Identifying gender differences in the independent effects of personality and psychological well-being on two broad affect components of subjective well-being

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Abstract

Subjective Well-Being (SWB) is defined in terms of positive and negative affect whilst Psychological Well-Being (PWB) reflects self-referent attitudes of mastery and self-acceptance. Whilst both SWB and PWB are associated with personality, concurrent analysis is limited. This study (n = 679) reports on a teacher sample in which personality, SWB and PWB were measured. Results indicated moderate correlations between variables. Hierarchical regression controlled for personality and identified PWB as a significant predictor of SWB. Separate predictors of negative and positive affect support the need to assess both SWB affective components. As the most significant predictor of positive affect the inclusion of PWB is needed in future well-being research.

Key Words: Subjective Well-being, Psychological Well-Being, Personality

Introduction

Considerable effort has sought to extend notions of well-being and wellness as the absence of ill-being states, with psychological constructs such as self-concept, mastery, and resilience that have been demonstrated as important components of positive well-being (e.g. Burns, 1979). Increasingly, findings that identify the impact of such positive psychology constructs are informing government policy on health and well-being (e.g. Huppert, 2008).

Two main approaches to the study of well-being have been described (Ryan & Deci, 2001). The Subjective Well-Being (SWB) approach focuses on those experiences that make life either enjoyable or unpleasant. The identification of two broad affect states, positive and negative affect, has been well supported (e.g. Watson, Clark & Tellegen, 1988) and increased pleasant and decreased negative valence states typically defines optimal SWB (Vitterso, 2001). Furthermore, it seems the relationship between these affective states is an excellent predictor for measures of life satisfaction. The need to discern between these affect states is important. For example, the negative affect and anxiety/depression link is well established (e.g. Watson et al, 1988), and the importance of positive emotions in broadening and expanding individuals' cognitive and behavioural tendencies, has also been indicated (Fredrickson, 2003).

Other important facets of SWB relate to its degree of temporal stability. Dynamic Equilibrium Theory (DET) proposes that SWB states are malleable to life events and experiences (Headey & Wearing, 1989), but that changes in affect generally return to their set-point level (Kahneman, 1999), a significant proportion of which appears genetically pre-determined (Lykken & Tellegen, 1996). However, much DET research

has used satisfaction measures which fail to describe different affective components, and much cross-sectional and longitudinal data fails to capture the extent and duration of changes from set-point levels. Consequently, the extent genetics determine SWB is likely over-estimated (Huppert, 2005). Headey (2008) has recently argued that DET describes SWB for most, although for a significant minority high in extraversion and/or neuroticism, long-term changes in life satisfaction can be substantial.

In contrast to SWB, the Psychological Well-Being (PWB) approach emphasises characteristics which are related to optimal SWB. Due to the reactive nature of SWB components, where variability would make them poor indicators of long-term wellness, PWB proponents (e.g. Ryff & Singer, 1998) have challenged SWB as limited in describing long-term positive functioning, and a fallible indicator of healthy living. PWB may function as a predictor of extent and duration of SWB reactivity. Ryff (1989) operationalised a multi-dimensional model of PWB that tapped six related concepts of well-being, including autonomy, personal growth, self-acceptance, purpose in life, environmental mastery, and positive relations with others, which are seemingly more temporally stable (Ryff & Singer, 1998). This clash of paradigms has led to differing definitions of wellness and different issues concerning the causes, consequences, and dynamics of well-being, yet terms like affect, well-being and personality are frequently cited topics (e.g. Schmutte & Ryff, 1997). However, the extension of the well-being-personality literature with PWB models is less detailed.

Well-Being and Personality

Generally using SWB models, associations between well-being and personality are frequently reported. Extraversion is typically related to positive affect and

neuroticism to negative affect (e.g. Costa & McCrae, 1980; Diener & Lucas, 1999). DeNeve and Cooper's (1998) meta-analysis identified extraversion and agreeableness as consistently positively correlated with global SWB, whilst neuroticism was consistently negatively correlated.

