The Psychological Well-Being−Post-Traumatic Changes Questionnaire (PWB-PTCQ): Reliability and Validity

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The Psychological Well-Being Post-Traumatic Changes Questionnaire (PWB-PTCQ) is an 18 item self-report measure to assess perceived changes in psychological well-being following traumatic events. The aim was to test its psychometric properties. Across three samples, evidence is provided for a single factor structure (invariant across clinical and general populations), high internal consistency (α > .87), six month stability, incremental validity over and above existing measures of posttraumatic growth as a predictor of subjective well-being, convergent validity with existing measures of posttraumatic growth ($r = .50−.56. p < .001$), concurrent validity with personality and coping measures, predictive validity of change in well-being over time, discriminant validity with social desirability, and prediction of clinical caseness.

Keywords: growth following adversity, psychological well-being, posttraumatic growth, psychometric assessment

Scientific interest in the topic of growth following adversity took hold during the 1990s with the emergence of several psychometric self-report tools, notably, the Changes in Outlook Questionnaire (CiOQ; Joseph, Williams, & Yule, 1993), the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), the Stress-Related Growth Scale (SRGS; Park, Cohen, & Murch, 1996), the Perceived Benefit Scales (PBS; McMillen & Fisher, 1998), and the Thriving Scale (TS; Abraido-Lanza et al., 1998). Since then research has progressed considerably (for reviews see, Helgeson, Reynolds, & Tomich, 2006; Joseph & Butler, 2010). While these earlier measures have fuelled scientific investigation, their limitations are now becoming evident. Most problematic is the lack of a clear theoretical conceptualization of what actually constitutes growth following adversity (see, Joseph & Linley, 2008).

One promising theoretical advance is Joseph and Linley's (2005) conceptualization of growth following adversity as an increase in psychological well-being (PWB) as opposed to subjective well-being (SWB). PWB and SWB are derived from two different philosophical perspectives on the good life, the eudaimonic and the hedonic approach, respectively (Keyes, Shmotkin, & Ryff, 2002; Linley, Maltby, Wood, Osborne, & Hurling, 2009; Ryan & Deci, 2001; Wood & Joseph, 2010). Whereas SWB reflects affective states and life satisfaction, PWB reflects engagement with the existential challenges of life. More specifically, Ryff's (1989; Ryff & Singer, 1996) conceptualization of PWB consists of six aspects; autonomy, environmental mastery, positive relations with others, personal growth, purpose in life, and self-acceptance. Those high on autonomy are self-determining and able to resist social pressures to think and act in certain ways. Those high on environmental mastery have a sense of control and are able to make effective use of opportunities. Those high on personal growth have a feeling of continued development and are open to new experiences. Those high on positive relationships have warm satisfying, trusting relationships with others and are capable of empathy, affection, and intimacy. Those high on purpose in life have goals in life and a sense of directedness and hold beliefs that give life purpose. Those high on self-acceptance possess a positive attitude toward themselves and feel positive about their life.

Using the above established theoretical architecture of PWB, coupled with the general format of existing growth measures, Regel and Joseph (2010) developed the Psychological Well-Being−Post-Traumatic Changes Questionnaire (PWB-PTCQ).

The PWB-PTCQ consists of 18 items (see Table 1), with three items developed to reflect each of the domains of self-acceptance (1, 7, & 13), autonomy (2, 8, & 14), purpose in life (3, 9, & 15), relationships (4, 10, & 16), sense of mastery (5, 11, & 17), and personal growth (6, 12, & 18). Respondents are asked to rate how much they perceive themselves to have changed on each item as a result of the trauma on a five-point scale; 5 = *Much more so now*, 4 = *A bit more so now*, 3 = *I feel the same about this as before*, 2 = *A bit less so now*, 1 = *Much less so now*. Thus, scores have a possible range of 18 to 90, with higher scores indicating greater positive change.

There are three potential advantages to the PWB-PTCQ. The first is theoretical as it adopts an established conceptual architecture to provide a definition of growth following adversity that allows researchers and clinicians to integrate posttraumatic growth within the wider literature on well-being and positive psychology. Second, it promises incremental validity as aspects of change are now included that were previously outside the measurement spotlight. Third, it allows for respondents to rate how they have changed in positive as well as negative directions. While it is true that over a prolonged period of time people will often have experienced both negative and positive changes (Joseph et al., 2005), at any single point in time respondents can only perceive themselves to have either decreased, stayed the same, or increased on any domain of PWB. The PWB-PTCQ appears promising as a new clinical and research tool, but as yet no empirical research has reported on its reliability and validity. The aim was to provide evidence in eight ways for its psychometric properties.

