Psychometric properties of time attitude scores in young, middle, and older adult samples

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ABSTRACT

In an effort to provide a measure of time perspective that can be used across the life-span, we examined the psychometric properties of the Adolescent Time Inventory-Time Attitude Scale (ATI-TA; Mello & Worrell, 2007) in three independent samples of young (N = 388), middle (N = 201), and older adults (N = 189). Results provided strong psychometric evidence that the ATI-TA can be used appropriately with individuals across adolescence and adulthood. Specifically, internal consistency estimates indicated that scores on the six subscales (Past Positive, Past Negative, Present Positive, Present Negative, Future Positive, & Future Negative) were reliable across the three samples. Confirmatory factor analyses showed that the theorized six-factor structure had acceptable fit and fit the data better than alternate models. Subsequent analyses provided support for invariance across young, middle, and older adults. Overall, these results show that the ATI-TA yields reliable scores and a valid structure across adulthood and can be used to measure time perspective throughout the life-span.

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1. Introduction

Time perspective is an individually varying and multidimensional construct that comprises thoughts and attitudes toward the past, the present, and the future, and is conceptualized to underlie many human behaviors (Mello & Worrell, 2015; Zimbardo & Boyd, 1999). Developmental theories suggest that time perspective will be related to age across the life-span (Carstensen, 2006; Erikson, 1968; Lewin, 1939; Mello & Worrell, 2015; Piaget, 1955). Cross-sectional studies focusing solely on the future have shown that between childhood and young adulthood, an orientation toward the future increased with age (Steinberg et al., 2009), whereas research with younger and older adults has indicated that future time perspectives become increasingly limited with age (Lang & Carstensen, 2002; Rakowski, 1979). A study on future opportunities also showed a decline from young adulthood to middle age and stability from early to late middle age (Cate & John, 2007). However, a challenge to interpreting these findings is that different measures are used across the life-span and that they assess different aspects of time perspective.

Research comparing young and older adults has often included the Future Time Perspective Scale (Carstensen & Lang, 1996; Lang & Carstensen, 2002). This measure includes 10 items and draws from socioemotional selectivity theory’s prediction that individuals’ subjective perception about the amount of time they have remaining in life predicts the relative priority of specific goals (Carstensen, 2006; Reed & Carstensen, 2012). For example, when people perceive their futures as limited, they prioritize goals related to emotional well-being and generativity (Lang & Carstensen, 2002). In studies with young adults, a frequently used measure is the Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999). The ZTPI includes five subscales: Past Positive, Past Negative, Present Hedonism, Present Fatalism, and Future.

Mello and Worrell (2007) created the Adolescent Time Inventory-Time Attitude Scale (ATI-TA) for researchers to use when studying time perspective with adolescents. An additional goal with the ATI-TA was to develop a measure that assessed positive and negative attitudes toward each time period exclusively to reduce construct-irrelevant variance (Hubley & Zumbo, 2011). ATI-TA scores have consistently yielded a theorized six-factor structure and strong reliability estimates among adolescent samples in America and Germany (Worrell, Mello, & Buhl, 2013), New Zealand (Alansari, Worrell, Rubie-Davies, & Webber, 2013), New Zealand (Worrell, Mello, & Buhl, 2013), and Australia (McKay, Worrell, et al., 2015; Worrell & Mello, 2007).

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completed the study via an online survey. Data included 0.27% missing responses. These participants were recruited from existing databases of older adult volunteers interested in research studies (Zhang, Howell, & Iyer, 2014; Zhang, Howell, Caprariello, & Beek, 2015). Thus, we examined the internal consistency, structural validity, and invariance of ATI-TA scores in young (aged 18–24), middle (aged 25–59), and older adults (aged 60–85) samples.

2. Method

2.1. Participants and procedures

Data came from young, middle, and older adult samples. The young adult sample included 388 individuals aged 18 to 24 (M_{age} = 20.50, SD_{age} = 1.86), with 78% females, 22% males, and 0.25% gender queer/nonspecific. The sample was 5% African American, 24% Asian American, 18% European American, 30% Latino, and the remainder other or mixed groups. Average maternal education was 2.65 (SD = 1.21) on scale from 1 (no high school diploma) to 6 (doctoral degree); and, the data included 0.27% missing responses. These participants were recruited from psychology courses at a university on the West Coast and completed the study via an online survey.

