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Associations between Psychosocial Well-being and the Development of Beneficial Time Perspectives

Abstract

A growing body of research suggests that some time perspective orientations are more beneficial than others with regard to well-being. However, little is known about the factors affecting the development of these time perspectives. This gap in the research was addressed through two studies. Study 1 (N = 218; M = 29.8 years, SD = 11.45) identified ZTPI past positive (PP) as a beneficial time perspective and past negative (PN) as a detrimental time perspective. Structural equation modelling was then used in Study 2 (N = 443; M = 31.2 years, SD = 13.0) to develop two models of the associations between attachment orientation, basic psychological need satisfaction and PP and PN, respectively. While anxious and avoidant attachment orientation were associated with both PP and PN, the three basic psychological needs were differentially associated. The findings of these studies suggest the importance of early childhood care to the development of beneficial time perspectives.

Keywords: time perspective, well-being, attachment, basic psychological needs

Związki między psychospołecznym dobrostanem a rozwojem korzystnych perspektyw czasowych

Streszczenie

Wyniki licznych badań wskazują, iż niektóre orientacje perspektywy czasowej w odniesieniu do samopoczucia jednostki są bardziej korzystne od innych. Wciąż jednak zbyt mało wiadomo na temat czynników wpływających na rozwój tych korzystnych perspektyw czasowych W dwóch przeprowadzonych przez autorkę artykułu badaniach poświęcono uwagę temu zagadnieniu. W badaniu nr 1 (N = 218; M = 29.8 lat, SD = 11.45) zidentyfikowano pozytywną przeszłość (PP) ZTPI jako korzystną perspektywę czasową oraz przeszłość negatywną (PN) jako szkodliwą perspektywę czasową. W badaniu nr 2 zastosowano model równań strukturalnych (N = 443; M = 31.2 lat, SD = 13.0), aby opracować dwa modele związków między wzorcem przywiązania, zaspokojeniem podstawowych potrzeb psychologicznych oraz odpowiednio PP i PN. O ile wzorce przywiązania typu *niepokoju* oraz *unikania* wykazały związek zarówno z PP jak i z PN, o tyle trzy podstawowe potrzeby psychologiczne okazały się

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powiązane w zróżnicowany sposób. Wnioski z przeprowadzonych badań potwierdzają istotne znaczenie stylu opieki we wczesnym dzieciństwie na późniejszy rozwój korzystnych perspektyw czasowych.

Słowa kluczowe: perspektywa temporalna, dobrostan, przywiązanie, podstawowe potrzeby psychiczne

Introduction

Time perspectives (TPs) are the temporal frames that are employed by an individual to inform decision making in the present moment, they affect behaviour and shape social, intrapersonal and interpersonal experiences, influencing the subjective interpretation of everyday events (Boniwell & Zimbardo, 2003; Zimbardo & Boyd, 1999, 2008). With reference to the Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999), the five time perspectives are Past-Negative (PN), Past-Positive (PP), Present-Hedonism (PH), Present-Fatalism (PF), and Future (F).

A PN time perspective is manifested when an individual thinks negatively (or ruminates) about past experiences, leading them to draw on unpleasant memories when interpreting events and making decisions (e.g. past failures, rejections, embarrassments). Such PN-influenced behaviours, thoughts and emotions tend to be based on 'worst case' scenarios, keeping individuals chained to the past. In contrast, a PP time perspective is evident when and individual draws instead on positive memories (e.g. successful coping, achievements, self-efficacy, evidence of being valued and loved by others), which provides a solid foundation for decision making in the present and a more positive interpretation of experiences. When decisions are influenced by a PH time perspective, they are driven by the gratification of present desires. This enables an individual to experience pleasure in the present moment without thought of future consequences, which is often necessary for an individual to become nurtured, revitalised and reenergised but is also associated with risk-taking. While also present focused, PF is quite different. A PF time perspective is utilised when an individual feels that they have no control over their future, such as when they see no link between their current actions and future outcomes; they believe that it does not matter what they do (or do not do) now. This fatalistic approach to decision making is sometimes associated with feelings of helplessness and/or hopelessness. In contrast, a future time perspective is evident when decisions are made with reference to anticipated consequences. This temporal frame influences decisions when working towards and achieving goals is a priority for an individual (i.e. delaying gratification), and may be associated with a sense of purpose or feelings of responsibility for (or control over) future outcomes (Boyd & Zimbardo, 2005; Zimbardo & Boyd, 1999, 2008).

