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Gender based adolescent self-compassion profiles and the mediating role of nonattachment on psychological well-being

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Abstract

Emerging research has shown that boys and girls may relate to compassionate and uncompassionate components of self-compassion differently and have distinct gender based self-compassion profiles. This study extended upon recent research by investigating gender based adolescent self-compassion profiles and their relationship with psychological well-being and the role of nonattachment in the link between self-compassion and well-being. A large cross-sectional sample of Australian Year 10 high school students ($N = 1{,}944$, $M_{age} = 15.65$ years, $SD_{age} = 0.43$; 50% girls) completed measures of self-compassion, nonattachment, and well-being. Latent profile analysis identified distinct self-compassion profiles based on gender. Four profiles labelled 'Low Self-Relating', 'Moderate Self-Relating', 'Compassionate', and 'Uncompassionate' emerged for girls. Three profiles emerged for boys labelled 'Low Self-Relating', 'Moderate Self-Relating, and 'Compassionate'. 'Low' and 'Moderate Self-Relating' profiles involved low and moderate levels of both compassionate and uncompassionate self-relating. 'Compassionate' profiles involved high levels of compassionate and low levels of uncompassionate self-relating, and 'Uncompassionate' profiles involved the opposite. For both genders, 'Compassionate' profiles were associated with the highest psychological well-being and nonattachment and 'Uncompassionate' profiles with the lowest of both. 'Low' and 'Moderate Self-Relating' profiles showed no difference in psychological well-being or nonattachment. Mediation analysis indicated that nonattachment partially mediated the relationship between self-compassion profile and psychological well-being. These findings support recent research that illustrates adolescents relate to the components of self-compassion differently both between and within genders. It also highlights the crucial role nonattachment plays in the relationship between self-compassion and psychological well-being in adolescents.

Keywords Self-Compassion · Nonattachment · Adolescent Well-being · Latent Profile Analysis

Adolescence is a period of rapid cognitive, biological, and social change which can leave adolescents vulnerable to mental health issues such as stress, anxiety, and depression. Over the past decade, prevalence rates of adolescent depression (Wilson & Dumornay, 2022) and anxiety symptoms (Lebrun-Harris et al., 2022), psychotropic medication use (Olfson et al., 2015), and death by suicide (Simon, 2017) have been on the rise. Global prevalence rates of mental health disorders in adolescents nearly doubled since the beginning of the COVID-19 pandemic (Racine et al., 2021). Consequently, identification of protective factors that increase resilience and decrease the likelihood of developing mental health disorders in this critical developmental period are vital. Further understanding and cultivation of such protective factors can aid in the development of preventative and early intervention strategies to promote psychological well-being and assist adolescents to better manage future stressors and prevent mental ill health. One such protective factor that has emerged is self-compassion (Gilbert, 2009; Neff, 2003a).

Self-compassion is defined as the ability to turn one's compassion inwards using a caring and accepting orientation towards oneself when faced with distress or difficulty (Gilbert, 2009; Neff, 2003a). According to Gilbert's (2009) three-circle affect regulation model, inability to flexibly

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move between the threat system (fight or flight response), drive system (organisation and motivation to achieve goals), and soothing system (down-regulation and feelings of peace, calmness, and comfort) lead to mental ill health and psychological distress. Gilbert (2009) suggests that self-compassion acts as a protective factor by increasing an individual's ability to access the soothing system, leading to more adaptive and kind responses to stressors in life. Relatedly, Neff (2003b) popularised the concept within Western psychology through the development of the Self-Compassion Scale (SCS) and defined self-compassion as six interacting subcomponents; three compassionate components (self-kindness, common humanity, and mindfulness) and three uncompassionate components (self-judgement, over-identification, and isolation).

In adolescence, meta-analyses have found that a lack of self-compassion may play a significant role in the development and maintenance of mental health issues (Marsh et al., 2018). Indeed, a growing number of studies have shown a strong relationship between higher levels of psychological distress (e.g., depression, anxiety, and stress) and lower self-compassion (Bluth & Blanton, 2015; Neff & Mcgehee, 2010; Pullmer et al., 2019). In addition, self-compassion has been found to weaken the link between several psychological factors and mental ill health in adolescents. Specifically, it has been found to weaken links between perfectionism and depressive symptoms (Ferrari et al., 2018), perceived stress and internalising symptoms (Lathren et al., 2019), academic difficulties and depressive symptoms (Lahtinen et al., 2020), and body dissatisfaction and suicidal ideation (Fan et al., 2022). Early studies evaluating compassion-based interventions, such as the Mindful Self-Compassion intervention for adolescents, show promise enhancing psychological well-being through increasing mindfulness and self-compassion in teens (Bluth & Eisenlohr-Moul, 2017; Bluth et al., 2015, 2016). Results suggest that these programs have potential to reduce stress and increase resilience in adolescents by increasing self-compassion (Bluth & Eisenlohr-Moul, 2017; Bluth et al., 2015). A systematic review of self-compassion interventions for adolescents found that anxiety and depression decreased post intervention, and interviews with adolescents and young adults indicated that there is interest in self-compassion interventions (Egan et al., 2022). As illustrated, there is increasing evidence that self-compassion is a strong protective factor against a myriad of mental health symptoms in adolescence and can be targeted to promote improved psychological well-being.

During adolescence and puberty, there are distinct differences in the physical and psychological development between girls and boys. Indeed, there is considerable research to suggest gender differences in coping styles (Eschenbeck et al., 2007), personality traits (De Bolle et al., 2015), and self-related constructs (Muris et al., 2016) during adolescence. Furthermore, Hayward and Sanborn (2002) found that adolescent girls display higher levels of psychopathology compared to boys, thus it would be expected that gender differences in the factors that play a role in the development of these problems, such as self-compassion, would also exist. Despite this, there is limited research on gender differences in self-compassion in adolescents. In adult populations, meta-analysis has found females to be less self-compassionate than males (Yarnell et al., 2019). Similarly, in adolescent populations, girls appear to have lower self-compassion than boys when compared using a SCS single factor score of self-compassion (Bluth & Blanton, 2015; Bluth et al., 2017). Bluth et al. (2017) also found gender differences in how self-compassion changes over adolescence with self-compassion in girls decreasing with age but staying stable across adolescence in boys. When examined more closely, however, lower self-compassion in adolescent girls appear to be explained by higher scores on self-judgement, over-identification, and isolation SCS subscales (Sun et al., 2016; Muris et al., 2019; Gill et al., 2018).