First, we were concerned to establish the factor structure. While the PWB-PTCQ was developed on the conceptualization of six domains of functioning, the six domains are likely highly interrelated so that it would be best scored as a single scale, similar to other widely used assessment inventories in clinical and counseling psychology which likewise are scored as single scales but

Table 1
1 Factor Solution With Maximum Likelihood With Promax Rotation of All the Items

	1 Factor
1. I like myself.	.54
2. I have confidence in my opinions.	.61
3. I have a sense of purpose in life.	.51
4. I have strong and close relationships in my life.	.42
5. I feel I am in control of my life.	.58
6. I am open to new experiences that challenge me.	.46
7. I accept who I am, with both my strengths and limitations.	.61
8. I don't worry what other people think of me.	.55
9. My life has meaning.	.47
10. I am a compassionate and giving person.	.44
11. I handle my responsibilities in life well.	.53
12. I am always seeking to learn about myself.	.62
13. I respect myself.	.64
14. I know what is important to me and will stand my ground, even if others disagree.	.66
15. I feel that my life is worthwhile and that I play a valuable role in things.	.48
16. I am grateful to have people in my life who care for me.	.45
17. I am able to cope with what life throws at me.	.45
18. I am hopeful about my future and look forward to new possibilities.	.61

developed on a theoretical architecture of several underlying and interrelated domains of functioning (e.g., Beck Depression Inventory). Second, it is important to establish internal-consistency reliability and test–retest reliability in order to show that the items do cohere and responses remain relatively stable over time. Third, we wished to test for correlation with extant measures of growth following adversity, in this case the CiOQ and the PTGI, in order to establish convergent validity. Fourth, we wished to test for incremental validity: whether the PWB-PTCQ is able to account for variance on well-established SWB outcome measures, in this case the Positive and Negative Affect Schedule (PANAS) and the Satisfaction with Life Scale (SWLS), over and above these existing growth measures. Fifth, the PWB-PTCQ is a retrospective measure of perceptions of change. But it is assumed that perceptions of change correlate with actual change. As such, we were concerned to establish that scores on the PWB-PTCQ correlate with differences in state levels of PWB over the time asked for.

Sixth, we formed a nomological net of theoretically related constructs for which correlations with the PWB-PTCQ would demonstrate concurrent validity. Some correlations were expected with personality, particularly with the Big Five constellation, since previous research using measures such as the PTGI has shown small positive associations with extraversion, openness, agreeableness, and conscientiousness, and a moderate negative association with neuroticism. Results are not always consistent and when partial correlations are conducted, neuroticism seems to be the main correlate (Linley & Joseph, 2004).

But given that the purpose of the new measure is to assess not only the absence of negative functioning but also the presence of positive psychological functioning, it is also important to expand our nomological net to include measures that assess optimal functioning. Posttraumatic growth is thought to arise through the rebuilding of shattered assumptions about the self and the world, such that a positive association is to be expected with self-esteem and optimism. In support of this theoretical prediction, previous research has shown self-esteem and optimism to be correlates of growth as measured by the PTGI (Linley & Joseph, 2004). The rebuilding process also involves the person becoming truer to themselves and more appreciative of life, as predicted by organismic valuing theory (Joseph & Linley, 2005). As such, we would expect that growth is also related to greater authenticity (Wood, Linley, Maltby, Baliousis, & Joseph, 2008) and gratitude (Wood, Maltby, Stewart, & Joseph, 2008), two of the newer positive psychology constructs.

Growth following adversity requires at least some effortful deliberation. Positive reappraisal coping refers to attempts to deal with stressful situations by deliberately looking for new ways to positively reframe the situation. It is a common coping mechanism in those who are stressed and as such a high score on positive reframing per se does not imply growth, which is defined as a more permanent change in well-being, but for those who have experienced posttraumatic growth it is likely that this will have involved reappraisal coping. In support of this prediction, previous research has shown reappraisal coping to be a correlate of growth as measured by the PTGI (Linley & Joseph, 2004). As a further test of concurrent validity, we wished to test whether the pattern of associations between the PWB-PTCQ and the above nomological net of theoretically related constructs would be similar to that found with the CiOQ and the PTGI. If so, this would be consistent

with the view that all three measures are tapping a related construct.

Seventh, as a test of discriminant validity we wished to test for association with social desirability. Growth following adversity is not expected to be related to social desirability. A relationship with socially desirable responding would suggest that the scale was capturing an aspect of experience for which it was not intended and would undermine its utility.

Finally, it is thought that diagnostic levels of PTSD impede growth (Butler et al., 2005) and so we wished to establish whether the PWB-PTCQ was able to discriminate between those with and those without diagnostic levels of posttraumatic stress. While the PWB-PTCQ is not intended as a diagnostic instrument as such it is expected that lower scores on the scale will increasing reflect psychopathology.

In these eight ways we aim to seek evidence for the reliability and validity of the PWB-PTCQ as a measure of changes following adversity that will be useful to clinicians and researchers who wish to look beyond the traditional spotlight of posttraumatic stress to the positive psychological ways in which trauma can impact on people's lives.

