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The Use of Latent Profiles to Explore the Multi-dimensionality of Self-compassion

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Abstract

Objectives Self-compassion is a multi-dimensional construct; however, little is known about the multi-dimensionality because a composite self-compassion score is typically used. The purpose of this study was to explore profiles of the self-compassion dimensions using latent profile analysis.
Methods Three healthy, independent samples completed assessments of self-compassion and psychological inflexibility (sample 1 $N = 419$), perceived stress (sample 2 $N = 384$), or perceived stress, anxiety, and depression (sample 3 $N = 509$).
Results Similar profile patterns emerged across three independent samples. Profile differences in composite self-compassion revealed different underlying dimensional patterns that resulted in similar composite self-compassion scores. In addition, some profiles with different composite scores had similar levels of psychological inflexibility or perceived stress.
Conclusions Although there is general support for the use of a composite score representing the relative balance of self-compassion, limitations to representing self-compassion with a single score are highlighted. Key limitations are clarity of what a composite score captures, specific mechanisms underlying the construct, and targeted intervention implications.

Keywords Psychological inflexibility · Perceived stress · Profile analysis · Self-coldness

Self-compassion is a compassionate stance towards oneself in times of failure or suffering and reflects an adaptive way of interacting with oneself that is consistently associated with psychological thriving (Neff 2003; Neff and Germer 2017). Compassion has been more broadly conceptualized by Gilbert (2009) utilizing a therapeutic framework describing a regulatory processes that reflect threat and safety systems activated by either self-coldness/criticism or self-compassion, respectively. Neff (2003) conceptualized self-compassion with a different framework. The two conceptualizations represent unique perspectives and one is not considered superior.

The bulk of the literature adopts Neff's conceptual framework, defining self-compassion through three core components that each have a positive and negative pole representing a compassionate and uncompassionate dimension, respectively. The first dimension reflects mindfulness, a receptive state of mind that does not repress or deny feelings, but allows them to be observed with neutrality. The opposing dimension is over-identification, reflected in either ignoring or over-identifying with thoughts and feelings. The second positive dimension is self-kindness, which is responding with acceptance, warmth, and understanding. The opposing dimension is self-judgment, which represents criticism, frustration, intolerance, or impatience directed towards the self. The third positive dimension is a sense of common humanity, which reflects an understanding that suffering and imperfection comprise a shared or universal human experience. The negative dimension is experiencing a sense of isolation reflecting the belief that one's inadequacy is unique. These dimensions are assessed through six subscales on the Self-Compassion Scale (SCS; Neff et al. 2019) designed to test Neff's conceptualization of self-compassion. Researchers have predominantly used a composite self-compassion score where all subscales are averaged with negative dimension items reverse scored to represent the relative balance of the negative and positive dimensions of self-compassion. However, it should be noted that self-compassion has been conceptualized differently by Gilbert (2009) and although the SCS is the primary assessment tool, aspects of self-compassion according to Gilbert may not be fully captured with the SCS.

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Despite the nuanced conceptualization of self-compassion as a multi-dimensional construct, few researchers have used a multi-dimensional perspective. Initial evidence has shown that specific dimensions associated differently with depression (Körner et al. 2015; Kriegar et al. 2013). There has been some advocacy for a two-dimensional perspective, where the positive dimensions were used to represent self-compassion and the negative dimensions were used to represent self-coldness (Costa et al. 2016; López et al. 2015). The use of two scores was driven by empirical factor analyses, but is also consistent with the theoretical distinction outlined by Gilbert's (2005) theory of social mentalities, distinguishing distinct threat and safety systems activated through self-coldness and self-compassion, respectively.

Muris and Petrocchi (2017) further suggested that the positive dimensions of self-compassion represent protective factors or resilience while risk or vulnerability was represented in the negative dimensions of self-compassion. In their meta-analysis, Muris and Petrocchi found that the negative dimensions of self-compassion demonstrated stronger associations with psychopathology than the positive dimensions. They concluded that composite self-compassion may over-represent the protective function of self-compassion in the relation to maladaptive outcomes as the positive relationships could be driven in large part to the reverse-coded negative dimensions. Additionally, there is growing evidence to support the contention that positive (self-reassurance) and negative (self-critical) self-relating processes are distinct and should not be considered along a single dimension (Longe et al. 2010; Petrocchi et al. 2018). Yet, because a composite score has primarily been used, little attention has been given to the relative conceptual or practical role of specific risk factors (Muris and Petrocchi 2017).

In response, Neff (2016) maintained that a composite score reflects the relative balance between the positive and negative dimensions and is consistent with her original conceptualization of self-compassion. However, the current scoring procedure using the SCS can result in a lack of clarity about the magnitude of the positive and negative dimensions. One issue concerning the use of the composite score is that the SCS assesses each dimension independently rather than as the bi-polar opposites described by Neff. Neff contends that there are opposing responses to failure and suffering that on one end reflect self-judgment and at the other end self-kindness. However, the current scoring protocol allows individuals to report being both self-judgmental and self-kind, for example. There is currently no clear conceptual understanding of what it means to have strong risk and protective factors on the SCS.

A recent study has re-framed how these dimensions are labeled and suggests that the negative dimensions be referred to as reduced uncompassionate dimensions (Neff et al. 2018). Describing reverse-scored items reflecting uncompassionate behavior as reduced uncompassion is a new way to describe these dimensions. This language aligns with a focus on what makes each dimension self-compassionate; however, the way the items are written reflects degree of uncompassionate self-responses. If the items are reverse scored, high scores reflect low endorsement of uncompassion towards oneself which is not necessarily "reduced" uncompassion. Such scores could reflect apathy or lack of self-awareness. The conceptualization of these dimensions is evolving and, therefore, examining how the six self-compassion dimensions combine in different patterns within individuals, based on the way the SCS items are worded, is important for advancing our understanding of the multi-dimensionality of self-compassion.

Empirical evidence supporting the use of a single composite score to represent self-compassion has resulted in mixed perspectives. One SCS factor structure test across multiple samples endorsed a correlated six-factor structure, suggesting the dimensions do not form a higher-order self-compassion factor and rather six factor scores should be used (Williams et al. 2014). A different factor structure was tested with a bifactor model, with support endorsing a model with two general factors (self-compassion and self-coldness) and six specific dimension factors (Brenner et al. 2017). The two general factors, however, do not align with Neff's original conceptualization of self-compassion.

A recent comprehensive re-analysis of the SCS across 20 samples tested multiple factor structures, including comparing a one- and two-bifactor model (Neff et al. 2019). This comprehensive test of the SCS found the strongest support for a single bifactor structure, suggesting that a general self-compassion factor and the six dimension scores represent distinct factors that explain unique variance in item responses and can thus be used simultaneously. Such a bifactor structure indicates that the dimensions alongside the composite score represent unique elements of self-compassion. The literature shows differing perspectives exist on the underlying structure of the SCS and the use of composite self-compassion scores; however, the most recent evidence supports a bifactor structure, suggesting that there is merit in exploring the six dimensions of self-compassion alongside a general self-compassion score (Neff et al. 2019).

Recent evidence supports the unique nature of each dimension of self-compassion and supports the multi-dimensional nature of the construct (Neff et al. 2018, 2019). One way to examine the self-compassion dimensionality is to utilize a person-centered approach, which addresses whether different combinations of the self-compassion dimensions exist and how resulting profiles or patterns of dimensions may differ. Unlike a variable-centered approach of examining how *variable* scores relate, a person-centered approach recognizes that people possess multiple characteristics and distinct latent groups exist based on different combinations of these characteristics. For example, one pattern of self-compassion dimensions may reflect high scores across the positive dimensions

and low scores across the negative dimensions. Such a pattern would reflect a self-compassionate individual, where the relative balance between positive and negative dimensions is in conceptually congruent patterns (e.g., high on self-kindness and low on self-judgment).

There has only been one exploration of the patterns of self-compassion dimensions using a person centered approach. Phillips (2019) recently identified three self-compassion mindsets using latent profile analysis (LPA). LPA represents a person-centered latent modeling approach of identifying meaningful subgroups of participants based on patterns of characteristics assessed within a study (see Marsh et al. 2009; Morin and Wang 2016). The mindsets that emerged from Phillip's study reflected uncompassionate self-responding, moderately self-compassionate, and highly self-compassionate patterns of the six dimensions. This study concluded support for Neff's conceptualization of relative balance of self-compassion among the six dimensions representing a general factor. Approximately 50% of participants were considered moderately self-compassionate with similar level scores across all dimensions (ranging from 3.27–3.49 on a 5 point scale). It appears a large portion of individuals respond on average to both positive and negative dimensions at similar levels (e.g., not more or less compassionate). It is unclear, however, what this classification represents. Because profile analysis is highly sample dependent and replication is necessary, there is value in exploring if additional potential combinations of the six dimensions can be identified to provide a more nuanced understanding of the dimensions. Therefore, further examining dimension profiles will extend our understanding of how the multiple dimensions of self-compassion exist and operate together.

A strong body of literature supports adaptive psychological functioning associated with self-compassion. For example, self-compassion has been found to foster positive psychological outcomes such as empathy (Bibeau et al. 2015) and may buffer against psychopathology indicators of stress, anxiety, and depression (MacBeth and Gumley 2012). In fact, self-compassion has been found to mediate the reduction of stress associated with participation in mindfulness-based stress reduction (Shapiro et al. 2005). The positive outcomes associated with self-compassion are conceptualized to occur through the deactivation of the threat system and the activation of self-soothing which fosters emotional balance (Gilbert and Irons 2005) which leads to more adaptive motivation and healthy behavior choices (see Neff and Germer 2017). Empirical support for this process has shown self-compassion decreased cortisol and increased heart-rate variability which represents physiological markers of the self-soothing system when stressed (Rockcliff et al. 2008).

