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Self-compassion Is Best Measured as a Global Construct and Is Overlapping with but Distinct from Neuroticism: A Response to Pfattheicher, Geiger, Hartung, Weiss, and Schindler (2017)

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Abstract: Pfattheicher and colleagues recently published an article entitled 'Old Wine in New Bottles? The Case of Self-compassion and Neuroticism' that argues the negative items of the Self-compassion Scale (SCS), which represent reduced uncompassionate self-responding, are redundant with neuroticism (especially its depression and anxiety facets) and do not evidence incremental validity in predicting life satisfaction. Using potentially problematic methods to examine the factor structure of the SCS (higher-order confirmatory factor analysis), they suggest a total self-compassion score should not be used and negative items should be dropped. In Study 1, we present a reanalysis of their data using what we argue are more theoretically appropriate methods (bifactor exploratory structural equation modelling) that support use of a global self-compassion factor (explaining 94% of item variance) over separate factors representing compassionate and reduced uncompassionate self-responding. While self-compassion evidenced a large correlation with neuroticism and depression and a small correlation with anxiety, it explained meaningful incremental validity in life satisfaction compared with neuroticism, depression, and anxiety. Findings were replicated in Study 2, which examined emotion regulation. Study 3 established the incremental validity of negative items with multiple well-being outcomes. We conclude that although self-compassion overlaps with neuroticism, the two constructs are distinct. © 2018 European Association of Personality Psychology

Key words: bifactor exploratory structural equation modelling (bifactor ESEM); Big Five; neuroticism; self-compassion; Self-compassion Scale (SCS)

Pfattheicher, Geiger, Hartung, Weiss, and Schindler (2017) recently published an article entitled 'Old Wine in New Bottles? The Case of Self-compassion and Neuroticism'. In this paper, the authors argue that the Self-compassion Scale (SCS) commits the 'jangle fallacy' because the negative SCS items are simply a measure of neuroticism under a new name. The jangle fallacy is a well-known fallacy of construct identity that can occur in psychological measurement when the same construct is assumed to be two different constructs merely because it is called by two different names (Kelley, 1927; Larsen & Bong, 2016). Based on the findings of a single study examining correlations between neuroticism and self-compassion and the incremental predictive validity of self-compassion compared with neuroticism in predicting life satisfaction, they make a strong assertion: 'we suggest excluding the negative items from the SCS, as these purely reflect neuroticism' (p. 166). While establishing the incremental predictive validity of self-compassion compared with neuroticism is an important and worthwhile goal, we would argue that this assertion is premature. Before coming to such an extreme conclusion, it is worth re-examining their data and their choice of analytic methods (which we do in Study 1) and also examining the generalizability of their findings to other datasets with more varied outcomes (which we do in Studies 2 and 3) to see if another interpretation is possible. Before we present these data, however, a brief review of the SCS will be provided.

The Self-compassion Scale

Self-compassion represents a particular way of relating to oneself in times of suffering, whether the pain is caused by failure, perceived inadequacy, or general life difficulties. As defined by Neff (2003b), self-compassion represents the balance between increased compassionate and reduced uncompassionate responding to personal struggle: increased self-kindness and reduced self-judgment, increased feelings of common humanity and reduced isolation, and increased mindfulness and reduced over-identification. These components are thought to interact as a dynamic system to create a self-compassionate state of mind. Self-kindness entails

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being more supportive and understanding towards oneself and less harshly judgmental. It involves greater recognition of the shared human experience, understanding that all humans are imperfect and lead imperfect lives, and fewer feelings of being isolated by one's imperfection. It entails more mindful awareness of personal suffering, while ruminating less about negative aspects of oneself or one's life experience. The six components of self-compassion are conceptually distinct and represent the increased compassionate and reduced uncompassionate ways individuals relate to themselves along three basic dimensions: how they emotionally respond to pain or failure (with kindness and less harsh judgment), cognitively understand their predicament (as part of the human experience and less isolating), and pay attention to suffering (in a mindful and less over-identified manner). These elements are separable and are not thought to co-vary in a lockstep manner, but they do mutually impact one another (Neff, 2016a, 2016b).

Since the construct was introduced into the scientific literature a decade and a half ago (Neff, 2003b), research on self-compassion has grown at an exponential rate (Neff & Germer, 2017). The vast majority of research studies have utilized the SCS (Neff, 2003a) to measure the construct of self-compassion and its link to well-being. The SCS is intended to be used as a total score to measure self-compassion or else as six subscale scores to assess its constituent elements. Items representing uncompassionate behaviours towards the self are reverse coded to indicate their absence. Neff (2016a, 2016b) argues that the trait of self-compassion entails the relative presence of compassionate and absence of uncompassionate self-responding in times of suffering, which is why the SCS measures and combines both.

Although Pfattheicher et al. claim that 'research on self-compassion has neglected analyses of construct validity and incremental predictive validity' (p. 160), this assertion is overstated. While more research establishing the validity of any measure is welcome, there is a research literature that establishes the construct validity and incremental predictive validity of score interpretations on the SCS. For example, higher scores on the SCS have been associated with greater levels of happiness, optimism, life satisfaction, body appreciation, perceived competence, and motivation (Hollis-Walker & Colosimo, 2011; Neff, Hseih, & Dejitthirat, 2005; Neff, Pisitsungkagarn, & Hseih, 2008; Neff, Rude, & Kirkpatrick, 2007); lower levels of depression, anxiety, stress, rumination, self-criticism, perfectionism, body shame, and fear of failure (Breines, Toole, Tu, & Chen, 2014; Finlay-Jones, Rees, & Kane, 2015; Neff, 2003a; Neff et al., 2005; Raes, 2010); and healthier physiological responses to stress (Breines, Thoma, et al., 2014; Friis, Johnson, Cutfield, & Consedine, 2016). This same pattern of results has been obtained with experimental methods involving behavioural interventions or mood manipulations designed to increase self-compassion (Albertson, Neff, & Dill-Shackleford, 2015; Arch et al., 2014; Breines & Chen, 2012; Diedrich, Grant, Hofmann, Hiller, & Berking, 2014; Johnson & O'Brien, 2013; Leary, Tate, Adams, Allen, & Hancock, 2007; Mosewich, Crocker, Kowalski, & DeLongis, 2013; Neff & Germer, 2013; Odou & Brinker, 2014; Shapira & Mongrain, 2010; Smeets, Neff, Alberts, & Peters, 2014), adding robustness to these findings.

The SCS demonstrates good discriminate validity and is not significantly associated with social desirability as measured by the Marlowe–Crowne Social Desirability Scale (r = .05, p = .34; Strahan & Gerbasi, 1972; Neff, 2003a). Self-compassion can be empirically differentiated from self-esteem and demonstrates incremental predictive validity with regard to the construct in terms of both self-report (Neff & Vonk, 2009) and experimental studies differentially priming each construct (Breines & Chen, 2012; Leary et al., 2007). Self-compassion can also be differentiated from self-criticism. Although a key feature of self-compassion is the lack of self-judgment, overall SCS scores still negatively predict anxiety and depression when controlling for self-criticism and negative affect (Neff, 2003a; Neff, Kirkpatrick, & Rude, 2007). Neff, Rude, and Kirkpatrick (2007) found that the SCS predicted significant variance in positive well-being after controlling for all of the Big Five personality traits. And a recent longitudinal study (Stutts, Leary, Zeveney, & Hufnagle, in press) found that scores on the SCS at baseline while controlling for neuroticism predicted lower depression, anxiety, and negative affect after 6 months and also moderated the effects of stress so that it was less strongly related to negative outcomes, providing incremental predictive validity for self-compassion compared with neuroticism over time. Thus, although the literature is still growing, research supports the construct and incremental predictive validity of score interpretations on the SCS.

Factor structure of the Self-compassion Scale

In her original scale publication paper, Neff (2003a) used confirmatory factor analysis (CFA) to examine the factor structure of the SCS and found adequate fit for a six-factor correlated model and marginal fit for a higher-order model, justifying use of the SCS as a total score or else six subscale scores. Since then, several other validation studies have been carried out on the SCS (for an overview, see Neff, Tóth-Király et al, in press), but a limitation of these studies is that they did not explicitly take into account the construct-relevant multidimensionality of the SCS (Morin, Arens, & Marsh, 2016; Morin, Arens, Tran, & Caci, 2016). Construct-relevant multidimensionality pertains to the fact that items of a scale can have more than one source of true score variance that does not refer to random measurement error, but simply to the fact that items tap into more than one construct and thus have more than one source of dimensionality (see Appendix S1 in the supporting information for a discussion of this issue).

The first source of construct-relevant multidimensionality refers to the assessment of conceptually related constructs. The central assumption of this source of dimensionality is that scale items are fallible indicators by nature and are rarely pure indicators of their respective subscales, suggesting in turn that they are expected to demonstrate at least some degree of association with non-target but still conceptually similar constructs (e.g. self-kindness and reduced self-judgment). The vast majority of validation studies of the

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SCS have been conducted with CFA (Tóth-Király, Bőthe, & Orosz, 2017). In CFA, items are only allowed to load on their target factors. Exploratory structural equation modelling (ESEM) is specifically designed to model system-level interactions (Asparouhov & Muthén, 2009; Marsh, Morin, Parker, & Kaur, 2014; Morin, Marsh, & Nagengast, 2013) as it allows for cross-loadings of items. Unlike exploratory factor analyses, in which no *a priori* hypotheses about models are advanced, ESEM with target rotation (Browne, 2001) can model *a priori* hypotheses and therefore be directly compared with CFA models (Marsh et al., 2014; Tóth-Király, Bőthe, Rigó, & Orosz, 2017). Previous findings with the SCS (Hupfeld & Ruffieux, 2011; Tóth-Király, Bőthe, & Orosz, 2017) have already demonstrated the value of ESEM in examining self-compassion compared with CFA, as it provides a more realistic representation of the construct (see Figure 1 for an example of a CFA versus ESEM first-order model).

The second source of construct-relevant multi-dimensionality refers to the assessment of global and specific constructs, which is of central importance to self-compassion. There has been controversy over whether or not self-compassion should be measured as an overall construct or if 'positive' and 'negative' self-compassion should be measured separately. Note that we prefer to use the terms compassionate self-responding (CS) and reduced uncompassionate self-responding (RUS), as these more accurately reflect the meaning of the positively and negatively worded self-compassion items. Some researchers have claimed that use of a total score is not justified through higher-order factor analyses and have instead found support for separate factors (Costa, Marôco, Pinto-Gouveia, Ferreira, & Castilho, 2016; López et al., 2015). Although Neff (2003a) initially proposed a higher-order model for the SCS to represent a global construct, this solution has been shown to be problematic (Gignac, 2016; Morin, Arens, & Marsh, 2016) because of the extremely strict assumption that the relations between items and the higher-order factor are only mediated by the first-order factors, more appropriate for constructs such as IQ. As an alternative, a bifactor approach (Reise, 2012; Rodriguez, Reise, & Haviland, 2016) provides a way to model a general factor and specific factors simultaneously by disaggregating the total item covariance matrix into global and specific components.

Neff (2016a) has argued that the higher-order model originally used to examine the factor structure of the SCS is theoretically inappropriate, writing 'future attempts to … examine the properties of the SCS in specific populations should not attempt to justify use of a total SCS score using a higher-order model. Instead, researchers should examine a bi-factor model' (p. 268). She proposes that a bifactor approach is more theoretically consistent with the idea that self-compassion operates as a system. Neff, Whittaker, and Karl (2017) examined the SCS using CFA in four samples and found that while a one-factor, two-factor correlated, and higher-order model had poor fit across samples, a six-factor correlated and bifactor model generally had acceptable fit and that over 90% of the variance in item responses was explained by a general factor (see Figure 2 for an example of a higher-order versus bifactor CFA model).

