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An ecological systems model of trait resilience: Cross-cultural and clinical relevance

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ABSTRACT

The study explored how scores on the three dimensions of the Engineering, Ecological, and Adaptive Capacity (EEA) trait resilience scale, derived from Holling's ecological systems theory of resilience, demonstrate fit within higher-order bifactor models of measurement, cultural invariance, and associations with clinical caseness of affect. Three samples (295 US adults, and 179 Japanese and 251 Polish university students) completed the EEA trait resilience scale. In addition, a subsample of US adults were administered the Ten-Item Personality Inventory and the Hospital Anxiety and Depression Scale). Across all samples, a higher-order bifactor model provided the best fit of the data, with salience of loadings on the three group factors. A multi-group comparison found configural invariance, but neither metric nor scalar invariance, for EEA resilience scores across the three samples. Among the US sample, engineering and adaptive trait resilience scores predicted clinical caseness of depression, and adaptive trait resilience scores predicted clinical caseness of anxiety, after controlling for sex, age, income, education, employment, and personality. The findings suggest the cross-cultural replicability of the structure (but not the meaning) of the three-factor EEA measure of trait resilience, and its relevance for predicting clinical caseness of affect among a US sample.

1. Introduction

Reviews of the trait resilience literature suggest multiple theoretical and measurement conceptualisations of how individuals typically approach and react to events that they experience to be negative. Within the psychological measurement literature, Windle, Bennett, & Noyes (2011) methodological review of 19 existing self-report measures and Pangallo, Zibarras, & Lewis (2015) interactionist framework review suggest a variety, with some shared, of theoretical and empirical contexts, comprising, but not exclusive to factors such as hardiness, coping, protective factors, perseverance, impulse control, self-efficacy, and social support. Furthermore, in terms of using the concept of resilience in applied settings, Rutter (2013) outlined eight conceptual approaches that encompass considering resilience in the treatment setting in terms of risk, inoculation effects of risk, mental attributes (and the fostering thereof), biological features, the effects of social relationships, and gene and environment interactions. Rutter (2013) observes that, although this provides a rich consideration of possible key resilience factors in clinical work, it does not necessarily translate into clear programmes for treatment. All the aforementioned authors highlight the inconsistency of the theoretical and empirical approaches for considering and measuring trait resilience.

In response to these reported inconsistencies, Maltby, Day, & Hall (2015) employed an approach developed by Holling and colleagues (Holling, 1973, 2006) in the ecological literature. This approach integrates ecology and systems theory to describe resilience across a number of ecological and social systems. Within Holling's approach there are three broad systems surrounding resilience: engineering resilience, ecological resilience, and adaptive capacity (EEA). Engineering resilience is the ability in terms of speed or status of any system to return to, or recover, an equilibrium following any disturbance (Holling, 2006). Ecological resilience is the ability of a system to absorb or resist perturbation, maintaining its stable state, in terms of function, purpose, structure, or identity, while making any necessary changes to key mechanisms or functions of the system (Holling, 2006). Adaptive capacity is

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the ability of a system to manage and accommodate change, and to adapt to disturbances. A key aspect of adaptive capacity is that systems make themselves resilient by continually varying their key functions and processes so that they are prepared to adapt when a disturbance occurs (Walker, Holling, Carpenter, & Kinzig, 2004).

To assess this model, Maltby et al. (2015) performed exploratory and confirmatory factor analyses among UK student and adult samples of the items contained within the five most cited trait resilience scales (the *Ego Resiliency Scale* [Block & Kremen, 1996], the *Hardiness Scale* [(Bartone, Ursano, Wright, & Ingraham, 1989)], the *Psychological Resilience Scale* [Wagnild & Young, 1993], the *Connor-Davidson Resilience Scale* [Connor & Davidson, 2003] and the *Brief Resilience Scale* [Smith et al., 2008)]). These scales encompass a series of theoretical propositions regarding resilience, such as the capacity to demonstrate controlled responses to environmental demands (Block & Kremen, 1996), a personality style encompassing cognitive, emotional, and behavioural traits (Bartone et al., 1989), as a 'resilience core' reflecting overall physical and mental health resilience (Wagnild & Young, 1993), clinical treatment contexts (Connor & Davidson, 2003), and an ability to recover from adverse situations (Smith et al., 2008). From the analyses of these scales, three dominant factors emerged, consistent with Holling's (2006) model, reflecting engineering resilience, ecological resilience, and adaptive capacity resilience. Furthermore, the items that were most prominent within these factors emphasised some of the dynamics that underpin descriptions of the resilience dimensions: their ability to recover and swiftness to do so (engineering resilience), ability to maintain key functions whilst accommodating a disturbance (ecological resilience), and general willingness to adapt across their life (adaptive capacity). From these findings, Maltby et al. (2015) suggested a 12-item measure comprising 4 items per factor. In terms of validity estimates, the EEA resilience measure fitted meaningfully within adaptive expressions of wider trait and well-being psychology with: lower neuroticism (of a medium effect size) accounting for unique variance in engineering resilience; lower neuroticism, and higher extraversion and conscientiousness (with conscientiousness presenting the highest effect size) accounting for unique variance in ecological resilience; and lower neuroticism, and higher extraversion, openness to experience, and conscientiousness accounting for unique variance in adaptive resilience (with openness to experience presenting the highest effect size). Moreover, after controlling for sex, age, and personality, ecological resilience was found to predict scores on measures of well-being.

