"Let us Create!": The Mediating Role of Creative Self-Efficacy Between Personality and Mental Well-being in University Students

Emanuele Fino[1], Siyu Sun[2]

Author Note

[1]Department of Psychology, Nottingham Trent University, Nottingham, United Kingdom

[2]School of Vocational Education, Tianjin University of Technology and Education, China

Name of department(s) and institution(s) to which the work should be attributed:

Nottingham Trent University, Department of Psychology, United Kingdom.

Ethical Approval Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Name, mailing address and email address of author responsible for correspondence about the manuscript:

Emanuele Fino, PhD

Senior Lecturer in Psychology

Department of Psychology

Nottingham Trent University

50 Shakespeare Street

Nottingham NG1 4FQ

+44(0)115 84 84282

Declaration of interest

Nothing to declare.

Acknowledgements

The work presented in the article was realized within the project “Research on the anxiety, professional identity and sense of gaining of young University teachers in China during the transition period” financially supported by the National Education Scientific Planning Youth Project of the Ministry of Education of China (No. EIA190500).

"Let us Create!": The Mediating Role of Creative Self-Efficacy Between Personality and Mental Well-Being in University Students

Abstract

The present study aimed to test a model of relationships between the Big-Five personality traits, Creative Self-Efficacy, and Mental Well-Being in a sample of Chinese undergraduate students (N = 248), controlling for gender and age. We found that Openness, Conscientiousness, Extraversion, and Agreeableness were positively associated with Mental Well-Being and Creative Self-Efficacy, and that Neuroticism was negatively associated with both Mental Well-Being and Creative Self-Efficacy, with the effects observed for Extraversion and Neuroticism being non-significant. Creative self-efficacy was positively and significantly associated with Mental Well-Being, fully mediated the effect of Openness, and partially mediated the effect of Conscientiousness on Mental Well-Being. These results contribute to explain individual differences in personality and Mental Well-Being through the indirect effect of Creative Self-Efficacy, a belief in one's ability to innovatively overcome problems and achieve creative outcomes, supporting a theoretical model integrating Trait Theory and Social-Cognitive Theory. Further implications for theory, research, assessment, and intervention are discussed.

Keywords: Creative Self-Efficacy; Personality; Big-Five; Mental Well-Being; University students.

"Let us Create!": The Mediating Role of Creative Self-Efficacy Between Personality and Mental Well-Being in University Students

Background

Individuals' well-being and functioning are determined by a combination of several psychological and contextual factors, among which individual differences in personality holds a key role (Fino et al., 2014). High levels of Neuroticism and low levels of Openness, Conscientiousness, Extraversion, and Agreeableness are associated with poorer Mental Well-Being (MWB) (Gale et al., 2013) and reduced academic performances in young adults (Kertechian, 2018), carrying dramatic long-term implications on their mental health and life satisfaction (Gale et al., 2013). Research has investigated the relationship between Creative Self-Efficacy (CSE) and the Big-Five personality traits (Karwowski et al., 2013; Tan et al., 2013; Tang et al., 2017), showing significant correlations. In the study here presented, we focussed on the role of CSE as a mediator between personality traits and MWB, drawing upon a theoretical perspective integrating Trait Theory and Social-Cognitive Theory (Caprara et al., 2010, 2013).

Personality and Mental Well-Being

A large corpus of research using Trait Theory has tested the associations between the Big-Five personality factors and MWB. For example, Ervasti et al. (2019) found that Conscientiousness, Extraversion, and Agreeableness were associated with low self-reported stress in a sample of Finnish individuals (n = 1,001), whereas Neuroticism was associated with rumination, anxiety, and depression. These results supported previous literature showing associations between Neuroticism and stress-related conditions, such as depression and anxiety (Abbott et al., 2008; Kotov et al., 2010; Takano et al., 2009). In the same article, Ervasti et al. (2019) presented the results from another study (n = 366) showing that individuals scoring high in Agreeableness and Neuroticism were more likely to manifest

interest in mobile stress management applications, highlighting the importance of personality traits over the ability to cope with stress, mental health, and well-being, confirming evidence from previous studies (Ferguson, 2010; Vollrath et al., 1999). Similarly, research has shown that Openness (Chen, 2008), Conscientiousness, and Agreeableness (Soto, 2015) are positively correlated with MWB. These relationships have been confirmed in university student samples (Kroencke et al., 2019), indicating the importance of progressing the study of individual differences in MWB in this key population.

Several definitions and measurement models of MWB exist, and there is no consensus about the dimensionality of the construct (e.g., see Black et al., 2019). Recently, based on Ryan and Deci's (2001) distinction between hedonic well-being and eudaimonic well-being, Tennant et al. (2007) have developed and tested a theoretical and measurement model of MWB incorporating aspects of positive affect and individual functioning, which were operationalised through the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Tennant et al., 2007), a self-reported measure of MWB. The short version of the scale (SWEMWBS) measures a unidimensional construct which relates more to an individual's functioning rather than emotional well-being, proposing a slightly different conceptualisation of MWB compared to the original bi-dimensional model. Specifically, the SWEMWBS measures one's perception of feeling optimistic, useful, relaxed, close to other people, to deal well with problems, to think clearly, and to be able to make up one's own mind about different aspects of life (Tennant et al., 2007). Research examining the relationship between the Big-Five personality traits and MWB measured through the WEMWBS showed positive correlations between Openness, Conscientiousness, Extraversion, Agreeableness and MWB (Pearson's *r* ranging from .05 and .26) and negative correlations with Neuroticism (r = -.24; Spence et al., 2012). Similar results were found by Lehberger et al. (2021) using the short version of the scale, with positive correlations ranging from .17 (Agreeableness) to .31

(Extroversion) and negative correlations (r = -.23) observed for Neuroticism. Notably, those correlations presented a relatively low to mid effect size, thus warranting further research incorporating additional constructs to improve the understanding of the psychological processes involved in complex system of relationships between individual differences in personality and MWB.

Integrating Trait Theory and Social-Cognitive Theory to explain Mental Well-Being: The role of Creative Self-Efficacy

Bandura (1997) originally defined Self-Efficacy as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3), providing individuals with confidence in their own abilities, ultimately helping them overcome life challenges competently and enhancing their personal well-being. More recently, CSE has been defined by Tierney and Farmer (2002) as "the belief one has the ability to produce creative outcomes" (p. 1138), which other authors suggested to act as a mechanism that enables individuals to successfully manage cognitive resources towards the creative generation of such outcomes within a specific social setting (Kelley & Kelley, 2013).

Previous work by Caprara et al. (2013) highlighted the significant theoretical and empirical implications and benefits deriving from an integration of Social-Cognitive Theory, within which the construct of Self-Efficacy was developed, and the Trait theoretical framework. One of the main advantages associated with such integration consists of the greater potential to explain individual differences in personality and their expression in relation to several outcomes and domains, such as health and MWB (Caprara et al., 1999, 2013). In particular, according to Trait Theory, personality can be conceptualised as a "hierarchical organisation of stable patterns of affect, cognition and behaviour traceable to endogenous basic tendencies" (Caprara et al., 2013, p. 145; see also McCrae & Costa, 2008), whereas Social-Cognitive Theory sees individual differences as the product of a "cognitive–

affective system resulting from the concerted action of functionally distinct mechanisms, which gradually take form over the course of development mostly under the guidance of experience" (p. 145). Although personality traits and Self-Efficacy beliefs have traditionally been defined, operationalised, and studied though different theoretical lenses and often within competing empirical paradigms, Caprara et al. (2013) proposed the need and utility to go beyond such dichotomy and work towards their integration, considering the two as "complementary intra-individual subsystems operating in concert at different levels and impinging on behaviour in varying degrees across domains of functioning" (p. 146). In this vein, Self-Efficacy beliefs were conceptualised as a socio-cognitive device that mediate the expression of personality traits towards a variety of outcomes. Based on such theoretical foundations, the integrative model combining both perspectives has shown great explanatory power, specifically contributing to explain individual differences in personality and their expression in several domains, clarifying the social-cognitive mechanisms through which individuals express their basic cognitive, affective, and behavioural predispositions and manage to achieve positive life outcomes, including MWB (Caprara et al., 2010; Alessandri et al., 2011).