There is some evidence that the tendency to predominantly (and habitually) utilise one or two temporal frames (or, have a TP bias) is learned, with the five TPs being somewhat associated with culture, education, socioeconomic status

and religion (Zimbardo & Boyd, 1999, 2008). The associations between the TPs and personality traits (Zimbardo & Boyd, 1999) also suggest that 'nature' may play a role in the development of TP biases. However, with much of the attention of TP researchers firmly focused on the psychosocial correlates and outcomes associated with different TPs (for reviews see: Boniwell & Zimbardo, 2004; Boyd & Zimbardo, 2005), little has been done to investigate other factors that may influence the development of beneficial (or detrimental) TPs. Knowledge of any such other factors will further our understanding of the individual differences in TPs that are evident within different population groups. Such information will also assist parents and educators to promote the development of beneficial time perspectives in the children for whom they provide nurturing and guidance.

Study 1: Determining beneficial time perspectives

Before examining the development of beneficial TPs, there is a need to first determine which of the TPs are beneficial. According to Zimbardo and Boyd (1999, 2008), the most beneficial TP profile is the Balanced Time Perspective (BTP), which consists of high PP, moderately high F, moderate PH, and low PN and PF (Boniwell & Zimbardo, 2004). It is believed that an individual with a BTP integrates past, present, and future temporal frames to achieve consistency of behaviour, shifting flexibility between the various TPs to employ the most appropriate perspective for the needs of their present situation (Boyd & Zimbardo, 2005). While the ability to shift TPs adaptively has not been demonstrated in the literature, the beneficial nature of a BTP has been established by a number of studies, where individuals with a BTP have been found to have more favourable levels of psychosocial functioning than individuals without a BTP (Boniwell, Osin, Linley & Ivanchenko, 2010; Drake, Duncan, Sutherland, Abernethy & Henry, 2008; Stolarski, Bitner & Zimbardo, 2011; Zhang, Howell & Stolarski, 2012).

These investigations into the benefits of a BTP are based on the premise that the BTP profile (as outlined above) is necessary for psychosocial well-being. However, there is some evidence that this may not be the case. For example, in a general population sample, Drake et al. (2008) found that PN was negatively associated with subjective happiness (large effect size), while both PP and PH were positively associated (small effect). PF and F were not found to be significantly associated with happiness. Thus, it is possible that levels of some TPs may be more (or less) important than others for psychosocial well-being.

Zhang et al. (2012) found somewhat similar findings to Drake et al. (2008) after examining the associations between the five TPs and subjective happiness as well as other indicators of psychosocial well-being, including life satisfaction and positive (PA) and negative (NA) affect, across three college student samples. Specifically, the researchers found PN was negatively associated with happiness (medium- to large-sized effects), life satisfaction (medium- to large-sized effects), and PA (small effects), but positively associated with NA (medium to large effects).

Unsurprisingly, the associations between PP and the well-being variables were the converse, with medium- to large-sized effects for happiness and life satisfaction, but small to medium effects for both PA and NA. The patterns of association for PH and F were similar, with both positively associated with happiness, life satisfaction and PA (small effects for all), and there was either no significant association with NA or a slight negative one (for F only). The pattern of associations for PF was similar to that for PN, but the effect sizes differed: small negative associations were evident between PF and happiness and life satisfaction, associations with PA ranged from none to a small negative one, and there were medium-sized, positive associations with NA. Thus, Drake et al.'s (2008) and Zhang et al.'s (2012) results indicate that PN is most strongly associated with indicators of psychosocial well-being, followed by PP, then PF, F and PH.

In line with these findings, van Beek, Kerkhof & Beekman (2011) found that PN was positively associated with depression and suicidality for a sample comprised of psychiatric patients and a control group of non-patients, while PP was negatively associated with both – the effect sizes for all of these associations were large. PF was also negatively associated with depression and suicidality (medium effects), while F was negatively associated with suicidality (small effect) and not significantly associated with depression. PH was not found to be associated with either depression or suicidality. In comparing their two participant groups, van Beek et al. (2011) found that psychiatric patients scored significantly higher than non-patients on PN and PF, and significantly lower on PP. The two groups did not differ significantly in relation to either PH or F TPs. The researchers concluded that high levels of PN, in particular, are implicated in psychiatric conditions. Further, they suggested that PP may be a protective factor against psychopathology.

