. (1998). Age and gender differences in the self-concepts of academically talented students. The Journal of Secondary Gifted Education, 9, 157–162.

Wyman, P. A., Cowen, E. L., Work, W. C., Raoof, A., Gribble, P. A., Parker, G. R., & Wannon, M. (1992). Interviews with children who experienced major life stress: Family and child attributes that predict resilient outcomes. Journal of the American Academy of Child and Adolescent Psychiatry, 31, 904–910.

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. Journal of Personality and Social Psychology, 77, 1271–1288.

Zimbardo, P. G., & Boyd, J. N. (2008). The time paradox: The new psychology of time that will change your life. New York, NY: Free Press.

Zimbardo, P. G., Keough, K. A., & Boyd, J. N. (1997). Present time perspective as a predictor of risky driving. Personality and Individual Differences, 23, 1007–1023.