With an overarching bifactor ESEM framework (Morin, Arens, & Marsh, 2016; Morin, Arens, Tran, & Caci, 2016), it is possible to explicitly and simultaneously consider the two sources of construct-relevant multidimensionality inherent in the SCS. Initial findings of Tóth-Király Bőthe, and Orosz (2017) in relation to self-compassion suggest that the bifactor ESEM framework provides a better way to examine the fit of a total score on the SCS and to measure the system-level interactions of SCS items.

In the context of a large international collaboration, Neff, Tóth-Király et al. (in press) employed this approach to examine the factor structure of the SCS in 20 samples. Five models were examined using both CFA and ESEM: one-factor, two-factor correlated, six-factor correlated, and bifactor models with one general factor representing a general self-compassionate response or two correlated general factors (a general CS factor and three specific factors representing self-kindness, common humanity, and mindfulness and a general RUS factor and three specific factors representing reduced self-judgment, isolation, and over-identification). See Figure 3 for an example of a single-bifactor ESEM versus two-bifactor ESEM.

The study included 7 English samples and 13 non-English samples, composed of 10 community, 6 student, 1 mixed community/student, 1 meditator, and 2 clinical samples (N = 11 685). Analyses found that the one-factor, two-factor, and single-bifactor models using CFA had poor fit across samples. While a two-bifactor CFA model had adequate fit in some samples, model fit for about half of the samples could not be identified because of negative residual variances and other model identification issues. Results using

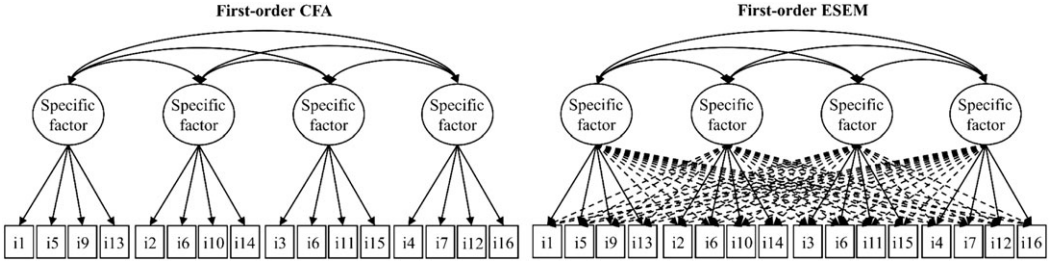

Figure 1. Schematic comparison of multi-factor correlated CFA and ESEM models. *Note*. CFA = confirmatory factor analysis; ESEM = exploratory structural equation modelling. Circles represent latent variables, and squares represent scale items. One-headed full arrows represent factor loadings, one-headed dashed arrows represent cross-loadings, and two-headed arrows represent factor correlations

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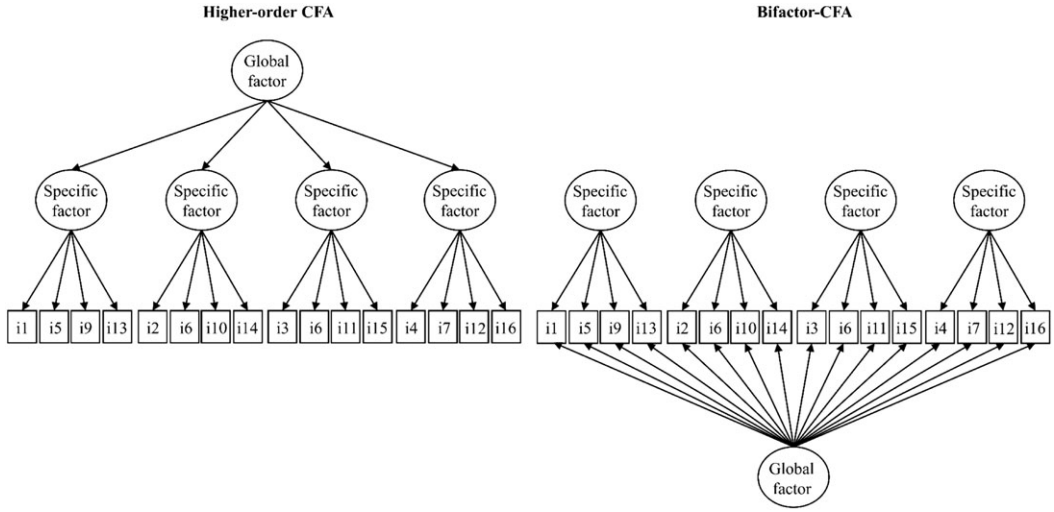

Figure 2. Schematic comparison of the higher-order and bifactor CFA models. *Note*. CFA = confirmatory factor analysis. Circles represent latent variables, and squares represent scale items. One-headed full arrows represent factor loadings

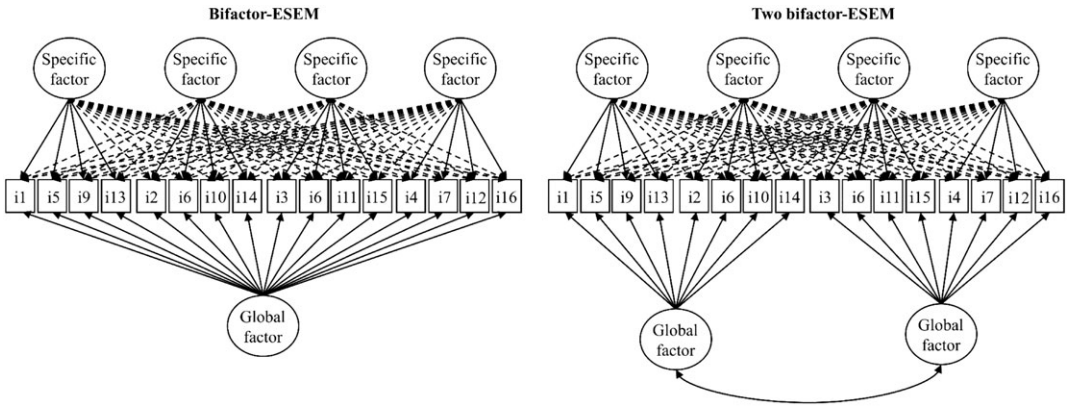

Figure 3. Schematic comparison of the single-bifactor and two-bifactor (or two-tier) ESEM models. *Note*. ESEM = exploratory structural equation modelling; Circles represent latent variables, and squares represent scale items. One-headed full arrows represent factor loadings, one-headed dashed arrows represent cross-loadings, and two-headed arrows represent factor correlations

ESEM were generally superior to those using CFA. The one-factor and two-factor ESEM solutions to the SCS generally had an inadequate fit across samples. However, the six-factor correlated model and single-bifactor ESEM had good fit and factor loadings in every sample examined. ESEM factor loadings revealed cross-loadings for eight out of the 26 SCS items (found equally within and across the CS and RUS dimensions), suggesting the items operate as a system. The single bifactor model was also found to be superior to the correlated two-bifactor ESEM, given that factor loadings suggested poor differentiation of a CS versus RUS factor. Moreover, omega values for the bifactor model revealed that 95% of the reliable variance in item responding was attributed to the general factor. Findings were interpreted as supporting use of an SCS total score (representing self-compassion) or six subscale scores (representing constituent elements of self-compassion), but not two separate CS and RUS scores.

STUDY 1

In their study, Pfattheicher et al. (2017) state they want to 'contribute to the ongoing debate about the factor structure of the SCS' (p. 162) by conducting psychometric analyses on the scale. Using CFA, they found that two higher-order models each representing the three CS and three RUS subscales had better fit than a single higher-order model explaining all six subscales. Although they cite Neff (2016a), they did not address her arguments about the theoretical inconsistency of using higher-order models to examine the factor structure of the SCS or her explicit advice against using this approach, nor did they use any of the recommended approaches for examining the SCS, including bifactor (Neff, Whittaker, & Karl, 2017), ESEM (Hupfeld & Ruffieux, 2011), or bifactor ESEM (Morin, Arens, & Marsch, 2016; Morin, Arens, Tran, & Caci, 2016; Tóth-Király, Bőthe, & Orosz, 2017). We

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therefore reanalysed the original data from Pfattheicher et al. (available through open access) using the same set of analyses as used in Neff, Tóth-Király et al. in press to examine the factor structure of the SCS using more theoretically consistent methods.

Pfattheicher et al. also compared self-compassion with neuroticism using the Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992). They used CFA to model the latent higher-order factor of neuroticism and reported large correlations (Cohen, 1988) between the latent RUS higher-order factor and latent first-order factors representing the neuroticism facets of anxiety (r = .85), depression (r = .90) and self-consciousness (r = .85), leading them to claim that the negative SCS items are redundant with neuroticism. (Note that contrary to coding instructions for the SCS, Neff, 2003a, Pfattheicher et al. did not reverse code the negative items, leading to a positive correlation between RUS and neuroticism.) However, many have argued that ESEM is a better way to model the facets of the Five Factor Personality Inventory regardless of the instruments at hand including 15 items (Marsh, Nagengast, & Morin, 2013), 44 items (Chiorri, Marsh, Ubbiali, & Donati, 2016), 60 items (Marsh et al., 2010), 240 items (Furnham, Guenole, Levine, & Chamorro-Premuzic, 2013), or even a smaller proportion of the factors (Marsh, Lüdtke, Nagengast, Morin, & Von Davier, 2013). Therefore, we opted to explore the factor structure of the NEO PI-R with ESEM as well.

Another goal of Pfattheicher et al. was to examine the incremental predictive validity of scores on the SCS by testing 'whether the predictive power of self-compassion regarding life satisfaction is actually due to individual differences in neuroticism' (p. 165). Pfattheicher et al. found that the amount of additional variance explained in life satisfaction by the CS and RUS components of self-compassion, although significant, was 'negligible' after controlling for the neuroticism facets of depression and anxiety. However, they did not report beta weights for the predictors in the final model, which could be important because the predictor entered first in a regression typically explains the lion's share of variance in outcomes. Therefore, in order to determine incremental validity, it is important to compare the size of standardized betas in the final model to assess the relative predictive power of each construct. While framing their argument in terms of redundancy with neuroticism as a whole, moreover, they did not actually conduct analyses with a general neuroticism score, only two of its facets. The facet of depression in particular shares a lot of conceptual and empirical overlap with life satisfaction (Schimmack, Oishi, Furr, & Funder, 2004). In order to test Pfattheicher et al.'s broad claim that self-compassion is redundant with neuroticism, we felt it was important to establish discriminate validity with a total neuroticism score. We therefore examined Pfattheicher et al.'s predictive model using a general neuroticism factor as well as the facets of depression and anxiety.

Based on previous analyses (Neff, Tóth-Király et al., in press; Tóth-Király, Bőthe, & Orosz, 2017), we expected that use of two separate CS and RUS scores would not be justified, so we planned to establish incremental validity with neuroticism and its facets using a total self-compassion score. We also examined beta weights, allowing for comparison of predictors. We hypothesized that when modelled using theoretically consistent approaches, self-compassion would evidence meaningful incremental validity with regard to neuroticism in general and the neuroticism facets of depression and anxiety in particular.

Method

Participants

Pfattheicher et al. (2017) included 576 participants in their study (58.3% female, M_{age} = 37.21). Please see the original publication for a full description of recruitment methods.

Measures

Life satisfaction was measured using the five-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985; Pons, Atienza, Balaguer, & García-Merita, 2000).