Personality also appears related to SWB reactivity. Individuals with higher SWB possess attribution styles which are self-promoting and subsequently contribute to higher levels of satisfaction and happiness and report stressful life events in a less negative way than those with lower SWB (Lyubomirsky & Ross, 1999). Similarly, Kling, Ryff, Love and Essex (2003) demonstrated how neuroticism and openness to experience predicted increases in negative affect after a stressful life event, whilst extraversion and openness to experience predicted increases in positive affect. That openness is positively related to both positive and negative affect has also been reported in large longitudinal panel data (Headey & Wearing, 1989). These findings suggest that the impact of stressful experiences on well-being may be influenced by personality. Also, the effect of different personality traits on different SWB components supports the need to discriminate between SWB components (Ryan & Deci, 2001).

There are clearly well-established relationships between SWB and personality. However, the role of PWB in the personality-SWB link is limited. One example includes Schmutte and Ryff's (1997) analysis of a five-factor personality inventory and Ryff's model of PWB which controlled for affect. Since only small to moderate correlations between the dimensions of PWB and personality remained after controlling for affect, there are significant non-overlapping effects between personality and PWB.

There has been little attempt to replicate Schmutte and Ryff's (1997) findings. Moreover, the factorial validity of Ryff's (1989) 6-PWB scales, has been questioned (e.g. Springer & Hauser, 2006). Whilst support for the 'a priori' 6-factor model has been received (e.g. Clarke, Marshall, Ryff & Wheaton, 2001) strong correlations between four PWB variables: environmental mastery (E), personal growth (G), purpose in life (P), self-acceptance (S) (EGPS), suggests that these variables reflect one super-ordinate PWB factor (Abbott et al., 2006). A recent analysis (Burns & Machin, in press) supported this amended PWB structure and importantly also differentiated items between this modified 3-factor PWB structure and two SWB affect components, positive and negative affect.

Aim

The current study will identify the unique effects of PWB on two broad SWB affect states, positive and negative affect, after controlling for personality and demographics effects. Analyses will test for gender differences on all of the variables. A multi-groups analysis will test whether a personality and PWB predictor model of SWB is invariant across the genders.

Method

Participants and Design

Data was drawn from an organisational climate study (N = 679) comprising three samples of high-school teachers, from privately-funded schools in the Australian Capital Territory, Australia (n = 253), school teacher members of the Norwegian teacher union (n = 250), and from International Schools (n = 176) worldwide. Predominantly female (63%), almost half of the sample (46.2%) was aged between 30 and 55 years of age, although 63.2% of the Norwegian sample was aged 45 years and older. Many participants did not live in the immediate vicinity of the university and so accessed the survey through a secure web facility, run and monitored by the technical services staff within the University of Southern Queensland's Department of Psychology. The University's Human Research Ethics Committee provided approval for the study.

Measures

Psychological Well-Being (PWB)

A 54-item version of Ryff's (1989) PWB scales assessed six dimensions of PWB: environmental mastery (E), personal growth (G), purpose in life (P), self-acceptance (S), (EGPS; $\alpha = .785$); autonomy (A; $\alpha = .613$); and positive relations (PR; $\alpha = .777$), with participants indicating their response on a 6-point Likert-type scale, with higher scores on each scale indicating greater well-being on each dimension. Factor analysis of the PWB variables (not reported here) supported previous analyses (Burns & Machin, in press), which combine 4 of the PWB variables E, G, P, S to create a super-ordinate first-order PWB factor, EGPS.

Subjective Well-Being (SWB)

The Positive And Negative Affect Schedule (PANAS; Watson et al. 1988) assessed SWB with 20-items relating to positive affect (α = .877) and negative affect (α = .885). Individuals indicated their response on a 5-point Likert-type scale, with higher scores on each scale indicating greater well-being on that dimension.