It may be valuable to investigate the multi-dimensionality of self-compassion by examining how it relates to core psychological experiences that would be considered key outcomes of self-compassion, such as stress, but also in relation to conceptually similar constructs. Psychological inflexibility reflects rigid psychological reactions instead of acceptance, leads to experiential avoidance of unwanted psychological events, and ultimately prevents the pursuit of value driven behaviors (Bond et al. 2011). Psychological inflexibility and self-compassion thus represent conceptually opposing general psychological stances to difficult or uncomfortable experiences, serving maladaptive and adaptive functions, respectively. Although a moderately strong negative correlation has been found using composite self-compassion (e.g., Marshall and Brockman 2016), we lack data on how the dimensions of self-compassion associate with psychological inflexibility. Collectively, evidence demonstrates that self-compassion plays an important role in adaptive psychological functioning and warrants further examination to understand more precisely how the collective set of dimensions of self-compassion may be driving its resilience function.

Although self-compassion is conceptualized and measured as a multi-dimensional construct, we know little about what patterns or profiles of the six dimensions exist or how they relate to conceptually relevant outcomes. Exploring profiles can contribute to the conceptual, methodological, and practical understanding of self-compassion because it is a complex, multi-dimensional construct that has not often been considered from a multi-dimensional perspective. Therefore, the first purpose of this study was to use LPA to identify self-compassion dimension profiles. Because profile analysis can be sample dependent, we conducted LPA on three independent samples. The second purpose of this study was to examine the profile representation of self-compassion compared to the three single composite scores that have been used in the past to represent self-compassion: relative self-compassion (all dimensions), self-compassion (all positive dimensions), and self-coldness (all negative dimensions) scores. The third purpose of this study was to begin to explore how profiles differ on relevant psychological outcomes as described earlier (i.e., psychological inflexibility, perceived stress, depression, anxiety). These differences can serve as a starting place to understand how profiles might associate with relevant outcomes and begin to characterize the profiles. Sample 1 tested for differences in psychological inflexibility, sample 2 tested for differences in perceived stress, and sample 3 tested differences in depression, stress, and anxiety. We expected several unique profiles would emerge; however, there is insufficient evidence to support specific predictions about the different composite self-compassion scores and psychological outcome variables.

Methods

Participants

Sample 1 Participants were undergraduate students with an average age of 20.13 ($SD = 1.98$), were primarily Caucasian (71%; 4% Black, 6% Asian, 8% Hispanic/Latino, 1% American Indian, 4% multi-racial, 2% other), and were primarily women (65%). There was negligible missing data on the constructs of interest (< 0.01%) and expectation likelihood was used to impute missing data values (Little's MCAR test $p = 0.93$), for a final sample of $N = 419$.

Sample 2 Participants were students taking a for-credit yoga class at a university. Participants had an average age of 20.48 ($SD = 2.22$) and were primarily Caucasian (78%) and women (86%). Participants were from the same institution as the researchers, but were not directly taught or supervised by any of the researchers. There were 384 participants who responded to the constructs used in this study at that time point. Only 0.12% of the values were missing (Little's MCAR test $p = 0.52$); therefore, expectation likelihood was used to impute missing data values.

Sample 3 Participants were primarily undergraduate students with an average age of 20.40 ($SD = 4.91$), were primarily Caucasian (68%; 3% Black, 10% Asian, 11% Hispanic/Latino, 1% American Indian, 5% multi-racial, 2% other), and were primarily women (69% of those reporting sex). There was negligible missing data on the constructs of interest (0.11%) and expectation likelihood was used to impute missing data values (Little's MCAR test $p = 0.95$), for a final sample of $N = 509$.

Procedures

This study utilized cross-sectional survey data from three independent samples. In study 1, participants completed an anonymous online survey that included measures of self-compassion and psychological inflexibility as part of a larger study. In study 2, participants completed a baseline assessment during the first week of a yoga class as part of a larger study. In study 3, participants completed an anonymous online survey that included measures of self-compassion, depression, anxiety, and stress. All studies received appropriate Institutional Review Board approval and were in compliance with ethical standards for conducting research.

Measures

Self-compassion was assessed using Neff et al.'s (2019) 26-item Self-Compassion Scale. Participants respond to how often they experience a particular response to pain and suffering using a 5-point Likert scale ranging from *almost never* to *almost always*. Subscale average scores were calculated where higher scores represent greater levels of each dimension (items not reverse scored). We chose not to reverse score the negative dimension items for the subscale scores so as not to conflate different interpretations of what the items actually assess. Therefore, higher scores represent greater levels of each respective dimension. Next, we averaged the positive dimensions to create a self-compassion score and averaged the negative dimensions to represent a self-coldness score. Finally, we calculated a relative self-compassion score (negative dimensions were reverse scored and dimension scores were averaged) where higher scores represent greater balance towards self-compassion.

Psychological inflexibility was measured with the Acceptance and Action Questionnaire-II (AAQ-II: Bond et al. 2011), which reflects experiential avoidance, or an unwillingness to experience unwanted emotions and thoughts. The AAQ-II has 7 items that use a 7-point scale ranging from *never true* to *always true*. The items were averaged and higher scores represent greater psychological inflexibility. The AAQ-II has evidence supporting reliability and construct validity (Bond et al. 2011).

Perceived stress was measured with the 10-item version of Cohen et al.'s (1983) Perceived Stress Scale (PSS). Participants responded to how often they felt a certain way during the last week reflecting for example feeling nervous or stressed, or dealing successfully with hassles (reverse scored item). Participants respond on a 5-point scale ranging from *never* to *very often*. Positively worded items reflecting low perceived stress were reverse scored and all items averaged so that higher scores reflect higher perceived stress. The PSS has been used extensively and has evidence supporting reliability and validity (Cohen et al. 1983).

Depression, *Anxiety*, and *Stress* were measured with the Depression, Anxiety, and Stress Short Form (DASS-21; Henry and Crawford 2005). The CASS-21 is a 21-item self-report measure with 7 items each assessing depression, anxiety, and stress on a 4-point scale ranging from *did not apply to me at all* to *applied to me very much*. The DASS-21 has evidence supporting reliability and construct validity on a normative adult sample (Henry and Crawford 2005).

Data Analysis

Data screening for missing values and normality was conducted, followed by descriptive statistics. It should be noted that there is overlap in the items used in the three composite scores representing relative self-compassion, self-compassion, and self-coldness and among some or all of the dimension scores. Latent Profile Analysis (LPA) is a person-centered model-based statistical analysis to identify underlying latent subgroups or profiles based on common response patterns on a

set of variables of interest (Gibson 1959; Vermunt and Magidson 2002). As a model-based analysis, LPA is superior to other person-centered approaches (e.g., cluster analysis), accounting for measurement error related to the uncertainty in profile membership and providing fit statistics that aid in the determination of the number of profiles that best represent the data (Marsh et al. 2009; Muthen 2001). The observed indicators were standardized scores for each of the six self-compassion dimensions. Thus, scores are interpreted relative to the sample.

We fit a series of LPA models specifying 1 through 6 profiles with each sample. Model identification used 1000 sets of starting values. To aid in model selection, we used information criteria (Bayesian information criterion, BIC; Akaike information criterion, AIC; and adjusted BIC) to compare models, with lower values indicating better relative fit. We also examined entropy, which ranges from 0 to 1 with numbers closer to 1 indicating improved accuracy for classifying individuals into the "correct" profile (> 0.80 represents high separation among classes), and Lo-Mendell-Rubin likelihood ratio test (LMR-LRT), a test statistic to show whether a lower versus higher number profile solution is a better fit. All models were fit using MPLUS 7.11 using robust maximum likelihood estimator where the means and variances of indicators were freely estimated.

To test how the profiles differed on the psychological outcome variables, the three-step procedure (DU3STEP) was used (Asparouhov and Muthén 2014). This approach accounts for measurement error in profile membership and reduces bias in estimates. Following model selection, the DU3STEP enters distal outcome auxiliary variables of psychological inflexibility (sample 1), perceived stress (sample 2), or depression, anxiety, and stress (sample 3) to examine the latent profile differences on these variables adjusting for classification error. Sex was included in all models; however, classification error exceeded 20% with this variable and sex was removed. To explore sex differences, participants were classified into profiles based on each participant's highest probability of profile membership followed by a chi-square analysis testing sex differences in profile membership.

Results

Sample 1

Data screening conducted on the calculated construct scores revealed approximately normal distribution of study variables. Only four cases were identified as multivariate outliers (p Mahalanobis distance < 0.001) and there were no univariate outliers. Multivariate analyses run with and without these cases were highly similar and did not change conclusions; therefore, all cases were retained. All scale scores

demonstrated good internal consistency reliability ($\alpha >$ 0.80). See Table 1 for descriptive statistics. A multivariate analysis of variance was conducted with all study variables to explore sex differences. There was not a significant multivariate effect (*Pillai's Trace* = 0.03, F (7, 410) = 1.73, p = 0.10; Eta_p^2 = 0.03).

The relative self-compassion score associated negatively with the negative dimensions, the self-coldness score, and psychological inflexibility and positively with the positive dimensions and the self-compassion score (see Table 2). The self-compassion score associated moderately negatively with the self-coldness score and all the negative dimensions, and strongly positively with all the positive dimensions. The self-coldness score associated strongly and positively with all the negative dimensions and psychological inflexibility, and moderately negatively with the positive dimensions. The expected pattern of associations was found between the positive and negative dimensions of self-compassion and psychological inflexibility; however, the common humanity dimension did not correlate ($p > 0.05$) with self-coldness or the self-judgment or over-identification dimensions.