In the same vein, previous studies showed that individuals scoring high in CSE tend to generate innovative ideas, solutions, and adaptive behaviour (Beghetto, 2006; Beghetto & Karwowski, 2017; Tierney & Farmer, 2002). In this regard, CSE can bee seen as instrumental for individuals, a fundamental resource that enables them to re-frame complex and difficult situations, cope with life stressors and identity threats, and ultimately take risks and modulate efforts to overcome hurdles and solve problems innovatively and creatively (Tang et al., 2017). Choi (2004) highlighted that CSE also provides individuals with the ability to appraise and calibrate the level of creative effort required by a specific situation or a problem, based on past creative achievements. Similarly, Tang et al. (2017) described CSE as

a highly dynamic set of beliefs, possibly mediating through the expression of individual differences in personality and the achievement of positive life outcomes. In fact, previous studies had already shown correlations between personality traits and CSE. A study by Tan et al. (2013) showed positive correlations between CSE and Openness, Conscientiousness, Extraversion, and Agreeableness, and negative correlations between CSE and Neuroticism, whereas other studies indicated Openness as the most highly correlated trait (Karwowski et al., 2013). Further research has found that CSE was positively and lowly to moderately correlated with Conscientiousness, Extraversion, and Agreeableness, whereas its correlation with Neuroticism was found to be negative, confirming evidence from other studies (Karwowski et al., 2013). Moreover, research conducted in Chinese samples showed that CSE represent a significant mediator between traits and positive behavioural outcomes (Li & Wu, 2011).

Nevertheless, previous evidence showed that gender and age can affect CSE, specifically in determining variations in the individuals' ability to come out with creative strategies, ultimately affecting their confidence, agency, and overall functioning in several domains, and possibly playing a role in the relationship between personality traits and MWB. In particular, Li and Wang (2011) measured CSE in seventh- to ninth-graders in different Chinese provinces, finding higher scores in female students compared to male students, with the former showing stronger beliefs in their ability to come out with creative strategies and solve problems. In addition, the study found that the seventh-graders scored significantly higher than the eighth- and the ninth-graders. Similarly, Yang (2007) found that undergraduates from lower grades and younger age scored higher in CSE than those from higher grades and older age, although they found no significant gender differences. Conversely, He & Wong (2021) found that male graduates scored higher than their female counterparts in CSE and concluded that gender should always be considered in research

investigating CSE. These results are consistent with previous literature that argued that differences in Self-Efficacy might be explained in terms of variations in gender- and age-specific socialization and interpersonal expectations (Bausch et al., 2014), which in turn, have been found to affect individuals' functioning and MWB, as well, with women scoring higher than men in their ability to establish positive interpersonal relationships, but lower in self-acceptance and autonomy, particularly in young adults (Karasawa et al., 2011; Li et al., 2015). For all these reasons, some authors have recommended including these important demographics in research incorporating Self-Efficacy beliefs and MWB (Bausch et al. 2014; He & Wong, 2021).

Proposed theoretical model and nomological network

Based on the previously presented evidence, we propose a theoretical model integrating Trait Theory and Social-Cognitive Theory, defining CSE as a mediator between personality traits and MWB, the latter being conceptualised mainly in terms of an individual's functioning (Tennant et al., 2009). Specifically, the nomological network underlying the model draws upon (i) previous studies showing positive associations between CSE and Openness, Conscientiousness, Extraversion, and Agreeableness, and a negative association with Neuroticism, and (ii) research that has shown that CSE mediates between individual differences in personality and adaptive behaviour (Li & Wu, 2011). In particular, we proposed that the functioning of those individuals tending to seek out for intense, unpredictable (open), and highly action-oriented (extraverted) experiences would be indirectly affected by the beliefs in their ability to overcome problems innovatively and creatively within those experiences and situations, which are characteristic facets of CSE. On the other hand, CSE would provide conscientious individuals with the ability to self-regulate and focus, enabling them to correctly appraise the level of difficulty and effort required within a challenging or stressful situation, and therefore, to calibrate their endeavour to

overcome problems creatively and ultimately achieve positive MWB outcomes, coming out with innovative and efficient solutions supported by their beliefs in CSE. As for agreeable individuals, their tendency to complacency and to compromise their interests, but also to generosity, trust, and optimism would positively correlate with CSE, which however, in turn, would not mediate the effect of such trait on an individual's functioning, given the tendency of such individuals to adhere to established norms rather than to innovate to obtain creative outcomes. Lastly, we propose that Neuroticism, would be negatively associated with both CSE and an individual's functioning, based on a previous evidence showing that negative emotionality correlates negatively with both Self-Efficacy (Caprara et al., 2013) and MWB (Abbott, 2008; Ervasti et al., 2019). Figure 1 illustrates the proposed theoretical model.

[Figure 1: About Here]

Aims and hypotheses of the current study

Considering the evidence from previous literature and the proposed theoretical model, we considered investigating the relationships between personality, CSE, and MWB in university students of foremost importance for at least six reasons: (i) it will help shed a light on the complex patterns between personality factors and MWB, which in turn, previous literature in several cultural contexts showed to be interrelated to several mental health, academic, and professional outcomes, by means of a solid theoretical model integrating Trait Theory and Social-Cognitive Theory; (ii) it will help improving the understanding of the mediating role of CSE between personality and MWB, following on from recent studies indicating an association between CSE and known correlates of personality and MWB, namely hope, optimism, resilience, and life satisfaction (e.g., Li & Wu, 2011); (iii) it will provide researchers in psychology with up-to-date evidence, which could be further used to investigate the role of personality and CSE in complex models of academic attainments, in which MWB is considered to play a key role; (iv) it will allow practitioners in psychology,

mental health and well-being to refine assessment and intervention strategies and aim to screen university students in personality and CSE, potentially improving their well-being while studying at university, for example by delivering targeted training and academic support; (v) it will allow policy-makers in education to improve policies and guidelines to empower students in CSE, aiming to enhance their beliefs in the ability to overcome problems innovatively and achieve creative outcomes, therefore ultimately helping them increase their MWB, which might potentially reflect on their academic performances, with significant impact on educational systems; (vi) it will provide evidence on the relationships between personality, CSE, and MWB in Chinese students, providing a solid basis for future cross-cultural research, thus allowing researchers to formulate and refine hypotheses on the role of culture in individual differences in personality, CSE, and MWB across different contexts and populations.

For all those reasons, the aim of the present study was to test the proposed model of relationships between the Big-Five personality factors, CSE, and MWB in a sample of Chinese undergraduate students, after controlling for gender and age. Specifically, the study tested the following hypotheses:

H1: Openness (a), Conscientiousness (b), Extraversion (c), and Agreeableness (d) are positively associated with MWB, whereas Neuroticism (e) is negatively associated with MWB.

H2: Openness (a), Conscientiousness (b), Extraversion (c), and Agreeableness (d) are positively associated with CSE, whereas Neuroticism (e) is negatively associated with CSE.

H3: CSE is positively associated with MWB.

H4: CSE fully mediates between Openness and MWB (a), Conscientiousness and MWB (b), and Extraversion and MWB (c), but not between Agreeableness and MWB (d) and Neuroticism and MWB (e).

Methods

Participants and procedure

In May 2021, a sample of undergraduate students currently attending courses were contacted at a north-eastern university in China, during classroom sessions. They were introduced to the study, specifying that this was a study on personality, CSE, and MWB, and that participation was voluntary. The procedure consisted in completing a set of self-reported measures via the online platform *www.wjx.cn*. Participants were not required to disclose any identifiable information. They were required to read, understand, and sign an electronic consent form. The procedure lasted about 20 to 25 minutes, after which students were debriefed. The data files were stored within a password-protected institutional web-based cloud service, with two-factor authentication, and the files being solely accessible by the investigators. Participants were also informed, prior to their participation, that the data collection platform would automatically collect IP addresses as measures of survey validation, and it was clearly indicated that such information was going to be immediately destroyed, so that no identifiable information was retained howsoever.

Specifically, 330 students were contacted, of which 278 completed the procedure. They were 144 (51.80%) female and 134 (48.20%) male individuals. Their age ranged from 18 to 23 years old (M = 19.50, SD = 1.03). They were all asked to sign an electronic consent form. The procedure was reviewed and approved by the [MASKED FOR REVIEW] institutional ethics committee.