Five-Factor Personality Structure

A 50 item personality measure from the International Personality Item Pool (IPIP: Grucza & Goldberg, 2007) assessed five domains: neuroticism (α = .871), extraversion (α = .789), agreeableness (α = .771), openness to experience (α = .737), and conscientiousness (α = .839). Comparative analysis of eleven personality inventories suggests that the IPIP scales are well-validated measures of the Five-Factor personality structure (Grucza & Goldberg, 2007). All internal reliabilities for all the sub-scales of these measures were within acceptable levels.

Statistical Procedure

Analyses were computed using SPSS and AMOS v17. Bi-variate correlations tested the associations between all PWB, personality and SWB variables, and t-tests identified gender differences on these variables. Hierarchical regression analysis controlled for demographics and personality variables to test the PWB effect on positive and negative affect. A multi-group Structural Equation Model (SEM) tested whether the PWB and personality regression model identified in the hierarchical regression analyses was invariant between gender.

Results

Bi-variate correlations between SWB, PWB and personality were highly significant ($p < .001$), except for the non-significant coefficients reported between openness to experience with neuroticism, positive relations, and conscientiousness (Table 1). Except for two negative coefficients with negative affect and neuroticism, positive affect reported positive associations with all other variables, whilst only neuroticism and openness to experience reported positive associations with negative affect. The super-ordinate factor, EGPS, reported the strongest association with positive affect, whilst neuroticism reported the strongest association with negative affect. With only 40% shared variance, the association between neuroticism and negative affect does not indicate serious collinearity. Positive associations between openness to experience with both positive and negative affect suggest that this personality trait is related to increases in both SWB domains. A t-test between genders indicated females reporting statistically higher on negative affect, EGPS, agreeableness and conscientiousness, whilst males scored higher on autonomy.

To test the first hypothesis, hierarchical regression analyses (Table 2) tested the effects of PWB on positive and negative affect (Model 3), controlling first for demographics (Model 1) and then personality variables (Model 2). PWB contributed considerably more explained variance in positive affect, and also a small additional amount of variance in negative affect. EGPS was the strongest predictor of positive affect, with moderate coefficients for extraversion, agreeableness and conscientiousness. Unlike the bi-variate associations reported earlier (Table 1), neuroticism, openness to experience and autonomy no longer reported significant associations with positive affect.

Despite a positive bi-variate correlation, positive relations now reported a small significant negative coefficient with positive affect. Gender reported a statistical significant effect on positive affect in the final model indicating a suppression effect with the inclusion of the PWB variables. These effects are weak and possibly a consequence of sample size. The strongest predictor of negative affect was neuroticism. Openness to experience reported a moderate positive coefficient, whilst increasing age, agreeableness and conscientiousness were negative predictors of negative affect. Despite a significant negative bi-variate correlation, EGPS was now a significant positive predictor of negative affect. A reported Variance Inflation Factor (VIF) high of 2.147 and a Condition Index (CI) high of 3.297, suggest that issues of collinearity were not identified.

The three suppression effects identified in the regression analyses were investigated further. Partial correlations between EGPS and negative affect, partialed out each personality variable in turn to test which variable interacted with EGPS to change its bi-variate negative relationship with negative affect (Table 3). Two smaller effects were reported for conscientiousness and agreeableness. A strong effect was identified with neuroticism and reveals that for those high in neuroticism, increased EGPS is associated with higher levels of negative affect (Figure 1). This is an important finding that suggests that high levels of PWB are not protective of negative SWB states for all individuals.

Partial correlations revealed that extraversion, neuroticism and EGPS all influenced the positive bi-variate correlation between positive relations and positive affect. Individual suppression effects were not significant. Instead, the relationship between positive relations and positive affect was influenced by a two-way interaction between neuroticism and extraversion (r = -.095; p = . 013) and a three-way interaction

between neuroticism, extraversion and EGPS (r = -.104; p = .007). The small size of the suppression effect reported in the hierarchical analysis suggests this effect is only statistically significant. Similarly, the suppression effect with gender on positive affect is likely due to the significant differences between gender on the PWB variable EGPS reported earlier (Table 1).