Thus, while BTP is theoretically and empirically linked to psychosocial well-being, it appears that the key components of this may be high levels of PP and low levels of PN and PF, with PH and F playing little if any role in explaining well-being. At least, this appears to be the case when examining univariate associations. It is, however, possible that multivariate analyses will indicate different findings. This possibility will be tested in the present study, which will focus on the association between the five TPs and psychological well-being and distress, where TPs that are positively associated with psychological well-being *and* negatively associated with psychological distress will be considered to be beneficial TPs. In keeping with the past findings discussed above, it is hypothesised that PP will be found to be a beneficial TP while PN and PF will, in showing the converse pattern of associations, be identified as detrimental TPs.

Method

The 218 participants (83% female) were recruited through undergraduate psychology courses at two regional universities in Australia. Participants, who were aged between 18 and 72 years (M = 29.8, SD = 11.45), were provided with a link

to an anonymous online questionnaire that was hosted by SurveyMonkey.com. The questionnaire contained demographic items, the 18 item version of the Mental Health Inventory (MHI-18; Ware, Manning, Duan, Wells & Newhouse, 1984; McHorney, Ware, Rogers, Raczek & Lu, 1992) and the Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999).

The MHI-18 was used to assess psychological well-being. Participants responded to 18 statements to indicate how often they have felt certain ways during the past four weeks using a 6-point scale (1 = all of the time, 6 = none of the time), enabling calculation of a Mental Health Index score (scoring range: 0–100, where higher scores indicate greater psychological well-being). Subscales measuring depression (4 items; e.g. 'did you feel depressed?'), anxiety (5 items; e.g. 'have you been a very nervous person?'), loss of behavioural control (4 items; e.g. 'did you feel emotionally stable?'), and positive affect (4 items; e.g. 'were you a happy person?') can also be calculated (scoring range: 0–100, where higher scores are indicative of higher levels of symptomatology).

The ZTPI was used to assess the participants TPs. The 56 ZTPI items are responded to on a 5-point scale (1 = very untrue of me, 5 = very true of me) and five subscales can be calculated: Past Positive (9 items; e.g. 'Familiar childhood sights, sounds, smells often bring back a flood of wonderful memories'), Past Negative (10 items; e.g. 'I often think of what I should have done differently in my life'), Present Hedonism (15 items; e.g. 'I believe that getting together with one's friends to party is one of life's important pleasures'), Present Fatalism (9 items; e.g. 'Fate determines much in my life'), and Future (13 items; e.g. 'I believe that a person's day should be planned ahead each morning'). All subscales have a scoring range of 1–5, where higher scores indicate a preference for that particular time perspective.

Results and discussion

The correlations between the ZTPI and MHI-18 scales (see Tab. 1) indicate that PP could indeed be defined as a beneficial TP, being positively correlated with the Mental Health Index and the positive affect scale and negatively associated with the depression, anxiety and loss of behavioural control scales (all medium-sized effects). As hypothesised, the patterns of associations for PN and PF were inversed, with large effect sizes evident for the associations between the MHI-I8 scales and PN, but medium-sized effects for PF, confirming that PN and PF can be considered detrimental TPs. The pattern of association for F was the same as that for PP, indicating that it also is a beneficial TP, although all effect sizes were small. PH was only found to be significantly associated with positive affect, and weakly at that.

A multiple regression analysis was completed to assess the relationships between the five ZTPI scales and the MHI-18 Mental Health Index scores. Together, the five scales explained 43% of the variance in Mental Health Index scores: $R^2 = .44$, Adjusted $R^2 = .43$, $F(5, 204) = 31.61$, $p < .001$. However, as is evident in Table 2, only PN and PP explained significant proportions of the variance, and PN was the most

important of the ZTPI scales for this purpose. Given the strength of their univariate associations with Mental Health Index scores, it is unsurprising that PH and F do not contribute significantly within the multiple regression analysis. However, the lack of significant contribution by PF is unexpected. It is likely that this is a reflection of the shared variance evident between this variable and PN, which correlate moderately (r = .43).

Tab. 1. Means, standard deviations, alphas, and inter-correlations between ZTPI and MHI-18 scales

	M	SD	α	PP	PN	PH	PF	F	MH Index	Depression	Anxiety	Loss BC
PP	3.59	0.58	.78	-								
PN	3.09	0.70	.85	-.38***	-							
PH	3.31	0.49	.81	.20**	< .01	-						
PF	2.45	0.50	.70	-.15*	.43***	.24***	-					
F	3.54	0.49	.79	.17**	-.13*	-.28***	-.35***	-				
MH Index	68.17	17.74	.95	.37***	-.64***	.09	-.35***	.13*	-			
Depression	70.87	21.28	.91	-.32***	.59***	-.06	.31***	-.16*	-.90***	-		
Anxiety	63.83	20.54	.86	-.36***	.58***	-.09	.29***	-.14*	-.83***	.76***	-	
Loss BC	74.77	20.22	.86	-.37***	.55***	-.09	.36***	-.16*	-.91***	.81***	.74***	-
Pos Affect	61.76	19.21	.86	.44***	-.59***	.17*	-.32***	.16*	.86***	-.70***	-.64***	-.73***