Identifying Profiles Using Latent Profile Analysis

Models 1–6 were well identified (see Table 3). The AIC, BIC, and adjusted BIC were lowest for the 6-profile solution suggesting this model fit the data best, but the entropy was lower in the 6-profile solution. In addition, the LMR-LRT indicates the 4-profile solution was better than 3 profiles ($p < 0.05$) and the 5-profile solution was better than 4 profiles ($p < 0.05$) while the 6-profile solution did not provide improved fit ($p > 0.05$). Although entropy was highest for the 5-profile solution (0.87), the 4-profile solution was similar (0.86). The elbow plots of the fit indices show clear drop offs in slope at 2, 4, and 5 profiles (see Fig. 1a). As a result of all information, we carefully examined the 4-, 5-, and 6-profile models. In determining the most appropriate profile solution, it is important to balance both the statistical fit criteria with the conceptual and practical understanding of the profiles (Bauer and Curran 2003; Collins and Lanza 2010). The additional profile in the 6-profile solution did not contribute unique information relative to the 5-profile solution and was deemed conceptually redundant. Since the 6-profile solution also did not represent a significant improvement in model fit, we eliminated this solution and focused our model selection on the more parsimonious 4- and 5-profile models. The 5-profile solution revealed the same patterns as the 4-profile solution and added a unique profile that was characterized by a pattern of relatively high scores on all six indicators. While this added profile only represented 5% of the sample, we believe this solution captured a meaningfully unique pattern of self-compassion dimensions. Small proportions of the sample in some profiles is an important consideration for having adequate power for

Table 1 Descriptive statistics for sample 1 ($N = 419$), sample 2 ($N = 384$), and sample 3 ($N = 509$)

	Scale	Sample 1		Sample 2		Sample 3	
		Mean (SD)	Alpha	Mean (SD)	Alpha	Mean (SD)	Alpha
Self-compassion	1–5	3.29 (0.71)	0.90	3.84 (0.68)	0.92	2.72 (0.74)	0.91
Self-coldness	1–5	2.98 (0.78)	0.92	3.08 (0.84)	0.89	2.84 (0.88)	0.93
Relative self-compassion	1–5	3.16 (0.60)	0.91	3.15 (0.67)	0.93	2.94 (0.57)	0.89
Self-kindness	1–5	3.30 (0.88)	0.88	3.39 (0.78)	0.84	2.61 (0.82)	0.81
Self-judgment	1–5	2.98 (0.91)	0.88	3.19 (0.94)	0.87	2.93 (0.94)	0.80
Common humanity	1–5	3.20 (0.86)	0.82	3.32 (0.89)	0.83	2.75 (0.82)	0.76
Isolation	1–5	3.01 (0.91)	0.86	3.02 (1.03)	0.87	2.81 (0.97)	0.81
Mindfulness	1–5	3.37 (0.82)	0.82	3.42 (0.82)	0.84	2.82 (0.84)	0.80
Over-identification	1–5	2.93 (0.94)	0.86	3.03 (0.97)	0.85	2.79 (0.93)	0.81
Psychological inflexibility	1–7	2.84 (1.41)	0.94				
Perceived stress	0–4			1.75 (0.74)	0.92	2.04 (0.61)	0.83
Depression	0–4					1.84 (0.70)	0.91
Anxiety	0–4					1.81 (0.60)	0.81

latent class modeling (Gudicha et al. 2016), especially when they reflect low separation among classes (Yang 2006). However, simulation studies suggest sample size does not primarily drive power (Tein et al. 2013). The 5-profile solution not only had substantive uniqueness, but resulted in entropy values that indicate highly discriminating latent classes (i.e., > 0.80; Celeux and Soromenho 1996; Muthén and Muthén 2007) and strong posterior probabilities for most likely class membership (i.e., > 0.80; Gudicha et al. 2016). Therefore, the 5-profile solution was selected based on both conceptual reasons and overall support from the model fit statistics.

To cross-validate the solution, the sample was randomly split into two sub-samples and all LPA models were run with the two sub-samples. All defining characteristics of the profiles were replicated in each sub-sample. Additionally, replication of the 5-profile solution was tested by conducting analyses separately with male-only ($n = 145$) and female-only ($n = 269$) samples. The emerging profile patterns were almost identical to the full sample. Therefore, the full sample results are reported and used in further analyses.

The 5-profiles are presented in Fig. 2a and Table 4 contains the estimated means and standard error of each self-compassion dimension for each profile based on the LPA results. The full sample estimated means (z scores) are also provided to aid in interpretation of profiles. The first profile represented 3% of the sample, had a high (0.93) average probability of classification, and was labeled *Indifferent* because this profile was characterized by scores well below (> 1 standard deviation) the sample average on all self-compassion dimensions. The second profile represented 57% of the sample, had a high (0.93) average probability of classification, and was labeled *Average* because they reported levels of all dimensions similar to the full sample average. The third profile

represented 14% of the sample, had a high (0.91) average probability of classification, and was labeled *Uncompassionate* because they reported a pattern of relatively low levels of the positive dimensions and high levels of the negative dimensions. The fourth profile represented 21% of the sample, had a high (0.91) average probability of classification, and was labeled *Compassionate*. This profile was characterized by a pattern of relatively high levels of positive dimensions and low levels of the negative dimensions. The fifth profile represented 5% of the sample, had a high (0.91) average probability of classification, and was labeled *High Responding* because of score levels well above the sample average on all dimensions.

Profile Differences on Composite Self-compassion Scores and Perceived Stress

The step 3 results for estimated profile differences are reported in Table 5. The *Compassionate* profile had the lowest psychological inflexibility, but did not differ from the *Indifferent* profile. The *Indifferent* profile also did not differ from the *Average* or *High Responding* (note that $p = 0.05$) profiles. The *Uncompassionate* profile had the highest level of psychological inflexibility, differing from all other profiles except the *High Responding* profile. The *Compassionate* profile had the highest and the *Uncompassionate* profile had the lowest relative self-compassion score. The *High Responding* profile had the second lowest score, significantly different from all profiles except the *Indifferent* profile. The *Indifferent* profile did not differ from the *Average* profile. All profiles differed on the self-compassion score. All profiles differed

Table 2 Correlations, confidence intervals, and tests of correlation differences between sample 1 and sample 2

Variables	1	2	3	4	5	6	7	8	9	10 stress
1 Self-compassion		−0.54**^ (−0.62/−0.45)	0.85**^ (0.82/0.88)	0.82** (0.78/0.85)	−0.48**^ (−0.56/−0.36)	0.82** (0.78/0.85)	−0.46**^ (−0.55/−0.36)	0.83** (0.79/0.86)	−0.45**^ (−0.53/−0.35)	−0.43** (−0.52/−0.34)
2 Self-coldness	−0.29**^ (−0.43/−0.16)		−0.90**^ (−0.92/−0.88)	−0.56**^ (−0.64/−0.47)	0.84** (0.81/0.87)	−0.30**^ (−0.40/−0.18)	0.87** (0.85/0.89)	−0.49**^ (−0.58/−0.39)	0.85** (0.82/0.88)	0.56** (0.48/0.64)
3 Relative self-compassion	0.78**^ (0.73/0.82)	−0.83**^ (−0.86/−0.78)		0.77** (0.73/0.81)	−0.77** (−0.82/−0.72)	0.61** (0.53/0.67)	−0.78**^ (−0.82/−0.74)	0.73** (0.67/0.78)	−0.76**^ (−0.80/−0.71)	−0.57** (−0.65/−0.49)
4 Self-kindness	0.84** (0.80/0.87)	−0.35**^ (−0.47/−0.22)	0.74** (0.68/0.79)		−0.57**^ (−0.66/−0.49)	0.50** (0.42/0.58)	−0.46**^ (−0.55/−0.37)	0.56** (0.46/0.64)	−0.40**^ (−0.49/−0.30)	−0.44** (−0.53/−0.35)
5 Self-judgment	−0.28**^ (−0.40/−0.15)	0.84** (0.81/0.87)	−0.73**^ (−0.78/−0.68)	−0.38**^ (−0.50/−0.26)		−0.24**^ (−0.34/−0.13)	0.60** (0.53/0.67)	−0.38**^ (−0.48/−0.28)	0.57** (0.49/0.65)	0.43** (0.34/0.52)
6 Common humanity	0.82** (0.77/0.85)	−0.09 (−0.20/0.03)	0.53** (0.44/0.61)	0.49** (0.40/0.58)	−0.08^ (−0.19/0.04)		−0.28**^ (−0.39/−0.17)	0.49** (0.39/0.57)	−0.23**^ (−0.33/−0.13)	−0.23** (−0.32/−0.12)
7 Isolation	−0.27**^ (−0.38/−0.15)	0.86** (0.83/0.89)	−0.71**^ (−0.76/−0.65)	−0.27**^ (−0.38/−0.16)	0.61** (0.53/0.67)	−0.13**^ (−0.23/−0.01)		−0.41**^ (−0.50/−0.31)	0.61** (0.54/0.67)	0.49** (0.40/0.57)
8 Mindfulness	0.84** (0.82/0.87)	−0.30**^ (−0.42/−0.17)	0.68** (0.63/0.74)	0.58** (0.51/0.65)	−0.24**^ (−0.35/−0.12)	0.54** (0.46/0.62)	−0.27**^ (−0.39/−0.15)		−0.48**^ (−0.56/−0.38)	−0.42** (−0.51/−0.32)
9 Over-identification	−0.21**^ (−0.33/−0.08)	0.85** (0.82/0.88)	−0.66**^ (−0.72/−0.60)	−0.23**^ (−0.35/−0.12)	0.55** (0.47/0.63)	−0.03^ (−0.14/0.08)	0.60** (0.53/0.67)	−0.25**^ (−0.37/−0.12)		0.51** (0.43/0.60)
10 Psychological inflexibility	−0.30**^ (−0.40/−0.19)	0.60** (−0.64/−0.50)	−0.57** (−0.64/−0.50)	−0.38** (−0.47/−0.27)	0.49** (0.41/0.57)	−0.10 (−0.19/0.00)	0.55** (0.47/0.61)	−0.27** (−0.37/−0.17)	0.48** (0.40/0.55)	