Multiple-group Analysis of SWB regressed on PWB and personality

We evaluated whether the significant predictor effects reported in the regression models (Table 2) were consistent between gender. A Structural Equation Model (SEM; Figure 2) supported the earlier hierarchical analyses in identifying the key predictors of positive affect and negative affect. Autonomy was not related to either affect and was omitted from the SEM. Slight differences in coefficient sizes relate to the use of Maximum Likelihood Estimation in Amos and Ordinary Least Squares in SPSS. Model fit revealed very good Goodness of Fit indices (GFI; χ^2 = 8.294, df = 8, p = .405; AGFI = .985; CFI = 1.00; RMSEA = .007 (.000 - .046), whilst results from the single group analyses reported GFI within acceptable bounds for both males (χ^2 = 18.460, df = 8, p = .017; AGFI = .914; CFI = .988; RMSEA = .073 (.029 - .116) and females (χ^2 = 18.999, df = 8, p = .015; AGFI = .945; CFI = .992; RMSEA = .057 (.024 - .090). Next, a simultaneous multi-group analysis was conducted in which all parameters were free to vary across gender.

The Critical Ratio of Differences test (CR) of an unconstrained model of the combined sample indicated several regression and covariance paths, and error and variance terms, to vary between genders where a CR score of > 1.96 is significant (p = .05). Most of these gender differences still reported significant (p < .05) coefficients in

the same direction, but two regression paths demonstrated a strong effect of gender variance. The coefficient for agreeableness predicting negative affect was not significant for males, whilst the coefficient for positive relations on negative affect was not significant for females. Constraining these two non-significant regression paths to zero, resulted in two more paths reflecting structural variance between genders; females reported non-significant coefficients for positive relations predicting positive affect, and agreeableness predicting positive affect.

Analysis of Chi-Square indicated that this constrained model performed significantly worse (Table 4). However, inspection of the modification index values suggested including a covariance path between positive and negative affect error terms would significantly improve fit and it was acceptable to assume that this covariance path reflected correlation between the dependent variables (Byrne, 2001). Chi-Square revealed no significant difference between this partially constrained model (with four constrained paths and a covariance path between the error terms for positive and negative affect) and the unconstrained model although inspection of the other GFI revealed this partially constrained model to report better fit to the data. This constrained model did not explain comparable amounts of variance in SWB affect states for both genders. For females, this final model explained greater amounts of variance in positive (46%) and negative affect (49%), than for males for both positive (38%) and negative affect (44%).

Discussion

This study identified strong independent effects of personality and PWB on two SWB components, positive and negative affect. Whilst associations between all variables were reported, VIF and CI scores were well below levels at which collinearity would be an issue. By incorporating a modified structure (Burns & Machin, in press) of Ryff's (1989) PWB scales, this study identified EGPS, a super-ordinate factor of four PWB variables, as the strongest predictor of positive affect, over and above the influence of personality. Prior research into the personality-SWB link (e.g. Costa & McCrae, 1980; Diener & Lucas, 1999) was supported with extraversion, agreeableness and conscientiousness reporting moderate positive coefficients with positive affect. However, the strength of this association is weakened by the inclusion of the PWB variables. Neuroticism reported the strongest effect on negative affect whilst openness to experience and agreeableness respectively reported moderate positive and negative coefficients. That openness to experience was a positive predictor of both positive and negative affect supports previous findings (Headey & Wearing, 1989). Positive relations was related to lower levels of negative affect which suggests that increased social support is related to better SWB outcomes. This appears related to the function of social support to buffer the effects of negative experiences on SWB, since a converse positive effect for positive relations on PA was not reported. Multi-groups analysis revealed gender differences in regression paths predicting SWB, but key predictors of SWB, such as neuroticism with negative affect, and EGPS with positive affect, were invariant across gender. Importantly, by controlling for the effects of personality, including its shared variance with SWB, these results demonstrate that PWB greatly increases the prediction of SWB, particularly

positive affect, and is not just capturing the same variance that personality measures typically predict.

