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Time attitudes profile stability and transitions: An exploratory study on adolescent health behaviours among high school students

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ABSTRACT

Purpose: Time attitudes refer to individuals' feelings about the past, present, and future, and an increasing number of cross-sectional studies have demonstrated that positive time attitudes are significantly related to better health and well-being. We investigated time attitude profile membership and associated transitions longitudinally in United Kingdom-based adolescents, and assessed the relationship between time attitude profile development on health behaviours at + 21 months after the data collection involving time attitudes.

Methods: Participants were high school students ($N = 1306$; 41.8% female, *M*age 12.5–14.5 years). The Adolescent and Adult Time Inventory – Time Attitudes Scale was employed to identify profiles, and a mover-stayer latent transition analysis was employed to examine developmental changes. Data were also gathered on sensation seeking, and a range of health indicators were assessed: Past week frequency of physical exercise, self-rated health, subjective life expectancy, lifetime cannabis and smoking, and dental attendance.

Results: Staying in a positive time attitude profile was related to higher subjective life expectancy, and less frequent use of cannabis and cigarettes ($1.00 \leq d \leq 4.00$). Further, moving to a positive profile predicted healthier outcomes for most health measures used.

Conclusions: Notwithstanding the limitation that health outcomes in the present study were distal, the present study bolstered a developing cross-sectional literature supporting the association between positive time attitudes and better health and well-being outcomes. Future longitudinal studies which assess measures concurrently are required.

Research into the ways in which an individual's time perspective influences health behaviours has grown considerably in recent years. Across studies, time perspective has been accounted for using both broad and narrowed methods. Zimbardo and Boyd (1999) assessed time perspective with the Zimbardo Time Perspective Inventory (ZTPI) using cognitive, affective, and behavioural items on five dimensions: (a) past negative, (b) past positive, (c) present hedonistic, (d) present fatalistic, and (e) future. Consideration of Future Consequences (CFC; Strathman, Gleicher, Boninger, & Edwards, 1994) is another widely-used construct which assesses both the degree to which individuals consider the future implications of current behaviour, and the degree to which that consideration influences present behaviour. The CFC scale (Strathman et al., 1994) also includes cognitive and behavioural items. Third, temporal

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focus concerns cognitions and describes the extent to which people characteristically devote their attention to perceptions of the past, present, and future (Bluedorn, 2002).

Last, and the focus of the present study, time attitudes are the affective dimension of time perspective: The emotional and evaluative feelings toward the three time periods (Andretta, Worrell, Mello, Dixson, & Baik, 2013). With the exception of the CFC scale, all of these assess various aspects of temporal psychology (cognitive, affective, behavioural, and indeed, in some cases [ZTPI] an amalgam of all three) with reference to the past, present, and future. The CFC scale assesses consideration of only the present and future. However, while it might seem intuitive to believe that the aforementioned time perspective constructs measure temporal psychology similarly, a recent study (Authors, blinded) in University students reported only one moderate-sized correlation between scores on the combined 16 factors of the four scales.

In terms of the broad time perspective literature, studies have demonstrated that a variety of temporal constructs are significantly related to health outcomes. Time perspective as conceptualised in the ZTPI (Zimbardo & Boyd, 1999) has been shown to be significantly related to cannabis use (Apostolidis, Fieulaine, Simonin, & Rolland, 2006; Fieulaine, 2017) and the frequency of physical exercise (Griva, Tseferidi, & Anagnostopoulos, 2015; Guthrie, Butler, Lessl, Ochi, & Ward, 2014). The extant literature in terms of smoking is more complex. Whereas some have reported no association between time perspective (assessed by the ZTPI) and smoking (e.g., Griva et al., 2015; Guthrie et al., 2014), Pozolotina and Olsen (2018) reported one significant but small correlation between ZTPI present fatalistic scores and smoking behaviour ($r = 0.20$); in this study, correlations between smoking and other ZTPI subscales were close to zero. Pozolotina and Olsenalos also reported statistically significant but small correlations between smoking and CFC-immediate ($r = 0.17$) and CFC-future ($r = -0.10$) scores. In a study on both smoking behaviour and frequency of physical exercise, Adams and Nettle (2009) reported that ZTPI future and CFC scores were significantly associated with current smoking status, and these results remained significant when socio-demographic factors were taken into account. Regarding frequency of physical exercise, only CFC was significantly associated with frequency of moderate intensity physical activity; however, this relationship did not remain significant after controlling for socio-demographic factors and five-factor personality constructs (Adams & Nettle, 2009).