Sample 1 correlations (95% confidence interval) below the diagonal. Sample 2 correlations (95% confidence interval) above the diagonal. *p < 0.05, **p < 0.01. ^ Sample 1 and sample 2 correlations differ significantly (p < 0.05). Sample 3 correlations are available from the first author

Table 3 Model fit for one through six profile solutions tested for sample 1, sample 2, and sample 3

	AIC	BIC	n adjusted BIC	Entropy	Lo Mendell Rubin LRT	Vuong Lo Mendell Rubin	Profile sizes
Sample 1							
1	6545.033	6593.487	6555.408	na	na	na	419
2	6198.948	6275.667	6215.375	0.727	$p < 0.001$	$p < 0.001$	289; 130
3	6032.483	6137.468	6054.962	0.790	$p = 0.128$	$p = 0.124$	264; 77; 78
4	5851.532	5984.781	5880.063	0.858	$p = 0.001$	$p = 0.001$	11; 256; 85; 67
5	5758.140	5919.655	5792.723	0.873	$p < 0.001$	$p = 0.001$	11; 243; 56; 88; 21
6	5725.135	5914.915	5765.770	0.835	$p = 0.478$	$p = 0.469$	11; 40; 59; 56; 232; 21
Sample 2							
1	6072.578	6119.986	6081.911	na	na	na	384
2	5577.206	5652.268	5591.984	0.764	$p < 0.001$	$p < 0.001$	220; 164
3	5395.836	5498.553	5416.059	0.802	$p = 0.015$	$p = 0.013$	225; 90; 69
4	5340.519	5470.890	5366.186	0.822	$p = 0.061$	$p = 0.058$	210; 21; 67; 86
5	5298.384	5456.410	5329.496	0.788	$p = 0.086$	$p = 0.082$	167; 24; 62; 105; 26
6	5274.530	5460.211	5311.086	0.814	$p = 0.256$	$p = 0.246$	162; 22; 60; 107; 29; 4
Sample 3							
1	7938.632	7989.421	7951.332	na	na	na	509
2	7248.714	7329.131	7268.822	0.835	$p < 0.001$	$p < 0.001$	235, 274
3	6895.857	7005.9	6923.373	0.839	$p = 0.173$	$p = 0.168$	53, 247, 209
4	6615.485	6755.156	6650.409	0.85	$p = 0.158$	$p = 0.154$	75, 94, 231, 109
5	6354.096	6523.394	6396.429	0.873	$p = 0.001$	$p = 0.001$	24, 127, 87, 193, 78
6	6255.107	6454.032	6304.847	0.849	$p = 0.329$	$p = 0.322$	22, 172, 99, 76, 77, 63

significantly on the self-coldness score, except for the *Uncompassionate* and *High Responding* profiles.

Sex Differences in Profile Membership and Composite Self-compassion Scores

Chi-square analysis testing sex differences in profile membership was significant (χ^2 ($df = 4$) = 19.38, $p = 0.001$). Men comprised 35% of the sample but were over-represented in the *Indifferent* profile ($n = 7$; 64%) compared to women ($n = 4$, 36%) and in the *High Responding* profile ($n = 13$, 62%) compared to women ($n = 8$, 38%). Women comprised 65% of the sample and were over-represented in the *Uncompassionate* profile ($n = 46$, 80%) compared to men ($n = 11$, 16%). Men ($M = 3.20$, $SD = 0.57$) and women ($M = 3.14$, $SD = 0.62$) did not differ on relative self-compassion ($F_{1, 416} = 1.13$, $p = 0.29$), self-compassion ($F_{1, 416} = 0.00$, $p = 0.99$), or self-coldness ($F_{1, 416} = 2.80$, $p = 0.10$) scores.

Sample 2

Data screening conducted on the calculated construct scores revealed approximately normal distribution of study variables. There were no multivariate outliers (p Mahalanobis distance < 0.001) and two univariate outliers. Analyses run with and without these cases were highly similar and did not change conclusions; therefore, all cases were retained. All scale scores

demonstrated good internal consistency reliability ($\alpha > 0.80$). See Table 1 for descriptive statistics. A multivariate analysis of variance with all study variables revealed no significant multivariate effect for sex (*Pillai's* Trace = 0.03, F (8, 371), $p = 0.16$; $Eta_p^2 = 0.03$).

Identifying Profiles Using Latent Profile Analysis

Models 1–6 were well identified (see Table 3). The AIC and BIC were lowest for the 5-profile solution, but the entropy was lower in the 5-profile solution compared to the 3- and 4-profile solutions. In addition, the LMR-LRT indicates the 3-profile solution was better than 2 profiles ($p < 0.05$) and the 4-profile solution was marginally better than 3 profiles ($p = 0.06$) while the 5-profile solution did not provide improved fit ($p > 0.05$). Entropy was highest for the 4-profile solution (0.82). The elbow plots for model fit show a clear change in slope at 3 profiles (see Fig. 1b). As a result of all fit information, we carefully examined the 3-, 4-, and 5-profile models. The additional profile in the 5-profile solution did not contribute unique information relative to the 4-profile solution and was deemed conceptually redundant. The 4-profile solution revealed the same patterns as the 3-profile solution and added a unique profile that was characterized by a pattern of moderately low scores on the six indicators. While this added profile only represented 5% of the sample, we believe this solution captured a meaningfully unique pattern of self-compassion
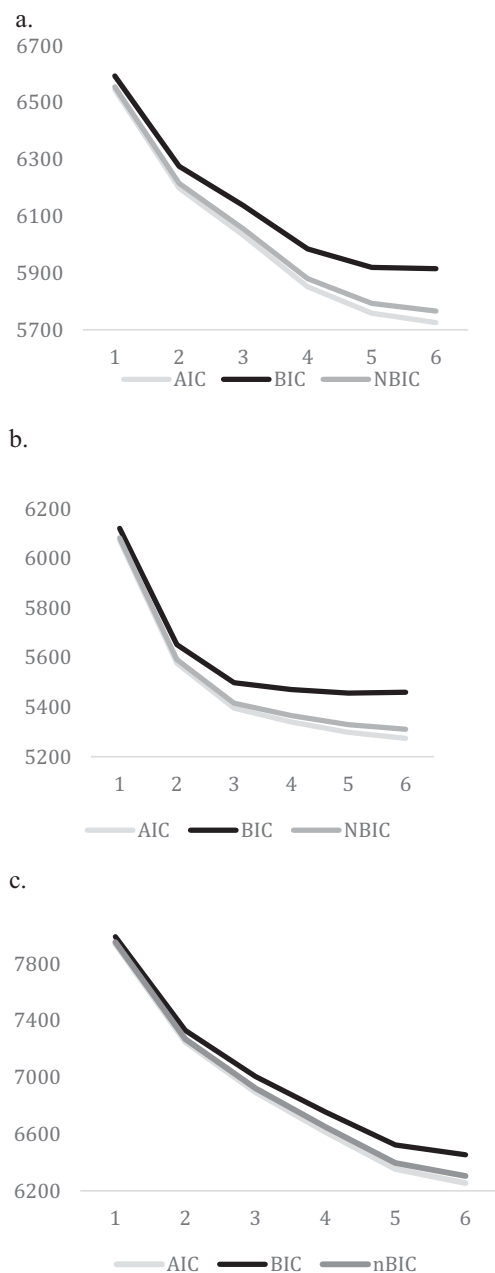
a.

b.

c.

Fig. 1 **a** Sample 1 elbow plot of fit indices by number of profiles. **b** Sample 2 elbow plot of fit indices by number of profiles. **c** Sample 3 elbow plot of fit indices by number of profiles

dimensions and the additional profile was similar to the low profile identified in sample 1. Thus, just as with the first sample, the 4-profile solution was selected based on these conceptual reasons and overall support from the model fit statistics.

The four profiles are presented in Fig. 2b and Table 4. The first profile (55% of the sample, 0.90 average probability of classification) was labeled *Average* as it was characterized by relatively even scores close to the sample average on all self-compassion dimensions. The second profile (5% of the

sample, 0.88 average probability of classification) was labeled *Below Average* because this profile reported levels of all dimensions below the sample average. The third profile (17% of the sample, 0.92 average probability of classification) was labeled *Compassionate* because of relatively high levels of the positive dimensions and low levels of the negative dimensions. The fourth profile (22% of the sample, 0.91 average probability of classification) was labeled *Uncompassionate* as it was characterized by relatively low levels of positive dimensions and high levels of the negative dimensions.

Profile Differences on Composite Self-compassion Scores and Perceived Stress

Step 3 results for estimated profile differences are reported in Table 5. The *Compassionate* profile had the highest and the *Uncompassionate* profile had the lowest relative self-compassion score. The *Average* profile was significantly lower than the *Compassionate* profile and higher than the *Uncompassionate* profile, but not different from the *Below Average* profile on relative self-compassion. All profiles differed on the self-compassion score, except for the *Uncompassionate* and the *Below Average* profiles. All the profiles differed on the self-coldness score. The *Uncompassionate* profile had the highest level of perceived stress, differing from all profiles. The *Compassionate* profile had the lowest perceived stress, but did not differ from the *Below Average* profile. The *Below Average* profile had significantly lower perceived stress than the *Average* profile.

