The Role of Psychosocial Factors in Adolescent Depressive Symptoms

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature: Mengya Zhao 赵梦雅 ……..

To my parents Mrs Lianxiu Ye (叶连秀) and Mr Chuanyong Zhao (赵传永),
without whom none of the PhD journey would have been possible.

To Professor Anke Karl and Professor Tamsin Ford,
I couldn't have wished for a better supervision team.

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Abstract

Psychosocial factors play a critical role in young people mental health and influence various developmental outcomes. This thesis aimed to examine a theory-informed multifactorial model of adolescent depressive symptoms that included self-perception and interpersonal factors. Briefly, this model posits that early parenting practices exert influence via self-perception and peer relationships (e.g., peer difficulties and friendships) and directly play a role in depressive symptoms. Depressive symptoms, on the other hand, could also negatively influence self-perception, such as low self-esteem and self-compassion, and one's social relationships, such as more peer difficulties and poor friendships. Furthermore, the model accounts for early parenting behaviour and peer relations playing an important role in developing self-esteem and self-compassion, but also for the opposite effect, one's self-perception can also impact peer relationships. The current thesis examined the model through a cross-sectional study recruiting adolescents in the UK and China (Study 3) and a secondary data analysis study using data from Avon Longitudinal Study of Parents and Children (Study 4). Before examining the hypothesised developmental pathways, Study 1 and Study 2 were conducted to explore the construct of self-compassion in Chinese samples due to the definition and assessment debate in the current literature. The current thesis found that positive parenting, self-esteem, self-compassion and fewer peer difficulties play a protective role in adolescent depression, but the role of friendships in depression remains unclear. Also, the notion that positive parenting and peer relationships shape how children think about themselves, known as social-origin development of self-perception, was supported. Conversely, during adolescence, self-perception and peer relationships were associated with each other. Finally, the thesis identified cultural differences in the development of young people's depressive symptoms with social relationships being more

important in a collectivist culture and self-compassion being more eminent an individualist culture. The current thesis discussed theoretical and clinical implication of the findings and provided several assessment considerations of psychosocial factors in empirical studies in adolescents. Future studies should further explore the hypothesised pathway model.

Keywords: depressive symptoms, self-perception, peer relationships, positive parenting, culture difference

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List of Abbreviations

ALSPAC: Avon Longitudinal Study of Parents and Children

CBT: Cognitive Behavioural Therapy

CFA: Confirmatory Factor Analysis

CFI: Comparative Fit Index

CH: Conmon Humanity

EFA: Exploratory factor analysis

ESEM: Exploratory Structural Equation Modelling

FD: Factor determinacy

GFI: Goodness of Fit Index

H: Construct Reliability

II: Isolation

M : Mean

MCS: Millennium Cohort Study

MI: measurement invariance

NNFI : Non-normed fit index

OI: Overidentification

RMSEA: root-mean-square error of approximation

SCS: Self-Compassion Scale

SCS-C: Chinese version of Self-Compassion Scale

SD: Standard deviation

SEM: Structural Equation Modelling

SJ: Self-Judgment

SK: Self-Kindness

TLI: Tucker–Lewis index

UK: United Kingdom

USA: United State

1 Theoretical Background

1.1 Depression in adolescents: a critical issue

Adolescent depression is a worldwide mental health challenge (Polanczyk et al., 2015), and various studies conducted in different countries have shown that it has increased in the past 30 years (Collishaw, 2015). The high rates of adolescent depression have become a burden to society and health care systems, and the burden is higher in low- and middle-income countries (Thapar et al., 2012). There has also been a rise in adolescents who report moderate or severe depressive symptoms. For example, in a group of 13,568 adolescents in the US, 9% reported moderate or severe depressive symptoms (Rushton et al., 2002), and in a group of 12,395 adolescents in 11 European countries, 29.2% were found to be experiencing sub-threshold depression (Balázs et al., 2013). The increase in adolescent depression is alarming because of its strong positive association with depression in adulthood (Fergusson et al., 2005; Kessler et al., 2001; Pine et al., 1999).

Depression has a detrimental impact on functioning in all aspects of life from adolescence to adulthood. Adolescents suffering from depression or depressive symptoms are more likely to miss school (Glied & Pine, 2002), to have problematic interpersonal relationships (Rudolph et al., 2008), internalising problems (Graber & Sontag, 2009), externalising problems and poor academic performance (Breslau et al., 2017). In addition to being linked to major depression in later life (Fergusson et al., 2005; Kessler et al., 2001; Pine et al., 1999), it is also associated with other adult mental health problems such as depression and anxiety disorder, suffering from intimate partner violence (McLeod et al., 2016), poor physical health (Keenan-Miller et al., 2007), and a decrease in employment and earnings (Fletcher, 2013). It is, therefore, crucial to explore adolescent depression and depressive symptoms.

The enormous biological and psychosocial changes after the onset of puberty that teenagers face can help us to understand why they are vulnerable to depression. With the onset of puberty, adolescents experience hormonal changes responsible for physical transformations and brain development (Blakemore et al., 2010). These biological changes may exaggerate adolescent difficulties. During adolescence, the social brain is developing, i.e., the medial prefrontal cortex and the posterior superior temporal sulcus (Blakemore, 2008). This development can impact both social behaviour and mental health (Lamblin et al., 2017). Additionally, psychosocial changes in adolescence include identity development (Erikson, 1968) and changes in interpersonal relationships (Giordano, 2003). Erikson's early theory defined adolescence as a stage of identity crisis during which teenagers experience a frequent change of identity and finally achieve a coherent sense of self (Erikson, 1968). Compared to their childhood years, adolescents are less close to and face more conflicts with their parents, and peer relationships and close friendships become more important as the main source of social support (Giordano, 2003).

Adolescence is a critical transition period for developing skills used in adulthood (Steinberg et al., 2010). Because adolescent depression is common across the world and exerts long-term effects on individuals' lives, it is essential to develop relevant interventions or preventions to help teenagers have a healthy sense of self, develop healthy relationships and cope with challenges. The importance of these psychosocial factors started to be shown in the interventions; for example, two psychosocial depression interventions used with adolescents are cognitive behavioural therapy and interpersonal psychotherapy supported by strong evidence (Weersing et al., 2017). It is critical to explore the protective and risk factors of youth depression and depressive symptoms from both a psychosocial perspective and an interpersonal perspective.

In this chapter, I will review the literature related to the protective and risk factors for depressive symptoms in young people. I focus first on self-perception such as self-esteem and self-compassion and then on social variables such as parenting, peer difficulties and friendships. I then review our current understanding of the association between self and social relationships. I propose a multifactorial developmental pathway model of young people's depression involving both self and social variables. I then argue the importance of bringing a cultural perspective to the global issue of young people's depression with a focus on cultural differences in the role of self and social relationships. Finally, I summarise the gaps in the literature and provide the rationale for my thesis.

1.2 The importance of self-perception

Self-perception is defined as 'different beliefs we have about ourselves' (Shapka & Khan, 2018, p 3406), and self-concept is defined as a person's self-perceptions following Shavelson et al.'s review (1976). From the definition, self-concept can be considered as the synonym of self-perception. Thus, in this thesis, I use self-perception when referring to how individuals think about, or view, themselves.

In the field of clinical psychology, self-perception is critical for making a diagnosis of depression. If individuals think they are worthless, that is one of the criteria for major depressive disorder (Association, 2013). Distorted self-perception, such as excessively negative thoughts about the self, is a risk factor for depression in the cognitive theory of depression (Beck, 1967). More recently, reviews have also consistently concluded that negative self-perception links with depression (LeMoult & Gotlib, 2019).

Adolescence is considered a transition period from childhood to adulthood with many challenges which influence young people's self-perception. Erikson (1968) stressed the importance of developing self-perception as the main developmental task of adolescence. Adolescents who have a healthy self-perception (e.g., a clearly defined evaluation of the self, a stable and consistent self-view) were more likely to have fewer internalising and externalising problems (Parise et al., 2019). In a 5-year longitudinal study, self-perception played a critical role in the onset and maintenance of peer victimisation and depressive symptoms (Saint-Georges & Vaillancourt, 2020).

Self-perception is understood as a global, comprehensive view of self, and there are different concepts related to how people view themselves from different perspectives. In this research, I focus on two forms of self-perception: self-esteem and self-compassion. These have been shown to relate to depression in young people (Muris et al., 2016) and are both in the area of self-perception and have a similar social origin (Brummelman & Thomaes, 2017). They are different ways of relating to the self (Neff & Vonk, 2009). Self-compassion is often considered an alternative form of self-esteem, but they function differently in mental health assessments (Neff, 2003). Self-compassion highlights the social connectedness of an individual, whereas self-esteem comes from a source of social comparison (Neff, 2003, 2011; Neff & Vonk, 2009).

It should be noted that in Study 4, the variables related to self were assessed at two time-points with different questionnaires. The first variable is self-esteem, and the other variable is assessed by the Self-Image Profile (Butler, 2001). Based on the items from the Self-Image Profile (Butler, 2001) and the way of assessment, the words can be roughly divided into positive adjectives and negative self-referential adjectives. Thus, I tried to map them on self-

compassionate/positive and self-critical/negative self-referential words (Kirschner, 2016) to tap into self-compassion as much as I can.

1.2.1 Self-esteem and its association with depressive symptoms in adolescents

1.2.1.1 Definition and assessment

Self-esteem is defined as one's evaluation of their own worth (Orth & Robins, 2014). Self-esteem involves self-acceptance (Orth & Robins, 2014) and also represents one's attitude towards oneself (Pyszczynski et al., 2004). Self-esteem can be assessed by self-reported measures, such as Rosenberg's Self-Esteem Scale (Rosenberg, 1965).

1.2.1.2 The development of self-esteem

To understand the development of self-esteem, Harter reviewed and summarised the developmental changes in self-representations and self-esteem during childhood (Harter, 2012). Harter (2012) found that how children think about themselves is not accurate during middle childhood (approximately 5-7 years old). They are more likely at this age to describe themselves excessively positively. In very early childhood, they do not directly compare themselves with others, and due to a lack of perspective, they cannot understand critical information from important others such as parents. During this stage of development, young children cannot develop global, concrete self-esteem. However, researchers can observe children's experience self-esteem via children's behaviour (Haltiwanger, 1989; Harter, 2006). High self-esteem in children is represented by behavioural confidence such as being curious, showing initiative and having adaptive reactions to changes or stressors such as frustration tolerance. Children with low self-esteem do not exhibit these behaviours.

From early to middle childhood (around 5-7 years old), self-perception is seen to be overly positive and inaccurate as children are more likely to use positive words to describe themselves, and they have still not developed a concept of global self-esteem (Harter, 2012). However, from middle to late childhood, children's self-perception becomes more accurate, which is observable in both positive and negative evaluations. This change can be attributed to cognitive development because cognitive development enables children to evaluate themselves and others simultaneously. This means they use social comparison information to evaluate themselves (Harter, 1990). Harter argued that children could verbally express their global self-esteem accurately in late childhood (2012). A meta-analysis of 191 studies exploring the mean level change of self-esteem found that self-esteem increased during childhood, was stable during early adolescence, and then from about the age of 15 years old, it increased until adulthood (Orth et al., 2018).

1.2.1.3 The association between self-esteem and depressive symptoms

Stable high self-esteem has been linked with better mental wellbeing and fewer mental health problems, and low or unstable self-esteem has been associated with mental health problems (Greenberg, 2008). Low self-esteem has been strongly linked with youth depression in the literature (Orth et al., 2008) and two theoretical models account for the association between low self-esteem and youth depression: the Vulnerability Model (Beck, 1967) and the Scar Model (Shahar & Davidson, 2003). The Vulnerability Model indicates that low self-esteem contributes to later youth depression. The Scar Model suggests that low self-esteem is a consequence of depression, and when depressed, an individual's self-concept is impacted, and individuals go on to develop low self-esteem.

Various studies have explored the association between self-esteem and depressive symptoms in adolescents, and evidence supporting the Vulnerability Model is stronger than that for the Scar Model. In a group of Mexican adolescents from 10 to 12 years old, the Vulnerability Model was replicated using a cross-lagged design with two-time-point assessments (Orth et al., 2014). Steiger et al.'s (2015) longitudinal research with two-time-point assessments supported both the Vulnerability Model and the Scar Model from adolescence to middle adulthood; however, the vulnerability effect represented by the Vulnerability Model was stronger than the erosion effect represented by the Scar model. Steiger et al.'s (2015) findings are consistent with a previous meta-analysis that revealed that both Vulnerability and Scar models were supported, but the Vulnerability Model had a bigger effect size than the Scar Model (Sowislo & Orth, 2013). The meta-analysis also found that the vulnerability effect of low self-esteem on depression was not moderated by gender, age or time between assessments (Sowislo & Orth, 2013).

Because both theoretical models and empirical evidence indicate that low self-esteem is a risk factor for young people's depression, concerns about self-esteem have increased due to its negative impact on high self-esteem. For example, high self-esteem was more likely to be linked to violence (Baumeister et al., 1996), increased drinking and early sexual activities in adolescents (Baumeister et al., 2003). The negative side of self-esteem may manifest in how individuals pursue self-esteem (Crocker et al., 2004). Specifically, if individuals seek self-esteem guided by pure self-evaluation and self-worth rather than by compassion or altruism, individuals appear to suffer from negative self-esteem when they fail or face difficulties, because failure challenges the value of, and leads to negative feelings about, the self (Crocker et al., 2010; Crocker & Park, 2004; Gilbert & Irons, 2005). Thus, researchers are exploring other self-related concepts, such as

self-compassion (Neff, 2003), as a new way to help individuals to have better wellbeing (Neff, 2003).

1.2.2 Self-compassion and its association with youth depressive symptoms

1.2.2.1 Definition

There are several definitions of self-compassion. In this thesis, Neff's definition was used because this definition is the most widely used. Neff was the first person to define self-compassion in psychology as a multifaceted construct comprising three main components (Neff, 2003, 2016). Self-compassion is an ability: to be kind and compassionate rather than being harsh and judgemental to one's flaws or inadequacies when one has a difficult time (self-kindness versus self-judgment; to understand that difficulties or feelings of inadequacy are shared by other human beings, and not only happened to oneself (common humanity versus isolation); and, handling a difficult time or a negative emotion in a balanced way, with non-judgemental and receptive attitudes rather than exaggerating or suppressing the difficulties or emotions (mindfulness and overidentification).

There is an unresolved debate related to the definition of self-compassion of whether it is a variable related to one's attitudes towards oneself (e.g., internal attitude towards oneself, being kind rather than being judgmental) or whether it is an emotion regulation strategy or skills (e.g., alleviating the pain from a failure). Some researchers state that self-compassion is an alternative concept to self-esteem, and self-compassion means mindfully accepting oneself and being kind to oneself with the awareness that no one is perfect (e.g., Neff, 2003; Neff, 2016). However, some researchers have argued that self-compassion is an effective emotion regulation strategy to cope with emotional difficulties (e.g., Diedrich et al., 2014). This debate is outside of the scope

of this thesis. However, to align it with the considerations of self-esteem, I have defined self-compassion as a healthy way of relating to oneself rather than an emotion regulation strategy, although it is acknowledged that self-compassion is associated with better emotional regulation (Inwood & Ferrari, 2018). Also, several developmental psychologists treated self-compassion in the domain of self-perception in childrens' development, as mentioned at the beginning of this session (Brummelman & Thomaes, 2017).

1.2.2.2 The assessment issue

Although there is increasing evidence supporting the benefit of self-compassion, there is inconsistency in its assessment. There are varying definitions of self-compassion, and based on these different definitions, a corresponding scale or questionnaire was developed. In this section, two more definitions of self-compassion and its relevant scale are reviewed. There is also an ongoing debate around using the Self-Compassion Scale (Neff, 2003), the most widely used measurement.

A recent review defined compassion and self-compassion as a combination of five components: recognition of suffering; understanding of its universality; feelings of sympathy, empathy, or concern for those who are suffering; tolerating distress associated with witnessing suffering; and motivation to act or acting to alleviate suffering (Strauss et al., 2016). Gilbert et al. (2017) defined self-compassion from a perspective of motive and competencies. Self-compassion involves engaging in one's suffering with an open mind, such as being sensitive and receptive to personal suffering and taking wise action to handle it (Gilbert et al., 2017).

Strauss et al.'s definition (2016) extended the existing definitions. Neff's definition (2003) closely overlaps with Strauss et al.'s (2016), except that Neff's definition did not cover the

component of ‘motivation to act or acting to alleviate the suffering’, as in Gilbert et al.’s (2017) definition. Compared with Strauss et al. (2016), Gilbert et al.’s definition does not explicitly define ‘understanding its universality’.

Several scales have been developed to assess self-compassion. The most widely used scale is the Self-Compassion Scale (SCS) (Neff, 2003). The SCS has six subscales: self-kindness; self-judgement; common humanity; isolation; mindfulness; and overidentification. The SCS has been translated into 19 languages (Neff et al., 2019). A short version of the SCS (SCS-SF) was also developed to assess self-compassion (Raes et al., 2011). It has been suggested that the SCS can be used to assess self-compassion as a total score or by using different scores on its subscales (Neff et al., 2019). The SCS-SF can only be used as a total score (Raes et al., 2011). To conduct self-compassion studies in adolescents, the SCS was tailored to be child friendly (Stolow et al., 2016). The short form of SCS was also used in adolescents (specific studies, please see the next session). Recently, a youth version of the SCS was developed with preliminary evidence showing its validity and reliability (Neff et al., 2021). There are other scales assessing self-compassion such as the Compassionate Engagement and Action Scale (Gilbert et al., 2017), which is based on Gilbert’s definition, and Gu et al. (2020) drew on Strauss et al. (2016) and developed the 20-item Sussex-Oxford Compassion for the Self Scale. Due to the widespread use of SCS, SCS was used in this thesis to assess self-compassion. However, there are still unresolved questions regarding its structure, especially in a specific population, such as the Chinese (Neff et al., 2019; Tóth-Király & Neff, 2020).

It is vital to learn the measurement construct of the SCS before using the measurement in empirical studies. The debate of the SCS is about scoring: whether the SCS should be scored in one total score or two separate scores, namely a compassionate self-responding score and an

uncompassionate self-responding score (Neff et al., 2019). Most studies have followed Neff's suggestion of using the SCS as a total score or six separate subscale scores for self-kindness, self-judgement, common humanity, isolation, mindfulness and overidentification. Neff provided empirical evidence for scoring SCS as a total score in 16 countries (Neff et al., 2019). Others have argued that the SCS should be scored as two separate scores based on evidence obtained in 11 countries (Halamová et al., 2020).

There is still a debate regarding the definition and assessment of self-compassion. Most of the evidence related to the factor structure of SCS is from adult samples. Therefore, examining the factor structure of self-compassion in adolescents and young adults is critical. After the assessment issue is addressed, more research on self-compassion development can be done in children and adolescents. Currently, there is limited research in that area, especially compared with self-esteem.

1.2.2.3 Developmental issues of self-compassion

Based on limited findings, self-compassion may decrease with age, but it is hard to conclude gender differences. A cross-sectional study using the SCS-SF (Raes et al., 2011) found that adolescents aged 12 years old had higher scores of self-compassion than adolescents aged 13 and 14 years old, and boys scored higher than girls (Bengtsson et al., 2016). Another cross-sectional study using the SCS-SF in adolescents from 11 to 19 years old explored the age and gender differences (Bluth et al., 2017). Bluth et al. found that overall, there was no age difference in the sample, but gender played a moderate role. In boys, there was no age difference in the level of self-compassion, which was similar to the whole sample. In girls, older girls have significantly lower self-compassion than younger girls, and older girls overall have lower self-compassion than boys. These two studies used a sum score of self-compassion. Recently a longitudinal study

with three different time assessments in Chinese adolescents aged 12 to 14 years old found that self-compassion decreased over time, but there were no gender differences (Yang et al., 2021). This research also used the SCS-SF, but they used a three-factor structure as a latent variable of self-compassion.

Limited research describing self-compassion development may be due to the assessment. Although the youth version of the SCS was published in 2021 (Neff et al., 2021), I was unable to find any empirical studies using the youth version. The studies mentioned above are related to the development of self-compassion in adolescence, but the way of assessing self-compassion in these studies is not in line with Neff's definition (2003). There exists an assessment issue for self-compassion in young people. In my research, I have used the SCS-SF because the youth version had not been published when the research was proposed.

1.2.2.4 Self-compassion and its association with youth depressive symptoms

Evidence for the positive effect of self-compassion on mental wellbeing has firstly been accumulated in adults. A meta-analysis found that self-compassion is negatively associated with psychopathology, i.e., depressive symptoms, anxiety and stress, and this negative association had a large effect size (MacBeth & Gumley, 2012). Evidence from another meta-analysis supported a positive association between self-compassion and wellbeing (Zessin et al., 2015), and its effect size was medium.

Although there is less evidence for adolescents, recent studies have found that self-compassion is associated with higher levels of emotional wellbeing (Bluth & Blanton, 2014, 2015), less anxiety (Neff & McGehee, 2010) and less perceived stress (Bluth et al., 2016). Another meta-analysis found a large effect size of the association between self-compassion and

psychological distress (Marsh et al., 2018). A recent systematic review confirmed the protective effect of self-compassion against adolescent depression (Pullmer et al., 2019).

Despite this evidence, the empirical evidence for the mechanism of the protective factor of self-compassion in adolescent depression is still limited (Pullmer et al., 2019). However, the tripartite model of affect regulation (Gilbert, 2005) can be used to understand the beneficial effect of self-compassion on alleviating adolescent depression. The theory states that there are at least three affect regulation systems: drive system; threat system; and soothing system. These three systems have their own functions, and they interact with each other (Gilbert, 2005). Specifically, the drive system helps human beings seek out resources and rewards, experience some positive emotions and even excitement when the system is active (Gilbert, 2009). The threat system helps individuals identify potential dangers, and people may experience some negative feelings, such as anxiety and disgust, when this system is active (Gilbert 2009). The soothing system helps individuals to manage distress, alleviate pain and promote social bonding when they are not facing a threat or chasing a goal, and individuals are more likely to feel contented, safe and protected when this system is activated (Gilbert, 2009). Theoretically, these three systems cooperate to regulate emotions in a balanced way. Recent research has found that self-compassion activates the soothing system represented by the reduced arousal and increased parasympathetic activation, and the state of self-compassion may be an effective emotion regulator to alleviate pain or difficulties (Kirschner et al., 2019).

1.2.2.5 The relationships between self-esteem and self-compassion

Although self-esteem and self-compassion have been positively associated with each other in both adolescents (Barry et al., 2015) and adults (Neff & Vonk, 2009), researchers have provided evidence that self-compassion is different from self-esteem. Neff (2003) discriminated

between self-compassion and global self-esteem. Global self-esteem, or the worthiness of the self, which involves social comparison and self-compassion, focuses on kindness to oneself and acceptance of difficulties or personal flaws (Neff, 2011). Self-compassion is negatively associated with social comparison (Neff & Vonk, 2009). Self-compassion is also linked with activation of the soothing system (Gilbert, 2005; Kirschner et al., 2019). Research has also shown a positive association between self-esteem and narcissism but no association between self-compassion and narcissism (Neff & Vonk, 2009).

Summarising the evidence from studies in adults, I concluded that even though they are correlated, self-compassion is a different concept from self-esteem (e.g., Leary et al., 2007), and self-esteem is more related to the evaluation of the self; whereas self-compassion is more related to one's belief about caring for themself (Brummelman & Thomaes, 2017; Neff, 2011). However, in adolescence, it is hard to conclude that self-compassion is considered as a more beneficial way to improve one's mental wellbeing compared to self-esteem as previous researchers have suggested (e.g., Neff & Vonk, 2009; Leary et al.2007). Current findings with young people about the role of self-compassion and self-esteem are mixed, and the evidence cannot support the assertion that self-compassion is more beneficial than self-esteem, especially in early adolescence.

Self-compassion was found to moderate the association between self-esteem and mental health in adolescents, which suggests that self-compassion buffers the negative effect of low self-esteem in later mental health (Marshall et al., 2015). A cross-sectional study in adolescents aged from 12 to 17 years old found that when controlling for self-esteem and self-efficacy, self-compassion was not associated with either depression or anxiety (Muris et al., 2016). This suggests that compared with self-compassion, self-esteem and self-efficacy may play a unique

role in adolescent mental health. Muris et al.'s (2016) study is inconsistent with the findings in Leary et al. (2007) that self-compassion explained unique variance of the negative affect and self-esteem did not explain any significant variance when calculating the semi-partial correlations between different self-related variables (i.e., self-compassion, self-esteem and narcissism) and a negative affect for unpleasant events. A possible explanation provided by Muris et al. (2016) could be that self-compassion has not been developed well during adolescence because self-compassion requires accurate self-evaluation and less defensiveness (Leary et al., 2007). Leary et al. found the protective mechanism of self-compassion might be that individuals with a higher level of self-compassion tend to have an accurate self-evaluation, both positive and negative. Those individuals with higher levels of self-esteem tend to be biased toward positive self-evaluation in social comparison, which means they are more likely to have an inflated self-evaluation. Children and adolescents are sensitive to social comparison (Lapan & Boseovski, 2017) or others' perspectives (Pfeifer et al., 2009), and especially children in late childhood and early adolescence (8-12 years old) are more likely to evaluate themselves in a positive way (Thomaes et al., 2017). Together with the empirical evidence that stability of self-esteem increases during adolescence, we could conclude that during adolescence, especially during early adolescence, teenagers may not have an accurate and stable self-evaluation.

Following this argument, self-compassion may depend on the development of self-esteem, which is considered an important perspective of self-evaluation. A four-year longitudinal study of 2,809 adolescents (the mean age at the first assessment was 14.7 years old) using autoregressive cross-lagged structural equation modelling found that self-esteem predicts self-compassion, whilst self-compassion cannot predict self-esteem (Donald et al., 2018). Although self-compassion was considered a healthy self-concept and is an alternative to self-esteem in

improving mental wellbeing (Neff & Vonk, 2009), self-esteem may be a pre-condition of self-compassion in adolescence (Donald et al., 2018). Self-compassion requires an individual to evaluate both themself (positively and negatively) and a situation clearly, accurately and using a receptive and non-judgmental attitude towards one's own flaws or difficulties (Leary et al., 2007).

Given the relationship between self-esteem and self-compassion and the understanding that adolescents are still developing their self-identity, it is important to further explore the role of self-esteem and self-compassion together in adolescent depression.

1.3 The importance of social factors

The critical role of social factors in adolescent depression has been proposed by the Interpersonal model of youth depression (Rudolph et al., 2008), which explained the negative effect of early family disruption and problems with peers on depression in young people. In addition to the disruption of self-identity, the disruption of interpersonal relationships is recognised as a prototype of depression (Blatt & Zuroff, 1992). Also, the importance of interpersonal relationships has been shown in the intervention; for example, interpersonal therapy is an evidence-based intervention for depression (de Mello et al., 2005) and aims to promote social support, improve interpersonal skills, and decrease stress from interpersonal contexts (Lipsitz & Markowitz, 2013).

Furthermore, the role of social factors in the development of self-perception in children and young people has been acknowledged by many theories such as attachment theory (Bowlby, 1969, 1973) and empirical studies. Brummelman and Thomaes (2017) proposed a social-

developmental perspective to understand how children develop self-perception (further discussion please see secrion1.4).

Within attachment theory, it is increasingly acknowledged that, in addition to the primary attachment with parents in childhood, young people can develop a secondary attachment with a variety of different people, such as teachers and peers (Aikins et al., 2009), and in adolescence, the original internal working models established by the attachment with parents will be shaped by the secondary attachment with peers (Nickerson & Nagle, 2005). In adolescence, where interpersonal relationships with peers or close friends become increasingly important (Millings et al., 2012), secondary attachment with peers play a different role from the attachment with parents (Laible et al., 2000). Especially for those having insecure attachment with their parents in childhood, positive and secure secondary attachment with peers may be buffer the previous negative impact of the primary attachment (Armsden et al., 1990). A recent cross-cultural study provided preliminary evidence of the moderating role of secondary attachment with self-selected secondary attachment figures (e.g., siblings, friends) in the association between primary attachment and psychological wellbeing in Pakistani and Scottish young people (Imran et al., 2021). Given that the interpersonal environment change in adolescence from mainly focusing on parents to peers, it is critical to understand the interpersonal relationships in adolescence.

This thesis particularly focuses on positive parenting and peer relationships because family and peers are two critical micro-systems for child development (Bronfenbrenner, 1979). Promoting positive parenting behaviour has been one of the mechanisms for parenting-based programmes to promote young people's mental health, as seen in the triple P-positive parenting programme (Sanders, 1999), and for young people, peer relationships are considered the main interpersonal context. In the following section, I discuss positive parenting, peer difficulties and

friendships. For each variable, I introduce the definition and assessment first and then introduce the relevant theories and empirical studies in young people's depression.

1.3.1 Positive parenting and its association with depressive symptoms in young people

1.3.1.1 Definition and assessment

Seay et al. (2014) defined positive parenting as 'the continual relationship of a parent(s) and a child or children that includes caring, teaching, leading, communicating, and providing for the needs of a child consistently and unconditionally' (p. 207). Although there is a range of parenting measures, only a few measures were supported by psychometric evidence (Hurley et al., 2014). Hurley et al. viewed different questionnaires and found only five questionnaires with comprehensive evidence of psychometric properties. Among these five, the Alabama Parenting Questionnaire (Shelton et al., 1996) is the most appropriate for this thesis because it measured parenting behaviours. Specifically, the Alabama Parenting Questionnaire was developed to assess a series of parenting behaviours, such as positive reinforcement, parental involvement, inconsistent discipline, punishment, and poor monitoring and supervision (Essau et al., 2006).