Method

Participants and Procedure

Sample 1: General population sample. Two hundred and 14 respondents (98 males, 116 females) were sampled from a number of workplace, church, and community groups in the North and East Midlands regions of the United Kingdom. Ages ranged from 20 to 65 years ($M = 33.54$ years, $SD = 11.0$). Participants were predominantly White (50.9%), with the next highest represented ethnicities being Asian (23.8%) and Black (15.9%). Initially 360 questionnaires were distributed, giving a response rate of 59.4%. Respondents were asked to indicate the most negative event in their lives in the previous six months, then to indicate on a 5-point scale the extent to which this event was negative ($1 = Not\ at\ all$, $2 = A\ little$, $3 = Somewhat$, $4 = A\ lot$, $5 = Very\ Much\ So$). The mean score on this scale ($M = 4.12$, $SD = .70$) indicated that respondents were thinking about an event which had a strongly negative valance.

Participants completed the PWB-PTCQ. In order to test for convergent validity participants also completed two other measures of growth following adversity. The *Posttraumatic Growth Inventory* (PTGI: Tedeschi & Calhoun, 1996) is a 21-item self-report measure of positive outcomes following trauma. The inventory yields a potential range of 0–105, with a higher score indicating greater experience of posttraumatic growth. The *Changes in Outlook Questionnaire* (CiOQ: Joseph et al., 1993) is a 26-item self-report measure designed to assess schematic changes. The CiOQ consists of two scales: positive change (CiOP: 11 items; e.g., "*I value other people more now*"), with a range of 11–66; and negative changes (CiON: 15 items; e.g., "*I no longer feel able to cope with things*"), with a range of 15−90. Higher scores indicate more positive and negative changes respectively.

In order to investigate incremental validity participants completed two measures that assessed SWB. The *Positive and Negative Affect Scales* (PANAS; Watson, Clark, & Tellegen, 1988) are two 10-item scales to assess positive and negative mood states.

The *Satisfaction With Life Scale* (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a 5-item measure of global judgment about life satisfaction.

In order to investigate concurrent validity, participants also completed six measures assessing the nomological net of personality, optimal functioning, and coping variables. The *Ten-Item Personality Inventory* (Gosling, Rentfrow, & Swann, Jr., 2003) is a 10-item measure of the Five-Factor Model dimensions of Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience, with two items assessing each of the five personality factors. The *Life Orientation Test–Revised* (Scheier, Carver, & Bridges, 1994) is a 10-item scale that contains six items that measure of optimism with four filler items. The *Rosenberg Self-Esteem Scale* (Rosenberg, 1965) is a 10-item measure of global self-esteem. The *Gratitude Questionnaire-6* (GQ6; McCullough, Emmons, & Tsang, 2002) is a 6-item measure of trait gratitude. The *Authenticity Scale* (Wood, Linley, Maltby, Baliousis, & Joseph, 2008) is a 12-item measure of authenticity consisting of three subscales—authentic living, external influence, and self-alienation. The *Emotional Regulation Questionnaire* (Gross & John, 1993) is a 10-item measure designed to assess individual differences in the habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression.

Sample 2: Trauma sample. Two-hundred and 54 respondents (224 females and 30 males) took part in an Internet survey. Ages ranged from 18 to 63 years ($M = 31.40$, $SD = 10.80$). Participants were mostly white ($n = 210$; 82.7%), single ($n = 126$; 49.6%), and educated to at least university level ($n = 133$; 52.4%). A variety of index traumatic events were reported. The events had occurred within two weeks to 31 years previously ($M = 6.32$ years, $SD = 6.06$ years); 43.3% of cases had experienced the event within the last three years and 20.4% had experienced the event more than 10 years previously. Participants ages at the time of the trauma ranged from three years to 62 years old ($M = 24.65$; $SD = 11.66$), with 21.3% of participants being aged 16 or younger at the time of the event. Participants were asked to rate how distressing they had found their experience ranging from 0 (*not at all distressing*) to 4 (*extremely distressing*); 66.9% of participants rated their experience as extremely distressing ($M = 3.54$, $SD = 0.75$). With respect to the *DSM–IV* A criterion, 59.7% of participants perceived the experience to have been a threat to their life or their physical or psychological well-being; 83.8% of participants agreed that their response to the event had involved intense fear, helplessness or horror; and 55.4% agreed with both statements.

Participants were recruited via requests for participants placed on websites, message-boards and forums devoted to traumatic stress and associated websites (e.g., cancer, bereavement, rape, sexual abuse). Potential participants followed a "link" from these websites to the online questionnaire, where they read information about the study, requirements of participation, and their rights as participants. The page access counter logged 471 "hits" to the study website. Three-hundred and 99 individuals agreed with the consent statements, but 98 of those did not proceed further to answer any questions and exited the study. Of the remaining 301 respondents, 18 answered the demographic questions but did not proceed to answer any further questions and exited the study. A further 29 participants did not complete all measures, leaving a final sample of 254 participants with complete responses. Completers and noncompleters did not differ in terms of age ($t =$

−1.910, $df = 299$, $p = .07$), sex ($\chi^2 = .704$, $df = 1$, $p = .401$), education ($\chi^2 = 3.666$, $df = 4$, $p = .453$), marital status ($\chi^2 = 2.141$, $df = 3$, $p = .544$), ethnicity ($\chi^2 = 2.570$, $df = 5$, $p = .766$), time since trauma ($t = .116$, $df = 292$, $p = .908$), age at trauma ($t = -1.616$, $df = 297$, $p = .107$), ratings of event stressfulness ($t = -1.098$, $df = 299$, $p = .273$), or whether they rated their experience as having met *DSM–IV* Criterion A ($\chi^2 = .067$, $df = 1$, $p = .796$).