The middle adult sample included 201 individuals aged from 25 to 59 (M_{age} = 36.60, SD_{age} = 10.13), with 71% females, 29% males, and 1 participant who did not report gender (0.5%). Self-reported racial/ethnic groups included 44% White/Caucasian, 10% Latino/Latina, 10% East Asian, 8% South Asian, and all other ethnic groups were less than 5%, and 43% obtained a college degree. The data included 1% missing cases. The sample was adult volunteers who were recruited through the academic website, BeyondThePurchase.org. This website attracts a more diverse and older population than recruitment from traditional college student samples. Importantly, these volunteers have similar characteristics to opt-in volunteers who have been used in previous studies (Zhang, Howell, & Iyer, 2014; Zhang, Howell, Caprariello, & Guevara, 2014; Zhang, Piff, Iyer, Koleva, & Keltner, 2014).

The older adult sample included 189 individuals aged 60 to 85 (M_{age} = 70, SD_{age} = 6.10) with 73% females, 26% males, and 0.5% intersex. The samples were 6% African American, 3% Asian American, 84% European American, 1% Latino, and the remainder other or mixed groups. Average maternal education was 2.51 (SD = 1.14) on a scale from 1 (no high school diploma) to 6 (doctoral degree) and the data included 1% missing responses. Participants were recruited from existing databases of older adult volunteers interested in research studies related to aging. Participants completed the study through an online system.

2.2. Measures

All participants completed the ATI-TA (see Mello & Worrell, 2007, for a description of the full ATI). The ATI-TA is comprised of six five-item subscales that assess positive and negative attitudes about one’s past, present, and future. Sample items include “I have very happy memories of my childhood” (Past Positive), “My past makes me sad” (Past Negative), “I am pleased with the present” (Present Positive), “My current life worries me” (Present Negative), “My future makes me smile” (Future Positive), and “Thinking about my future makes me sad” (Future Negative). Response options were from 1 (Totally Disagree) to 5 (Totally Agree).

Prior studies with adolescents have shown that the scale yields valid and reliable scores and a six-factor structure (Alansari et al., 2013). Table 1 includes descriptive statistics (i.e., means and standard deviations of ATI-TA scores) and internal consistency estimates for each sample. As is typical in previous research (Worrell et al., 2013), the subscale means mostly fell between 2.0 and 4.0 and participants reported higher mean scores on the positive scales than on the negative scales.

2.3. Statistical analyses

We used confirmatory factor analysis (CFA) to examine the model fit and robustness of the hypothesized six-factor structure by comparing it to a two-factor valence model (positive vs. negative subscales) as well as a three-factor temporal model (past, present, and future subscales). All CFAs were conducted using the maximum likelihood extraction and robust chi squares (Satorra & Bentler, 1994) in Mplus 7 (Muthén & Muthén, 1998–2012), as some ATI-TA items are skewed. Missing data were handled using multiple imputation, and no outliers were removed. We determined the fit of each CFA by examining various goodness-of-fit indices (Hu & Bentler, 1999). Although we reported the significance of the chi-square statistic, as noted by several scholars (Bentler & Bonett, 1980; McDonald & Marsh, 1990; Marsh, Balla, & McDonald, 1988), this value is highly sensitive to sample size. Thus, consistent with past recommendations (Byrne, 2001; Hu & Bentler, 1999; Thompson, 2004), we examined the chi-square likelihood ratio (χ²/df), which demonstrates good fit if the value is below 3.0.

We also considered the comparative fit index (CFI) as well as the Tucker Lewis index (TLI), which both suggest acceptable model fit when their values are at or above 0.90 (Byrne, 2008) and excellent fit when values are at or above 0.95 (Hu & Bentler, 1999). Finally, we examined the root mean square error of approximation (RMSEA; Steiger, 1990) as well as the 90% confidence interval around the RMSEA values, and the standardized root mean square residual (SRMR). For the RMSEA and SRMR, acceptable fit is demonstrated when the value is below or near 0.08 (Brown & Cudeck, 1993), with good fit indicated by values below 0.05 (Marsh, Hau, & Wen, 2004).