1.3.1.2 The association between positive parenting and depressive symptoms in adolescents

Numerous studies have provided evidence for the association between parenting and young peoples' depression. The evidence for the impact of negative parenting practice is stronger than the evidence for the impact of positive parenting, with more studies supporting the effect of negative parenting practice on depression in young people. Several review studies have indicated a small but significant longitudinal association between parenting practice and depression in young people. McLeod et al. (2007) found a significant association between parenting behaviour and childhood depression, but the effect sizes of the association regarding different parenting

practices vary. For example, parental rejection had a bigger impact than parental control. The association between parenting style and child depression was supported in a Chinese sample in a systematic literature review (Liu & Merritt, 2018). Clayborne et al. (2020) explored the association between parenting practice in childhood and adolescent depression and found that the majority of studies focused on a certain developmental period (e.g., only childhood or adolescence) rather than exploring the longitudinal association across time (e.g., from childhood to adolescence). Only two studies suggested that positive parenting can predict adolescent depression (Feng et al., 2009; Williams et al., 2016) compared to the negative parenting practice with more evidence supporting the longitudinal association from childhood to adolescence (Clayborne et al., 2020). Specifically, using Avon Longitudinal Study of Parents and Children (ALSPAC) data, William et al. (2016) found that maternal sensitivity to infant crying was negatively associated with adolescents' risk of depression. In a group of girls, childhood parental acceptance was longitudinally associated with lower levels of depressive symptoms in adolescence (Feng et al., 2009).

1.3.1.3 The internal working models based on attachment theory (Ainsworth et al., 2015)

The internal working models (Ainsworth et al., 2015) are considered the theoretical underpinning of the longitudinal association between parenting behaviour and offspring depression. The internal working models are based on the attachment theory (Bowlby, 1969, 1973) and are mental representations related to oneself, significant others, and the interaction between self and others (Ainsworth et al., 2015). Internal working models are established in an infant's early experience with carers (e.g., Thompson, 2008). They also guide children in interacting with their social world (e.g., interactions with peers) and build internal self-systems, such as, self-esteem (Pietromonaco & Barrett, 2000). Specifically, warm and responsive

parenting behaviour helps children to establish a secure attachment with caregivers, and children with secure attachments are more likely to develop positive internal working models of self and others. This means those children tend to accept themselves and consider themselves as worthwhile and see others as available to them. Securely attached children enjoy closeness and intimacy in social relationships and experience fewer mental health problems. In contrast, inadequate parenting practices lead to insecure attachment of children with their caregivers, and these children tend to develop negative internal working models of self and others. This means these children tend to criticise themselves, think they are unworthy and believe others are not available to them. Insecurely attached children may withdraw from social relationships and suffer from depressive symptoms (detail discussion can be reviewed in Pietromonaco & Barret, 2000).

Although attachment theory provides a strong base for the association between parenting style and depression, most of the research is cross-sectional or focused on a certain developmental period, such as adolescence (Clayborne et al., 2020), which is not in line with internal working models. It is not clear if the internal working model formed in early childhood still impacts adolescent development. Therefore, it is important to understand such an association across childhood and adolescence.

1.3.2 Peer relation difficulties

1.3.2.1 Definition and assessment

Peer relationship difficulties include peer rejection, peer neglect, the absence of friendship, reputation in the peer group, and peer group affiliations (Malik & Furman, 1993). I used the strengths and difficulties questionnaire (Goodman, 1997) in one study of this thesis because of the

instability of assessment in friendships (for further discussion of this, please see 1.3.3.1 and Chapter 5). In the strengths and difficulties questionnaire, there are 5 items to assess peer difficulties. It can be used as a self-report or teacher/parent report. Previous research provides preliminary evidence of its reliability and factor structure (Goodman, 2001).

1.3.2.2 The association between peer difficulties and depressive symptoms

There is a positive association between peer difficulties and depressive symptoms. A meta-analysis (Reijntjes et al., 2010) of 18 longitudinal studies found that peer victimisation can predict internalising problems in children, and internalising problems can predict peer victimisation. Kochel et al. (2012) reviewed three possible models to explain the association between poor relations and depressive symptoms: an interpersonal risk model in which poor peer relations contribute to depressive symptoms (Patterson & Capaldi, 1990), a symptom-driven model in which depressive symptoms erode peer relations (Nolen-Hoeksema et al., 1992; Rudolph, 2009), and which is consistent with the Scar model explaining the association between depressive symptoms and low self-esteem. Finally, a transactional model that peer relations and depressive symptoms are reciprocally related (Rudolph, 2017; Rudolph et al., 2008).

There are empirical studies supporting different models of the association between peer relations and depression. In support of the interpersonal risk model, Forrest et al. (2018) used the Millennium Cohort Study and found that teacher-reported peer difficulties at age seven predicted children's emotional difficulties at age 14. However, Sentse et al. (2017) found evidence supporting the symptom-driven model that child-reported depression predicted peer rejection in a large sample of Finnish adolescents age 14 years old to 16 years old. Similar findings came from Kochel et al. (2012) that peer victimisation predicted depressive symptoms in children from age ten years old to twelve years old with three-time-point assessments over time. Furthermore,

Yang et al. (2020) found in a group of Chinese adolescents age 11 to 14 years old that the longitudinal association between peer rejection and depressive symptoms supported the symptom-driven model. In contrast, the longitudinal association between peer acceptance and depressive symptoms is bi-directional, supporting the transactional model (Yang et al., 2020). Burke et al. (2017) conducted a two-year longitudinal study with four assessments over time in a group of Swiss adolescents (mean age 13.2 years old at the start). They found that the longitudinal association between peer victimisation and depressive symptoms was bidirectional.

1.3.2.3 Interpersonal model of youth depression (Rudolph et al., 2008)

The interpersonal model of youth depression is a hypothesised developmental model to explain the association between interpersonal factors and depression (Rudolph et al., 2008). There are three interpersonal components related to youth depression: early family disruption; social-behavioural deficits; and relationship disruptions. Early family disruption describes risk factors related to families in the early years of a child's life, such as insecure attachment between parents and child and parental depression. Social-behavioural deficits represent some problematic behaviours across social contexts, such as interacting with peers (e.g., aggressive behaviour), parents (e.g., excessively arguing with parents) or a maladaptive response to interpersonal interaction (e.g., social withdrawal). More specifically, depressed youth tend to engage less in interpersonal interaction (showing fewer social behaviours). Relationship disruptions indicate poor interpersonal relationship qualities, such as poor friendship qualities and conflicts with parents.

An early family disruption could cause later interpersonal dysfunction such as social-behavioural deficits and relationship disruptions, and childhood social-behavioural deficits tend to result in relationship disruptions. Altogether, these could be risk factors that contribute to later

depression (e.g., late childhood or adolescence). However, depression in young people also worsens interpersonal dysfunction. The theory of the interpersonal model indicates that in the development of depression, gender and some variables related to personality could play a moderating role. The interpersonal model of youth depression is in line with the transactional model in that the association between interpersonal relationships and youth depression is bidirectional.

The interpersonal model of youth depression (Rudolph et al., 2008) is the first well-rounded framework to understand youth depression in an interpersonal context. However, some research only replicates the interpersonal risk model or the symptom-driven model. The potential reasons may be different foci on developmental stages. The interpersonal model of youth depression describes the association between interpersonal relationships, social ability and depression from a long-term developmental perspective from early childhood to adolescence. However, most empirical studies only focus on a short period (e.g., three to five years). A longer follow-up study may support the model. Further evidence from a meta-analysis of 18 longitudinal studies supported the bidirectional association between peer victimisation and internalising problems (Reijntjes et al., 2010). Depressive symptoms can be considered as one form of internalising problems in children and adolescents (Brumariu & Kerns, 2010). Therefore, the association between peer difficulties and depression should be further investigated in a long-term longitudinal study with multiple waves.

1.3.3 Friendships

1.3.3.1 Definition

Friendships are vital for children's social development and emotional growth (Berndt, 2002; Newcomb & Bagwell, 1995). Although friendships are a form of interpersonal relationship, they are different from peer relationships as many studies indicate that friendships are closer reciprocal relations, but peer relationships are defined as a general interaction with peers (Gifford-Smith & Brownell, 2003; Newcomb & Bagwell, 1995).

Friendships are a multifaceted concept, and Gifford-Smith (2003) stated that friendships are voluntary, intimate, dynamic relationships founded on cooperation and trust' (p248). Berndt (2002) defined a high-quality friendship as 'high levels of prosocial behaviour, intimacy, and other positive features, and low levels of conflicts, rivalry, and other negative features' (p7). Friendships were also defined from three perspectives: positive qualities such as intimacy, negative qualities such as conflict, and the number of friends a child has (Schwartz-Mette et al., 2020). Some researchers have argued that it is hard to define friendships because children's friendships are not stable over time (Gifford-Smith & Brownell, 2003).

Social development may be one reason for the changeable nature of friendships in children (Poulin & Chan, 2010). Also, different needs of friendships appear at different developmental periods, such as companionship in childhood and intimacy in early adolescence(Sullivan, 2013). Overall, Poulin and Chan (2010) stated that it is common for young people's friendships to be unstable.

1.3.3.2 Assessment

Furman (1998) reviewed a series of questionnaires and interview measures of friendships. In this thesis, the interview measures were not used. Questionnaire measures are the main focus, such as the network of relationships inventory (Furman & Buhrmester, 2010) and friendship quality questionnaire (Parker & Asher, 1993), and the Cambridge Hormones and Moods project friendship

questionnaire (Goodyer et al., 1989). Although these questionnaires were all designed to assess friendships, they have different constructs and scoring.

The network of relationships inventory (Furman and Buhrmester, 2010) has three versions based on different concepts to assess different perspectives of relationships: Social Provisions Version based on social needs and social provision (Furman & Buhrmester, 1985); Behavioural Systems Version based on the integration of attachment theory (Furman & Wehner, 1994); and the Relationship Qualities Version based on both positive and negative relationship features (Buhrmester & Furman, 2008). The network of relationships inventory can be used to assess different types of relationships with parents and friends. The friendships quality questionnaire (Parker & Asher, 1993) was designed to measure the friendship quality of children's best friends. The questionnaire has several dimensions, including positive friendship qualities such as intimate exchange and companionship and recreation and negative friendship qualities such as conflict and betrayal. Goodyer et al.'s (1989) questionnaire assesses general friendships and includes five items for measurement: numbers of friends; understanding from friends; seeing friends; disclosure with friends; and friendship satisfaction.

For the scoring questionnaire, I will focus on the Cambridge Hormones and Moods project friendship questionnaire (Goodyer et al., 1989) and the network of relationships inventory (Furman and Buhrmester, 2010) because I used these two questionnaires in my thesis. Based on the scoring recommendations (Goodyer et al., 1989), a higher score means high friendship difficulties in the Cambridge Hormones and Moods project friendship questionnaire. It was only used as a total score based on my knowledge. However, different researchers used different methods to score the network of relationships inventory (Furman & Buhrmester, 2010). For example, the individual dimension of the network of relationships inventory can be used in the study (Furman &

Buhrmester, 2010). Besides, some researchers used a sum of negative dimensions to measure negative quality friendships and a sum of positive dimensions to measure positive quality friendships (La Greca & Harrison, 2005).

Different ways of scoring friendship questionnaires may be due to the challenge of defining friendships. Although Berndt (2002) stated that even best friendships have negative features, this definition (Berndt, 2002) does not separately define positive friendship quality and negative friendship quality. Goodyer et al. (1989) agree with Berndt (2002) and do not separate friendships' different perspectives. However, the method of scoring the network of relationships inventory illustrated the multidimensional nature of the concept. Due to the changing nature of friendships over time, it is critical to understand the factor structure of questionnaires when assessing friendships.

1.3.3.3 The association between friendships and depressive symptoms

There is evidence for a significant association between friendships and depressive symptoms. Recent meta-analyses (Schwartz-Mette et al., 2020) indicated a small but significant effect size between depression and friendships in children and adolescents from three perspectives: the number of friends, positive friendship quality, and negative friendship quality. It also found that negative friendship quality has a bigger effect size on adolescent depression compared to positive friendship quality. Several empirical studies have found different roles for positive friendship quality and negative friendship quality. A cross-sectional study found that negative friendship quality was associated with depressive symptoms, but positive friendship quality was not associated with depressive symptoms (La Greca & Harrison, 2005). A longitudinal study (Yang et al., 2020) found that negative friendship quality (i.e., conflicts with friends) was associated with depressive symptoms consistently from late childhood to middle adolescence (11.5 years old to

14.5 years old). Positive friendship quality (i.e., support from friends) did not associate with depressive symptoms in children from 11.5 to 13.5 years old, but from 13.5 years to 14.5 years old, support from friends predicted depressive symptoms and depressive symptoms longitudinally predicted support from friends, which means a bidirectional association from 13.5 years to 14.5 years. These findings indicated that it might be better to assess negative and positive qualities separately because they showed different roles of friendship quality in depressive symptoms.

As with the association between peer relationships and depressive symptoms, there are three different hypotheses regarding the association between friendships and depression. First, the interpersonal risk model (Patterson & Capaldi, 1990) states that poor friendship quality contributes to later depressive symptoms. In contrast, similar to the symptom-driven model (Rudolph, 2009), depressive symptoms impair friendship quality. Further, the association between friendship and depressive symptoms is hypothesised to be reciprocal (Rudolph et al., 2008). Cohen et al. (2015) found that conflicts with friends were longitudinally associated with depressive symptoms, which supports the interpersonal risk model. Similarly, Bremdgen et al. (2013) found that positive friendship quality was associated with fewer depressive symptoms in a group of genetically vulnerable children from depression. In contrast, Oppenheimer and Hankin (2011) supported the symptom-driven model that depressive symptoms predict higher levels of negative friendship quality and lower levels of positive friendship quality. Burke et al. (2017) found that the association between friend support and depressive symptoms was bidirectional, which supports the transactional model.

Although the hypothesised models are similar to the models explaining associations between peer difficulties and depressive symptoms, the findings related to the association between friendships and depressive symptoms are mixed. Some of the findings do not fit in any of the

models outlined here. Several studies found a positive association between friendship qualities and depressive symptoms. Miller et al. (2014) found that positive friendship quality (companionship, intimacy, and satisfaction) at the age of 16 positively associated with adolescent suicidal ideation at age 18. On the other hand, a cross-sectional study found no association between positive friendship quality and depressive symptoms (La Greca & Harrison, 2005) Similarly, Dykstra et al. (2020) did not find a association between friendship quality and depressive symptoms in a group of children aged from 8 to 15 years old.

Although friendships and peer difficulties are different concepts, their hypothesised models are similar. However, there are no consistent findings or robust conclusions regarding the association between interpersonal relationships with peer and depressive symptoms in young people. With these gaps, longitudinal studies across different developmental stages that involve the variables related to peer difficulties and friendships are needed.

1.4 Relationships between self-perception and social factors

The next section focuses on the association between self-perception and relevant social factors to establish an understanding of the developmental pathway of adolescent depressive symptoms involving both self-related and social-related variables.

1.4.1 Association between self-perception and social factors from the social-developmental perspective

It is established from the internal working models from attachment theory (Ainsworth et al., 2015)that children form their self-perception (self-esteem and self-compassion) from social relationships and their social environment (Brummelman & Thomaes, 2017).

1.4.1.1 The theoretical assumption for self-esteem and empirical studies

Harter (2012) theorised how parenting and peers shape children's self-esteem based on attachment theory. In early childhood, parenting behaviours, such as parental support, sensitivity, consistency and encouragement of exploration, can promote young children's self-esteem because parents or carers behaviour facilitates children's use of certain behaviours to develop skills and competencies. This can be an important predictor of self-esteem. As they develop, children start to anticipate the reactions of parents and carers, and they can incorporate rules of behaviour which would become more internalised personal standards. This self-regulation development can promote positive self-evaluation. From middle childhood, children tend to learn about themselves via comparison with peers.

Some research supports the social origin assumption of self-perception development that parenting forms self-esteem. Harris et al. (2017) found that parenting behaviour such as support predicted self-esteem development. A longitudinal study of Mexican-origin American families of children aged 10 to 16 found that warmth and monitoring predict adolescent self-esteem (Krauss et al., 2020) This also highlighted the importance of the family environment during late childhood to middle adolescence on self-esteem development. Furthermore, there is accumulating evidence supporting peer effects on self-esteem development. An experimental study in children aged 9-10 years old found that children's self-evaluation is more likely to be impacted by how their peers perform (Lapan & Boseovski, 2017). This suggests that children aged 9-10 can use social comparison to shape their self-evaluation. A review indicated that children suffering from peer victimisation tend to have lower self-esteem (Tsaousis, 2016). Children who report closer friendship relations tend to have higher levels of self-esteem (Bishop & Inderbitzen, 1995)

1.4.1.2 Theoretical assumption for self-compassion and empirical studies

Researchers have argued that self-compassion is rooted in early family experience (Neff & McGeehee, 2010), and further evidence linked attachment with individual differences in self-compassion in healthy (Pepping et al., 2015) and clinical populations (Mackintosh et al., 2018).

There is an evolutionary and bio-psychosocial model for explaining how shame and self-criticism develop (Gilbert & Irons, 2009), which can help us understand how individuals develop a low level of self-compassion. Early attachment and a sense of group belonging are innate motivators for human beings. The positive affect of others (providing secure attachment and feelings of belonging) is necessary for development, especially for cognitive competencies, which is important for self-evaluation. Human beings live in cultural and social contexts. These contexts can be toxic, with criticism and negative emotion expressed from family and bullying, and discrimination from family and others. These negative external experiences activate shame and self-criticism, which leads to low self-compassion.

Preliminary findings support the association between parenting and self-compassion. Higher levels of self-compassion were associated with higher maternal warmth (Temel & Atalay, 2018), parental acceptance, consistent discipline and less rejection (Marquez, 2017). Low levels of self-compassion were associated with parental rejection, overprotection, low parental warmth (Pepping et al., 2015) and parental indifference (Westphal et al., 2016). Kelly and Dupasquier (2016) found that recalled parental warmth was positively correlated with self-compassion, and recalled parental overprotection was negatively correlated with self-compassion. As for peer relationships, a very limited study explored how peer relationships play a role in forming self-compassion. Adolescents who experienced more types of victimisation, such as child maltreatment, internet victimisation and sexual victimisation, were likely to have a lower level of self-compassion (Játiva & Cerezo, 2014). Self-compassion mediates the association between

victimisation and psychological adjustment (Játiva & Cerezo, 2014). However, this study is cross-sectional.

1.4.2 The facilitating effect of self on peer relationships

Self-perception may influence children's social relationships. The self-verification theory (Swann Jr, 2011; Swann Jr & Read, 1981) explains how one's self-perception guides their behaviour. Individuals are more like to get along with people whose opinion about them is consistent with their own self-perception. This tendency influences their social interactions, and they behave in ways that are meant to seek approval from others. For example, if an individual thinks they are helpful, they show more prosocial behaviour, which leads others to think they are helpful. However, most of the empirical evidence for this theory is from adults (Harris & Orth, 2020). Marshall et al. (2014) conducted a 4-year longitudinal study in adolescents to explore the association between self-esteem and social support, and they found evidence supporting that self-esteem promote social support rather than the other direction.

Gilbert's model of the development of adolescent self-criticism or shame (Gilbert & Irons, 2009) states that individuals with a high level of external shame are more likely to be rejected by the community. Toxic social contexts and external shame interact with each other. Once individuals developed shame within a poisonous context, they were more likely to be devalued and criticised, avoided or even rejected by others. Furthermore, the tripartite model of affect regulation (Gilbert, 2005) indicates that, except for alleviating pain, the soothing system which is activated when individuals are in a state of self-compassion can also enhance social connectedness. There are limited empirical findings that support this assumption in adolescents. More evidence is available from adult samples, especially for general social functioning. Self-compassion is associated with better coping with conflicts (Yarnell & Neff, 2013), a higher level

of relationship satisfaction and dyadic adjustment (Jacobson et al., 2018). More evidence supports this: positive relationship behaviour in romantic relationships (Neff & Beretvas, 2013), higher levels of interpersonal competence in adults who have experienced trauma (Bistricky et al., 2017), higher levels of empathy, such as more perspective-taking, less personal distress, more empathetic concern and forgiveness in adults (Neff & Pommier, 2013), positive relationship maintenance in women and men who have higher levels of conscientiousness(Baker & McNulty, 2011), and finally, increased helping behaviours (Lindsay & Creswell, 2014).

With adolescents, self-compassion was negatively associated with peer victimisation, and self-compassion buffered the positive association between peer victimisation and non-suicidal self-injury (Jiang et al., 2016); Self-compassion was also positively related to peer reported pro-social behaviour in high school adolescents (Marshall et al., 2020), interpersonal competence (Bistricky et al., 2017), and interpersonal forgiveness (Barcaccia et al., 2019). A recent longitudinal study found self-compassion plays a role in promoting prosocial behaviour and gratitude in Chinese adolescents (Yang et al., 2021)

It should be noted that the majority of the studies in self-compassion are cross-sectional, and limited studies used an experimental design. Although there are theoretical assumptions for the facilitating effect of self-compassion and self-esteem in interpersonal relationships, current evidence is not strong enough to support this assertion. The evidence is mainly for general social functioning or social ability. Limited research explores interpersonal relationships, such as peer difficulties or friendships.

1.5 Multifactorial model of depressive symptoms in young people

Based on the theories and empirical studies reviewed, I proposed a multifactorial model of depressive symptoms in young people that included self-perception and social factors (Figure 1). This model posits that early parenting practices exert influence on self-perception and peer relationships and play a direct role in depressive symptoms. Depressive symptoms could also negatively influence self-perception and social relationships with more peer difficulties and poor friendships. The model accounts for early parenting behaviour and peer relations playing an important role in developing self-perception (e.g., self-esteem and self-compassion) and indicating that self-perception can impact peer relationships.

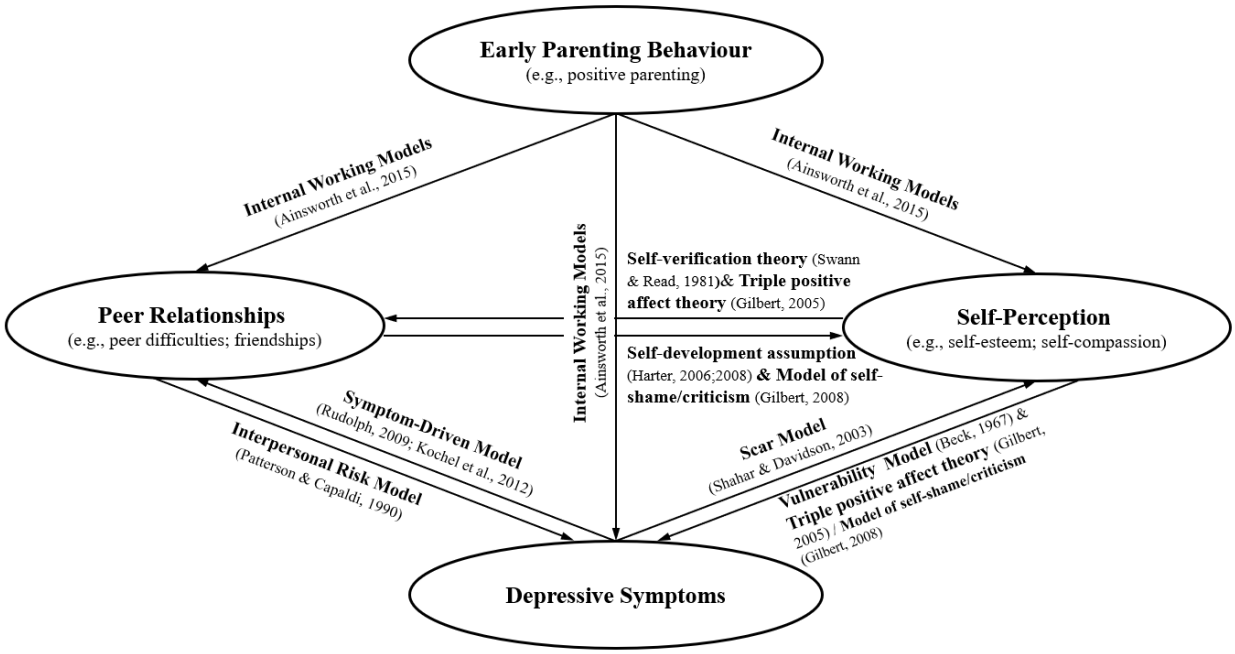

Figure 1. Multifactorial model of depressive symptoms in young people

Note. Based on the literature, children's depressive symptoms can also shape parenting practice, but I focus on early parenting behaviour in this thesis. Both studies in the thesis only assessed parenting at one-time point. Thus, the pathway from depressive symptoms to parenting practice was not hypothesised in the figure.

There are several specific, testable developmental pathways in the hypothesised model. First, through facilitating positive internal working models of self and others as postulated in attachment theory (Ainsworth et al., 2015), early positive parenting behaviour can predict fewer peer difficulties, better friendships, high self-esteem and self-compassion, and fewer depressive symptoms. Second, problematic peer relationships and unhealthy self-perception can be risk factors for depressive symptoms based on the interpersonal risk model (Patterson & Capaldi, 1990), the Vulnerability Model (Beck, 1967) and the tripartite model of affect regulation (Gilbert, 2005).

Two developmental pathways from early parenting behaviour to depressive symptoms through the mediation by peer relationships and by self-perception can be hypothesised. Conversely, depressive symptoms (early-onset depressive symptoms in childhood) can have an erosion effect on psychosocial factors leading to greater peer difficulties and poor friendships as postulated in the Symptom-Driven Model (Rudolph, 2009; Kochel et al., 2012) and to low self-esteem and low self-compassion as proposed in the Scar Model. The model proposed in my thesis allows for reciprocal relationships between psychosocial factors and depressive symptoms in which psychosocial factors are risk factors for depressive symptoms. Conversely, depressive symptoms erode psychosocial functioning.

Finally, the association between peer relationships and self-perception may also be reciprocal (Krauss et al., 2020). In line with Harter (2012) and Gilbert and Irons (2009)'s theoretical assumptions, peer relationships, and social comparison play an important role in the development of self-esteem and self-compassion, which agrees with the social origin self-development assumption (Brummelman & Thomaes, 2017). Other theories also indicate the

impact of self-perception on social relationships, such as the self-verification theory (Swann Jr & Read, 1981) and triple-positive affect theory (Gilbert, 2005).

1.6 Considering cultural difference in the development of adolescent depression

The multifactorial developmental pathway model of depression outlined above can be generalised across cultures because the evidence supporting the role of self-evaluation and social relationships in adolescent depression is increasing worldwide. For example, self-perception and social factors have been linked to depressive symptoms in Chinese young people. Low self-esteem from age 10 to 12 is a risk factor for depressive symptoms at age 13 in a Chinese sample (Leung et al., 2018). Peer problems and friendships play a role in adolescent depressive symptoms from age 11 to 14 years (Yang et al., 2020). However, it is vital to consider potential cultural differences when discussing adolescent depression because culture shapes identity and impacts emotional and social development in adolescence (Gibbons & Poelker, 2019). Compared to the research of cultural differences in adult samples, existing research on cultural differences in the development of youth depression to date is scarce, although there is an increasing understanding that cultural differences can be important when understanding mental health (Bass et al., 2007). The impact of cultural differences in self-construal, defined as how one thinks about oneself and others on the psychological processes (Markus & Kitayama, 1991), has been hypothesised and examined for other mental health conditions such as posttraumatic stress disorder (Bernardi & Jobson, 2019; Jobson, 2009).

In this section, I will first introduce an influential theory for understanding cultural differences in our understanding of self and others, the self-construal theory (Markus & Kitayama, 1991). Then, I will review existing cross-cultural research about psychosocial factors in adolescent depression and provide a rationale for studying cultural differences in my thesis.

1.6.1 Self-Construal Theory and Individualism vs Collectivism

The self-construal theory (Markus & Kitayama, 1991) is a framework used to understand the differences in relationships between self and others. The theory defines two self-construals, interdependent and independent (Markus and Kitayama, 1991). Individuals with a high level of independent self-construal define themselves as autonomous from others, social contexts and relationships and are more likely to be driven by a desire to be unique. Individuals consider social relationships mainly as a source of social comparison which can be used to validate or confirm their beliefs about the inner self. Markus and Kitayama (1991) state that an independent self-construal is more common in western cultures, such as the USA. In contrast, individuals with a high level of interdependent self-construal are more likely to define themselves by social relationships or social context and think that individuals are inseparable from others and social contexts. Their internal self is driven by how well they fit in or connect with others or in social contexts. Markus and Kitayama (1991) particularly mentioned that an interdependent self is common in mainland China.

Individualism and collectivism are also one of the cultural dimensions from Hofstede's cultural theory (Hofstede, 2011). Hofstede states that individualism and collectivism describe the integrations of individuals into groups. In individualist cultures, people tend to have loose social connectedness with others and predominantly care about themselves and their small families or close relationships. In contrast, individuals in collectivist cultures are more likely to develop stronger social connectedness with others to create cohesive, smaller groups and to integrate themselves with broader groups, such as extended families.

The terms independent or interdependent are normally used to describe individuals, whereas individualism and collectivism are used to describe cultures. Although Markus and Kitayama

(1991) did not explicitly link independent self-construal and interdependent self-construal with individualism and collectivism, it can be assumed that independent and interdependent self-construal correspond with individualist and collectivist cultures, respectively (Cross et al., 2011). This suggests that independent self-construal is predominantly observed in an individualistic culture, and interdependent self-construal is predominantly observed in a collectivist culture.