To date, this psychometric model of resilience, as it applies to trait resilience, has only been tested in UK samples. However, it does introduce a parsimonious model that might be considered in the future to address Rutter's (2013) observations of models that might be applied to clinical practice. In terms of beginning this dialogue, we suggest three considerations regarding the EEA model's cultural stability, structure, and association with personality and well-being that might be used to suggest its possible clinical value.

First, noting the robustness of Holling's (2006) model in terms of informing biological, psychological, and social systems, we propose assessing the cross-cultural replicability of the resilience model, thereby demonstrating how the resilience model might be applied across culturally diverse populations experienced in clinical practice. Second, the possible clinical application of the EEA model could be further informed by an examination of whether the EEA model fits within higher-order factor models of resilience. Although consideration of a second-order factor model is redundant (as the model is just-identified, and thus the incremental value of a higher-order single factor cannot be tested [MacCallum, Wegener, Uchino, & Fabrigar, 1993]), consideration of a bifactor model would be informative regarding the overall conceptual approach that might be adopted for the EEA model. Within a bifactor model, there would be the simultaneous consideration of a concept of a general factor of resilience alongside the three EEA group factors to explain the variance between items. Consequently, if this model proved useful, acknowledging potential aetiological differences between a general factor of resilience and EEA facets as separate constructs would inform treatment approaches. Finally, scores obtained on the EEA have shown close relationships with five-factor personality domains, and predictive validity in predicting well-being over time. The five-factor model of personality has provided relevant markers for personality and psychotic disorders (e.g. Suzuki, Samuel, Pahlen, & Krueger, 2015) and shown the importance in primary care of the recognition of clinical caseness of depression and anxiety in the general population across lifespans (Rhebergen et al., 2011). Therefore, the ability to replicate the association between EEA facets and the five-factor model of personality, and demonstrating that the EEA facets predicted clinical caseness after controlling for demographic and main personality traits would show that applying the model to clinical practice had some relevance.

The study presented here had three aims:

(i) To show that the measurement invariance of the three-factor structure of the EEA resilience scale could be replicated among non-UK and non-English-speaking samples.
(ii) To demonstrate the utility of higher-order bifactor models for explaining the variance between the items.
(iii) To consider the clinical relevance of EEA resilience scores.

2. Method

2.1. Sample

Data were collected from three samples. The first sample comprised 295 US participants (168 men, 127 women) aged 19 to 66 years ($M = 33.65$; $SD = 11.0$), recruited via the Amazon Mechanical Turk survey software on two occasions, in which all respondents confirmed they were residents of the USA and English was their first language. Further demographic statistics regarding this sample are provided in Table 1. The second sample comprised 179 undergraduate university students (87 men, 90 women, with 2 respondents not indicating their sex), aged from 18 to 27 ($M = 20.31$, $SD = 1.23$), via taught courses at two Japan universities. The third sample comprised 251 undergraduate university students (62 men, 186 women, and 3 respondents not indicating their sex), aged from 18 to 27 ($M = 20.47$, $SD = 2.02$) via taught courses from two Poland universities.

The rationale for choosing these three countries was opportunistic in terms of researchers available to collect data. However, Table 2 shows a summary of Hofstede's (2001) cultural summary of six dimensions (scored from 0 to 100) of power distance, individualism, masculinity, uncertainty, long term orientation and indulgence for each country from where each sample is drawn. This table includes a cultural summary for the UK, from where Maltby et al. (2015) drew their sample. The variability in these six dimensions across the samples suggests cultural variability among the current samples.