After establishing acceptable fit for the individual samples, invariance analyses were conducted. Configural invariance, which tests for the same pattern of factors and items loading on factors, was assessed first. When configural invariance was met, metric invariance, which constrains factor loadings to be equal across groups, was assessed. Finally, if metric invariance was attained, scalar invariance, which constrains intercepts to be equal across the samples, was assessed. When

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Means, standard deviations, and internal consistency estimates for time attitude scores in young, middle, and older adults for the six-factor model.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Younger adults Past Positive</td>
<td>3.45</td>
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<tr>
<td>Past Negative</td>
<td>2.66</td>
</tr>
<tr>
<td>Present Positive</td>
<td>3.57</td>
</tr>
<tr>
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<td>2.60</td>
</tr>
<tr>
<td>Future Positive</td>
<td>4.01</td>
</tr>
<tr>
<td>Future Negative</td>
<td>2.00</td>
</tr>
<tr>
<td>Middle adults Past Positive</td>
<td>3.18</td>
</tr>
<tr>
<td>Past Negative</td>
<td>2.93</td>
</tr>
<tr>
<td>Present Positive</td>
<td>3.45</td>
</tr>
<tr>
<td>Present Negative</td>
<td>2.89</td>
</tr>
<tr>
<td>Future Positive</td>
<td>3.85</td>
</tr>
<tr>
<td>Future Negative</td>
<td>2.09</td>
</tr>
<tr>
<td>Older adults Past Positive</td>
<td>3.48</td>
</tr>
<tr>
<td>Past Negative</td>
<td>2.27</td>
</tr>
<tr>
<td>Present Positive</td>
<td>3.90</td>
</tr>
<tr>
<td>Present Negative</td>
<td>2.16</td>
</tr>
<tr>
<td>Future Positive</td>
<td>3.66</td>
</tr>
<tr>
<td>Future Negative</td>
<td>1.95</td>
</tr>
</tbody>
</table>

Note. The omega values were based on the coefficients from the six-factor models in Table 3.
invariance was not met, post-hoc analyses were conducted to identify
the subscales that were not invariant. We used two methods to see if
the fit deteriorated with greater constraints: (a) the ΔCFI test proposed
by Meade, Johnson, and Bradly (2008), who argue that the CFI value for
the more restrictive should not decrease by more than .002, and (b) the
chi-square test for the Satorra-Bentler chi-square, which assesses if the
difference from the less restrictive to the more restrictive model is
statistically significant, indicating a lack of invariance.

3. Results

Internal consistency estimates (α) for the raw scores as well as 95%
confidence intervals are shown in Table 1. Cronbach’s alphas (Cronbach
& Shavelson, 2004) ranged from 0.81–0.94 across the age groups, with
16 of the 18 estimates ≥ 0.88; only Future Negative scores had lower
estimates in two samples. Hierarchical omega internal consistency
estimates (ωi) are also shown in Table 1. For a single homogeneous fac-
tor, omega (McDonald, 1999) is the ratio of true-score variance to the
total variance, and is calculated using the item’s coefficients on the
factor. Values ranged from 0.81–0.95 across the age groups. Table 2 in-
cludes the intercorrelations among the six subscales. Correlations be-
tween positive and negative subscales were negative and correlations
within valence groupings were positive across the three age groups. A
similar pattern for young, middle, and older adults was also observed
within time periods with the strongest associations between scores
from the same time period (e.g., Present Positive and Present Negative)
that between scores across time periods (e.g., Past/Present, Present/
Future).

The goodness-of-fit indices from each of the nine CFAs are reported
in Table 3. In all three samples, the two-factor valence model fell well
short of acceptable fit, with the chi-square likelihood ratios > 3, CFI
and TLI values < 0.90, and RMSEA and SRMR values > 0.08. Although the
goodness-of-fit indices for the three-factor time period models showed
marked improvements over the two-factor model, most of the
fit indices were also not in the acceptable range (CFIs ≤ 0.90, TLI
≤ 0.90, RMSEA and SRMR > 0.08), except for the CFI and RMSEA values
for the young adult sample. Thus, the three-factor model was also
rejected. As in previous studies, the six-factor model demonstrated the
best fit, with all but one of the fit indices (i.e., the TLI for older adults)
in the acceptable or close range, and therefore this model was chosen.

