**The Relationship between Time Attitudes Profiles and Self-Efficacy, Sensation Seeking, and Alcohol Use: An Exploratory Study**

**Abstract**

A growing body of research has begun to report on Time Attitudes which specifically refers to an individual’s emotional and evaluative feelings toward the past, the present, and the future. The present study used data from the first wave of a longitudinal cohort study in the United Kingdom. Sample 1 consisted of 1,580 adolescents (40% female, 1.7% unreported) in Northern Ireland, while Sample 2 consisted of 813 adolescents (46.7% female, 1.4% unreported) in Scotland. Five similar Time Attitudes profiles emerged in both countries, with one additional “balanced” profile in Scotland. Results show that there were no substantive differences between profiles in terms of socio-demographic indicators. However, in respect of academic, social and emotional self-efficacy, best results were observed for those with Positive, Ambivalent, and Balanced profiles, with the reverse true for those with Negative, Past Negative, and Pessimistic profiles. Positives were also less likely to report using alcohol.

**Keywords:** Adolescent Time Inventory-Time Attitudes Scale; Time Attitudes Profiles; Self-Efficacy; Sensation Seeking; Alcohol

**1 Introduction**

Although not new to the psychological literature, *time perspective* has come to be understood as an umbrella term for a broad construct, within which other, more specific constructs exist (Lasane & O’Donnell, 2005). One of these is *time attitudes*, which refers to an individual’s emotional and evaluative feelings toward the past, the present, and the future (Andretta, Worrell, Mello, Dixson & Baik, 2013). Accordingly, what is true of the broad time perspective literature may not necessarily be true when only time attitudes are assessed.

The literature on the relationship between time attitudes and both adolescent behaviors and development has recently been advanced by the introduction of the Adolescent Time Inventory –Time Attitude Scales (ATI-TA; Mello & Worrell, 2007), which assess both negative and positive attitudes towards all three time domains. Previously, using a range of assessment techniques and broadly speaking, positive attitudes toward the future have been shown to be significantly and positively correlated with psychological well-being, with moderate positive correlations to optimism and self-esteem and negative correlations to depression and perceived stress (Scheier & Carver, 1985; Wyman, Cowen, Work & Kerley, 1992). Elsewhere, hope was shown to have significant and meaningful positive relationships with self-esteem and positive affect, and an inverse association with negative affect (Snyder et al., 1996). Sensation seeking has been found to be meaningfully and negatively related to future time perspective, and significantly and positively related to present time perspective (Keough, Zimbardo & Boyd, 1999; Zimbardo & Boyd, 1999).

Moreover, Zimbardo and Boyd (1999) reported statistically significant relationships between self-esteem and their past negative, past positive, and present fatalistic factors in theoretically congruent directions. In terms of the relationship between temporal orientation and alcohol use, results elsewhere have consistently shown that more problematic use of alcohol is significantly associated with a foreshortened future time perspective, and/or greater present focus (e.g., Beenstock, Adams, & White, 2011; Robbins & Bryan, 2004). In other studies, hopelessness in adolescents has been shown to be associated with drinking to cope with negative emotions (Hudson, Wekerle & Stewart, 2015; Woicik, Conrod, Stewart, & Pihl, 2009); hence, it is not unreasonable to hypothesize that a negative temporal attitude would be significantly related to alcohol use indicators. Indeed, Linden et al. (2014) reported that having a pessimistic view of one's past may help explain the positive relationship between detrimental mental health symptoms and alcohol-related problems.

The majority of temporal studies have used bivariate or correlational approaches to assess how scores in one temporal domain relate to other constructs. However, because individuals hold attitudes towards the past, present and future simultaneously (Boniwell & Zimbardo, 2004), some recent studies have included person-oriented analyses, simultaneously accounting for scores on multiple scales using latent profile and heuristic cluster analysis (e.g., Andretta, Worrell & Mello, 2014). Latent profile and cluster analysis are used to develop categories, so that individuals within categories have multiple, co-occurring time attitudes that are as similar as possible and as dissimilar as possible with individuals between categories (Bergman, Magnusson, & El-Khouri, 2003).

Buhl and Lindner (2009) reported that those with Optimistic, Balanced, and Ambivalent ATI-TA 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 Tendentially Pessimistic or Pessimistic profiles. Subsequently, Andretta et al. (2014) found that positive ATI-TA profiles were associated with higher self-esteem and educational expectations and lower perceived stress. However, to date, there has been no data published on the association between ATI-TA profiles and adolescent alcohol use. This is an emerging literature and on-going research is needed to investigate the relationship of time attitudes profiles to other constructs.