The relationship with personality and PWB on SWB is not a straightforward one. A strong and significant interaction effect was reported for EGPS with neuroticism on negative affect. Although increased EGPS may typically be a benefit, our analyses revealed that for those high in neuroticism, higher EGPS is related to higher levels of negative affect. This is an important finding since the well-being literature typically assumes 'a more is better' approach.

EGPS can not be reduced to a method artefact since it has been reported in two separate analyses (Abbott et al.'s; 2006; Burns & Machin, in press). Whilst items between the four variables that comprise EGPS appear to reflect different content, they nevertheless fail to differentiate between the four PWB variables that comprise EGPS. The EGPS items appear to reflect cognitive components of self-concept at a general level (Burns, 1979), and may also reflect notions of self-determinism (Ryan & Deci, 2001), personal resourcefulness, positivity and mindfulness (Seligman, 2003). Further investigations into the construct validity of Ryff's PWB scales are warranted, to determine whether the scales reflect other validated measures of self-referent attitudes. Still, a strong independent association revealed that EGPS was a significant predictor of SWB and the implications of this result should not be minimised. It is important to investigate the nature of this relationship further, but clearly the PWB variables are significant predictors of SWB.

Several limitations need to be highlighted. Firstly, the data is cross-sectional. Whilst prior theory and research may posit temporal relationships, these findings will

need to be extended to longitudinal designs to assess these established cross-sectional relationships across time, particularly to demonstrate the influence of PWB as a predictor of SWB outcomes. It cannot be ignored that SWB states may be quite strong predictors of PWB, or that a reciprocal relationship may exist.

A further issue is the extent to which PWB is an outcome of personality traits. A longitudinal study has recently identified personality, measured at age 16 and 26, as a strong predictor of PWB at age 52 (Abbott et al., 2008). However, Abbott et al. (2008) were unable to test the reverse causation of the PWB, personality and SWB link since the PWB scales were not available for the earlier waves. The current authors propose a model in which personality and PWB are distinct cognitive constructs that relate to different aspects of an array of self-referent attitudes. Support for such a model has previously been identified, though comprising slightly different psychological constructs. Judge, Erez, Bono & Thoresen (2003) identified a correlated four-factor structure comprising independent cognitive components of generalized self-efficacy, self-esteem, neuroticism, and locus of control which reflect a broad latent trait of 'core self-evaluations'.

A further weakness relates to the conceptual overlap of PWB, SWB and personality variables. The distinct yet relatedness of PWB and SWB variables have previously been identified (Burns & Machin, in press) and supported here. Also, previously identified associations between personality and well-being were also supported (e.g. Costa & McCrae, 1980; DeNeve & Cooper, 1998; Diener & Lucas, 1999). Issues relating to the degree to which these constructs overlap are frequently raised, yet the bi-variate correlations from this study suggest only 40% and 35% shared variance between neuroticism and negative affect, and extraversion and positive affect,

respectively. A similar conclusion could be drawn about the overlap between PWB and personality since the highest amount of shared variance between these constructs was 31%. Clearly, whilst there are strong associations between the well-being and personality variables, the findings from this study indicate greater independence of the PWB, SWB and personality constructs.

Usual methodological concerns relating to response bias and social-response desirability may have influenced participant response to well-being and personality. In particular, the data was drawn from three teacher cohorts and cohort effects were not partialed out. Whilst unpublished work by the authors has indicated that cohort effects are not a significant issue for the pattern of relationships reported here, it should be considered that the cultural diversity was relatively homogenous and that these results are drawn from primarily wealthy and western industrialised countries. Two of the samples were drawn from Australian and Norwegian school-teacher populations. Even the International school-teacher sample mostly comprised UK, Australian/NZ and US/Canadian school-teachers. Therefore we urge caution over the generalisation of these findings to non-western or collectivist societies.

Conclusion

Despite growing interest in Eudaimonic notions of well-being, its role in the personality-SWB link is unclear. PWB appears to be a significant factor in determining SWB, even after controlling for personality and demographic effects and supports the need to assess well-being in both SWB and PWB terms. PWB's importance lies in providing a direction for interventions that by focusing on developing facets of individuals' PWB, may instil longer-lasting attitudinal changes that engender feelings of

vigour and lessen emotional reactivity to environmental triggers. Future longitudinal research should be designed to capture SWB's dynamic nature and identify the roles personality and PWB play in determining SWB reactivity.