Given that respondents for this study were recruited via a website, we further checked that data screening revealed no incorrect data or invalid entries. Missing values were infrequent (0.65%). No one item on any of the measures had more than six missing values and no participants had more than three missing items for each measure or six missing items overall. Of the 87 participants with missing values, 55 had only one value missing and a further 20 had only two values missing. Missing values analysis revealed that missing data were completely random (Little's MCAR test $\chi^2 = 6364.07$, $df = 6578$, $p = .970$). The data were also explored to determine suitability for parametric analyses. Box-plots indicated that the data had no extreme values or outliers for the majority of variables and this was confirmed using the criterion that values should be ≤ 3 standard deviations of the mean (Stevens, 2002). Skewness and kurtosis values were examined for all variables using the criterion that they should fall within two standard errors of skewness or kurtosis, respectively, and were found to be acceptable for all variables. Inspection of histograms with normal curves demonstrated normal distributions for all variables of interest, which were confirmed by nonsignificant Komologrov-Smirnov tests.

As well as the PWB-PTCQ, participants completed the *Impact of Event Scale*—Revised (IES-R: Weiss & Marmar, 1997). The IES-R is a 22-item self-report measure of subjective distress after experiencing trauma. Respondents rate each item on a 5-point Likert scale of 0 (*not at all*) to 4 (*extremely*), indicating how distressing each item had been in their life during the past seven days. In addition to the total score, the IES-R assesses avoidance, intrusion and hyper-arousal using three subscales. Scores for the total and each subscale are derived by calculating the mean score of nonmissing items; thus, the total and subscale scores can all range from a minimum of 0 to a maximum of 4; higher scores indicate greater distress.

Sample 3: General population sample. Eighty-five respondents (36 males, 49 females) were sampled from a number of workplace and community groups in the Yorkshire regions of the United Kingdom. Ages ranged from 22 to 62 years at the start of the study ($M = 35.55$ years, $SD = 6.2$). Initially 150 questionnaires were distributed, giving a response rate of 56.6%. Participants were asked to think of a recent upsetting event and to rate how distressing it was on a four-point scale: *a little* (4%), *somewhat* (15%), *a lot* (40%), and *very much* (41%). Participants volunteered for the study after being approached for their potential participation. Respondents were given full disclosure about the nature of the study and consented to being recontacted at one subsequent time point six months later.

As well as the PWB-PTCQ, participants completed the *Social Desirability Scale-17* at Time 1 (Stöber, 2001). The scale comprises 16 items that are answered using "true"–"false" categories so that scores on the total scale have a possible range from 0 to 16, with higher scores indicating greater socially desirable responding.

Each of the items provides a statement which most people would like to agree with but are unlikely to be able to truthfully do so (e.g., 'I always accept others' opinions even when they don't agree with my own'). At both time points, participants completed the *Scales of Psychological Well-being* (Ryff, 1989). This is an 18-item measure of state levels of PWB. The purpose of administering Ryff's measure at the two points in time was so that we could calculate a difference score—representing actual growth over the time period and use this to test for convergence with scores on the PWB-PTCQ as a retrospective measure of how much the person perceives themselves to have changed.

Results

Exploratory Factor Analysis

Exploratory factor analysis (EFA) was conducted on the 18-item PWB-PTCQ completed by sample 1. The decision on the number of factors to retain was based on parallel analysis of Monte Carlo simulations (Horn, 1965), an approach which is recommended because it allows the comparison of the eigenvalues to those that might be expected from purely random data with no structure (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Ledesma, & Valero-Mora, 2007; Zwick & Velicer, 1986). Parallel Analysis determines the number of factors because it demonstrates the least variability and compares well to others methods (Fabrigar et al., 1999; Ledesma & Valero-Mora, 2007; Zwick & Velicer, 1986). For the parallel analysis, the 2nd eigenvalue (5.810, 1.341) failed to exceed the 2nd mean eigenvalue (1.55, 1.43) calculated from 1,000 generated datasets with 218 cases and 28 variables, suggesting an optimal 1 factor solution. Table 1 shows item loadings ranged from .42 to .66 on the one factor solution.

Confirmatory Factor Analysis

Two models were tested. The first model assumes that all of the items exist under a single latent factor. This model is consistent with the theoretical expectation that although the items assess six aspects of PWB related growth, PWB growth itself is a unitary appraisal, with the six forms of PWB growth changing to a largely equal degree posttrauma. This model is also consistent with the EFA which suggested a clear single factor structure. The second model again assumed that PWB growth was a single factor, but also allowed errors to correlate between the three items of each of the six aspects. This would suggest that while the scale has a single structure, there is a greater integrative force between, for example, two items assessing self-acceptance, than there would be between a self-acceptance item and an item assessing environmental mastery. This could occur through either greater similarity in item wording or through each of the six aspects genuinely assessing a slightly different aspect of functioning.