Neuroticism was measured with the NEO PI-R (Costa & McCrae, 1992). This 48-item scale measures six facets of neuroticism: anxiety (e.g. 'I often feel tense and jittery'), hostility (e.g. 'It takes a lot to get me mad'), depression (e.g. 'Sometimes things look pretty bleak and hopeless to me'), self-consciousness (e.g. 'I feel comfortable in the presence of my bosses or other authorities'), impulsiveness (e.g. 'I have trouble resisting my cravings'), and vulnerability (e.g. 'I can handle myself pretty well in a crisis'). Responses are given on a 5-point scale from 1 = *strongly disagree* to 5 = *strongly agree*. Note that almost half of the neuroticism items represent positive behaviours that are reverse coded to indicate their absence. To calculate a total neuroticism score, a grand mean of all six facets is taken.

Self-compassion was measured with the 26-item SCS (Neff, 2003a), which assesses six different components of self-compassion: self-kindness (e.g. 'I try to be understanding and patient toward aspects of my personality I don't like'), self-judgment (e.g. 'I'm disapproving and judgmental about my own flaws and inadequacies'), common humanity (e.g. 'I try to see my failings as part of the human condition'), isolation (e.g. 'When I think about my inadequacies it tends to make me feel more separate and cut off from the rest of the world'), mindfulness (e.g. 'When something painful happens I try to take a balanced view of the situation'), and over-identification (e.g. 'When I'm feeling down I tend to obsess and fixate on everything that's wrong'). Responses are given on a 5-point scale ranging from 1 = *almost never* to 5 = *almost always*. Negative items are reverse coded so that higher scores indicate their absence. To calculate a total self-compassion score, a grand mean of all six subscales is taken. Note that alphas for all study variables are presented in Table S1 of the supporting information.

Statistical analyses

All analyses were performed with MPLUS 8 (Muthén & Muthén, 1998-2017), and models were estimated with the weighted least squares mean-adjusted and variance-adjusted estimator, which was demonstrated (Finney & DiStefano, 2006; Rhemtulla, Brosseau-Liard, & Savalei, 2012; Sass, Schmitt, & Marsh, 2014) to be more suitable, relative

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to maximum-likelihood-based estimation methods, to the ordered-categorical nature of Likert scales with five or less answer categories, which in turn results in more accurate estimates.

To investigate the potential sources of construct-relevant multidimensionality of the SCS, five corresponding CFA and ESEM (a, b) models were tested and contrasted: (1a, 1b) a one-factor model with a single self-compassion dimension; (2a, 2b) a two-factor correlated model with one factor representing CS and the other RUS; (3a, 3b) a six-factor correlated model representing the six components of self-compassion; (4a, 4b) a bifactor model with a general self-compassion factor and six specific factors that were orthogonal to each other; and (5a, 5b) a two-bifactor model including two correlated general CS and RUS factors, each with three CS or RUS group factors, which were orthogonal to one another and the general factors as well. Note that we did not examine a higher-order model because Neff, Whittaker and Karl et al. (2017) showed that a CFA bifactor model was clearly superior to a CFA higher-model for the SCS in four different samples. Because of the complexity of the two-bifactor ESEM as well as computational limitations, on the basis of previous applications (Tóth-Király, Morin, Bőthe, Orosz, & Rigó, 2018), the two general factors were specified as correlated CFA factors (cross-loadings were not estimated between the two general factors), while the six specific factors were specified as ESEM factors (cross-loadings were freely estimated between the six specific factors, but targeted to be zero). We also examined the parameter estimates and theoretical conformity of the alternative models to determine which had the best fit, as suggested by Morin, Arens, and Marsh (2016) and Morin, Arens, Tran, and Caci, (2016; see Appendix S2 for more details about the model specification, including issues of orthogonality and model evaluation).

As bifactor models allow the partitioning of the different sources of variance into global and specific factors, two indices were calculated using standardized estimates (Rodriguez et al., 2016): first, omega (ω) estimated the proportion of the variance in the total score that was attributed to all sources of the variance (global and specific factors as well); second, omega hierarchical (ω_H) estimated the proportion of variance in the total score that is attributable to the general factor only. Omega divided by omega hierarchical indicates the amount of reliable variance explained by the general factor. Note that Reise, Bonifay, and Haviland (2013) suggest 75% or higher accounted for by the general factor as the ideal amount of variance to justify use of a total score.

To examine the factor structure of the NEO PI-R, we compared CFA and ESEM solutions, which were specified beforehand to estimate a general neuroticism higher-order factor based on the six first-order factors (6a and 6b in Table 1). As the ESEM was expected to have a better fit and representation of the data, the ESEM solution was re-expressed using the ESEM-within-CFA method (Morin et al., 2013) and a higher-order neuroticism factor was incorporated, which is of relevance in the present investigation. This was needed because it is currently not possible to directly model a higher-order structure in the ESEM framework.

In assessing and comparing the alternative models, instead of relying on the sample-size-sensitive chi-square test (Marsh, Hau, & Grayson, 2005), typical goodness-of-fit indices were examined with their respective thresholds (Hu & Bentler, 1999; Marsh et al., 2005; Marsh, Hau, & Wen, 2004; Yu, 2002): the comparative fit index (CFI; ≥0.95 for good, ≥0.90 for acceptable), the Tucker–Lewis index (TLI; ≥0.95 for good, ≥0.90 for acceptable), the root mean square error of approximation (RMSEA; ≤0.06 for good, ≤0.08 for acceptable) with its 90% confidence interval, and the weighted root mean square residual (WRMR; ≤1.00 for acceptable) with the latter being specifically developed for this estimation method. Because the ESEM-based models estimate more parameters than the corresponding CFA ones, the parsimony-adjusted CFI was also calculated to consider the fit of the estimated models relative to their complexity (Arbuckle, 2010). Parsimony-adjusted CFI values above 0.50 indicate a better fitting model (Kim & Kim, 2013; Meyers, Gamst, & Guarino, 2016). However, model interpretation should be based not only on these statistical indices but also on the inspection of parameter estimates as well as the underlying theoretical conformity (Morin, Arens, & Marsh, 2016).

Finally, in the correlation analyses and the predictive models, we simultaneously included a bifactor model (self-compassion), a re-expressed ESEM higher-order model (neuroticism), and a standard CFA single-factor model (life satisfaction). Given the complexity of the models, we opted to rely on latent factor scores instead of fully latent variables and, in the process, decrease the number of freely estimated parameters (Morin, Meyer, Creusier, & Biétry, 2016). While latent factor scores do not control for measurement error the way fully latent variables do, they still provide a partial control for measurement errors by allocating more weight to the items with lower error variances (Skrondal & Laake, 2001). Latent factor scores were obtained from each measurement model separately using the FSCORES command of MPLUS (Muthén & Muthén, 1998–2017). Moreover, factor scores preserve the nature of the *a priori* measurement model better relative to manifest scale scores (Morin, Meyer, et al., 2016), and this procedure has already been used in a diverse range of studies (e.g. Gillet, Morin, Cougot, & Gagné, 2017; Litalien et al., 2017; Maïano, Aimé, Lepage, Morin, & ASPQ Team, 2017).

Results and discussion

Goodness-of-fit statistics for the SCS are reported in Table 1. The one-factor and two-factor CFA and ESEM solutions clearly resulted in a poor fit (CFI and TLI < 0.90; RMSEA > 0.08; WRMR > 1.00). Although the six-factor CFA model showed acceptable fit to the data (except WRMR = 1.33), the corresponding ESEM solution showed superior fit (ΔCFI = +0.02; ΔTLI = +0.02; ΔRMSEA = −0.02; ΔWRMR = −0.77). Table 2 shows parameter estimates for the six-factor, bifactor, and two-bifactor models. The parameter estimates for the six-factor model showed well-defined factors by their target loadings in both solutions (CFA: $|\lambda|$ = .67 to .92, M = 0.81; ESEM:

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Table 1. Goodness-of-fit statistics for the estimated models for the Self-compassion Scale, the neuroticism factor of the Revised NEO Personality Inventory, and the Satisfaction with Life Scale in Study 1 (N = 576)

Model	χ^2	*df*	CFI	TLI	RMSEA	90% CI	WRMR	PCFI
Self-compassion Scale								
1a. One-factor CFA: one G-factor (SC)	4241*	299	0.83	0.81	0.15	0.15–0.16	3.17	0.76
1b. One-factor ESEM: one G-factor (SC)	4241*	299	0.83	0.81	0.15	0.15–0.16	3.17	0.76
2a. Two-factor CFA: two G-factors (CS, RUS)	2396*	298	0.91	0.90	0.11	0.11–0.12	2.03	0.83
2b. Two-factor ESEM: two G-factors (CS, RUS)	2477*	274	0.90	0.89	0.12	0.11–0.12	1.67	0.76
3a. Six-factor CFA: six S-factors (SK, SJ, CH, IS, MI, OI)	1231*	284	0.96	0.95	0.08	0.07–0.08	1.33	0.84
3b. Six-factor ESEM: six S-factors (SK, SJ, CH, IS, MI, OI)	580*	184	0.98	0.97	0.06	0.06–0.07	0.56	0.55
4a. Bifactor CFA: one G-factor (SC) six S-factors (SK, SJ, CH, IS, MI, OI)	2420*	273	0.91	0.89	0.12	0.11–0.12	2.20	0.76
4b. Bifactor ESEM: one G-factor (SC) six S-factors (SK, SJ, CH, IS, MI, OI)	465*	164	0.99	0.97	0.06	0.05–0.06	0.47	0.50
5a. Two-bifactor CFA: two G-factors (CS, RUS) six S-factors (SK, SJ, CH, IS, MI, OI)	1164*	272	0.96	0.95	0.08	0.07–0.08	1.29	0.80
5b. Two-bifactor ESEM: two G-factors (CS, RUS) six S-factors (SK, SJ, CH, IS, MI, OI)	383*	157	0.99	0.98	0.05	0.04–0.06	0.43	0.48
Revised NEO Personality Inventory								
6a. Six-factor CFA	5518*	1065	0.84	0.83	0.09	0.08–0.09	2.27	0.79
6b. Six-factor ESEM	1628*	855	0.97	0.96	0.04	0.04–0.04	0.84	0.74
Satisfaction with Life Scale								
7a. One-factor	30*	5	1	1	0.09	0.06–0.13	0.54	0.50

Note. CFA = confirmatory factor analysis; CFI = comparative fit index; CH = common humanity; χ^2 = chi-square test of exact fit; CS = compassionate self-responding; ESEM = exploratory structural equation modelling; df = degrees of freedom; G-factor = global factor; IS = isolation (reduced); MI = mindfulness; 90% CI = 90% confidence interval of the RMSEA; OI = over-Identification (reduced); PCFI = parsimony-corrected CFI; RMSEA = root mean square error of approximation; RUS = reduced uncompassionate self-responding; SC = self-compassion; S-factor = specific factor; SJ = self-judgment (reduced); SK = self-kindness; TLI = Tucker–Lewis index; WRMR = weighted root mean square residual. *$p < .01$.

|λ| = .16 to .99, M = 0.56), whereas factor correlations were also substantially reduced in ESEM (|r| = .21 to .67, M = 0.46) relative to CFA (|r| = .51 to .93, M = 0.74). Additionally, while cross-loadings were small in magnitude (|λ| = .00 to .51, M = 0.12), they also suggest the presence of an unmodelled G-factor (or G-factors depending on the model).