* $p < .05$, ** $p < .01$, *** $p < .01$

Note: *PP* is Past-Positive, *PN* is Past-Negative, *PH* is Past-Hedonism, *PF* is Present-Fatalism, *F* is Future, *Loss BC* is Loss of Behavioural Control, *Pos Affect* is Positive Affect

Tab. 2. Standard multiple regression, predicting Mental Health Index scores from ZTPI scales

	B	*β*	*r*	sr^2
PP	3.79*	.120	.37	.011
PN	-14.11***	-.544	-.64	.210
PH	3.66	.097	.09	.008
PF	-3.89	-.108	-.35	.008
F	1.30	.035	.13	<.001

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: $R^2 = .44$, Adjusted $R^2 = .43$, $F(5, 204) = 31.61$, $p < .001$. The squared semi-partial (sr^2) correlation is derived from the part correlation in SPSS. The *r* given is for the zero-order correlation. Predictors were entered simultaneously

These results support those of van Beek et al. (2011), indicating that PN is the principal ZTPI scale explaining psychological well-being differences between individuals, and that PP also plays a small role. As noted by van Beek et al., the relationship between PN and psychological distress is likely to be bidirectional, with people who are experiencing symptoms of psychological distress (i.e. depression, anxiety) being more likely to ruminate on past negative experiences, and those who dwell on negative experiences being more likely to develop symptoms of depression

and anxiety. It is also possible that a similar bidirectional relationship is present for psychological well-being and PP, with individuals with high levels of well-being, such as positive affect, being more likely than those with lower levels to draw on positive memories in everyday life and to interpret current experiences in a positive light, thus increasing their levels of PP. Nevertheless, at least in relation to psychological well-being, it appears that low PN and high PP are more important than the other ZTPI scales for explaining positive everyday functioning.

Study 2: The development of beneficial time perspectives

While there is some evidence that TPs are learned and are related to personality (Zimbardo & Boyd, 1999, 2008), there is a lack of research investigating other factors that may influence their development. Consistent with the findings of the previous study, the present study focused on using structural equation modelling to develop a model of the factors underlying PP, which was identified as the most beneficial TP. A model was also developed for PN, which was identified as the most detrimental TP. For this study, the decision was made to focus on basic psychological need satisfaction and attachment orientation as possible factors underlying PP and PN TPs.

The three basic psychological needs, as outlined within Deci and Ryan's Self-Determination Theory, are autonomy, competence and relatedness. Deci and Ryan (2000) state that these needs are 'innate psychological nutriments that are essential for ongoing psychological growth, integrity and well-being' (p. 229). Need satisfaction is evident when an individual's actions are undertaken of their own free will, with such behaviour being self-directed and regulated (autonomy), when they feel they are capable of accomplishing tasks and of interacting with others and their environment effectively (competence), and they have close emotional bonds and attachments with other people (relatedness). As such, optimal functioning, growth and well-being are evident when the three needs are satisfied (Deci & Ryan, 2000). Research supports this theory, with individuals with high levels of autonomy, competence and relatedness being found to be more likely than those with low levels of these qualities to: have high levels of psychological well-being and positive affect, be intrinsically motivated, have enhanced self-motivation and self-regulation, engage in prosocial behaviours; and to be less likely to experience burnout, depression and anxiety (Ryan & Deci, 2000; Ryan, Huta & Deci, 2008; Van den Broeck, Vansteenkiste, De Witte & Lens, 2008).

Zhang et al. (2012) found overall psychological need satisfaction to be positively associated with PP, PH and F, and negatively associated with PN and PF; they did not examine associations independently for autonomy, competence and relatedness. The patterns of inter-correlations between these variables are likely to provide some clarification on the mechanisms underlying these associations. However, it can be speculated that PP is positively associated with relatedness, because pleasant memories are often the result of social interactions (e.g. celebrations, family

gatherings, shared experiences with friends); competence, because an individual tends to feel this when they can draw on examples from their past to provide evidence of their ability to successfully engage with their environment (e.g. coping with challenges, attainment of skills, accomplishments); and autonomy, because when an individual acts autonomously, they are likely to engage in activities that they enjoy and have experiences that they value, thus their autonomy may result in the creation of a greater number of 'positive' memories.

