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## Time attitudes predict changes in adolescent self-efficacy: A 24-month latent transition mover-stayer analysis



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### ABSTRACT

Increasingly, the study of temporal psychology is moving away from bivariate analyses towards person-centered analyses, which simultaneously account for scores on past, present and future dimensions. However, longitudinal studies are lacking. This study builds on a developing literature by examining the 24-month relationship between time attitudes and criterion variables. Four latent profiles called Positive, Ambivalent, Moderately Negative, and Negative, were identified. Results showed that time attitude profiles were generally unstable across the first three years of high school. However, those who stayed in the Positive profile developed higher self-efficacy in all domains. Transitioning to the Positive profile was associated with positive outcomes, whereas other transitions among profiles were associated with negative outcomes. There were small-sized, socio-demographic effects such that living in Northern Ireland (compared to Scotland), being male, and not being entitled to a free school meal, were all related to membership of, or transition to, the Positive profile.

Time perspective has been defined as “the often non-conscious process whereby the continual flows of personal and social experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events” (Zimbardo & Boyd, 1999, p. 1271). It is a multi-dimensional construct which encompasses, among other dimensions, temporal valence, attitudes, focus, and depth (Lasane & O'Donnell, 2005). This study focusses on time attitudes, which have been described as an individual's emotional and evaluative feelings toward the past, the present, and the future (Andretta, Worrell, Mello, Dixon, & Baik, 2013), and seeks to further build on a rapidly growing literature centered on the Adolescent Time Inventory – Time Attitudes Scale (ATI-TA; Mello & Worrell, 2007).

The way that individuals think and feel about the past, present, and future has been shown to be related to a range of criterion variables. For example, using the Zimbardo Time Perspective Inventory (ZTPI), Zimbardo and Boyd (1999) reported moderate to large correlations between ZTPI scores and scores on aggression, depression, lack of ego control, and trait anxiety. Additionally, other studies have demonstrated that scores on the ZTPI relate to both risky driving (Zimbardo, Keough, & Boyd, 1997) and several addictive behaviours, including alcohol, drug, and tobacco use (Keough, Zimbardo, & Boyd, 1999). The literature concerning the Consideration of Future Consequences (CFC) construct (Strathman, Gleicher, Boninger, & Edwards, 1994) shows meaningful relationships between CFC and a range of criterion variables, including environmental concern, alcohol-related problems, and psychopathology (Arnocky, Milfont, & Nicol, 2014; McKay, Perry, Percy, & Cole, 2016; McKay, Percy, & Cole, 2013). In a study using the ATI-TA, Worrell and Mello (2009) reported that time attitudes had moderate correlations with both self-esteem ( $|0.44| - |0.63|$ ) and

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perceived stress ( $|0.32| - |0.80|$ ). In short, a large number of single-period studies have suggested that the way in which people perceive time relates to how they behave; however, few studies have examined the prospective relationship between time constructs and criterion variables.

Moreover, several scholars have theorized that time-oriented constructs, such as hope and optimism, are adaptive developmentally (e.g., Burrow, O'Dell, & Hill, 2010; Roberts, Brown, Johnson, & Reinke, 2002; Schmid & Lopez, 2011; Sun & Shek, 2013), and a few recent studies have supported this hypothesis. Marques, Lopez, and Mitchell (2013) found that hope predicted life satisfaction 6 months and 1 year later in a sample of 227 middle and older Portuguese adolescents. Schmid et al. (2011) followed 2273 American adolescents from Grades 7 to 9, measuring trajectories of development; they reported that hope predicted membership in the more favourable developmental trajectories. Similarly, in a 3-year longitudinal study of 5634 Australian adolescents, higher levels of optimism resulted in reduced risk for symptoms of depression (Patton et al., 2011). Although these studies highlight the long-term benefits of two temporal constructs, they are limited in that the constructs only assess the *future*, whereas recent research has highlighted the importance of studying the past, present, and future (Alansari, Worrell, Rubie-Davies, & Webber, 2013).