The present study sought to examine (a) the viability of time attitude profiles in young adolescents, (b) to what extent, these relate meaningfully to a variety of other constructs, and (c) if there were socio-demographic differences in time attitude profiles. We included the third question based on the interesting and counter-intuitive findings of Andretta et al. (2013), who reported that the majority of low SES adolescents in their study had Positive or Balanced time attitude profiles, while the highest frequencies of negative time attitude profiles (i.e., Negatives and Pessimists) and the lowest frequencies of positive time attitude profiles were in high SES adolescents. However, this finding needs to be contextualized within the broader temporal literature. Where other studies examining the relationship between SES and time perspective have examined income, education, and occupation, they have yielded generally low correlations (e.g., Guthrie, Butler & Ward, 2009; [Zimbardo & Boyd, 1999](http://www.sciencedirect.com.ezproxy.liv.ac.uk/science/article/pii/S0140197112001698#bib87)).

Based on previous research, we hypothesized that there would be no association between time attitude profiles and socioeconomic status. As our measures were of alcohol use generally and not *problematic* alcohol use, it was not clear if there would be a relationship with time profiles. However, to the extent that any alcohol use in early adolescence is considered problematic, we hypothesized that adolescents with positive profiles would be less likely to drink than those with negative profiles. We also hypothesized that individuals with more positive profiles would report higher self-efficacy than individuals with more negative profiles.

**2 Methods**

**2.1 Participants**

Data were from two independent samples in the UK. At the time of data collection participants were in school Grade 8 (aged 12–13 years old). Sample 1 consisted of 1,580 adolescents (40% females, 1.7% unreported) attending secondary schools in Northern Ireland.

Sample 2 consisted of 813 adolescents (46.7% female, 1.4% unreported) attending secondary schools in Scotland. Both groups of adolescents completed the ATI-TA alongside several other questionnaires as part of a large scale representative longitudinal study. The present study reports on available baseline data.

**2.2 Measures**

The ATI-TA is a 30-item instrument with six 5-item subscales assessing Past Negative, Past Positive, Present Negative, Present Positive, Future Negative, and Future Positive attitudes (e.g., “*I look forward to my future*”, or, “*The past is full of happy memories*”). ATI-TA items are scored on a 5-point Likert scale with verbal and numerical anchors (1 = *Totally Disagree*, 5 = *Totally Agree*). Recently, using data gathered from adolescents in both Scotland and Northern Ireland, Authors (blinded) reported good internal consistency for subscale scores in both samples (.68 ≤ α ≤ .83), good structural validity (.950 ≤ CFI ≤ .957; RMSEA = .057).

The Self-Efficacy Questionnaire for Children (SEQ-C; Muris, 2001) contains 21 items assessing three domains of self-efficacy: (a) academic self-efficacy (e.g., “*How well do you succeed in passing all subjects?*”, α current study = .84), (b) emotional self-efficacy (e.g., “*How well can you control your feelings?*”, α current study = .78), and (c) social self-efficacy (e.g., “*How well do you succeed in staying friends with other children?*”, α current study = .68). Each subscale consists of seven items, and respondents rate their competence in each self-efficacy domain on a 5-point Likert scale (1 = *not at all*; 5 = *very well*). SEQ-C subscale scores have been found to be structurally valid and internally consistent (α > .80; Muris, 2001).

Sensation seeking was measured using the four-item Brief Sensation Seeking Scale (BSSS-4; Stephenson, Hoyle, Palmgreen, & Slater, 2003, “*I like new and exciting experiences, even if I have to break the rules*”). Responses to the four items were given on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). Scores in the present study were found to be internally consistent (α current study = .79).

Alcohol use was assessed using two questions concerning the consumption of a full alcoholic drink with answer options *yes*/*no*. Participants were asked if they had ever consumed a full alcoholic drink (lifetime use) and if they had consumed one in the past month.

Information was gathered on gender, and free school meals entitlement, an imperfect proxy for low-income families, and thus socio-economic status (Hobbs & Vignoles, 2007).

**2.3 Analyses**

STATA13 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) Caliński 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* ≥ 67; Bergman, Magnusson, & El-Khouri, 2003). Third, *T*-scores were plotted to examine distinctions between and across potential profiles (See Figures 1 and 2). SPSS (V21) was used to compute correlations and descriptive data, as well as *t*-tests between profiles and scores on dependent measures. Effect size differences were computed using Hedge’s *g*.

