



An exploratory examination of the viability and meaningfulness of time attitudes profiles in adults



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ABSTRACT

The temporal psychology literature has developed in recent years, both in terms of the volume of studies, and the sophistication of analyses. One area of particular interest is time attitudes, the way in which individuals feel about the past, present and future. Recently, results supporting the psychometric validity and internal consistency of Adolescent Time Inventory–Time Attitudes scores in adults have emerged. In the present study, person-centered analyses supported the viability of time attitudes profiles in an adult sample ($N = 410$), and showed that membership of those profiles related to a range of other temporal measures and symptoms of psychopathology. Five profiles emerged, two of which were associated with favorable outcomes such as a focus on the future alongside the lowest levels of depression (Positives and Optimists), two which were associated with unfavorable outcomes such as the highest levels of anxiety coupled with prominent fatalistic attitudes (Pessimists and Negatives), and a profile with outcomes falling between the poles (Ambivalents). It was noted that profiles were not related to alcohol-related problems.

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1. Introduction

Temporal psychology was recently stimulated by the emergence of several psychometrically valid measures. A conceptual problem that has materialized alongside the proliferation of instruments is that researchers have neglected the importance of an individual's temporal profile of considering the past, present, and future simultaneously (Zimbardo & Boyd, 1999). Regarding the Zimbardo Time Perspective Inventory (ZTPI), a number of studies have reported that individuals with different ZTPI profiles differ on a variety of outcomes (e.g., Boniwell & Zimbardo, 2004; Boniwell, Osin, Linley, & Ivanchenko, 2010; Cole, Andretta, & McKay, 2016; Worrell, McKay, & Andretta, 2015). Of particular interest is the paper by Worrell et al. (2015), the only one to examine the relationship between ZTPI profiles and scores on other temporal constructs. In the aforementioned adolescent study, those with Future and Balanced profiles also scored higher on self-efficacy, self-esteem, as well as on other temporal constructs, including consideration of future consequences (CFC) and future temporal focus, than those with Past Negative or Present Hedonist profiles.

With increasing concerns regarding the psychometric validity and internal consistency of ZTPI scores (see Worrell et al. in press), a number

of other, more specific measurement instruments began to emerge. These measures were intended to assess narrower aspects of temporal psychology, including temporal focus (Shipp, Edwards, & Schurer-Lambert, 2009), and time attitudes (Worrell & Mello, 2009). Time attitudes refer to an individual's emotional and evaluative feelings toward the past, the present, and the future (Andretta, Worrell, Mello, Dixon, & Baik, 2013). Temporal focus describes the extent to which people characteristically devote their attention to perceptions of the three time periods (Bluedorn, 2002). Additional to these constructs exists the CFC construct, referring to the extent that individuals consider the potential outcomes of present behaviors, and the degree to which that consideration influences behaviors (Strathman, Gleicher, Boninger, & Edwards, 1994).

To date, the only one of these measures free of substantive psychometric criticism is the Adolescent Time Inventory–Time Attitudes Scale (ATI-TA; Worrell & Mello, 2009). In addition to good structural validity and internal consistency, researchers have also shown that meaningful ATI-TA profiles can be derived from observed scores (Alansari, Worrell, Rubie-Davies, & Webber, 2013; Andretta et al., 2013; Andretta, Worrell, & Mello, 2014; Buhl & Linder, 2009; McKay, Percy, Cole, Worrell, & Andretta, 2016). Importantly, profile membership predicted differences in self-efficacy, self-esteem, perceived stress, academic expectations, attitudes toward teachers and schools, and alcohol use in theoretically congruent ways: More positive profiles are positively associated with adaptive behaviors and attitudes and negatively associated with maladaptive behaviors and attitudes, and vice-versa.

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Recently, Mello, Zhang, Barber, Howell, and Worrell (2016) examined the psychometric validity and internal consistency of ATI-TA scores in three samples of adults, and reported a good fitting and internally consistent model. Building on Mello et al., and the literature reviewed above, the present study sought to examine the viability of profiles based on ATI-TA scores in a sample of adults. Additionally, no study to date has examined the convergent and discriminant validity of ATI-TA scores using scores on other temporal measures. The present study sought to address this gap in the literature, both at a bivariate level, and at the level of person-centered analyses. Previously (Cole et al., 2016; McKay, Cole, & Andretta, 2016) we reported that temporal profiles using the broader “time perspective” conceptualisation, related meaningfully to alcohol-related problems and symptoms of psychopathology. Because time attitudes is a related, but narrower construct than time perspective (assessing attitudes only), we were keen to see how it related to these health variables in adults also. Although the present study was exploratory, given the fact that this was the first to use ATI-TA profiles with adults, we hypothesized to find that membership of a future-oriented profile would be associated with higher future time perspective, higher CFC, higher future temporal focus, and a reduced likelihood of reporting symptoms of anxiety and depression, and lower levels of alcohol-related problems.

2. Method

2.1. Participants

Participants were 410 adults aged 18–65 ($M = 24.83$, $SD = 8.52$; 45.4% male) recruited from a University in the North West of England through opportunistic and snowball sampling. The study was given ethical approval by the relevant university ethics committee and all participants gave informed consent.

2.2. Measures

The ATI-TA (Mello & Worrell, 2007) is a 30-item instrument with six 5-item subscales assessing Past Negative (PaN), Past Positive (PaP), Present Negative (PrN), Present Positive (PrP), Future Negative (FN), and Future Positive (FP) attitudes. TAS scores are scored on a 5-point Likert scale with verbal and numerical anchors (1 = *Totally Disagree*, 5 = *Totally Agree*). As previously noted, in adolescents, TAS scores have been shown to be internally consistent and structurally valid (Alansari et al., 2013; Mello et al., 2016; Worrell, Mello, & Buhl, 2013), and there has also been evidence of convergent and discriminant validity (Worrell & Mello, 2009).