1.6.2 Cultural differences in the role of self-perception for adolescent depressive symptoms

According to the self-construal theory, self-related variables would play a greater role in depressive symptoms in an individualist culture than in a collectivist culture. Some evidence supports this hypothesis. Choi and Choi (2016) found that the indirect effect of self-esteem from body dissatisfaction on depressed mood is bigger in adolescents from the USA than in Korean adolescents, indicating that the mediating role of self-esteem was stronger in an individualistic culture. Similarly, Chen et al. (2006) found that self-efficacy was more important in explaining depressive symptoms in young people from the USA than in young people from Hong Kong.

Some findings do not align with this assumption. Farruggia et al. (2004) conducted a cross-cultural study that explored cultural differences in the association between self-esteem and depressive mood in adolescents from two individualistic cultures (the USA and the Czech Republic) and two collectivistic cultures (China and South Korea). They found that the regression coefficient from positive self-image to depressive mood was larger in the USA and Korean samples than in the Czech and Chinese samples. As for the association between negative self-image and depressive symptoms, the coefficient was larger in the Czech and Chinese samples than in the USA and Korean samples. Their findings relating to the role of the positive self-image in depressive symptoms in the USA and Chinese sample was in line with self-construal theory, but the findings in the Czech and Korean samples were not. Whilst these

surprising results may be due to methodological issues (the use of a different factor structure of self-esteem by separating positive and negative self-image), the study highlights inconsistent evidence for cultural differences in the role of self-related variables for adolescent depression.

Similarly, there is limited research related to cultural differences in the role of self-compassion in depressive symptoms in adolescents. Yamaguchi et al. (2014) found no cultural difference between Japanese and American college students regarding the role of self-compassion in depressive symptoms. Neff et al. (2008) examined cultural differences in the association between self-compassion and depression across Thailand, Taiwan, and the USA among college students. Whilst they found differences in the overall levels of self-compassion reported, they did not find a significant cultural difference in the correlation between self-compassion and depression. With results indicating no cultural differences regarding the association between self-compassion and depression, this study is also at odds with the self-construal theory. However, the interpretation of the findings on the cross-cultural research in self-compassion should be cautious because the known issue with measurement invariance of self-compassion has been previously raised for Japanese and Chinese samples (Tóth-Király & Neff, 2020). Understanding measurement invariance is an important prerequisite when assessing differential associations between variables across different groups (Chen, 2008). Several studies did not indicate measurement invariance, such as Choi and Choi's (2016) research only checking the measurement invariance of self-esteem, not for the variables in the associations. Previous research highlights the importance of exploring and establishing measurement invariance in cross-cultural research; otherwise, the findings related to cultural differences may be biased (Chen, 2008). Given that none of the self-compassion studies supported the theory and there is a

lack of consideration of measurement invariance for self-compassion, cultural differences in the role of self-compassion in adolescent depression should be further examined.

1.6.3 Cultural differences in the role of social factors in adolescent depressive symptoms

Following the self-construal theory, social factors (parenting, peer relations, and friendships) can be hypothesised to have a more important effect on depressive symptoms in individuals from collectivist as compared to individualist cultures.

Some empirical evidence supported this hypothesis. Greenberger et al. (2000) found that the role of family relationship quality is more important in Chinese adolescents than in American adolescents. Dekovic et al. (2002) found that peer relations are more important in adolescents' wellbeing in Japan than in the Netherlands. Abe (2004) also found that family cohesion accounted for more variance in explaining university students' emotional distress in a Japanese sample than in a US sample.

Some findings are not consistent with the hypothesis or the theory. Peers were found to be more important for adolescents' life satisfaction in individualist cultures than collectivist cultures in 11 countries (Schwarz et al., 2012). Chen et al. (2006) did not find cultural differences in the role of peer harmony and family harmony in adolescents' depressive symptoms in the USA and Hong Kong.

In addition to measurement invariance, the inconsistent findings regarding cultural differences in interpersonal relationships may also be due to an individualist culture having an ambivalent attitude towards close relationships, such as with parents and friends (Oyserman et al. 2002). Although individualist cultures value personal values (Markus and Kitayama 1991), individuals benefit from having social support and can achieve personal goals via close relationships, which is consistent with the core of individualist culture (Oyserman et al. 2002).

Therefore, cultural differences in interpersonal relationships in adolescent depression require further exploration.

1.7 Current thesis

In summary, self-perception and social factors have been linked to adolescent depression. However, I have identified several specific gaps and limitations in the current literature:

1. There is a debate about the definition of self-compassion and the construct of self-compassion, especially in China
2. Limited studies directly explore the cross-sectional or longitudinal association between self-perception and social factors in adolescent depression. Most of the research has focused on either self-perception or social factors.
3. The majority of the evidence regarding the psychosocial factors in youth depression is from cross-sectional studies, and only limited research has explored the longitudinal association.
4. In some longitudinal and cross-cultural studies, the measurement invariance of the variables was not established or clarified.
5. Scales or questionnaires used in adolescent depression research may suffer from measurement errors. The measurements used in research are tailored or shortened for adolescents, and this sometimes lacks evidence for psychometric properties.
6. Limited theories explain how self-perception and social factors contribute to depression in young people from a developmental perspective through the lens of culture.

Therefore, I examine psychosocial factors (parenting, friendship, peer difficulties, self-compassion and self-esteem) related to depressive symptoms in young people and test the proposed

hypothesised developmental pathway model (Figure 1). Based on the theory and previous study findings reviewed in the theoretical background, I conducted four studies to address the gaps that exist.

I used mixed methods to explore the measurement construct of self-compassion in the Chinese sample from a cultural perspective in Study 1 and Study 2.

In Study 1, I explored the measurement construct of self-compassion in Chinese young adults using confirmatory factor analyses (CFA) and exploratory structural equation modelling (ESEM), which was recently recommended for examining the factor structure of the SCS (Neff et al., 2019). This study aims to provide psychometric evidence of the validity and reliability of the Chinese version of the SCS, which was used in a subsequent cross-cultural study in depressive symptoms in adolescents between the UK and China.

For Study 2, to understand the inconsistent factor structure of self-compassion in Chinese samples in Study 1, I used qualitative methods (focus group discussions) to explore how the Chinese sample understands self-compassion with a cultural lens, and it provided preliminary evidence of a cultural difference in self-compassion for the subsequent cross-cultural study.

Study 3 and Study 4 examined the hypothesised pathway in adolescents outlined in Figure 1. Study 3 is a cross-cultural study to provide preliminary cross-sectional evidence, and study 4 replicates the developmental pathway of depressive symptoms in young people in a longitudinal dataset. Structural equation modelling with measurement constructs that were examined and supported by CFA was used in both Study 3 and Study 4 to analyse data to address the measurement errors.

For Study 3, I explored the association between psychosocial factors, such as positive parenting, self-compassion and friendship, and adolescent depressive symptoms in the UK and China. My hypotheses, based on the literature, are that positive parenting cultivates adolescent's self-compassion, and adolescents with a higher level of self-compassion tend to have fewer depressive symptoms via using support from a best friend. Also, based on the self-construal theory (Markus & Kitayama, 1991), self-compassion would explain more variance in the association with depressive symptoms in the UK sample than in the Chinese sample. Parenting and friendships would explain more variance in the association with depressive symptoms in the Chinese sample than in the UK sample.

In Study 4, I explored the longitudinal association between parenting, self-esteem, self-compassion-based self-concept, friendship, peer difficulties and depression using ALSPAC in children and young people from 3 to 17 years old. I provide longitudinal evidence for psychosocial factors in the development of depressive symptoms; particularly, I aim to address the unclear findings from Study 3 and the previous literature.

(1) How is friendship associated with depressive symptoms?

(2) How is self-perception associated with peer difficulties and friendships?

(3) Is there longitudinal evidence supporting the proposed model in Figure 1?

2 Self-Compassion in Chinese Young Adults (Study 1)

Self-Compassion in Chinese Young Adults: Its Measurement and Measurement Construct*

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Candidate's contribution to the manuscripts
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*Due to the complexity of the topic, I felt it was better to report our findings in two separate but related manuscripts rather than skim over detail in a single manuscript. Because our work used a mixed-methods approach to explore the construct of self-compassion, it would make sense to be put together as a pair in review.

2.1 Abstract

Objectives Previous inconsistent psychometric findings of the Self-Compassion Scale – Chinese version's (SCS-C) psychometric properties impede cross-cultural research. This study aimed to explore the factor structure of SCS-C. **Methods** Two young adult Chinese samples were recruited [Sample 1, N = 465, 141 males, Mean age (M_{age}) = 20.26; Sample 2, N = 392, 71 males; M_{age} = 18.97]. Confirmatory Factor Analyses (CFA) and Exploratory Structural Equation Modeling (ESEM) were used to examine previously reported four-and six-factor structures of SCS-C. **Results** Although ESEM supported the six-factor structure when problematic items were omitted, stronger evidence for a novel four-factor structure of the SCS-C was revealed with self-kindness, common humanity, mindfulness and uncompassionate self-responding. This suggests that Chinese individuals have a different understanding of the negative components than conceptualized in the original self-compassion definition based on the US and other mostly Western samples. Omega coefficients of the bifactor models suggested that it is not appropriate to use the SCS total score in Chinese samples. However, high factor determinacy and construct replicability indicated that the general factor of SCS-C could be used in a structural equation modelling context for both four-factor and six-factor structures. **Conclusions** When using the existing SCS-C in path models, researchers are advised to use a latent variable approach and establish the measurement construct rather than sum scores of the scale or subscales without checking the factor structure in future empirical studies. Also, the SCS-C needs to be revised, and we proposed ways forward for future research.

Keywords Self-Compassion Scale, Chinese Version, Factor Analysis, Exploratory Structural Equation Modeling, Bifactor Model

2.2 Introduction

Self-compassion means being kind to oneself when facing difficulties (Neff, 2003). According to the predominant definition, self-compassion is defined as a multidimensional construct about the way we relate to ourselves when facing challenges or our inadequacies (Neff, 2003, 2016). Individuals can meet these with compassion, kindness and understanding (self-kindness) rather than harshly judging or blaming oneself (self-judgment). Additionally, individuals understand their difficulties, failure or inadequacies as a shared experience with other human beings (common humanity) rather than feeling the difficulties only happened to themselves (isolation). Furthermore, to process a difficult situation, individuals use a mindful and balanced way (mindfulness) rather than carried away by their emotions (over-identification).

Although the concept of self-compassion is rooted in Ancient Buddhist tradition (Neff, 2003), only in the last two decades has predominantly Western academic psychology explored its role as a protective factor for mental health. This research has demonstrated a positive association between self-compassion and mental wellbeing in both adolescents (Marsh et al., 2018) and adults (Zessin et al., 2015). Self-compassion can be cultivated using psychological interventions for healthy individuals and clinical patients (Germer & Neff, 2013). Additionally, self-compassion has been positively associated with social functioning, such as increased interpersonal trust and social support provision (Crocker & Canevello, 2008) and better relationship conflict solving(Yarnell & Neff, 2013).

Not surprisingly, research into self-compassion has increased in China over the last decade. For example, cross-cultural studies revealed higher levels of self-compassion in Americans compared to Taiwanese participants (Neff et al., 2008) and larger negative associations between self-compassion and depressive symptoms in the UK compared to Chinese adolescents (Zhao et

al., submitted). Other research has replicated positive associations between self-compassion and mental health, such as less non-suicidal self-injury behaviour in Chinese adolescences (Jiang et al., 2017a; Jiang et al., 2017b), higher life satisfaction (Yang et al., 2016), lower depressive symptom and higher positive qualities of friendships in youth (Zhao et al., submitted) and higher relationship harmony in young adults (Yang, 2016). Although this research substantially contributed to the understanding of self-compassion in the Chinese culture, emerging psychometric findings (Neff et al., 2019; Tsai, 2015; Zeng et al., 2016) raise some issues about the measurement and potentially the cross-cultural conceptualisation of the construct (Zhao et al., submitted).

To date, the Self-Compassion Scale (SCS, Neff, 2003) has been the most widely used measure in research related to self-compassion and has been translated into nineteen different languages (Neff et al., 2019). The SCS has six subscales: self-kindness, self-judgment, common humanity, isolation, mindfulness and overidentification (Neff, 2003; Neff et al., 2019). The scale was originally designed to assess self-compassion as a total score or separate scores of the six subscales (Neff et al., 2019). However, there has been a lively scientific debate about the factor structure and scoring of the SCS.

For the original English version and various translations, confirmatory factor analysis (CFA) studies supported the proposed six-factor structure where the subscales described above are intercorrelated (the six-factor correlated model) or load onto a single factor self-compassion (the higher-order model) (Neff et al., 2019). Hence scoring suggestions for the SCS as one global factor or six sub-scores have been most widely used to date (Neff et al., 2019). Alternative research has proposed two general factor scores for the SCS with its three positive (self-kindness, common humanity, and mindfulness) and three negative (self-judgment, isolation, and

overidentification) subscales rather than one global factor (Halamová et al., 2020). This way to score the SCS has been theoretically associated with social mentalities theory, which postulates that in addition to a safeness system (self-compassion), there is a functionally separate threat-defence system that, when activated, leads us to treat ourselves with self-criticism (Brenner et al., 2017; Gilbert, 2005). Psychometric support has been obtained for a factor 'compassionate self-responding' (including self-kindness, common humanity, and mindfulness) and a factor 'uncompassionate self-responding' (including self-judgment, isolation, and overidentification) using the original and translated versions of the SCS (Costa et al., 2016; Halamová et al., 2020), but other research failed to confirm this proposition (Neff et al., 2019). In practice, it is less common to calculate a negative and a positive total score for the SCS, and some researchers have suggested only using the subscales from compassionate self-responding (Muris & Otgaar, 2020).

Psychometric research has sought to address the controversy about the structure and scoring of SCS by comparing various models using different statistical approaches. Further to the original higher-order model, a bifactor model was tested and deemed the more appropriate approach because all latent variables (self-compassion and its components) are directly defined by the observed variables (specific items) (Neff et al., 2019; Neff et al., 2017; Rodriguez et al., 2016). In contrast, the strict assumptions of higher-order CFA models only allow an indirect hierarchical structure where specific items define subscales/factors and these, in turn, define the full scale/global factor (Gignac, 2016). Neff (2016) argued that the direct hierarchical structure inherent to bifactor models is in line with the definition of self-compassion and hence more suitable when exploring the scoring of the SCS. Despite this advantage, the bifactor model could not fully address the debate. When exploring the SCS factor structure in clinical samples, the model fits of the bifactor model were not acceptable (Neff et al., 2017). Therefore, another

statistical approach was considered; Exploratory Structural Equation Modelling (ESEM). This approach allows cross-loading (correlations between items from one subscale with items from another subscale), whereas CFA only allows the items to load on one factor (Asparouhov & Muthén 2009). Neff et al. (2019) argued that this is warranted because self-compassion is a multidimensional system of associated components (Neff, 2016), and ESEM is specifically designed for models considered a multidimensional system of different factors (Morin et al., 2013). Emerging research using ESEM explored the issue of SCS factor structure and scoring and found good model fits across different samples using the original English version of the SCS (seven samples) and several translated versions (thirteen samples) (Neff et al., 2019). Comparing five different models, Neff et al. (2019) found that ESEM consistently outperformed CFA in terms of model fits and supported the use of the SCS's original six subscale scores or a total score, whereas no evidence for two separate scores of compassionate self-responding and uncompassionate self-responding was found. Additionally, the authors recommended that ESEM should be used for determining the factor structure of the SCS (Neff et al., 2019).

However, despite the use of ESEM, Neff et al. (2019) had model identification problems with the Chinese version of the SCS (SCS-C). In addition, existing psychometric evaluations were based on different translations of the SCS (SCS-C) (see Table S2.1 in supplementary materials), with mixed support of construct validity. Interestingly, four previous studies did not satisfactorily replicate the higher-order six-factor model (Chen et al., 2011; Deng et al., 2012; Tsai, 2015; Zeng et al., 2016), and there is growing evidence for a different, not previously observed factor structure of the SCS in Chinese samples. After failing to replicate both the six-factor correlated model and its higher-order model, Tsai (2015) proposed a novel four-factor structure comprising self-kindness, common humanity, mindfulness and one factor on which all

items from negative subscales self-judgment, isolation and overidentification loaded (which corresponds with uncompassionate self-responding). Similarly, Zeng et al. (2016) found evidence for three correlated positive but only one negative factor in community samples who identified as Buddhist or non-religious and that the three negative components were highly correlated. These two studies (Zeng et al., 2016; Tsai, 2015) raise a particular problem with specifying the hypothesised three distinct negative components of the original self-compassion definition in the Chinese sample. These findings suggest that further research on the understanding of self-compassion in Chinese samples should examine a four-factor structure in addition to the original conceptualisation. Unfortunately, Chinese validation studies did not further discuss why these novel factor structures may have emerged (Tsai, 2015; Zeng et al., 2016).

There are several possibilities to explain the discrepancy between English and Chinese versions of the SCS. The first could lie in the statistical approaches used. The Chinese validation studies used CFA (Chen et al., 2011; Deng et al., 2012; Jing et al., 2011; Tsai, 2015; Zeng et al., 2016), whereas recent research recommended ESEM to account for the synergetic factor structure (Neff et al., 2019). However, there were other problems with the SCS-C that further challenge the six-factor structure in Chinese samples. Across studies, low internal consistency of certain subscales was observed. In undergraduate samples, this was found for the subscale self-judgement, with Cronbach's Alphas (α) of .64 (Chen et al., 2011) and .51 (Jing et al., 2011). Only the mindfulness subscale (α = .70) in Chen et al. (2011) and the self-kindness subscale (α = .74) in Jing et al. (2011) revealed acceptable internal consistencies, whereas for the whole scale it was good, with α = .84 (Chen et al., 2011) and .87 (Jing et al., 2011) despite the fact that the one higher-order factor structure was not supported in these studies. In Deng et al. (2012)'s study in

an adolescent sample, most subscales (α = .58 - .68) and even the total scale (α = .64) had low internal consistency. This accumulation of psychometric problems revealed for the SCS-C raises the possibility of another explanation: that cultural differences in the understanding of the scale could be at the root of these measurement difficulties. However, the statistical issues need to be addressed first.

Taken together, research regarding psychometric properties of the SCS-C has revealed several limitations or gaps. Firstly, different studies support different factor models, including a novel four-factor structure (Tsai, 2015) requiring further discussion and replication. Secondly, some subscales appear to suffer from low internal consistency. More importantly, there are several different versions of the SCS-C, and previous studies did not provide specific suggestions on how to use the scale in light of the potential problems with factor structure and internal consistency. Additionally, there are different samples recruited in Chinese validation studies, such as undergraduates (Chen et al., 2011), adolescents (Tsai, 2015), and Buddhist participants (Zeng et al., 2016) making generalisation difficult. Finally, methodologically, the use of the bifactor model and ESEM rather than CFA have been recommended for studying the factor structure and for making scoring recommendations for the SCS which the SCS-C studies have not done. Research that addresses the gaps in our understanding of the construct of SCS-C in a Chinese population of young adults is therefore necessary.

The current study aimed to test the factor structure of the SCS-C using two samples and provide a recommendation for the use of SCS-C. For this, the study intends to test seven potential factor models (one-factor, two-factor correlated, six-factor correlated, single-bifactor, and two-bifactor models) following Neff et al. (2019) and another novel four-factor structure

(four-factor correlated and its single-bifactor) following Tsai (2015) and Zeng et al. (2016)' s work.

2.3 Methods

2.3.1 Participants and procedure

We recruited two separate samples in this study. Sample 1 was recruited via an online platform. Participants in Sample 2 completed the survey in a paper-and-pen format. We used both samples to explore the factor structure. The inclusion criteria were being aged over 18 years, native Chinese speaker and university student (undergraduates or postgraduates). The study was approved by the Ethics Committee of the University (UK).

Sample 1. Participants comprised 465 Chinese university students (141 males and 324 females, M_{age} = 20.26, SD_{age} = 2.18). Data collection was conducted via the online platform (https://www.wjx.cn/), which has been widely used for survey-based research in China. All participants were recruited by social networks (e.g., WeChat). Participant information sheet and debriefing sheet were provided online. Participants gave informed consent and received 5 yuan as a reimbursement for their time.

Sample 2. A convenience sample of participants was recruited from a university in Northern China. Participants included 392 undergraduate students (71 males; 317 females. M_{age} = 18.97; SD_{age} = .98). All participants were given the participant information sheet, consent form and debriefing sheet. After finishing the questionnaire, two gel pens were given as a reimbursement for their time.

Recruitment of two samples was necessary because we aimed to test validity (including construct, convergent and discriminant validity) following measurement and procedure conducted by Neff (2003) and Neff et al. (2019). In Neff (2003)'s study, two samples were recruited to check convergent and discriminant validity. Moreover, due to the length of the questionnaire, we recruited two samples to examine convergent and discriminant validity separately to reduce the burden on our participants. Given the unstable factor structure of the SCS-C in the current study, convergent and discriminant validity analyses are not suitable. However, given that participants have already responded to the questionnaires, I presented preliminary results in supplementary materials.

2.3.2 Measures

Self-compassion scale Chinese version (SCS-C, both samples). The Self-compassion scale (Neff, 2003) includes 26 items using a five-point Likert scale (from 1 "almost never" to 5 "almost always"). The Chinese version of the scale was based on the version from You's research team (Jiang et al., 2017a; Jiang et al., 2017b). Although there were several Chinese versions in use when I was planning this research study (which I had learned via reading the Chinese literature), I contacted several authors who were using an SCS-C, however only You shared their translation. Despite the fact that You's version had been used in several adolescents' samples (Jiang et al., 2017a; Jiang et al., 2017b), You's team had not established/ published psychometric properties. Thus, we decided to thoroughly check its validity from the translation procedure. Two postgraduates (YL and KH) who majored in translation revised several words and re-translated several items according to explanations provided by a native English speaker (AC) who was doing a PhD in Psychology. The translated version was reviewed by the first author (MZ) and then back-translated into English by two postgraduate students (JL and MW)

who are bilingual (Chinese is their native language) and were studying psychology in English-speaking countries to ensure the language relevance and cultural correctness. The co-author (AK), a clinical psychologist and researcher into self-compassion, reviewed two back-translated versions. Mutual agreement between the first author (MZ) and the co-author (AK) was reached on the final SCS-C.

2.3.3 Data Analysis Approach

SPSS 23.0, Mplus 7.0 and R were used to analyse data. All factor analyses were conducted using Mplus syntax provided by Neff et al. (2019) apart from the novel four-factor structure models which were not tested in Neff's study. Seven correlated and bifactor CFA and ESEM models were tested (Figure 2.1 for the model diagrams). Briefly, these were Model1, a one-factor model; Model 2, a two-factor correlated model; Model 3, a six-factor correlated model; Model 4, a single-bifactor model with a general factor and six specific factors; Model 5: a two-bifactor model including two general factors each with three specific factors; Model 6, a 4-factor correlated model; Model 7, a single-bifactor model with a general factor and 4 specific factors. In model assessments, we followed the benchmarks: the comparative fit index (CFI; greater than .95 for good, greater than .90 for acceptable), the Tucker–Lewis index (TLI; greater than .95 for good, greater than .90 for acceptable), the root-mean-square error of approximation (RMSEA; less than .06 for good, less than .08 for acceptable) with its 90% confidence interval (Hu & Bentler, 1999; Marsh et al., 2005). Also, followed by Neff et al. (2019), we also presented parameter estimates (e.g., factor loadings and inter-factor correlations) to evaluate the measurement models.

For the models that investigated the bifactor structure, we used the R package "Bifactor Indices Calculator" (Dueber, 2020a) to evaluate omega coefficients to assess if the total score of

the SCS-C reflects variations of the general factor in the bifactor models, in other words, if the SCS-C represents a general construct self-compassion (Neff et al., 2019). Following the suggestions by Rodriguez et al. (2016), we determined coefficients omega (omega), omega hierarchical (omegaH), factor determinacy (FD), and construct reliability (H). Omega reflects the proportion of variance in the unit-weighted total score, which can be attributed to all sources of common variance (Reise et al., 2013a; Revelle & Zinbarg, 2009), with scores of above .60 indicating acceptable and above .70 good variance attribution (Bagozzi &Yi, 1988), as used in previous research (Neff et al., 2019). OmegaH reflects the proportion of variance in total scores attributable to a single general factor (Reise et al., 2013b). To evaluate omega coefficients, Rodriguez et al. (2016) proposed to determine the ratio of omegaH/omega as the percentage of the reliable variance in total scores that can be attributed to the general factor. Recent research (Reise et al., 2013a) suggested 75% as the benchmark for the ratio of omegaH/omega, which was applied as a criterion in Neff et al. (2019). Additionally, we used FD and H to assess if the general factor that was generated by the items is trustworthy and appropriate to be used in structural equation modelling (SEM) contexts. The factor score estimates are trustworthy when FD is greater than .90 (Gorsuch, 1983). H reflects if the latent variable is defined well by the relevant items, which is the case when H is greater than .70 (Hancock & Mueller, 2001).

2.4 Results

2.4.1 Testing model fits and factor loadings

The full version of SCS-C. Model fit indices for our hypothesised factor models (Model 1 to Model 7) are shown in Table 2.1. All models using CFA did not provide an adequate fit to the

data. Using ESEM in Sample 1, we found the acceptable model fits for Models 3 (six-factor correlated model), 6 (four-factor correlated model), and 7 (single-bifactor model with four specific factors). In Sample 2, the acceptable model fits were revealed for Models 6 (four-factor correlated model). Consistent support across both samples was therefore observed for Model 6 based on the model fits.

We then examined the standardized item factor loadings for the ESEM solutions, which have the acceptable model fits, presented in Table S2.2, S2.3, and S2.4. When examining the six-factor correlated model in Sample 1 (Table S2.2), we found cross-loadings for some items. Also, we identified three items that did not significantly load on the factors as hypothesised: for self-judgement, item 11 ("I'm intolerant and impatient towards those aspects of my personality I don't like"), and for mindfulness, item 9 ("When something upsets me I try to keep my emotions in balance") and item 22 ("When I'm feeling down I try to approach my feelings with curiosity and openness"). Overall, the six factors were acceptably defined (λ = .11 to .80, M_{λ} = .51). As for the correlation between factors, self-judgement was not significantly correlated with common humanity (r = -.05) and mindfulness (r = .03), and overidentification was not significantly correlated with common humanity (r = -.02). The correlation between self-kindness and common humanity, self-judgment was significant, r=.11 to .45, M_r = .27.

For the four-factor correlated model (Table S2.3), we found in Sample 1 that mindfulness was poorly defined with either significantly negative factor loading (item 17: "When I fail at something important to me I try to keep things in perspective") or no significant loadings. The other three factors were overall acceptably defined (λ = .18 to .72, M_{λ} = .53). There were cross-loadings for several items. As for the correlation between factors, mindfulness was not significantly correlated with self-kindness (r = -.04), and negatively correlated with common

humanity (r = -.16, p <.001) and uncompassionate self-responding (r = -.11, p <.001). In Sample 2, the factor loadings of the items were significant, and the four factors were acceptably defined (λ = .22 to .84, M_λ = .53), but several items had cross-loadings. The correlation between the four factors, self-kindness, common humanity, mindfulness and uncompassionate self-responding was significant (r=.15 to.43, Mr = .25).

For the single-bifactor model with four specific factors in Sample 1 (Table S2.4), the factor loadings of the general factor, although significant, were fairly defined ($|\lambda|$ = .18 to .69, M_λ = .45), and there are two items with small negative factor loading, items 8 ("When times are really difficult, I tend to be tough on myself") and 21 ("I can be a bit cold-hearted towards myself when I'm experiencing suffering respectively"). As for the specific factors, similar to the results of the four-factor correlated model, the factors were fairly defined (λ = .22 to .82, M_λ = .39 apart from mindfulness which was not defined by significant loadings.

In summary, although ESEM revealed acceptable solutions in Sample 1 and/or 2, all models had some factor loading problems (with some non-significant loadings or low factor loadings) and cross-loadings of some items. Also, although Model 6 was supported with an acceptable model fit in both samples, subscale mindfulness was not defined in Sample 1. None of the bifactor solutions was supported. Although Models 3 to 5 (Table 2.1) showed good model fits, they had identification issues (see supplementary materials) similarly to those found in previous research (Neff et al., 2019).

The version of SCS-C without item 21. Based on the Mplus warning message, there were four potential items which may lead to model identification problems in two samples (Table 2.2): item 21, item14, item10, and item 17. We decided to delete item 21 based on three reasons: firstly, item 21 was reported to be problematic in more models. Also, given that Model 3 to

Model 5 using ESEM in Table 1 had the acceptable model fits (ignoring the model identification problem), there are two potential problematic items, item 10 in sample 1 and item 21 in sample 2. Furthermore, we checked the inter-item correlation (polychoric correlation) for all problematic items stated above, and we used the cut-off point .20 -.40 (Piedmont, 2014). In Sample 1, the inter-item correlations between item 21 and other 24 items below .20 and with only 1 item above .40; in Sample 2, the correlation between item 21 and other 15 items below .20 and with 1 item above .40. Thus, we decided to omit item 21, and we reran the analysis.

The results of the ESEM for the SCS-C without item 21 are shown in Table 2.1. The model solution using ESEM performed better than using CFA, but Model 6 (four-factor correlated model) in Sample 1 and Model 7 (single-bifactor model with four specific factors) in Sample 2 using CFA were supported with acceptable model fits. Models 5 (two-bifactor model with six specific factors), 6 (four-factor correlated model) and 7 (single-bifactor model with four specific factors) had acceptable model fits in both samples using ESEM. However, Model 3 (six-factor correlated model) using ESEM was only supported in Sample 2, but in Sample 1, it had an overidentification issue and was no longer supported. Its bifactor solution, Model 4, was only supported in Sample 2.