There continues to be substantial controversy regarding the structure of the SCS, with arguments for and against the reporting of a single factor score (Ferrari et al., 2022b). Several researchers, including Gilbert et al. (2011) and Muris (2016) propose the SCS (Neff, 2003b) is best understood to reflect two separate components of self-compassion; Self-Compassion or Compassionate Self-Relating (CSR) consisting of the three compassionate subscales and Self-Coldness or Uncompassionate Self-Relating (USR) consisting of the three uncompassionate subscales. Many researchers have advocated for the exclusion of the SCS total score arguing that the two components of self-compassion (CSR/USR) are two semi-independent and unipolar constructs (Muris & Petrocchi, 2017; Muris et al., 2016). Indeed, this 2-factor solution of self-compassion has been supported by various factor analysis studies (Brenner et al., 2017; López et al., 2015) and according to Muris et al. (2021) a single factor score of self-compassion "inflates the relationship with internalising symptoms and hinders the proper investigation of the protective role of self-compassion" (p. 1). Subsequently, Ferrari et al. (2022b) suggested that self-compassion functions as a system of interacting processes and argues for the use of 2-factor (CSR/USR) or 6-factor (individual subscales) solution of the SCS. However, Ferrari et al. (2022b) also suggested that the structure of self-compassion may differ between individuals. The authors speculated that for some, CSR and USR may move together (positive correlation) and thus be unrelated and inconsistent with the group average correlation (negative). If this is true, then some individuals will be low or high in both CSR and USR.

Using the 6-factor solution of the SCS, fundamental gender differences were found by Ferrari et al. (2022a) using latent profile analysis to identify distinct self-compassionate

and uncompassionate psychological profiles in adolescents. Specifically, five profiles emerged for girls labelled 'Low Self-Relating', 'Uncompassionate', 'High Self-Relating', 'Moderately Compassionate' and 'Highly Compassionate', and two profiles labelled 'Low Self-Relating' and 'Moderate Self-Relating' emerged for boys. 'Low Self-Relating' profiles were characterised by low levels of both CSR and USR, and 'Moderate/High Self-Relating' profiles characterised by moderate to high levels of both. Interestingly, 'Low Self-Relating' profiles in both girls and boys consistently predicted better mental health outcomes, including fewer symptoms of anxiety and depression, and lower levels of perfectionism, compared to all other profiles except the "Highly compassionate" profile for girls (Ferrari et al., 2022a). In contrast to literature, these findings suggest that being high in self-compassion does not necessarily equate to better mental health if a person is also high in USR.

In contrast, Wu et al.'s (2020) latent profile analysis of self-compassion profiles in Chinese university students found four profiles; nondialectical low self-compassion (low CSR and high USR), nondialectical high self-compassion (high CSR and low USR), dialectical moderate self-compassion (moderate CSR and moderate USR), and dialectical high self-compassion (high CSR and high USR). Dialectical emotions refer to the co-existence of and potential transformation between positive and negative emotions (Wu et al., 2020) and Wu et al. (2020) found dialectical high self-compassion profiles were associated with higher self-esteem, life-satisfaction, and resilience and lower levels of anger and depressive symptoms. Culture likely plays an important role in the contrast between these findings as dialectical emotions are more endorsed by Eastern cultures making it easier to accept conflicting ideas and find a balance between negative and positive emotions (Wu et al., 2020). Nevertheless, in Western adolescent populations, Ferrari et al.'s (2022a) findings suggest that prioritising a style of self-relating that is low in both CSR and USR may be beneficial in improving psychological well-being. However, given the uniqueness of the gender profiles found by Ferrari et al. (2022a) and the contrast of their results from the current self-compassion literature, further exploration and replication of the profile analysis is valuable.

One possible factor that could explain the relationship between 'Low Self-Relating' profiles and greater psychological well-being found in past research (Ferrari et al., 2022a) is nonattachment. Although a relative newcomer within psychological literature, the construct nonattachment can be traced back centuries within Eastern religious and philosophical traditions (Sahdra et al., 2010). According to Buddhist teachings, attachment or clinging to ideas and holding a mistaken view that reality is fixed or permanent is described as a 'mental affliction' that leads to suffering (Sahdra & Shaver, 2013). In contrast, nonattachment is defined both in psychological literature and traditional Eastern teachings as a flexible, balanced way of relating to one's own experience without a need to cling, avoid, or change them (Sahdra et al., 2010). Importantly, Sahdra et al. (2010) distinguishes that nonattachment is not the same as detachment or disconnection from one's own thoughts and feelings, rather it implies engagement with both desirable and undesirable aspects of one's own experience without the need to cling to the desirable and avoid or reject the undesirable. It is possible adolescents with 'Low Self-Relating' profiles may relate to their own CSR and USR in a more flexible way, cling to these responses less, and may feel less need to judge their own experience either positively or negatively.

Conceptually, nonattachment is closely related to mindfulness and its various aspects including present moment awareness, being non-judgmental, and being able to observe and describe one's internal experiences, however, has been found to be a distinct and empirically different construct (Sahdra et al., 2016). Although relatively new within Western psychology, nonattachment has already been found to act as a protective factor against a myriad of mental health issues including depression (Whitehead et al., 2021), anxiety (Bhambhani & Cabral, 2016), stress (Whitehead et al., 2018), suicidal ideation (Lamis & Dvorak, 2014), and also acts as a protective factor against mental ill health in adolescence (Ciarrochi et al., 2020). Nonattachment has also been linked with positive psychology and well-being in various contexts including flourishing in the workplace (Tsoi et al., 2022), self-actualisation in athletes (Lewis et al., 2022), prosocial behaviour in teens (Sahdra et al., 2015), and increased motivation and engagement in educational settings (Elphinstone et al., 2019, 2021). Despite this, to date there has been no research on the relationship between nonattachment and self-compassion, another construct strongly linked with psychological well-being (Marsh et al., 2018). Sahdra et al. (2016) suggested that nonattachment may be an outcome of extended mindfulness practice and a mechanism through which mindfulness promotes well-being. Indeed, several studies have shown that nonattachment mediates the effect of mindfulness on psychological well-being (Ju & Lee, 2015; Moussa et al., 2022), depression (Tran et al., 2014), anxiety/stress (Whitehead et al., 2019), and the three elements of advanced psychological development (wisdom, self-transcendence, and self-actualization; Whitehead et al., 2020). Therefore, it is possible that nonattachment may play a similar mediating role on the relationship between self-compassion profile membership and psychological well-being.

The current study aims to build on recent research of self-compassion response profiles in adolescents to determine if the distinct gender based self-compassion profiles found by Ferrari et al. (2022a) can be replicated in a separate adolescent sample. The second aim is to attempt to

explain the unexpected findings of Ferrari et al. (2022a) through addition of a measure of nonattachment to understand how nonattachment may influence the relationship between 'Low Self-Relating' profiles and better mental health outcomes. It is hypothesised that (1) distinct gender based self-compassion profiles will emerge in the current adolescent sample, and these profiles will be similar to those found by Ferrari et al. (2022a), (2) that 'Low Self-Relating' profiles will predict greater psychological well-being and nonattachment compared to the 'Moderate Self-Relating', 'Uncompassionate', and 'High Self-Relating' profiles, and (3) that nonattachment acts as a mediator in the relationship between self-compassion profile membership and psychological well-being.