**3 Results**

Table 1 contains descriptive statistics for the ATI-TA scores in the sample: means, standard deviations, subscale intercorrelations, and internal consistency estimates by sample. In all three temporal domains, mean scores for the positive valance are almost twice those for the negative.

Insert Table 1

Pearson’s correlation coefficients (two-tailed) between ATI-TA scores and scores on other measures used in the study, along with descriptive statistics, are displayed in Table 2.

Insert Table 2

Results show that the correlation coefficients between time attitudes scores and sensation seeking scores were statistically significant, but too small to interpret, suggesting that the constructs are unrelated. The coefficients between time attitudes scores and scores on the self-efficacy domains were all significant, somewhat larger, theoretically meaningful, and, to a large degree, consistent across both samples. As might be expected, negative time attitudes were associated with lower self-efficacy, with the reverse true for positive time attitudes.

The results of profiling of ATI-TA scores in both samples are displayed in Figures 1 and 2 below.

Insert Figures 1 and 2

In Scotland, a six-cluster solution emerged as best. The clusters were labeled (a) Positives (*n* = 230 28.3%), (b) Negatives (*n* = 90, 11.1%), (c) Past Negatives (*n* = 77, 9.5%), (d) Pessimists (*n* = 64, 7.9%), (e) Ambivalent (n = 203, 25.0%), and (f) Balanced (n = 148, 18.2%).

In Northern Ireland, a five-cluster solution emerged as best, with all five clusters replicating ones observed in the Scottish sample. These were labeled Positives (*n* = 502, 31.7%), (b) Negatives (*n* = 173, 11.0%), (c) Pessimists (*n* = 126, 8.0%), (d) Past Negatives (*n* = 221, 14.0%), (e) Ambivalent (n = 558, 35.3%). Thus, five clusters generalized across the two samples.

Using effect sizes, elevated scores for positive valence and low scores for negative valence across all three time periods characterized adolescents with Positive profiles; Negatives were marked by the opposite. Past Negatives reported very high scores for negative and very low scores for positive attitudes toward the past. Pessimists were identified by their strong negative attitudes toward the future alongside an almost equally negative appraisal of the past and present. Adolescents with Ambivalent profiles did not report strong attitudes toward any of the time periods. Last, the Balanced profile was only identified in Scottish adolescents, and this profile was characteristic of slightly below average negative attitudes toward the present and future, slightly above average positive attitudes toward the present and the future, and slightly above average positive and negative attitudes toward the past.

Insert Table 3

Table 3 displays the gender distribution and alcohol use distribution of individuals in the various time attitudes profiles. Cramer’s *V* values suggest that the distribution of individuals across time attitudes profiles was not meaningfully related to gender, free school meals entitlement, lifetime consumption of a full alcoholic drink, nor past month consumption of a full alcoholic drink. However, there were discernible patterns for alcohol use that were similar in both samples, although more pronounced in NI. More Positives responded *no* to lifetime drinking and drinking in the past month than responded *yes* (differences ranging from 9% to 18%) and more Negatives (ranging from 1.7% to 7%) and Pessimists (ranging from 3.8% to 11.1%) responded *yes* to lifetime drinking and drinking in the past month than responded *no.* The latter pattern also held for Past Negatives except for drinking in the past month in the Scottish sample.

Insert Table 4

Table 4 displays the results of a series of pre-planned *t*-tests between ATI-TA profiles and scores on dependent measures. Hedge’s *g* effect sizes indicate meaningful differences between profiles on all measures except for sensation seeking. There were meaningful differences between time attitudes profiles on academic self-efficacy in NI (-1.17 > *g* > -.40) and Scotland (-1.12 > *g* > .66), social self-efficacy in NI (-1.26 > *g* > .50) and Scotland (-1.26 > *g* > .59), and emotional self-efficacy in NI (-1.19 > *g* > .50) and Scotland (-1.13 > *g* > -.47). The largest effect sizes were observed for the comparison between Negatives and Positives, with Positives scoring higher in all cases. Large differences were observed in all three efficacy domains between Positives and Pessimists, with Positives scoring higher. Results in Table 5 also indicate domain-specific results as well as a broad pattern of non-substantive differences across both samples. For example, in Scotland, Negatives and Pessimists did not differ meaningfully on any efficacy measure, a finding supported in NI for academic self-efficacy. Past Negatives did not differ substantively from Ambivalents or Pessimists on any efficacy measure in both samples, a finding that was also true for the comparison between Ambivalents and Pessimists save for the academic self-efficacy domain in the NI sample.