The findings related to the factor loadings can be found in the supplementary material. Although the two-bifactor model with six specific factors (Model 5) had good model fits, its general factors were poorly defined in both samples. In Sample 1, there were only 4 out of 13 items that significantly loaded on compassionate self-responding and 2 out of 12 items on uncompassionate self-responding. Similarly, in Sample 2, there were only four items significantly loading on compassionate self-responding and 1 item on uncompassionate self-responding (Table S2.5). For Model 6 (four-factor correlated model), the findings resembled that

of the full version. In Sample 1, mindfulness was not defined well, nor was it significantly correlated with any other factors. In Sample 2, the four factors were defined well, and the factors were intercorrelated with each other (Table S2.6). For Model 7 (single-bifactor model with four specific factors; Table S2.7), the general factor was fairly defined in both samples (Sample 1, λ = .30 to .70, M_{λ} = .45; Sample 2, λ = .15 to .85, M_{λ} = .43), but item 8 was not loaded on the general factor in both samples. Furthermore, for every specific factor, one or two items were not loaded on the hypothesised factor.

For Model 3 (six-factor correlated model; Table S2.8), as mentioned above, it was only supported in Sample 2, the 6 factors were fairly defined, but these factors are not intercorrelated, self-judgment was not significantly correlated with common humanity and mindfulness, and overidentification was not significantly correlated with common humanity. For Model 4 (single-bifactor model with six specific factors; Table S2.8), in Sample 2, all 25 items significantly loaded on the general factor, and three specific factors (self-kindness, common humanity and mindfulness) were identified as hypothesised. However, the negative factors were not defined as well as hypotheses. Specifically, there were two items significantly loading onto self-judgment, and there were three items significantly loading onto isolation. However, there was only one item significantly loading onto overidentification.

In summary, although there were more ESEM solutions supported with acceptable model fit in both samples when item 21 was excluded, the factor loadings as hypothesised were systematically low, and there were some cross-loadings of some items. The popular six-factor structure was supported in Sample 2. Although Model 5 has a good model fit, the two general factors, compassionate self-responding and uncompassionate self-responding, were not defined. Thus the assumption that six specific factors operate in two systems was not supported. The

novel four-factor structure was supported in both samples, especially, the general factor of the bifactor model was defined well in both samples, but the specific factors were not defined consistently in both samples.

The version of SCS-C without item 10: replicating six-factor structure in Sample 1. Model 3 (six-factor correlated model) and Model 4 (single-bifactor model with six specific factors) were replicated across languages (Neff et al., 2019), and this model was supported in Sample 2 using ESEM for the version SCS-C without item 21. However, in Sample 1, the models were not supported for the version of SCS-C without item 21. As for the full version, in Sample 1, Model 3 was supported using ESEM with the acceptable model fit, but there was an identification issue in Model 4. We checked the Mplus warning message, and we found that the problematic item in Sample 1 for identifying Model 4 was item 10 ("When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people") from common humanity. In order to replicate Model 4 in Sample 1, we ran the analysis of Model 3 and 4 using the SCS-C only without item 10 (Table S2.9).

After removing item 10, the identification issue was solved for Model 4 both using CFA and ESEM. For Model 3 using CFA, it was not supported with acceptable model fit (χ^2=1157.87, *df* = 26, $p < .001$, CFI = .85, TLI =.82, RMSEA[90% C.I.] = .09[.08, .09]), SRMR = .062, but the Model 3 using ESEM was supported by the acceptable model fit (χ^2=309.44, *df* = 165, $p < .001$, CFI = .98, TLI =.96, RMSEA[90% C.I.] = .04[.04, .05]), SRMR = .02. We found cross-loading problems for some items and identified three items that did not significantly load on the hypothesised factors: for self-judgment, items 1 ("I'm disapproving and judgmental about my own flaws and inadequacies") and 11 ("I'm intolerant and impatient towards those aspects of my personality I don't like"), and for mindfulness, items 9 ("When something upsets me I try to

keep my emotions in balance") and 22 ("When I'm feeling down I try to approach my feelings with curiosity and openness"). As for the correlation between factors, self-judgment was not significantly correlated with self-kindness (r = .12) and mindfulness (r = .004), and common humanity was not significantly correlated with isolation (r = .07), mindfulness (r = .011) and overidentification (r = -.02).

The Model 4 using CFA was not supported with poor model fit (χ^2=1038.38, df = 250, p < .001, CFI = .87, TLI =.84, RMSEA[90% C.I.] = .08[.08, .09]), SRMR = .07, whereas the Model 4 using ESEM was supported with acceptable model fit (χ^2=252.72, df = 146, p < .001, CFI = .98, TLI =.96, RMSEA[90% C.I.] = .04[.03, .05], SRMR = .02). The general factor of self-compassion was fairly defined (λ = .26 to .72, M_λ = .50), but only 23 items loaded onto the general factor, and two items from self-judgment, items 8 ("When times are really difficult, I tend to be tough on myself") and 21 ("I can be a bit cold-hearted towards myself when I'm experiencing suffering") did not significantly load onto the general factor. As for the specific factors, items 23 ("I'm tolerant of my own flaws and inadequacies") and 26 ("I try to be understanding and patient towards those aspects of my personality I don't like") did not load onto self-kindness as hypothesized. For self-judgment, items 1 and 11 did not load; For common humanity, all three items 3,7 and 15 loaded, λ = .41/.44/.38. Four items significantly loaded onto isolation as hypothesized (λ = .46 to .43, M_λ = .352). However, all four items did not significantly load onto mindfulness. Item 20 ("When something upsets me I get carried away with my feelings") did not significantly load on overidentification. We also found there are cross-loadings for some items.

In summary, based on Model 3, we found factor self-judgment and mindfulness in Sample 1 were problematic. Based on the findings related to Model 4, for the general factor, two items

from self-judgment did not significantly load on the general factor. As for the specific factors, self-kindness, self-judgment, and mindfulness seemed to be problematic.

2.4.2 Bifactor model evaluation

In total, there were two single-bifactor models supported in different versions of SCS-C, the single-bifactor model with four specific factors using SCS-C omitting item 21 in both samples, and the single-bifactor model with six specific factors using SCS-C omitting item 10 in Sample 1 and item 21 in Sample 2. We evaluated bifactor models, which were supported in both samples based on Rodriguez et al. (2016).

For the single-bifactor model with 4 specific factors, omega for the general factor was high, omega = .91/.91, Sample 1/2, but omega H was low in both samples, omega H =.729/.662, Sample 1/2. The ratio of the omega H/ omega was 79.85% Sample 1 and 72.43% in Sample 2 indicating that around 80% /72% (Sample 1/2) of reliable variance in the total score can be attributed to the general factor self-compassion (Rodriguez et al., 2016). In contrast, only around 18% /25% (Sample 1/2) of the reliable variance ($\omega - \omega_H$) in the total score can be attributed to the multidimensionality caused by the four specific factors, and 9% (1- ω) in both samples could be estimated to be due to random error. The construct reliability (H) index for the general factor (self-compassion) was .89/.90, Sample 1/2, indicating that the general factor was represented well by the 26 items and that the general factor suggested a well-defined latent variable across both samples. The factor determinacy (FD) for the general factor was .94/.96 in Sample 1/2, indicating that the factor score from the general factor (self-compassion) is trustworthy, and it allows the factor score estimation of this general factor in SEM research.

For the single-bifactor model with six specific factors, in Sample 1, we replicated this model using the version of SCS-C omitting item 10. The omega was .92, and omega H was .838. Thus, around 91% of reliable variance in total score can be attributed to the general factor, self-compassion. Only around 8% of the reliable variance in the total score can be attributed to the multidimensionality caused by the six specific factors, and 8% could be estimated to be due to random error. Both H (.90) and FD (.95) were high. These findings indicated that the general factor, but not individual subscales, was represented well by the 25 items, and it can be used in later SEM context. In Sample 2, we replicated the model using the version of SCS-C omitting item 21. Evaluation of the general factor revealed omega = .92, omega H =. 80, H = .90, and FD =.96, were all above the benchmarks indicating that the general factor, but not individual subscales, was represented well by the 25 items and it can be used in later SEM context.

Table 2.1 Model fit indices for the alternative models tested (SCS-C)

Model	Sample	CFA						ESEM					
		χ^2	df	CFI	TLI	RMSEA90% C.I.	SRMR	χ^2	df	CFI	TLI	RMSEA90% C.I.	SRMR
Full SCS-C													
Model 1	1	1993.61***	299	.72	.690	.11[.11, .12]	.09	1993.67***	299	.72	.69	.11[.11, .12]	.09
	2	2028.26***	299	.66	.628	.12[.12, .13]	.10	2028.26***	299	.66	.62	.12[.12, .13]	.10
Model 2	1	1363.31***	298	.82	.805	.09[.08, .09]	.07	1224.63***	274	.84	.81	.09[.08, .09]	.06
	2	1269.59***	298	.81	.790	.09[.09, .10]	.08	991.81***	274	.86	.83	.08[.08, .09]	.06
Model 3	1	1214.22***	284	.84	.821	.08[.08, .09]	.06	**382.08*** **	**184**	**.97**	**.94**	**.05[.04, .06]**	**.03**
	2	1000.46***a	284	.86	.838	.08[.08, .09]	.07	399.12***a	184	.96	.93	.06[.05, .06]	.03
Model 4	1	1076.77***a	273	.87	.839	.08[.08, .09]	.07	314.13***a	164	.98	.95	.04[.04, .05]	.02
	2	1204.90***a	273	.82	.781	.09[.09, .10]	.08	321.42***a	164	.97	.94	.05[.04, .06]	.03
Model 5	1	641.09***a	272	.94	.926	.05[.05, .06]	.05	251.32***a	157	.98	.97	.04[.03, .04]	.02
	2	759.87***a	272	.90	.885	.07[.06, .07]	.06	271.37***a	157	.98	.95	.04[.03, .05]	.02
Model 6	1	1264.40***	293	.84	.819	.08[.08, .09]	.06	**609.09*** **	**227**	**.94**	**.91**	**.06[.05, .07]**	**.04**
	2	1134.52***	293	.83	.815	.09[.08, .09]	.07	**566.96*** **	**227**	**.93**	**.90**	**.06[.06, .07]**	**.04**
Model 7	1[b]							**467.50*** **	**205**	**.96**	**.93**	**.05[.05, .06]**	**.03**
	2[b]							471.54***a	205	.95	.92	.06[.05, .06]	.03
SCS-C (without 21)													
Model 1	1	1511.56***	275	.78	.76	.10[.09, .10]	.08	1511.56***	275	.78	.76	.10[.09, .10]	.08
	2	1678.39***	275	.71	.69	.11[.11, .12]	.09	1678.39***	275	.71	.69	.11[.11, .12]	.09
Model 2	1	871.95***	274	.90	.89	.07[.06, .07]	.06	759.99***	251	.91	.89	.07[.06, .07]	.05
	2	973.40***	274	.86	.84	.08[.08, .09]	.07	726.33***	251	.90	.88	.07[.06, .08]	.05
Model 3	1	726.57***a	260	.91	.91	.06[.06, .07]	.05	302.02***a	165	.98	.96	.04[.04, .05]	.03
	2	754.93***a	260	.90	.88	.07[.06, .08]	.06	**318.03*** **	**165**	**.97**	**.94**	**.05[.04, .06]**	**.03**
Model 4	1	1048.88***a	250	.86	.83	.08[.08, .09]	.07	246.70***a	146	.98	.96	.04[.03, .05]	.02
	2	1171.83***	250	.81	.77	.10[.09, .10]	.08	**271.76*** **	**146**	**.97**	**.95**	**.07[.04, .06]**	**.02**
Model 5	1	610.03***a	249	.94	.92	.06[.05, .06]	.05	**205.73*** **	**139**	**.99**	**.98**	**.03[.02, .04]**	**.02**
	2[b]							**237.44*** **	**139**	**.98**	**.96**	**.04[.03, .05]**	**.02**
Model 6	**1**	**762.89*** **	**269**	**.91**	**.90**	**.06[.06, .07]**	**.06**	**479.92*** **	**206**	**.95**	**.93**	**.05[.05, .06]**	**.03**
	2	819.35***	269	.89	.87	.07[.07, .08]	.06	**548.46*** **	**206**	**.95**	**.93**	**.06[.05, .06]**	**.04**
Model 7	1	626.88***a	250	.93	.92	.06[.05, .06]	.05	**369.50*** **	**185**	**.97**	**.95**	**.05[.04, .05]**	**.03**
	2	**649.07*** **	**250**	**.92**	**.90**	**.06[.06, .07]**	**.05**	**391.18*** **	**185**	**.96**	**.93**	**.05[.05, .06]**	**.03**

Note. CFA confirmatory factor analysis; ESEM exploratory structural equation modelling; CFI comparative fit index; TLI Tucker-Lewis Index; RMSEA root mean square error of approximation; WRMR weighted root mean square residual; CI confidence interval; a These solutions had model identification issues, suggesting overparameterization. Model 1, 1-factor model; Model 2, 2-factor correlated model; Model 3, 6-factor correlated model; Model 4 single-bifactor model with 6 factors and one general factor; Model 5, 2-bifactor model with 6 factors and two general factors; Model 6: 4-factor correlated model; Model 7, single-bifactor model with 4 factors and one general factor. a . model has identification issues with Mplus warning message b. Mplus warning message, the residual covariance matric (theta) is not positive definite, not model fit results.

2.5 Discussion

Our research aimed to address problems and gaps around the factor structure of the Chinese version of the SCS. Informed by previous research, we examined seven different models and applied recent statistical analyses recommendations to investigate if previous failures of establishing the original factor structure in Chinese samples could be accounted for by approaches that do not consider the hypothesised synergetic nature of six components of self-compassion. We first investigated the full version of SCS-C in two samples of Chinese young adults and then repeated our analysis omitting a few problematic items. Lastly, we evaluated the variance explained by the general factor for those bifactor models that were supported by the acceptable model fits (i.e., single-bifactor model with four or six specific factors).

For the full SCS-C, in line with Neff et al. (2019), we found that overall ESEM outperformed CFA in terms of model fits. However, none of our analyses unequivocally supported the originally proposed six-factor structure (Model 3, 4, and 5) (Neff, 2003) in both samples. We also found only partial support for the four-factor structure (Model 6 and 7) that was previously put forward as an alternative for the SCS-C (Tsai 2015). Five of the seven tested models were based on Neff et al. (2019)'s study. One-factor or two-factor models had inadequate fits using CFA and ESEM, which is consistent with Neff's et al. (2019)'s findings. Using ESEM for the six-factor correlated model, we only obtained an acceptable model fit in Sample 1, but the six factors were not defined as well as Neff et al. (2019). In Sample 2, there was a

problem with the model identification, an issue previously also observed by Neff et al. (2019). Although this model solution of the SCS-C has been replicated in some Chinese studies (Chen et al., 2011), others failed to replicate it (Tsai, 2015; Zeng et al., 2016). These findings, together with our results, suggest that in Chinese samples, the factor structure of the SCS might not align with the original definition. This is surprising, given that the six-factor correlated model has been replicated in many different samples and other languages (Neff et al., 2019). Worse, and similar to Neff et al. (2019), for the single-bifactor model with six specific factors, we did not obtain model fits either using CFA or ESEM in either sample due to identification problems. There was a similar identification issue when we explored the two-bifactor model with six specific factors, which is consistent with Neff et al. (2019).

The possibility that the SCS in Chinese samples may follow a novel four-factor structure as proposed in Tsai (2015) was also only partially supported. The model solution with four factors correlated, self-kindness, common humanity, mindfulness and uncompassionate self-responding, had acceptable fits using ESEM in both samples. However, only in Sample 2, all four factors were defined with at least medium factor loadings, whereas in Sample 1, mindfulness was not specified at all. Additionally, for its bifactor model with one general factor, we only obtained acceptable model fit in Sample 1, whereas we had a model identification issue in Sample 2. The potential explanation for this issue in the sample may be due to low intercorrelation between the four factors. Thus, although the four-factor correlated

model was supported in both samples, this solution is not a stable construct in different samples due to these factor specification issues.

We further explored the factor structure of SCS-C without problematic item 21 (“I can be a bit cold-hearted towards myself when I'm experiencing suffering”) from self-judgment and reran the whole analysis. There were similar findings as compared to the full SCS-C for one factor, and inadequate model fits where found for two-factor models. The six-factor correlated model was not supported in Sample 1 anymore but supported with good model fit in Sample 2, and all six factors were specified. Also, the single-bifactor model with six specific factor models was supported in Sample 2 with acceptable model fits and specified general factor. The novel four-factor structure (Model 6 and 7) was supported in both samples with acceptable model fits, despite some issues of factor specification found in the full version of SCS-C.

Taken together, our findings suggest that the SCS-C may have a different factor structure in Chinese samples than proposed by the initial theory (Neff, 2003, 2016), but evidence for an alternative four-factor was also not unequivocal. We found no consistent results of the six-factor structure for the two samples. For example, in Sample 1, the solution related to the six-factor structure was only supported when we omitted item 10 (“When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people”) from common humanity, in Sample 2, it was only supported when omitting item 21 (“I can be a bit cold-hearted towards myself when I'm experiencing suffering”) from self-judgment. Neff et al.

(2019) did not support the six-factor structure either. In contrast, a novel four-factor structure was supported that has not been suggested by the original SCS or any other translations but appears to be supported by previous research in Chinese samples (Tsai, 2015). This suggests that Chinese young adults may understand the negative components (self-judgment, isolation and over-identification) as a whole factor (Tsai, 2015; Zeng et al., 2016). Unfortunately, previous research has not further unpacked this possibility yet. The four-factor structure appeared more consistent across our samples than the six-factor structure, although inconsistencies and problems occurred with specific factors. For example, in Sample 1, the mindfulness factor was not defined for any models. More importantly, some items did not load onto the hypothesised factors, but this was not consistent across the two samples suggesting we cannot just propose an abbreviated version that works across different samples.

Even omitting individual problematic items did not address the problems with the SCS-C's subscales. After thus failing to address the psychometric problems with SCS-C, we propose that Chinese participants may have a different understanding of the components of SCS-C and that it may be useful to explore this in more detail to further unpack some unexpected findings of our validation study. In order to address this, a focus group study was conducted (Zhao et al., submitted), where it was found that Chinese samples partially showed a different understanding of these sub-dimensions when compared with the original definitions. Particular discrepancies were identified in the perception of common humanity, partially described as a "negative coping strategy" that resembles an excuse for failure. In contrast, the

perceptions of self-judgment and overidentification were partially described as helpful, with “self-criticism as an adaptive strategy” and “helpful for self-reflection”. These alternative views may guide participants to answer the questions from a different perspective and thus partially explain the psychometric problems we observed in this study.

The problems observed with the mindfulness subscale could be attributed to challenges in translating the term so that it resonates with the core concept of mindfulness. When translating the self-compassion scale, we found that in Chinese, there is no literal translation for the combination of the words “emotion” and “balance”, to express “keep emotion in balance”(保持情绪平衡). Instead, the contemporary Chinese language uses “keep emotion stable” (保持情绪稳定), which indicates both emotional stability and balance whilst being aware of the emotion. Native English speakers who are not experts in clinical psychology confirmed that “keep emotion stable” is a synonym for “keep emotion in balance”. Therefore, we chose the translation of “keep emotion stable” whilst being aware of the potential discrepancy of the two languages. Our study highlighted that sometimes it is hard to find a recognized term in a different language to capture the main concept. For example, there was a focus group study aiming to discuss the items from the Warwick-Edinburgh mental well-being scale, and a participant mentioned that there was no translation for the word ‘optimistic’ in Pashtun (Taggart et al., 2013). Thus, it is important to be aware of such language discrepancies when translating scales and evaluating a translated version scale.

Although we found partial support for both the four-factor structure and the six-factor structure with fairly acceptable model fits and factor loadings, given the issues with factor specifications, our psychometric results do not support one specific factor structure over another. The finding from a qualitative focus group study about the understanding of self-compassion (Zhao et al., submitted) regarding individuals' views of the negative subscales was in line with the psychometrically suggested general negative component. However, further research on different samples is necessary to confirm support for this. If a four-factor model would be endorsed, it is in contrast to the psychometrically better established original six-factor structure (Neff et al., 2019). Our and Neff et al.'s (2019) recent studies highlighted the need for more research to inform a revised SCS-C.

Furthermore, in contrast to Neff et al (2019), our study suggests that the use of the SCS-C total score is not strongly supported. Whereas in their study, both high omega and omegaH were identified, we only replicated the high omega but not high omegaH. Therefore, we need to be cautious to suggest using the total score in our SEM because only when both omega and omegaH are high, as is the case in Neff et al (2019)'s study, the total score can be calculated (Dueber 2020b). The rationale for this recommendation is that if the value of omegaH is not as high as omega, the difference of the total score could be driven by a specific factor rather than the general factor which could lead to a misinterpretation of the general factor (Dueber 2020b). Taken together, based on our findings, we would therefore not suggest using the total score of the general factor of SCS-C without a relevant measurement check.

In the interim, before a valid self-compassion scale is available for Chinese participants, researchers should consider a few points when using the current SCS-C. Firstly, based on our results that the two-bifactor model (Model 5) was not supported, it might be more appropriate to consider as a synergetic system with positive and negative factors and to treat SCS-C as a general factor rather than two general factors. Secondly, as for the single general factor, we do not encourage researchers to sum all items together to get a total score. Instead, we strongly recommend that researchers use a latent variable approach for their measurement construct in the SEM context. Lastly, we caution against using individual subscale scores of the SCS-C given the unclear factor structure, systematically low factor loadings, and problematic factor specification. We are aware that this is not convenient for future studies in Chinese samples with smaller sample sizes, but based on our recent findings together with those from Neff et al. (2019), there is limited evidence for the use of the total score of SCS-C or individual subscales in research.

Limitations and strengths. This study was designed to conduct a comprehensive investigation of the psychometric properties of SCS-C with an appropriate sample size, including a novel four-factor structure using both CFA and ESEM, but there are several limitations. Firstly, this study sample was university students, and the findings may not generate to other groups, such as clinical patients. Secondly, this report does not include other validity tests, such as convergent and discriminate validity. Although we acquired this information from all participants similarly to Neff's original validation study (2003), we abandoned its further evaluation because we did not get consistent findings

related to the factor structure.

Future direction. Our findings suggested that it is necessary to revise the SCS-C in order to account for the possibility of a different factor structure. There are several potential directions in which to revise the SCS-C. Groups of participants should be invited to freely discuss the translation and meaning of the items to make sure that the items assess the same scenario and avoid language discrepancy, such as the discrepancy of "keep emotion in balance" (Zhao et al., submitted), which may help to get a clear six-factor structure. Further, more larger-scale qualitative research (Smithson, 2020) could help confirm the themes from the studies and might inform whether the SCS-C in its current form needs additional items to help to differentiate the negative factors (Zhao et al., submitted). For example, for SJ, qualitative evidence supported "self-criticism as undermining the self" and "self-criticism as an adaptive strategy" of which the existing items cover the former but not the latter description. Thus, extra items that describe benign self-criticism may potentially be added. For example, "I try to reflect on the failure to overcome my flaws when I fail in something important". Future studies should continue to explore the understanding and meaning of the main components of self-compassion in Chinese populations as well as the understanding of specific items.

Further research on the construct in Chinese populations could draw on other aspects proposed to characterise compassion, such as engaging in one's suffering with an open mind and taking wise actions to handle it (Gilbert et al., 2017). In a recent review, five components of compassion were identified: recognition of suffering; understanding its universality; feeling sympathy, empathy, or concern for those who

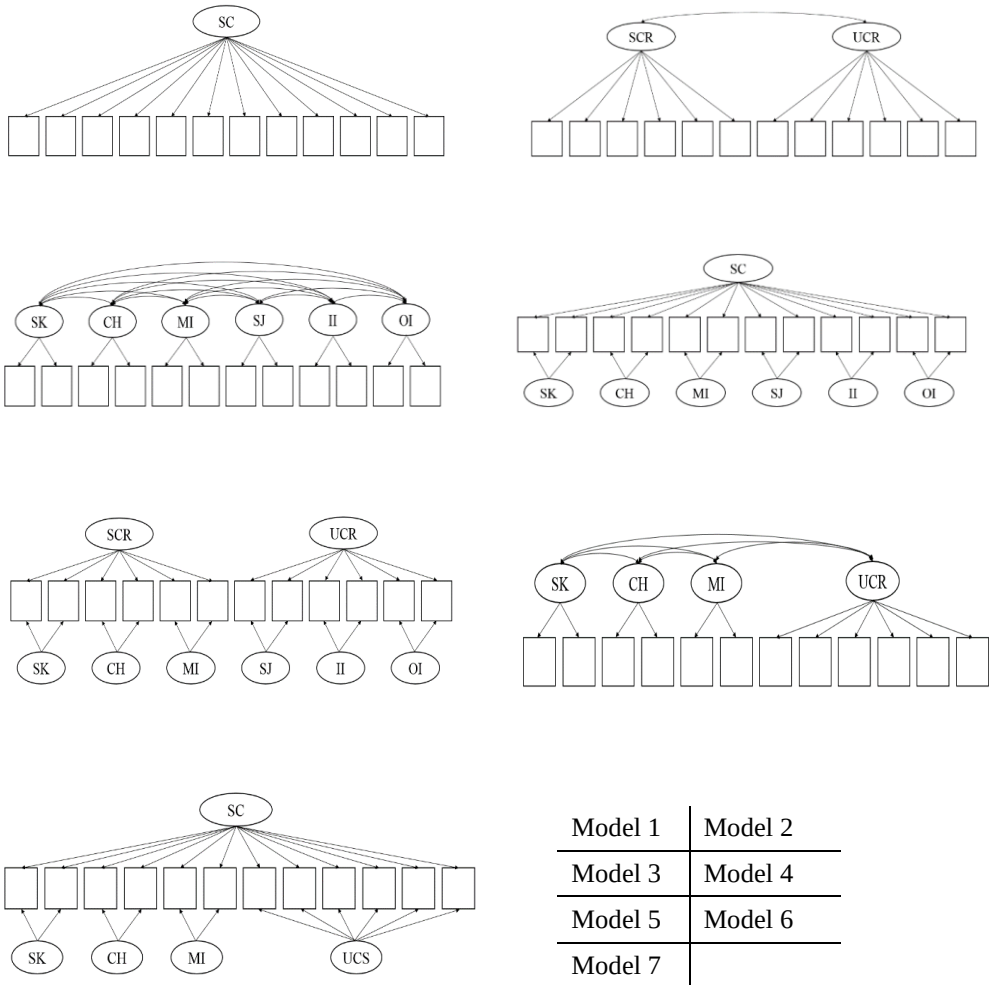
are suffering; tolerating the distress associated with the witnessing of suffering; and motivation to act or acting to alleviate the suffering(Strauss et al., 2016). The action of handling the current difficulties appears to be a core component that could be added to the questionnaire to assess self-compassion in Chinese samples. We do not argue that involving the action component is more important than the other components, but there is a published self-compassion scale based on Strauss et al. (2016)'s definition (Gu et al., 2020), and it was revealed in a preliminary focus group study that in Chinese samples self-compassion appears to be associated with active problem-solving in difficult times, e.g., "problem solving" and "self-reflection" (Zhao et al., submitted).

Lastly and ideally, in connection with the previous suggestions, we may need to extend the self-compassion definition by embedding theories relevant for the Chinese culture as specific features of self-compassion may vary by cultural background (Motero-Marin et al., 2018; Neff et al., 2008). Additionally, the SCS was not supported in Japanese and Chinese samples, which both are collectivist cultures (Oyserman et al., 2002). As defined in the self-construal theory by Markus and Kitayama (1991), collectivist cultures are characterised by a dominant interdependent self-construal and encouraging social harmony, thus shaping individuals' emotion, motivation, thinking style and behaviour and thus also their understanding of self-compassion. For example, individuals with high interdependent self-construal tend to use self-criticism as a motivation to grow to achieve social harmony, thus, Chinese participants may not consider self-judgement as an uncompassionate behaviour.

Second, Confucianism could be another lens through which self-compassion can be considered in China. There are many critical values in Confucianism still dominant in the current society. For example, Confucianism encourages introspection or self-reflection as the main way for growth and for improving the relationship between self and others (Cheng, 2004). Furthermore, in Confucianism, shame is considered a positive motivation (Mencius, 372BC-289BC; Seok, 2015), a perspective different from Western psychology, where shame was considered as a source of negative self-evaluation and a maintenance factor for mental health problems (Gilbert, 2003). This specific Confucianism mentality could also be considered as a form of interdependent self-construal. Taken together, drawing self-compassion into the specific cultural context is not only beneficial for its assessment but also promoting relevant cultural adaptation of psychological therapy.

2.6 Conclusion

We suggest that the SCS-C needs to be revised, and there may be a cultural difference in the understanding of self-compassion in the Chinese sample. When using the existing SCS-C in research, especially for path models, researchers are advised to use a latent variable approach and establish the measurement construct first rather than sum scores of the scale or subscales without checking psychometric properties.



Model 1	Model 2
Model 3	Model 4
Model 5	Model 6
Model 7	

Figure 2.1 Diagrams of the models

Note. SC, self-compassion; SCR, compassionate self-responding; UCR, uncompassionate self-responding; SK, self-kindness; CH, common humanity; MI, mindfulness; SJ, self-judgement; II, isolation; OI, over-identification.