Method

Participants and procedure

The study used archival data collected as part of the Australian Character Study, a longitudinal study of the development of character and well-being in adolescents. The multiyear research program collected data on a number of additional variables reported elsewhere including adolescent behaviors (Marshall et al., 2020), self-esteem (Donald et al., 2018), and well-being (Ciarrochi et al., 2020). Confidential questionnaires were administered using similar procedures across 17 Catholic high schools in Wollongong, Cairns, and regional areas in Australia. In total, 1944 Year 10 participants (M_{age} = 15.65 years, SD_{age} = 0.43) completed several self-report questionnaires. Of the 1944 participants 17 were excluded as outliers due to falling outside 1.5 times the interquartile range on box plots. The final sample consisted of 1927 participants with 963 girls (50%) and 964 boys (50%). Participants largely identified as Caucasian Australian (73.6%) or European (8.5%), with the remaining identifying as 'Other' (11.5%), Aboriginal (5.2%), and New Zealander (1.2%). Ethics approval was granted by the Australian Catholic University Human Research Ethics Committee (HE10/158) and informed consent was obtained from all study participants (Ciarrochi et al., 2019).

Measures

Self-compassion

Self-compassion was measured using the 12-item short form of the Self-Compassion Scale (SCS-SF; Raes et al., 2011) which utilizes a 5-point Likert scale (1 = "almost never" to 5 = "almost always"). Participants indicate their agreement with statements such as "I try to see my failings as part of the human condition" with higher scores indicating greater self-compassion. The measure also includes reverse scored items, for example "When times are really difficult, I tend to be tough on myself". The six subscales of the SCS-SF were used in the current study including compassionate subscales (Self-Kindness, Mindfulness and Common Humanity) and uncompassionate subscales. The uncompassionate subscales were not reverse scored such that higher scores indicated a greater tendency towards Self-Judgment, Isolation, and Over-Identification to allow for greater clarity when interpreting the results of the study. The SCS-SF has high internal consistency and reliability (Raes et al., 2011), and has been used extensively in adolescent populations (Marsh et al., 2018; Bluth et al., 2018; Muris, 2016). The SCS-SF demonstrated good internal consistency in the current sample for both the Compassionate Self-Relating subscale (Cronbach's α = 0.81) and Uncompassionate Self-Relating subscale (Cronbach's α = 0.82).

Psychological well-being

Psychological well-being was measured using the 12-item short form of the General Health Questionnaire (GHQ-12; Goldberg et al., 1997) which uses a 4-point Likert scale (0 = "Not at all" to 3 = "More than usual"). Participants indicate the severity of a mental health problem over the past several weeks with higher scores indicating lower levels of psychological well-being. Scores were reversed in the current study such that higher scores indicated greater psychological well-being for clarity of interpretation of the results. The GHQ-12 has demonstrated high internal consistency and reliability in samples of Australian adolescents (French & Tait, 2004; Tait et al., 2003). Consistent with previous research, the GHQ-12 demonstrated strong internal consistency in the current sample (Cronbach's α = 0.90).

Nonattachment

Nonattachment was measured using the 7 item Nonattachment Scale (NAS-7; Sahdra et al., 2015) which uses a 6-point Likert scale (1 = "Disagree Strongly" to 6 = "Agree Strongly"). Participants indicate how attached they feel to self-related concepts, thoughts, and feelings by indicating their agreement with statements such as "I can let go of regrets and feelings of dissatisfaction about the past" with higher scores indicating higher levels of nonattachment. The NAS-7 is highly correlated with the 30-item Nonattachment Scale and has been validated in Australian and US samples (Sahdra et al., 2015, 2016). It demonstrated good internal consistency in the current sample (Cronbach's α = 0.82).

Data analysis

Missing data analysis revealed that data was missing at random and multiple imputation methods were used to manage missing data. Latent profile analysis using maximum likelihood estimation was conducted using Mplus v7 (Muthen & Muthen, 1998) to investigate the study's first aim and determine whether distinct gender based self-compassion profiles appear in the current sample. Associations between the determined profiles and mental health outcomes were determined using one-way ANOVAs. Mediation analyses were conducted using PROCESS v4.1 (Hayes, 2018) on IMB SPSS Statistics (Version 26). The statistical significance of indirect effects was the primary effect of interest, interpreted via the bootstrap confidence interval; if the confidence interval does not cross zero, the effect is statistically significant ($p < 0.05$).

Results

Sample characteristics

Descriptive gender comparisons showed that girls scored significantly higher on uncompassionate subscales (Self-Judgement $t(1925) = -9.15$, $p < 0.001$; Over-Identification $t(1925) = -10.04$, $p < 0.001$; Isolation $t(1925) = -7.17$, $p < 0.001$) with small to moderate effect sizes (Self-Judgement $d = 0.42$; Over-Identification $d = 0.46$; Isolation $d = 0.33$), and significantly lower on compassionate subscales (Self-Kindness $t(1925) = 3.95$, $p < 0.001$; Mindfulness $t(1925) = 5.06$, $p < 0.001$; Common Humanity $t(1925) = 2.54$, $p < 0.05$) with small effect sizes (Self-Kindness $d = 0.18$; Mindfulness $d = 0.23$; Common Humanity $d = 0.12$). Girls also scored significantly lower in GHQ-12 ($t(1925) = 10.33$, $p < 0.001$) with a moderate effect size ($d = 0.47$) indicating that boys had significantly greater psychological well-being. Lastly, there were no differences in nonattachment (NAS-7) scores between boys and girls.

Correlations split by gender between SCS-SF scores, NAS-7 scores, and GHQ-12 scores were conducted for descriptive purposes (Table 1). For girls, compassionate subscales (Self-Kindness, Mindfulness, and Common Humanity) positively correlated with each other and negatively correlated with uncompassionate subscales (Self-Judgement, Isolation, and Over-Identification), and vice versa. Contrastingly for boys, compassionate subscales were positively correlated with each other but only Self-Kindness was negatively correlated with all uncompassionate subscales. Mindfulness showed only a small negative correlation with Self-Judgement ($r(964) = -0.08$, $p < 0.05$) and Over-Identification ($r(964) = -0.08$, $p < 0.05$), and Common humanity did not correlate with uncompassionate subscales. Furthermore, as illustrated in Table 1, correlation sizes between compassionate subscales and uncompassionate subscales were smaller for boys than girls for every subscale.

Interestingly, for both genders, nonattachment showed moderate positive correlations with compassionate subscales and moderate negative correlations with uncompassionate subscales. Nonattachment was also positively correlated with psychological well-being. Compassionate subscales were positively correlated and uncompassionate subscales negatively correlated with psychological well-being across both genders, with correlations sizes smaller for boys.