Sex Differences in Profile Membership and Composite Self-compassion Scores

Chi-square analysis testing sex differences in profile membership was significant (χ^2 ($df = 3$) = 13.66, $p < 0.01$). Men comprised 13% of the sample and were over-represented in the *Below Average* profile ($n = 7$; 33%) compared to women ($n = 14$, 66%). Women comprised 87% of the sample and were over-represented in the *Uncompassionate* profile ($n = 82$, 95%) compared to men ($n = 4$, 5%). Men and women differed on relative self-compassion score ($F_{1, 378} = 5.57$, $p = 0.02$), the self-coldness score ($F_{1, 378} = 6.32$, $p = 0.01$), and the over-identification dimension ($F_{1, 378} = 8.16$, $p = 0.01$).

Sample 3

Data screening conducted on the calculated construct scores revealed approximately normal distribution of study variables. There were no multivariate outliers (p Mahalanobis distance < 0.001) or univariate outliers. All scale scores demonstrated good internal consistency reliability ($\alpha > 0.80$). See Table 1 for descriptive statistics. A multivariate analysis of variance with all study variables revealed a significant multivariate

a.

b.

c.
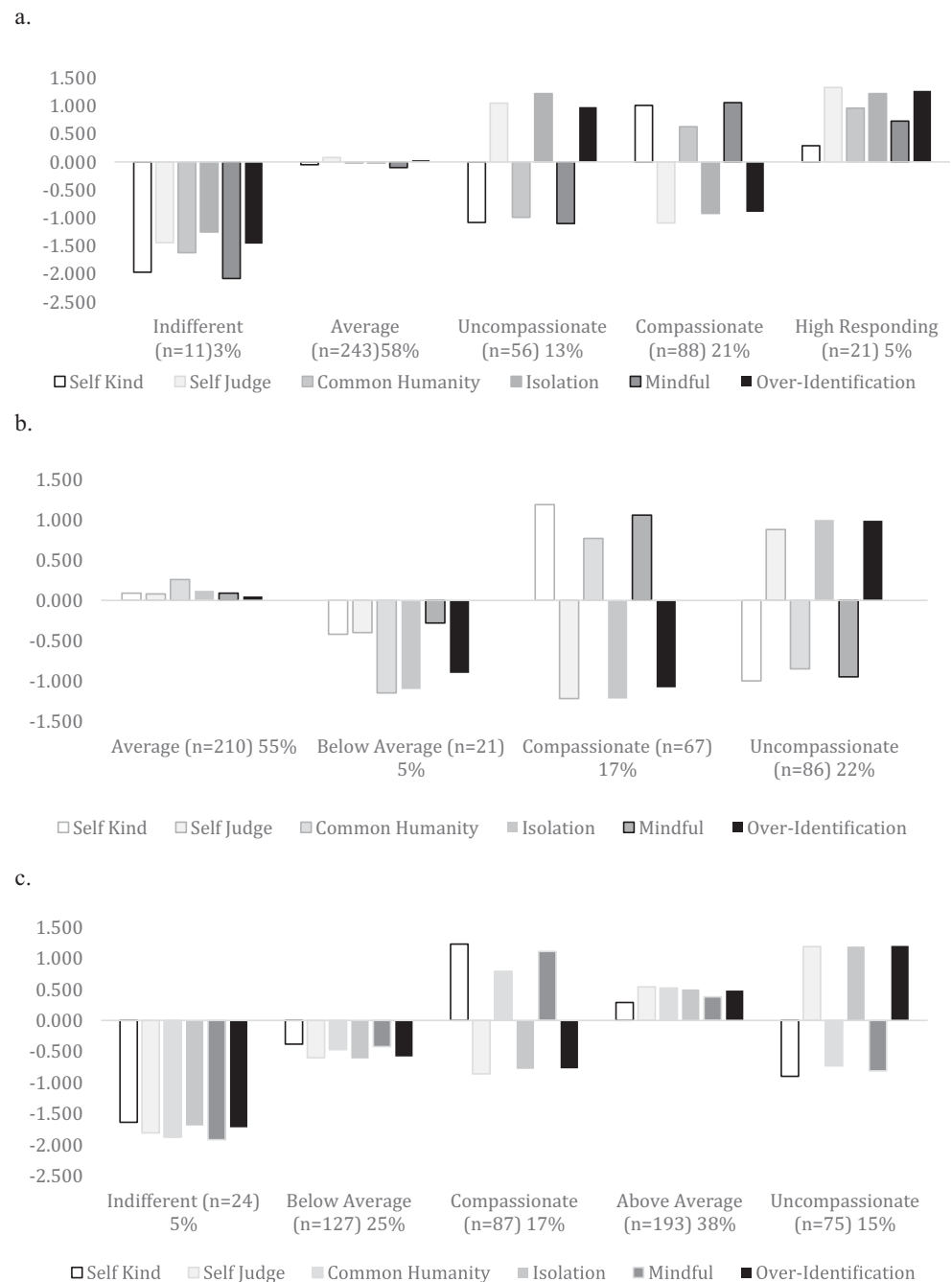
effect for sex ($n = 455$; *Pillai's* Trace = 0.10, F (9, 445),
$p < 0.001$; $Eta_p^2 = 0.10$) where women were higher
($p < 0.05$) on all negative dimensions of self-compassion, anx-
iety, and stress, and lower ($p < 0.05$) on self-kindness and
mindfulness than men.

Identifying Profiles Using Latent Profile Analysis

Models 1–6 were well identified (see Table 3). The AIC and
BIC were lowest for the 6-profile solution, but the entropy was
highest in the 5-profile solution. In addition, the LMR-LRT

indicates the 2-profile solution was better than 1 profile
($p < 0.001$) and the 5-profile solution was better than 4 profiles
($p = 0.001$). The elbow plots for model fit show a clear change
in slope at 2 and 5 profiles (see Fig. 1c). As a result of all fit
information, we carefully examined the 2-, 5-, and 6-profile
models. The 2-profile solution revealed a marginally self-
compassionate profile (sample average scores on all dimen-
sions) and an uncompassionate profile. The 5-profile solution
captured unique patterns across all dimensions that closely
replicated the sample 1 profiles. The 6-profile solution re-
vealed the same patterns as the 5-profile solution but added

Table 4 Latent profile average probability, means, standard error, and full sample estimated means

	n	Average probability	Self-kind		Self-judge		Common humanity		Isolation		Mindful		Over-identification	
			M	SE	M	SE	M	SE	M	SE	M	SE	M	SE
Sample 1														
1 Indifferent	11	0.93	−1.97	0.29	−1.44	0.29	−1.62	0.25	−1.25	0.20	−2.08	0.25	−1.46	0.14
2 Average	243	0.93	−0.05	0.06	0.08	0.06	−0.02	0.07	−0.02	0.06	−0.10	0.07	0.03	0.06
3 Uncompassionate	56	0.91	−1.08	0.13	1.05	0.13	−0.99	0.14	1.22	0.11	−1.10	0.13	0.98	0.15
4 Compassionate	88	0.91	1.01	0.10	−1.09	0.12	0.63	0.12	−0.92	0.12	1.06	0.09	−0.89	0.12
5 High responding	21	0.91	0.29	0.28	1.33	0.26	0.96	0.21	1.22	0.21	0.73	0.19	1.27	0.23
Full sample	419		3.30	0.04	2.98	0.05	3.20	0.04	3.01	0.05	3.37	0.04	2.93	0.05
Sample 2														
1 Average	210	0.90	0.09	0.08	0.08	0.10	0.26	0.09	0.12	0.12	0.09	0.08	0.05	0.09
2 Below average	21	0.88	−0.42	0.30	−0.40	0.27	−1.15	0.34	−1.10	0.23	−0.28	0.24	−0.90	0.33
3 Compassionate	67	0.92	1.19	0.14	−1.22	0.19	0.77	0.13	−1.22	0.12	1.06	0.13	−1.08	0.16
4 Uncompassionate	86	0.91	−1.00	0.14	0.88	0.09	−0.85	0.14	1.00	0.13	−0.95	0.16	0.99	0.11
Full sample	384		3.92	0.04	3.19	0.05	3.32	0.05	3.02	0.05	3.42	0.04	3.03	0.05
Sample 3														
1 Indifferent	24	0.98	−1.64	0.09	−1.81	0.07	−1.88	0.08	−1.69	0.06	−1.92	0.11	−1.72	0.07
2 Below average	127	0.93	−0.38	0.12	−0.60	0.10	−0.47	0.10	−0.61	0.09	−0.42	0.13	−0.58	0.09
3 Compassionate	87	0.90	1.23	0.18	−0.86	0.09	0.79	0.21	−0.78	0.10	1.11	0.16	−0.77	0.10
4 Above average	193	0.92	0.29	0.08	0.54	0.07	0.52	0.07	0.50	0.07	0.38	0.07	0.48	0.08
5 Uncompassionate	78	0.93	−0.90	0.10	1.19	0.07	−0.73	0.12	1.19	0.09	−0.81	0.13	1.20	0.10
Full sample	509		2.61	0.04	2.93	0.04	2.75	0.04	2.81	0.04	2.82	0.04	2.79	0.04