Laghi, D'Alessio, Pallini and Baiocco (2009) also assessed psychological need satisfaction in conjunction with ZTPI scales, but did not report associations between the variables. Nevertheless, they found that parental and peer attachment were positively associated with PP, autonomy, competence and relatedness, and negatively associated with PN. Positive associations between basic psychological need satisfaction and secure attachment orientation were also found by La Guardia, Ryan, Couchman and Deci (2000). Attachment theory explains the mechanisms by which the caregiver-child relationship impacts on the psychosocial well-being of individuals throughout life; the attachment orientation developed during early childhood generally does not change substantially over the lifespan without intervention or therapy. Attachment orientation is measured in relation to two continuums: attachment anxiety and attachment avoidance. A securely attached individual will score low on both continuums. In contrast, insecurely attached individuals may be high on attachment anxiety, which is associated with feeling negatively about the self while holding positive views of others, and/or high on attachment avoidance, which is associated with holding positive views of the self and negative views of others (Bartholomew, 1990).

The basic tenants of attachment theory (for review see: Ainsworth & Bowlby, 1991) state that a child develops a secure attachment style when they receive warm, responsive and consistent caregiving. Through this nurturing relationship, the child learns that other people are reliable, caring and trustworthy, and the child develops feelings of self-worth because they feel valued. The outcomes of such a secure attachment to a caregiver enable an individual to feel safe in relationships, being able to give and receive support and care, and to feel connected to others (i.e. satisfaction of relatedness needs). Secure attachment relationships in childhood also lead the child to view the physical environment as a place into which they can venture safely, because they know that their caregiver is available if needed. This provides optimal conditions for a child to explore their environment, learning about the physical and social world and developing abilities, skills and feelings of self-efficacy (i.e. satisfaction of competency needs). When appropriately supported, such exploration of their environment also enables a child to be autonomous in their behaviour, learning to be self-directed and to regulate their behaviour as necessary for different contexts, but also learning to act independently of others to achieve their own goals, on their own terms (i.e. satisfaction of autonomy needs).

To summarise, it is posited here that secure attachment relationships during early childhood provide optimal conditions for an individual to achieve satisfaction

of their autonomy, competency and relatedness needs, laying the foundation for the development of beneficial TPs and social and emotional well-being throughout life. Conversely, without intervention, insecure attachment can have adverse repercussions across the lifespan, undermining the satisfaction of basic psychological need satisfaction, promoting the use of detrimental TPs, and leading to psychological distress. It is, therefore, hypothesised that the attachment orientation and basic psychological need satisfaction will be associated with PP and PN as is depicted in Figure 1. However, it is likely that the two attachment orientation variables and three basic psychological needs will interrelate differently with PP and PN, thus two separate models will be developed.

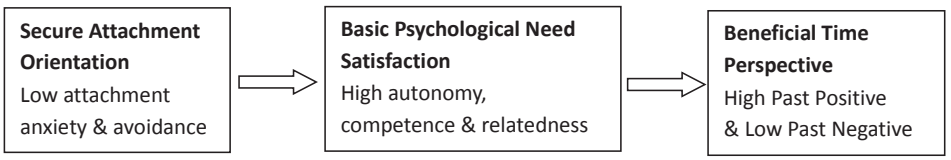

Fig. 1. Proposed model of association between factors leading to the development of beneficial time perspectives

Method

The sample of 443 (75% female) participants consisted of undergraduate psychology students and members of the broader population. Students were recruited through courses at two regional universities in Australia, while other participants were recruited via social media (e.g. Facebook) and email snowballing. Participants were aged between 18–80 years (M = 31.2, SD = 13). As in Study 1, participants were provided with a link to an anonymous online questionnaire that was hosted by SurveyMonkey.com. The questionnaire contained demographic items, the Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999), the revised version of the Experiences in Close Relationships Questionnaire (ECR-R; Fraley, Waller & Brennan, 2000), and the Basic Psychological Need Satisfaction Scale (BPNS; Gagne, 2003).

The 36-item ECR-R was used to assess adult attachment orientation. Participants responded to items on a 7-point scale (1 = strongly disagree, 7 = strongly agree), indicating how they felt about someone with whom they were in a relationship. Two subscales can be calculated: attachment anxiety (18 items; e.g. 'I worry that they won't care about me as much as I care about them') and attachment avoidance (18 items; e.g. 'I get uncomfortable when they want to be very close'), both with scores ranging 0–7, where higher scores indicate higher levels of attachment insecurity.