Latent profile analysis by gender

Analyses were initially conducted on the whole sample, where a 5-profile solution was deemed most appropriate. We then used a test of model of invariance to determine if the model differed by gender. Sotorra-Bentler scaled chi-square difference testing showed significant differences in

Table 1 Correlations, Means, and Standard Deviations of Variables. (Girls ($n = 963$) below diagonal; Boys ($n = 964$) above diagonal)

	1	2	3	4	5	6	7	8
Self-compassion Subscales								
1. Self-Kindness (SCS-SF)		0.65**	62**	-0.18**	-0.09**	-0.11**	0.43**	0.32**
2. Mindfulness (SCS-SF)	0.64**		0.49**	-0.08*	-0.08*	-0.03	0.43**	0.30**
3. Common Humanity (SCS-SF)	0.54**	0.50**		-0.02	0.02	0.03	0.31**	0.22**
4. Self-Judgement (SCS-SF)	-0.40**	-0.29**	-0.21**		0.57**	0.55**	-0.31**	-0.34**
5. Over-Identification (SCS-SF)	-20**	-0.18**	-0.14**	0.59**		0.65**	-0.31**	-0.35**
6. Isolation (SCS-SF)	-0.23**	-0.22**	-0.13**	0.54**	0.64**		-0.28**	-0.37**
7. Nonattachment (NAS-7)	0.46**	0.48**	0.35**	-0.36**	-0.33**	-0.33**		0.39**
8. Mental Ill Health (GHQ-12)	0.43**	0.39**	0.29**	-0.43**	-0.40**	-0.46**	0.46**	
Boys M & SD	3.12 (0.86)	3.42 (0.84)	3.04 (0.87)	2.84 (1.00)	2.95 (0.95)	3.10 (0.98)	4.01 (0.82)	3.15 (0.49)
Girls M & SD	3.00 (0.88)	3.21 (0.90)	2.94 (0.86)	3.27 (1.07)	3.39 (0.94)	3.42 (0.99)	4.00 (0.83)	2.91 (0.57)

Uncompassionate subscales are not reverse scored such that high scores reflect greater endorsement of these items. * $p < 0.05$; ** $p < 0.01$.

model parameters by gender, TRd(35) = 1647.99, $p < 0.001$, suggesting a single model for both girls and boys did not fit the data. Consequently, latent profile analysis was conducted independently for boys and girls.

The final number of profiles for each gender was decided using both statistical indices of model of fit (i.e., bootstrapped likelihood ratio test, Vuong-Lo-Mendell-Rubin likelihood ratio test, Lo-Mendell-Rubin adjusted likelihood ratio test, AIC and sample-size adjusted BIC values, entropy, and theoretical considerations (Ferguson et al., 2020). The bootstrapped likelihood ratio test, Vuong-Lo-Mendell-Rubin likelihood ratio test, Lo-Mendell-Rubin adjusted likelihood ratio test were used as the primary statistical indices on determining how many profiles to retain. These tests all assess if a given number of profiles is a significantly better fit than the previous number of profiles with statistically significant results indicating that the higher number profile model is an improvement on the previous model. AIC and sample-size adjusted BIC values were also used to determine model fit with smaller numbers indicating a better fit. In contrast, higher entropy values (closer to 1) are more desirable and indicated a better model fit. Lastly, log likelihood values were plotted and to see when decreasing values plateaued (which indicates that the more complex model is not an improvement on the previous model) when there was ambiguity in other statistical indices.

For girls, models containing between 1 and 5 profiles were fit with full results illustrated in Table 2. Each model was a statistically significant improvement from 2 to 4 profiles. However, Vuong-Lo-Mendell-Rubin and Lo-Mendell-Rubin adjusted likelihood ratio tests showed no statistically significant improvement from 4 to 5 profiles, and entropy values were closest to 1 for the 4-profile model. Based on these statistical indices a 4-profile result was considered the best model fit. Scores from the 4-profile model were then interpreted.

Profile labels were named based on classifications used by Ferrari et al. (2022a) and illustrated in Fig. 1. Fifty-six girls (6%) were classified into the 'Low Self-Relating' profile, which was characterised by relatively low scores across all subscales. The 'Moderate Self-Relating' profile was characterised by moderate scores on all subscales and 586 girls (61%) were classified into this profile. The 'Uncompassionate' profile was characterised by high uncompassionate and low compassionate scores and 206 girls (21%) were classified into this profile. The 'Compassionate' profile was the opposite of the 'Uncompassionate' profile, characterised by high compassionate scores and low uncompassionate scores with 115 girls (12%) classified into this profile.

For boys, models containing between 1 to 6 profiles were fit. Each model was a statistically significant improvement from 2 to 6 profiles. As demonstrated in Table 2, all bootstrapped likelihood tests remained significant across all models and therefore other statistical indices were used in model selection. The 6-profile model was excluded due to the smallest group consisting of only 20 boys (2%) which is lower than the recommended 5% (Ferguson et al., 2020). Entropy values showed that the best profile pattern was 3 or 5 profiles, with the 5-profile model consisting of two more small profiles with distinct response patterns when compared to the 3-profile model. Specifically, a profile characterised by high scores across all subscales and a profile characterised by low scores on compassionate subscales and high score on uncompassionate subscales similar to the 'Uncompassionate' profile for girls emerged for the 5-profile model.

Table 2 Latent profile analysis results

Number of profiles	Log likelihood	AIC	SA-BIC	VLMR-LRT *p*-value	LMRa-LRT *p*-value	BLRT *p*-value	Entropy	N_{min} (%)
Males ($n = 964$)								
2	-7369.011	14,776.023	14,808.230	< 0.001	< 0.001	< 0.001	0.745	273 (28%)
3	-7137.175	14,326.351	14,370.424	< 0.001	< 0.001	< 0.001	0.864	64 (7%)
4	-6945.151	13,956.302	14,012.241	0.008	0.009	< 0.001	0.853	56 (6%)
5	-6730.502	13,541.004	13,608.809	< 0.001	< 0.001	< 0.001	0.868	62 (6%)
6	-6672.145	13,438.290	13,517.960	0.008	0.009	< 0.001	0.862	20 (2%)
Females ($n = 963$)								
2	-7408.360	14,854.721	14,886.908	0.006	0.007	< 0.001	0.693	416 (43%)
3	-7181.214	14,414.428	14,458.474	0.009	0.010	< 0.001	0.819	140 (15%)
4	-6973.770	14,013.540	14,069.445	0.007	0.007	< 0.001	0.863	56 (6%)
5	-6867.174	13,814.348	13,882.111	0.059	0.062	< 0.001	0.817	37 (4%)

AIC Akaike information criterion, *SA-BIC* sample size adjusted Bayesian information criterion, *VLMR-LRT* Vuong-Lo-Mendell-Rubin likelihood ratio test, *LMRa-LRT* the Lo-Mendell-Rubin adjusted likelihood ratio test, *BLRT* bootstrapped likelihood ratio test, N_{min} minimum profile sample size.