The bifactor CFA model did not have acceptable fit on most indices (e.g. TLI = 0.89; RMSEA = 0.12; WRMR = 2.20), while the bifactor ESEM had superior fit (ΔCFI = +0.08; ΔTLI = +0.08; ΔRMSEA = −0.06; ΔWRMR = −1.73). The two-bifactor CFA had adequate to good fit (except for WRMR = 1.29), but the two-bifactor ESEM had superior fit (ΔCFI = +0.03; ΔTLI = +0.03; ΔRMSEA = −0.03; ΔWRMR = −0.86) relative to the two-bifactor CFA solution. Also, note that in our 20-sample international study, about half of the samples could not identify a two-bifactor CFA model owing to problems with model identification (see also problems with model identification in Study 2), suggesting this solution is not generalizable. Moreover, the correlation between the two general factors representing CS and RUS in the two-bifactor CFA was so high that it calls into question the discriminant validity of the factors (r = .78). This high correlation is reduced (r = .00, p = .98) in the two-bifactor ESEM (5b), suggesting it is a superior model to the two-bifactor CFA model (5a). We next addressed whether the two-bifactor ESEM (Model 5b) could provide an improved representation over the ESEM with one G-factor representing a global self-compassion factor (Model 4b). As both models had good fit with only negligible differences, the examination of parameter estimates (Table 2) could highlight substantial differences between the models. Indeed, in Model 5b, the two general factors were weakly defined (CS: |λ| = .16 to .67, M = 0.43; RUS: |λ| = .00 to .31, M = 0.16). This poor definition is likely responsible for the fact that the two factors were not significantly correlated. Also, the system-level interaction of items appeared to be expressed in the cross-loading of items, which occurred both within and across the CS and RUS dimensions, rather than being expressed as two intercorrelated factors. For instance, many of the self-kindness items loaded on the self-judgment factor and vice versa. This argues against two G-factors representing CS and RUS and instead supports the superiority of the bifactor ESEM with one G-factor representing a global self-compassion factor.

As seen in Table 2, parameter estimates for this solution (4b) showed a well-defined G-factor (|λ| = .50 to .84, M = 0.71) representing a general self-compassionate response. Regarding the S-factors after extraction of the variance due to the G-factor, common humanity retained a relatively high degree of specificity (|λ| = .40 to .68, M = 0.56), and reduced isolation (|λ| = .26 to .53, M = 0.41), mindfulness (|λ| = .22 to .46, M = 0.36), and reduced over-identification (|λ| = .20 to .53, M = 0.36) retained a moderate degree of specificity, while self-kindness (|λ| = .11 to .39, M = 0.26) and reduced self-judgment (|λ| = .05 to .34, M = 0.17) retained almost no meaningful specificity (see Appendix S3 in the supporting information for a discussion on the interpretation of specific factors). Finally, cross-loadings also substantially decreased in

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Table 2. Standardized parameter estimates for the CFA and ESEM solutions of the Self-compassion Scale in Study 1 (N = 576)

	Model 3a: six-factor CFA	Model 3b: six-factor ESEM						Model 4a: bifactor CFA		Model 4b: bifactor ESEM							Model 5a: two-bifactor CFA			Model 5b: two-bifactor ESEM							
	SF (λ)	SK (λ)	SJ (λ)	CH (λ)	IS (λ)	MI (λ)	OI (λ)	SC (λ)	SF (λ)	SC (λ)	SK (λ)	SJ (λ)	CH (λ)	IS (λ)	MI (λ)	OI (λ)	CS (λ)	RUS (λ)	SF[1]	CS (λ)	RUS (λ)	SK (λ)	SJ (λ)	CH (λ)	IS (λ)	MI (λ)	OI (λ)
Self-kindness																											
sk5	**.76**	**.71**	*.01*	.14	*−.04*	*.04*	*−.01*	**.66**	**.41**	**.67**	**.35**	*−.04*	.14	−.11	.17	−.11	**.73**		**.27**	**.44**		**.43**	.41	*.02*	.14	.31	*.03*
sk12	**.86**	**.83**	.14	*.04*	.10	*−.02*	−.13	**.75**	**.47**	**.79**	**.39**	*.03*	*.04*	*−.04*	.08	−.19	**.83**		**.39**	**.46**		**.51**	.49	−.16	.33	.14	*.07*
sk19	**.85**	**.76**	.15	*−.03*	*.02*	.16	−.07	**.73**	**.50**	**.79**	**.30**	*−.04*	*−.01*	−.13	.11	−.20	**.82**		**.25**	**.36**		**.60**	.44	*−.03*	.19	.20	.09
sk23	**.74**	**.16**	.34	.10	*.06*	.40	*−.04*	**.68**	**.20**	**.72**	**−.13**	*.02*	*.01*	−.11	*.04*	−.20	**.75**		**−.19**	**.16**		**.58**	.34	.26	*.08*	*.02*	.25
sk26	**.84**	**.25**	.18	.09	.11	.51	*−.04*	**.77**	**.24**	**.81**	***−.11***	−.14	.05	−.13	.15	−.22	**.84**		**−.10**	**.30**		**.66**	.25	.23	.21	*.11*	.26
Self-judgment																											
sj1	**.80**	.14	**.63**	.06	*.06*	*.00*	.17	**.73**	**.41**	**.76**	−.05	**.34**	−.13	*.01*	−.19	*.04*		**.77**	**.51**		***.08***	.33	**.68**	.08	.18	−.08	.36
sj8	**.84**	.30	**.43**	−.07	.24	*−.06*	.19	**.77**	**.37**	**.79**	.09	***.13***	−.17	.10	−.18	.12		**.82**	**.16**		***.12***	.35	**.61**	*.00*	.38	.07	.26
sj11	**.77**	.11	**.38**	.12	.11	.06	.23	**.72**	**.28**	**.74**	*−.02*	***.05***	*−.02*	*.02*	−.12	.13		**.76**	**.09**		***.12***	.34	**.54**	.24	.23	.17	.22
sj16	**.92**	.19	**.46**	.12	.19	−.10	.29	**.86**	**.29**	**.84**	.06	**.23**	−.06	.12	−.13	.19		**.90**	**.12**		***.08***	.30	**.70**	.12	.33	.15	.34
sj21	**.84**	.23	**.36**	*.08*	.17	*−.01*	.23	**.79**	**.21**	**.81**	.09	***−.11***	*−.05*	*.02*	−.25	.18		**.83**	***−.03***		**.27**	.41	**.52**	.18	.45	.18	*.10*
Common humanity																											
ch3	**.75**	*−.06*	−.12	**.75**	.09	*.03*	*.04*	**.53**	**.54**	**.50**	*.02*	−.12	**.55**	.05	.16	*.03*	**.57**		**.50**	**.51**		.10	.17	**.41**	.25	.22	.12
ch7	**.82**	−.06	.10	**.99**	*.04*	*−.07*	−.19	**.57**	**.66**	**.57**	*.03*	−.06	**.68**	*.01*	*−.03*	−.11	**.61**		**.62**	**.60**		.14	.29	**.52**	.27	*.04*	*.00*
ch10	**.79**	*.02*	*.04*	**.86**	−.15	*.00*	*.03*	**.55**	**.60**	**.52**	*.05*	.09	**.61**	−.07	.18	*−.03*	**.59**		**.56**	**.67**		*.07*	.26	**.34**	.14	.09	.20
ch15	**.84**	*.06*	*−.04*	**.54**	.12	.17	*.00*	**.63**	**.41**	**.61**	*.00*	*−.06*	**.40**	*.02*	.19	−.07	**.67**		**.35**	**.49**		.26	.19	**.31**	.26	.15	.20
Isolation																											
is4	**.86**	*−.01*	.29	.11	**.53**	−.10	.15	**.77**	**.27**	**.74**	*−.03*	*.11*	*−.03*	**.31**	−.17	.16		**.80**	**.18**		***.05***	.22	.49	.11	**.58**	*.00*	.33
is13	**.84**	*.01*	−.12	*−.02*	**.99**	*.05*	*−.05*	**.73**	**.51**	**.72**	*−.04*	*−.01*	*.00*	**.53**	*.05*	*.03*		**.76**	**.47**		**−.30**	.25	.40	.20	**.56**	.20	.32
is18	**.80**	*−.03*	−.10	*.04*	**.93**	*−.02*	*−.03*	**.69**	**.51**	**.67**	*−.03*	*.00*	*.03*	**.52**	*.01*	.07		**.72**	**.47**		**−.28**	.18	.41	.21	**.55**	.19	.29
is25	**.85**	*.01*	.23	*.05*	**.52**	*.05*	.11	**.76**	**.26**	**.75**	−.07	*.05*	−.04	**.26**	−.09	.09		**.79**	**.18**		***.00***	.32	.43	.15	**.50**	*.05*	.33
Mindfulness																											
mi9	**.67**	.22	−.25	.18	*−.02*	***.20***	.45	**.58**	**.45**	**.53**	.10	*−.01*	.18	*−.01*	**.46**	.22	**.63**		**.41**	**.36**		.17	.18	.10	.11	**.48**	.38
mi14	**.82**	.30	−.28	.13	.19	**.30**	.31	**.74**	**.44**	**.70**	.10	−.20	.17	*.03*	**.40**	.11	**.79**		**.33**	**.37**		.37	.18	.18	.28	**.50**	.30
mi17	**.83**	.35	*−.05*	.23	*−.03*	**.29**	.24	**.75**	**.37**	**.72**	.08	*.02*	.19	−.08	**.38**	*.00*	**.80**		**.25**	**.44**		.39	.29	.16	.12	**.34**	.34
mi22	**.78**	.23	*.08*	.21	.11	**.44**	*−.09*	**.72**	**.11**	**.71**	*−.07*	*−.06*	.16	−.08	**.22**	−.24	**.77**		***−.07***	**.43**		.55	.15	.17	.23	***.02***	.30
Over-identification																											
oi2	**.88**	*.06*	.39	*.02*	.13	*.02*	**.49**	**.81**	**.28**	**.77**	*−.04*	.28	−.13	.10	*.02*	**.31**		**.83**	**.18**		***.15***	.22	.56	*.02*	.32	.14	**.54**
oi6	**.87**	*.06*	.36	*.00*	.25	*.06*	**.35**	**.81**	**.18**	**.78**	*−.06*	.21	−.12	.14	*−.02*	**.20**		**.83**	**.07**		***.09***	.28	.53	.07	.35	.10	**.46**
oi20	**.77**	−.17	.11	.09	.11	.10	**.73**	**.68**	**.50**	**.66**	−.10	*−.08*	*−.02*	.09	*.06*	**.53**		**.71**	**.48**		**.31**	.11	.31	.16	.41	.35	**.46**
oi24	**.78**	*−.05*	.09	*−.02*	*.09*	.22	**.68**	**.69**	**.47**	**.69**	−.09	*−.07*	−.08	*.04*	.14	**.42**		**.72**	**.43**		**.26**	.24	.27	.12	.36	.36	**.48**

Note. CFA = confirmatory factor analysis; CH = common humanity; CS = compassionate self-responding factor; ESEM = exploratory structural equation modelling; IS = isolation (reduced); λ = standardized factor loadings; MI = mindfulness; OI = over-identification (reduced); RUS = reduced uncompassionate self-responding factor; SC = global self-compassion factor; SF = intended specific factor of the Self-compassion Scale; SJ = self-judgment (reduced); SK = self-kindness. Note that negative Self-compassion Scale items are reverse coded. Target factor loadings are in bold. Non-significant parameters ($p \geq .05$) are italicized.
[1]Each item loaded on their respective specific factor, while cross-loadings were constrained to zero.

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magnitude ($|\lambda|$ = .00 to .28, M = 0.09) relative to the six-factor ESEM.