We first tested the fit of these two models in both the clinical sample and the general population sample which hadn't been used in the EFA (Sample 3). Showing that both models have the same structure across the two samples is important because much of the psychometric testing in this paper uses the two samples interchangeably. As can be seen in Table 2, the correlated errors model fit the data slightly better than the one factor model (as shown by a significant Chi Squared difference in fit, $p < .01$, much lower AIC coefficient,

Table 2
Comparison of Two CFA Models

Model	Model fit						Model comparison			
	χ^2	df	AIC	CFI	SRMR	RMSEA	Comparison	$\Delta\chi^2$	Δdf	ΔAIC
Clinical Sample										
1. 1 Factor	638.59	135	710.59	.83	.06	.12				
2. 1 Factor Correlated errors	457.24	117	565.24	.90	.05	.10	Model 1 vs. Model 2	181.35	18	145.35
General Population Sample 3										
1. 1 Factor	256.82	135	328.83	.85	.07	.10				
2. 1 Factor Correlated errors	194.37	117	302.37	.90	.06	.09	Model 1 vs. Model 2	62.45	18	26.45

Note. All χ^2 and are $\Delta\chi^2$ are significant at $p < .001$.

and superior fit as indicated by the RMSEA, CFI, and SRMR). The fit of the model is perhaps best described as moderate, with values of RMSEA $< = .10$, SRMR $< = .10$, and CFI $> .90$ conventionally being considered minimal acceptable fit (Hu & Bentler, 1998). However, as Floyd and Widaman (1995) note, a high numbers of items normally leads to a poorer fit. Given these issues, we interpret the fit of the CFA as providing support for the expected factor structure.

We next more directly tested whether the one factor correlated error structure was invariant across the two samples with multi-group CFA (parameter estimates for both groups presented in Figure 1). The fit of the unconstrained model, where parameters were free to vary between the two models was: Chi Squared [$df = 234$] = 651.86, CFI = .90, RMSEA = .07, AIC = 867.89. The fit of the constrained model, where the factor loadings were fixed to
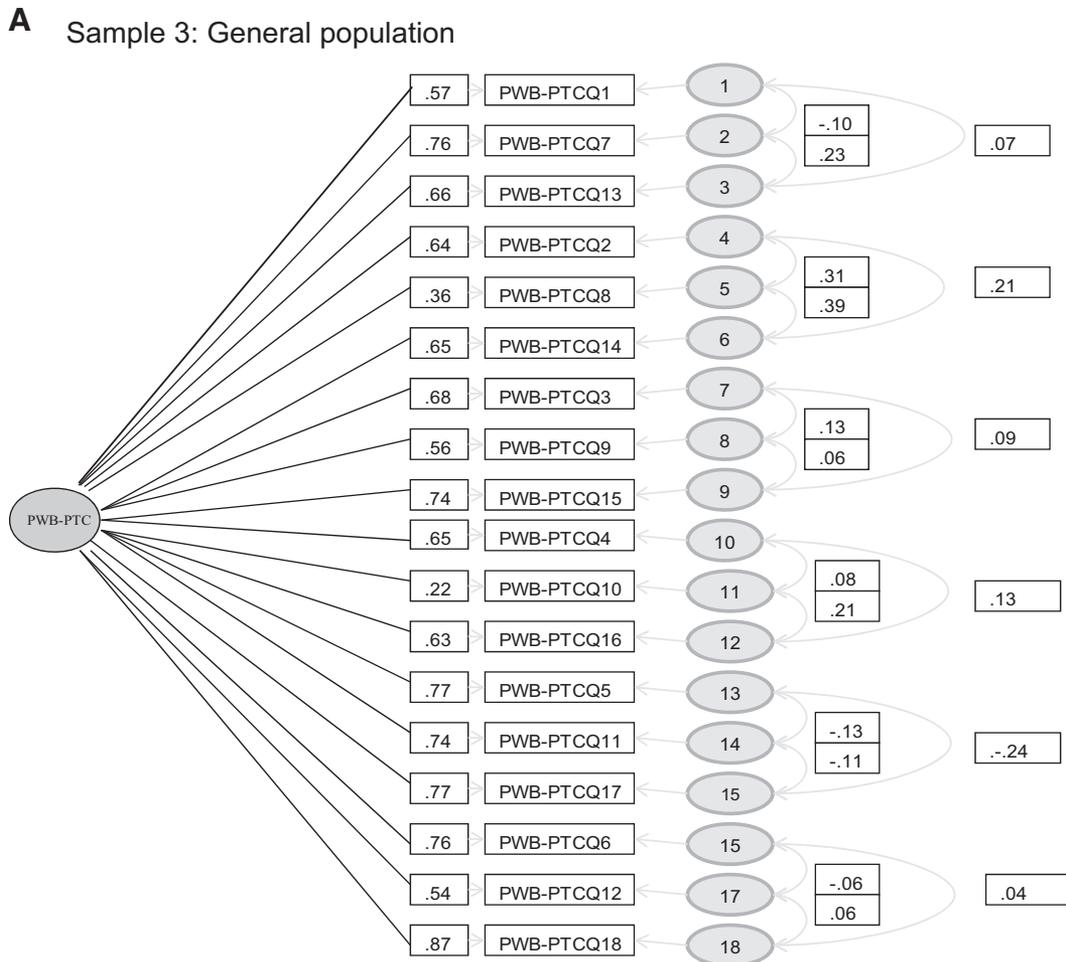
A Sample 3: General population