Table 2.2 Potential problematic item/factor according to Mplus warning message

	Sampel1		Sample 2	
	CFA	ESEM	CFA	ESEM
Full SCS-C				
Model 1	-	-	-	-
Model 2	-	-	-	-
Model 3	-	-	OI	SC21
Model 4	SC14	SC10	SC21	SC21
Model 5	SC17	SC10	SC14	SC21
Model 6				
Model 7	SC17		SC17	SC21
SCS-C no SC 21				
Model 1				
Model 2				
Model 3	Overidentification	SC10	Mindfulness	
Model 4	SC14	SC10		
Model 5	SC17		SC14/SC24	
Model 6				
Model 7	SC17			

2.7 Supplementary Materials for Study 1

Table S2.1 Summary of studies related to SCS-C

Studies	Participants	Validity Factor analysis	CFA	Reliability Internal Consistency	Test-retest Reliability
Jing, Wang, & Liu, 2011	University students $N_{sample\ 1}$ =184 $N_{sample\ 2}$ = 222	7 factors: total explained variance is 58.44% 6 factors: total explained variance is 53.26% (it is hard to say whether they get a clear factor structure based on EFA since the authors did not present whole factor loading table)	6-factor oblique model: GFI = .85; NFI = .88; CFI = .94 ; RMSEA =.069	$\alpha_{SCS\text{-}C}$ = .87 α_{SK} = .74 α_{SJ} = .64 α_{CH} = .69 α_{IS} = .68 α_{MI} = .67 α_{OI} = .68	-
Chen, Yan, & Zhou, 2011	Sample 1: 315 undergraduate students Sample 2: 312 undergraduate students; 50 students took part in time 2 measurement	6 factors: total explained variance is 51.33%, but the items loading on the factors not consistent with SCS.	6-factor oblique model: CFI = .91; NNFI = .90; RMSEA = .072; A higher-order model: CFI = .89, NNFI = .88, RMSEA = .077	$\alpha_{SCS\text{-}C}$ = .84 α_{SK} = .59 α_{SJ} = .51 α_{CH} = .61 α_{IS} = .69 α_{MI} = .70 α_{OI} = .59	$r_{SCS\text{-}C}$ = .89 r_{SK} = .73 r_{SJ} = .79 r_{CH} = .62 r_{IS} = .78 r_{MI} = .63 r_{OI} = .71
Deng, Ding, Zhang, & Deng, 2012	Sample 1: 200 adolescents aged from 11 to 19; Sample 2: 275 adolescents aged from 11 to 19. 69 participants took part in time 2 (after 4 weeks) assessment	6 factors: total explained variance is 53.87% (it is hard to say whether they get a clear factor structure based on EFA since the authors did not present whole factor loading table)	6-factor oblique model: CFI = .90; NNFI = .90; RMSEA = .071 ; A higher-order model: CFI = .88, NNFI = .87, RMSEA = .076	$\alpha_{SCS\text{-}C}$ = .64 α_{SK} = .60 α_{SJ} = .66 α_{CH} = .62 α_{IS} = .59 α_{MI} = .58 α_{OI} = .68	$r_{scs\text{-}c}$ = .76
Tsai, 2015	Sample 1: 384 junior high school students; Sample 2: 712 gifted	4 factors named self-kindness, self-criticism, common humanity, and mindfulness, and total explained variance is	4 factor model consistent with EFA results: GFI = .948; RMSEA = .0069; RMR = .076	$\alpha_{SCS\text{-}C}$ = .85 $\alpha_{self\text{-}kindness}$ = .86 $\alpha_{Self\text{-}criticism}$ = .90 $\alpha_{Common\ humanity}$ = .82 $\alpha_{Mindfulness}$ = .84	-

	students	59.51%; 6 factor structure was not supported.			
Zeng et al., 2016	Sample 1:179 Buddhist participants (*M age* =35.5, *SD* = 8.9) Sample 2: 232 non-Buddhists (*M age* = 31.1, *SD* = 6.7)	--	6-factor model was not supported both in Buddhists and non-Buddhists. The model consisting of three intra-correlated positive dimensions and the model that combined all items of negative dimensions were supported by the both samples	--	--

Note. *M* = Mean; *SD* = Standard deviation; EFA = Exploratory factor analysis; CFA = Confirmatory factor analysis; GFI = Goodness of fit index; NNFI = Non-normed fit index; CFI = Comparative fit index; RMSEA = Root mean square error of approximation; α = Cronbach's alpha; *r* = Pearson correlation.

Table S2.2 Standardized factor loadings for the Model 3 using ESEM in Sample 1 (full SCS-C)

	SK(λ)	SJ(λ)	CH(λ)	IS(λ)	MI(λ)	OI(λ)
SK						
SK5	**.59*****	-.09*	.10*	-.004	.03	-.18***
SK12	**.79*****	.09**	.05	-.002	-.15**	-.14**
SK19	**.76*****	-.04	.01	.15**	-.14*	.11
SK23	**.52*****	.13**	-.13*	-.30***	.31***	.28***
SK26	**.31*****	-.05	.08	.07	.43***	.10*
SJ						
SJ1	-.02	**.09**	.1^{1*}	-.06	.15*	.43***
SJ8	.01	**.80*****	-.001	-.08	.01	-.18**
SJ11	.30***	**.10***	-.18**	-.03	.28***	.26***
SJ16	.16**	**.17****	-.14*	.13*	.01	.40***
SJ21	-.08	**.89*****	.04	.10**	-.07	-.09
CH						
CH3	.02	-.12**	**.34*****	.26***	.24**	-.04
CH7	.02	-.003	**.67*****	-.04	-.02	.010
CH10	.05	.03	**.71*****	-.30***	-.06	.28***
CH15	-.01	.02	**.48*****	.004	.29***	-.002
IS						
IS4	.18**	.05	-.01	**.21****	.06	.42***
IS13	.03	.07	.01	**.52*****	.14**	.22***
IS18	.06	.07	-.08	**.42*****	.14**	.25***
IS25	.09*	.09*	-.003	**.61*****	.15**	.22***
MI						
MI9	.25***	-.04	.30***	.13*	**.14**	-.01
MI14	.22***	.08*	.25***	.16**	**.47*****	-.16***
MI17	.13*	-.03	.14**	.21***	**.55*****	-.16**
MI22	.32***	.01	.23***	.10*	**-.02**	.04
OI						
OI2	.002	.07	.23***	.22***	-.12*	**.54*****
OI6	.05	.07	-.02	.30***	.09	**.44*****
OI20	-.10*	.05	.12*	.19***	.10	**.43*****
OI24	.13**	.02	.04	.53***	-.10	**.33*****

Note. SK = self-kindness; SJ = self-judgment; CH = common humanity; IS =isolation; MI = mindfulness; OI = over-identification; λ = standardized factor loadings. Target factor loadings are in bold. *, p <.05; **, p <.01; ***, p<.001

Table S2.3 Standardized factor loadings for the Model 6 in Sample 1 and Sample 2 (full SCS-C)

	Sample 1				Sample 2			
	SK	CH	MI	USR	SK	CH	MI	USR
SK								
SC5	**.60*****	.17***	-.06	-.16***	**.64*****	.02	.17***	-.07
SC12	**.66*****	.12*	.13***	-.06	**.84*****	.07	.11**	-.09**
SC19	**.58*****	.14**	.01	.03	**.64*****	.08	.10**	.003
SC23	**.56*****	-.22***	-.07	.24***	**.32*****	.05	-.12**	.32***
SC26	**.47*****	.06	-.23***	.25***	**.37*****	.07	.10*	.31***
CH								
SC3	.10	**.41*****	-.16**	.15**	.27***	**.22*****	.07	.01
SC7	.01	**.72*****	.11**	-.04	-.01	**.67*****	.03	-.01
SC10	.04	**.54*****	.08*	.02	-.003	**.70*****	.01	-.04
SC15	.14*	**.44*****	-.04	.08	-.02	**.57*****	.14**	.07
MI								
SC9	.28***	.33***	**-.07**	.12**	.36	.09	**.43*****	.12**
SC14	.42***	.28***	**-.06**	.14**	.17**	.30***	**.24*****	.18***
SC17	.38***	.19***	**-.19*****	.15***	.34***	.17***	**.27*****	.10*
SC22	.26***	.27***	**.02**	.13**	.14**	.25**	**.36*****	.19***
USR								
SC1	.01	-.03	-.05	**.41*****	.05	-.05	-.02	**.44*****
SC8	.15**	-.14*	.72***	**.18***	-.05	.13*	-.63***	**.46*****
SC11	.38***	-.28***	-.10*	**.36*****	.35***	-.12*	.09	**.42*****
SC16	.07	-.21***	.02	**.55*****	-.05	-.26***	.03	**.65*****
SC21	-.01	-.08	.82***	**.40*****	.15**	.04	-.66***	**.49*****
SC4	.08	-.04	-.09*	**.58*****	-.14**	-.10*	.18***	**.68*****
SC13	-.04	.07	-.08	**.67*****	.04	-.08	.15***	**.57*****
SC18	-.02	-.03	-.08*	**.63*****	.15**	.01	.05	**.51*****
SC25	-.02	.11**	-.07	**.75*****	.09	.09*	.10*	**.68*****
SC2	-.19**	.17**	.003	**.62*****	-.25***	.14**	.22***	**.63*****
SC6	-.04	-.05	-.09*	**.68*****	-.13**	.03	.13**	**.69*****
SC20	-.14**	.05	-.08	**.55*****	.05	-.07	.15***	**.52*****
SC24	-.10*	.13	-.05	**.59*****	-.09	.08	.18***	**.66*****

Note. SK = self-kindness; CH = common humanity; MI = mindfulness; USR = uncompassionate self-responding; λ = standardized factor loadings. Target factor loadings are in bold. *, p <.05; **, p <.01; ***, p<.001

Table S2.4 Standardized factor loadings for the Model 7 solution using ESEM in sample 1 (full SCS-C)

	SC	SK	CH	MI	USR
SK					
SC5	**.37*****	**.48*****	.13**	-.06	-.13**
SC12	**.37*****	**.60*****	.11**	-.09	.09**
SC19	**.47*****	**.55*****	.04	-.18**	.03
SC23	**.47*****	**.28****	-.07	.49***	.19***
SC26	**.66*****	**.21*****	.05	.20***	.01
CH					
SC3	**.49*****	.07	**.25*****	-.12*	-.10*
SC7	**.28*****	.10*	**.60*****	-.10*	-.07
SC10	**.28*****	.04	**.56*****	.14*	-.02
SC15	**.40*****	.10*	**.40*****	.06	-.04
MI					
SC9	**.49*****	.21***	.24***	**-.05**	-.02
SC14	**.56*****	.29***	.25***	**.05**	.02
SC17	**.57*****	.21***	.13**	**.08**	-.05
SC22	**.40*****	.23***	.19**	**-.10**	.06
USR					
SC1	**.35*****	-.16**	.05	.26***	**.22*****
SC8	**-.24****	.30***	.12**	.10	**.67*****
SC11	**.44*****	.12	-.17**	.31***	**.23*****
SC16	**.36*****	-.06	-.18***	.11*	**.38*****
SC21	**-.18***	.20***	.12**	-.02	**.82*****
SC4	**.55*****	-.06	-.09	.06	**.29*****
SC13	**.59*****	-.07	-.10*	-.19***	**.30*****
SC18	**.52*****	-.07	-.16***	-.10	**.30*****
SC25	**.69*****	-.02	-.11**	-.23***	**.34*****
SC2	**.47*****	-.21***	.08	-.05	**.32*****
SC6	**.54*****	-.15***	-.13**	.02	**.33*****
SC20	**.43*****	-.24***	.005	.06	**.25*****
SC24	**.59*****	-.08	-.08*	-.27***	**.32*****

Note. SK = self-kindness; CH = common humanity; MI = mindfulness; USR = uncompassionate self-responding; λ = standardized factor loadings. Target factor loadings are in bold. *, p <.05; **, p <.01; ***, p<.001

Table S2.5 Standardized factor loadings for the model 5 solution using ESEM in sample 1 and sample 2 (SCS-C omitting item 21)

	Sample 1								Sample 2							
	CSR	USR	SK	SJ	CH	IS	MI	OI	CSR	USR	SK	SJ	CH	IS	MI	OI
SK																
SK5	**.13**		**.55*****	-.10	.17**	.01	.19**	.02	**.36****		**.40*****	-.08	.15*	.12*	.33***	-.005
SK12	**.23**		**.75*****	-.09	-.03	.10	.02	.07	**.60*****		**.52****	-.19***	.33***	.23**	.21*	.03
SK19	**.11**		**.68*****	-.14**	.08	.18**	.13*	.12*	**.45****		**.38****	-.01	.30***	.13	.23**	.10
SK23	**-.16**		**.52*****	.64***	.08**	.21*	.13	-.09	**-.02**		**.59*****	.41**	.07	.19**	.01	.03
SK26	**.09**		**.39*****	.26***	.23***	.14	.44***	.24***	**.17**		**.40*****	.29***	.16*	.18**	.29***	.19***
SJ																
SJ1		**-.21**	.04	**.31*****	.13**	.36***	.05	.11		**-.17**	.18	**.43*****	-.06	.18**	.13*	.19**
SJ8		**.06**	.14**	**.14***	-.11	.05	-.16**	-.04		**-.14**	-.03	**.24****	.06	.34***	-.19**	.07
SJ11		**.06**	.30***	**.47*****	-.11	.08	.19***	.31***		**.06**	.54***	**.24**	-.14	.22***	.08	.18**
SJ16		**.14**	.15**	**.35*****	-.07	.29*	-.06	.32***		**.36***	.07	**.34****	-.15*	.18	-.05	.50***
CH																
CH3	**-.02**		.18**	-.17*	**.49****	.18*	.42**	.13*	**.08**		.22*	-.22***	**.18***	.26***	.24***	-.001
CH7	**.32**		.21***	-.14**	**.46*****	.02	.06	.07	**-.16**		.29**	-.08	**.54*****	.04	.16**	.08
CH10	**.63***		.16	.18**	**.55**	-.05	-.23*	.13*	**-.12**		.24	.09	**.73*****	-.03	.13**	.04
CH15	**.36****		.17**	.03	**.35****	.18**	.23***	.01	**-.23**		.21*	-.20**	**.38****	.08	.31***	-.006
II																
IS4		**-.03**	.20***	.23***	.06	**.49*****	.10	.28*		**.02**	.14*	.20	-.07	**.25****	.01	.59***
IS13		**.33***	.15**	.09*	.12*	**.43***	.16*	.42***		**.18**	.14*	.04	-.05	**.42*****	.13*	.41***
IS18		**.21**	.13**	.15***	.01	**.50*****	.12*	.29***		**.16**	.26***	.17**	.03	**.57*****	.13**	.16**
IS25		**.26**	.23***	.06	.10	**.58*****	.21***	.29***		**.07**	.24***	.16***	.15***	**.68*****	.12**	.35***
MI																
MI9	**.13**		.36***	-.06	.31***	.05	**.30****	.25***	**.23***		.40***	-.20	.13	.01	**.36*****	.39***
MI14	**.35*****		.39***	.06	.13	.20***	**.41*****	.13**	**-.09**		.29***	-.08	.11	.20***	**.54*****	.15**
MI17	**.37***		.24***	.09*	.03	.32***	**.59*****	.01	**.23**		.10	.184**	.17*	.10	**.76*****	.04
MI22	**.12**		.38***	-.05	.24***	.15*	**.10**	.01**	**.23**		.19*	-.028	.29***	.07	**.36*****	.34***
OI																
OI2		**-.49***	.09	.06	.15*	.61***	-.10	**.41**		**-.23**	.04	.128*	.29*	.19***	.12**	**.68*****
OI6		**.11**	.11*	.26***	.06	.49**	.08	**.42*****		**.24**	-.05	.28***	.11	.35*	.17**	**.54*****
OI20		**-.11**	-.02	.26***	.09	.09	.17**	**.60*****		**-.10**	.16*	.13	-.17**	.24***	.31***	**.40*****
OI24		**.12**	.21***	-.01	.05	.37*	.09	**.60*****		**-.18**	.16**	.06	.02	.44***	.16**	**.53*****

Table S2.6 Standardized factor loadings for the model 6 solution using ESEM in sample 1 and sample 2 (SCS-C omitting item 21)

	Sample 1				Sample 2			
	SK	CH	MI	USR	SK	CH	MI	USR
SK								
SC5	**.59*****	.13**	-.13*	-.13**	.60***	-.01	.25***	-.08
SC12	**.75*****	-.03	-.14**	-.07	.80***	.04	.24***	-.11***
SC19	**.70*****	-.04	.25***	.05	.61***	.05	.20***	-.01
SC23	**.53*****	-.05	.48***	.05***	.44***	.16**	-.38***	.28***
SC26	**.36*****	.21***	.15**	.27***	.40***	.11*	.01	.30***
CH								
SC3	.06	**.42*****	-.16*	.19***	.23***	**.18****	.19**	-.002
SC7	.01	**.66*****	-.09	-.09**	.003	**.67*****	.03	-.04
SC10	<.001	**.62*****	.11*	-.07	.02	**.74*****	-.04	-.07*
SC15	.08	**.53*****	.04	.04	-.04	**.54*****	.18***	-.07
MI								
SC9	.26	.34***	**-.10**	.13**	.30***	.05	.44***	.17***
SC14	.37	.35***	**<.001**	.13**	.13*	.25***	.36***	.20***
SC17	.30	.29***	**.01**	.18***	.29***	.11*	.36***	.11**
SC22	.29	.29***	**-.12***	.13**	.10	.21***	.37***	.22***
SCR								
SC1	-.09	.14*	.30***	**.38*****	.09	-.004	-.13*	**.43*****
SC8	.18**	-.18**	.11	**.01**	-.04	.04	-.26***	**.31*****
SC11	.30***	-.13*	.30***	**.35*****	.40***	-.06	-.17**	**.39*****
SC16	.07	-.20***	.15**	**.53*****	-.03	-.22***	-.07	**.65*****
SC4	.06	-.02	.08	**.60*****	-.11*	-.08	.05	**.71*****
SC13	.001	-.03	-.17***	**.71*****	.05	-.09	.12*	**.58*****
SC18	.02	-.10	-.08	**.66*****	.22***	.06	-.13*	**.58*****
SC25	.07	-.04	-.21***	**.78*****	.13**	.13**	-.05	**.68*****
SC2	-.18**	.144*	.01	**.61*****	-.27***	.09*	.23***	**.67*****
SC6	-.05	-.14	.05	**.70*****	-.12**	.01	.10*	**.70*****
SC20	-.21***	.13*	.10*	**.70*****	.02	-.12*	.22***	**.53*****
SC24	-.02	-.03	-.24***	**.73*****	-.09*	.05	.17***	**.68*****

Note. SK = self-kindness; CH = common humanity; MI = mindfulness; USR = uncompassionate self-responding; λ = standardized factor loadings. Target factor loadings are in bold. *, p <.05; **, p <.01; ***, p<.001

Table S2.7 Standardized factor loadings for the model 7 solution using ESEM in sample 1 and sample 2 (SCS-C omitting item 21)

	Sample 1					Sample 2				
	SC	SK	CH	MI	USR	SC	SK	CH	MI	USR
SK										
SC5	.51***	**.31***	.06	.08	-.16***	.64***	**-.09**	-.08	.10*	-.15***
SC12	.58***	**.49***	<.001	-.08**	-.09*	.85***	**-.27**	-.05	-.09	-.18***
SC19	.58***	**.47***	-.01	.02	.01	.68***	**-.14**	-.02	.01	-.08*
SC23	.66***	**-.18**	-.18***	-.29***	.03	.51***	**.51***	.01	-.21**	.14*
SC26	.70***	**-.11***	-.01	.14**	.09**	.60***	**.20***	-.01	.08	.18***
CH										
SC3	.42***	.04	**.25***	.36***	.09	.40***	-.18**	**.14***	.03	-.02
SC7	.33***	.13**	**.54***	.09	-.07*	.38***	.02	**.57***	.04	-.04
SC10	.36***	-.02	**.54***	-.20***	-.06	.38***	.09*	**.60***	.02	-.08
SC15	.45***	-.06	**.34***	.16***	-.03	.30***	-.03	**.45***	.19***	-.08
MI										
SC9	.51***	.12**	.20***	.18**	.05	.58***	-.18**	.01	**.29***	.09*
SC14	.66***	.04	.10**	.24***	-.004	.49***	.01	.17**	**.34***	.12**
SC17	.61***	-.08	.01	.34***	.01	.54***	.01	.03	**.37***	.02
SC22	.43***	.21***	.17***	.04	.08	.47***	-.10*	.16***	**.30***	.16***
SCR										
SC1	.30***	-.26***	.07	-.16*	.27***	.24*	.34***	-.08	.08	**.33***
SC8	.06	.06	-.11	-.24***	.01	.04	.10	.04	-.24***	**.29***
SC11	.49***	-.16*	-.22***	-.16*	.20***	.46***	.29***	-.16**	.07	**.26***
SC16	.30***	-.07	-.14**	-.23***	.43***	.15*	.07	-.20***	-.06	**.58***
SC4	.43***	-.05	-.03	-.08	.46***	.22***	.06	-.06	.07	**.62***
SC13	.40***	.05	-.04	.17**	.55***	.33***	-.12*	-.07	-.01	**.62***
SC18	.36***	.001	-.04	.09	.51***	.45***	.05	.02	-.18***	**.42***
SC25	.49***	.11*	-.06	.20	.61***	.53***	-.05	.11*	-.20***	**.60***
SC2	.30***	-.03	.20***	-.11*	.53***	.22***	-.01	.11*	.25***	**.60***
SC6	.37***	-.09	-.03	-.05	.55***	.28***	-.04	.03	.06	**.63***
SC20	.27***	-.19***	.08	-.01	.44***	.30***	.06	-.13*	.27***	**.44***
SC24	.36***	.19**	.04	.10	.61***	.35***	-.06	.06	.12*	**.59***

Note. SK = self-kindness; CH = common humanity; MI = mindfulness; USR = uncompassionate self-responding; λ = standardized factor loadings. Target factor loadings are in bold. *, p <.05; **, p <.01; ***, p<.001

Table S2.8 Standardized factor loadings for the model 3 solution and model 4 solution using ESEM in sample 2 (SCS-C omitting item 21)

	Model 3						Model 4						
	SK	SJ	CH	IS	MI	OI	SC	SK	SJ	CH	IS	MI	OI
SK													
SK5	**.56**	-.02	-.03	.01	.24***	-.12*	**.30*****	**.53*****	-.10	.06	.03	.27***	-.01
SK12	**.87**	-.18**	.03	.10*	.03	-.11*	**.40*****	**.80*****	-.16	.13***	.06	.10*	.05
SK19	**.68**	-.04	.06	.02	.03	.04	**.40*****	**.56*****	-.09	.12**	-.06	.11*	-.10*
SK23	**.31****	.60***	.16**	.19	.07	-.17**	**.42*****	**.27***	.57***	.13*	.07	-.13	.03
SK26	**.36**	.31***	.09	.04	.16*	.07	**.54*****	**.27*****	.23**	.09	-.03	.14*	-.10
SJ													
SJ1	.01	**.45*****	-.01	.04	.12*	.14*	**.41*****	-.07	**.33*****	-.06	-.03	.01	.10
SJ8	-.04	**.14***	.07	.29***	-.24***	.05	**.21*****	-.09	**.10**	.06	.15*	-.26***	-.002
SJ11	.27***	**.42*****	-.08	.19**	.09	-.05	**.21*****	.20***	**.34*****	-.09	.11*	-.02	.002
SJ16	.11	**.22****	-.19***	.22***	-.14*	.39***	**.54*****	-.15*	**.04**	-.28***	-.02	-.20**	-.22*
CH													
CH3	.16**	-.22***	**.14***	.29***	.20**	-.13*	**.22*****	.25***	-.14	**.18****	.24***	.20**	.08
CH7	.04	-.05	**.63*****	.04	.02	.04	**.24*****	.14***	-.04	**.59*****	.003	.07	.01
CH10	.10*	.04	**.76*****	-.10*	-.02*	.09	**.25*****	.14**	.01	**.72*****	-.12*	<.001	-.13**
CH15	-.12*	-.12*	**.50*****	.08	.28***	-.06	**.15***	.07	-.05	**.50*****	.10	.27***	.12
II													
IS4	.02	.19**	-.05	**.20****	-.01	.48***	**.62*****	-.15**	.03	-.14***	**-.04**	-.14**	.11
IS13	.08	-.02	-.09	**.44*****	.07	.26***	**.57*****	-.03	-.09	-.13**	**.21****	-.01	.01
IS18	.08	.13**	.04	**.63*****	.05	-.08	**.55*****	.06	.13**	.01	**.44*****	-.001	-.11
IS25	.12**	.04	.14***	**.67*****	-.04	.16**	**.73*****	.04	-.001	.06	**.37*****	-.10**	.03
MI													
MI9	.39***	-.09	.04	-.07	**.32*****	.26***	**.48*****	.33***	-.15	.08	-.13	**.27****	.18*
MI14	-.05	.03	.17***	.15**	**.61*****	-.003	**.42*****	.09*	.03	.19***	13**	**.48*****	.09
MI17	.21***	.07	.06	.15	**.51*****	.003	**.41*****	.21***	.04	.10*	-.05	**.54*****	-.14*
MI22	.21***	-.04	.20***	-.08	**.27*****	.34***	**.48*****	.15**	-.13*	.20***	-.15**	**.24****	.06
OI													
OI2	-.10*	.09	.12**	.06	.12*	**.64*****	**.65*****	-.22***	-.09	.02	-.18**	-.05	**.25**
OI6	.01	.07	.03	.31***	-.001	**.47*****	**.70*****	-.22***	-.13	-.06	.03	-.04	**.27**
OI20	-.05	.19**	-.15**	.14*	.39***	**.28*****	**.53*****	-.09	.08	-.17***	.02	.21***	**.15**
OI24	-.03	.05	.05	.33***	.15**	**.41*****	**.67*****	-.10	-.05	.02	.10	-.01	**.29***

Note. SK = self-kindness; SJ = self-judgment; CH = common humanity; IS =isolation; MI = mindfulness; OI = over-identification; λ = standardized factor loadings. Target factor loadings are in bold. *, p <.05; **, p <.01; ***, p<.001

Table S2.9 Standardized factor loadings for the model 4 solution using ESEM in sample 1 (SCS-C omitting item 10)

	SC	SK	SJ	CH	IS	MI	OI
SK							
SK5	**.37*****	**.45*****	-.09*	.15**	-.07	-.04	-.15**
SK12	**.42*****	**.64*****	.10***	.06	-.05	.02	-.03
SK19	**.47*****	**.58*****	-.01	.07	.06	-.06	-.02
SK23	**.61*****	**.10**	.09	-.07***	-.25***	.06**	-.09
SK26	**.72*****	**.04**	-.09**	.05	-.09*	-.04	-.18***
SJ							
SJ1	**.40*****	-.16**	**.05**	-.06	-.14*	.31**	.30***
SJ8	**.03**	.06	**.73*****	-.05	-.03	.04	-.06
SJ11	**.56*****	-.05	**.08**	-.31***	-.08	-.05	-.09
SJ16	**.42*****	-.07	**.15****	-.31***	.16**	-.03	.12
SJ21	**.08**	.002	**.94*****	.02	.07**	-.05	.08*
CH							
CH3	**.44*****	.04	-.94***	**.41*****	.01	-.08	.01
CH7	**.26*****	.18**	-.04	**.44*****	-.08	-.02	.02
CH15	**.40*****	.06	-.04	**.38*****	-.04	.02	-.02
IS							
IS4	**.56*****	-.06	.03	-.12*	**.14***	.12	.26***
IS13	**.57*****	-.08*	.04	-.01	**.43*****	-.10*	.06
IS18	**.51*****	-.06	.04	-.10	**.39*****	.13*	.12**
IS25	**.66*****	-.001	.06	.03	**.46*****	.02	.14**
MI							
MI9	**.50*****	.17***	-.06	.30***	-.13**	**-.21**	.02
MI14	**.60*****	.17***	.02	.31***	-.02	**.11**	-.15***
MI17	**.58*****	.06	-.10**	.25***	.05	**.21**	-.21***
MI22	**.40*****	.26***	-.001	.17**	.05	**-.08**	.05
OI							
OI2	**.46*****	-.04	.05	.05	.04	.10	**.66*****
OI6	**.55*****	-.13**	.04	-.16***	.23***	-.06	**.20***
OI20	**.47*****	-.29***	.04	-.05	-.01	-.28***	**.24**
OI24	**.55*****	.03	.03	-.02	.37***	-.22**	**.27****

Note. SK = self-kindness; SJ = self-judgment; CH = common humanity; IS =isolation; MI = mindfulness; OI = over-identification; λ = standardized factor loadings. Target factor loadings are in bold. *, $p < .05$; **, $p < .01$; ***, $p < .001$

Measures and results for convergent and discriminant validity

In the following section, the description of questionnaires used for the convergent and discriminant validity and the results of the statistics to establish convergent and discriminant validity will be presented.

Measures

Self-criticism (Sample 1). Participants were given the Personal Standards subscale of Zi and Zhou's (2006) Chinese Frost Multidimensional Perfectionism Scale. It is a 6-item subscale about individual goals and standards (e.g., I hate being less than the best at things) rating on 5-point Likert scale (from 1 "not like me at all" to 5 "very like me"). In the current study, it had good internal reliability (Cronbach's Alpha is .822).

Connectedness (Sample 1). The Chinese version (Fan et al., 2015) of the revised Social Connectedness Scale (Lee et al., 2001) was used to assess connectedness. It includes ten positive items relate to closeness with others (e.g. "I am able to connect with other people") and ten negative items related to the isolation from others (e.g., "I don't feel related to most people") on a 6-point Likert scale(1 from "strongly disagree" to 6 "strongly agree"). The Chinese version (Fan et al., 2015) has good reliability (total scale's α = .911, positive items' α = .822, and negative items' α = .867) and validity in the sample of middle school and high school students. In the current study, Cronbach's Alpha of the total scale is .921, which indicated great reliability.