Measures

The *Chinese Big-Five Personality Inventory-15* (CBF-PI-15), is a 15-item, short form of the Chinese 134-item Big-Five personality inventory (Zhang et al., 2019). Items are scored on a 6-point Likert scale, from 1. The CBF-PI-15 measurement model was first tested by Zhang et al. (2019) in a sample of 10,738 Chinese adult individuals, whereas they assessed its

reliability and validity in a second independent sample of 256 Chinese college students. Results showed that the CBF-PI-15 had acceptable psychometric properties, showing internal consistency (Cronbach's alpha ranging from .61 to .80).

The *Creative Self-Efficacy Scale* (CS-ES) is a self-reported measure of creative self-efficacy based on Tierney and Farmer's (2002) theoretical model. The measure consists of four items asking participants to rate how they feel about their creative ability on a 7-point Likert scale. Gong et al. (2009) reported that the Chinese version of the scale if internally consistent (alpha = .91).

The Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS; Tennant et al., 2007) is a self-reported 7-item measure of MWB. Items are scored on a 5-point Likert scale. We used the Chinese version validated by Ng et al. (2014). The authors found the Chinese version of the scale internally consistent (alpha = .89).

Statistical analyses

We tested the hypotheses by means of path analysis and Structural Equation Modelling with maximum likelihood estimation, with all the effects estimated simultaneously.

To adjust for the possible low reliability (Omega) of the measures, we applied the model-based reliability correction proposed by Hayduk (1987, as detailed in Cole & Preacher, 2014). We tested for the normality and homoscedasticity of the distribution of residuals, respectively using the Q-Q plot and the scale-location plot. Multivariate outliers were detected using Mahalanobis' distance (Alpha = .001).

To correct for possible violations of the assumptions, we estimated adjusted statistics for nonnormal data and robust standard errors (MLM estimator; Rosseel, 2012). In addition, we used bootstrapping as a resampling method (5,000 repetitions) for estimating 95% bias-corrected percentile confidence intervals that adjusted for the possible nonnormal distribution

of the products of coefficients obtained through mediation (MacKinnon et al., 2012). Confidence intervals were then used to establish the significance of the estimated effects, rejecting the null hypothesis that an effect was equal to zero when zero was not comprised within the relevant confidence interval (MacKinnon et al., 2012). R^2 was used as a measure of explained variance.

Based on Kenny's (2021) recommendations for mediation in Structural Equation Modelling, we assessed model fit by means of indices based on information criteria (AIC, BIC, SABIC), comparing the fit of the following models: (i) the saturated model; (ii) a model with no direct effects; (iii) a model with no effects from the independent variables to the mediator, and no effect from the mediator to the dependent variable.

The analyses were conducted through R (Version 3.6.2; R Core Team, 2019) and lavaan (Version 0.6-7; Rosseel, 2012).

Results

Preliminary data screening

We detected and removed three unengaged responses ($SD < .3$ across all the items) and 27 multivariate outliers. Among the 248 retained observations, 133 participants self-reported to be female and 113 male, aged 18-23 years ($M = 19.49$, $SD = 1.02$), with no significant gender differences ($t_{(244)} = -24$, $p = .814$). The distribution of age showed skewness and kurtosis comprised between .24 and .48, and equal variances in females and males ($F_{(1)} = .59$, $p = .442$).

Following, the estimated Omega values (95% CI) are reported, for all the measures: CBF-PI-15 Neuroticism = .918 (.901-.936), CBF-PI-15 Conscientiousness = .794 (.749-.838), CBF-PI-15 Agreeableness = .899 (.878-.921), CBF-PI-15 Openness = .910 (.890-.929), CBF-PI-15 Extraversion = .848 (.815-.880), CSE = .912 (.894-.935) and SWEMWBS = .935 (.923-.948).

Finally, we observed violations of normality and homoscedasticity (Figure 2a, Figure 2b).

[Figure 2: About Here]

Correlations

Openness showed the highest correlation with CSE (r = .571, p < .001), followed by MWB (r = .517, p < .001), Conscientiousness (r = .394, p < .001), Agreeableness (r = .307, p < .001), Extraversion (r = .091, p > .05) and Neuroticism (r = .004, p > .05). We observed positive and significant correlations for Conscientiousness (r = .499, p < .001), Agreeableness (r = .436, p < .001), and Openness (r = .377, p < .001), whereas the correlation observed for Extraversion was not statistically significant (r = .082, p > .05). Lastly, Neuroticism correlated negatively and non-significantly with MWB (r = .088, p > .05).

H1: Personality and MWB

Openness (H1a; β = 0.22, *SE* = 0.5, 95% CI = 0.06 to 0.4), Conscientiousness (H1b; (β = 0.35, *SE* = 0.5, 95% CI = 0.17 to 0.66), Extraversion (H1c; β = 0.02, *SE* = 0.54, 95% CI = -0.09 to 0.14), and Agreeableness (H1d; β = 0.26, *SE* = 0.45, 95% CI = 0.1 to 0.46) were positively associated with MWB, whereas the association observed for Neuroticism (H1e; β = -0.12, *SE* = 0.63, 95% CI = -0.27 to 0) was negative. However, the effects of Extraversion and Neuroticism on MWB were not statistically significant, with zero being comprised within the relevant 95% confidence intervals, and therefore, in those cases, we rejected the null hypothesis that the pattern was different from zero.

H2: Personality and Creative Self-Efficacy

Openness (H2a; β = 0.45, *SE* = 0.38, 95% CI = 0.28 to 0.74), Conscientiousness (H2b; β = 0.21, *SE* = 0.61, 95% CI = 0.04 to 0.55), Extraversion (H2c; β = 0.02, *SE* = 0.51, 95% CI = -0.09 to 0.14), and Agreeableness (H2d; β = 0.1, *SE* = 0.49, 95% CI = -0.04 to 0.3) were positively associated with CSE, whereas Neuroticism was negatively associated with

CSE (H2e; β = -0.05, *SE* = 0.5, 95% CI = -0.17 to 0.05). The patterns observed for Extraversion and Neuroticism were not statistically significant.

H3: Creative Self-Efficacy and MWB

CSE was significantly and positively associated with MWB (H3; β = 0.33, *SE* = 0.32, 95% CI = 0.13 to 0.51).

H4: Personality, Creative Self-Efficacy, and MWB

CSE fully mediated between Openness (H4a; β = 0.15, *SE* = 0.2, 95% CI = 0.05 to 0.26) and MWB, and partially mediated the relationship between Conscientiousness (H4b; β = 0.07, *SE* = 0.2, 95% CI = 0.01 to 0.15) and MWB, whereas no significant indirect effect was found for Extraversion (H4c; β = 0.01, *SE* = 0.17, 95% CI = -0.03 to 0.05), Agreeableness (H4d; β = 0.03, *SE* = 0.16, 95% CI = -0.01 to 0.09), and Neuroticism (h4e; β = -0.02, *SE* = 0.16, 95% CI = -0.06 to 0.02).

Finally, R^2 values were equal to .50 for MWB and .27 for CSE. No significant effects were found for gender and age.

[Table 2: About Here]

Fit of the saturated and of the trimmed models

We estimated, assessed, and compared the fit of three models. The results showed that the saturated mediation model was the best to represent the data (AIC = 18856.83, BIC = 19561.67, SABIC = 19912.08), compared to the second (no direct effects) model (AIC = 18979.66, BIC = 19666.95, SABIC = 20017.37) and the third (no effects from the independent variables to the mediator, nor from the mediator to the dependent variable) model (AIC = 18868.71, BIC = 19571.85, SABIC = 19922.27).

Discussion

We found that Openness, Conscientiousness, Extraversion, and Agreeableness were positively associated with MWB, whereas the pattern between Neuroticism and MWB was

negative. However, the effects of Neuroticism and Extraversion on MWB were not statistically significant, and therefore, H1a, H1b, and H1d were confirmed, but H1c and H1e were not. Furthermore, Openness, Conscientiousness, Extraversion, and Agreeableness, were positively associated with CSE, whereas Neuroticism was negatively associated to it. The effects of Neuroticism and Extraversion were not statistically significant, and for these reasons, H2a, H2b, and H2d were confirmed, but H2c and H2e were not. CSE was positively and significantly associated with MWB, thus confirming H3. Regarding indirect effects, we found that CSE fully mediated the effect of Openness to MWB, confirming H4a, whereas CSE partially mediated the effect of Conscientiousness to MWB, thus not confirming H4b. Moreover, we found no mediation of CSE between, respectively, Agreeablenes (H4d) and Neuroticism (H4e), thus confirming the relevant hypotheses. However, the hypothesis of a significant indirect indirect effect of CSE between Extraversion and MWB (H4c) was not confirmed.