Figure 1. Parameter estimates for the general population and clinical samples.
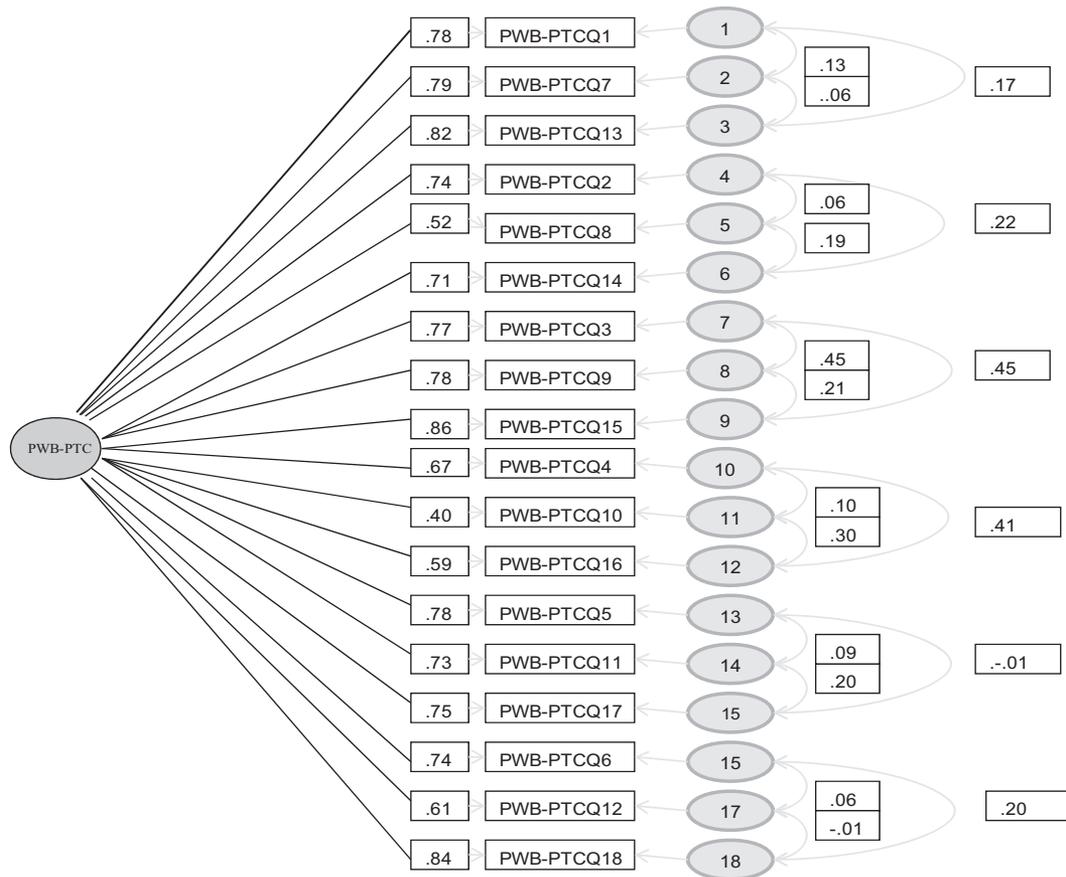
B Sample 2: Clinical

Figure 1 (continued).

be equal in both samples was: Chi Squared [*df* = 216] = 691.10, CFI = .90, RMSEA = .07, AIC = 871.10. The fit of the unconstrained model was absolutely better (Change in Chi Squared [*df* = 18] = 39.32, *p* < .01), as may be expected with the high *N* and large change in the degrees of freedom. However, the two models have identically sized RMSEA and CFI values (to 2 dp), and the small change in AIC (3.21) all indicate the retention of the more parsimonious (constrained) model. On this basis it appears that the model is largely invariant across both general population and clinical samples.

Reliability

Internal consistency reliability was satisfactory across the three samples and four data collection points (sample 1, *M* = 56.79, *SD* = 11.16, α = .87; sample 2, *M* = 58.71, *SD* = 16.08, α = .95; Sample 3 Time 1, *M* = 60.49, *SD* = 11.80, α = .93; Time 2, *M* = 62.46, *SD* = 12.27, α = .95). For sample 3, scores on the PWB-PTCQ showed a moderate level of consistency over time. Scores at Time 1 were associated with scores at Time 2 (*r* = .55, *p* < .001).