The results of the invariance analyses are reported in Table 4.
Configural variance was obtained for the six-factor model across the
age groups. Metric invariance did not meet the ΔCFI criterion, and the
difference was also statistically significant, indicating a lack of metric
invariance. We examined invariance in the six subscales separately and
found across all three groups scalar invariance for Present Negative
scores (Factor 4: CFI = 0.987, TLI = 0.983, RMSEA = 0.067 [0.044,
0.090], SRMR = 0.045, χ²[8] = 15.23, p > 0.05) and metric invariance
for Future Positive scores (Factor 5: CFI = 0.987, TLI = 0.983,
RMSEA = 0.067 [0.040, 0.093], SRMR = 0.046, χ²[8] = 15.19,
p > 0.05). Finally, we examined invariance across sets of two groups
(young and middle adults, young and late adults, and middle and late
adults). We obtained scalar invariance for five factors—excluding Future
Negative scores—across young and middle adults (see Table 4).

4. Discussion

Developmental theory suggests that time perspective differs across
the life-span (Carstensen, 2006; Erikson, 1968; Lewin, 1939; Mello &
Worrell, 2015; Piaget, 1955). Some empirical evidence supports this no-
tion. Studies have shown how an orientation toward the future in-
creases through adolescence (Steinberg et al., 2009) and decreases
between younger and older adulthood (Cate & John, 2007; Lang &
Carstensen, 2002; Rakowski, 1979). However, this research is limited
because different conceptualizations and measures of time perspective
have been employed. To provide the field with a measure that may be
used across the life-span, we examined the psychometric properties of
the ATI-TA in independent samples of young, middle, and older adults.
Overall, internal consistency estimates, structural analyses, and tests of
invariance showed that the ATI-TA yielded reliable scores and a theore-
ically-expected structure in all of these age groups.

Reliability estimates indicated good to excellent internal consistency
for each of the six subscales (i.e., Past Positive, Past Negative, Present
Positive, Future Positive, & Future Negative) across young, middle, and
older adult samples. Both alpha and omega estimates indicated internal
consistency. These reliabilities are similar to prior research with adoles-
cent participants (Alansari et al., 2013; McKay, Cole, et al., 2015; Worrell
et al., 2013). Patterns of correlations were also similar with this prior re-
search, where correlations between positive and negative subscales were
negative and correlations within valence groupings were positive.

Findings indicated that the theorized six-factor structure fit the data
for all adult groups better than alternate models. Confirmatory factor
analyses were used to compare models including valence (two factor),
time periods (three factors), and the theorized model (six factor). We

Table 2
Inter-correlations between the six-factors across younger, middle, and older adults.

<table>
<thead>
<tr>
<th></th>
<th>Younger adults</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Future Positive</th>
<th>Future Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Past Positive</td>
<td>Past Negative</td>
<td>Present Positive</td>
<td>Present Negative</td>
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<td>Past Positive</td>
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<tr>
<td>Past Negative</td>
<td>−0.73 *</td>
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<tr>
<td>Present Positive</td>
<td>0.34 *</td>
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<tr>
<td>Present Negative</td>
<td>−0.32 *</td>
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<tr>
<td>Future Positive</td>
<td>0.11 *</td>
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<tr>
<td>Future Negative</td>
<td>−0.13 *</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Middle adults</td>
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<tr>
<td>Past Positive</td>
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<tr>
<td>Past Negative</td>
<td>−0.68 *</td>
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<tr>
<td>Present Positive</td>
<td>0.31 *</td>
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<tr>
<td>Present Negative</td>
<td>−0.28 *</td>
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<tr>
<td>Future Positive</td>
<td>0.22 *</td>
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<tr>
<td>Future Negative</td>
<td>−0.22 *</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Older adults</td>
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<td></td>
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<tr>
<td>Past Positive</td>
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<tr>
<td>Past Negative</td>
<td>−0.70 *</td>
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<tr>
<td>Present Positive</td>
<td>0.23 *</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Present Negative</td>
<td>−0.23 *</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Future Positive</td>
<td>0.16 *</td>
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<tr>
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<td>−0.21 *</td>
<td></td>
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</tr>
</tbody>
</table>