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Table 1

Descriptives and correlations on the personality, SWB and PWB measures.

Variables	Male		Female		1	2	3	4	5	6	7	8	9
	M	SD	M	SD									
1. Positive Affect[+]	-.07	6.89	.04	6.71	1								
2. Negative Affect [+]	-.20	6.83	.12[*]	7.49	-.224*	1							
3. EGPS[$+]	-.18	1.04	.11[*]	.88	.589*	-.237*	1						
4. Positive Relations [+]	-.08	.84	.05	.95	.182*	-.386*	.314*	1					
5. Autonomy[+]	.11	.79	-.06[**]	.90	.250*	-.293*	.305*	.247*	1				
6. Extraversion	35.97	5.49	35.29	5.87	.373*	-.207*	.456*	.382*	.342*	1			
7. Neuroticism	23.59	6.54	23.35	7.05	-.442*	.633*	-.553*	-.481*	-.499*	-.422*	1		
8. Openness	38.26	5.85	38.53	5.29	.148*	.137*	.200*	-.031	.165*	.234*	-.049	1	
9. Agreeableness	37.23	5.28	38.48[**]	4.98	.408*	-.368*	.462*	.270*	.276*	.213*	-.535*	.182*	1
10. Conscientiousness	38.11	6.00	39.07[***]	5.74	.463*	-.340*	.537*	.241*	.406*	.305*	-.546*	.043	.408*

[*]p < .001; [**] p < .01; [***] p < .05; [+]Variables were saved in SPSS using the regression method following Factor Analysis; [$] EGPS - super-ordinate PWB factor computed following Burns and Machin (in press).

Table 2

Hierarchical Regression of SWB on Demographics, PWB and personality

	Positive Affect						Negative Affect					
	Model 1 (adj R^2 = .000)		Model 2 (adj R^2 = .326)		Model 3 (adj R^2 = .405)		Model 1 (adj R^2 = .063)		Model 2 (adj R^2 = .455)		Model 3 (adj R^2 = .469)	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Gender	.000	.992	-.038	.242	-.073	.019	-.025	.509	.008	.777	.004	.886
Age	-.045	.248	-.059	.079	-.015	.642	-.260	.000	-.168	.000	-.148	.000
Extraversion			.179	.000	.123	.001			-.006	.850	-.008	.817
Neuroticism			-.129	.004	-.078	.100			.562	.000	.560	.000
Openness To Experience			.053	.113	.012	.715			.177	.000	.152	.000
Agreeableness			.184	.000	.134	.000			-.116	.001	-.129	.000
Conscientiousness			.267	.000	.163	.000			.017	.616	-.028	.438
EGPS [$]					.384	.000					.136	.001
Positive Relations					-.083	.019					-.101	.002

Autonomy	-.038	.285		.006	.863

[$] EGPS - super-ordinate PWB factor computed following Burns and Machin (in press).

Table 3

Correlations between EGPS and Negative Affect controlling for personality

	Negative Affect	
	r	*p*
EGPS[$]	-.237	.000
Controlling for		
Extraversion	-.164	.000
Neuroticism	**.176**	**.000**
Openness to Experience	-.273	.000
Conscientiousness	-.081	.035
Agreeableness	**-.068**	**.075**

[$]EGPS - super-ordinate PWB factor computed following Burns and Machin (in press).