Table 5 Profile estimated mean, standard error, and pairwise differences

Sample 1 ($N=419$)	Relative self-compassion		Self-compassion		Self-coldness		Psychological inflexibility					
Profile	M	SE	M	SE	M	SE	M	SE				
Indifferent	2.99ad	0.08	1.72a	0.14	1.72a	0.11	2.15ab	0.63				
Average	3.12a	0.02	3.24b	0.03	3.02b	0.05	2.93ad	0.22				
Uncompassionate	2.19c	0.04	2.34c	0.05	4.02c	0.06	4.23c	0.21				
Compassionate	4.01b	0.03	4.12d	0.05	2.04d	0.05	1.51b	0.07				
High responding	2.80d	0.08	3.89e	0.10	4.23c	0.09	3.56a^c	0.40				
Sample 2 ($N=384$)	**Relative self-compassion**		**Self-compassion**		**Self-coldness**		**Perceived stress**					
Profile	M	SE	M	SE	M	SE	M	SE				
Average	3.17a	0.02	3.49a	0.03	3.13a	0.03	1.80a	0.05				
Below average	3.30a	0.08	2.76b	0.08	2.22b	0.09	1.31b	0.19				
Compassionate	4.14b	0.04	4.24c	0.05	1.90c	0.06	1.07b	0.08				
Uncompassionate	2.28c	0.03	2.56b	0.05	4.07d	0.04	2.32c	0.09				
Sample 3 ($N=509$)	**Relative self-compassion**		**Self-compassion**		**Self-coldness**		**Perceived stress**		**Depression**		**Anxiety**	
Profile	M	SE	M	SE	M	SE	M	SE	M	SE	M	SE
Indifferent	3.00a	0.01	1.18a	0.06	1.18a	0.04	1.35a	0.09	1.36a	0.12	1.28a	0.07
Below average	3.05a	0.03	2.36b	0.03	2.26b	0.04	1.86b	0.04	1.63b	0.04	1.61b	0.04
Compassionate	3.76b	0.04	3.63c	0.05	2.07c	0.05	1.56c	0.05	1.22a	0.03	1.37a	0.05
Above average	2.86c	0.02	3.04d	0.03	3.29d	0.03	2.27d	0.04	2.05c	0.06	2.06c	0.05
Uncompassionate	2.04d	0.04	2.02e	0.05	4.02e	0.05	2.55e	0.08	2.50d	0.10	2.20c	0.09

Unique letters (within each column) indicate significant ($p < 0.05$) pairwise differences across profiles on each outcome variable as tested in step 3 of the DU3STEP. ^ ($p = 0.05$)

a largely redundant profile that was characterized by a pattern of moderately self-compassionate scores on the six indicators. This solution did not represent a meaningfully unique pattern of self-compassion dimensions. Thus, the 5-profile solution was selected based on conceptually unique profiles, overall support from the model fit statistics, and similarity to sample 1 profiles.

The five profiles are presented in Fig. 2b and Table 4. The first profile (5% of the sample, 0.98 average probability of classification) was labeled *Indifferent* as it was characterized by scores that were well below (> 1 standard deviation) the sample average on all self-compassion dimensions. The second profile (25% of the sample, 0.93 average probability of classification) was labeled *Below Average* because this profile reported scores on all dimensions below the sample average. The third profile (17% of the sample, 0.90 average probability of classification) was labeled *Compassionate* because of relatively high levels of the positive dimensions and low levels of the negative dimensions. The fourth profile (22% of the sample, 0.92 average probability of classification) was labeled *Above Average* due to levels of all dimensions scores above the sample average. The fifth profile (15% of sample, 0.93 average probability) was labeled *Uncompassionate* due to relatively high levels of negative dimensions and low levels of the positive dimensions.

Profile Differences on Composite Self-compassion Scores and Depression, Anxiety, and Stress

The step 3 results for estimated profile differences are reported in Table 5. The *Compassionate* profile had the highest and the *Uncompassionate* profile had the lowest relative self-compassion scores. The *Below Average* profile was significantly higher than the *Above Average* profile, but not different from the *Indifferent* profile. All profiles differed on the self-compassion and self-coldness scores, and perceived stress. The *Indifferent* profile had the lowest self-compassion, self-coldness, and stress. The *Uncompassionate* profile had the highest level of perceived stress, depression, and anxiety (but did not differ on anxiety from *Above Average)*. The *Compassionate* profile did not differ from the *Indifferent* profile on depression or anxiety.

Sex Differences in Profile Membership and Composite Self-compassion Scores

Chi-square analysis testing sex differences in profile membership was significant (χ^2 ($df = 1$) = 15.13, $p < 0.01$). Women comprised 69% of the sample but were over-represented (86%) in the *Uncompassionate* profile compared to men (14%). Men reported higher relative self-compassion score ($F_{1, 453}$ = 7.15, $p < 0.001$) and self-compassion ($F_{1, 453}$ =

4.70, $p = 0.03$) and lower the self-coldness ($F_{1, 453}$ = 19.31, $p < 0.001$) compared to women.

Discussion

The multidimensional nature of self-compassion was explored using a person-centered approach. Through three independent samples, we identified profiles of the self-compassion dimensions that reflect clearly interpretable self-compassionate and uncompassionate profiles but profiles also emerged that were not as easily interpretable. Across all samples, three profiles were clearly replicated: self-compassionate, uncompassionate, and average (moderate) scores across self-compassion dimensions, replicating profiles identified by Phillips (2019). Several unique profiles also emerged. Examination of composite self-compassion scores and psychological outcomes across profiles shed light on how differing levels of self-compassion dimensions function together.

The moderately strong inverse association between the self-compassion indices and psychological inflexibility (Table 2) supports the conceptual overlap of these constructs as expected and is consistent in magnitude with the correlation reported by Marshall and Brockman (2016). Perceived stress correlated with a similar magnitude to self-compassion and closely aligned with past research (MacBeth and Gumley 2012). Descriptive evidence of differences across dimensions in their relationships with psychological outcomes supports further exploration of how the six self-compassion dimensions may represent unique risk and resilience.

Neff et al. (2019) recommended SCS score use based on whether one is more interested in the relative balance of dimensions (i.e., total score) or with the specific functions of individual dimensions (i.e., individual dimensions). However, the use of a relative score across research studies is described almost exclusively as self-compassion, with no reference to the relative balance. The nature of what relative balance among the self-compassion dimensions means was explored by identifying unique patterns of the self-compassion dimensions within individuals.

The *Compassionate* and *Uncompassionate* profiles that emerged in all samples represent dimensional patterns that are consistent with Neff's description of responses to failure and suffering that reflect hypothesized opposing or inverse relationships between the negative and positive dimensions. The respective high and low relative self-compassion composite scores are thus easily interpretable. Conceptually consistent differences emerged between these two profiles on psychological outcomes. The *Uncompassionate* profile displayed a high-risk pattern across the dimensions and reported the highest levels of psychological inflexibility, depression, and perceived stress. The *Compassionate* profile represented a resilient pattern of responses across the dimensions and reported

the low levels of psychological inflexibility, depression, anxiety, and perceived stress. These two profiles are consistent with Neff's description of dimensional balance and the pattern of results clearly represent being either compassionate or uncompassionate.

The prototypical profiles show a relative degree of the positive and negative self-compassion dimensions that are consistent with Gilbert's (2005) theory of social mentalities. Gilbert outlines a threat defense system and a safety system that activate different internal response systems. The safety system is related to being self-compassionate and is rooted in the parasympathetic nervous system, whereas the threat defense system is related to being self-cold and is rooted in the sympathetic nervous system (Gilbert et al. 2011). A flexible and dynamic balance between sympathetic and parasympathetic nervous systems is linked with more adaptive functioning and can be captured through heart rate variability (Porges 2007). In an experimental study, individuals who responded to compassion imagery with increased heart rate variability also experienced a decrease in the stress hormone cortisol (Rockcliff et al. 2008), showing activation of the parasympathetic nervous system and adaptive emotion regulation (Porges 2007). Reflecting these processes, in the current study, the *Compassionate* profile demonstrated lower levels of psychological inflexibility, depression, anxiety, and perceived stress compared to the *Uncompassionate* profile. However, in the current study and in Rockcliff et al.'s study, these two processes underlying compassion and coldness are not straightforward. For example, Rockcliff et al. also found that compassion exposure did not result in adaptive responses for everyone. Exposure to compassionate imagery actually undermined the self-soothing system (e.g., decreased heart rate variability, no change in cortisol) for some individuals. These individuals reported being more self-critical and insecurely attached, consistent with descriptions of being fearful of compassion (Gilbert 2007). Self-compassion appears to be more nuanced than a dichotomous representation of being either compassionate or uncompassionate. This supports current psychometric evidence that self-compassion is represented best as either a single score or six dimensional scores (Neff et al. 2018, 2019).

Our profile results uncovered dimensional patterns that diverge from the way Neff describes dimensional balance as opposite (bipolar) responses to suffering. Three profiles representing the majority (65%) of sample 1 were characterized by similar levels and direction (i.e., all low, all high, or all average) across all dimensions. The *Indifferent* and *Average* profiles did not differ on the relative self-compassion score or psychological inflexibility demonstrating similar levels of risk/protection. This finding supports the idea that a similar relative balance should reflect similar psychological functioning. In contrast, the *Indifferent* and the *High Responding* profiles also do not differ on the relative self-compassion score

but marginally differed ($p = 0.05$) on psychological inflexibility. The *High Responding* profile aligned more closely with the *Uncompassionate* profile and the *Indifferent* profile aligned more closely with the *Compassionate* profile on psychological inflexibility. Thus, despite having similar balance across self-compassion dimensions, psychological inflexibility was higher for those whose had relatively high scores across all dimensions compared to those relatively low across all dimensions. It is possible that having high levels of the negative dimensions reflects a persistent self-critical state that overstimulates a threat-defense system (Gilbert 2007), despite also having relatively high levels of the positive self-compassion dimensions. The elevated psychological inflexibility with this pattern of self-compassion dimensions shows that being self-cold is particularly relevant to maladaptive psychological functioning. It should be noted that the *Indifferent* and *High Responding* profile represented a small portion of the sample, perhaps representing a clinically at-risk group. Both the *Indifferent* and *High Responding* profiles may not generalize to other samples and could reflect spurious profiles. Further exploration of clinically relevant samples is needed.