* p < 0.05.
examine CFI, TLI, and RMSEA fit indices for each age group. Based on recommendations outlined by Byrne (2008); Hu and Bentler (1999), and Marsh et al. (2004), acceptable fit was demonstrated for the six-factor structure in young, middle, and older adult samples. These findings are consistent with research in adolescent samples (Alansari et al., 2013; McKay, Cole, et al., 2015; Worrell et al., 2013). We conducted invariance analyses to determine if ATI-TA subscales and items could be interpreted similarly across the three age groups. Results provided support for configural invariance for the six-factor model showing that scores were consistent across youth, middle, and older adult age groups. Further analyses with scalar and metric invariance suggested that although time attitudes can be measured with integrity across young, middle, and late adulthood, the meaning of time attitudes in young and middle adults may differ from the meaning of time attitudes for older adults, a finding that should be examined in future research. Moreover, Future Negative attitudes may also differ in meaning across all three groups, as these attitudes were the least likely to be invariant across groups, an issue of interest given that these scores have served and meaningful relationships with developmental outcomes (Carstensen, 2006; Mello & Worrell, 2015; Stolarski et al., 2015), it served and meaningful relationships with developmental outcomes across the life-span will strengthen the psychometric and substantive contributions to the literature.

Several additional directions for research are apparent. First, creating a measure that enables the valid and reliable assessment of time perspective in childhood will be particularly useful for understanding the construct even farther across the life-span. Such a measure would enable comparisons of time perspectives between critical periods of development. Second, generating time attitude profiles with ATI-TA scores in adult samples may prove useful in understanding relationships between this construct and educational and psychological outcomes. Indeed, profiles with ATI-TA scores in adolescent samples have been observed and meaningful relationships with developmental outcomes have been shown (Alansari et al., 2013; Andretta, Worrell, & Mello, 2014).

Lastly, given the broad nature of the time perspective construct (Carstensen, 2006; Mello & Worrell, 2015; Stolarski et al., 2015), it will be important for additional measures to be developed that assess other dimensions of time perspective across the life-span. As scholars have highlighted (Carstensen, 2006; Mello & Worrell, 2015; Stolarski et al., 2015; Zimbardo & Boyd, 1999), individual differences in time perspective have implications for our ability to self-regulate (Bandura, 1997) and for our cognitions, emotions, and motivation (Carstensen, 2006).

### Table 3

<table>
<thead>
<tr>
<th>Model</th>
<th>Chi-squared (Δ)</th>
<th>df</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>90% CI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger adults Baseline</td>
<td>6526.79</td>
<td>435</td>
<td>0.913</td>
<td>0.901</td>
<td>0.06</td>
<td>0.051</td>
<td>0.06</td>
</tr>
<tr>
<td>2-Factor (valence)</td>
<td>3265.90</td>
<td>404</td>
<td>0.81</td>
<td>0.894</td>
<td>0.044</td>
<td>0.043</td>
<td>0.043</td>
</tr>
<tr>
<td>3-Factor (temporal)</td>
<td>1009.12</td>
<td>402</td>
<td>0.25</td>
<td>0.932</td>
<td>0.015</td>
<td>0.133</td>
<td>0.133</td>
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<tr>
<td>Middle adults Baseline</td>
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<td>390</td>
<td>0.913</td>
<td>0.932</td>
<td>0.06</td>
<td>0.051</td>
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<td>0.015</td>
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<td>0.932</td>
<td>0.06</td>
<td>0.051</td>
<td>0.06</td>
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<td>0.913</td>
<td>0.901</td>
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<td>0.051</td>
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<td>0.015</td>
<td>0.133</td>
<td>0.133</td>
</tr>
<tr>
<td>6-Factor</td>
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<td>0.932</td>
<td>0.932</td>
<td>0.06</td>
<td>0.051</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Note. Younger adults are 18–24, middle adults 25–59, and older adults 60–85. MLM = maximum-likelihood robust; σ-b = Satorra-Bentler; CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

* p < 0.001.

4.1. Limitations and future directions

The limitations of this study concern gender and criterion validity. The small number of males in each sample (<100) did not allow for invariance testing by gender. However, Andretta, Worrell, Mello, Dixson, and Baik (2013) found no meaningful differences in observed ATI-TA scores, nor did they find differences in gender representation across ATI-TA profiles; however, these authors did not examine differences in latent means. Although there is no reason to anticipate that ATI-TA scores would not be invariant by gender, this question should be examined in future studies of ATI-TA scores. The field would also benefit from examining the criterion validity of the ATI-TA across age groups. Studies that investigate relationships between time attitudes and psychological outcomes across the life-span will strengthen the psychometric and substantive contributions to the literature.