Table 4

Comparisons of GFI for unconstrained and constrained demographic, PWB, and Personality predictor models of SWB

	χ^2	DF	*p*	AGFI	CFI	RMSEA (95% CI)	*Sig of* χ^2 of difference
Unconstrained	22.497	14	.069	.953	.996	.030 (.000 - .052	-
Partially Constrained Model							
(Constraining the following parameters to 0):							
Males Agreeableness on NA Females Positive Relations on NA Females Positive Relations on PA Females on Agreeableness on PA	39.652	20	.006	.944	.991	.038 (.020 - .055)	0.009
Partially Constrained Model							
(Constraining the following parameters to 0):							
Males Agreeableness on NA Females Positive Relations on NA Females Positive Relations on PA Females on Agreeableness on PA	24.547	18	.138	.960	.997	.023 (.000 - .044)	0.727
Including Covariance Path between PA and NA							

χ^2 difference test computed with the unconstrained model as the baseline model

Figure 1

Interaction between EGPS and neuroticism on negative affect for all participants.

Figure 2

A path model of the demographic, PWB and personality predictor model of SWB.

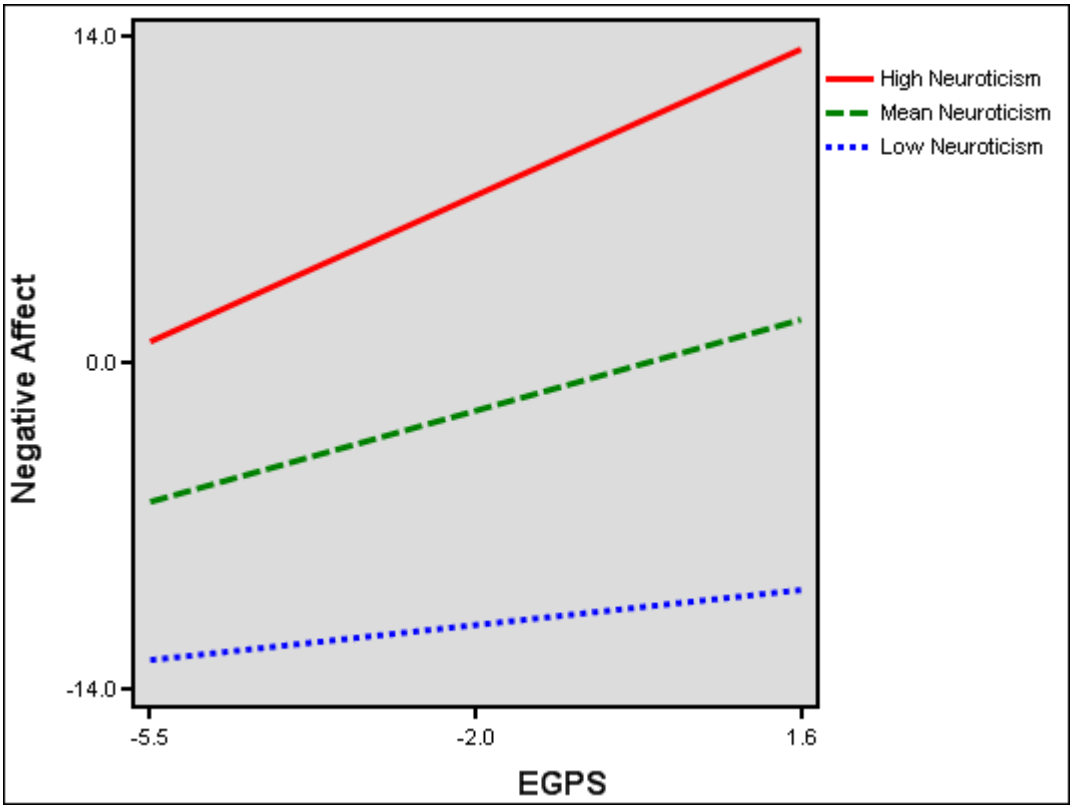
14.0
0.0
-14.0
Negative Affect
-5.5
-2.0
1.6
EGPS
High Neuroticism
Mean Neuroticism
Low Neuroticism

Figure 1.