Emotional intelligence (Sample 1). The Chinese version of the Trait Meta-Mood Scale was used to measure emotional intelligence (Wei et al., 2013). The Trait Meta-Mood Scale (TMMS, Salovey et al., 1995) includes 30 items on a 5-point scale (from 1 "Strongly disagree" to 5 "strongly agree") and has three subscales, specifically attention (e.g., "I often think about my feelings"), clarity (e.g., "I almost always know exactly how I feel") and repair (e.g., "When I become upset I remind myself of all the pleasures in life"). The Chinese

version of the TMMS shares the same structure as TMMS but contains only 27 items. Previous research showed that the scale is suitable to be used in the Chinese sample (Wei et al., 2013). In this study, all subscales had acceptable reliability (attention, α =.717; clarity, α = .729; repair, α = .788).

Self-esteem (Sample 2). To assess participants' globe self-esteem, the 10-item Rosenberg self-esteem scale (Rosenberg, 1965) was used. This scale uses a 5-point Likert scale (from 1 "Strongly agree" to 5 "Strongly disagree").It has been widely used in China to assess self-esteem and has good reliability in this study (α =.852). The Self-acceptance questionnaire (Cong & Gao, 1999) was also used as another measure of self-esteem. The 16-item self-acceptance questionnaire has two subscales, namely self-acceptance and self-evaluation, using a 4-point scale (from 1 "very opposite" to 4 "very similar"). Cong and Gao (1999) reported good reliability (total scale's α = .857, subscales' α = .935 and .912) and validity. In the current study, the reliability was acceptable (total scale's α = .721).

True self-esteem (Sample 2). The Chinese version of the Basic Psychological Needs Scale (Liu, Lin, Lv, Wei, Zhou, & Chen, 2013) was used to assess true self-esteem. It includes 19 items and three subscales (autonomy, competence and relatedness) measured on a 7-point Likert scale (from 1 "Strongly agree" to 7 "strongly disagree"). Liu et al. (2013) reported that the Chinese version has good reliability (total scale's α = .84, α autonomy = .57, α competence =.62, and α relatedness =.72) and validity.

Narcissism (Sample 2). The Narcissistic Personality Inventory (Raskin & Hall, 1979) was used to assess narcissism. The 40-item inventory requests participants to select one from two statements within a pair and one of the statements is narcissistic (e.g., "I am more capable than other people" and ''There is a lot that I can learn from other people"). The number of the narcissistic statements which participants selected would be the final score. The Chinese version has good reliability in this study (α =.82).

Convergent validity (Sample 1)

To test the convergent validity, Pearson's correlation was run to assess the association between self-compassion and relevant variables which share the similar constructs with self-compassion based on the theory. As expected, the SCS-C was significantly negatively associated with Personal Standard Subscale, r (465) = -.21, p < .001, positively linked to Social Connectedness Scale, r (465) = .56, p < .001, and all subscales of the trait-Meta Scale, Attention, r (465) =.32, p < .001, Clarity, r (465) = .46, p < .001, and Repair, r(465) = .68, p < .001. These results showed that SCS-C has a good convergent validity.

Discriminant validity (sample 2)

In order to test the discriminant validity with other self-attitude scales, the correlation test was conducted to test the correlations between SCS-C and other self-attitude scales. The results showed that SCS-C had significant positive correlations with Self-Acceptance Questionnaire, $r(392) = .57$, $p < .001$, Rosenberg Self-Esteem Scale, $r\ (392) = .56$, $p < .001$, and all subscales of the Basic Psychological Need Scale: Autonomy, $r\ (392) = .51$, $p < .001$, Competence, $r\ (392) = .45$, $p < .001$, and Relatedness, $r\ (392) = .45$, $p < .001$, whereas there was no significant correlation with the Narcissistic Personality Inventory, $r\ (392) = .08$, $p > .05$. These results indicated that SCS-C is different from other self-attitude scales

3 Self-Compassion in Chinese Young Adults (Study 2)

Self-compassion in Chinese Young Adults: Specific Features of the Construct from a culture perspective

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Study design, ethics application, data collection, data analysis, interpretation of data, writing the draft, reviewing and editing the draft.

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3.1 Abstract

Objectives Evidence suggests that self-compassion, or being kind to oneself in difficult times, is beneficial for mental wellbeing and social functioning. However, relatively little is known about this multidimensional concept from a cross-cultural perspective. Recent research suggested that Chinese individuals, representing a collectivist culture, may have a different understanding of self-compassion, which could differentially contribute to mental health. Therefore, this study aimed to get an in-depth insight into Chinese adults' understanding of self-compassion. **Methods** Four online focus groups comprising young adults (Mean age 19 years old) across genders with different levels of self-compassion were recruited to discuss Neff (2003)'s construct of self-compassion based on self-kindness, self-judgment, common humanity, isolation, mindfulness and over-identification. Thematic analysis was used to analyze the data. **Results** Chinese participants valued what can be described as benign self-criticism and self-reflection when contemplating on their understanding of self-judgement. Similarly, participants' view of self-compassion dimensions can be described as dialectical in that they reflected both negative and positive perceptions in each factor rather than suggesting separate and purely negative or purely positive dimensions. There was also an overlap in the interpretation of the negative dimensions (self-judgment, isolation and over-identification). **Conclusions** Our findings highlight particularities in the understanding of self-compassion in China, a collectivist culture influenced by philosophical traditions promoting dialecticism and the dual focus on the transformation of the self and social participation. Our results highlight the importance of a cultural perspective when studying self-compassion and interpreting research findings on its effect on mental health.

Keywords Self-Compassion; Definition; Culture similarities; Culture Differences; Collective Culture.

3.2 Introduction

Self-compassion can be defined as a kind and compassionate attitude towards oneself in relation to challenge and inadequacy (Gilbert et al., 2017; Neff, 2003; Strauss et al., 2016). Research has found that self-compassion has beneficial effects on mental health in both adolescents and adults (MacBeth & Gumley, 2012; Marsh et al., 2018). It is therefore considered as a promising skill that can be cultivated in mental health interventions (Barnard & Curry, 2011). The association between self-compassion and mental health has hence been studied across countries in adults from Taiwan, Thailand, and the United States (Neff et al., 2008), and adolescents across China and the United Kingdom (Zhao et al., submitted).

Interestingly, empirical exploration of self-compassion in different countries yields inconsistent results, which could be due to cultural differences (Montero-Marin et al., 2018; Tóth-Király and Neff 2020). For example, there are differences in how self-compassion is associated with depression and social functioning between Chinese and UK adolescents (Zhao et al., submitted). Qualitative research that permits the exploration of how people from a specific population view self-compassion is to date limited but could help explore and explain such cultural differences. Here we first review the definition of self-compassion and its measurement and evidence for the understanding of self-compassion from a cultural perspective before introducing the qualitative approach we propose for studying the gap in our understanding of self-compassion in China.

3.2.1 The definition of self-compassion and its measurement

Self-compassion means being kind to oneself when facing difficulties (Neff, 2003). According to the predominant definition, self-compassion is a multidimensional construct about how we relate to ourselves when facing challenges or our inadequacies (Neff, 2003, 2016). Individuals can meet these with compassion, kindness and understanding (self-

kindness) rather than harshly judging or blaming oneself (self-judgment). Additionally, individuals understand their difficulties, failure or inadequacies as a shared experience with other human beings (common humanity) rather than feeling the difficulties only happened to themselves (isolation). Furthermore, to process a difficult situation, individuals use a mindful and balanced way (mindfulness) rather than carried away by their emotions (over-identification). The six subscales of the self-compassion scale (SCS) (Neff, 2003), the most widely used measure of self-compassion across cultures, reflect this definition.

Since Neff defined self-compassion and developed the self-compassion scale (Neff, 2003), debate continues about its psychometric properties stimulated by partially inconsistent findings (Muris & Otgaar 2020; Neff, 2020). While across many different countries the originally proposed six-factor structure was detected (Neff et al. 2019), it was not replicated in samples from several countries that are widely regarded as representing a collectivist culture (Oyserman et al. 2002), including China (Zhao et al., submitted; Neff et al. 2019) and Japan (K. D. Neff et al. 2019; Tóth-Király and Neff 2020).

In Chinese samples, several studies failed to support the 6-factor structure of SCS-C (e.g., Neff et al., 2019; Zeng et al., 2016) and partially supported a novel 4-factor structure with confirmed factors self-kindness, common humanity, mindfulness, whereas the negative factors, self-judgment, isolation and overidentification converged into a single negative factor (Tsai, 2015; Zhao et al., submitted). For example, Zeng et al. (2016) found that the subscales self-kindness and common humanity did not correlate with their negative poles, self-judgement and isolation, and self-kindness did not correlate with better life satisfaction in a Chinese Buddhist sample, despite significant correlation in American undergraduates samples (Neff, 2003; Neff et al., 2008). Even when successfully replicating the six-factor structure, some studies reported low internal consistency for the subscales of the Chinese version of the self-compassion scale (e.g., Chen et al,. 2011; Deng et al., 2012). These

findings suggest that there might be a cultural difference in the understanding of self-compassion in the Chinese sample from its original definition (Neff, 2003, 2016).

3.2.2 Understanding self-compassion from a cultural perspective

Although informed by Ancient Buddhist tradition, the concept of self-compassion has been defined and predominantly studied in academic psychology in industrialised countries of the Western world with a predominantly individualist culture. Despite growing interest in exploring self-compassion in areas such as mainland China, Taiwan, Hong Kong and Japan, culturally informed research on our understanding of the construct is limited.

Within cultural psychology literature, one framework that may be useful in understanding differences in psychological constructs, such as Markus and Kitayama's (1991) self-construal theory. Self-construal theory states that for individuals in collectivistic cultures such as China, the dominant self-construal is interdependency, prioritising social harmony and interpersonal connectedness when relating to self and others. Individuals in collectivist cultures with a high level of interdependent self-construal tend to show more other-focused emotions than those in individualist cultures, like shame, and they tend to use self-criticism as motivation. In contrast, individuals in individualistic cultures highly value personal goals, autonomy, and personal needs as part of an independent self-construal they develop, and they tend to express and experience more ego-focused emotions than those in collectivist cultures, such as anger and pride (Markus & Kitayama 1991). Given the importance of how individuals relate to themselves and others for self-compassion, culturally shaped self-construal could influence how individuals view self-compassion and how they complete the self-compassion scale.

The role that cultural differences play for mental health has now been acknowledged, such as self-construal of trauma appraisals for explaining differences in posttraumatic stress

disorder between independent and interdependent cultures (Jobson &T O'Kearney, 2009). Little research has been conducted to date on the relevance of the self-construal theory for the self-compassion construct. Neff et al. (2008) used a survey design to assess the association between different self-construals (independent vs interdependent) and self-compassion to explore cultural differences in undergraduate samples from Taiwan, Thailand (both collectivist), and the USA (individualist). Thai students had high self-compassion, and self-compassion was only correlated with interdependence. In Taiwan, there was low self-compassion, and self-compassion was associated with both independence and interdependence. Whereas for USA undergraduates, they had the highest level of self-compassion and self-compassion was only associated with independence. The findings of this study highlighted that individuals from collectivist (or individualist) cultures do not represent a homogenous group, and within each collectivist culture, there could be unique cultural-related factors contributing to self-compassion.

Furthermore, the studies (Neff et al., 2008; Tóth-Király & Neff, 2020) did not establish the measurement invariance of self-compassion in the Chinese sample, and measurement invariance (or equivalence of measures) is the foundation of quantitative research concerned with cultural comparison (Milfont & Fischer, 2010). Failure to establish measurement invariance implies that there are different meanings to scale items across cultures. Thus, exploring and learning the understanding of self-compassion from sub-dimensions from a cultural perspective is necessary. Qualitative research may help understand how Chinese individuals view self-compassion. Assuming that participants' preconceptions about self-compassion and familiarity with the concept will influence how they understand the items and answer the questionnaire, a qualitative study that explores participants' understanding of self-compassion could help understand some unexpected findings of the validation studies and explore cultural-specific perceptions of the construct of self-compassion.

3.2.3 Current study

Self-compassion is a multifaceted construct, with an ongoing theoretical discussion of its definition. Although a small number of quantitative studies suggest cultural differences in how components of self-compassion are associated with aspects of cultural orientation, an in-depth understanding of why some samples from collectivist cultures, such as China, may interpret the Western psychology construct differently, is currently lacking. Although the need for qualitative research on self-compassion has recently been highlighted (Tóth-Király & Neff, 2020), there are to date few studies available, and they predominantly investigated how clients perceive therapeutic change (Gilmour, 2014) or how clinical practitioners who use the approach in their therapeutic work understand self-compassion (Wiklund Gustin & Wagner, 2013). There is also limited research focusing on the understanding of different dimensions of self-compassion. This study, therefore, aims to explore how Chinese young adults understand the different dimensions of the self-compassion scale –Chinese version (SCS-C) via a focus group study. Focus groups are "a carefully planned discussion designed to obtain perceptions on a defined environment" (Kreuger, 1998 p88). Also, the focus group is part of mixed-methods research which used a sequential explanatory design (Creswell et al., 2011). The focus group was following a quantitative study which was dominant (Zhao et al., submitted), and the focus groups were used for clarification and developing the findings from the quantitative study.

3.3 Method

3.3.1 Design

An online focus group discussion was used in this study. In the dominant psychometric study (Zhao et al., submitted), the findings partially supported the 6-factor structure, but this structure was not stable in two Chinese samples. Additionally, the internal consistency of the

6 subscales was low for the Chinese version of the self-compassion scale (SCS-C) thus replicating previous research (e.g., Chen et al., 2011; Deng et al., 2012), whereas for the English version, we confirmed high internal consistency (e.g., Neff, 2003). Interestingly, a novel 4-factor structure put forward by previous research (Tsai, 2015) was partially supported. Also, we found that compared with other language versions of the self-compassion scale (Neff et al., 2019), some items did not load on the hypothesised components (Zhao et al., submitted). Informed by divergent psychometric findings and inspired by previous research about cultural differences in the self-compassion scale (Neff et al., 2008), we aimed at exploring cultural differences of the proposed six components of the self-compassion scale.

Also, SCS-C was directly translated from the English version, and using SCS-C in quantitative research is based on the premise that the understanding of self-compassion in the Chinese sample follows Neff (2003, 2016)'s theory. Furthermore, three psychometric studies of SCS-C indicated that SCS-C was not consistent with Neff's theory (Tsai, 2015; Zeng et al., 2016; Zhao et al., submitted). Thus, only using quantitative research cannot explain the inconsistent findings of the factor structure of self-compassion in Chinese, specifically, if the understanding of self-compassion in the Chinese context is different from another cultural context such as the US, where the manipulation definition of self-compassion scale was proposed.

3.3.2 Participants

Participants were recruited as a subsample from a related psychometric study, including two-time assessments of the self-compassion scale (Study 1). Study 1 Sample 2 was planned to do test-retest reliability. Thus, we asked participants to fill the SCS-C again after two weeks. The criteria for approaching participants were that they attended two-time

assessments (n=187) with better stability demonstrated by a smaller mean difference of the score of self-compassion, a high or low score of self-compassion scale to ensure perspectives were obtained from the full distribution of self-compassion. For the cut-off point of the high/low score of the self-compassion scale, we used the common cut-off point of 27% for the high/low group. Practically, we ordered the participants based on the score of the first assessment from lowest to highest and then found the cut-off point. In order to follow guidelines for conducting qualitative research which requires homogenous focus groups (Smithson, 2020) and to allow the inclusion of participants representing relevant key demographic and SCS criteria, we conducted four different groups: female and high score group, male and high score group, female and low score group, and male and low score group. Setting the focus groups by gender and by the levels of self-compassion aimed to keep the homogeneity within each group which has been known to encourage all participants to share their views (Smithson, 2020). We invited 32 participants based on their self-compassion score (high score and low score) and gender (16 females and 16 males). 27 participants agreed to join the sequential group discussion: low-score male group (N = 7, M_{age} = 18.86, SD_{age} = .69; Group 1) low-score female group (N = 7, M_{age} = 18.71, SD_{age} = .95; Group 2), high-score male group (N = 5, M_{age} = 19.00, SD_{age} = .71; Group 3) and high-score female group (N = 8, M_{age} = 19.13, SD_{age} = .83; Group 4). The study was approved by the Ethics Committee of the University (UK, eCLESPsy000574 v4.1).

3.3.3 Materials

Focus group discussion schedule. The focus group discussion schedule was a translated version of the schedule used in previous research (Gilmour 2014), developed to explore each of these factors in detail the six-factor structure for self-compassion scale (Neff 2003); self-kindness, common humanity, mindfulness, self-judgment, isolation, and overidentification form (Table 3.1). Gilmour (2014) selected one statement for each dimension from SCS to

provide a specific example (i.e., When you failed in the important thing, …) to help participants to discuss their thoughts and opinion of the dimensions of self-compassion. The Chinese version (see supplementary materials) was translated by the first author (MZ) and reviewed by a native Chinese speaker whose research area is mindfulness (DZ).

3.3.4 Procedure

Before initiating the online focus group discussion, participants received the information sheet and informed consent form. Demographic data, including age and gender, had been collected in the initial psychometric study. Due to the geographical distance between participants and moderator, a synchronous online group was conducted (Smithson 2020). We used Chinese online social software (QQ) to create online groups. The group discussions were led and moderated by the first author (MZ) and lasted approximately one hour. During the online discussion, participants would join the corresponding online chat group, and the first author would post the question in the group. All participants typed their answers. After finishing the discussion, the author saved the text and then dismissed the online group. To facilitate more openness and anonymity in online groups (Smithson 2020), participants used pseudonyms.

Table 3.1 The focus group discussion statements

Dimension	Discussion Statement ("When I fail something important,…")
Self-Kindness	"…, I give myself the caring I need."
Common Humanity	"…,I try to remind myself that failures are shared by most people."
Mindfulness	"…,I try to keep my emotions in balance."
Self-Judgment	"…,I am critical about myself and dislike my own flaws and inadequacies."
Isolation	"…,I tend to feel that I am the only person that ever fails at anything or gets anything wrong."
Over-Identification	"…, I tend to obsess and fixate on everything that is wrong. "

3.3.5 Data analysis

All data were analysed using thematic analysis (TA); a method for identifying, analysing and reporting patterns within data (Braun & Clarke, 2006), applied as a realistic approach in that we interpreted participants' responses to be indicative of their actual experiences (Braun & Clarke, 2006). Groups were treated as the unit of analysis, with the following steps (Braun & Clarke, 2006; see Table 3.2): becoming familiar with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing a report. The first four steps were completed in Chinese, while the theme maps were translated into English. In order to increase reliability, two coders generated the initial codes for all the focus groups (MZ and NYBW), which were double-checked by another two native Chinses speakers (YL and NS), after resolving initial discrepancies. After this initial coding, MZ searched the themes and reviewing themes, and NYBW double-checked the themes and assisted the translation of the themes. Once MZ and NYBW agreed on the themes, a psychological therapist who is working in the USA (Chinese native speaker, JL) double-checked their translation, which were reviewed by an experienced qualitative researcher and native English speaker (JS) and an experienced self-compassion researcher (AK).

Table 3.2 Thematic analysis steps

Steps	Language(s)	Researcher(s)	Reviewer(s)
Familiar with the data	Chinese	MZ and BW	YL and NS
Generating initial codes	Chinese	MZ and BW	YL and NS
Searching for themes	Chinese	MZ	NYBW
Reviewing themes	Chinese and English	MZ	NYBW and JL
Defining and naming themes	English	MZ	AK and JS
Producing a report	English	MZ	AK, JS and PW

3.4 Results

Table 3.3 for the themes illustrates the themes identified for each of the factors (i.e., self-kindness, common humanity, mindfulness, self-judgment, isolation and over-identification) from the focus group discussions.

Table 3.3 Themes

Components of self-compassion	Global themes	Specific Themes	Groups
Self-Kindness	Self-pity	Excuses	1,2,4
	Self-pity	Rumination on Failure	1,2
	Self-pity	pessimism	1,3,4
	Self-comfort	Leisure Activities	2,3,4
	Self-comfort	Emotion regulation	1,2,3,4
	Self-comfort	Self-confidence	1,3,4
	Self-comfort	Problem solving	1,2,3,4
	Self-comfort	Self-encouragement	1,2,3,4
Common Humanity	Self-comfort	Universality	1,2,3,4
	Self-comfort	Emotion regulation	1,2,3,4
	Self-comfort	Avoid rumination on Failure	4
	Coping strategies	Self-deception	1,4
	Coping strategies	Problem solving	1,3,4
	Coping strategies	Successful cases as a motivator	2,3,4
	Coping strategies	Needing a positive self-adjustment	3,4
	Coping strategies	Excuses	1,2,4
	Individuality	Self-focused	1,2
	Individuality	Variability in failure experiences	1,4
Mindfulness	Emotion regulation	Emotion stability	1,2,3,4
	Emotion regulation	Avoid wallowing in negative emotions	1,2,3,4
	Emotion regulation	Emotion awareness and acceptance	2,3,4
	Decision making	Analyzing the causes	1,4
	Decision making	Problem solving	1,2,4
	Self-image management	Affecting others	1,2,3,4
	Self-image management	Saving faces	1,2,3,4
	Self-image management	A sign of maturity	1,2
	Emotion suppression	Releasing emotion	1,2,3,4
	Emotion suppression	Low mood	1,2,4
	Emotion suppression	Superficially calm	1,2,4
Self-Judgment	Self-criticism as an adaptive strategy	Improvement	1,2,3,4
	Self-criticism as an adaptive strategy	Self-knowledge	1,2,3,4
	Self-criticism as an adaptive strategy	habit	1,2,3,4
	Self-criticism as an adaptive strategy	Problem solving	1,4
	Self-criticism as an adaptive strategy	Guilt	1
	Self-criticism as an adaptive strategy	Motivation	1,2
	Self-criticism as undermining	Self-blame	1,4
	Self-criticism as undermining	Inferiority	1,4
	Self-criticism as undermining	Guilt	1
	Self-criticism as undermining	Motivation	1,2

Isolation	Social comparison	Social comparison	1, 2, 4
	Negative thoughts	Exaggeration	1
	Negative thoughts	Pessimism	1,2,3
	Negative thoughts	Vicious cycle	1, 2
	Self-undermining	Self-blame	1,2,3,4
	Self-undermining	Self-denial	1,4
	Self-undermining	Inferiority	1,2,3,4
Over-Identification	Common phenomenon	Common phenomenon	1,2,3,4
	Negative outcomes	Rumination	1,2,3,4
	Negative outcomes	Negative emotions	1,2,3,4
	Negative outcomes	Vicious cycle	1,2,4
	Self-undermining	Self- dissatisfaction	2,4
	Self-undermining	Self-blame	2,4
	Self-undermining	Inferiority	2
	Benefits	Helpful for reflection, as a reminder	3,4
	Benefits	Motivation	3,4

3.4.1 The understanding of self-kindness

Self-comfort. For some participants, this was a way to soothe negative emotions (e.g., frustration, self-doubt) after failure, and they identified several ways: doing some leisure activities (e.g., *"I would try to do something I enjoy, like shopping and singing, to soothe my mood"*), encouraging themselves via positive self-talk (e.g., *"I can do better next time*" or "*it is okay and anyway I tried my best"*), and reflecting on the failure in order to solve a problem (e.g., "*Normally, I would identify my weaknesses…*"). Moreover, several participants believed that self-kindness shows self-confidence in dealing with the next challenge and this can help to rebuild confidence damaged by failure.

"Self-caring is the rebuilding of self-confidence, which was damaged by failure. This process requires courage."

Self-pity. Some participants reported that they could not be kind to themselves because they were carried away with their emotional responses to failure and that they needed care from others in these situations:

"I don't feel this statement make sense. After failing in something, I am always wallowing in failure. The care I need has to come from others, and I cannot give myself the care I need."

Additionally, several participants thought that whether they could be kind to themselves or not depended on the situation. For example, one failed after not putting in sufficient effort, and therefore felt it would not be appropriate to comfort oneself with the thoughts that "it is okay" and "I will do better next time". In this context, self-kindness becomes "making excuses for one's mistake" which leads to self-pity and hinders people from progress and success.

"So it depends on different circumstances. Sometimes, it is understandable to take care of oneself to soothe internal frustration, but we cannot engage in self-pity. It is important to reflect on your problems and then give appropriate self-comfort or self-encouragement."

In brief, participants described self-comfort as different ways to deal with negative emotions when experiencing failure, confirming the definition of self-kindness, "being gentle, supportive, and understanding toward oneself" and compassionate emotional response of failure (Neff 2016).

3.4.2 The understanding of common humanity

Self-comfort. Several participants agreed that everyone would experience failure (e.g., "*Life is never going smoothly, and everyone, more or less, goes through failure*"), and "*This is the way some people choose to comfort themselves*". This self-comfort can avoid rumination on failure (i.e., "*avoid wallowing in the failure*" and "*get out of failure quickly*"). So self-comfort was perceived to assist in regulating negative emotions. For example, this reminder helps to "*get rid of negative emotions*", reduce negative thoughts, "*face failure calmly*" and "*motivate to move forward*".

"When we make mistakes, we tend to think of ourselves as worthless. At that time, if we thought about the fact that other people make mistakes too, we would bring ourselves to their level to reduce the negative self-suggestions. "

Coping strategies. Most participants stated that they tend to use a more positive way to adjust (e.g., "*I don't believe it as a common thing that happens to everyone. Instead, I should think that we have weaknesses, and we should analyse and improve ourselves"*) because perceived self-comfort as excusing the failure instead of facing and reflecting on it (e.g., "T*his would just be making unnecessary excuses for my own failure*"). More specifically, they wanted to reflect on the failure to learn from their mistakes in order to solve problems or succeed next time (e.g., "*we should reflect on ourselves*"). Several participants mentioned that they would rather learn from or be motivated by successful cases than from the reminder that failure is universal because success is also universal (e.g., "*I will think of how successful people deal with their failure rather than focusing on failure itself.*").

Individuality. Several participants were likely to focus on themselves rather than connecting their experiences to others (e.g., "*After experiencing failure, I would focus on myself instead of comparing myself with my peers or others*"). Secondly, because of variability in failure experiences (e.g., "*it is impossible to say that everyone's experience is the same*"), they stated that reminding oneself that failures are shared by most people is an escape from facing the failure.

In summary, participants agreed that everyone experiences failure, which is consistent with the definition, "acknowledge the shared nature of imperfection" (Neff, 2016), but at the same time, some participants regarded this as a negative coping strategy, such as excuses and self-deception, which is in contrast to the definition, "cognitively understand their suffering with a sense of common humanity" (Neff, 2016). Many participants mentioned that they tended not to choose this way to adjust themselves, although they know this is the fact. This might

interpret why the low internal consistency of common humanity in previous studies (e.g., Chen et al., 2011).

3.4.3 The understanding of mindfulness

Emotion regulation. Emotion regulation was one of the key themes emerging. For some participants, keeping emotion in balance helped to regulate their emotions in order to avoid going to extremes (e.g., *"If one doesn't keep the emotion in balance, their behaviour might get affected by negative emotions, and they do something they would later regret*"). Also, emotional regulations avoided negative emotions. Three participants from different groups mentioned that this would help them to be objectively aware and calmly accept their emotions (e.g., "*It is difficult to be aware the emotion that the one is going through, and it is even more difficult than analysing one's emotion.*").

Decision making. Secondly, keeping emotionally balanced was important to make safe and sound decisions (e.g., "*one must keep the emotions in balance in order to think calmly and make the right decision*"). Specifically, several participants mentioned that keeping emotion in a balanced way assisted them in thinking calmly, analysing what happened and selecting appropriate solutions or plans (e.g., "*It can help you to calmly analyse the cause of failure and be ready for the next attempt*").

Self-image management. Keeping emotion in balance was perceived as a form of self-image management. Several participants mentioned *"this is a sign of maturity"* and shows a person with high emotional intelligence. All groups mentioned that this could save face (e.g., "not sob") and avoid exerting a negative influence on others:

"At the very least, I believe not allowing myself to burst of crying at the point. I think that keeping my emotions in check is a sign of being mature in crucial moments."

Emotion suppression. In contrast, some participants argued that keeping emotion in a balanced way is a form of emotion suppression. Several participants stated that although some

people may appear emotionally stable, superficial calmness might hide negative emotions inside. Participants admitted that they wallow in a low mood (e.g., "*Because whenever I experience failure, I do not want other people to see my sadness, I tend to present superficial calmness to others. On the other hand, because I am too sad inside, kind of losing hope, I would also reach a calm state of mind*").

All groups stated that releasing emotions is necessary when it would not affect others, which would enable coping (e.g., "*return to normal life and continue to do something else*"):

"However, I think when I am alone, which means that my behaviour wouldn't affect others, it is necessary to let off some emotions."

In summary, participants' views indicated emotion awareness; avoiding wallowing in negative emotions partially reflects Neff's definition (2016), e.g., "being aware of one's present moment experience of suffering and treating it with clarity and balance". However, some participants understood this statement as indicating emotion suppression, maybe due to the differences in the expression "balance in emotion" between the English and Chinese languages. In Chinese, the word "balance" is not typically used in combination with the word "emotion", whereas, "make emotion stable" is widely used in Chinese, which refers to both keeping emotion in a balanced way as well "emotion stability". This language discrepancy might cause the misunderstanding of mindfulness items as "emotion suppression", and this might lead to the low internal consistency of this SCS subscale when participants answering these items.

3.4.4 The understanding of self-judgment

Half of the participants considered self-judgement as undermining, whereas the other half perceived self-judgement as an adaptive strategy.