The BPNS consists of 21 items, which can be responded to on a 7-point scale (1 = not at all true, 7 = very true). There are three subscales: autonomy (7 items; e.g. 'I feel like I am free to decide for myself how I live'), competence (6 items; e.g. 'Most

days I feel a sense of accomplishment from what I do'), and relatedness (8 items; e.g. 'I get along with people I come into contact with'). All subscales have a scoring range of 1–7, with higher scores indicating greater levels of need satisfaction.

Results and discussion

As can be seen in Table 3, PP was positively correlated with all three BPNS scales and negatively associated with attachment anxiety and avoidance scales. The inverse pattern of associations was evident for PN. Additionally, the two attachment scales were negatively associated with autonomy, competence and relatedness.

Tab. 3. Means, standard deviations, alphas, and inter-correlations between ZTPI, ECR-R and BPNS scales

	M	SD	α	PP	PN	PH	PF	F	AAnxiety	AAvoidance	Autonomy	Competence
PP	3.64	0.55	.75	-								
PN	3.09	0.71	.85	-.36***	-							
PH	3.37	0.47	.80	.19***	.05	-						
PF	2.47	0.52	.72	-.13**	.42***	.22***	-					
F	3.54	0.47	.76	.13**	-.08	-.25***	-.30***	-				
AAnxiety	3.12	1.3	.93	-.14**	.50***	.14**	.33***	-.08	-			
AAvoidance	2.88	1.14	.89	-.19***	.31***	-.09	.27***	-.09	.59***	-		
Autonomy	4.95	0.89	.77	.29***	-.56***	.15**	-.28***	.04	-.48***	-.40***	-	
Competence	4.97	1.01	.75	.35***	-.57***	.11*	-.35***	.25***	-.47***	-.38***	.61***	-
Relatedness	5.52	0.83	.82	.40***	-.38***	.17*	-.23***	.07	-.29***	-.38***	.58***	.48***

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: *PP* is Past-Positive, *PN* is Past-Negative, *PH* is Past-Hedonism, *PF* is Present-Fatalism, *F* is Future, *AAnxiety* is Attachment Anxiety, *AAvoidance* is Attachment Avoidance

A series of multiple regression analyses were undertaken to identify variables for inclusion in the two SEM models. In keeping with the hypothesised model, the first set of two regressions examined the relationships between the three BPNS scales and PP and PN, respectively (see Tab. 4). These analyses indicated that competence and relatedness explained significant proportions of the variance in PP scores ($R^2 = .19$, Adjusted $R^2 = .19$), while autonomy and competence explained significant proportions of variance in PN scores ($R^2 = .39$, Adjusted $R^2 = .39$). Relatedness explained the largest proportion of variance in PP scores whereas competence explained the largest proportion in PN scores.

Tab. 4. Standard multiple regressions, predicting Past-Positive and Past-Negative from BPNS scales

	B	*β*	R	*sr²*
Past Positive: R^2 = .19, Adjusted R^2 = .19, F(3, 456) = 35.47, p < .001				
Autonomy	-0.02	-.026	.29	<.001
Competence	0.12***	.215	.35	.028
Relatedness	0.20***	.310	.40	.062
Past Negative: R^2 = .39, Adjusted R^2 = .39, F(3, 456) = 98.26, p < .001				
Autonomy	-0.25***	-.337	-.55	.050
Competence	-0.26***	-.360	-.57	.082
Relatedness	-0.03	-.009	-.39	<.001

* p < .05, ** p < .01, *** p < .001

Note: The squared semi-partial (sr^2) correlation is derived from the part correlation in SPSS. The *r* given is for the zero-order correlation. Predictors were entered simultaneously

The second set of three regression analyses examined the relationships between the ECR-R scales and autonomy, competence and relatedness, respectively (see Tab. 5). For autonomy (R^2 = .25, Adjusted R^2 = .24) and competence (R^2 = .24, Adjusted R^2 = .24) both attachment scales explained significant proportions of the variance, with attachment anxiety explaining the largest amount. In contrast, only attachment avoidance explained a significant proportion of variance in relatedness scores (R^2 =.15, Adjusted R^2 =.15), however attachment anxiety was near significance (p = .06).