2.2. Measures

All respondents completed the 12-item EEA measure of trait resilience. Polish and Japanese versions of the items were obtained using the independent back-translation procedure. In each case, a bilingual researcher translated the English version of the scale into the relevant language, and a second bilingual researcher translated that version back into English. This was then checked by a researcher whose first language was English.

In addition, on the second administration in the US, 175 respondents (102 men, 73 women; M age $= 34.01$, $SD = 11.0$) also completed the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003) and the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). The TIPI comprises 10 items, scored on a 7-point scale ('1 = Disagree strongly' to '7 = Agree strongly') that are used to assess

Table 1
Scores for the six dimensions of Hofstede cultural dimensions theory for the four populations studied from which the current samples and Maltby et al.'s are drawn.

	Hofstede cultural dimensions					
	Power distance	Individualism	Masculinity	Uncertainty avoidance	Long term orientation	Indulgence
USA	40	91	62	46	26	68
Japan	54	46	92	92	88	42
Poland	54	60	64	93	38	29
UK	35	89	66	35	51	69

neuroticism, extraversion, conscientiousness, agreeableness, and openness to experience. The HADS comprises two seven-item subscales measuring anxiety and depression, scored on a variety of four-point scales indicating greater intensity or frequency of symptoms. The HADS has been found to predict clinical cases of depression and anxiety, using the established cut-off score of 8 + for caseness of anxiety or depression (Bjelland, Dahl, Haug, & Neckelmann, 2002), making the HADS potentially suitable for the initial assessment of depression and anxiety clinical caseness among the general population.

2.3. Procedure

The US and Japanese respondents were administered the scale via online survey software. The Polish respondents were administered the scale via pen and paper. The study procedure received ethical approval from a university Psychology Ethics committee. Respondents provided consent via the first page of the electronic or paper survey, where they had to indicate agreement before proceeding or were allowed to exit the survey at any time. The consent form contained statements and directions regarding the nature of the study, the anonymity of the data, withdrawal both during and after participation, how the data would be stored in a coded form, how they could obtain the results of the study if required, and the intended use, length of storage, and disposal of the data.

2.4. Data analysis

The structural validity of the EEA trait scale was examined via factor analytic comparisons were performed using Confirmatory Factor Analysis (CFA). A key focus of CFA is to demonstrate the incremental value of proposed models (Barrett, 2007). Three possible models were tested for goodness-of-fit. The first was a unidimensional model representing an underlying latent factor structure of general trait resilience among the items. The second was the proposed three-factor structure comprising four-item assessments of engineering, ecological, and adaptive capacity trait resilience. The third was the bifactor model. To assess the goodness-of-fit of the data, we looked at the five statistics recommended by Hu & Bentler (1999) and Kline (2005): the chi-square (χ^2), the comparative fit index (CFI), the non-normed fit index (NNFI), the root mean square error of approximation (RMSEA), and the standardised root mean square residual (SRMR). Additionally, we report the relative χ^2 (CMIN/DF) as well as the χ^2 degrees of freedom. We used the following criteria to assess whether the model fit was adequate (noting that any χ^2 test was likely to be significant due to the large sample size: (i) that CMIN/DF should be less than 3 to be acceptable, and less than 2 to be 'good', (ii) that the CFI and NNFI should exceed .90 to be acceptable and exceed .95 to be 'good', (iii) that the RMSEA should not exceed .08, and be below .06 to be a 'good' fit, and (iv) that for the SRMR values less than .08 are 'acceptable', and those less than .05 are 'good' (Hu & Bentler, 1999; Kline, 2005).

Multi-group CFA (MGCFA) was used to examine whether scores on the EEA resilience scale were comparable between the three samples. MGCFA assumes three levels of measurement invariance: (i) configural, i.e. whether the number of factors (and, therefore, the structure of the scale) are comparable across groups; (ii) metric, assuming equal factor loadings across groups, and (iii) scalar, assuming equal intercepts across groups (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014).