Several additional directions for research are apparent. First, creating a measure that enables the valid and reliable assessment of time perspective in childhood will be particularly useful for understanding the construct even farther across the life-span. Such a measure would enable comparisons of time perspectives between critical periods of development. Second, generating time attitude profiles with ATI-TA scores in adult samples may prove useful in understanding relationships between this construct and educational and psychological outcomes. Indeed, profiles with ATI-TA scores in adolescent samples have been observed and meaningful relationships with developmental outcomes have been shown (Alansari et al., 2013; Andretta, Worrell, & Mello, 2014).

Lastly, given the broad nature of the time perspective construct (Carstensen, 2006; Mello & Worrell, 2015; Stolarski et al., 2015), it will be important for additional measures to be developed that assess other dimensions of time perspective across the life-span. As scholars have highlighted (Carstensen, 2006; Mello & Worrell, 2015; Stolarski et al., 2015; Zimbardo & Boyd, 1999), individual differences in time perspective have implications for our ability to self-regulate (Bandura, 1997) and for our cognitions, emotions, and motivation (Carstensen, 2006).

### Table 4

<table>
<thead>
<tr>
<th>Model</th>
<th>Chi-squared (Δ)</th>
<th>df</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>90% CI</th>
<th>SRMR</th>
<th>Model Comparison</th>
<th>ΔCFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Configural</td>
<td>1986.90</td>
<td>1170</td>
<td>0.941</td>
<td>0.934</td>
<td>0.056</td>
<td>0.051</td>
<td>0.06</td>
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</tr>
<tr>
<td>2. Metric</td>
<td>2088.76</td>
<td>1218</td>
<td>0.937</td>
<td>0.933</td>
<td>0.056</td>
<td>0.052</td>
<td>0.06</td>
<td>2–1</td>
<td>−0.004</td>
</tr>
<tr>
<td>3. Scalar</td>
<td>2295.46</td>
<td>1266</td>
<td>0.526</td>
<td>0.524</td>
<td>0.060</td>
<td>0.056</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Five factors</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Configural</td>
<td>836.43</td>
<td>530</td>
<td>0.964</td>
<td>0.960</td>
<td>0.046</td>
<td>0.040</td>
<td>0.05</td>
<td>5–4</td>
<td>0.000</td>
</tr>
<tr>
<td>5. Metric</td>
<td>857.35</td>
<td>550</td>
<td>0.964</td>
<td>0.961</td>
<td>0.046</td>
<td>0.040</td>
<td>0.05</td>
<td>5–4</td>
<td>0.000</td>
</tr>
<tr>
<td>6. Scalar</td>
<td>888.20</td>
<td>570</td>
<td>0.963</td>
<td>0.961</td>
<td>0.046</td>
<td>0.040</td>
<td>0.05</td>
<td>5–6</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Note. σ-b = Satorra-Bentler. Younger adults are 18–24, middle adults 25–59, and older adults 60–85.

* p < 0.001.

ΔCFI comparison and the chi-square test.

This analysis included only young and middle adults and excluded the Future Negative subscale. Configural, metric, and scalar invariance supported using both the ΔCFI comparison and the chi-square test.
Isaacowitz, & Charles, 1999). Thus, it is crucial that well-constructed instruments assessing temporal constructs are developed to permit examination of time perspective across the life-span.

5. Conclusion

Overall, this study provides strong psychometric evidence that the ATI-TA (Mello & Worrell, 2007) may be employed effectively with young, middle, and older adults (Alansari et al., 2013; McKay, Cole, et al., 2015; Worrell et al., 2013). We included independent samples and conducted internal consistency, factor structure, and age-invariance analyses. Findings indicated that the ATI-TA yields a theorized six-factor structure and reliable scores with adults in varying stages of adulthood. Based on this evidence, the ATI-TA can be considered the Adolescent and Adult Time Inventory-Time Attitude scale. Now, researchers can clarify age-related patterns of time attitudes—positive and negative feelings about the past, the present, and the future from adolescence to late adulthood. This type of research will allow us to see if patterns of relationship with other constructs differ across the life-span. For example, studies can determine how time attitudes predict educational attainment, psychological well-being, and physical health among participants of various age groups.

References