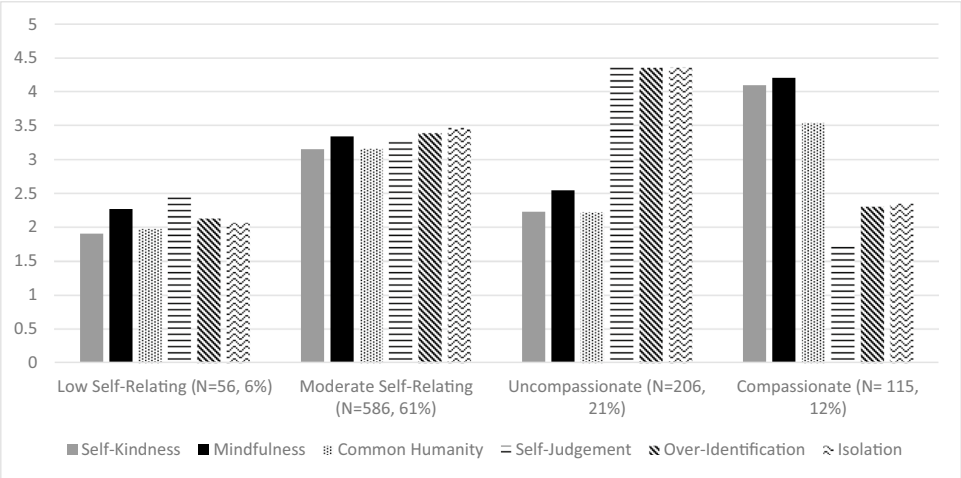

Fig. 1 Self-compassion profiles for girls

Although log likelihood decreases flattened after 5, the statistical indices indicated that both the 3 and 5-profile models were similarly viable. As such, due to considerations around theoretical clarity, the conceptual model, and model parsimony, a 3-profile model was favoured. Further comparisons of group membership between 5 vs 3 profiles showed that over 70% of boys stayed within the same profile when shifting from 5 to 3 profiles further supporting the simpler 3-profile model.

Sixty-four boys (7%) were classified into the 'Low Self-Relating' profile which was characterised by low scores across all subscales. The 'Moderate Self-Relating' profile was characterised by moderate scores across all subscales with 722 boys (73%) classified into this profile. The 'Compassionate' profile was characterised by high scores on compassionate subscales and low scores on uncompassionate profiles indicating a tendency to be self-compassionate with 178 boys (18%) classified into this profile (Fig. 2).

Self-compassion profiles, psychological well-being and nonattachment

One-way ANOVAs were used to determine whether there were differences in psychological well-being and nonattachment between the self-compassion profiles. For girls, results showed that the 'Compassionate' profile was associated with the highest psychological well-being and nonattachment and significantly higher than all other profiles, whilst the 'Uncompassionate' profile was associated with the lowest for both compared to all other profiles. Interestingly, there was no difference in psychological well-being or nonattachment between 'Low Self-Relating' and 'Moderate Self-Relating' profiles.

Similarly for boys, the 'Compassionate' profile was associated with the highest psychological well-being and nonattachment and significantly higher than both the 'Low Self-Relating' and 'Moderate Self-Relating' profiles. There was also no difference in psychological well-being or

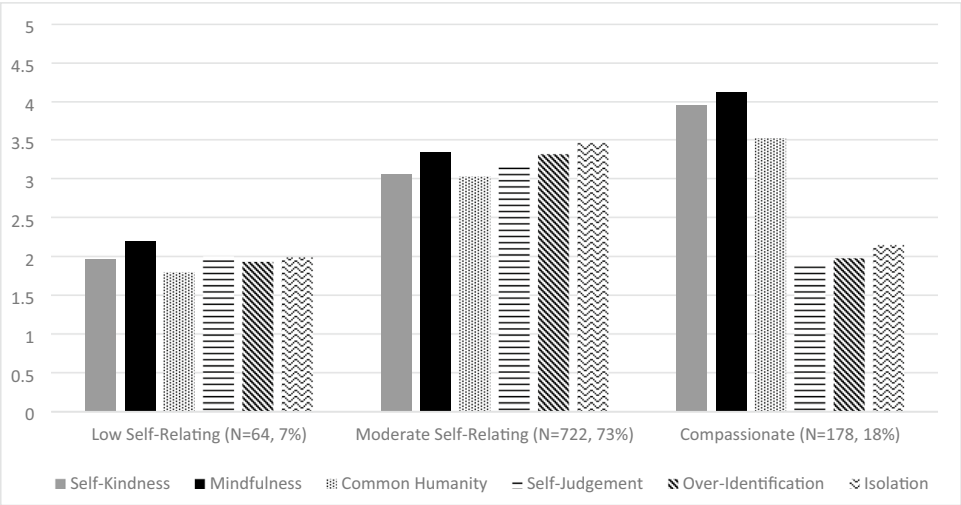

Fig. 2 Self-compassion profiles for boys

nonattachment between 'Low Self-Relating' and 'Moderately Self-Relating' profiles for boys (Table 3).

Mediating role of nonattachment

The mediating role of nonattachment on the relationship between self-compassion profile membership and psychological well-being was assessed using multicategorical mediation analysis with indicator and sequential coding methods (Hayes & Preacher, 2014). Indicator methods compared 'Low Self-Relating' profiles with each other profile group whilst sequential methods compared each profile with the following profile allowing for comparisons between 'Moderate', 'Compassionate', and 'Uncompassionate' profiles.

For boys, when comparing the lower psychological well-being and nonattachment scores of 'Low' and 'Moderate Self-Relating' profiles with the higher scores of 'Compassionate' profiles there was a significant indirect effect. Furthermore, direct effects of profile membership on psychological well-being in the presence of the mediator was also significant for comparisons between 'Low Self-Relating" and 'Compassionate' profiles ($b = 0.200$, $t = -1.32$, $p < 0.001$) and 'Moderate Self-Relating' and 'Compassionate' profiles ($b = 0.275$, $t = 2.99$, $p < 0.05$), suggesting that nonattachment partially mediated the relationship between self-compassion profiles and psychological well-being. The results for the direct relationship between nonattachment and psychological well-being, the initial relationship between self-compassion profile and psychological well-being, and after the inclusion of nonattachment for boys are shown in Fig. 3.

For girls, all profile comparisons except 'Low Self-Relating' compared to 'Compassionate' profiles showed that nonattachment partially mediated the relationship between profile membership and psychological well-being. As illustrated in Table 4, all direct effects and total effects were significant ($p < 0.001$), and confidence intervals did not cross zero indicating significant indirect effects. For comparisons of the "Low Self-Relating' and 'Compassionate' profiles, indirect effects were significant ($b = 0.23$, SE = 0.03, CI[0.164, 0.311]) but direct effects were not ($b = 0.143$, $t = 1.79$, $p = 0.074$), suggesting that nonattachment fully mediated the relationship between profile membership and psychological well-being in this comparison.