Self-criticism as undermining. Participants supporting this view thought self-criticism would cause perceived inferiority, guilt and exaggerated self-blame. What they need is self-

reflection to help them critically reflect on failures to learn their flaws and inadequacies and make progress:

"*For me, I would blame myself after failure, but I would also find my flaws and correct them. However, there should be a limit for self-blame. If we blindly blamed ourselves for our shortcomings and weaknesses, this would not be beneficial but only lead to feelings of inferiority."*

Self-criticism as an adaptive strategy. The participants seeing self-criticism as adaptive, argued that it was habitual and assisted them in correcting their mistakes and enhancing weaknesses. Thus, they considered self-criticism as helpful to make improvement, self-reflection and problem-solving:

"Firstly, one should be strict with oneself, and self-criticism is necessary, which would push one to make a plan to improve. Without being strict with oneself, one wouldn't improve on one's flaws."

Interestingly, several participants also acknowledged that self-criticism could cause negative emotions, such as guilt and rumination on one's flaws or inadequacies. However, they argued that they could find motivations from guilt or their flaws to move forward. Several participants mentioned that the appropriate level of self-criticism should depend on the situation and person. For something easy or those who are positive and mentally strong, they should criticise themselves in order to avoid self-pity or self-indulgence.

"I will criticize myself and find out my weaknesses. I might wallow in self-blame for a while. But I would also find motivations from my weaknesses."

In brief, half of the participants agreed that self-judgment is a cold, harsh and undermining way to treat oneself, consistent with Neff's definition (2003, 2016), however, the other half of the participants argued that being self-judgmental is beneficial to self-improvement and problem-solving. Some proponents of both views shared the same theme, "self-reflection" in

some participants. These different views of self-judgment may lead participants to respond differently, which might explain the lower internal consistency reported in several studies (e.g., Chen et al., 2011).

3.4.5 The understanding of isolation

Negative thoughts, self-undermining, and social comparison. All participants agreed that this is a form of negative thought (e.g., the exaggeration of failure) and self-undermining (e.g., "*This is a kind of pessimistic, negative emotion. It is an exaggeration of the failure and the underestimation of one's performance*"). They perceived this response to cause harsh self-blame, self-denial and perceived inferiority (e.g., "*this is a sign of inferiority and excessive self-pitying. It's an exaggeration of one's flaws and completely self-denial*"). Two participants mentioned that holding this view might step into a vicious cycle (e.g., "*This is a kind of pessimistic, negative emotion. It is an exaggeration of the failure and the underestimation of one's performance*"). Five participants from three groups mentioned that this view was generated from social comparison with others (e.g., *"……If people around me all succeeded in one thing and only I failed in it, sometimes, I would have this thought"*).

In brief, initial findings supported that Chinese young adults treat isolation similarly to Neff's definition (2016), "an egocentric response to suffering". However, interestingly, five participants mentioned that this egocentric response is usually generated by social comparison, which is not consistent with the previous argument of adolescent egocentrism (Neff, 2016). Neff (2016) argued that this egocentric response to suffering is similar to adolescent egocentrism (Elkind 1967), which was rooted from "the personal fable" that "one's personal experience is unique and unrelated to that of others"(Lapsley et al., 1989). Whereas, this could be considered as supportive evidence of Neff's idea (2016) that it is important to assess isolation separate from self-judgment and over-identification.

3.4.6 The understanding of overidentification

Common phenomenon. Participants from all groups stated that obsessing and fixating on everything that is wrong is very normal and common for everyone, and they would tend to react in this way. Although they were aware that this was harmful, they could not easily avoid it (e.g., "*I always find that this emotion is very negative, but hard to get rid of it*").

Negative outcomes and self-undermining. They acknowledged that this would cause wallowing in negative emotions (e.g., stress) and rumination on the failure or other negative events (*"but one shouldn't ruminate on it, or else the negativity would be overwhelming to handle…"*). Four participants mentioned that this is a vicious cycle, for example, the rumination on everything wrong would cause something bad, and something bad would aggravate rumination, thus maintaining a vicious cycle (e.g., *"…I think if one is always thinking in this way, the one would be ill. And the illness would enhance this kind of thought, and this would cause one to ruminate even more. I'm just like that. This can lead to a vicious cycle"*). Several participants also mentioned that this reflected self-undermining (i.e., self-dissatisfaction, self-blame and inferiority, e.g., *"…this is an excessive criticism of oneself, which means that one is very dissatisfied with oneself"*).

Benefits. Interestingly, four participants mentioned that it was beneficial to focus on everything that is wrong. They argued that these negative outcomes (ruminations or negative emotions) caused by focusing on everything wrong helped them to reflect upon themselves thoroughly, and this could be a reminder for avoiding similar mistakes in the future. Also, two participants mentioned that it could be a motivation to move forward:

"…it is also useful. I can reflect deeply on myself, like that I would know where I did wrong and where I did not do as well, to help me learn the cause of failure…"

"…remembering my own failure and treating it as a motivation to avoid similar mistakes."

In brief, most participants admitted that they tended to ruminate on negative experiences and emotions from where they risked stepping into a vicious cycle, which is consistent with Neff's definition (2016) that one is "caught up in an exaggerated storyline about negative aspects of oneself or one's life experience". However, they agreed that this reaction was normal, and several participants mentioned the potential benefits of over-identification, such as reflecting upon themselves thoroughly and serving as a reminder for avoiding similar mistakes in the future.

3.4.7 Summarizing the analysis of the six statements: the understanding of self-compassion as a "dynamic" and "synergistic" system

In summary, participants from different groups discussed six statements representing six dimensions, which partially aligned with Neff's definitions. Examples include, "self-comfort" for self-kindness, "universality" for common humanity, "emotion awareness and acceptance" for mindfulness, "self-criticism as undermining" for self-judgment, "self-undermining" for isolation, and "rumination" for over-identification. However, there were also examples where dimensions were viewed differently from Neff's definition. For example, "self-comfort" was identified as a core concept of self-kindness, but it also showed in the discussion of common humanity. In addition, "self-undermining" was described as a core concept of "isolation", but it also figured in the discussion of self-judgment and over-identification. Several themes repeatedly appeared across dimensions, for example, "problem-solving" emerged in the discussion of self-kindness, common humanity, mindfulness and self-judgment. This aligns with the definition of self-compassion by Neff (2003; 2016) and the association between six dimensions (Neff, 2016), which stated that self-compassion is a dynamic and synergistic system in a sample of Chinese young adults.

Some interesting themes were identified, such as "negative coping strategies" in the discussion of common humanity, "emotion suppression" in the discussion of mindfulness,

"self-criticism as an adaptive strategy" in the discussion of self-judgment. Chinese young adults may interpret and respond to some items differently from individuals answering the original SCS (Neff, 2003) and might explain some of the low internal consistency findings for some subscales in the previous study.

Lastly, three distinct positive dimensions could be distinguished in this Chinese sample; although there are similarities indicated by several themes (i.e., "self-comfort", "rumination" and "emotion regulation") shared by different dimensions, based on other themes, see Table 2. Specifically, participants understand self-kindness as a way to comfort oneself, although some participants consider it as a form of self-pity. For common humanity, participants considered common humanity as a coping strategy, although some participants did not perceive difficulties as a shared universal experience because everyone's challenges differ; these participants wanted a more positive way to cope with their difficulties. Participants considered the dimension of mindfulness as a way to regulate the emotion, make wise decision and manage one's image, while, some participants saw this dimension as emotion suppression. In contrast, there were such large overlap between themes for the negative dimensions self-judgement, isolation and overidentification that arguably these are not distinct constructs as conceptualised by Neff (2003).

3.5 Discussion

This study aimed to explore the understanding of the construct of self-compassion based on the self-compassion scale and applied focus group discussion in Chinese young adults. Our results revealed that overall, Chinese participants showed dialectical views when reflecting on the different facets of self-compassion in that they reported both negative and positive perceptions for each factor. This diverges from the original definition as Neff (2016) stated that "self-compassion entails three main components, each of which has a positive and negative pole that represents compassionate versus uncompassionate behaviour"(p265). In Neff's

definition, compassionate behaviours include self-kindness, common humanity and mindfulness and uncompassionate behaviours involve self-judgement, isolation and over-identification. Additionally, study participants tended to emphasise the importance of self-reflection or benign self-criticism across all dimensions. Lastly, we found that for negative factors, there were similar themes sharing across three negative factors, such as self-undermining, and negative emotions, which suggests that these are not perceived as distinct from each other.

3.5.1 Dialectical understanding of self-compassion dimensions

The first difference we observed was that Chinese young adults presented a more dialectical understanding of different factors. Higher levels of dialectical thinking in Chinese young adults are consistent with previous research (Peng & Nisbett, 1999; Zhang et al., 2015). Peng and Nisbett's (1999) found that Chinese undergraduates equally weighted two contradictory statements, whereas American undergraduates tended to choose one over the other statement. There are two philosophical traditions that explain why Chinese young adults engage more in dialectical thinking. Every Chinese student in senior high school and the university is taught Marxist Dialecticism (Zhang et al., 2015). Also, Taoism, one of the three main Chinese philosophies, teaches the mutual dependency of two opposites and contradictions in active harmony (Lao-zi, BC 570 - 490), which may contribute to the phenomenon that Chinese individuals are more likely to engage in this flexible, dialectical thinking (Peng et al., 2006).

3.5.2 Self-reflection and benign self-criticism

Secondly, participants valued self-reflection or a form of benign self-criticism, represented by repetitive themes with similar meaning, "problem-solving" from self-kindness, common humanity and mindfulness, "self-reflection" from self-judgment and "helpful for reflection"

from over-identification. Many participants mentioned searching a reason for failure, self-reflection, and self-criticisms in different dimensions. Also, some of the participants agreed that self-reflection and benign self-criticism are necessary for them in order to grow. As Neff (2011) elaborated, there are differences in self-criticism in different cultures. In a collectivist culture, people are relatively more self-critical than people in an individualist culture (Kitayama et al., 1997). Confucianism stresses that *Xin* (mind-heart), which means self-cultivation, and *Si* (reflection) as a cognitive element of *Xin* (self-cultivation) (Wei et al., 2016), serve a vital role in one's development (Cheng, 2004). Hence, Confucianism guides people to pursue self-cultivation via self-reflection. This idea influences individuals' tendency to engage in self-reflection and benign self-criticism. Participants of our study mentioned that focussing on the things that had gone wrong or negative emotions facilitated improving self-reflection. This is consistent with previous research, which found that when feeling unhappy, USA undergraduate students tend to experience anger and aggression whereas Japanese undergraduate students tend to associate it with self-improvement and transcendental reappraisal (Uchida & Kitayama, 2009).

Our finding of benign self-criticism and self-reflection may provide a different perspective for understanding self-compassion through the lens of culture. Self-criticism of one's flaws is redefined as self-judgment (Neff, 2003, 2016), and self-judgment has been considered as a maladaptive trait of those with a lower level of self-compassion (Neff et al., 2008). In our Chinese sample, we observed that self-judgment had two sides, maladaptive and benign. Benign self-criticism is similar to self-reflection, which can be considered as a constructive habit of problem-solving, whereas maladaptive self-criticism is associated with a threatening form of self-judgment as defined by other researchers (Gilbert & Irons, 2009; Neff, 2003). Maladaptive self-criticism is related to shame (Gilbert & Irons, 2009) and has been linked to self-damning and self-undermining (Gilbert & Irons, 2009 for review). Whereas shame has

moral significance in the Confucian philosophy (Seok, 2015), it stresses the facilitating effect of shame on self-reflection to achieve growth or self-criticism in order to improve oneself that "Be aware of shame then go forward" ("知耻而后勇"，Mencius, 372BC-289BC). Thus, in China, shame is a motivation for self-improvement via benign self-criticisms or self-reflection.

Additionally, this motivation for self-improvement in a collective culture is stemming from achieving social harmony, i.e., the notion of a balanced positive state within an organization or society, which is an important concept in China (Fu et al., 2004). Specifically, benign self-criticism about one's shortcomings or flaws can be considered as an adaptive strategy to improve oneself when aiming to achieve social harmony (Kitayama et al., 1997). This could be understood within self-construal theory (Markus & Kitayama, 1991), which postulates that there are two different culture-dependent self-construals. In individualist cultures, people tend to develop self-views as independent and more separated from the social context. However, in collectivist cultures, people are more likely to develop an interdependent self-construal in which a person views themselves solely through the lens of social context and relationships. Thus, the Confucian philosophy with great emphasis on shame, self-reflection and social harmony as the desired pathway to positive character development may influence how Chinese interpret the self-judgement factor when answering the SCS-C. Our conclusions warrant further research focussing also on potential cultural differences in the understanding of self-compassion in China.

The current study provides insight into how Chinese young adults understand the construct of self-compassion and offers a possible explanation for some unique findings regarding the SCS-C's factor structure in this population. The understanding of self-criticism and shame in ancient Chinese culture is different from the theory defined in western culture, which stresses the negative impact on one's mental health. This potentially influences the understanding of self-compassion in Chinese participants. Given that there are similarities between Chinese

culture and Japanese culture, such as the value of self-criticism, these findings may also contribute to the understanding of self-compassion in Japanese culture, but it needs empirical study.

3.5.3 Limitations

We should be cautious about generalizing the findings to the Chinese population as well as others. Our sample only included university students, and the understanding of self-compassion may be different in other groups, such as the clinical population (Gilmour, 2014). Further, the sample size of the groups was small (Smithson, 2020). We only had 4 different types of focus groups (by gender and self-compassion score), different characteristics (i.e., gender and levels of self-compassion) should be sufficient for tentative conclusions and suggestions for further research. Although we ran focus groups separately for gender and levels of self-compassion, this was primarily done to keep homogeneity in the group and to avoid missing the potential views or thoughts of a certain characteristic of participants (such as low self-compassion). It also allowed us to look out for possible differences in the role that gender or dispositional self-compassion could play in understanding self-compassion in Chinese young adults. However, when we were analysing the data, we did not find differences between groups, as shown in Table 3.3. The potential reason may be a fairly small sample size (i.e., four focus groups) and the sociodemographic homogeneity of our groups, who are all young undergraduate students. However, evidence from quantitative studies found gender differences that males are more likely to have a high score of self-compassion compared to females (Yarnell et al., 2015), and individuals with a high score of self-compassion are more likely to have better mental wellbeing (Zessin et al., 2015). Given the group differences in literature, future studies could account for such potential group differences when designing studies.

Time constraints meant that we asked only one question relating to each factor, following a previous focus group protocol for studying self-compassion (Gilmour, 2014). The choice of

the questions may have influenced our findings, such as misunderstanding “keep emotion in balance”. Keeping emotion in balance is the core concept from the mindfulness subscale. However, from a perspective of mindfulness, the core concept should be “receptive” “non-judgmental” (Kabat-Zinn, 2009). In our study, the example item from mindfulness may focus participants towards emotion regulation rather than mindfulness. Future studies could have more than one question regarding different dimensions or explore those omitted in prior studies.

3.5.4 Future directions: Implications for the understanding of self-compassion and research

Future qualitative research could be conducted to explore how Chinese people understand self-compassion to compare the different definitions and theories and ensure that cultural issues are considered in studies comparing these measures and definitions, such as, the two-component theory from Gilbert et al. (2017) or 5 component definition from Strauss et al. (2016). Specifically, Strauss et al. (2016) review of the definitions of compassion that concluded that it involves 5 components: “recognition of suffering; understanding its universality; feeling sympathy, empathy, or concern for those who are suffering; tolerating the distress associated with the witnessing of suffering; and motivation to act or acting to alleviate the suffering” (p 25).

Regarding the construct validity of SCS in the Chinese population, mixed-method research is needed for future study. For qualitative research, future studies should continue to explore the understanding and meaning of the main components of self-compassion in Chinese populations as well as the understanding of specific items. Based on the qualitative findings, the self-compassion scale should be revised/adapted for collectivist cultures, and researchers could use the quantitative methods to check the psychometric properties of the revised version.

Additionally, in this study, we only slightly simplified the dimensions of national cultures into individualistic verse collective culture, we did not thoroughly explore how culture impacts the understanding of self-compassion and lack using relevant cultural theories, e.g., Hofstede's cultural dimension theory (Hofstede, 2011) as a guidance to design the research. For example, Indulgence versus Restraint from Hofstede's cultural dimension theory, which is related to the attitudes towards enjoying life (Hofstede, 2011), has been associated with associated to the construct of self-compassion (Montero-Marin et al., 2018). Future studies could draft qualitative study protocol based on the relevant cultural theories.

3 Young People Depressive Symptoms in the UK and China (Study 3)

The role of parenting, self-compassion and friendships in depressive symptoms among young people in the UK and China

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4.1 Abstract

Objectives Self-compassion, being kind to oneself in difficult times, is a way of relating to oneself that promotes better mental health, but little is known about how self-compassion affects interpersonal relationships. The current study examined the association between self-compassion and adolescent depressive symptoms from an interpersonal perspective in different cultural contexts. **Methods** Adolescents (*N* = 422/570, Mean age = 14.44/13.41, UK/China) completed questionnaires about their perceptions of their parents' behaviour towards them, self-compassion, friendship and depressive symptoms. **Results** Structural equation modelling revealed that positive parenting was positively associated with higher self-compassion, positive friendship quality, and with fewer depressive symptoms in both samples. Additionally, we confirmed a negative association between self-compassion and depressive symptoms. The pathway from positive parenting to lower depressive symptoms via higher self-compassion was also corroborated in both cultures. Contrary to our hypothesis, positive quality of friendship was associated with higher depressive symptoms in both countries. Conflicts were associated with more depressive symptoms in the Chinese sample only. There was evidence of a negative association between self-compassion and conflicts in the Chinese sample only. Finally, the direct association between self-compassion and depressive symptoms was greater in the UK sample, whereas in the Chinese sample, interpersonal factors were more strongly associated with self-compassion and depressive symptoms. **Conclusions** Our findings suggest that self-compassion may be a useful therapeutic target to improve social functioning and mental health among adolescents and that it may be necessary to account for cross-cultural differences in interpersonal factors when designing psychological interventions.

Keywords adolescent depressive symptoms; self-compassion; parenting behavior; friendship; cultural comparison

4.2 Introduction

The prevalence of adolescent depressive symptoms is increasing worldwide (Collishaw, 2015), and therefore, it is crucial to develop interventions to target adolescent depression and reduce the associated societal burden (Herrman et al., 2019). Adolescence is an important transition period characterised by puberty onset, interpersonal relationship changes (i.e., the relationships with parents and peers) and the development of self (Steinberg & Morris, 2001). Although it is considered a time window of increased vulnerability for mental health problems, adolescence also represents a window of opportunity for interventions that reduce the impact of risk factors and build resilience to future challenges (Collishaw, 2015). One candidate factor, self-compassion, or being kind towards oneself in challenging times (Neff, 2003), has been positively associated with better mental health (MacBeth & Gumley, 2012) and better social functioning (Neff & Beretvas, 2013).

There is emerging evidence that individual differences in self-compassion may be shaped by family experience (Neff & McGehee, 2010), such as parenting behaviour (Pepping et al., 2015). However, no studies have directly explored the associations between self-compassion, social factors (i.e., parenting behaviour and friendships) and depressive symptoms in adolescents. If a relationship between adolescent depressive symptoms and self-compassion was demonstrated, it would suggest that its cultivation could be a promising therapeutic target.

Additionally, culture is a critical factor in the development of adolescent psychopathology (Polanczyk et al., 2015). Growing up in an individualistic culture such as the UK that promotes values of personal goals, or growing up in a collectivistic culture such as China that promotes social harmony (Markus & Kitayama, 1991; Singelis, 1994), could differentially influence how self-related characteristics and interpersonal relationships contribute to adolescent depression (Greenberger et al., 2000; Stewart et al., 2004).

Understanding of the potential associations between culturally-dependent social factors, such as parenting behaviour and friendships, with self-compassion and depressive symptoms in adolescent samples from different cultures is a current research gap that needs to be addressed. We proposed the examination of a theoretically informed pathway model (see Figure 4.1) in which positive parenting, which was defined and assessed as encompassing praise, involvement and good quality supervision, is positively associated with self-compassion, and self-compassion is positively associated with close friendships that can be associated with youth depressive symptoms. Below we outline the theoretical and empirical rationale for this model.

4.2.1 Self-compassion, adolescent depressive symptoms and friendships

Being kind and compassionate towards oneself in difficult times enables individuals to process unpleasant emotions in a non-judgmental, receptive way and to acknowledge such emotions as a transitory, common experience shared by all human beings (Neff, 2003). Self-compassion is positively associated with better mental health and lower levels of psychological distress in adolescence (Marsh et al., 2018; Neff & McGehee, 2010). Given the association between self-compassion and adaptive emotion regulation under stress (Inwood & Ferrari, 2018), it is intuitively plausible that there is a beneficial effect of self-compassion on interpersonal functioning in adolescence (Neff et al., 2018). Self-compassion has been associated with increased prosocial behaviour (Marshall et al., 2020), lower physiological responses to social stressors (Bluth et al. 2016), less interpersonal aggression (Barry et al., 2015) and reduced peer victimisation (Jiang et al., 2016). However, none of these studies has focused on the association between self-compassion and the ability to form and maintain close friendships, which in the current study was defined and assessed by fewer conflicts and higher levels of support and intimate disclosure. Given the importance of close friendships in

adolescence as a source of happiness (Demir et al., 2007), it is vital to understand such associations.

Kindness, the ability to accept oneself and others even in times of adversity, and a heightened sense of togetherness with others, are key features of self-compassion and form prerequisites to form and maintain healthy, close, supportive friendships. This requires adaptive emotion regulation to manage both negative (e.g. conflicts) and positive (e.g., intimacy, support) aspects of relationships (Schwarz et al., 2012), and higher levels of self-compassion have previously been associated with better emotion regulation (Inwood & Ferrari, 2018). The tripartite model of affect regulation could explain the association between depressive symptoms, self-compassion and friendships (Gilbert, 2005, 2009). When individuals activate their drive or threat system in interpersonal relationships, they are in fight-or-flight mode where they may become aggressive or withdraw from other people. The chronic stress associated with the overactivation of these systems and the related social isolation or lack of social support can contribute to the development of depression (Gilbert, 2009). In contrast, when they activate the soothing system, people tend to feel connected with others, safe and calm (Kirschner et al., 2019). Hence, they could adaptively manage distress and effectively seek and give social support in times of adversity. Therefore, self-compassion should theoretically be associated with better close friendships and less depressive symptoms in adolescents (Figure 4.1, path d and e).

4.2.2 Positive parenting effects on self-compassion and depressive symptoms

If self-compassion contributes to adolescent mental health, it is also important to understand developmental social influences that help an individual to develop self-compassion. One candidate, positive parenting, is inversely related to depressive symptoms in adolescence (Smokowski et al., 2015), and depression diagnoses in early adulthood (Costello & Maughan, 2015). Warm, sensitive and responsive parenting as an individual's

early family or caregiver experiences is hypothesised to lead to higher levels of self-compassion (Neff & McGehee, 2010) which has been supported by previous studies (Pepping et al., 2015; Temel & Atalay, 2018). We could therefore hypothesise a potential pathway to lower levels of adolescent depressive symptoms from positive parenting via self-compassion (Figure 4.1 path a, e, c).

4.2.3 The potential pathway to depressive symptoms from parenting via best friendships

Based on the interpersonal model of youth depression (Rudolph et al., 2008), maladaptive parenting could also indirectly influence depressive symptoms via poor friendships (Figure 4.1, path b c f). Early family disruption is posited to lead to later maladaptive social behaviour, which in turn is more likely to cause problems in interpersonal relationships, such as peer victimisation and low-quality intimate friendships. In turn, such problematic interpersonal relationships undermine adolescents' mental health and predispose to depression. There is empirical evidence supporting aspects of this pathway. Children exposed to high parental psychological control were more likely to struggle to give and receive support, dealing with conflict and establishing intimacy with their closest friend (Cook et al., 2012). Praise and parental involvement were correlated with best friendships qualities (Gaertner et al., 2010). There is also evidence for the friendships-depression pathway of the interpersonal model of youth depression (Rudolph et al., 2008). Negative aspects of best friendships (e.g., conflicts) were associated with higher levels of depressive symptoms (La Greca & Harrison, 2005), whereas better higher levels of friendships qualities were associated with fewer depressive symptoms (Gaertner et al., 2010). However, La Greca and Harrison (2005) failed to identify the negative association between positive qualities of friendships and depressive symptoms, and there is also a lack of research directly examining the pathway from parenting to depressive symptoms via friendships.

4.2.4 Self-compassion as a potential mediator between parenting and both friendships and depressive symptoms

The interpersonal model of youth depression (Rudolph et al., 2008) does not include self-related variables. Developing an unhealthy sense of self (e.g., self-criticism, fragile self-esteem) in adolescence may undermine interpersonal relationships and predispose to depressive symptoms. Based on the literature reviewed above, we propose extending the interpersonal model by adding self-compassion as a mediator between parenting, friendships and depression. Self-compassion in times of adversity is shaped by parenting experiences and in turn may shape the ability to form close friendships and prevent depressive symptoms by allowing individuals to make use of adaptive, positive social support. This developmentally informed sequential path could be understood within the tripartite model of affect regulation (Gilbert, 2005, 2009) and is supported by evidence that self-compassion is shaped by positive parenting (Pepping et al., 2015) and associated with interpersonal functioning (Neff et al., 2018) and lower levels of depressive symptoms (Marsh et al., 2018; Path a, d, c, f in Figure 4.1).

4.2.5 Cultural differences

Although psychosocial factors are universally important for understanding adolescent depression, when studying it in different countries, it is important to consider cultural differences because culture impacts socio-emotional and self-identity development (Gibbons & Poelker, 2019). Specifically, a differential role of individualism versus collectivism has previously been reported in intrapersonal factors, interpersonal relationships and mental health (Oyserman et al., 2002).

As proposed in the self-construal theory (Markus & Kitayama, 1991), individualism promotes the understanding of the self as independent and striving towards personal goals. In

contrast, in collectivism, the self is understood as interdependent and inseparable from the social context, and social harmony is prioritised over self-fulfilment. The role of family and friendships in the development of depressive symptoms may, therefore, be more critical in a collectivistic context. For example, the quality of family relationships was found to explain more variance in depressive symptoms in Chinese adolescents than in US adolescents (Greenberger et al., 2000). Conversely, self-related variables such as self-esteem and self-efficacy may be more salient in individualistic societies and hence play a more important role in adolescent mental health than in collective cultures (Choi & Choi, 2016; Stewart et al., 2004).

However, not all empirical studies on cultural differences in adolescent depression are consistent with the theory. For example, Yamaguchi et al. (2016) found that there is no cultural difference between Japan and the USA regarding the role of self-compassion in depressive symptoms among college students. Neff et al. (2008), although finding cultural differences in levels of self-compassion between college students from Thailand, Taiwan and the USA, revealed no difference when examining the strength of the correlation between self-compassion and depression. Furthermore, Chen et al. (2006) did not find cultural differences in the role of peer harmony and family harmony in adolescents' depressive symptoms between the USA and Hong Kong. These partially mixed findings suggest that further research is necessary to understand potential cultural differences in the way psychosocial factors contribute to adolescent depression. One potential confounder in previous cross-cultural studies is an insufficient understanding of an important methodological issue.

Measurement invariance refers to the equivalence of an assessment instrument in different groups (Milfont & Fischer, 2010) and is an important prerequisite in cross-cultural studies to make the findings related to cultural differences or similarities meaningful (Chen, 2008). There is particularly limited evidence of the measurement invariance of self-

compassion in certain samples, such as samples from Japan, Taiwan and mainland China for which no measurement invariance could be established (Neff et al., 2008; Tóth-Király & Neff, 2020). Furthermore, in other empirical studies, there was no explicit consideration of measurement invariance (e.g., Chen et al., 2006; Neff et al., 2008).

The rationale for more cross-cultural research into psychosocial factors for adolescent depression results further from a current paucity of studies focusing on the role of friendships in adolescent depressive symptoms. This is important because of the potentially larger influence of peer relationships on adolescent mental health in collectivistic compared to individualistic cultures (Dekovic et al., 2002). Also, the potential cultural differences could impact on the developmental pathways of young people depressive symptoms, which in turn could inform clinical assessment (Polanczyk et al., 2015) and psychological interventions (Herrman et al., 2019). Therefore, this study also aims to examine the assumptions of self-construal theory.

In summary, the current study addresses several gaps in the literature by exploring key assumptions of a theoretically informed path model of positive parenting, self-compassion, friendships and depressive symptoms (Figure 4.1). We hypothesised that positive parenting was positively associated with self-compassion (Path a) and friendships (Path b), and associated with fewer depressive symptoms (Path c). Self-compassion was positively associated with friendships (Path d) and associated with fewer depressive symptoms (Path e). Friendships were associated with fewer depressive symptoms (Path f) in both China and the UK. In line with self-construal theory, we expected the coefficients of Path a, b, c and f were bigger in China than the UK, and the coefficients of Path d and e were bigger in the UK than in China.