Using data from the USA sample, three multiple regressions were performed with engineering, ecological and adaptive capacity resilience scores were used as dependent variables and scores from the Ten-Item Personality Inventory used as predictor variables. Further, two hierarchical logistic regressions were performed to test whether scores on the EEA resilience subscales (Step 2) predicted clinical scores of depression and anxiety, using the established cut-off score of 8 + for caseness of anxiety or depression to create clinical groups for depression ($n = 51$, 29.1%; $M = 5.47$, $SD = 4.2$) and anxiety ($n = 25$, 14.3%; $M = 3.22$, $SD = 3.9$), after controlling for sex, age, income level (nine-point scale: \$0 to \$100,000 in increments of \$10,000, $M = 4.01$, $SD = 2.57$), education level (four-point scale: no qualifications, high school diploma, degree, postgraduate degree; $M = 1.84$, $SD = .69$), employment status (unemployed/employed), and personality (Step 1), due to previous reports of gender, age-based differences, education, income and personality related to well-being (Hagger, 2009). All continuous variables were standardised; consequently, the odds ratios represent that inclusion in the clinical caseness group is associated with being one SD higher for the predictor variable. The conventional frame of reference, with $r >= .5$ representing a large effect size, $.3 \le r < .5$ representing a moderate effect size, and $.1 \le r < .3$ representing a small effect size (Cohen, 1992) was used to assess the importance of standardised regression weights.

3. Results

3.1. Reliability statistics for the TIPI and HADS measures

The computation of reliability statistics for the TIPI is not recommended due to 2-item pairs comprising the scales (Gosling et al., 2003). The reliability statistics for the HADS subscales (depression, $\alpha = .82$; anxiety, $\alpha = .84$) were above the 'good' reliability criterion of $\alpha > .70$ (e.g. Kline, 1996).

3.2. Confirmatory factor analysis (CFA)

The goodness-of-fit statistics for the three models across the three samples are presented in Table 3. The pattern of the findings comparing

Table 2
Most reported frequencies for ethnicity, education, employment status and income in the US sample.

Ethnicity	%	Education qualification	%	Employment status	%	Income	%
Caucasian	80.0%	Bachelor's degree	37.6%	Employed, 40 + hours a week	46.1%	\$0–\$10,000	16.9%
Asian	7.8%	High school diploma	28.8%	Employed, 1–39 h per week	28.5%	\$40,000–\$50,000	12.5%

Table 3
Confirmatory factor analysis fit statistics for the different models proposed for the EEA Resilience Scale.

	χ^2	df	$P \leq$	CMIN/DF	CFI	NNFI	RMSEA	SRMR
USA								
One-factor	864.740	54	.001	16.014	.548	.447	.226	.167
Three-factor	112.949	51	.001	2.215	.965	.955	.064	.047
Bifactor	82.581	43	.001	1.920	.978	.966	.056	.043
Japan								
One-factor	367.982	54	.001	6.184	.451	.330	.200	.176
Three-factor	64.387	51	.099	1.262	.977	.970	.043	.053
Bifactor	45.530	43	.327	1.084	.995	.993	.022	.037
Poland								
One-factor	367.64	54	.001	6.808	.655	.578	.152	.114
Three-factor	89.55	51	.001	1.756	.958	.945	.055	.049
Bifactor	57.27	43	.071	1.332	.984	.976	.036	.044

each proposed model is similar across the three samples. For the unidimensional model, the goodness-of-fit statistics did not meet all the aforementioned criteria. For the three-factor model, the majority of the goodness-of-fit statistics exceeded the 'good' criteria, the exceptions being CMIN/DF and RMSEA for the US sample, and NNFI for the Japanese sample (though all these statistics exceeded the 'acceptable' criteria). For the bifactor model, all of the statistics exceeded the 'good' criteria, and demonstrated improvement over the three-factor model, as indicated by the changes in CFI (ΔCFI) being greater than .01 (Cheung & Rensvold, 2002).

Within the bifactor model, the variance accounted for by the general trait resilience factor was 44.8% (USA), 29.4% (Japan), and 44.2% (Poland). The group factors together explained a larger proportion of the variance for engineering (USA, 23.6%; Japan, 15.1%; Poland, 12.0%), ecological (USA, 4.2%; Japan, 25.6%; Poland, 21.6%), and adaptive capacity (USA, 27.4%; Japan, 29.9%; Poland, 22.1%). In terms of salience of loading on the factors, the mean loadings on the general resilience factor (USA, $m = .49$ [.10–.86]; Japan, $m = .37$ [.17–.81]; Poland, $m = .45$ [.25–.77]) were lower than on the group factors (USA, $m = .55$ [.26–.85]; Japan, $m = .60$ [.06–.85]; Poland, $m = .49$ [.04–.78]). These findings suggest a weighting towards a multidimensional assessment of trait resilience. The reliability estimates (Cronbach's alpha, omega total) for the group factors exceeded the aforementioned criteria of $\alpha > .70$: engineering: USA, $\alpha = .88$, $\omega t = .89$; Japan, $\alpha = .75$, $\omega t = .82$; Poland, $\alpha = .75$, $\omega t = .81$; ecological: USA, $\alpha = .83$, $\omega t = .89$; Japan, $\alpha = .79$, $\omega t = .81$; Poland, $\alpha = .75$, $\omega t = .76$; adaptive capacity: USA, $\alpha = .86$, $\omega t = .80$; Japan, $\alpha = .85$, $\omega t = .86$; Poland, $\alpha = .80$, $\omega t = .82$.