Tab. 5. Standard multiple regressions, predicting BPNS from ECR-R scales

	B	β	R	*sr²*
Autonomy: R^2 = .25, Adjusted R^2 = .24, F(2, 437) = 71.58, p < .001				
AAnxiety	-0.25***	-.371	-.48	.089
AAvoidance	-0.14**	-.178	-.40	.021
Competence: R^2 = .24, Adjusted R^2 = 24, F(2, 437) = 68.19, p < .001				
AAnxiety	-0.29***	-.377	-.47	.092
AAvoidance	-0.14**	-.160	-.38	.017
Relatedness: R^2 = .15, Adjusted R^2 = .15, F(2, 437) = 39.25, p < .001				
AAnxiety	-0.06	-.103	-.29	.007
AAvoidance	-0.23***	-.321	-.38	.067

* p < .05, ** p < .01, *** p < .001

Note: *AAnxiety* is Attachment Anxiety, *AAvoidance* is Attachment Avoidance. The squared semi-partial (sr^2) correlation is derived from the part correlation in SPSS. The *r* given is for the zero-order correlation. Predictors were entered simultaneously

Based on these findings, two models were tested using structural equation modelling (see Fig. 2 & 3) and found to be a good fit with the data (see Tab. 6 for model fit indices). For PP, the model explained 19% of variance in scores, while the PN model explained 44% of variance.

Tab. 6. Indices of model fit for Past-Positive and Past-Negative

Model	χ2	*df*	χ^2/df	RMSEA (90% *CI*)	CFI	TLI
Past Positive	1.703	2	0.852	<.001 [<.001, .090]	1.000	1.003
Past Negative	3.084	1	3.084	.069 [<.001, .163]	0.997	0.974

Note: RMSEA is Root Mean Square Error of Approximation, CFI is Comparative Fit Index, TLI is Tucker-Lewis Index

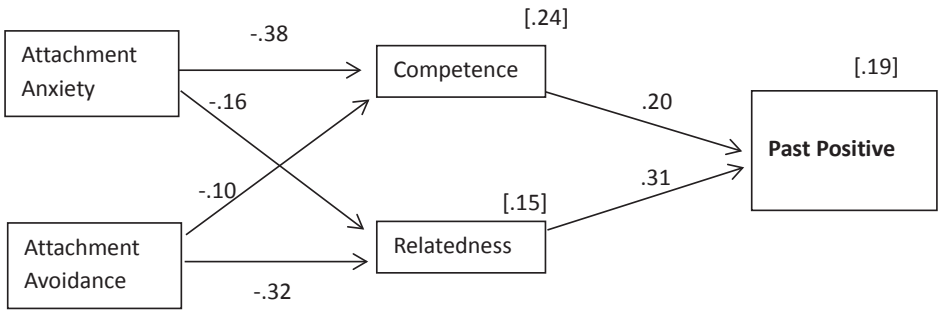

Fig. 2. Model of cross-sectional predictors of past positive scores. Relationships are statistically significant (p < .001), with the exception of attachment avoidance and competence (p = .002) and attachment anxiety and relatedness (p = .058). Values in square brackets are the percentage variance explained

The model for PP (see Fig. 2) indicates that its relationships with both attachment anxiety and attachment avoidance are fully mediated by competence and relatedness. While keeping in mind that these models are based on cross-sectional data, it appears that attachment security (i.e. low levels of attachment anxiety and avoidance) leads to higher levels of satisfaction of competence and relatedness needs, which in turn lead to a PP bias. As such, this model generally conforms to the pattern of associations hypothesised. Specifically, it seems that attachment anxiety, where individuals are overly dependent on others, undermines the development of feelings of competency, whereas attachment avoidance (unsurprising) adversely affects the ability of individuals to develop close relationships with others. In turn, it is suggested that the activities and experiences associated with the satisfaction of relatedness and competence needs provide a ready store of pleasant memories and experiences for individuals to draw on when interpreting events and making decisions in the present, which is reflected by high PP scores.

The model for PN (see Fig. 3) indicates that attachment anxiety is directly related to PN but that the relationship between attachment avoidance and PN is mediated by both autonomy and competence. Thus, it appears that high levels of attachment avoidance lead to lower levels of satisfaction of autonomy and competency needs, which, along with high levels of attachment anxiety, lead to a PN bias. While there were no specific hypotheses for the PN model, it was implied that it would be somewhat the reverse of the PP model. In terms of the directions of the associations,

this is the case; however, it is important to note the differences between the two models. Specifically, the direct association between attachment anxiety and PN and the fact that the satisfaction of autonomy needs does not play a role in PP, whereas satisfaction of relatedness needs is not associated with PN. Further, the importance of attachment orientation and competence in both models should be noted.