These results are aligned with recent literature on CSE and personality (Farmer & Tierney, 2017; Karwowski & Lebuda, 2016), confirming that Openness, Conscientiousness, and Agreeableness are positively associated with CSE. Particularly, they confirmed the relationship between personality and CSE, and in particular, the association between being open and conscientious and feeling confident about one's own ability to solve problems creatively and to come up with new ideas to tackle everyday challenges (Gong et al., 2009; Tierney & Farmer, 2002). The results are of even greater interest when looking at the mediating role of CSE between Openness and MWB. In fact, they show that individual differences in confidence in the ability to use creativity and to identify new ways to solve problems, on the one hand, and in perceiving oneself as being able to generate new ideas and to use other people's ideas to creatively overcome challenges, on the other (Gong et al., 2009;

Tierney & Farmer, 2002), fully mediated the relationship between being intellectually curious, creative and imaginative, and MWB, mainly intended as an individual's functioning.

This study contributes to expanding the literature within personality and individual differences research, using the integrative perspective combining Trait Theory and Social-Cognitive Theory to explain the psychological mechanisms underlying the relationships between personality, CSE, and MWB. In particular, the results showed that the relationships between personality and MWB, the former reflecting an organised and stable patterns of affect, cognition and behaviour derived from endogenous traits (Caprara et al., 2013, p. 150; McCrae & Costa, 2008), was mediated by a cognitive and affective system that regulates individuals' beliefs in their ability to overcome challenging situations by means of creativity. The two theoretical paradigms, once considered mutually exclusive and distinct, have been shown to be complementary and mutually inform the study of personality development (Caprara et al., 2010, 2013) and individuals' functioning (Roberts & Mroczek, 2008). The results from the present study support such integrative approach proposed by Caprara et al. (2013), in that Openness and Conscientiousness, considered as the main basic traits associated with creativity, curiosity, and the ability to self-regulate even in difficult and challenging situation, were mediated by CSE in their relationship with MWB. Thus, the former can be considered as basic predispositions that provide individuals with "consistent patterns of thought, feeling and action" (p. 151) that are regulated through CSE beliefs, the latter acting as "the gatekeepers of their actualization in view of the best fit between person and environment" (p. 151), allowing the individuals to come out with creative and innovative solutions to function within such environment. This perspective also contributes to redefine traits not just as fixed and rigid organisations of thought, affect, and behaviour, rather basic predispositions of agentic subjects who dynamically and socio-cognitively modulate their expression in relation to their beliefs to creatively and innovatively function within their

environment, suggesting a theoretically and empirically founded integration, thus enabling researchers to rely on solid theory and evidence to formulate and test their hypotheses (Caprara et al., 2010).

Specifically, the current study supported the hypothesis that individual differences in the tendency to seek out for intense, unpredictable (open) experiences are mediated by the beliefs in the ability to overcome problems innovatively and creatively within those experiences and situations, which may represent a necessary social and cognitive infrastructure for open individuals to express their traits instrumentally and develop and maintain their MWB. A recent study by Casali et al. (2021) has shown that Openness correlated positively with mental distress in 944 individuals from the Italian community undergoing social restrictions associated to the COVID-19 pandemic, and the authors argued that the general disposition of open individuals "to seek and create stimuli and emotions to make life fulfilling" (p. 2268) might have been "curtailed by the inability to express these feelings due to limitations on an individual's interpersonal relationships and activities under lockdown" (p. 2259), possibly through limiting their belief in their ability to innovate and overcome the current challenges as they would otherwise be inclined to do.

In addition, Conscientiousness intended as an individual's predisposition to self-regulate, appraise, and diligently use contextual affordances to modulate their efforts to overcome difficult situations, was partially mediated by CSE in its relationship with MWB. Our hypothesis was that CSE beliefs could mediate between the effect of such original disposition to self-regulation and discipline and an individual's functioning, providing conscientious individuals with a set of useful cognitive and creative processes, ultimately enabling them to exercise a higher degree of control to innovate and obtain positive MWB outcomes. However, as mentioned, in the current study, the indirect effect of CSE was only partially mediating between Conscientiousness and MWB. Hayes (2013) and Kenny (2021)

argued that claims of partial mediation require caution and that they might reveal poorly meaningful, and for this reason, we considered our hypothesis as not supported by the data. These results are apparently in conflict with recent literature showing the mediating role of Self-Efficacy between Conscientiousness and quality of life and well-being (Pocnet et al., 2017; Tabernero et al., 2020), considered as an important mechanism that channels, modulates, and ultimately links the expression of Conscientiousness to positive mental outcomes in patients affected by several conditions. In fact, we believe that the important differences attributable to both the characteristics of the target population and the specificity of CSE in educational settings rather more general beliefs in Self-Efficacy in patients' reported outcomes, may suggest the need for a context-specific analysis of CSE in relation to personality and MWB, possibly leading to different results.

As for Agreeableness, our hypotheses was supported, as we found no significant indirect effect of CSE on MWB. Although we hypothesised that a tendency to complacency but also to generosity, trust, and optimism, would favour a positive relationship with CSE, with typical facets of agreeableness such as altruism, tendency to cooperation, modesty, and trust possibly playing a role in such a significant association, the relationship between Agreeableness and CSE was relatively low (.10), similar to what found in other studies (e.g., Silvia et al., 2011). Moreover, CSE did not mediate the relationship between Agreeableness and MWB, indicating that creativity and the belief in one's capacity to creatively impact a situation and solve problems innovatively had no indirect effects between the characteristic patterns that link the expression of Agreeableness to the ability to function at the individual's level. Silvia et al. (2011) suggested that the expansion of the Big-Five factor model to the HEXACO six-factor model of personality might help explaining the low or even null association of Agreeableness to creativity through hostility, which in turn, was associated with low Agreeableness and was found to predict greater level of creative outcomes. For this

reason, to avoid speculations, we invite future research to consider and compare alternative models of personality in their capacity to explain individual differences in Agreeableness, CSE, and MWB, drawing upon results from literature that showed a possible role of traits, and even more specifically, looking at characteristic facets of those traits that could help shed a light of those relationships, which were not considered in the current study

Furthermore, it must be noted that Extraversion and Neuroticism were not significantly associated with CSE and MWB, in contrast with literature showing that the two represent major correlates of both constructs (Abbott et al., 2008; Ervasti et al., 2019; Kotov et al., 2010; Takano et al., 2009). We think that this might be due to several reasons, not least the implicit selection bias that might characterise admissions to university, ultimately favouring students scoring substantially highly in Conscientiousness, Agreeableness, and Openness, and lowly in Neuroticism and Extraversion. In addition, we suggest an interpretation of such conflicting evidence along two conceptual lines: (i) the specific definition and measurement of MWB utilised in the present study; (ii) the role of cultural differences in the expression of personality traits that might influence the relationship between those traits and MWB.

With regards to the former, as discussed, the current study conceptualised MWB mainly in terms of an individual's functioning, including one's perception of feeling optimistic, useful, relaxed, close to other people, to deal well with problems, to think clearly, and to be able to make up their own mind about different things (Tennant et al., 2007). Previous meta-analytic work showed that different conceptualisations of MWB across several studies led to significant variations in their correlations with personality traits (DeNeve et al., 1998). A recent longitudinal study by Gale et al. (2013) in a UK cohort (N = 4,583), showed that the correlations between MWB and Neuroticism measured through the WEMWBS ranged from -.15 to -.23, and those between MWB and Extraversion ranged from .22 to .21,

at 16 and 26 years, respectively, indicating a relatively low degree of association between the constructs, as substantially confirmed in further research, as well (e.g., Lehberger et al., 2021; Spence et al., 2012). In the same vein, Abbot et al. (2008) found that the effect of Neuroticism on MWB was fully mediated through emotional adjustment, suggesting variations in the expression of such trait, dependent on the inclusion of specific cognitive and emotional mediators.