We then calculated the amount of reliable variance in the total score attributable to the general self-compassion factor in the bifactor ESEM. With an omega value of .98 and an omega hierarchical of .94, we found that the general self-compassion factor explained 94% of the variance in item responding, well over the 75% threshold recommended by Reise et al. (2013) to justify use of a total score. Overall, by taking into account the construct-relevant multidimensionality of the SCS, our findings strongly counter the suggestion that a total SCS score should *not* be used. Given that a single score explains almost all the item variance, moreover, it is more parsimonious to use a single score than two separate CS and RUS scores even though model fit for the CFA and two-bifactor ESEM was adequate. Note that the fit for our final selected model (4b) was superior to the solution identified by Pfattheicher et al. as their final model (ΔCFI = +0.06, RMSEA was the same, and TLI was not reported by Pfattheicher et al.).

In the next step, based on previous findings (e.g. Furnham et al., 2013; Marsh, Nagengast, & Morin, 2013), we re-examined the neuroticism factor of the NEO PI-R with the model fit indices being reported in Table 1. Comparing the CFA and ESEM (6a vs 6b) reveals that the ESEM is substantially better relative to the CFA solution (ΔCFI = +0.13; ΔTLI = +0.13; ΔRMSEA = −0.05, ΔWRMR = −1.43). Importantly, this solution also makes it possible to include all theoretically relevant facets in a way that it still provides good model fit as opposed to the selection and removal of items to achieve acceptable fit with the overly restrictive CFA framework. As a general neuroticism factor was our major interest, we re-expressed the ESEM solution in a standard CFA framework where the ESEM-within-CFA solution has the same model fit indices (Morin et al., 2013). Note that the higher-order solution with a superordinated neuroticism factor and six first-order factors still provided good fit to the data (χ^2 = 1841, df = 864; CFI = 0.97; TLI = 0.97; RMSEA = 0.04, WRMR = 0.85). For more details, see Appendix S4 and Table S2 of the supporting information.

We then examined the correlation of self-compassion and neuroticism including the total self-compassion score as well as six specific factors and a total neuroticism score as well as scores for the six facets of anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability (Costa & McCrae, 1992), using factor scores saved from the ESEM (i.e. neuroticism) and bifactor ESEM (i.e. self-compassion) measurement models detailed above. Significance values were set to $p < .01$ to reduce the risk of type I error given the relatively large sample size. As seen in Table 3, the global self-compassion factor had a large correlation with the global neuroticism factor (r = −.76) and the facet of depression (r = −.75), slightly smaller with angry hostility (r = −.67), impulsivity (r = −.58), and vulnerability (r = −.56), while the correlation was small with the facet of self-consciousness (r = −.14) and non-significant with anxiety (r = .07). The three specific factors of the SCS representing RUS (which were modelled after the variance of the general factor was taken into account, see Appendix

Table 3. Correlations (based on factor scores) between the global and specific factors of self-compassion (derived from the bifactor exploratory structural equation modelling 4b) and neuroticism in Study 1 (N = 576)

	Tot N		Anxiety		Angry hostility		Depression		Self-consciousness		Impulsivity		Vulnerability	
	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p
	−.76		.07		−.67		−.75		−.14		−.58		−.56	
Tot SC	[−.79, −.72]	<.001	[−.01, .15]	.074	[−.71, −.62]	<.001	[−.78, −.71]	<.001	[−.22, −.06]	.001	[−.63, −.52]	<.001	[−.61, −.50]	<.001
	−.03		.14		.00		−.13		.12		−.01		.03	
SK	[−.11, .05]	.482	[.06, .22]	<.001	[−.08, .08]	.919	[−.21, −.05]	.002	[.04, .20]	.004	[−.09, .07]	.821	[−.05, .11]	.540
	−.09		−.02		.02		−.19		−.22		−.09		−.06	
SJ	[−.17, −.01]	.041	[−.10, .06]	.715	[−.06, .10]	.683	[−.27, −.11]	<.001	[−.30, −.14]	<.001	[−.17, −.01]	.040	[−.14, .02]	.167
	.06		.06		.04		.04		.19		.14		−.05	
CH	[−.02, .14]	.130	[−.02, .14]	.124	[−.04, .12]	.354	[−.04, .12]	.392	[.11, .27]	<.001	[.06, .22]	.001	[−.13, .03]	.226
	−.17		−.01		−.14		−.19		−.18		−.12		−.11	
IS	[−.25, −.09]	<.001	[−.09, .07]	.829	[−.22, −.06]	.001	[−.27, −.11]	<.001	[−.26, −.10]	<.001	[−.20, −.04]	.003	[−.19, −.03]	.009
	−.12		−.03		−.08		.00		.23		−.06		−.29	
MI	[−.20, −.04]	.006	[−.11, .05]	.460	[−.16, .00]	.070	[−.08, .08]	.889	[.15, .31]	<.001	[−.14, .02]	.146	[−.36, −.21]	<.001
	−.34		−.05		−.37		−.15		−.13		−.31		−.28	
OI	[−.41, −.27]	<.001	[−.13, .03]	.282	[−.44, −.30]	<.001	[−.23, −.07]	<.001	[−.21, −.05]	.002	[−.38, −.24]	<.001	[−.35, −.20]	<.001

Note. CH = common humanity; CI = confidence interval; IS = reduced isolation; MI = mindfulness; OI = reduced over-identification; SJ = reduced self-judgment; SK = self-kindness; Tot N = total neuroticism; Tot SC = total self-compassion. Note that negative Self-compassion Scale items are reverse coded.

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S3) had only small to medium correlations with a general neuroticism factor as well as the six facets. However, the smaller size of these correlations could be due to the fact that variance was reduced after accounting for the general factor in the bifactor model.

We also estimated correlations between the six components of self-compassion and the six neuroticism facets using factors obtained from the ESEM six-factor correlated models (Table 4). Again, correlations were not so consistently strong (|*r*s| = .04–.77) as to suggest that the three components of self-compassion representing RUS are redundant with the depression, anxiety, and self-consciousness facets. Note also that these were not as strong as those found by Pfattheicher et al. using factors obtained with CFA higher-order models (|*r*s| = .85–.90).

Although the correlated two-bifactor CFA model had poor model fit on some indices and was not shown to be generalizable across samples in past research (Neff, Tóth-Király, et al., in press), we nonetheless include tables in the supporting information with correlations between factors found with this model and neuroticism and its facets (Table S3). These correlations were in the expected direction and magnitude for all self-compassion factors. The correlation between the RUS factor and total neuroticism as well as the depression facet was $r = -.79$. We also include a table presenting the zero-order correlations between observed scores (Table S1). When examining these zero-order correlations, self-compassion and neuroticism had a correlation of $r = -.76$, suggesting the two constructs share about 58% of their variance using standard scoring procedures. Because of the large correlation found between a global self-compassion factor and a global neuroticism factor as well as the depression facet, however, it is important to establish incremental validity between the two constructs to determine if they are redundant or merely overlapping.

In order to test the incremental validity of self-compassion over neuroticism in predicting life satisfaction (Model S1a), we conducted regression analyses (based on factor scores rather than fully latent variables due to the complexity of the models) in which neuroticism was entered in Step 1, and self-compassion was entered in Step 2 (Table 5). In Step 1, neuroticism significantly predicted life satisfaction ($\beta = -.56$), explaining 31.8% of its variance. When self-compassion is added to the model in Step 2, the explained variance of life satisfaction increased by an additional 3.0%, and the size of the regression coefficient for neuroticism predicting life satisfaction was reduced ($\beta = -.36$). Moreover, the amount of variance predicted by self-compassion ($\beta = .26$) was roughly in the same range, suggesting that self-compassion has incremental validity in predicting life satisfaction compared with neuroticism. In order to directly compare results with those of Pfattheicher et al., we also investigated the incremental validity of self-compassion over the anxiety and depression facets of neuroticism. In Model S1b, self-compassion explained significant additional variance over and above depression (1.5%), although depression was a stronger predictor (depression: $\beta = -.47$; self-compassion: $\beta = .19$). In Model S1c, while anxiety was a significant predictor of life satisfaction, adding self-compassion into the model explained 28.2% more additional variance, and self-compassion explained almost all of the variance in life satisfaction relative to anxiety (anxiety: $\beta = .10$; self-compassion: $\beta = .53$).[1] The finding that depression was a stronger predictor of life satisfaction is not surprising given the previously demonstrated overlap between these two constructs (Schimmack et al., 2004).

Because the two-bifactor CFA model was most similar to the model used by Pfattheicher et al., we also investigated the incremental validity of an RUS factor compared with neuroticism (see Table S4 of the supporting information). These results are highly similar to those of the bifactor ESEM model with one global factor in that the RUS factor provides additional explained variance over neuroticism, depression, and anxiety with 2.2%, 1.0%, and 28.8%, respectively. This added variance is also visible in the magnitude of standardized betas as well.

Taken as a whole, our reanalysis calls into question Pfattheicher et al.'s suggestion to drop the negative items (i.e. RUS) from the SCS. Firstly, our results indicated that a bifactor ESEM model had a better fit than a two-bifactor model once parameter estimates were taken into account, and the fact that 94% of the reliable variance in item responding is explained by a general self-compassion factor provides a strong reason to view self-compassion as a holistic construct. While results also indicated that self-compassion had a large correlation with neuroticism, it provided incremental validity compared with neuroticism, including the depression and anxiety facets, in predicting life satisfaction scores. Moreover, when examining the incremental validity of the RUS factor in particular (based on the two-bifactor CFA model), results suggest that these items also show incremental validity compared with neuroticism and its depression and anxiety facets in predicting life satisfaction. These findings cast doubt on the claim that the negative items are so redundant with neuroticism—the depression and anxiety facets in particular—that they should be dropped from the SCS. Still, findings suggest that it is important to further establish the incremental validity of self-compassion and neuroticism given the large correlations between the two constructs. We do so with two more studies, therefore, examining outcomes other than life satisfaction.

[1]The results related to anxiety would appear to be somewhat surprising, especially when compared with the general neuroticism factor and the depression facet. However, it should be noted that the anxiety items only weakly defined this factor (i.e. the highest target loading was .49). Consequently, these target items also loaded highly on the other, non-target factors, indicating that their content do not clearly describe the construct of anxiety, but the other related neuroticism facets as well. Indeed, these findings underscore the importance of relying on latent variable models, which take into account the imprecision of the scale indicators and sophisticated methods that provide a more accurate depiction of the constructs at hand (Marsh & Hau, 2007).

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Table 4. Correlations (based on factor scores) between the first-order six-factor exploratory structural equation models of the Self-compassion Scale (derived from the six-factor exploratory structural equation modelling 3b) and the Revised NEO Personality Inventory neuroticism facets in Study 1 (N = 576)

	Anxiety		Angry hostility		Depression		Self-consciousness		Impulsivity		Vulnerability	
	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p	r [95% CI]	p
SK	−.11 [−.19, −.03]	.007	−.51 [−.57, −.45]	<.001	−.67 [−.71, −.62]	<.001	−.20 [−.28, −.12]	<.001	−.45 [−.51, −.38]	<.001	−.42 [−.49, −.35]	<.001
SJ	−.15 [−.23, −.07]	<.001	−.47 [−.53, −.40]	<.001	−.63 [−.68, −.58]	<.001	−.48 [−.54, −.42]	<.001	−.46 [−.52, −.39]	<.001	−.25 [−.33, −.17]	<.001
CH	−.10 [−.18, −.02]	.014	−.44 [−.50, −.37]	<.001	−.57 [−.62, −.51]	<.001	−.10 [−.18, −.02]	.018	−.32 [−.39, −.25]	<.001	−.42 [−.49, −.35]	<.001
IS	−.21 [−.29, −.13]	<.001	−.65 [−.69, −.60]	<.001	−.77 [−.80, −.74]	<.001	−.42 [−.49, −.35]	<.001	−.57 [−.62, −.51]	<.001	−.48 [−.54, −.42]	<.001
MI	−.15 [−.23, −.07]	<.001	−.38 [−.45, −.31]	<.001	−.42 [−.49, −.35]	<.001	−.04 [−.12, .04]	.344	−.31 [−.38, −.24]	<.001	−.39 [−.46, −.32]	<.001
OI	−.27 [−.34, −.19]	<.001	−.72 [−.76, −.68]	<.001	−.71 [−.75, −.67]	<.001	−.33 [−.40, −.26]	<.001	−.64 [−.69, −.59]	<.001	−.59 [−.64, −.54]	<.001

Note. CH = common humanity; CI = confidence interval; IS = isolation (reduced); MI = mindfulness; OI = over-identification (reduced); SJ = self-judgment (reduced); SK = self-kindness. Note that negative Self-compassion Scale items are reverse coded.

