**Temporal Profiles relate meaningfully to Anxiety and Depression in University Undergraduates.**

**Abstract**

The present study investigated the viability of time perspective profiles and the degree (if any) to which these are associated with meaningful differences in anxiety and depression.Participants were University undergraduates recruited from a University in the North West of England. Full survey data were available for 455 individuals (aged 18-25; 49.7% male): (a) time perspective, (b) anxiety, and (c) depression. Four profiles emerged and were labelled Future-Positive, Present, Past Negative-Future, and Ambivalent. The Future-Positive profile was associated with the best outcomes with those in the Present and Past-Negative-Future profiles associated with the worst outcomes. Results indicated that the use of temporal profiles affords new insight into the relationship between time perspective and psychiatric symptomatology.

Keywords: Zimbardo Time Perspective Inventory; HADS; Anxiety; Depression; Temporal Profiles

**1. Introduction**

Symptoms of psychological distress, including anxiety and depression have been observed in university undergraduates (e.g., Blanco et al., 2008), however, wide variations in the proportion of students identified as “depressed” or “anxious” have been reported. This variation has included rates of around 10% (Vazquez & Blanco, 2008) to rates of 84% (Bayati, Beigi, & Salehi, 2009; Garlow et al., 2008) and is said to be influenced by many factors including assessment methods, geographical location and socio-economic status (Ibrahim, Kelly, & Glazebrook, 2013).

Time perspective is an individual difference variable, which refers to the influence that consideration of, and attitudes towards, the past, present, and future have on human behaviors (Adams, 2009). Zimbardo and Boyd (1999) proposed a five factor construct assessed by the Zimbardo Time Perspective Inventory (ZTPI) wherein: Past Negative (PN), represents a pessimistic attitude toward the past; Past Positive (PP), represents a positive view of the past; Present Hedonistic (PH), includes the desire for enjoyment of present experiences; Present Fatalistic (PF) represents a lack of hope for the future and the belief that uncontrollable forces determine one’s fate; Future (F) represents a general future orientation. In their development of the ZTPI, Zimbardo and Boyd (1999) included measures of depression and anxiety in order to demonstrate construct validity. Accordingly, some meaningful correlations were observed between scores on ZTPI factors and depression (-.17 < *r* < .59) and anxiety (.07 < *r* < .62). Subsequent research has demonstrated that ZTPI scores are significantly associated with psychiatric symptoms in the general population and psychiatric patients (e.g. Bitsko, Stern, Dillon, Russell, & Laver, 2008; Laghi, Baiocco, D’Alessio, & Gurrieri, 2009; Van Beek, Berghuis, Kerkhof, and Beekman, 2010).

One weakness in examining the bivariate relationship between ZTPI factors and depression and anxiety is that individuals concurrently hold all five time perspectives to matters of degree (Zimbardo & Boyd, 1999) therefore to label an individual as “past” or “future” fails to account for the totality of their time perspective. In light of this, some studies have begun to successfully apply person-oriented analyses to ZTPI scores (e.g., Boniwell, Osin, Alex Linley, & Ivanchenko, 2010; McKay results the present study Andretta, Magee, & Worrell 2014), which begins with the grouping of participants into categories based on similarity in scores across a set of target variables (i.e., independent variables; Bergman et al., 2003). For example, McKay and colleagues (2014) recently demonstrated that among adolescents, those with a future temporal profile were least likely to be a problematic drinker, while those with a hedonistic profile were most at risk.