Nevertheless, to the best of our knowledge, evidence on the relationship between personality traits and MWB measured through the WEMWBS in Asian linguistic and cultural contexts is lacking, whereas in fact, challenges to the cross-cultural interpretation of the stability of the Big-Five personality factors and their relationship with MWB exist. For example, Eap et al. (2008) found that Asian American male individuals scoring high in concerns for loss of face tended to significantly differ in the organisation of their personality compared to European American male individuals, showing lower Extraversion scores in the former, as already found in research in Asian populations (Mastor et al., 2000; Peng & Luo, 2021; Yang, 1986). Similarly, McCrae et al. (1998) found substantial differences in the expression of personality traits between Hong Kong and North American undergraduates. They also identified a different vulnerability to stress, and as a consequence, a different pattern of coping mechanisms that may lead to differences in the association between the manifestations of those traits and MWB, across the different groups. These differences could be interpreted in the light of known variations in values of individualism and collectivism derived from distinct acculturation processes, exerting an influence on “the development and expression of personality traits” (McCrae et al., 1998, p. 1045), and establishing hierarchies of salience of values such as imaginative fantasy, need for variety, liberality, and optimism (McCrae et al., 1998), which are known to be key mediators in the expression of personality

traits, and as a result, in the current study, these might have determined differences in the association between those traits and MWB, compared to research realised in other contexts.

Such variations might be even greater, due to the definition and measurement of MWB that we utilised, intended mainly as an individual's functioning vs. a conception rather framing it in terms of a state of mood and emotional stability. Previous cross-cultural studies showed that Chinese individuals tended to score more highly in competence, efficiency, and modesty, which in turn, are known to play a role in the expression of Extraversion and Neuroticism, thus potentially altering their impact on an individual's functioning (McCrae et al., 1996). For these all these reasons, further cross-cultural research in individual differences in personality, CSE, and MWB may enable researchers to clarify the relationship between the expression of Extraversion and Neuroticism across different socio-cultural contexts and their interplay with social and cultural systems of beliefs in their actualisation of MWB outcomes, also in relation to gender and age, which in the current study were not significantly associated to the considered traits, although the homogeneity of the sample used might have played a role in that regard, hence the need for further research.

The results here presented also carry a number of implications for future assessment and intervention, especially in the light of the student population in which they were observed. In particular, having shown a significant mediating effect of CSE between traits such as Openness and Conscientiousness and MWB reinforces the theoretical and practical value of assessing university students' creativity and perception of CSE, aiming to help them enhance their MWB while studying at university, especially in the light of the known risk for a number of negative mental health outcomes experienced by such population (Cheung et al., 2020; Karing, 2021; Sheldon et al., 2021), with potentially detrimental impact on their personal, interpersonal and academic functioning (Matteucci & Soncini, 2021), educational outcomes (Bolinski et al., 2020; Matteucci & Soncini, 2021; Rahiem, 2021), and lifelong

adjustment and satisfaction (Gale et al., 2013). This implies, for example, the need for screening students for their personality traits and CSE beliefs and helping those scoring lower in CSE develop their own creative potential by means of targeted training and vocational programs. Furthermore, a timely and targeted assessment of university students for their personality traits and individual differences in CSE might reveal key in orienting their university, career, and life choices, helping them express the best of their potential, with subsequent positive impact on their life satisfaction and on the organisation of public education programs and policies. In this regard, the contribution of educational and psychological practitioners might be instrumental, in that they could provide students with targeted educational support during ordinary and extra-curricular sessions, helping students develop beliefs in CSE and fostering favourable conditions for them to fully function through the complex challenges posed by the academic environment. In particular, this could be achieved by training lecturers and university staff who could act as role models, embracing CSE and providing students with the necessary set of competences and skills for their development. From the perspective of educational policy makers, the results here presented should invite them to review their strategies and guidelines, aiming to perform targeted reviews of academic programmes, including CSE-enhancing training and support to foster a positive and empowering student experience and training while at university.

Limitations

Despite such meaningful implications, the study has limitations. First, the cross-sectional nature of the data limits the significance of the results. Second, the sample size was relatively small, drawn from a unique institution and country, and including a substantially homogeneous set of students in terms of age, thus limiting the generalizability of the observed results. Second, the use of self-reported measures represents a significant limitation to the objectivity and accuracy of the effects observed between the variables investigated in

the study. Third, the total variance of MWB explained by the model (.50) was relatively small, challenging the interpretation of observed effects and requiring further investigation using comprehensive models including additional variables that might contribute to explain the variance of MWB, for example (but not limited to): Internal working models of attachment, self-regulation, emotional intelligence. Moreover, in the light of the known commonalities between Self-Efficacy and "sister" psychological constructs such as Mental Toughness (Clough et al., 2002), Grit (Duckworth et al., 2007) and Hope (Zhou & Kham, 2016), future research will benefit from integrating the theoretical perspective here presented by means of models of individual differences in personality, CSE, and MWB accounting for the role of such constructs and their dynamic interrelation with traits and CSE beliefs in determining positive MWB outcomes. Fourth, in the light of such important limitations, we recommend future research to attempt to replicate and further explore such complex relationships, including using longitudinal designs.

Conclusions

Creative self-efficacy fully mediated the effect of Openness and Mental Well-Being, and partially mediated the effect of Conscientiousness and Mental Well-Being in a sample of Chinese undergraduate students. These results open novel theoretical and research questions, possibly impacting assessment and intervention targeting Creative Self-Efficacy in student populations, with potentially significant implications for university students' Mental Well-Being and functioning, and educational systems' policy.

References

Abbott, R. A., Croudace, T. J., Ploubidis, G. B., Kuh, D., Wadsworth, M. E. J., Richards, M., & Huppert, F. A. (2008). The relationship between early personality and midlife psychological well-being: Evidence from a UK birth cohort study. *Social Psychiatry and Psychiatric Epidemiology*, *43*(9), 679–687. https://doi.org/10.1007/s00127-008-0355-8

Alessandri, G., Perinelli, E., De Longis, E., Schaufeli, W. B., Theodorou, A., Borgogni, L., Caprara, G. V., & Cinque, L. (2018). Job burnout: The contribution of emotional stability and emotional self-efficacy beliefs. *Journal of Occupational and Organizational Psychology*, *91*(4), 823–851. https://doi.org/10.1111/joop.12225

Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman and Co.

Bausch, S., Michel, A., & Sonntag, K. (2014). How gender influences the effect of age on self-efficacy and training success. *International Journal of Training and Development*, *18*(3), 171–187. https://doi.org/10.1111/ijtd.12027

Beghetto, R. A. (2006). Creative self-efficacy: Correlates in middle and secondary students. *Creativity Research Journal*, *18*(4), 447–457. https://doi.org/10.1207/s15326934crj1804_4

Beghetto, R. A., & Karwowski, M. (2017). Toward untangling creative self-beliefs. In M. Karwowski & J. C. Kaufman (Eds.). *The creative self.* Academic Press.

Black, L., Panayiotou, M., & Humphrey, N. (2019). The dimensionality and latent structure of mental health difficulties and wellbeing in early adolescence. *PLOS ONE*, *14*(2), e0213018. https://doi.org/10.1371/journal.pone.0213018

Bolinski, F., Boumparis, N., Kleiboer, A., Cuijpers, P., Ebert, D. D., & Riper, H. (2020). The effect of e-mental health interventions on academic performance in university and

college students: A meta-analysis of randomized controlled trials. *Internet Interventions*, *20*, 100321. https://doi.org/10.1016/j.invent.2020.100321

Caprara, G. V., Alessandri, G., & Barbaranelli, C. (2010). Optimal functioning: Contribution of self-efficacy beliefs to positive orientation. *Psychotherapy and Psychosomatics*, *79*(5), 328–330. https://doi.org/10.1159/000319532

Caprara, G., Vecchione, M., Barbaranelli, C., & Alessandri, G. (2013). Emotional Stability and Affective Self-regulatory Efficacy Beliefs: Proofs of Integration between Trait Theory and Social Cognitive Theory. *European Journal of Personality*, *27*(2), 145-154. https://doi.org/10.1002/per.1847

Casali, N., Feraco, T., Ghisi, M., & Meneghetti, C. (2021). "Andrà tutto bene": Associations Between Character Strengths, Psychological Distress and Self-efficacy During Covid-19 Lockdown. *Journal of Happiness Studies*, *22*(5), 2255–2274. https://doi.org/10.1007/s10902-020-00321-w

Chen, L. S.-L. (2008). Subjective Well-Being: Evidence from the Different Personality Traits of Online Game Teenager Players. *CyberPsychology & Behavior*, *11*(5), 579–581. https://doi.org/10.1089/cpb.2007.0192

Cheung, K., Tam, K. Y., Tsang, H., Zhang, L. W., & Lit, S. W. (2020). Depression, anxiety and stress in different subgroups of first-year university students from 4-year cohort data. *Journal of Affective Disorders*, *274*, 305–314. https://doi.org/10.1016/j.jad.2020.05.041

Choi, J. N. (2004). Individual and contextual predictors of creative performance: The mediating role of psychological processes. *Creativity Research Journal*, *16*(2–3), 187–199.