**4 Discussion**

The present study found that it is possible to extract clusters of individuals with similar time attitude response profiles across independent UK samples. Five profiles, present in both samples show similarities with time attitude profiles reported by Andretta et al. (2014), and Buhl and Lindner (2009), although distinct differences in the extracted clusters were observed. In relation to this study, a sixth profile (balanced) was detected in the Scottish sample but was absent from the NI sample. Profiles are often sample-specific and it is probable that a Balanced profile will emerge in another sample of NI adolescents. However, it is possible that temporal attitudes are (sub) culturally determined and therefore a recurring problem for this literature will be (sub) cultural variations that are difficult to explain and not stable across time. In this context, subtle differences between the study sites may explain the differences and these may be transitory differences, for example negative experiences during the recent Global recession (e.g., austerity measures, parental unemployment, or use of food banks) may affect young people’s attitudes in a way that will not affect subsequent cohorts who do not experience such problems. It may therefore be more sensible to focus on those temporal profiles that are invariant across samples.

 Whilst the ATI-TA subscales showed modest to moderate correlations with various domains of self-efficacy (academic, social and emotional) with positive time attitudes associated with high self-efficacy, time attitudes were not associated with sensation seeking in any meaningful way (all below 0.12). It is possible that this is due to the measure used as the BSSS-4 may not contain sensation seeking items that correspond to temporal attitudes. It is also possible that as sensation seeking and impulsivity change across adolescence that we sampled at a point in the samples’ development where there was no link between the variables. As the sample ages and their brains develop, these variables may be more closely related.

 The results of the pre-planned contrasts among ATI-TA profiles (Table 5) show that the majority of comparisons yielded anticipated results with substantive effect sizes. It is also noted that correlations between ATI-TA scores and outcomes were modest when compared to effect sizes generated from between profile comparisons of outcomes. These results point to the importance of accounting for the cumulative effect of time attitudes on functioning through person oriented cluster analysis. These results also point to the shortcomings associated with reporting on too narrowly focused bivariate relationships between attitudes toward specific time periods and outcomes, which the results of this study showed are misleading. Results also suggest that Positive and Pessimistic profiles may be predictors of alcohol use in early adolescence.

In some cases, results in the present study were somewhat inconsistent with the previous literature. Previously (see Buhl & Linder, 2009 and Andretta et al., 2014) results suggested that the worst outcomes were observed in those with a Pessimist profile, while the best outcomes were observed in those with Optimist, Balanced, or Ambivalent profiles. In terms of all of the self-efficacy domains, those with a Positive profile also scored substantively higher scores than those with a Negative profile. However, taking Ambivalents as an example, the scores for all three self-efficacy domains when comparing Ambivalents and Past Negatives were not substantively different, and this finding was true for both research sites. Therefore, ambivalence toward time might be as detrimental to self-efficacy as harboring all together negative attitudes about the past. Substantive differences on all three self-efficacy domains between Positives and Ambivalents in both research sites was not anticipated. Although Pessimists may have had the worst outcomes in previous studies, in some cases herein expected results did not emerge, and there was variability in results across research sites. For example, when comparing Pessimists and Negatives, the former reported substantively higher social and emotional (but not academic) self-efficacy scores in the Northern Ireland sample, while no substantively different scores were observed in the Scottish sample. Nonetheless, the extant research, present study included, appears to show that the Positive profile is the ideal profile, and that the Balanced profile is indicative of adequate functioning. In contrast, the Pessimist, Negative, Past Negative (and to a lesser degree the Ambivalent profile) appear most problematic.

 The present study must be understood in the context of some important limitations. Firstly, participants were relatively young (aged 12-13) and results for alcohol use and sensation seeking measures may be compromised accordingly. Although the age of participants may have justified simple alcohol use questions with binary answer options, this limits the insight into alcohol use offered by the study. Secondly, all data were self-reported, although equally they were gathered under examination-like conditions with confidentiality guaranteed. Thirdly, the SES indicator being a proxy one, limits the interpretation that can be made with regard to this measure. The relative novelty of the research area makes meaningful comparisons between outcomes on time attitudes profiles difficult. However, results also show that in general those with a Positive time attitudes profile also report substantively higher self-efficacy than their peers and a reduced likelihood of lifetime and past month consumption of a full drink than their peers. More work will be needed in other, more diverse samples to see if this finding can be generalized. Research should also focus on the development of time attitudes, particularly how life histories might shape attitudes toward the three time periods and the ways in which time attitude profiles might influence alcohol consumption during adolescence.

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