Table 5. Incremental validity predicting life satisfaction using regression analyses (based on factor scores derived from the bifactor exploratory structural equation model), with total neuroticism score entered in Step 1 (Model S1a), depression entered in Step 1 (Model S1b), or anxiety entered in Step 1 (Model S1c) with total self-compassion score entered in Step 2 for all models in Study 1 (N = 576)

	R^2	ΔR^2	β	95% CI for β	p
Model S1a: life satisfaction					
Step 1	31.8				
Tot N			−.56	[−.62, −.51]	<.001
Step 2	34.8	3.0*			
Tot N			−.36	[−.46, −.27]	<.001
Tot SC			.26	[.17, .36]	<.001
Model S1b: life satisfaction					
Step 1	37.0				
Depression			−.61	[−.66, −.56]	<.001
Step 2	38.5	1.5*			
Depression			−.47	[−.56, −.37]	<.001
Tot SC			.19	[.09, .29]	<.001
Model S1c: life satisfaction					
Step 1	1.9				
Anxiety			.14	[.06, .22]	.001
Step 2	30.1	28.2*			
Anxiety			.10	[.03, .17]	.006
Tot SC			.53	[.48, .59]	<.001

Note. β = standardized regression coefficient; CI = confidence interval; ΔR^2 = change in explained variance; R^2 = proportion of explained variance; Tot N = total neuroticism score; Tot SC = total self-compassion score. *p < .01.

STUDY 2

One of the major conceptual differences between neuroticism and self-compassion is that the former is focused on the tendency to experience negative affect generally, whereas self-compassion represents how we relate to ourselves in times of suffering. For this reason, we felt it would be informative to examine the incremental predictive validity of self-compassion compared with neuroticism in terms of how people deal with difficult emotional situations, particularly their ability to regulate difficult emotions. We decided to use the Difficulties with Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), which conceptualizes healthy versus unhealthy emotion regulation as a set of behaviours that involve the awareness and acceptance of difficult emotion as well as the ability to flexibly modulate emotional reactions. We collected a Mechanical Turk sample similar to that collected by Pfattheicher and colleagues so that we could also see if our psychometric analyses of the SCS conducted in Study 1 would be replicated.

Method

Participants

Initially, a total of 801 participants filled out survey questionnaires on Mechanical Turk. Participants needed to meet specified criteria (18 years or older and a US citizen) and were paid $2.00 for completion of the study. The study was

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approved by the relevant institutional review board. After providing consent, participants filled out a demographic questionnaire, the SCS, the neuroticism items from the NEO PI-R, and the DERS. Participants who missed more than one attention check, who took on average less than 3 seconds per question, and/or who had excessive missing data were dropped from the final dataset. In total, 581 participants were retained (59% female) who were aged between 18 and 74 (M_{age} = 36.40; SD = 11.40). In terms of ethnicity, 72% identified as White, 11% as Black/African-American, 7% as Asian American, 6% as Latino/Hispanic, and 4% other. In terms of education, 38% reported that they had a bachelor's college degree, 12% had an associate's degree, 27% completed some college, 10% had a high school degree only, and 13% had a professional degree.

Measures

Participants completed the SCS and the NEO PI-R, as in Study 1. They also completed the DERS (Gratz & Roemer, 2004). This 41-item scale contains items assessing difficulties with awareness and understanding of emotions, the acceptance of emotions, the ability to engage in goal-directed behaviour and refrain from impulsive behaviour when experiencing negative emotions, and access to effective emotion regulation strategies. Responses are given on a 5-point scale ranging from *almost never* to *almost always*. Although the DERS is multidimensional, a total score can also be calculated. Note that alphas for all study variables are presented in Table S5 of the supporting information.

Results and discussion

Psychometric analyses in Study 2 replicated those of Study 1 and are mainly presented in the supporting information. Examination of model fit indices (Table S6) supports our previous conclusions in that the ESEM solutions (particularly 3b, 4b, and 5b) outperformed their CFA counterparts (3a, 4a, and 5a). Again, the central question relates to the comparison of the bifactor ESEM (4b) with the models including two general factors (5a and 5b). Standardized parameter estimates (Tables S7) revealed a well-defined general self-compassion factor for Model 4b ($|\lambda|$ = .53 to .88, M = 0.73), and the six specific factors also retained small to moderate amount of specificity. In the two-bifactor CFA model (5a), while model fit was adequate (except for WRMR = 1.31), the association between the CS and RUS factors was excessively high (r = .85, $p < .001$) and the model also had identification issues, suggesting that it might not be a satisfactory solution. On the other hand, while model fit was better and the correlation was reduced between the two global factors (r = −.02, p = .935) in the two-bifactor ESEM model (5b), the factors were once again weakly defined (CS: $|\lambda|$ = .28 to .56, M = 0.40; RUS: $|\lambda|$ = .01 to .32, M = 0.13), as made apparent by the low standardized factor loadings interpreted by the guidelines of Comrey and Lee (2013). These results corroborate our previous findings in that self-compassion (as measured by the SCS) is better modelled with one global self-compassion factor and six specific factors. Moreover, when we calculated the amount of reliable variance in the total score attributable to the general self-compassion factor in the bifactor ESEM, we found an omega value of .98 and an omega hierarchical of .94. This means that the general self-compassion factor explained 98% of the variance in item responding.

In the following step, similar to Study 1, we examined the associations between global and specific factors of self-compassion (using the bifactor ESEM 4b) and neuroticism which was also modelled the same way as in the previous study. The correlations (Table S8) revealed that self-compassion had a strong negative correlation with the global neuroticism factor (r = −.82). Regarding the specific self-compassion factors, mostly mindfulness and over-identification had additional associations with the neuroticism facets. Zero-order correlations of observed scores, presented in Table S5, revealed that self-compassion and neuroticism have a correlation of (r = −.84), sharing 69% of their variance.

Regression analyses were conducted with neuroticism entered in Step 1 and self-compassion entered in Step 2, to establish incremental validity with regard to difficulties in emotion regulation. The main findings of these analyses are reported in Table 6 of the main document. In Step 1, neuroticism was negatively related to difficulties in emotion regulation. When self-compassion was entered in Step 2, ΔR^2 indicated that self-compassion added significant variance to the outcome (3.7%). Moreover, when the standardized betas were examined after self-compassion was entered into the model, self-compassion explained a

Table 6. Incremental validity predicting difficulties in emotion regulation using regression analyses (based on factor scores derived from the exploratory structural equation bifactor model), with total neuroticism score entered in Step 1 (Model S1a), depression entered in Step 1 (Model S1b), or anxiety entered in Step 1 (Model S1c) with total self-compassion score entered in Step 2 for all models in Study 2 (N = 581)

	R^2	ΔR^2	β	95% CI for β	p
Model S2a:					
Step 1	66.5				
Tot N			.82	[.79, .84]	<.001
Step 2	70.2	3.7*			
Tot N			.55	[.47, .62]	<.001
Tot SC			−.33	[−.41, −.26]	<.001
Model S2b:					
Step 1	47.4				
Depression			.69	[.65, .73]	<.001
Step 2	61.6	14.2*			
Depression			.19	[.11, .28]	<.001
Tot SC			−.62	[−.70, −.54]	<.001
Model S2c:					
Step 1	33.8				
Anxiety			.58	[.53, .64]	<.001
Step 2	62.7	28.9*			
Anxiety			.19	[.13, .25]	<.001
Tot SC			−.66	[−.72, −.61]	<.001

Note. β = standardized regression coefficient; CI = confidence interval; ΔR^2 = change in explained variance; R^2 = proportion of explained variance; Tot N = total neuroticism score; Tot SC = total self-compassion score. *$p < .01$.

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significant amount ($\beta = -.33$) of variance in emotion regulation after accounting for neuroticism ($\beta = .55$). As in Study 1, we also examined models in which depression and anxiety were the predictors, instead of a general neuroticism factor, to establish incremental validity with these facets. For the models examining depression (Model S2b), self-compassion provided an additional 14.2% of explained variance and a large regression coefficient ($\beta = -.62$) compared with depression ($\beta = .19$) This was also the case when anxiety was entered in Step 1 (Model S2c) with an additional 28.9% of R^2 change and a large regression coefficient ($\beta = -.66$) compared with anxiety ($\beta = .19$).

Finally, although a two-bifactor CFA model could not be identified and separate CS and RUS factors were not well defined in the two-bifactor ESEM, we nevertheless decided to investigate the incremental validity of a mean of the self-judgment, isolation, and over-identification subscales (reverse coded) compared with neuroticism and its depression and anxiety facets using observed scores to insure that findings were not due to the positive items only (see Table S9 in the supporting information). In each case, RUS explained significant additional variance in outcomes, suggesting that the negative items were not redundant with neuroticism or its depression and anxiety facets. Thus, self-compassion displayed clear incremental validity with regard to neuroticism in predicting difficulties in emotion regulation.

STUDY 3

Neff, Rude, and Kirkpatrick (2007) examined the incremental validity of the SCS with personality and found self-compassion explained significant variance in positive psychological health—specifically reflective and affective wisdom, happiness, optimism, personal initiative, curiosity/exploration, and positive affect—after controlling for the Big Five personality traits, measured with the NEO Five-Factor Inventory, Form S (NEO-FFI S; Costa & McCrae, 1992). They did not test for incremental validity with neuroticism in particular, however, so this study presents a reanalysis of their data, which do so. Because of the relatively small sample size of Study 3 ($N = 177$), we did not have the power needed to reliably conduct factor analyses as we did in Studies 1 and 2 (Wolf, Harrington, Clark, & Miller, 2013). Thus, analyses were conducted on observed neuroticism scores and self-compassion scores. In addition, we calculated the mean of the self-kindness, common humanity, and mindfulness subscales representing CS and also calculated the mean of the self-judgment, isolation, and over-identification subscales (reverse coded) representing RUS. Even though our analyses in Studies 1 and 2 found that it is preferable to use a total score over separate CS and RUS scores, we felt that examining the incremental validity of CS and RUS scores with neuroticism separately would help us to more directly assess the validity of Pfattheicher et al.'s claims. If the negative items are in fact redundant with neuroticism, we would expect that only a total SCS score (Tot SC) or CS but not a RUS score would explain meaningful additional variance in outcomes after controlling for neuroticism, as suggested by Pfattheicher et al.'s analyses using separate 'positive' and 'negative' factor scores. We did not expect to find this, however, and instead expected each model to explain unique variance in outcomes over and above neuroticism.