Clough, P. J., Earle, K., & Sewell, D. (2002). Mental toughness: the concept and its measurement. In Cockerill, I. (Ed.), *Solutions in sport psychology*. Thomson.

Cole, D. A., & Preacher, K. J. (2014). Manifest variable path analysis: Potentially serious and misleading consequences due to uncorrected measurement error. *Psychological Methods, 19*(2), 300-315. http://dx.doi.org/10.1037/a0033805

DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, 197–229. https://doi.org/10.1037/0033-2909.124.2.197

Duckworth, A., Peterson, C., Matthews, M., & Kelly, D. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, *9*(6), 1087–1101. http://dx.doi.org/10.1037/0022-3514.92.6.1087

Eap, S., DeGarmo, D. S., Kawakami, A., Hara, S. N., Hall, G. C. N., & Teten, A. L. (2008). Culture and Personality Among European American and Asian American Men. *Journal of Cross-Cultural Psychology*, *39*(5), 630–643. https://doi.org/10.1177/0022022108321310

Ervasti, M., Kallio, J., Määttänen, I., Mäntyjärvi, J., & Jokela, M. (2019). Influence of Personality and Differences in Stress Processing Among Finnish Students on Interest to Use a Mobile Stress Management App: Survey Study. *JMIR Mental Health*, *6*(5), e10039. https://doi.org/10.2196/10039

Farmer, S. M., & Tierney, P. (2017). Chapter 2 - Considering Creative Self-Efficacy: Its Current State and Ideas for Future Inquiry. In M. Karwowski & J. C. Kaufman (Eds.), *The Creative Self* (pp. 23–47). Academic Press. https://doi.org/10.1016/B978-0-12-809790-8.00002-9

Ferguson, E. (2001). Personality and coping traits: A joint factor analysis. *British Journal of Health Psychology*, *6*(4), 311–325. https://doi.org/10.1348/135910701169232

Fino, E., Iliceto, P., Sabatello, U., Petrucci, F., & Candilera, G. (2014). Self/other perception mediates between personality and suicidal ideation in young adults. *The European Journal of Psychiatry*, *28*(2), 104–113.

Gale, C. R., Booth, T., Mõttus, R., Kuh, D., & Deary, I. J. (2013). Neuroticism and Extraversion in youth predict mental wellbeing and life satisfaction 40 years later. *Journal of Research in Personality*, *47*(6), 687–697. https://doi.org/10.1016/j.jrp.2013.06.005

Gong, Y., Huang, J.-C., & Farh, J.-L. (2009). Employee Learning Orientation, Transformational Leadership, and Employee Creativity: The Mediating Role of Employee Creative Self-Efficacy. *Academy of Management Journal*, *52*. https://doi.org/10.5465/AMJ.2009.43670890

Hayduk, L. A. (1987). *Structural equation modeling with LISREL: Essentials and advances.* Johns Hopkins University Press.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* Guilford Press.

He, W., & Wong, W. (2021). Gender differences in creative self-efficacy: Findings of mean and variability analyses. *Thinking Skills and Creativity*, *42*, 100955. https://doi.org/10.1016/j.tsc.2021.100955

Karing, C. (2021). Prevalence and predictors of anxiety, depression and stress among university students during the period of the first lockdown in Germany. *Journal of Affective Disorders Reports*, *5*, 100174. https://doi.org/10.1016/j.jadr.2021.100174

Karasawa, M., Curhan, K. B., Markus, H. R., Kitayama, S. S., Love, G. D., Radler, B. T., & Ryff, C. D. (2011). Cultural Perspectives on Aging and Well-Being: A Comparison of Japan and the U.S. *International Journal of Aging & Human Development*, *73*(1), 73–98.

Karwowski, M., Lebuda, I., Wisniewska, E., & Gralewski, J. (2013). Big five personality traits as the predictors of creative self-efficacy and creative personal identity: Does gender matter? *Journal of Creative Behavior*, *47*(3), 215–232. https://doi.org/10.1002/jocb.32

Kelley, D., & Kelley, T. (2013). *Creative Confidence: Unleashing the Creative Potential Within Us All*. William Collins.

Kenny, D. A. (2021). *Mediation*. http://davidakenny.net/cm/mediate.htm

Kertechian, S. K. (2018). Conscientiousness as a key to success for academic achievement among French university students enrolled in management studies. *The International Journal of Management Education*, *16*(2), 154–165. https://doi.org/10.1016/j.ijme.2018.02.003

Klassen, R. M. (2004). Optimism and realism: A review of self-efficacy from a cross-cultural perspective. *International Journal of Psychology*, *39*(3), 205–230. https://doi.org/10.1080/00207590344000330

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking 'big' personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin*, *136*(5), 768–821. https://doi.org/10.1037/a0020327

Kroencke, L., Harari, G. M., Katana, M., & Gosling, S. D. (2019). Personality trait predictors and mental well-being correlates of exercise frequency across the academic semester. *Social Science & Medicine*, *236*, 112400. https://doi.org/10.1016/j.socscimed.2019.112400

Lehberger, M., Kleih, A.-K., & Sparke, K. (2021). Self-reported well-being and the importance of green spaces – A comparison of garden owners and non-garden owners in times of COVID-19. *Landscape and Urban Planning*, *212*, 104108. https://doi.org/10.1016/j.landurbplan.2021.104108

Li, R.-H., Kao, C.-M., & Wu, Y.-Y. (2015). Gender differences in psychological well-being: Tests of factorial invariance. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation, 24*(11), 2577–2581. https://doi.org/10.1007/s11136-015-0999-2

Li, C.-H., & Wu, J.-J. (2011). The Structural Relationships Between Optimism and Innovative Behavior: Understanding Potential Antecedents and Mediating Effects. *Creativity Research Journal*, *23*(2), 119–128. https://doi.org/10.1080/10400419.2011.571184

Li, J., & Wang, J. (2011). 初中生创新自我效能感现状调查及培养策略 [Investigation into the creative self-efficacy of junior middle-school students and the creative self-efficacy cultivation strategies]. *教育测量与评价: 理论版 · May*, 39-43.

MacKinnon, D. P., Cheong, J., & Pirlott, A. G. (2012). Statistical mediation analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 313-331). American Psychological Association.

Mastor, K., Jin, P., & Cooper, M. (2000). Malay Culture and Personality: A Big Five Perspective. *American Behavioral Scientist*, *44*(1), 95–111. https://doi.org/10.1177/00027640021956116

Matteucci, M. C., & Soncini, A. (2021). Self-efficacy and psychological well-being in a sample of Italian university students with and without Specific Learning Disorder. *Research in Developmental Disabilities*, *110*, 103858. https://doi.org/10.1016/j.ridd.2021.103858

McCrae, R. R., & Costa, P. T. Jr., (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 159–181). The Guilford Press.

McCrae, R. R., Costa, P. T. Jr., & Yik, M. S. M. (1996). Universal Aspects of Chinese Personality Structure. In M. H. Bond (Ed.), *The handbook of Chinese psychology* (pp. 189–207). Oxford University Press.

McCrae, R. R., Yik, M. S., Trapnell, P. D., Bond, M. H., & Paulhus, D. L. (1998). Interpreting personality profiles across cultures: Bilingual, acculturation, and peer rating studies of Chinese undergraduates. *Journal of Personality and Social Psychology*, *74*(4), 1041–1055. https://doi.org/10.1037//0022-3514.74.4.1041

Ng, S. S. W., Lo, A. W. Y., Leung, T. K. S., Chan, F. S. M., Wong, A. T. Y., Lam, R. W. T., & Tsang, D. K. Y. (2014). Translation and validation of the Chinese version of the short Warwick-Edinburgh Mental Well-Being Scale for patients with mental illness in Hong Kong. *East Asian Archives of Psychiatry: Official Journal of the Hong Kong College of Psychiatrists*, *24*(1), 3–9.