Convergent Validity

Higher scores on the PWB-PTCQ were associated with higher scores on the PTGI (*r* = .56, *p* < .001) and CiOP (*r* = .50, *p* < .001), and lower scores on the CiON (*r* = −.56, *p* < .001) for sample 1, confirming that the bipolar response format of the PWB-PTCQ is equally able to assess both positive and negative schematic changes. Consistent with previous research PTGI and CiOP scores were moderately positively associated (*r* = .31, *p* < .001), and PTGI and CiON scores moderately negatively associated (*r* = −.41, *p* < .001). Scores on the CiOP and CION were negatively associated (*r* = −.77, *p* < .001).

Incremental Validity

To examine the incremental value of PWB-PTCQ we examined how overall PWB-PTCQ, as a theoretical antecedent, predicted current hedonic (subjective) well-being, reflecting shorter term evaluation of present-day feeling and comprising the triad of positive affect, negative affect, and satisfaction with life (Keyes, Shmotkin, & Ryff, 2002) after controlling for the PTGI and the CiOQ, in sample 1.

Three hierarchical regression analyses were performed with Positive Affect, Negative Affect, and Satisfaction with Life used as dependent variables. For each multiple regression the PTGI and the positive and negative scales from the CiOQ were entered in the first step, and scores for the PWB-PTCQ on the final step. Table 3 shows the unstandardized regression coefficient (B), standardized regression coefficients (β), t test scores and probability values for each predictor variable for each regression.

When the PTGI and the scales from the CiOQ were entered in the first step they were not able to predict Positive Affect scores ($F = 2.16$, $df = 3, 210$, $p = .094$, $r = .17$, $r^2 = .03$, adjusted $r^2 = .02$) but did predict Negative Affect ($F = 4.27$, $df = 3, 210$, $p = .006$, $r = .24$, $r^2 = .06$, adjusted $r^2 = .02$) and Satisfaction with Life ($F = 6.77$, $df = 3, 210$, $p < .001$, $r = .30$, $r^2 = .09$, adjusted $r^2 = .08$).

When overall scores for the PWB-PTCQ were entered as a second step, there was a R^2 Change which reached statistical significance for Positive Affect (R^2 Change $= .04$, F Change $= 8.58$, $df = 1, 209$, $p = .004$, $r = .26$, $r^2 = .07$, adjusted $r^2 = .05$), Negative Affect (R^2 Change $= .06$, F Change $= 15.34$, $df = 1, 209$, $p < .001$, $r = .35$, $r^2 = .12$, adjusted $r^2 = .11$) and

Table 3
Regression Analysis With Well-Being Variable (Positive Affect, Negative Affect and Satisfaction With Life) Used as a Dependent Variable and Post-Traumatic Growth Inventory, Changes in Outlook Questionnaire and the PWB-PTCQ Used as Predictor Variables

	B	Beta	t	sig
Positive Affect				
Step 1				
PTGI	.06	.14	1.89	.060
CiOP	.05	.06	.60	.548
CiON	−.01	−.01	−.04	.966
Step 2				
PTGI	.02	.04	.49	.625
CiOP	.03	.03	.29	.775
CiON	−.05	−.08	−.75	.453
PWB-PTCQ	.18	.26	2.93	.004
Negative Affect				
Step 1				
PTGI	−.04	−.11	−1.42	.157
CiOP	−.01	−.01	−.06	.950
CiON	.10	.17	1.58	.115
Step 2				
PTGI	−.01	−.03	−.34	.731
CiOP	−.03	−.04	−.37	.716
CiON	.04	.07	.64	.526
PWB-PTCQ	−.23	−.34	−3.92	.000
Satisfaction with Life				
Step 1				
PTGI	.05	.17	2.27	.024
CiOP	.13	.20	1.88	.062
CiON	−.16	−.31	−2.94	.004
Step 2				
PTGI	.01	.04	.47	.636
CiOP	.16	.24	2.35	.020
CiON	−.11	−.21	−2.01	.046
PWB-PTCQ	.19	.33	3.86	.000

Satisfaction with Life (R^2 Change $= .06$, F Change $= 14.91$, $df = 1, 209$, $p < .001$, $r = .39$, $r^2 = .15$, adjusted $r^2 = .13$). Thus, scores on the PWB-PTCQ were able to substantially predict variance in SWB over and above both existing measures of growth, the CiOQ and the PTGI.

Correlations With Actual Change

Ryff's PWB measure was completed at both times by participants in sample 3 allowing for the calculation of difference scores for the PWB scales as a measure of actual change that had taken place over the six months (i.e., a new variable was computed by subtracting PWB at Time 1 from PWB at Time 2). It was found that higher scores on the PWB-PTCQ at Time 2 were correlated with actual growth as measured by the PWB total difference score ($r = .41$, $p < .001$).