Table 3 Differences in psychological well-being for girls and boys self-compassion profiles

Outcome	Mean and standard deviation for self-compassion profiles				ANOVA	Eta squared
Girls	Low Self-Relating	Moderate Self-Relating	Uncompassionate	Compassionate		
Psychological Well-being (GHQ-12)	3.05* (0.49)	2.95* (0.48)	2.43 (0.60)	3.43 (0.28)	$F(3, 959) = 112.39$, $p < 0.001$	0.26
Nonattachment (NAS-7)	3.87* (0.88)	3.99* (0.72)	3.49 (0.73)	5.03 (0.56)	$F(3, 959) = 113.95$, $p < 0.001$	0.26
Boys	Low Self-Relating	Moderate Self-Relating		Compassionate		
Psychological Well-being (GHQ-12)	3.12* (0.52)	3.07* (0.49)		3.51 (0.24)	$F(2, 961) = 66.10$, $p < 0.001$	0.12
Nonattachment (NAS-7)	3.73* (0.95)	3.85* (0.71)		4.79 (0.82)	$F(2, 961) = 120.21$, $p < 0.001$	0.20

Across rows an * denotes groups that did not differ from each other using Tukey's test. For example, for girls, Low Self-Relating and Moderate Self-Relating profiles did not significantly differ according to psychological well-being.

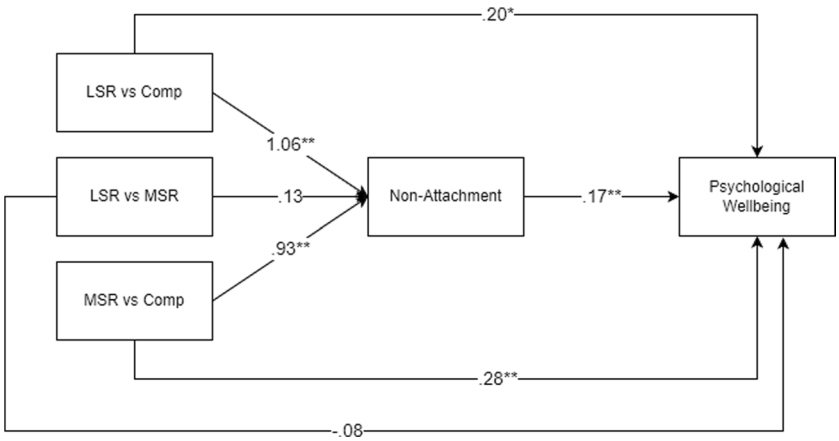

Fig. 3 Path model for mediation with non-attachement entered as the mediator in the relationship between self-compassion profile and psychological well-being for boys. *Note.* LSR = 'Low Self-Relating', MSR = 'Moderate Self-Relating', Comp = 'Compassionate'. * $p < 0.05$; ** $p < 0.01$

Table 4 Summary of mediation analysis results

Profile Comparison	Total Effect	Direct Effect	Indirect Effect	Standard Error	Confidence Interval (Indirect Effect)
Girls					
'Low Self-Relating vs 'Moderate Self-Relating'	-0.10	-0.13	0.02	0.02	-0.02 to 0.07
'Low Self-Relating' vs 'Uncompassionate'	-0.62**	-0.54**	-0.08	0.03*	-0.13 to -0.03
'Low Self-Relating' vs 'Compassionate'	0.38**	0.14	0.23	0.04*	0.16 to 0.31
'Moderate Self-Relating' vs 'Uncompassionate'	-0.52**	-0.42**	-0.10	0.02*	-0.14 to -0.07
'Uncompassionate' vs 'Compassionate'	1.00**	0.69**	0.31	0.04*	0.24 to 0.39
Boys					
'Low Self-Relating' vs 'Moderate Self-Relating'	-0.05	-0.08	0.02	0.02	-0.02 to 0.07
'Low Self-Relating' vs 'Compassionate'	0.38**	0.20*	0.18	0.04*	0.12 to 0.26
'Moderate Self-Relating' vs 'Compassionate'	0.44**	0.28**	0.16	0.03*	0.12 to 0.22

* $p < 0.05$; ** $p < 0.01$

As excepted, due to no significant differences in psychological well-being or nonattachment between 'Low' and 'Moderate Self-Relating' profiles for both genders, mediation analysis showed no significant direct, total, or indirect effects when comparing these two profiles.

Discussion

The first aim of the current study was to extend recent research regarding adolescent self-compassion profiles by Ferrari et al. (2022a) by investigating whether the distinct gender based self-compassion profiles found in the original paper emerged in a separate adolescent sample. The second aim was to explore and attempt to explain the unique findings of Ferrari et al. (2022a) through the addition of a measure of nonattachment. The first hypothesis that distinct gender-based profiles similar to those found by Ferrari et al. (2022a) would appear in the current sample was supported by the results. Latent profile analysis showed that the six subscales of the SCS-SF interacted to form distinct self-compassion profiles that differed based on gender. Specifically, four profiles emerged for girls and three for boys. For girls, the 'Low Self-Relating' profile consisted of girls who showed low endorsement across all SCS subscales whilst the 'Moderate Self-Relating' profile comprised of moderate endorsement across all subscales. An 'Uncompassionate' profile characterised by high endorsement on uncompassionate subscales and low endorsement on compassionate subscales, and a 'Compassionate' profile characterised by the opposite also emerged for girls.

The profiles for girls in the current sample appear near identical to the profiles found by Ferrari et al. (2022a) minus the inclusion of a 'High Self-Relating' profile which was characterised by high endorsement across all subscales. Similarly for boys, profiles that emerged in the current sample were identical to those found by Ferrari et al. (2022a) with the addition of a 'Compassionate' profile. Specifically, a 'Low Self-Relating' and 'Moderate Self-Relating' profile emerged in the current sample. These profiles shared the same characteristics with the girls' 'Low' and 'Moderate Self-Relating' profiles. However, in contrast to Ferrari et al. (2022a) a third 'Compassionate' profile sharing the same characteristics as the 'Compassionate' profile for girls also appeared.

Overall, despite small differences in the profiles that emerged, distinct gender-based differences in how adolescents relate to self-compassion are evident in both the current study and Ferrari et al. (2022a). Various possibilities were suggested by Ferrari et al. (2022a) to explain these gender differences including differences in hormonal changes during puberty (Pfeifer & Allen, 2021), emotional regulation (Zimmermann & Iwanski, 2014), and self-awareness (Rankin et al., 2004). In addition, societal expectations of femininity which tend to encourage greater ability to recognize and label emotional experiences and societal expectations of masculinity which promotes stoicism may lead to different ways of relating to self-compassion. Indeed, girls report perceiving more frequent and negative messages from society around appearance (Gillen & Lefkowitz, 2009), and engagement with these and other similar messages from a young age may increase uncompassionate and self-critical thinking resulting in the emergence of the 'Uncompassionate' profile. Furthermore, the prevalence of media that sexually objectifies women may offer a potential explanation why the 'Uncompassionate' profile emerged for girls in both studies, as exposure to sexually objectifying media has been directly linked with self-objectification (Goodin et al., 2011), body shame (Monro & Huon, 2005), anxiety around appearance (Grabe et al., 2008), and likely in turn increased

self-critical or USR. Indeed, increasing social media use in adolescents has been linked with poorer mental health, particularly among girls (Twenge et al., 2022), and it could be argued that social media emphasizes social comparisons and increases self-evaluation both positive and negative to a large degree for girls. In contrast, studies have shown that boys are less vulnerable to social messages around appearance, feel less pressure to conform to cultural and societal ideals portrayed in media, and respond to these ideals with less intensity resulting in less body dissatisfaction and self-critical messages compared to girls (Knauss et al., 2007; Lawler & Nixon, 2011). These findings may explain why an 'Uncompassionate' profile did not emerge for boys in both studies despite increasing exposure to ideas of the 'ideal male' through social media platforms.