The ZTPI is a 56-item instrument assessing time perspective in five factors: Past Negative (PN; e.g., *Painful past experiences keep being replayed in my mind*); Past Positive (PP; e.g., *It gives me pleasure to think about my past*); Present Hedonistic (pH; e.g., *Ideally, I would live each day as if it were my last*); Present Fatalistic (PF; e.g., *It doesn't make sense to worry about the future since there is nothing I can do about it anyway*); and Future (F; e.g., *Meeting tomorrow's deadlines and doing other necessary work comes before tonight's play*). All items were answered on a 5-point Likert scale (1 = *Very Unlike Me*, 5 = *Very Like Me*). Internal consistency estimates (α) in the present study were: PN = 0.80; PP = 0.69; pH = 0.79; PF = 0.74; F = 0.73.

The Consideration of Future Consequences Scale-14 (Joireman, Shaffer, Balliet, & Strathman, 2012) is a derivative of the original CFCs (Strathman et al., 1994) and is made up of seven positively worded items and seven negatively worded items. Responses were on a 7-point Likert-type scale from 1 (*very unlike me*) to 7 (*very like me*). In their development of the scale, Joireman et al. (2012) reported that scores on the two factors were highly reliable: CFC-Future ($\alpha = 0.82$) and CFC-Immediate ($\alpha = 0.82$). Internal consistency estimates (α) in the present study were: CFC-I = 0.82; CFC-F = 0.82.

The Temporal Focus Scale (Shipp et al., 2009) is a 12-item scale assessing cognitive engagement with the past (TFSP), current (TFSC) and future (TFSF). The scale consists of four Past, Current and Future items. Cronbach's alphas for TFS scores ranged from 0.74 to 0.89 (Shipp et al., 2009). Convergent validity evidence for the three TFS subscale scores was demonstrated through correlations with other pre-existing measures of time perspective, including the ZTPI (Shipp et al., 2009). Internal consistency estimates (α) in the present study were: TFSP = 0.83; TFSC = 0.65; TFSF = 0.79.

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was used to screen participants for depression (e.g., *I still enjoy the things I used to enjoy*) and anxiety (e.g., *I get sudden feelings of panic*). The HADS scores for anxiety (HADS-A) and depression (HADS-D) range from zero to 28. There is evidence of validity and internal consistency (HADS-A: $\alpha = 0.83$; HADS-D: $\alpha = 0.82$) for HADS scores, and equivalent levels of sensitivity (0.80) and specificity (0.80; for a review, see Bjelland, Dahl, Haug, & Neckelmann, 2002). Internal consistency estimates (α) in the present study were: HADS-A = 0.82; HADS-D = 0.70.

The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) was used to assess problematic alcohol use in the sample. AUDIT is a 10-item questionnaire with reliable scores that yield valid inferences across different contexts and cultures (e.g., De Meneses-Gaya, Waldo Zuardi, Loureiro, & Crippa, 2009). When used to detect problematic alcohol use in a population of university undergraduates, AUDIT demonstrated good sensitivity (0.94) and specificity (0.92; Adewuya, 2005). AUDIT scores can range from 0 to 40. The Internal consistency (α) of scores in the present study was 0.83.

2.3. Analyses

We performed Confirmatory Factor Analyses on the hypothesized six-factor solution; a three-factor solution (by time period); and a two-factor solution (by valence). Several indicators (e.g., Byrne, 2012) of fit were used to evaluate the models: the Tucker–Lewis Index (TLI); the Comparative Fit Index (CFI); and the root squared error of approximation (RMSEA) and its 90% confidence interval. TLI and CFI values >0.95 are indicative of close fit. As the RMSEA is an index of misfit, values <0.08 are indicative of acceptable fit and values below 0.05 are indicative of close fit (Marsh, Hau, & Wen, 2004).

SPSS (v21) software was used to conduct Ward's hierarchical cluster analysis of ATI-TA scores, and to identify a set of potential solutions using two stopping rules: (a) Calinski and Harabasz (1974) pseudo-F index and (b) Duda and Hart's (1973) $Je(2)/Je(1)$ index with associated pseudo-T-squared. Cluster solutions were validated in several ways. First, K-means iterative partitioning was applied to the data to validate Ward's solutions, and to provide cluster assignments for the subsequent analyses. Second, homogeneity of ATI-TA scores within each cluster had to meet the recommended cutoff (i.e., $EV \geq 67$; Bergman, Magnusson, & El-Khoury, 2003). Third, T-scores were plotted to examine distinctions between and across potential profiles (see Fig. 1). SPSS (V21) was also used to compute correlations and descriptive data, as well as *t*-tests between profiles and scores on dependent measures. As a rule of thumb, Field (2005) suggested that correlation coefficients of 0.1 should be interpreted as small, coefficients of 0.3 as medium, and coefficients of $r = 0.5$ or greater as large. Given the variation in the numbers within each profile, effect size differences were computed using Hedge's *g*. Additionally, power analysis was developed using the *pwr* package in R Statistics to aid in the interpretation of effect sizes.

3. Results

Confirmatory Factor Analysis supported the six-factor solution. Results were as follows: six-factor solution [$\chi^2 = 709.16$, $p < 0.001$, CFI = 0.94, TLI = 0.93, RMSEA = 0.05 (0.04, 0.05)]; three factor solution

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