**In the present study, we employed person-oriented analyses to examine the relationship between time perspective profiles and psychiatric symptomology in a large sample of university undergraduates. In keeping with the extant literature which has used bivariate or correlational analytical approaches, we hypothesized to observe the highest levels of problems in undergraduates with a present oriented profile, and the lowest levels of psychiatric symptomatology in those with a future-oriented profile.**

**2. Methods**

**2.1 Participants**

**The participants were 530 University undergraduates (aged 18-25 [Mean = 20.60, SD = 1.60]; 49.7% male) recruited from a University in the North West of England through opportunistic and snowball sampling.**

**2.2 Measures**

**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 produces scores for anxiety (HADS-A) and depression (HADS-D) on separate subscales that range from zero to twenty-eight. Bjelland et al. (2002) suggested that a score of eight or more on each subscale indicated caseness. Both subscales of the HADS have good validity and internal consistency (HADS-A: α = .83; HADS-D: α = .82), and equal levels of sensitivity (.80) and specificity (.80; for review see Bjelland, Dahl, Haug, & Neckelmann, 2002). Reliabilities for HADS scores in the present study were as follows: (a) HADS-A α = .84. and (b) HADS-D α = 88.**

**The ZTPI (Zimbardo and Boyd, 1999) consists of 56 items scored using a 5 point Likert scale ranging from “*extremely* *like me* to “*extremely unlike* *me*”. Sample items are as follows: PN, “*I think about the bad things that have happened to me in the past*”; PP, “*Happy memories of good times spring readily to mind*”; PH, “*Taking risks keeps my life from becoming boring*”; PF, “*My life is controlled by forces I cannot influence*”; F, “*When I want to achieve something, I set goals and consider specific means for reaching those goals*”. Reliabilities for ZTPI factor scores in the present study were as follows: PN, α = .80; PP, α = .69; PH, α = .80; PF, α = .75; F, α = .76.**

**2.3 Procedure**

**The study was given ethical approval by the relevant university ethics committee and all participants gave informed consent. Data were collected anonymously as part of a research project by Masters Degree students, participants were not required to give their names, and confidentiality was guaranteed.**

**3. Results**

Intercorrelations among ZTPI subscale scores, as well as correlations among ZTPI subscale and dependent variable scores are shown in Table 1. Intercorrelations among ZTPI scores were modest (.10 ≤ *r* ≤ .37), as were correlations among ZTPI and dependent variable scores (.01 ≤ *r* ≤ .38). Descriptive statistics for all variables are shown in Tables 1 and 2. Scores were not skewed or kurtotic with the exception that HADS-D scores were leptokurtic (i.e., scores clustered around the mean). Internal consistency estimates for ZTPI scores were generally acceptable.

Model-based clustering of ZTPI scores using the *mclust* package in *R* statistics yielded four ZTPI profiles (See Figure 1; Fraley, Raftery, & Scrucca, 2014; R Core Team, 2014), and the number of profiles was determined by the following: (a) model fit indices, (b) differences in ZTPI scores across clusters, and (c) average posterior probabilities. Profile 1 was labeled F-positive because undergraduates in this cluster reported F scores that were substantially above the mean (≈ +1 *SD*) and PP scores that were close to the mean, with PH, PF, and PN scores that were far below the mean (> -1 *SD*). Profile 2 was labeled Present and was characterized by elevated PH and PF scores (≈ +1 *SD*), coupled with average scores on both PP and PN and depressed Future scores when compared to peers (≈ -1 *SD*). The third profile was labeled PN-future, and undergraduates with this profile reported high PN scores (≈ +1 *SD*), average F scores and low scores on the remaining ZTPI subscales (≈ -1 *SD*). Last, the Ambivalent profile was marked by average scores on all five ZTPI subscales when compared to peers with different time perspective profiles. It could not be labeled Balanced as the theoretically Balanced profile (Zimbardo & Boyd, 1999; Boniwell et al., 2010) is characterized by relatively low PF and PN scores, coupled with relatively high PP, PH and F scores.

Results of crosstabulation showed that ZTPI profiles were not contingent upon gender, (*χ²* (3)= 6.07, *p* = .11, *Cramer’s V* = .11). Table 2 displays the results of *χ²* analyses examining differences in distribution of those with clinically significant levels of anxiety and depression, across the four time perspective profiles. There were significant differences in the categorical distributions for both anxiety and depression with small to moderate effect sizes (.12 < *V* ≤ .30). The profile with the highest proportion of those meeting the criteria for clinically significant anxiety was the PN-future profile, followed by the Present, Ambivalent and F-positive. Finally, there were only 26 (4.9%) participants who met the cut-off for clinically significant depression, 12 from the Ambivalent profile, 11 from the Present, and three from the PN-future profile.