3.3. Multi-group confirmatory factor analysis (MGCFA)

The results for the MGCFA (see Table 4) suggested both the configural and metric models indicated a good fit to the data. However, the ΔCFI between them was higher than .01. Therefore, the current findings indicate only a configural level of invariance, suggesting that the structure of the scale is cross-culturally replicable but that the meaning and measurement are cross-culturally variable.

Table 4
Results for multigroup CFA for bifactor model, for UK, Polish, and Japanese versions.

	χ^2	df	$p <$	CFI	RMSEA	SRMR
Configural	199.93	128	.001	.979	.028 (.020 .035)	.048
Metric	361.39	172	.001	.945	.039 (.033 .045)	.053
Scalar	768.96	196	.001	.835	.064 (.059 .068)	.069

Key: χ^2 = chi-square, df = degrees of freedom, CFI = comparative fit index, RMSEA = root mean square error of approximation, SRMR = standardised root mean square residual.

3.4. Multiple regression

Mean scores for the TIPI are presented in Table 5. For each dependent variable, the five-factor personality models research statistical significant (Engineering, $r = .62$, $r^2 = .38$, adj $r^2 = .36$, $F = 20.69$, $p < .001$; Ecological, $r = .53$, $r^2 = .28$, adj $r^2 = .26$, $F = 12.99$, $p < .001$; Adaptive Capacity, $r = .62$, $r^2 = .38$, adj $r^2 = .36$, $F = 20.61$, $p < .001$). Table 5 presents the statistics for each regression: lower neuroticism accounted for unique variance in higher engineering resilience; lower neuroticism and higher conscientiousness (presenting the largest effect size) accounted for unique variance in higher ecological resilience; and lower neuroticism, and higher extraversion, conscientiousness and openness to experience (presenting the largest effect size) accounted for unique variance in higher adaptive resilience.

3.5. Logistical regression

Table 6 shows the results for the logistic regressions. In Step 1, the variables reached statistical significance for depression caseness ($\chi^2 = 20.61$, $p = .024$, Nagelkerke $R^2 = .16$), but not for anxiety caseness ($\chi^2 = 17.20$, $p = .070$, Nagelkerke $R^2 = .17$), with sex accounting for unique variance in terms of inclusion in the depression clinical group.

In Step 2, inclusion of the resilience scale reached statistical significance for depression caseness ($\chi^2 = 23.89$, $p < .001$, Nagelkerke $R^2 = .32$), and anxiety caseness ($\chi^2 = 9.40$, $p = .024$, Nagelkerke $R^2 = .25$). Engineering and adaptive capacity resilience accounted for unique variance in predicting depression caseness. Adaptive capacity resilience accounted for unique variance in predicting anxiety caseness.

4. Discussion

This study provides preliminary support for a bifactor structure underlying scores on the EEA trait resilience scale across US, Japan and Poland samples. Though, across the three samples, the bifactor model provided a better fit to the data than the three-factor model. The weighting of the variance and loadings of items within the model suggested an emphasis on the group factors and therefore towards a multidimensional assessment of trait resilience, comprising separate dimensions of engineering, ecological, and adaptive capacity resilience. This finding that the three factors are best represented as different dimensions is also consistent with the wider academic literature (Holling, 2006; Maltby et al., 2015). The MGCFA results also suggest that this structure is reproduced cross-culturally. However, although these dimensions are present in all three countries, the psychological meaning (as indicated by the failure to report metric and scalar invariance) varies between cultures. This suggests, perhaps unsurprisingly given Hofstede's (2001) cultural dimensions noted in Table 1, that the aetiology and average scores of the resilience scales vary across US, Poland and Japan and are not necessarily comparable in terms of meaning across these three samples.