Peng, L., & Luo, S. (2021). Impact of social economic development on personality traits among Chinese college students: A cross-temporal meta-analysis, 2001–2016. *Personality and Individual Differences*, *171*, 110461. https://doi.org/10.1016/j.paid.2020.110461

Pocnet, C., Dupuis, M., Congard, A., & Jopp, D. (2017). Personality and its links to quality of life: Mediating effects of emotion regulation and self-efficacy beliefs. *Motivation and Emotion*, *41*(2), 196–208. https://doi.org/10.1007/s11031-017-9603-0

R Core Team. (2019). R: A language and environment for statistical computing. *R Foundation for Statistical Computing, Vienna, Austria*.

Rahiem, M. D. H. (2021). Remaining motivated despite the limitations: University students' learning propensity during the COVID-19 pandemic. *Children and Youth Services Review*, *120*, 105802. https://doi.org/10.1016/j.childyouth.2020.105802

Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science, 17,* 31–35. https://doi.org/10.1111%2Fj.1467-8721.2008.00543.x

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36. https://doi.org/10.18637/jss.v048.i02

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166. https://doi.org/10.1146/annurev.psych.52.1.141

Sheldon, E., Simmonds-Buckley, M., Bone, C., Mascarenhas, T., Chan, N., Wincott, M., Gleeson, H., Sow, K., Hind, D., & Barkham, M. (2021). Prevalence and risk factors for mental health problems in university undergraduate students: A systematic review with meta-analysis. *Journal of Affective Disorders*, *287*, 282–292. https://doi.org/10.1016/j.jad.2021.03.054

Silvia, P. J., Kaufman, J. C., Reiter-Palmon, R., & Wigert, B. (2011). Cantankerous creativity: Honesty–Humility, Agreeableness, and the HEXACO structure of creative achievement. *Personality and Individual Differences*, *51*(5), 687–689. https://doi.org/10.1016/j.paid.2011.06.011

Soto, C. J. (2015). Is Happiness Good for Your Personality? Concurrent and Prospective Relations of the Big Five With Subjective Well-Being. *Journal of Personality*, *83*(1), 45–55. https://doi.org/10.1111/jopy.12081

Spence, R., Owens, M., & Goodyer, I. (2012). Item response theory and validity of the NEO-FFI in adolescents. *Personality and Individual*

Differences, *53*(6), 801–807. https://doi.org/10.1016/j.paid.2012.06.002

Tabernero, C., Gutiérrez-Domingo, T., Vecchione, M., Cuadrado, E., Castillo-Mayén, R., Rubio, S., Arenas, A., Delgado-Lista, J., Jiménez-Pérez, P., & Luque, B. (2019). A longitudinal study on perceived health in cardiovascular patients: The role of conscientiousness, subjective wellbeing and cardiac self-efficacy. *PLOS ONE*, *14*(10), e0223862. https://doi.org/10.1371/journal.pone.0223862

Takano, K., & Tanno, Y. (2009). Self-rumination, self-reflection, and depression: Self-rumination counteracts the adaptive effect of self-reflection. *Behaviour Research and Therapy*, *47*(3), 260–264. https://doi.org/10.1016/j.brat.2008.12.008

Tan, A.-G., Li, T., & Neber, H. (2013). Creativity self-efficacy and its correlates. In *Creativity, talent and excellence* (pp. 107–119). Springer Science + Business Media. https://doi.org/10.1007/978-981-4021-93-7_8

Tang, M., Hu, W., & Zhang, H. (2017). Chapter 13 - Creative Self-Efficacy From the Chinese Perspective: Review of Studies in Mainland China, Hong Kong, Taiwan, and Singapore. In M. Karwowski & J. C. Kaufman (Eds.), *The Creative Self* (pp. 237–257). Academic Press. https://doi.org/10.1016/B978-0-12-809790-8.00013-3

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Parkinson, J., Secker, J., & Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS): Development and UK validation. *Health and Quality of Life Outcomes*, *5*(1), 63. https://doi.org/10.1186/1477-7525-5-63

Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, *45*(6), 1137–1148. Scopus. https://doi.org/10.2307/3069429

Vollrath, M., Knoch, D., & Cassano, L. (1999). Personality, risky health behaviour, and perceived susceptibility to health risks. *European Journal of Personality*, *13*(1), 39–50. https://doi.org/10.1002/(SICI)1099-0984(199901/02)13:1<39::AID-PER328>3.0.CO;2-J

Yang, L. (2007b). **大学生**创新自我效能感现状的调查分析[Investigation into the creative self-efficacy of college students]. ***四川教育学院学报***，*23*(5), 9-10.

Zhang, X., Wang, M.-C., He, L., Jie, L., & Deng, J. (2019). The development and psychometric evaluation of the Chinese Big Five Personality Inventory-15. *PLOS ONE*, *14*(8), e0221621. https://doi.org/10.1371/journal.pone.0221621

Zhou, M. & Kam, C. C. S. (2016) Hope and General Self-efficacy: Two Measures of the Same Construct? *The Journal of Psychology*, *150(*5), 543-559. https://doi.org/10.1080/00223980.2015.1113495

Table 1. Pearson's correlations (*N* = 248)

Variable	1	2	3	4	5	6
1. Neuroticism						
2. Conscientiousness	0.053					
3. Agreeableness	0.068	0.413***				
4. Openness	0.097	0.333***	0.281***			
5. Extraversion	-.315***	-0.022	-0.038	0.135*		
6. Mental well-being	-0.088	0.499***	0.436***	0.377***	0.082	
7. Creative self-efficacy	0.004	0.394***	0.307***	0.571***	0.091	0.517***

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

Table 2. Path analysis, standardised estimates from the mediation structural model (*N* = 248)

Direct	Openness	-	Mental well-being	0.07	0.5	0.14	0.869	-0.06	0.22
	Conscientiousness	-	Mental well-being	0.28	0.47	0.6	0.548	0.13	0.54
	Extraversion	-	Mental well-being	0.02	0.51	0.03	0.931	-0.09	0.13
	Agreeableness	-	Mental well-being	0.23	0.4	0.57	0.567	0.09	0.41
	Neuroticism	-	Mental well-being	-0.1	0.59	-0.17	0.858	-0.23	0.01
	Openness	-	Creative self-efficacy	0.45	0.38	1.19	0.236	0.28	0.74
	Conscientiousness	-	Creative self-efficacy	0.21	0.61	0.35	0.722	0.04	0.55
	Extraversion	-	Creative self-efficacy	0.02	0.51	0.03	0.926	-0.09	0.14
	Agreeableness	-	Creative self-efficacy	0.1	0.49	0.2	0.835	-0.04	0.3
	Neuroticism	-	Creative self-efficacy	-0.05	0.5	-0.1	0.906	-0.17	0.05
	Creative self-efficacy	-	Mental well-being	0.33	0.32	1.01	0.32	0.13	0.51

Gender	-	Openness	0.26	0.15	1.72	0.214	-0.05	0.55
Gender	-	Conscientiousness	-0.09	0.16	-0.56	0.438	-0.42	0.23
Gender	-	Extraversion	-0.14	0.17	-0.82	0.394	-0.48	0.21
Gender	-	Agreeableness	-0.26	0.14	-1.84	0.188	-0.55	0.04
Gender	-	Neuroticism	0.25	0.17	1.48	0.264	-0.12	0.58
Gender	-	Creative self-efficacy	-0.01	0.3	-0.05	0.737	-0.26	0.23
Gender	-	Mental well-being	-0.17	0.34	-0.5	0.593	-0.44	0.07
Age	-	Openness	-0.07	0.04	-1.74	0.034	-0.82	0.84
Age	-	Conscientiousness	0.19	0.05	3.67	0.092	-0.2	0.95
Age	-	Extraversion	0.12	0.05	2.58	0.137	-0.78	0.9
Age	-	Agreeableness	0.09	0.05	1.82	0.024	-0.35	0.94
Age	-	Neuroticism	-0.13	0.05	-2.75	0.2	-0.91	0.75