We included the outcomes of reflective and affective wisdom, happiness, optimism, personal initiative, curiosity, and positive affect from the Neff et al. (2007) study. (Note that we did not include cognitive wisdom, as this was not found to be significantly associated with self-compassion in that study.) Moreover, we included three additional outcomes collected for but not presented in Neff et al. (2007) that we felt were of interest to a comparison with neuroticism: negative affect, self-esteem, and psychological well-being. Although we were not able to examine the facets of neuroticism as in the prior two studies because the NEO-FFI S was used, we believed that this brief measure of neuroticism would still provide useful information.

Method

Participants

The study included 177 undergraduate students (58 men; 119 women; M_{age} 20.19 years; $SD = 2.26$) who were randomly assigned from an educational psychology subject pool at a large south-western university in the USA. The ethnic breakdown of the sample was 55.4% Caucasian, 25.4% Asian, 13.6% Hispanic, 4.5% mixed ethnicity, and 1.1% other. For a full description of participant recruitment procedures, please see Neff et al. (2007).

Measures

Self-compassion was measured with the 26-item SCS (Neff, 2003a). Neuroticism was measured using the neuroticism subscale of the standard 60-item NEO-FFI S (Costa & McCrae, 1992). Wisdom was measured with the 39-item Three-dimensional Wisdom Scale (Ardelt, 2003), but only findings with the 12-item reflective and 13-item affective wisdom subscales are reported here (cognitive wisdom was not significantly linked to self-compassion). Happiness was measured with the four-item Subjective Happiness Scale (Lyubomirsky & Lepper, 1999). Optimism was measured with the six-item Life Orientation Test-Revised (Scheier, Carver, & Bridges, 1994). Curiosity was measured with the four-item and Curiosity and Exploration Inventory (Kashdan, Rose, & Fincham, 2004). Personal initiative was measured with the nine-item Personal Growth Initiative Scale (Robitschek, 1998). Affect was measured with the 20-item Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Self-esteem was measured with the 10-item Rosenberg Self-esteem Scale (Rosenberg, 1965). Psychological well-being was measured with the 54-item Psychological Well-being Scale (Ryff & Keyes, 1995). Note that alphas for all study variables are presented in Table S10 of the supporting information.

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Table 7. Incremental validity predicting well-being outcomes using regression analyses (based on observed scores), with total neuroticism score entered in Step 1, and a total self-compassion score (Model S3a), compassionate self-responding score (Model S3b), or reduced uncompassionate self-responding score (Model S3c) entered in Step in Study 3 ($N = 177$)

	Model S3a Neuroticism and self-compassion					Model S3b Neuroticism and CS					Model S3c Neuroticism and RUS				
	R^2	ΔR^2	β	95% CI	p	R^2	ΔR^2	β	95% CI	p	R^2	ΔR^2	β	95% CI	p
Reflective wisdom															
Step 1	31.2					31.2					31.2				
Tot N			−.56	[−.66, −.45]	<.001			−.56	[−.66, −.45]	<.001			−.56	[−.66, −.45]	<.001
Step 2	41.3	10.1*				38.6	7.4*				38.0	6.7*			
Tot N			−.29	[−.44, −.14]	<.001			−.41	[−.54, −.28]	<.001			−.33	[−.48, −.17]	<.001
Tot SC			.42	[.27, .56]	<.001										
CS								.31	[.18, .44]	<.001					
RUS													.35	[.19, .50]	<.001
Affective wisdom															
Step 1	5.0					5.0					5.0				
Tot N			−.22	[−.37, −.08]	.004			−.22	[−.37, −.08]	.004			−.22	[−.37, −.08]	.004
Step 2	7.0	2.0				5.5	0.5				8.0	3.0*			
Tot N			−.10	[−.30, .09]	.299			−.19	[−.35, −.02]	.033			−.07	[−.27, .13]	.491
Tot SC			.19	[−.01, .38]	.063										
CS								.08	[−.09, .25]	.372					
RUS													.23	[.04, .42]	.023
Happiness															
Step 1	29.8					29.8					29.8				
Tot N			−.55	[−.65, −.44]	<.001			−.55	[−.65, −.44]	<.001			−.55	[−.65, −.44]	<.001
Step 2	37.6	7.8*				35.0	5.2*				35.6	5.8*			
Tot N			−.31	[−.46, −.15]	<.001			−.42	[−.55, −.29]	<.001			−.33	[−.49, −.17]	<.001
Tot SC			.37	[.22, .52]	<.001										
CS								.26	[.12, .40]	<.001					
RUS													.32	[.16, .48]	<.001
Optimism															
Step 1	36.4					36.4					36.4				
Tot N			−.60	[−.70, −.51]	<.001			−.60	[−.70, −.51]	<.001			−.60	[−.70, −.51]	<.001
Step 2	44.9	8.5*				45.6	9.2*				39.6	3.2*			
Tot N			−.36	[−.50, −.21]	<.001			−.44	[−.56, −.32]	<.001			−.45	[−.59, −.30]	<.001
Tot SC			.38	[.24, .53]	<.001										
CS								.35	[.22, .47]	<.001					
RUS													.24	[.08, .40]	.004
Curiosity															
Step 1	7.1					7.1					7.1				
Tot N			−.27	[−.41, −.13]	.001			−.27	[−.41, −.13]	.001			−.27	[−.41, −.13]	.001
Step 2	9.4	2.3*				11.2	4.1*				7.3	0.2			
Tot N			−.14	[−.33, .05]	.159			−.16	[−.32, .00]	.062			−.23	[−.42, −.03]	.026
Tot SC			.20	[.01, .39]	.046										
CS								.23	[.07, .39]	.008					
RUS													.06	[−.26, .14]	.562

(Continues)

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Table 7. (Continued)

	Model S3a Neuroticism and self-compassion					Model S3b Neuroticism and CS					Model S3c Neuroticism and RUS				
	R^2	ΔR^2	β	95% CI	p	R^2	ΔR^2	β	95% CI	p	R^2	ΔR^2	β	95% CI	p
Personal initiative															
Step 1	19.7					19.7					19.7				
Tot N			−.44	[−.57, −.32]	<.001			−.44	[−.57, −.32]	<.001			−.44	[−.57, −.32]	<.001
Step 2	23.8	4.1*				23.5	3.8*				21.7	2.0*			
Tot N			−.27	[−.44, −.10]	.003			−.34	[−.48, −.19]	<.001			−.32	[−.49, −.14]	.001
Tot SC			.27	[.10, .44]	.003										
CS								.22	[.08, .37]	.005					
RUS													.19	[.01, .37]	.042
Positive affect															
Step 1	7.8					7.8					7.8				
Tot N			−.28	[−.42, −.14]	<.001			−.28	[−.42, −.14]	<.001			−.28	[−.42, −.14]	<.001
Step 2	11.7	3.9*				17.0	9.2*				7.8	0			
Tot N			−.11	[−.30, .08]	.249			−.11	[−.27, .04]	.163			−.27	[−.46, −.08]	.008
Tot SC			.26	[.07, .44]	.008										
CS								.35	[.20, .50]	<.001					
RUS													.02	[−.21, .18]	.877
Negative affect															
Step 1	26.6					26.6					26.6				
Tot N			.52	[.40, .63]	<.001			.52	[.40, .63]	<.001			.52	[.40, .63]	<.001
Step 2	26.9	0.3				26.7	0.1				28.7	2.1*			
Tot N			.47	[.31, .63]	<.001			.54	[.41, .67]	<.001			.39	[.22, .55]	<.001
Tot SC			−.08	[−.25, .10]	.395										
CS								.05	[−.10, .19]	.548					
RUS													−.19	[−.36, −.02]	.031
Self-esteem															
Step 1	35.3					35.3					35.3				
Tot N			−.59	[−.69, −.50]	<.001			−.59	[−.69, −.50]	<.001			−.59	[−.69, −.50]	<.001
Step 2	46.8	11.5*				45.2	9.9*				41.5	6.2*			
Tot N			−.31	[−.45, −.16]	<.001			−.42	[−.54, −.30]	<.001			−.37	[−.52, −.22]	<.001
Tot SC			.45	[.31, .58]	<.001										
CS								.36	[.24, .48]	<.001					
RUS													.33	[.18, .49]	<.001
Psychological well-being															
Step 1	35.9					35.9					35.9				
Tot N			−.60	[−.70, −.50]	<.001			−.60	[−.70, −.50]	<.001			−.60	[−.70, −.50]	<.001
Step 2	39.9	4.0*				39.2	3.4*				38.1	2.2*			
Tot N			−.43	[−.58, −.28]	<.001			−.50	[−.62, −.38]	<.001			−.47	[−.62, −.31]	<.001
Tot SC			.26	[.11, .42]	.001										
CS								.21	[.08, .34]	.003					
RUS													.20	[.04, .36]	.016

Note. β = standardized regression coefficient; CI = confidence interval; CS = compassionate self-responding; ΔR^2 = percent change in explained variance; R^2 = proportion of explained variance; RUS = reduced uncompassionate self-responding; Tot N = total neuroticism score; Tot SC = total self-compassion score. Note that negative Self-compassion Scale items are reverse coded. *$p \leq .05$.

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Results and discussion

We first examined the association of neuroticism with Tot SC, a CS score, and a RUS score. As shown in Table S10 of the supporting information, significant correlations were found between neuroticism and Tot SC ($r = -.65$) as well as with CS ($r = -.49$) and RUS ($r = -.67$). Correlations suggest that that these constructs shared less than half their variance using observed scores. We also conducted regression analyses to determine the incremental validity of Tot SC over neuroticism in predicting well-being (Model S3a), a second set of analyses examining the incremental validity of CS (Model S3b), and a third set of analyses examining the incremental validity of RUS (Model S3c). Results, which are presented in Table 7, suggest that whether a Tot SC, a CS score, or a RUS score was used, significant additional variance was explained in most of the outcomes examined. For reflective wisdom, happiness, optimism, self-esteem, and psychological well-being, each displayed incremental validity with neuroticism, and standardized betas suggest that Tot SC, CS, and RUS predicted approximately the same amount of variance in outcomes as did neuroticism. For affective wisdom, RUS explained all the unique variance in outcomes once it was entered into the model, and neuroticism was no longer a significant predictor. For curiosity, only CS but not Tot SC or RUS explained additional variance in outcomes. For personal initiative, Tot SC and CS but not RUS explained additional variance. Findings with positive and negative affect were especially interesting given that neuroticism is in many ways a measure of habitual affect. It was found that both Tot SC and CS scores explained additional variance in positive affect after accounting for neuroticism and that neuroticism was no longer a significant predictor once these were entered into the models. When examining negative affect, however, neither Tot SC nor CS explained additional variance over neuroticism, but RUS did, suggesting that uncompassionate responses to the self and neuroticism are not simply identical measures of negative affect. Overall, these results suggest that the positive and negative items of the SCS (representing CS and RUS) explain incremental variance compared with neuroticism.

GENERAL DISCUSSION

Results from our reanalysis of Pfattheicher et al.'s data in Study 1 and the additional data presented in Studies 2 and 3 do not support the extreme suggestion of 'excluding the negative items from the SCS, as these purely reflect neuroticism' (p. 166). Firstly, Studies 1 and 2 demonstrated that a single self-compassion factor was found to have superior psychometric properties compared with separate CS and RUS factors using a more theoretically consistent bifactor ESEM approach (Morin, Arens, & Marsh, 2016; Morin, Arens, Tran, & Caci, 2016), as well as compared with the two higher-order CFA model proposed by Pfattheicher et al. One could argue that model fit will always be better with ESEM-based models, given that they are less restrictive compared with the classical CFA methods. While we agree that CFA-based models are more parsimonious and generally preferable, they are also overly restrictive in the case of complex multidimensional measures. In such situations when the restrictive assumptions of CFA are violated, Morin, Arens, and Marsh (2016) propose that CFA and ESEM should be systematically contrasted to find the most suitable model. If the discrepancy is small between the two models (i.e. similar fit indices and parameter estimates), then the CFA model should be preferred as it is more parsimonious. However, the present findings reinforced the importance of relying on sophisticated statistical methods that take into account the different sources of construct-relevant psychometric multidimensionality stemming from the fallible nature of indicators.