Further, among the US subsample, a number of adaptive expressions of personality predict unique variance in resilience scores, largely replicating UK findings, with the exception that extraversion does not predict unique variance in ecological resilience. Moreover, the results repeat the UK findings in that engineering resilience shares most variance with neuroticism, ecological resilience shares most variance with conscientiousness, and adaptive capacity shares most variance with openness to experience (from a medium to large effect size). In terms of EEA resilience predicting clinical caseness in depression and anxiety, unlike previous findings

Table 5
Multiple regression with EEA resilience scores used as dependent variables and the five-factor personality model scores used as predictor variables.

	Mean (SD)	Engineering				Ecological				Adaptive capacity			
		B	β	t	Sig	B	β	t	Sig	B	β	t	Sig
1. Extraversion	3.45 (1.8)	.060	.084	1.30	.197	.035	.058	.83	.409	.131	.186	2.87	.005
2. Agreeableness	3.21 (1.7)	.061	.062	.96	.341	.077	.095	1.36	.180	−.085	−.089	−1.36	.175
3. Conscientiousness	5.41 (1.4)	.057	.059	.86	.394	.302	.374	5.05	.000	−.192	−.202	−2.93	.004
4. Neuroticism	5.16 (1.3)	−.426	−.558	−8.05	.000	−.099	−.155	−2.07	.040	−.130	−.172	−2.48	.014
5. Openness	4.84 (1.5)	−.033	−.038	−.57	.572	.021	.029	.39	.695	.446	.516	7.68	.000

(where ecological resilience scores were found to be associated with positive affect [Maltby et al., 2015]), the engineering and adaptive capacity resilience scores predict depression caseness, and the adaptive capacity resilience scores account for unique variance in predicting anxiety caseness. These differences between the US and UK may echo an earlier consideration regarding a variable aetiology of the resilience factors across cultures or that difference assessments of well-being were used. However, the current findings suggest the clinical relevance of engineering (ability to recover and swiftly) and adaptive capacity (willingness to adapt) resilience for predicting clinical caseness, after controlling for sex, age, education, income, employment status, and personality.

These findings are encouraging, given the potential variation that might emerge from cross-cultural comparisons. This consistency is perhaps due to (i) the strength of the Holling's model (Holling, 2006) in terms of evidence that it is applicable to a range of biological and social systems (Maltby et al., 2015) and (ii) the pedigree of items used, being taken from existing well-used and well-cited resilience scales. There are limitations to the study. For example, only personality and well-being were assessed in a US sub-sample, and there is the absence of other variables considered (e.g. other well-being and coping variables) that would inform construct validity assessments around resilience. Therefore further research is required to extend the nomological network around resilience.

In summary, the current findings suggest structural validity for a bifactor model of the EEA resilience scale among US, Japanese, and Polish samples, and convergent validity with measures of personality and well-being among a US sample. Consequently, we recommend the instrument as a potential measure of three main dimensions of resilience, as described by an ecological systems theory of resilience.

Table 6
Logistic regression with depression and anxiety clinical caseness used as dependent variables, and gender, age, employment status, income, education, and personality scores entered as predictor variables at Step 1 and EEA resilience scores used as predictors variables at Step 2.

	Depression caseness				Anxiety caseness			
	B	Wald	Sig	Odds ratio	B	Wald	Sig	Odds ratio
Step 1								
Sex	−1.01	6.23	.013	.37	.31	.40	.526	1.36
Age	−.46	1.10	.293	.63	−.14	.36	.548	.87
Employment status	.21	1.31	.252	1.23	−.84	2.59	.108	.43
Income	−.12	.36	.551	.89	−.27	.94	.331	.76
Education level	−.07	.12	.731	.94	.37	2.02	.156	1.44
Extraversion	.12	.36	.548	1.13	−.09	.12	.730	.91
Agreeableness	−.21	1.13	.289	.81	.06	.04	.835	1.06
Conscientiousness	.03	.02	.878	1.03	−.19	.61	.435	.83
Neuroticism	.32	2.35	.126	1.38	.62	5.16	.023	1.86
Openness	−.29	2.11	.147	.75	.07	.09	.767	1.08
Step 2								
Engineering resilience	−.82	9.16	.002	.44	−.13	.15	.698	.88
Ecological resilience	−.26	1.09	.297	.77	.05	.02	.877	1.05
Adaptive capacity	−.71	6.45	.011	.49	−1.00	7.78	.005	.37

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