The profiles from sample 2 (representing 60% of the sample) corroborate results from sample 1, where the relative self-compassion score did not differ between the *Average* and *Below Average* profiles, but perceived stress was significantly higher for the *Average* profile compared to the *Below Average* profile, which was not different from the *Compassionate* profile. Again, elevated levels on both positive and negative dimensions point to higher psychological risk compared to lower levels across all dimensions. A composite relative self-compassion score does not reflect the nuances of the multidimensionality of self-compassion and thus reduces the ability to understand specific explanatory mechanisms. The profile approach, in contrast, suggests future exploration of those with elevated levels of the negative and positive self-responding.

Sample 3 provided further corroboration of profiles with 68% of this sample reporting even scores across all compassion dimensions, highly similar profile patterns to sample 1, and patterns of both overlapping and differing relative compassion and psychological functioning. Collectively, these results support further exploration of dimensional combinations.

One explanation for the *Indifferent /Below Average*, *Average*, and *High Responding* profiles could be related to method effects. Inherent with self-report assessment is the possibility for socially desirable responding, or for response styles (e.g., responding generally low, middle, or high) to introduce method effects (Paulhus 1991). Such patterns reflecting response styles were revealed through the use of the profile analysis, an added value to this analytic approach. Further research should explore potential method effects in the measurement of self-compassion. An alternative interpretation

for the consistent responses across dimensions is that the general construct of self-compassion drives response patterns. Some individuals may differ in level of self-responsiveness, showing either indifferent or highly responsive patterns. The results of this study question the assumption that having positive self-compassion dimensions will *automatically* result in reduced self-coldness or vice versa. Rather, the majority of participants report similar levels of both self-compassion and self-coldness. It may take intentional intervention efforts to both increase self-compassion and reduce self-coldness.

Across three independent samples, the most maladaptive outcomes are associated with higher levels of the negative dimensions regardless of the level of positive dimensions. The overlap between the *Compassionate* and *Indifferent* profile on psychological inflexibility, depression, anxiety, and stress suggests that low levels of negative dimensions are perhaps more protective than higher levels of the positive dimensions, whereas the *Uncompassionate* and *High Responding/ Above Average* profiles had higher levels of maladaptive psychological functioning than other profiles showing that being relatively high on the negative dimensions was maladaptive, independent of the positive dimensions. It could be that when the threat defense system is activated chronically, under repeated stress or inability to cope with repeated stress, the sympathetic nervous system is difficult to inhibit (Gilbert 2007). The parasympathetic nervous system is effortful and requires deliberate self- and affect-regulatory action that leads to adaptive socioemotional functioning compared to the automatic fight or flight response of the sympathetic nervous system (Porges 2007). Thus, the salience of negative dimensions of self-compassion is likely highlighted with stress-related psychological outcomes. The stronger magnitude of the correlations among negative dimensions and psychological inflexibility corroborate these findings (see Table 2), consistent with prior research (e.g., Brenner et al. 2017; Muris and Petrocchi 2017).

The current study extends past research by clearly showing that not only do the negative dimensions align more strongly to maladaptive outcomes, but that the presence of the positive dimensions may not diminish these relationships. An alternative explanation is that specific types of positive self-relating processes (e.g., self-kindness) may act as a buffer to negative outcomes of negative self-relating processes (e.g., self-judgment). Petrocchi et al. (2018) recently found that self-reassurance moderated the relationship between self-criticism and depressive symptoms, acting as a buffer, whereas self-esteem did not moderate the relationship. Partial correlations of each dimension, within self-compassion profiles, highlighted unique correlations of self-kindness with psychological well-being and emotional regulation within uncompassionate and moderately compassionate profiles, perhaps showing individuals who may be at higher risk (Phillips 2019). Interestingly, there were few unique correlations

among dimensions in the highly compassionate profile, where perhaps the dimensions worked in concert together to form a more unified general self-compassion construct. We found that correlations among the dimensions were stronger (modestly in magnitude but not in direction) in sample 2 compared to sample 1 (see Table 2). It is possible there were sample specific factors that moderated these relationships. Sample 2 was comprised of students enrolled in a yoga class, which represents a selection bias. Future research may explore specific dimensional moderation.

Further research identifying specific state experiences of self-compassion (e.g., response to a specific situation), rather than assessing self-compassion as a trait, or typical response to suffering, may help to uncover individual differences in response to suffering and how the different types of responses may co-occur, or not. One might respond differently in specific situations, which is not well captured in a trait measure. Longe et al. (2010) found that neural activity captured through fMRI show partial independence of self-criticism and self-compassion in response to threatening scenarios. Recently, a state scale to assess self-compassion and self-criticism responses to eight specific self-threatening scenarios has been developed and revealed that the state experience of self-compassion and self-criticism was not correlated (Falconer et al. 2015). Thus, specific situations may elicit different responses and measuring self-compassion at the trait level may explain the conceptually inconsistent profiles representing similar levels of both positive and negative responses to suffering.

An important research implication of this study is to carefully consider whether interventions could be tailored differently for groups based on specific patterns of self-compassion dimensions. Our findings support the recognition that self-compassion intervention should carefully consider individual differences (e.g., Gilbert 2007; Rockcliff et al. 2008) and responses to specific experiences of suffering (Falconer et al. 2015). For example, for some individuals, compassion may need to be introduced differently in order to break a chronic defense system elicited in fear of compassion or being overly self-critical (Gilbert and Irons 2005). Some individuals report responding to suffering with both self-compassion and self-coldness, and as such, uncovering which particular situations trigger the threat defense system may be informative.

Perhaps, in accord with the bifactor structure supported by Neff et al. (2018, 2019) and Brenner et al. (2017), both composite and dimension scores should be used in combination to understand psychological responses to failure and suffering. Neff further recommends that the six dimensions be examined collectively rather than in a piecemeal fashion, because they collectively represent self-compassion. Gilbert et al. (2011) suggest two dimensions are more justified based on fMRI data showing activation along two different physiological systems (Longe et al. 2010). Based on our results, we suggest that

profiles of self-compassion dimensions can represent information regarding self-compassion collectively. Only the *Below Average* profile in sample 2 represented a deviation from a two-factor structure where all self-compassion and self-coldness dimensions align respectively on two dimensions. In this profile, the positive dimension of common humanity was markedly lower than the other positive dimensions. Although it should be noted that this profile represented a small portion of sample 2 (5.5%), it is important to continue to explore whether empirically there are two general factors rather than one factor.

Limitations and Future Directions

Limitations of this study include using cross-sectional surveys. Longitudinal studies exploring the development of relative risk and protective functions of the dimensions of self-compassion will aid our understanding of the multidimensionality and causal role of self-compassion. Sample limitations include a largely undergraduate student convenience sampling approach, and an imbalance between male and female participants. These sample limitations represent possible selection biases (e.g., sample 2 participants self-selected into yoga). In particular, the use of clinical samples could provide valuable insight into the different underlying patterns of self-compassion dimensions, with a greater chance for reporting variability across the dimensions, which may corroborate the profiles representing a small portion of our convenience samples, or reveal unique profile patterns. Further exploration of profiles in relation to a broader range of clinically relevant symptoms is also an important extension of this study. Examination of different psychological experiences at different levels of context specificity and those that represent adaptive psychological functioning will also be helpful to examine how self-compassion dimensions associate with specific and more global psychological functioning. The emergence of multiple studies reporting on profiles can aid in the further development of profile models that may include covariates in the profile identification process. The nature of person-centered analyses limits generalizability and replication is important to validate results; however, our purpose was not to identify prototypical or normative profiles, but to highlight the multi-dimensional complexity of self-compassion. We chose to not reverse score the negative dimension scores in order to represent what the items in these subscales actually assessed. However, future research fleshing out the new conceptualization of the negative dimensions as reduced uncompassionate self-responding represents an opportunity to reconcile conflicting views regarding the role of the negative dimensions.

This study provides a unique representation of self-compassion by exploring different patterns of the six self-compassion dimensions in relation to the relative self-compassion, self-compassion, and self-coldness scores and psychological outcomes of psychological inflexibility and perceived stress. Given the complexity of the six dimensions underlying self-compassion, it has been unclear if the positive role of self-compassion is due to lower risk factors (e.g., self-judgment) or stronger protective factors (e.g., mindfulness), or a balance of risk and protection factors. The LPA results highlight the risk associated with having relatively higher levels of the negative dimensions, regardless of the level of positive self-compassion dimensions. Although findings generally support the use of the relative self-compassion score in predicting psychological functioning, key limitations were also highlighted. Questions regarding the underlying makeup of a composite self-compassion score suggest further research is needed concerning what different combinations of self-compassion dimensions mean conceptually, empirically, and practically. The benefits of examining individual self-compassion dimension patterns in future research include unpacking conceptual underpinnings of psychological resilience or risk and informing self-compassion based interventions.

Compliance with Ethical Standards

References

Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: Three-step approaches using Mplus. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(3), 329–341.

Bauer, D. J., & Curran, P. J. (2003). Over extraction of latent trajectory classes: Much ado about nothing? Reply to Rindskopf (2003), Muthén (2003), and Cudeck and Henly (2003). *Psychological Methods, 8*, 384–393. https://doi.org/10.1037/1082-989x.8.3.384.

Bibeau, M., Dionne, F., & Leblanc, J. (2015). Can compassion meditation contribute to the development of psychotherapists' empathy? A review. *Mindfulness, 7*, 1–9. https://doi.org/10.1007/s12671-015-0439-y.