In addition, a general score was found to explain 94% of the reliable variance in item responding in Study 1 and 98% in Study 2. These data suggest that items representing CS and RUS in the SCS are part of a single system-level global construct of self-compassion. Thus, one of Pfattheicher et al.'s main justifications for advocating that the negative items of the SCS be dropped—that they form a separate general factor from the positive items—was not borne out when more appropriate psychometric models were used. Moreover, the three specific factors of self-compassion representing RUS—reduced self-judgment, isolation, and over-identification—had only small to moderate correlations with general neuroticism, depression, and self-consciousness and non-significant correlations with anxiety in our bifactor ESEM analyses. When correlations of the ESEM with six first-order factors with neuroticism were examined, while correlations were stronger, they did not suggest that the negative items are redundant with neuroticism either.

It should be noted that we did find a large correlation of a general self-compassion factor with a general neuroticism factor and the depression facet in Study 1 ($r = -.76$ for both) as well as in Study 2 ($r = -.82$ and $-.80$, respectively), confirming that the constructs are overlapping and share about two-thirds of their variance. Nonetheless, self-compassion evidenced incremental validity compared with neuroticism and its depression and anxiety facets in predicting life satisfaction in Study 1 and emotion regulation in Study 2. Moreover, when a RUS factor (using a CFA two-bifactor model) is examined in Study 1 or a RUS mean (based on observed scores) in Study 2, incremental validity was still established. Finally, when the specific contribution of a Tot SC, CS, or RUS mean compared with a neuroticism mean (based on observed scores) for outcomes such as positive and negative affect, self-esteem, psychological well-being, optimism, happiness, personal initiative, and reflective and affective wisdom was examined in Study 3, all three clearly demonstrated incremental validity. These findings of incremental validity are in line with the recent longitudinal study by Stutts et al. (in press), showing that self-compassion predicts well-being over time while controlling for neuroticism.

Although the large correlations found between neuroticism and self-compassion may raise concerns, strong correlations between constructs do not necessarily mean they are measuring exactly the same thing, especially if incremental validity is established. Thus, while self-compassion and

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neuroticism clearly overlap, the evidence presented here suggests that neither self-compassion as a whole nor the items representing RUS are identical or fully redundant with neuroticism or its facets, countering the claim that the negative items of the SCS should be dropped.

When the contents of the negative SCS items and the neuroticism items of the NEO PI-R are examined, there are differences that help explain why they are not redundant. The SCS measures reduced uncompassionate ways of relating to oneself in times of suffering along three basic dimensions—emotional responding, for example, 'When times are really difficult, I tend to be tough on myself'; cognitive understanding, for example, 'When I'm feeling down, I tend to feel like most other people are probably happier than I am'; and paying attention to suffering, for example, 'When something painful happens I tend to blow the incident out of proportion'. These items are reverse coded to indicate their relative absence. Neuroticism items, in contrast, are designed to measure habitual negative mood states in general without reference to how individuals respond to instances of suffering in particular and are not structured along the dimensions of emotional responding, cognitive understanding, or paying attention to that suffering. Rather, they tap into six dimensions of positive or negative affect (with positive items reverse coded to indicate their absence): anxiety, for example, 'I often feel tense and jittery'; hostility, for example, 'It takes a lot to get me mad'; depression, for example, 'Sometimes things look pretty bleak and hopeless to me'; self-consciousness, for example, 'I feel comfortable in the presence of my bosses or other authorities'; impulsiveness, for example, 'I have trouble resisting my cravings'; and vulnerability, for example, 'I can handle myself pretty well in a crisis'. Thus, while the items of the SCS and neuroticism both tap into self-related affect, the items are distinct.

There is another important reason to retain the negative items of the SCS: They are crucial for measuring what changes when individuals learn to be more self-compassionate. A large and ever-growing body of research indicates that self-compassion training increases compassionate and reduces uncompassionate behaviour towards the self. The vast majority of intervention studies examining change in self-compassion have documented a simultaneous increase in self-kindness, common humanity and mindfulness, and a decrease in self-judgment, isolation, and over-identification subscale scores. For instance, after 8 weeks of mindful self-compassion training (Neff & Germer, 2013) participants reported a 30% increase in compassionate and a 33% decrease in uncompassionate responding toward the self (Neff, 2016a, 2016b). This pattern has been observed for a wide variety of methodologies such as self-compassion meditation training (Albertson et al., 2015; Toole & Craighead, 2016; Wallmark, Safarzadeh, Daukantaitė, & Maddux, 2013); online psycho-education (Finlay-Jones, Kane, & Rees, 2017[2]; Krieger, Martig, van den Brink, & Berger, 2016); affect training (Hildebrandt, McCall, & Singer, 2017); imaginal exposure therapy (Hoffart, Øktedalen, & Langkaas, 2015); self-compassion field training (Khorami, Moeini, & Ghamarani, 2016); compassion-based Kg-Free weight reduction training (Pinto-Gouveia et al., 2016); compassion-focused therapy (Beaumont, Irons, Rayner, & Dagnall, 2016; Kelly & Carter, 2015); compassionate mind training (Arimitsu, 2016; Beaumont, Rayner, Durkin, & Bowling, 2017); and mindful self-compassion (Finlay-Jones, Xie, Huang, Ma, & Guo, 2017, Friis et al., 2016, see Footnote 2; Neff, 2016a). Mindfulness-based interventions also yield a simultaneous increase in compassionate SCS subscale scores and a decrease in uncompassionate SCS subscale scores: for example, mindfulness-based stress reduction (Birnie, Speca, & Carlson, 2010; Raab, Sogge, Parker, & Flament, 2015); mindfulness-based cognitive therapy (Kuyken et al., 2010, see Footnote 2); and Koru (Greeson, Juberg, Maytan, James, & Rogers, 2014). In most of these studies, the size of change in CS and uncompassionate self-responding was equivalent.

If reduced levels of self-judgment, isolation, and over-identification were not an intrinsic part of self-compassion, why would teaching people to be more self-compassionate so consistently yield simultaneous changes in CS and RUS? In fact, one could argue that the negative items *must* be included in the SCS in order to fully capture how self-responding changes as a result of self-compassion training. These findings also highlight why there is so much excitement about the construct of self-compassion in the field of psychology: It is a skill that can be learned, and it is a skill that lasts. Neff and Germer (2013) found that after completing the mindful self-compassion programme, self-compassion gains were maintained by participants for at least a year.

In order for Pfattheicher et al. to support their claim that the SCS commits the 'jangle fallacy' and its negative items are simply a measure of neuroticism under a new name, they would need to demonstrate that after relatively brief self-compassion interventions, neuroticism scores change to the same degree as the negative items of the SCS (or rather a total SCS score, as our psychometric evidence counters the idea that there are separate CS and RUS factors). While it is likely that neuroticism would lessen after self-compassion training given that neuroticism has been shown to be changeable (Ormel et al., 2013), it is not clear that it would do so to the same extent as self-compassionate behaviours, which are the explicit target of such interventions.

Of course, it is likely that neuroticism and self-compassion interact, so that more neurotic individuals are less likely to treat themselves compassionately. Similarly, it is likely that individuals who are more self-compassionate are less likely to experience the negative mood states associated with neuroticism. However, learning the skill of self-compassion may help neurotic individuals change the balance of compassionate versus uncompassionate behavior toward themselves when faced with difficult thoughts and emotions, so that their neurotic tendencies are lessened. An interesting and potentially productive line of future research would involve determining how the two interact, whether individuals high in neuroticism respond to self-compassion training differently than those low in the trait and whether

[2]Results obtained by personal communication with the lead author.

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self-compassion is actually a useful way to lessen the vulnerability to psychopathology associated with this personality type (Ormel, Rosmalen, & Farmer, 2004).

In their conclusion, Pfattheicher et al. acknowledge that 'we do not question the meaningfulness of self-compassion per se. In fact, research on self-compassion can inform us how to adaptively deal with painful experiences. The strength of self-compassion is that it reflects a differentiated construct emphasizing different strategies for dealing with negative emotions and experiences (i.e., being self-kind, believing in common humanity and engaging in mindfulness and being less judgmental, feeling less isolated and over-identifying less with difficult emotions). In contrast, neuroticism encompasses individual differences in emotional reactivity to environmental stimuli and in the perception, reaction to or coping with them, but the definition of neuroticism does not include explicit coping strategies. These considerations speak to the possibility that neuroticism and self-compassion largely overlap on a personality level in that neuroticism can substitute for the trait self-compassion, especially the negative factor. Yet on a strategic level (i.e. how individuals deal exactly with negative events), self-compassion is more specific than neuroticism' (p. 167).

We agree that an important difference between neuroticism and self-compassion is that the former represents habitual mood states and negative reactivity, while the latter represents the habitual use of more adaptive coping strategies for dealing with distress. We do not agree, however, that neuroticism can substitute for trait self-compassion on a personality or measurement level. It is unclear exactly what the implications of this view are. Would it suggest that researchers interested in how compassionately people respond to themselves in instances of suffering at the trait level should use a neuroticism measure instead of the SCS? The SCS directly assesses increased compassionate and decreased uncompassionate behaviours in response to suffering that measures of neuroticism do not. This difference presumably accounts for the incremental validity of self-compassion compared with neuroticism demonstrated in the three studies reported here. The fact that neuroticism does not refer to the way that individuals relate to themselves in times of distress, but rather refers to negative mood states that are more reflective of psychopathology itself, means that it is distinct from self-compassion by definition. The two constructs are overlapping, but distinct.

Given that the SCS measures a set of behaviours that directly map on to what changes in self-compassion interventions, whereas neuroticism may be a better proxy for the lessened negative mood states that are the *outcomes* of such interventions, there is not a strong reason to substitute neuroticism for self-compassion as a trait. To do so would result in far less precision in identifying the behaviours displayed by individuals high in trait self-compassionate or that change after self-compassion training and would run the risk of conflating outcomes with mechanisms of action. Far from being old wine in a new bottle, we would argue that self-compassion represents an adaptive strategy for relating to distressing experiences that can be learned, offering a new framework for understanding how to cope with personal suffering in a way that pre-existing models of neuroticism do not typically address.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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Table S2. Standardized parameter estimates for the higher-order ESEM representation of the neuroticism factor of the NEO PI-R
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Table S5. Cronbach's alphas and zero-order correlations between observed scores for all variables in Study 2 ($N = 581$)
Table S6. Goodness-of-fit statistics for the estimated models for the Self-compassion Scale, the neuroticism factor of the NEO P-RI and the Difficulties in Emotion Regulation Scale in Study 2 ($N = 581$)
Table S7. Standardized parameter estimates for the CFA and ESEM solutions of the Self-compassion Scale in Study 2 ($N = 581$)
Table S8. Correlations (based on factor scores) between the global and specific factors of Self-compassion (using the bifactor ESEM 4b) and neuroticism in Study 2 ($N = 581$)
Table S9. Incremental validity predicting difficulties in emotion regulation using regression analyses with observed scores, with total neuroticism score entered in Step 1 (Model S2a), depression entered Step 1 (Model S2b), or anxiety

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entered in Step 1 (Model S2c), and reduced uncompassionate self-responding score entered in Step 2 for all models in Study 2 (N = 581)

Table S10. Cronbach's alphas and zero-order correlations between observed scores for all variables in Study 3 (N = 177)

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