The temporal psychology literature is also somewhat compromised in that the vast majority of studies have been cross-sectional, and have used samples of university students. Because the way in which people view time can change across the lifespan (e.g., Steinberg et al., 2009), it is important to conduct longitudinal studies, which can better allow researchers understand how temporal constructs change, and further, how these changes predict changes in criterion variables. This is particularly important in adolescence, which is a period of intense physical and psychological change (Mosknes, Moljord, Espnes, & Byrne, 2010), and what is true at one stage, may not be true of another.

The present study builds on previous work (Morgan, Wells, Andretta, & McKay, 2017) which employed a latent transition profile, mover-stayer analysis over a one-year period in Scottish and Northern Irish adolescents. These authors, using a person-centered analytical strategy, reported on four time attitudes profiles, Positives, Negatives, Ambivalents, and Negative Futures. Positives were characterized by having high scores on the positive factors, with lower scores across the negative time attitude factors. The Negative profile was characterized by high scores on the past-negative, present-negative, and future-negative factors relative to peers in other groups. Conversely, they tended to have lower scores across the positive time attitude factors when compared with adolescents with different time attitude profiles. The Ambivalent profile was characterized by a lack of strong feelings toward the three time periods, with negative and positive time attitude scores that were close to the mean. The Negative-Future profile was characterized by having high scores on the negative time attitude factors, with the positive time attitude scores were all near zero.

Among other findings, Morgan et al. (2017) reported that staying in the Positive profile over a 12 month period was significantly associated with increased academic, social, and emotional self-efficacy, and a decrease in sensation seeking. The reverse was true for those staying in the Negative profile. Two other notable findings emerged. Firstly, there was relative instability in profile membership with around, or less than half of participants remaining in the same profile at +12 months: Positives (50.2%), Negatives (40.1%), Ambivalents (47.4%), and Negative Futures (33.3%). Secondly, transitions to the positive profile were associated with positive outcomes, while transitions among all other profiles were associated with negative outcomes. The present study uses newly-available data from a third wave of data (Time 3) to examine how transitioning from, or staying in, time attitudes profiles predicts the scores on these same variables across a 24 month period.

Adolescence is a time of substantial changes in behaviour and attitudes, and it is possible that changes over a two-year time period differs substantially from changes over an on-year period. Moreover, participants were 12.5 years old at Time 1 and 14.5 years old at Time 3, moving from early adolescence into middle adolescence. Morgan et al. (2017) noted that there was relative instability over the course of one year and one research question was would the level of instability be higher in a two-year period. Given the lack of research in this area, we did not offer a specific hypothesis for this question. The second question centered on the adaptive nature of some profiles. Based on the previous findings (Morgan et al., 2017) we hypothesized that being in, or transitioning to the Positive profile would be associated with the development of higher levels of self-efficacy and lower levels of sensation seeking, with the reverse true for membership of, or transition to the Negative profile.

## 1. Method

### 1.1. Participants

Participants were students in a longitudinal study and data in this study were from Waves 1 and 3. At Wave 1, participants were from two samples in school Grade 8 ( $M_{\text{age}} = 12.5$  years), and Wave 3 data were collected at +24 months (i.e. when participants were 14.5 years on average). Sample 1 consisted of 1574 adolescents (40% female, 1.7% unreported) attending high schools in Northern Ireland. Sample 2 consisted of 811 adolescents (46.7% female, 1.2% unreported) attending high schools in Scotland. Both samples completed the ATI-TA alongside other measures as part of a three-wave study. Because the analytical strategy employed herein (and described below) requires data completion at both time points, only those who had fully completed all questionnaires were retained for analysis. This restriction yielded a final analytical sample of 1932 adolescents. Those who did not participate in Wave 3 were excluded from the study because their responses from Wave 1 could not be longitudinally matched. To assess the potential bias associated with the exclusion of those who did not complete both Wave 1 and Wave 3 data collect, the mean difference in standardized units (i.e.,  $d$ ; Cohen, 1988) of the time attitude scores were examined at Wave 1 between those included versus excluded from the final analytic sample. Mean differences in time attitude scores were 0.09, 0.12, 0.06, 0.10, 0.04, and 0.09, respectively. Therefore, the effect of excluding participants with only one Wave of data on the final results was likely negligible.

Ethical approval was granted by the University ethics committee of the corresponding author. An opt-out form of parental consent

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