 A statistically and practically significant difference in anxiety and depression scores was shown across ZTPI profiles (Table 3). The least amount of anxiety and depression symptoms were reported in F-positives, with robust differences observed with undergraduates who reported Present and PN-future time perspectives. Differences in anxiety between F-positive and Ambivalent undergraduates were too small to interpret. Ambivalent undergraduates were also shown to report substantively lower levels of anxiety than peers with Present and PN-future profiles. The highest levels of anxiety were reported among PN-futures. However, there was no difference in anxiety observed between Present and PN-future undergraduates.

**4. Discussion**

The present study examined the degree to which temporal profiles are related to scores on depression and anxiety in a large undergraduate sample. Previously reported ZTPI profiles in undergraduates (Boniwell et al., 2010) were not replicated in the present study, in particular the Balanced profile, previously considered to be optimal was not identified. However, in their study, Boniwell et al. reported some difficulties in identifying a Balanced profile in both of their samples. Given the relative novelty of this approach it may take more time for a consistent set of profiles to emerge across studies.

The Ambivalent profile suggests that some individuals hold all five of the ZTPI time perspectives to similar degrees and are thus not primarily driven by any one temporal dimension. The very existence of this profile suggests the appropriateness of profiling, otherwise in bivariate analyses those belonging to this profile could find themselves crudely attributed to being a “future”, a “present” or a “past” person. The other two profiles, F-positive and PN-future are more similar to those reported previously using ZTPI scores (McKay et al., 2014). In terms of demographics gender did not differ significantly in their representation across time perspective profiles, a finding that replicates those previously reported (Andretta et al., 2013; McKay et al., 2014).

The cognitive symptoms of anxiety and depression are consistent with undergraduates having the PN-future profile reporting the highest scores on both HADS subscales. Although we have chosen to use the term ‘future’ in the profile name, the F score was only average and it was the PN score that was elevated. Because F does not include positive and negative items as with the past and present ZTPI subscales, future negative orientation and attitudes are unknown in the present study. Future work is therefore needed to separate the future time perspective by valence. The lowest HADS subscale scores reported by the F-positives is again entirely consistent with low cognitive symptoms of anxiety and depression.

This study has several strengths including the use of robust and reliable assessment tools, the use of sophisticated analytical techniques and a relatively large sample size. However, it is also important to contextualize the results in the light of several limitations. Firstly, all data were gathered using self-report. Secondly, the sample was a fairly homogenous one, and generalizability of findings may be inappropriate. Finally, the problem behaviors measures were relatively mild. However, it was impossible to foresee that in advance.

**Conclusion**

 **Results of the present study contribute to a growing body of studies to suggest time perspective profiles are indicators of functioning. On this note, young adults who present with a future orientation might simultaneously be suffering from negative feelings about their past. In fact, the conflict of personal time perspective unique to an individual with a PN-F profile appears to be associated with both anxiety and depression. However, interpretation of these findings should be made in light of a few limitations that offer directions for future inquiry.**

 **It is noted that the time perspective profiles reported in the present study were not in keeping with previously reported profiles. Therefore, more research is needed before conclusions can be made about the generalizability of time perspective profiles in young adults more broadly. Results were further limited by the sample and associated caseness. That is, anxiety and depression were studied in a sample that included very few individuals suffering from clinically significant levels of symptomatology, and it is possible that a far different set of results would be observed in a clinical population. Last, data were cross-sectional. Consequently, the effect of time perspective profiles on anxiety and depression over time remains unknown. In this regard, it would also be important to know about the stability of time perspective profiles, and if shifting from one time perspective profile to another is associated with changes in anxiety and depression.**

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