	Age	-	Creative self-efficacy	-0.15	0.5	-0.31	0.709	-1.2	0.53
	Age	-	Mental well-being	0.19	0.43	0.44	0.431	-0.44	0.8
Indirect	Openness	Creative self-efficacy	Mental well-being	0.15	0.2	0.73	0.469	0.05	0.26
	Conscientiousness	Creative self-efficacy	Mental well-being	0.07	0.2	0.32	0.749	0.01	0.15
	Extraversion	Creative self-efficacy	Mental well-being	0.01	0.17	0.03	0.928	-0.03	0.05
	Agreeableness	Creative self-efficacy	Mental well-being	0.03	0.16	0.19	0.844	-0.01	0.09
	Neuroticism	Creative self-efficacy	Mental well-being	-0.02	0.16	-0.1	0.909	-0.06	0.02
Total	Openness	Creative self-efficacy	Mental well-being	0.22	0.5	0.43	0.668	0.06	0.4
	Conscientiousness	Creative self-efficacy	Mental well-being	0.35	0.5	0.69	0.488	0.17	0.66
	Extraversion	Creative self-efficacy	Mental well-being	0.02	0.54	0.04	0.928	-0.09	0.14
	Agreeableness	Creative self-efficacy	Mental well-being	0.26	0.45	0.58	0.558	0.1	0.46
	Neuroticism	Creative self-efficacy	Mental well-being	-0.12	0.63	-0.18	0.846	-0.27	0

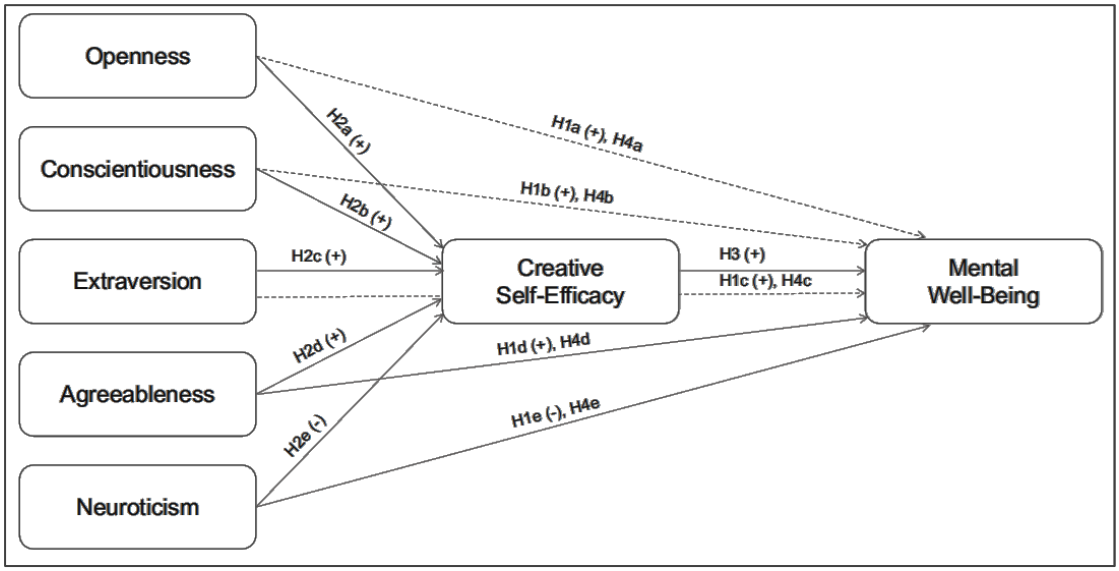
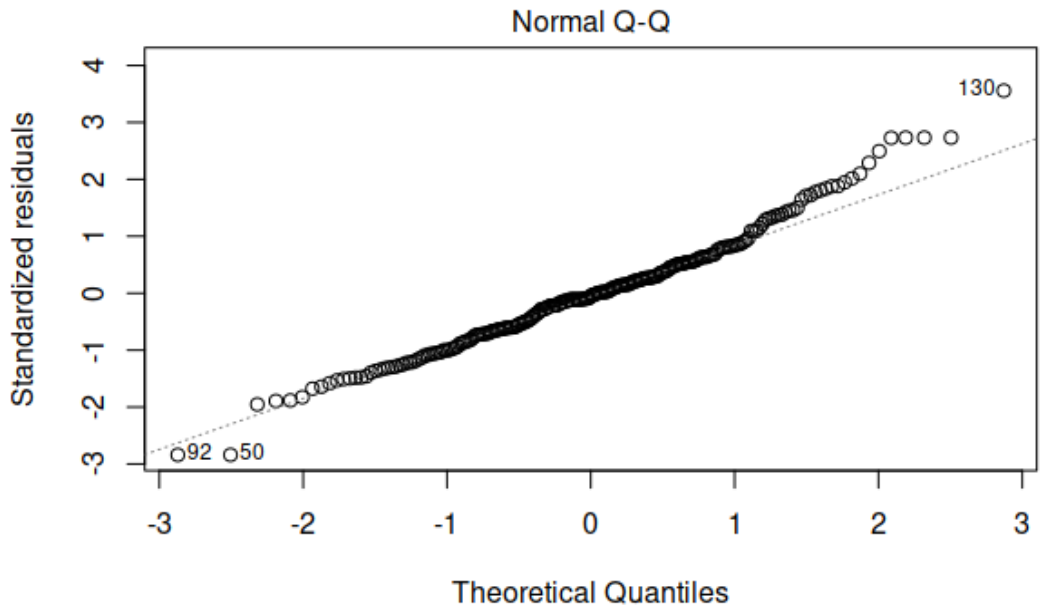


Figure 1. Theoretical model. Dotted lines represent hypothesised significant indirect effects.

2a


Normal Q-Q
Standardized residuals
Theoretical Quantiles
130
92
50
-3
-2
-1
0
1
2
3
4

2b

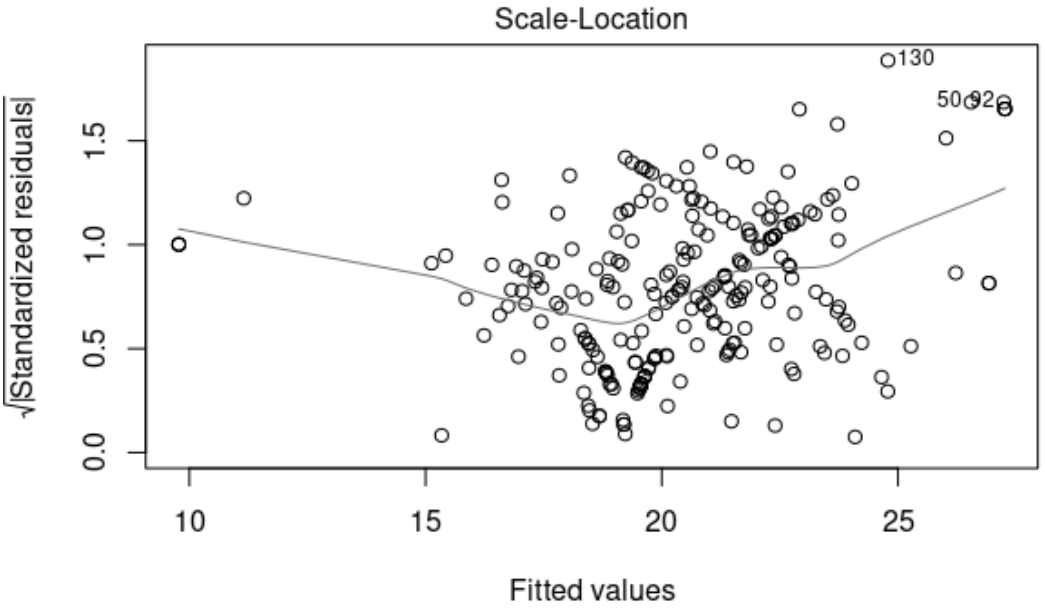

Scale-Location
√|Standardized residuals|
Fitted values
130
50
92
0.0
0.5
1.0
1.5
10
15
20
25

Figure 2. Normal probability (Q-Q) plot (2a) and scale-location plot (2b) of the distribution of residuals extracted from a linear model with Mental Well-Being as dependent variable, and the Big-Five personality factors and Creative Self-Efficacy as independent variables.