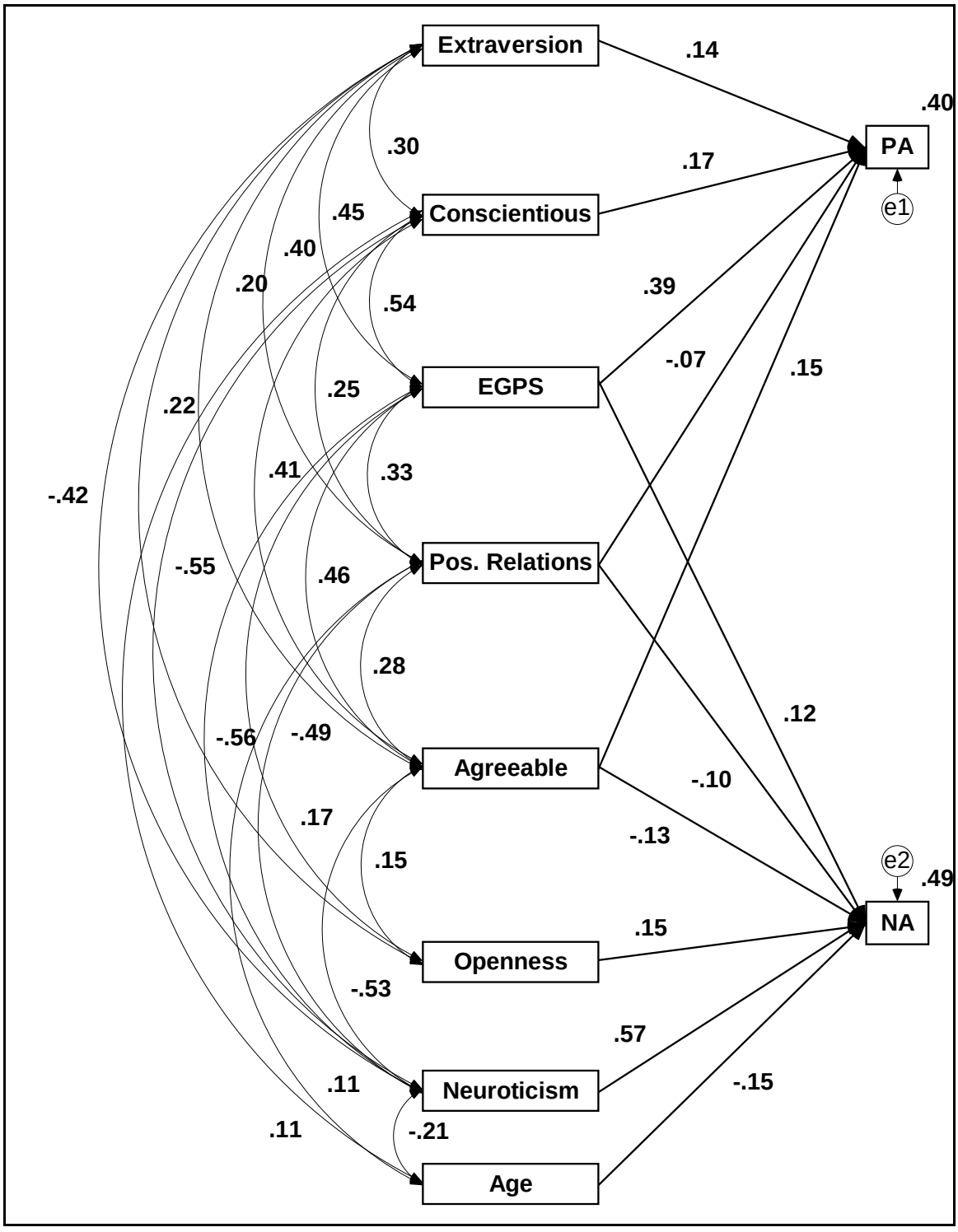
Extraversion
Conscientious
EGPS
Pos. Relations
Agreeable
Openness
Neuroticism
Age
PA
NA
e1
e2
.14
.40
.17
.30
.45
.40
.20
.54
.39
-.07
.15
.25
.22
.41
.33
-.42
-.55
.46
.28
.12
-.56
-.49
-.10
.17
-.13
.15
.49
.15
-.53
.57
.11
-.15
.11
-.21

Figure 2.