A further similarity across both studies is the emergence of a 'Low Self-Relating' profile for both genders, suggesting that there exists a small proportion of adolescents that do not identify strongly with either self-compassionate or self-critical thinking. The second hypothesis that the 'Low Self-Relating' profile would be predict greater psychological well-being compared to 'Moderate Self-Relating' and 'Uncompassionate' profiles was partially supported as 'Low Self-Relating' profiles predicted greater psychological well-being compared to 'Uncompassionate' profiles for girls. However, in contrast to Ferrari et al. (2022a), 'Low Self-Relating' profiles did not predict greater psychological well-being compared to the 'Moderate Self-Relating' profiles in both genders. In fact, the two profiles were associated with similar levels of psychological well-being which did not support the second hypothesis. The results, however, do support Ferrari et al.'s (2022a) argument that higher levels of self-compassion do not necessarily equate to greater psychological well-being if the individual is also high in self-criticism/USR. Yet it could be argued that psychological well-being is also not negatively impacted if an individual is higher on both. Similarly, Wu et al. (2020) found that Chinese university students who were high in both self-compassion and self-criticism were associated with greater psychological well-being indicating that culture likely plays an important role in in the impact of how individuals relate to components of self-compassion. Wu et al. (2020) suggested that profiles that responded to all six subscales in a uniform way exhibited dialectical thinking which is more prevalent and adaptive in collectivist cultures. However, the current study which used a western sample who may not embrace dialectical thinking to the same extent could explain the differences in psychological well-being due to their difficulties accepting and finding a balance of the conflicting ideas between CSR/USR.

A further explanation may be the role of nonattachment. Studies have shown individuals who are more non-attached tend to have greater psychological and emotional well-being (Sahdra et al., 2010; Whitehead et al., 2021). Interestingly, there were no significant differences in non-attachment between 'Low' and 'Moderate Self-Relating' profiles for both genders which also did not support the second hypothesis. Consequently, it is possible that despite differences in endorsement of components of self-compassion across the profiles because both profiles were non-attaching to similar levels there was no significant difference in psychological well-being. The nonattachment results in combination with psychological well-being results suggest that being in the 'Low Self-Relating' profile may not necessarily be beneficial as low endorsement of both CSR and USR may not be related to higher nonattachment but rather possibly a result of low insight or psychological awareness of one's own thoughts and feelings. However, for girls, being in the 'Low Self-Relating' profile appears to be more beneficial than the 'Uncompassionate' profile due to its association with both greater psychological well-being and nonattachment.

The third hypothesis that nonattachment mediates the relationship between self-compassion profile membership and psychological well-being was supported by mediation analyses. As illustrated in Figs. 3 and 4, for both genders, there was a direct relationship between self-compassion profile and nonattachment and an indirect effect on psychological well-being through nonattachment suggesting that that nonattachment partially mediated the relationship between different self-compassion profiles and psychological well-being. Specifically, for boys, differences in psychological well-being between 'Low' and 'Compassionate' profiles and 'Moderate' and Compassionate' profiles were partially mediated by nonattachment. In comparison, for girls, differences in psychological well-being between 'Low' and 'Uncompassionate' profiles, 'Moderate' and 'Compassionate' profiles, and 'Moderate' and 'Uncompassionate' profiles were partially mediated by nonattachment. The remaining effects can likely be attributed to changes in CSR and USR as literature has shown these greatly impact mental health (Muris et al., 2021). When comparing the 'Low Self-Relating' versus 'Compassionate' profiles for girls, the results showed that nonattachment fully mediated the relationship between profile membership and psychological well-being. However, as this was the only group comparison that resulted in full mediation, whether this is a unique mediation for this particular group comparison or an outlier result is unclear. What is clear is that the results suggest that increases in psychological well-being are not solely based on increases in CSR and decreases in USR but also indirectly affected by an adolescent's ability to non-attach from experiences both positive and negative. Indeed, the ability to let go of the need to hold onto or avoid internal experiences may lead to a more flexible, open, and mindful approach to how they interact with both CSR and USR allowing for perhaps

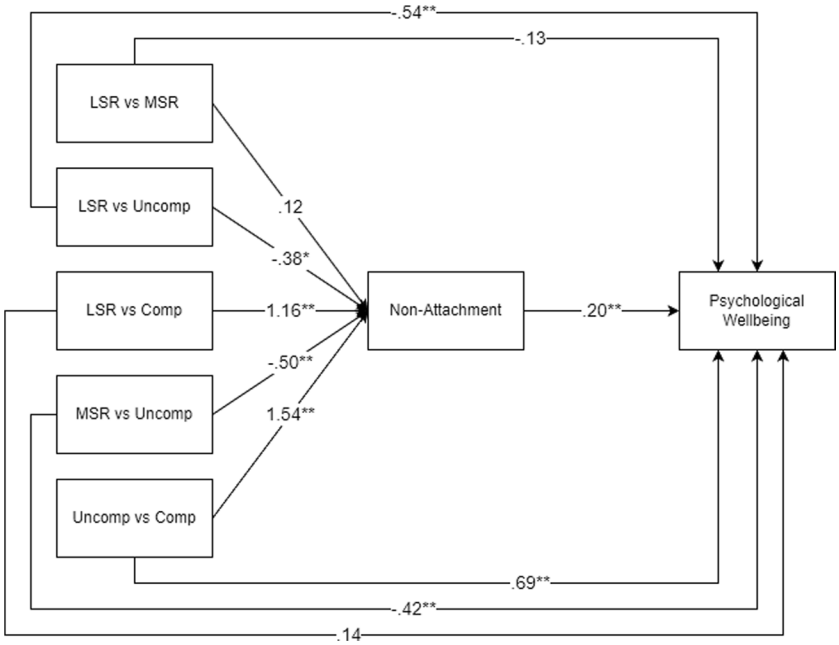

Fig. 4 Path model for mediation with non-attachement entered as the mediator in the relationship between self-compassion profile and psychological well-being for girls. *Note.* LSR = 'Low Self-Relating', MSR = 'Moderate Self-Relating', Uncomp = 'Uncompassionate', Comp = 'Compassionate'. * $p < 0.05$; ** $p < 0.01$

greater freedom of choice in the degree to which they engage with different components of self-compassion.