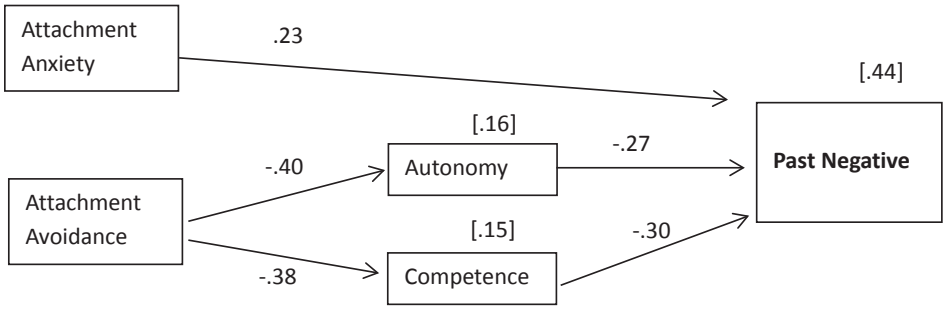

Fig. 3. Model of cross-sectional predictors of past negative scores. Relationships are statistically significant ($p < .001$). Values in square brackets are the percentage variance explained

Together, these models suggest that attempting to counter high PN by working to increase PP, as suggested by van Beek et al. (2011), will only do part of the job. Additionally, the level of success of this method will be dependent on which underlying factors are improved by these efforts. That is, if efforts are made to increase levels of relatedness, this may act to increase PP but have no impact on PN. In contrast, if competency needs or attachment issues are addressed, it is likely that increases will be evident for both PP and PN.

General discussion

The findings from the two studies presented here indicate that there is benefit in looking at individual TPs rather than just focusing on the ideal of a BTP. In relation to psychological well-being/distress, it is evident that PN is a detrimental TP and that it is the most important TP in terms of explanatory power. That is, while PP is a beneficial TP, it only explains a small amount of the variance in symptomatology scores. It is possible that the patterns of association between the five TPs and other psychosocial indicators of well-being may differ, with other TPs explaining a higher proportion of variance than PN, but there is little evidence of this in the literature. Thus, it is suggested that greater research and clinical attention be paid to high levels of PN to improve our understanding of the impact of this TP on everyday functioning and determine the best methods in which levels can be lowered for affected individuals.

The model developed for PN in the present study provides a starting point for future efforts in this area. For example, research is needed to determine if interventions aimed at increasing the satisfaction of autonomy and competence

needs result in decreased levels of PN and associated psychological distress over time. Similarly, and in line with the tenants of positive psychology (Seligman & Csikszentmihalyi, 2000), it is important to also assist people to increase their levels of well-being, such as by increasing PP levels. This may be achieved through interventions aimed at increasing social connections and building feelings of competency. Attachment orientation could also be addressed in both cases, however, this is likely to be a somewhat harder task than increasing basic psychological need satisfaction.

These models should, however, be interpreted with some level of caution as they are based on cross-sectional rather than longitudinal data. As TPs are likely to be dynamic rather than fixed over time, probably being affected through bidirectional relationships or 'feedback loops' (e.g. TP impacting on current well--being and affect, leading to rumination and/or memory biases, which then impact TP [or perhaps their measurement]). There is a need for longitudinal studies to determine how stable TPs are during adulthood and what types of life experiences can cause both positive and adverse changes in an individual's TP. Additionally, while a somewhat developmental approach has been suggested in this study, particularly through the use of attachment orientation (which is known to be relatively stable throughout life, without intervention), longitudinal studies are needed to fully investigate the development of TP from infancy through adulthood to capture the interplay of nature, nurture and life experiences on the development of beneficial time perspectives, and in doing so, determine the veracity of the models proposed here.

Further to this, it is also important to note that the PP model only explains 19% of the variance in PP scores, and the PN model explains 44% of variance. This indicates that there are likely to be other factors that explain significant proportions of the variance. It is likely that such factors will have some effect on efforts to increase PP and decrease PN scores, thus, further research is needed in this area to identify possible factors and investigate the role/s they play in relation to the development of both beneficial and detrimental TPs. Moreover, the results presented here should be viewed with the knowledge that the predominantly female samples in both studies may mean that results are not as applicable to males.

Nevertheless, it is suggested that greater efforts are made to encourage and support parents to develop secure attachment relationships with their children, promote the satisfaction of their basic psychological needs, and assist in their development of beneficial TP profiles. Further, due to their influence on the daily lives of children, there is a need for early childhood educators to learn about these psychosocial factors so that they can actively support the development of social and emotional well-being in the children they teach and nurture (Temple & Emmett, 2013). It is likely that such efforts will have a preventative effect on incidence rates of psychological distress, particularly if information provision is augmented with training in skills and techniques associated with promoting the development and maintenance of well-being across the lifespan.

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