Concurrent and Discriminant Validity

Table 4 shows the Pearson product–moment correlation coefficients between the PWB-PTCQ, PTGI, and the CiOP and the other personality and coping variables for sample 1. Higher scores on the PWB-PTCQ were associated with lower scores on Neuroticism, higher scores on self-esteem, optimism, and reappraisal, as predicted. The pattern of correlation with the other variables was identical to that found with the PTGI and similar to that found with the CiOP. Turning to the newer positive psychology variables, the PWB-PTCQ was correlated with aspects of authenticity whereas the PTGI and the CiOP were not, suggesting that people who grow following adversity become more authentic but previous scales have not succeeded in tapping into this. Scores on the social desirability scale were not associated with scores on the total PWB-PTCQ ($r = .16$, *ns*) for sample 3.

Association With Posttraumatic Stress

For sample 2, higher scores on the PWB-PTCQ were associated with lower scores on the IES-R Total ($r = −.44$, $p < .001$). The mean for the IES-R Total was 1.60 ($SD = .942$), representing an average item rating between '*a little bit*' and '*moderately*' on the 0–4 scale and, therefore, modest level of distress in this population. Using the clinical cut-off of 1.5 for the total score, as recommended by Creamer and colleagues (2003), 131 participants (51.6%) scored above the clinical cut-off level. An independent samples t test was then conducted and demonstrated that participants reporting clinical levels of posttraumatic distress scored significantly lower ($n = 131$, $M = 53.10$, $SD = 16.79$) on the PWB-PTCQ, $t = 6.18$, $p < .001$ than individuals with subclinical levels of distress ($n = 123$, $M = 64.67$, $SD = 12.88$). This is a large enough difference to be described as readily noticeable to the naked eye (Cohen's $d = .77$).

Discussion

The PWB-PTCQ can be utilized in clinical settings to compliment more traditional measures of symptom severity and explore changes in narrative themes and directions which might not otherwise be obvious in therapeutic conversations. The main advantage of the PWB-PTCQ is that it uses an existing theoretical architecture to provide a much needed framework for growth

Table 4

Pearson Product Moment Correlations Between the Growth Scales and Personality, Coping, and Well-Being Scales

	PWB-PTCQ	PTGI	CiOP	CiON
Big Five				
Extraversion	.11	.10	.08	−.10
Agreeableness	.03	−.03	.00	.05
Conscientiousness	−.07	−.04	.01	−.05
Openness	.03	.03	−.05	.05
Neuroticism	−.22**	−.16*	−.28**	.19**
Optimal functioning				
Self-esteem	.33***	.20**	.11	−.16*
Optimism	.36**	.23**	.22**	−.24**
Gratitude	.32**	.27**	.13*	−.16*
Authentic living	.28**	.09	.11	−.09
External influence	−.23**	−.04	−.08	.04
Self-alienation	−.31**	−.16*	−.18**	.14*
Coping				
Reappaisal	.39**	.28**	.30**	−.27**
Suppression	−.03	−.03	−.03	.04

$* p < .05.$ $** p < .01.$ $*** p < .001$ (2 tailed tests).

following adversity. Importantly, we were able to demonstrate that the PWB-PTCQ provides incremental validity over and above existing measures of growth following adversity in predicting levels of SWB.

While the demonstration of incremental validity is important, we would emphasize that PWB can also be conceptualized as an outcome in its own right, and that there is a need to understand the measurement and facilitation of growth for its own sake rather than simply as a utilitarian vehicle for the development of SWB (Joseph & Wood, 2010).

The present research replicates previous research showing that neuroticism, self-esteem, optimism, and positive reappraisal coping are correlates. We also found that growth was associated with the newer positive psychology constructs of gratitude and authenticity. No association was found with the SDS-17 suggesting that responses to the PWB-PTCQ are not substantially influenced by social desirability. But further exploration of this topic would be useful as other research suggests that socially desirable behavior results from two different processes, impression management and self-deception (Paulhus, 1984).

We found a moderate correlation between the PWB-PTCQ and actual change as measured by changes in Ryff's PWB scale. The implication of this, consistent with previous research (Frazier et al., 2009) is that while correlated, and to a stronger degree than that found with the other personality and coping variables in the study, actual change and perceived change are not synonymous. This is not surprising as the measurement of growth using retrospective measures involves complex cognitive operations (Ford, Tennen, & Albert, 2008), but it does mean that researchers should clearly distinguish between perceptions of growth and actual growth. Current research knowledge is largely based on retrospective accounts. While this must be the case in cross-sectional research, in longitudinal research it is also possible to employ measures of actual growth, that is, measure of PWB administered at several time points allowing change scores to be calculated, alongside measure of perceived growth. But even if there is some divergence between perceived growth and actual growth it is important to

emphasize that both forms of assessment have merit. Perceptions of growth, in themselves, seem to be psychologically helpful (e.g., Affleck, Tennen, Croog, & Levine, 1987) and should remain a focus for clinical intervention.

In conclusion, the PWB-PTCQ promises to be a useful addition to the armory of positive functioning measures used by clinicians in their research and practice. Using the PWB-PTCQ alongside more traditional measures of psychopathology in clinical settings is recommended as a way of monitoring how clients perceive themselves to have changed.

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