The overall findings of the study have significant theoretical and clinical implications which may guide the direction of future research. A major implication is support for the large body of research advocating for the use of a 2-factor score (Muris et al., 2016) or 6-factor score (Ferrari et al., 2022b) of the SCS. Indeed, the results of the current study may have been lost if only reporting a single factor score of the SCS-SF as the clear gender differences in self-compassion is only evident when looking at CSR and USR components or the six subscales of the SCS-SF individually. A further implication is the need to acknowledge gender when exploring self-compassion in adolescents (Bluth et al., 2017; Yarnell et al., 2019), as the results show there are clear differences in how boys and girls relate to the different components of self-compassion. Indeed, studies that fail to account for gender when exploring self-compassion may produce results that lack subtle differences or miss important variations in patterns of self-relating between different genders. However, it must be noted that even after acknowledging the differences in gender there remains a large overlap in profiles with 56 girls and 64 boys were classified in 'Low Self-Relating' profiles, 586 girls and 722 boys classified in 'Moderate Self-Relating' profiles, and 115 girls and 178 girls classified into 'Compassionate' profiles. This suggests that gender-based group averages would also miss important information on how individuals relate to the components of self-compassion and supports recent research pushing against a 'one-size-fits-all' and group averages approach of exploring self-compassion (Sahdra et al., 2022). Future research would benefit from moving away from the traditional variable centered approach to a more individual centered idionomic approach using experience sampling method (ESM) which would allow for exploration of individual self-compassion data first and then only making group-based generalizations if consistent with the individual level fit.

The current study is also the first to examine the mediating effect of nonattachment on self-compassion and psychological well-being. The findings extend on the emerging nonattachment literature showing its ever-increasing key role in psychological and emotional well-being in adolescents. There appears to be a clear interaction between nonattachment and self-compassion and their links with psychological well-being. Merging the research for these two emerging constructs would be beneficial in further understanding the factors that influence well-being in adolescence and aid in future development of preventative strategies and interventions. Future research could further explore the interaction between nonattachment and self-compassion. In particular, current findings indicate that nonattachment changes as adolescents identify more or less with CSR and USR and future research examining the direct associations between changes in nonattachment and their impact on self-compassion, and vice versa, would be of interest. Qualitative studies examining adolescents' understandings of self-compassion and nonattachment could also be beneficial in learning more about adolescent perceptions about these constructs and how these could be used in clinical practice.

The findings of the current study also have important clinical implications for self-compassion-based interventions for adolescents. The distinct self-compassion profiles show that we cannot assume that everyone relates to the components of self-compassion in the same way, supporting

Ferrari et al. (2022b)'s arguments that individuals may have different structures of self-compassion. Consequently, it could be assumed that different profiles may benefit or require different intervention strategies. For example, individuals in 'Low Self-Relating' profiles may benefit the most from strategies aimed at increasing CSR whilst individuals in 'Moderate Self-Relating' profiles may benefit more from decreasing USR. Therefore, it may be beneficial for clinicians to explore an individual's self-compassion profile to understand how they relate to the components of self-compassion to help understand the role self-compassion plays in their psychological processes, as self-compassion may not universally affect everyone in the same way (Ferrari et al., 2022b). Another clinical implication of the current study is the advocation of interventions aimed at promoting nonattachment. In line with the literature, higher levels of nonattachment were associated with greater psychological well-being suggesting that interventions aimed at increasing non-attachment are likely to improve well-being outcomes in adolescents. In addition, the findings suggest that intervention strategies that target both constructs of self-compassion and nonattachment may be more effective at producing positive outcomes than interventions targeting either construct by itself. Indeed, inclusion of strategies that facilitate nonattachment to one's inner experiences are likely to lead to positive changes in both adolescents' self-compassion and well-being. One possible such strategy is cognitive defusion, which refers to the ability detach, separate, or create distance from one's thoughts and emotions and aims to reduce individuals' over-identification with their thoughts and emotions (Hayes et al., 2012). However, the current findings are new and future research building on these findings would be beneficial in supporting future implementation of clinical interventions that address both self-compassion and nonattachment.

The study also had several limitations to acknowledge. The study used the SCS-SF, a 12-item short form of the original SCS. Although this version demonstrates almost perfect correlations with the longer 24 itemed SCS (Raes et al., 2011) and is well validated in adolescent samples (Bluth et al., 2018), each subscale consists of only 2 items and may not detect subtle differences in CSR/USR. Furthermore, the GHQ-12 is a broad measure of general psychological well-being and although helpful in community samples and as an overall indicator of psychological well-being it may miss nuances and differences in more specific psychological outcomes. In particular, mood disorders such as depression often are associated with higher levels of repetitive negative thinking (Kircanski et al., 2012) and it may be possible that USR and membership into the 'Uncompassionate' profile may be influenced by one's mood. However, due to the broad nature of the GHQ-12 this was difficult to explore in the current study. Future research exploring the extent that USR and the 'Uncompassionate' profile is a product of mood through use of measures specific to mood would be of interest and extend upon the current findings. The current study also used a community sample of Western adolescents at Catholic schools in Australia who were predominantly Caucasian. The limited diversity of the sample suggests that the results may not generalize in adolescents with psychological disorders and given the evident differences culture causes in self-relating styles, to different cultural populations. Finally, it could be argued that a confirmatory latent profile analysis could have been used to test the first hypothesis. However, given the uniqueness of Ferrari et al. (2022a)'s findings and the exploratory nature of the current study, a latent profile analysis was favored.

In conclusion, this study built on recent research looking at adolescent self-compassion profiles using the SCS-SF in a large cross-sectional sample and explored the mediating role of nonattachment between self-compassion profiles and psychological well-being. In line with past research, clear gender differences in self-compassion profiles appeared with three profiles emerging for boys and four profiles emerging for girls. For both genders 'Compassionate' profiles predicted the best psychological well-being and nonattachment, but in contrast to past research, 'Low Self-Relating' profiles and 'Moderate Self-Relating' profiles predicted the same psychological well-being and nonattachment. Furthermore, the relationship between different self-compassion profiles and psychological well-being was found to be partially mediated by nonattachment for both genders. The results indicate that nonattachment plays an integral role in the relationship between self-compassion and psychological well-being in adolescents and that further exploration of these two constructs would be beneficial. The results also indicate the need to acknowledge gender and the individual when exploring self-compassion in adolescents given the clear differences in how different individuals relate to the components of self-compassion.

Authors contribution All authors contributed to the study conception and design. Data collection was performed by Joseph Ciarrochi and analysis was performed by William Li and Alissa Beath. The first draft of the manuscript was written by William Li and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data availability The datasets generated and/or analyzed during the current study are not publicly available as participants are from a protected population (children under 18), but de-identified versions are available from the corresponding author on reasonable request.

Declarations

Ethical approval Ethics approval was granted by the Australian Catholic University (ACU) Human Research and Ethics Committee (project code: HE10/158). All procedures performed in studies involving human participants were in accordance with the ethical standards of ACU and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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