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the acceptance and action questionnaire II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy, 42*, 676–688. https://doi.org/10.1016/j.beth.2011.03.007.

Brenner, R. E., Health, P. J., Vogel, D. L., & Credé, M. (2017). Two is more valid than one: examining the factor structure of the self-compassion scale. *Journal of Counseling Psychology, 64*, 696–707. https://doi.org/10.1037/cou0000211.

Celeux, G., & Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification, 13*, 195–212. https://doi.org/10.1007/bf01246098.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 386–396. https://doi.org/10.2307/2136404.

Collins, L. M., & Lanza, S. T. (2010*). Latent class and latent transition analysis: with applications in the social, behavioral, and health sciences*. New York: John Wiley & Sons.

Costa, J., Marôco, J., Pinto-Gouveia, J., Ferreira, C., & Castilho, P. (2016). Validation of the psychometric properties of the Self-Compassion Scale. Testing the factorial validity and factorial invariance of the measure among borderline personality disorder, anxiety disorder, eating disorder and general populations. *Clinical Psychology & Psychotherapy, 23*, 460–468. https://doi.org/10.1002/cpp.1974.

Falconer, C. J., King, J. A., & Brewin, C. R. (2015). Demonstrating mood repair with a situation-based measure of self-compassion and self-criticism. *Psychology and Psychotherapy, 88*, 351–365. https://doi.org/10.1111/papt.12056.

Gibson, W. A. (1959). Three multivariate models: factor analysis, latent structure analysis, and latent profile analysis. *Psychometrika, 24*, 229–252. https://doi.org/10.1007/bf02289845.

Gilbert, P. (2005). *Compassion: conceptualisations, research and use in psychotherapy*. London: Routledge.

Gilbert, P. (2007). Psychotherapy and counseling for depression. *Sage*. https://doi.org/10.4135/9781446279830.

Gilbert, P. (2009). *The compassionate mind: A new approach to life's challenges*. London: Constable & Robinson.

Gilbert, P., & Irons, C. (2005). Focused therapies and compassionate mind training for shame and self-attacking. In P. Gilbert (Ed.), *Compassion: Conceptualizations, research and use in psychotherapy* (pp. 263–325). London: Routledge.

Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: development of three self-report measures. *Psychology and Psychotherapy, 84*(3), 239–255. https://doi.org/10.1348/147608310x526511.

Gudicha, D. W., Tekle, F. B., & Vermunt, J. K. (2016). Power and sample size computation for Wald tests in latent class models. *Journal of Classification, 33*, 30–51. https://doi.org/10.1007/s00357-016-9199-1.

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 44*, 227–239. https://doi.org/10.1348/014466505x29657.

Körner, A., Coroiu, A., Copeland, L., Gomez-Garibello, C., Albani, C., Zenger, M., & Brähler, E. (2015). The role of self-compassion in buffering symptoms of depression in the general population. *PLoS One, 10*(10), e0136598. https://doi.org/10.1371/journal.pone.0136598.

Kriegar, T., Altenstein, D., Baettig, I., Doerig, N., & Holtforth, M. G. (2013). Self-compassion in depression: associations with depressive symptoms, rumination, and avoidance in depressed outpatients. *Behavior Therapy, 44*, 501–513. https://doi.org/10.1016/j.beth.2013.04.004.

Longe, O., Maratos, F. A., Gilbert, P., Evans, G., Volker, F., Rockliff, H., & Rippon, G. (2010). Having a word with yourself: neural correlates of self-criticism and self-reassurance. *Neuroimage, 49*, 1849–1856. https://doi.org/10.1016/j.neuroimage.2009.09.019.

López, A., Sanderman, R., Smink, A., Zhang, Y., van Sonderen, E., Ranchor, A., & Schroevers, M. J. (2015). A reconsideration of the Self-Compassion Scale's total score: self-compassion versus self-criticism. *PLoS One, 10*(7). https://doi.org/10.1371/journal.pone.0132940.

MacBeth, A., & Gumley, A. (2012). Exploring compassion: a meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review, 32*, 545–552. https://doi.org/10.1016/j.cpr.2012.06.003.

Marsh, H. W., Ludtke, O., Trautweign, U., & Morin, A. J. S. (2009). Classical latent profile analysis of academic self-concept dimensions: synergy of person- and variable-centered approaches to theoretical models of self-concept. *Structural Equation Modeling: A Multidisciplinary Journal, 16*, 191–225. https://doi.org/10.1080/10705510902751010.

Marshall, E.-J., & Brockman, R. N. (2016). The relationships between psychological flexibility, self-compassion, and emotional well-being. *Journal of Cognitive Psychotherapy: An International Quarterly, 30*, 60–72. https://doi.org/10.1891/0889-8391.30.1.60.

Morin, A. J. S., & Wang, J. C. K. (2016). A gentle introduction to mixture modeling using physical fitness data. In N. Ntoumanis, & N. Myers (Eds.), *An introduction to intermediate and advanced statistical analyses for sport and exercise scientists* (pp. 183–210). London: Wiley.

Muris, P., & Petrocchi, N. (2017). Protection or vulnerability? A meta-analysis of the relations between the positive and negative components of self-compassion and psychopathology. *Clinical Psychology & Psychotherapy, 24*, 373–383. https://doi.org/10.1002/cpp.2005.

Muthen, B. O. (2001). Latent variable mixture modeling. In G. Marcoulides & R. Schumacker (Eds.), *New developments and techniques in structure equation modeling* (pp. 1–33). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Muthén, L.K., Muthén, B.O. (2007) Online comment Re: what is a good value of entropy? Retrieved from http://www.statmodel.com/discussion/messages/13/2562.html?1237580237.

Neff, K. D. (2003). Self-compassion: an alternative conceptualization of a healthy attitude toward oneself. *Self and Identity, 2*, 85–102. https://doi.org/10.1080/15298860309032.

Neff, K. D. (2016). Does self-compassion entail reduced self-judgment, isolation, and over-identification? A response to Muris, Otgaar, & Petrocchi (2016). *Mindfulness, 7*, 791–797. https://doi.org/10.1007/s12671-016-0531-y.

Neff, K. D., & Germer, C. (2017). Self-compassion and psychological well-being. In E.M. Seppala, E. Simon-Thomas, S.L. Brown, C.D. Cameron, & J. Doty (Eds.) *Oxford handbook of compassion science.* New York: Oxford University Press.

Neff, K. D., Long, P., Knox, M., Davidson, O., Kuchar, A., Costigan, A., Williamson, Z., Rohleder, N., Tóth-Király, I., & Breines, J. (2018). The forest and the trees: examining the association of self-compassion and its positive and negative components with psychological functioning. *Self and Identity, 17*, 627–645. https://doi.org/10.1080/15298868.2018.1436587.

Neff, K. D., Tóth-Király, I., Yarnell, L. M., Arimitsu, K., Castilho, P., Ghorbani, N., Guo, H. X., Jameson, H. K., Hupfeld, J., Hutz, C. S., Kotsou, I., Kyeong, W. L., Marin, J. M., Sirois, F. M., Souza, L. K., Svendsen, L. J., Wilkinson, R. B., & Mantzios, M. (2019). Examining the factor structure of the Self-Compassion Scale in 20 diverse samples: Support for use of a total score and six subscale scores. *Psychological Assessment, 31*, 27–45. https://doi.org/10.1037/pas0000629.

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measurement of personality and social psychological attitudes* (pp. 17–59). San Diego: Academic Press.

Petrocchi, N., Dentale, F., & Gilbert, P. (2018). Self-reassurance, not self-esteem, serves as a buffer between self-criticism and depressive symptoms. *Psychology and Psychotherapy: Theory, Research and Practice, 92*(3), 394–406. https://doi.org/10.1111/papt.12186.

Phillips, W. J. (2019). *Self-compassion mindsets: the components of the self-compassion scale operate as a balanced system within individuals*. Current Psychology, Online, 1–14. https://doi.org/10.1007/s12144-019-00452-1.

Porges, S. W. (2007). The polyvagal perspective. *Biological Psychology, 74*, 116–143. https://doi.org/10.1016/j.biopsycho.2006.06.009.

Rockcliff, H., Gilbert, P., McEwan, K., Lightman, S., & Glover, D. (2008). A pilot exploration of heart rate variability and salivary cortisol responses to compassion-focused imagery. *Clinical Neuropsychiatry, 5*, 132–139.

Shapiro, S. L., Astin, J. A., Bishop, S. R., & Cordova, M. (2005). *Mindfulness-based stress reduction for health care professionals: results from a* randomized trial. *International Journal of Stress Management, 12*, 164–176. https://doi.org/10.1037/1072-5245.12.2.164.

Tein, J. Y., Coxe, S., & Cham, H. (2013). Statistical power to detect the correct number of classes in latent profile analysis. *Structural Equation Modeling: A Multidisciplinary Journal, 20*, 640–657. https://doi.org/10.1080/10705511.2013.824781.

Vermunt, J. K., & Magidson, J. (2002). Latent class cluster analysis. In J. A. Hagenaars & A. L. McCutcheon (Eds.) *Applied latent class analysis* (pp. 89–106). Cambridge, England: Cambridge University Press.

Williams, M. J., Dalgleish, T., Karl, A., & Kuyken, W. (2014). Examining the factor structures of the Five Facet Mindfulness Questionnaire and the Self-Compassion Scale. *Psychological Assessment, 26*, 407–418. https://doi.org/10.1037/a0035566.

Yang, C. (2006). Evaluating latent class analysis models in qualitative phenotype identification. *Computational Statistics & Data Analysis, 50*, 1090–1104. https://doi.org/10.1016/j.csda.2004.11.004.