1. Changes in time attitude profiles during early adolescence

The present study was solely focused on time attitudes during early adolescence for several reasons. Beginning with age, early adolescence is marked by a surge in developmental changes. In fact, the development of synapses in the brain between the ages of 11 and 12 is so rapid that early adolescents have been shown to suffer affective setbacks (e.g., ability to recognize emotions in faces and words; McGirven, Andersen, Byrd, Mutter, & Reilly, 2002). Time attitudes have also been shown to change during early adolescence, where transitions to unfavourable profiles led to poor health behaviour outcomes (Morgan, Wells, Andretta, & Mckay, 2017). To provide an example, Morgan et al. (2017) reported that 12 and 13-year olds who transitioned from being relatively positive about all three time periods to being characterized by negative attitudes toward the future reported a concomitant increase in sensation seeking behaviour ($d = 0.56$).

Turning to the narrowed scope on time attitudes, the construct was ideal because it is not encumbered by other constructs: Whereas the ZTPI uses an amalgam of cognitive, affective, and behavioural items, time attitudes are exclusively affective items. Further still, several studies using the Adolescent and Adult Time Inventory – Time Attitudes Scale (AATI-TA; Mello & Worrell, 2007) have yielded significant and meaningful associations between AATI-TA scores and alcohol-related behaviours and attitudes, subjective life expectancy (SLE), and psychiatric symptomatology (Authors, blinded I, II, III). Indeed, Knepple Carney and Patrick (2017), using the AATI-TA in an adult sample, reported that present positive, future positive, and future negative time attitudes were all significantly related to health intentions, albeit with small effect sizes.

Although time attitudes might comprise just one dimension of time perspective, the construct is multivariate. In point of fact, individuals' have been shown hold attitudes towards the past, present, and future both simultaneously and to varying matters of degree (e.g., Andretta et al., 2013). For that reason, researchers have begun to account for heterogeneity in time attitudes using latent profile analysis (LPA), and the longitudinal extension of latent profile analysis, latent transition analysis (LTA; Morgan et al., 2017). LPA is one of many person-centered methods, where individual differences in time attitudes are appraised by grouping participants into categories based on both similarities and differences in attitudes towards the three time periods. Only after the identification of categories, or in this case time attitude profiles, are associations with covariates or distal outcomes assessed (Andretta et al., 2013). By contrast, in variable-centered analyses, such as correlation and regression, only the average associations between or among time attitudes and other constructs are captured in the sample.

Across the extant person-centered studies, individuals with positive time attitude profiles have been found to have the best mental health and alcohol-related outcomes, with the reverse largely true for those with negative profiles (e.g., Andretta et al., 2013). However, and in keeping with the reality that adolescence is a period of intense biological, physical, and psychological change (e.g., Moksnes, Moljord, Espnes, & Byrne, 2010), previous longitudinal studies have reported relative instability in profile membership across time. For example, in a two-wave (+12 months) study, Authors (blinded) reported that 55.9% of the sample ($n = 1100$) were identified as movers, and 44.1% ($n = 868$) participants were identified as stayers. In an additional study using three waves of data (+24 months) based on a similar sample, Authors (blinded) reported that 91.2% ($n = 1521$) of participants were identified as movers, and only 8.8% ($n = 146$) of participants were identified as stayers (stayed in the same profile across all three waves).

2. The present study

Because it remains unclear if this prospective relationship extends to a *broader* range of health behaviours, we examined the effect