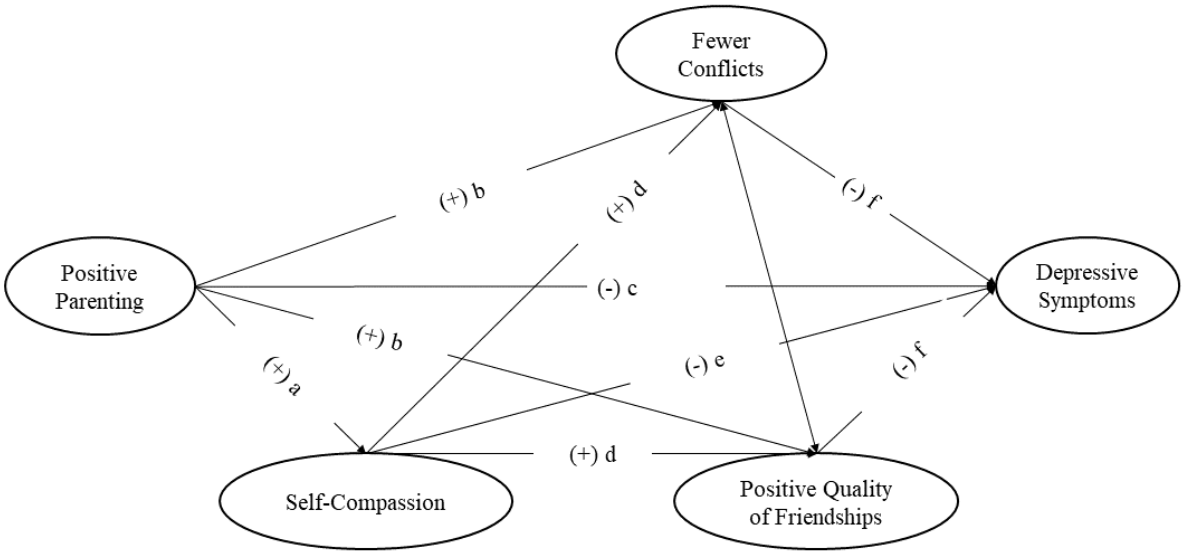


Figure 4.1 Proposed structural model explaining adolescent depressive symptoms

Note. "+" means positive association and "-" means negative association.

4.3 Method

4.3.1 Design and participants

The theoretical model was assessed using a cross-sectional survey design. The sample consisted of 422 adolescents (M_{age} = 14.44, SD_{age} = 1.24; 47.0% male) in the UK and 570 in China (M_{age} = 13.41, SD_{age} =1.72; 43.9 % female). The study was approved by the University Ethics Committees (UK).

4.3.2 Measures

A detailed justification of the choice of measures and procedures to establish its psychometric properties can be found in the supplementary material.

Positive Parenting was assessed using a revised child-report short version of the Alabama Parenting Questionnaire (Scott et al., 2011). The Chinese translation was adapted from the traditional Chinese version of the Alabama Parenting Questionnaire by MZ to be appropriate for use in mainland China. Adolescents rated how often a behaviour typically occurs in their home on a five-point Likert scale (1 = never; 5 = always). After a psychometric analysis

(Table S1, S2), nine items were used in the final model to represent positive parenting practices. The items were from three subscales; praise (e.g., "Your parents/carers praise you if you behave well"), poor supervision (e.g., "You go out with friends your parents/carers don't know") and involvement (e.g., "Your parents/carers help you with your homework"). The internal consistency of the 9-item questionnaire was α = .82/.73, UK/Chinese Sample.

Self-compassion was assessed using a 12-item version of Stolow's adolescent self-compassion scale (Stolow et al., 2016) and its Chinese translation (Zhao et al., submitted) in order to reduce the assessment burden. Whilst item wording followed the adolescent SCS, the item selection for the short form was informed by Raes' SCS short-form for adults (Raes et al., 2011). Participants were asked to indicate their responses on a 5-point Likert scale (1 = almost never; 5 = almost always; e.g., "When I fail at something important to me I feel completely stupid"). The psychometric analyses confirmed a general factor of self-compassion, but this construct was different from the original definition (Neff 2003; Table S5, S6, S7, S8, S9). The internal consistency of self-compassion in both samples was α = .84/.76, UK/Chinese Sample.

Friendships were assessed via four subscales comprising every three items chosen from the Network of Relationships Inventory (NRI). Friendships were measured in relation to the participants' most important friend (Furman & Buhrmester, 2010) on a five-point Likert scale (from "1", little or none, to "5", the most). The three-item conflict subscale assessed negative friendships qualities (e.g., "How often do you and this person get mad at or get in fights with each other"). Nine items assessed positive friendships quality from three subscales; intimate disclosure (e.g., "How often do you tell this person things that you don't want others to know"), *seeks safe haven* (e.g., "How much does this person turn to you for comfort and support when s/he is troubled about something") and *provides secure base* (e.g., "How much do you encourage this person to try new things that s/he would like to do but is nervous

about?"). For the Chinese version, we picked the corresponding items from Liu's (2015) translation. Psychometric evaluation (Table S3, S4) demonstrated good reliability for measuring both the positive (α = .93/.84, UK/Chinese sample) and negative friendships qualities (α = .89 /.73, UK/Chinese sample).

Depressive symptoms were measured using the 13-item short form of the Mood and Feelings Questionnaire (Angold et al., 1995; Cheng et al., 2009). Items asked about feelings or behaviours (e.g., "I cried a lot") in the past two weeks on a three-point scale (from "0", not true, to "2", true). Psychometric evaluation (Table S10) revealed that the 13 items could be used as a latent variable, depressive symptoms, with high reliability (α = .92/.89, UK/Chinese sample).

4.3.3 Procedure

We used two methods (Figure 4.2) to recruit participants, firstly via an online survey link on social media; and secondly through local schools (one in Devon, UK and six in Shandong, China). For school recruitment, headteachers gave consent for school involvement, then the participant information sheet for parents and parent opt-out consent form were given out to students to take to their parents. On the day of the assessment, which took place in school, students who did not return the parental opt-out form were given an information sheet, assent form, questionnaires and debriefing sheet. For online recruitment, an advertisement with the Qualtrics link was posted in parent Facebook groups. Parents read the participant information sheet and consented for their children to take part in the study, at which point they received a link to pass to their child. Young people read the information sheet and provided assent. After answering the questionnaire, adolescents were sent the debriefing sheet.

In line with the Mood Disorders Centre risk protocol, we followed the risk management plan, and if a young person’s answers to the questions indicated that s/he is at risk of depression, we informed the school’s child safeguarding officer (for those recruited via

schools)/parents (for those filling online questionnaire). We also provided a list of local and national sources of support to all participants.

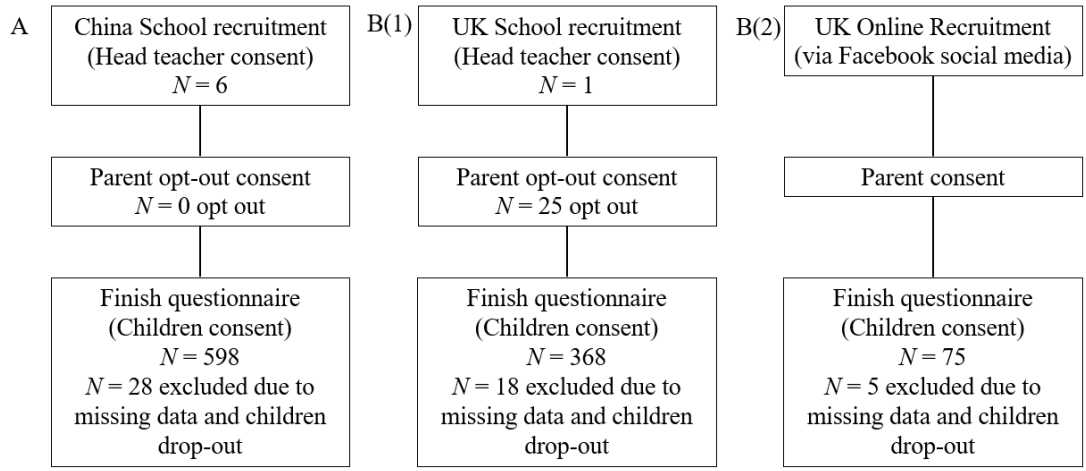


Figure 4.2 Participant recruitment flow diagram; procedure for recruitment and data collection

Note. A represents sample recruited via schools in China; *B(1)* represents sample recruited via school in the UK; *B(2)* represents sample recruited online in the UK.
Individuals were excluded who had more than 25% missing data (i.e., children who did not answer one scale) and had too consistent answers (for example, if participants always gave the same response) were excluded.

4.3.4 Data Analysis

MPlus 8.3 was used for data analysis (Muthén, 2018). Weighted least squares mean and variance adjusted estimation (WLSMV) and the theta parameterisation were used for all analyses because Likert-type scales should be treated as ordinal categorical variables (Millsap & Yun-Tein, 2004; Muthén, 1984). Prior to the analyses, the percentage of missing data was assessed. As it was low (< 3%), pairwise deletion, the default method of managing missing data in Mplus, was used (Muthén, 2018). Negative items were reverse-scored (e.g., poor supervision).

First, we conducted Confirmatory Factor Analysis (CFA) to confirm the measurement constructs based on the theory. For friendships and parenting, bifactor models with one

general factor for positive parenting and positive friendships quality were established. We did not replicate the construct of the short-form self-compassion scale of Raes et al. (2011), so we ran a bifactor exploratory factor analysis (EFA) in the UK sample (more information, please see supplementary materials) and found that the bifactor model with three specific factors was the best solution, which was also confirmed by acceptable model fits of CFA in the Chinese sample (Table 4.1). CFA results supported the one-factor model of conflict (Furman & Buhrmester, 2010) and depressive symptoms following the original one-factor construct (Angold et al., 1995). Based on the CFA results, a structural equation model (SEM) was established to test our hypothesised model. Table 1 shows the model fits of CFA for all measurements in China and UK. The factor loadings of the general factors were all significant.

Second, in order to establish the measurement invariance (MI) across samples, a series of nested models with different constraints were conducted via multi-group CFA (Putnick & Bornstein, 2016). There are different levels of MI, such as configural MI, metric MI and Scalar MI. In the current study, the configural and metric invariance across samples were examined following recommendations (Putnick & Bornstein, 2016). For comparing regression coefficients, the MI can be built on the metric level (Chen, 2007; Hirschfeld & Von Brachel, 2014). The Chi-square difference statistics and changes in approximate fit indices are presented (Table 4.2) for the interpretation of the measurement invariance (Sass, Schmitt, & Marsh, 2014). We first established configural invariance and then metric invariance. The partial metric invariance was established (Table 4.2). These analyses revealed partial metric invariance of parenting, friendship, self-compassion and depression was supported, but the metric invariance of conflict was not supported. Specifically, for parenting behaviour, the partial metric invariance of general factors was established except for the loading of one item. For friendship, the partial metric invariance of the general factor

was established except for the loading of two items. For self-compassion, the partial metric invariance of the general factor was established except for the loading of four items. For depression, the partial metric invariance of the general factors was established except for the loading of three items. Thus, the differences of association between the general factors of positive parenting, self-compassion, friendships and depressive symptoms could be compared across countries via multi-group SEM, but conflicts could not.

Third, for multi-group SEM, we freed the loadings of some indicators of general factors and all the specific factors, and we also freed the thresholds. The Wald test was used to test for the equality of coefficients between countries.

We evaluated the model fits for CFA and SEM based on a joint consideration of the value of chi-square/degree of freedom (χ^2/df , ≤5), the values of root mean square error of approximation (RMSEA, ≤.08), standardised root mean square residual (SRMR, ≤.06), comparative fit index (CFI, ≥.90) and Tucker-Lewis index (TLI, ≥.90) followed standard recommendations (Hu & Bentler, 1999; Marsh et al., 2005).

Table 4.1 Model fit parameters of CFA results of measurements in both samples

Measurement	Sample	χ^2	df	CFI	TLI	RMSEA[90% CI.]	SRMR
Parenting	UK	15.584	18	1.000	1.001	<.001[.000, .037]	.014
	China	42.630***	18	.995	.989	.049[.030, .068]	.026
Positive Friendships Quality	UK	48.499***	18	.998	.996	.062[.040, .084]	.014
	China	89.028***	18	.982	.963	.083[.066, .101]	.026
Conflicts	UK	<.001***	0	1.000	1.000	<.001[.000, .000]	.001
	China	<.001***	0	1.000	1.000	<.001[.000, .000]	.001
Self-compassion	UK	53.415	38	.995	.991	.031 [.001, .049]	.018
	China	113.368***	38	.967	.942	.059 [.047, .072]	.029
Depressive symptoms	UK	207.578***	65	.984	.981	.072[.061, .083]	.042
	China	269.819***	65	.962	.954	.074[.065, .084]	.053

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA= root mean square error of approximation; CI = confidence interval; SRMR = root mean square residual and standardized root mean square residual. ***, p<.001.

Table 4.2 The results of measurement invariance

Model	χ^2	*df*	CFI	TLI	RMSEA [CI]	Model Comparison	χ^2_{Diff}	Δdf	ΔCFI	Δ RMSEA	Decision
M_{P_1}	61.289**	36	.997	.994	.038 [.020, .053]						
M_{P_2}	117.490***	44	.992	.987	.058 [.045, .071]	M_{P_1} vs. M_{P_2}	38.344***	8	-.005	-.020	Reject
M_{P_3}	65.484*	43	.998	.996	.032 [.015, .048]	M_{P_1} vs. M_{P_3}	9.587	7	-.001	.006	Accept
M_{F_1}	142.066***	36	.994	.988	.077 [.064, .091]						
M_{F_2}	210.784***	44	.991	.985	.088 [.076, .985]	M_{F_1} vs. M_{F_2}	62.474***	8	-.003	-.011	Reject
M_{F_3}	136.073***	43	.995	.991	.066 [.054, .079]	M_{F_1} vs. M_{F_3}	18.754***	7	.001	.011	Reject
M_{F_4}	129.904***	42	.995	.992	.065 [.053, .078]	M_{F_1} vs. M_{F_4}	10.870	6	.001	.012	Accept
M_{C_1}	<.001	0	1	1	<.001						
M_{C_2}	49.489***	2	.990	.970	.219 [.169, .274]	$Mc_{\_1}$ vs. $Mc_{\_2}$	49.416***	2			Reject
Msc_1	174.315***	76	.982	.969	.051 [.041, .061]						
Msc_2	288.185***	87	.963	.944	.068 [.060, .077]	M_{sc_1} vs M_{sc_2}	75.966***	11	-.019	.017	Reject
Msc_3	228.632***	86	.974	.960	.058 [.049, .067]	M_{sc_1} vs M_{sc_3}	45.082***	10	-.008	.007	Reject
Msc_4	203.678***	85	.978	.966	.053 [.044, .062]	M_{sc_1} vs M_{sc_4}	31.242***	9	-.004	.002	Reject
Msc_5	183.446***	54	.982	.971	.049 [.039, .058]	M_{sc_1} vs M_{sc_5}	19.987*	8	0	.003	Reject
Msc_6	167.593***	83	.984	.975	.045 [.035, .055]	M_{sc_1} vs M_{sc_6}	9.369	7	.002	.006	Accept
M_{D_1}	481.398***	130	.976	.971	.074 [.067, .081]						
M_{D_2}	548.111***	142	.974	.972	.073 [.066, .080]	M_{D_1} vs M_{D_2}	71.1000***	12	-.002	-.001	Reject
M_{D_3}	477.419***	141	.977	.975	.069 [.063, .076]	M_{D_1} vs M_{D_3}	51.217***	11	-.004	-.005	Reject
M_{D_4}	432.478***	140	.980	.978	.065 [.058, .072]	M_{D_1} vs M_{D_4}	29.587*	10	.004	-.009	Reject
M_{D_5}	393.733***	139	.983	.981	.061 [.054, .068]	M_{D_1} vs M_{D_5}	10.326	9	.007	-.013	Accept

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA= root mean square error of approximation; CI = confidence interval;* <.05; ***, <.001

M_{P_1} = parenting configural model; M_{P_2} = metric invariance of general factor; M_{P_3} = metric invariance of general factor, free item 3

M_{F_1} = Friendship configural model; M_{F_2} = metric invariance of general factor; M_{F_3} = metric invariance of general factor, free item 8; M_{F_4} = metric invariance of general factor, free items 8 and 2;

M_{C_1} = configural model; M_{C_2} = metric model;

M_{SC_1} = configural model; M_{SC_2} = metric invariance of general factor; M_{SC_3} = metric invariance of general factor free, item 11; M_{SC_4} = metric invariance of general factor free, items 11 and 10; M_{SC_5} = metric invariance of general factor free, items 11, 10 and 4; M_{SC_5} = metric invariance of general factor free, items 11, 10, 4 and 2;

M_{D_1} = configural model; M_{D_2} = metric invariance of general factor; M_{D_3} = metric invariance of general factor, free item 4; M_{D_4} = metric invariance of general factor, free items 4 and 3; M_{D_5} = metric invariance of general factor free, items 4, 3 and 9.

4.4 Results

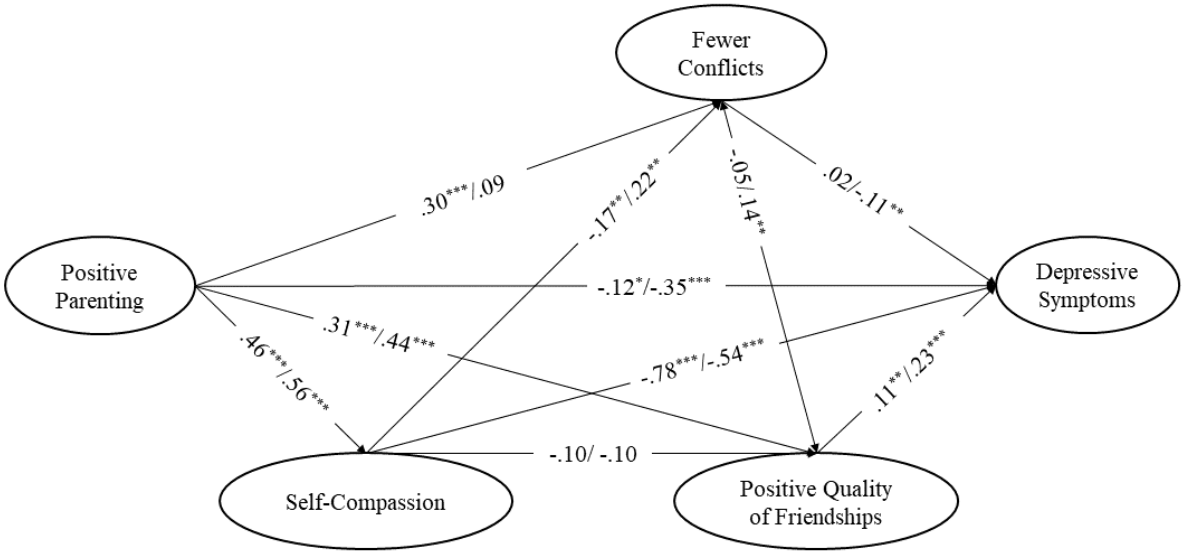
Descriptive statistics are summarized in Table 4.3. The proposed model (Figure 4.1) fitted both the UK and Chinese sample well: χ^2=1668.770, *df* = 945, $p < .001$, CFI =.968, TLI =.965, RMSEA =.043, SRMR =.065 in the UK sample, and in the Chinese samples, χ^2=1717.567, *df* = 945, $p < .001$, CFI =.943, TLI =.938, RMSEA =.038, SRMR =.059.

Table 4.3 Correlation and descriptive statistics

		UK				
	Variables	1	2	3	4	5
China	1 Positive Parenting	-	.455***	.265***	.217***	-.441**
	2 Self-compassion	.560***	-	.041	-.039	-.832***
	3 Positive Quality of Friendships	.387***	.148**	-	.023	.047
	4 Fewer Conflicts	.215***	.269***	.193***	-	.024
	5 Depressive Symptoms	-.582***	-.729***	-.001	-.282***	-

Note. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$. *The UK sample: n= 422; The Chinese sample: n =570*

Figure 4.3 Standardised coefficients of paths in SEM in the UK and Chinese samples



Note. The coefficients labelled on the path, UK/China; $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$;

As illustrated by the models in Figure 3, there were five significant paths with the same direction in both samples (from parenting to depressive symptoms, to self-compassion, and to friendships; from self-compassion to depressive symptoms, and from friendships to depressive symptoms).

In the UK sample (Figure 4.3), the predicted positive associations between parenting and self-compassion, and parenting and friendships were confirmed; as were the negative associations between positive parenting and depressive symptoms, and between self-compassion and depressive symptoms. Contrary to the hypotheses, positive quality of friendships was *positively* associated with depressive symptoms, and self-compassion was *not* associated with the positive quality of friendships but associated with *more conflicts*. Conflicts were not associated with depressive symptoms. Mediation path analysis revealed a significant indirect effect of parenting on depression via self-compassion, β = -.32, SE = .05, $p < .001$, and via friendship, β =.03, SE = .01, $p < .05$, but this is an inconsistent mediation model (MacKinnon et al., 2000), as the direct and indirect effects have different signs.

In the Chinese sample (Figure 4.3), we confirmed positive associations between parenting and self-compassion, plus parenting and positive friendships quality, as well as negative associations between parenting and depressive symptoms, plus self-compassion and depressive symptoms. Although self-compassion was *not* positively associated with the positive quality of friendships, it was positively associated with *fewer conflicts*, thus partially supporting the hypothesis that self-compassion and friendships are associated. As in the UK sample, positive quality of friendships was *positively* associated with depressive symptoms and not associated with self-compassion. However, fewer conflicts were *negatively* associated with depressive symptoms. Mediation analyses revealed significant indirect effects of parenting on depressive symptoms via self-compassion, β = -.30, SE = .04, $p < .001$, and via friendships, β =.10, SE = .03, $p < .001$.However, the indirect effect of parenting on depressive symptoms via friendships was also an inconsistent mediation (MacKinnon et al., 2000). Although the association between self-compassion, conflict and depressive symptoms was supported, there was no significant indirect effect of parenting on depression via self-compassion and conflict on depressive symptoms.

Next, we examined differences in path coefficients across countries via multiple-group SEM and Wald test. The model fit for the multigroup SEM was acceptable, χ^2=3422.703, *df* = 1919, $p < .001$, CFI =.959, TLI =.956, RMSEA =.040, SRMR =.063. Significantly different path coefficients were identified for the paths from parenting to depressive symptoms (χ^2 (Wald test) = 10.004, $\Delta df = 1$, p =.002); from friendships to depressive symptoms (χ^2 = 5.549 (Wald test), $\Delta df = 1$, p =.019); and from parenting to self-compassion (χ^2 (Wald test) = 8.994, $\Delta df = 1$, p =.003). This suggests that the role of interpersonal factors (i.e., parenting and friendships) in self-compassion and depressive symptoms were more salient in the Chinese than in the UK sample. In contrast, the association between self-compassion and depressive symptoms was more salient in the UK sample than the Chinses sample, χ^2 (Wald test) = 12.102, $\Delta df = 1$, p <.001). The coefficient of the path from parenting to friendships was marginally significant (χ^2 (Wald test) = 3.712, $\Delta df = 1$, p =.054).

4.5 Discussion

This cross-sectional study examined a theoretically and empirically informed path model of the associations between parenting, self-compassion and friendships to explain the development of depressive symptoms among adolescents in the UK and China, and explored whether cultural differences existed in these relationships. Our hypotheses were partially supported, and although the directions of the associations were broadly similar in the two cultures, there were some significant differences. Contrary to our hypothesis, positive friendships quality was *positively* associated with depressive symptoms in both countries, and the association between self-compassion and friendships was complex. Self-compassion was associated with *fewer* conflicts in China but *more* conflicts in the UK. We demonstrated a path from parenting to depressive symptoms via self-compassion in both countries, but the path via friendships was an inconsistent mediation in both countries, and there was also no

strong evidence for a sequential path from parenting to self-compassion to friendships to depressive symptoms in either country.

4.5.1 The effect of parenting on self-compassion, friendships and depressive symptoms

Our findings in both samples are consistent with previous research showing that parenting was positively associated with self-compassion (Pepping et al., 2015), better friendships competence (Cook et al., 2012) and fewer internalising problems (Smokowski et al., 2015). Theoretically, these findings could be explained by attachment theory, which postulates that early caregiver experiences contribute to the development of an individual's internal working models about the self, others and relationships between self and others (Ainsworth et al., 2015). These models shape how an individual relates to themselves (e.g. “I am lovable”) and others (e.g. “I can trust others to be supportive”). Thus, a secure parent-child relationship is thought to exert a positive impact on the ability of the child to acknowledge their own needs, to seek care and compassion and to be able to provide these to others (Neff & McGehee, 2010; Pepping et al., 2015). This, in turn, reduces the individual's susceptibility to psychopathology (Thompson, 2008). Our findings extend previous research on positive effects of self-compassion on mental health in adolescents (Neff & McGehee, 2010) by demonstrating for the first time that positive parenting was associated with higher self-compassion which in turn was associated with fewer depressive symptoms, as well as demonstrating a negative association between self-compassion and depressive symptoms.

4.5.2 The role of self-compassion and friendships in the path to depressive symptoms

The relationship between self-compassion, friendships and depressive symptoms in the pathway model was equivocal. First, we only partially confirmed the positive association between self-compassion and social functioning in adolescents that has been demonstrated in previous research (Barry et al., 2015; Jiang et al., 2016); this was evident only in the Chinese sample. We based our hypotheses on Gilbert's (2005, 2009) theory that when an individual is

self-compassionate, the soothing system is activated, which enables adaptive emotion regulation, the ability to self-soothe in stressful situations, to seek support and experience a sense of togetherness with others. If, in contrast, the individual is highly self-critical, the threat system is activated, and the individual becomes preoccupied with regulating their distress, which may manifest as anxiety and withdrawal, or anger and aggressive behaviour, thus undermining peer relationships. If the individual seeks pleasure and self-worth by outperforming others, this activates the drive system. A predominant activation of the threat and drive systems is associated with problematic interpersonal relationships and poor mental health (Gilbert, 2014; Taylor et al., 2011). Predominant soothing system activation has been associated with higher wellbeing and more positive social functioning (Gilbert, 2009, 2014; Kirschner et al., 2019). The absence of a significant association between self-compassion and positive friendships qualities in both samples and the counterintuitive association between self-compassion and increased conflicts in the UK sample are therefore surprising. We used a short form of the self-compassion scale, and although we established a valid general factor, we did not replicate Neff's (2003) factor structure of self-compassion. To date, there are limited studies exploring the construct of self-compassion in adolescents, and the recently published youth self-compassion scale (Neff et al., 2020) had not been published when we conducted our study. Future studies need to examine in more detail the construct of self-compassion in young people given that during adolescence some core features of self-compassion are still under development and may be harder to assess (Muris et al., 2016).

Contrary to our hypotheses and at odds with theoretical models (Rudolph et al., 2008), we found that *positive* friendships quality was *positively* associated with depressive symptoms in both samples. Interestingly, there was no significant zero-order correlation between friendships and depression, and we observed an inconsistent mediation (MacKinnon et al., 2000) in the association between parenting, friendships and depressive symptoms in

both cultures (see Table 3 and Figure 3). This finding is difficult to interpret and requires further investigation in line with Mackinnon et al. (2000) 's recommendation that inconsistent mediation warrants further hypothesis-driven testing and replication in other datasets.

The positive association between positive friendships quality and depressive symptoms was unexpected but is in line with a previous study in male adolescents who reported suicidal thoughts (Kerr et al., 2006). Additionally, Miller et al. (2014) found that positive friendship quality (i.e., companionship, intimacy and satisfaction) at the age of 16 was positively associated with adolescent suicidal ideation at age 18. These accumulating findings highlight the importance of a more nuanced exploration of the friendship context; i.e., it could play a beneficial role, but sometimes it may not be protective for mental health (Miller et al., 2014). Interacting with depressed friend in best friendship dyads has been shown to affect the young person by the friend's depressive symptoms, especially for female teenagers (Giletta et al., 2012). This phenomenon is called co-rumination and involves excessively discussing personal problems within a dyadic relationship (Rose, 2002). It has been associated with better self-reported friendships quality but also higher levels of depressive symptoms in adolescents (Spendelow et al., 2017). Additionally, there is evidence that depression travels in social networks (Rosenquist et al., 2011); those who experience higher levels of depression may share similar social networks. Therefore, future longitudinal research into friendships quality and depressive symptoms should consider friendship context. The unexpected positive association between depressive symptoms and friendship could be due to the way we assessed friendship. Focussing on best friendships, positive quality of friendship, particularly targeting intimacy, could have tapped into co-rumination between two individuals in a close relationship (Rose, 2002), as discussed above. Second, interestingly, positive friendship qualities have not always been linked with less depressive symptoms, as we discussed above regarding friendship context in depression, whereas negative qualities of friends such as

exclusion have been positively linked with more depressive symptoms in previous research (e.g., La Greca & Harrison, 2005).

Additionally, our results are in line La Greca and Harrison (2005) that negative and positive friendships quality might play differential roles in youth depression, suggesting that future research should study these constructs separately. We found that conflicts were associated with more depressive symptoms in our Chinese sample, which could be understood within the youth interpersonal depression model (Rudolph et al., 2008) and is consistent with previous research (La Greca & Harrison, 2005). The absence of this association in the UK sample is surprising. Measuring friendships quality solely by self-report has previously been criticised by La Greca and Harrison (2005) who recommended the use of other informants as well. Conflicts rated by adolescents may underly social desirability, and this may differ in the two cultures. Therefore, these results require replication, and future studies should aim to obtain ratings from another informant about friendships quality.

Altogether, given that self-compassion and friendships are multifaceted concepts (Furman & Buhrmester, 2010; Neff, 2003) and the psychometric definition of self-compassion requires more research in adolescent samples (Muris et al., 2016), especially in Chinese version (Neff et al., 2019; Tóth-Király & Neff, 2020), our findings on the association between parenting, self-compassion, friendships and depressive symptoms need replication in a longitudinal design.

4.5.3 Cultural differences between China and the UK

Our findings corroborated cross-cultural theory and previous research, including research on other constructs relating to the self. The stronger association between self-compassion and depressive symptoms detected in the UK compared to the Chinese sample is similar to differences detected by studies comparing the association with self-efficacy or self-esteem

and depressive symptoms in these two cultures (e.g., Choi & Choi, 2016; Stewart et al., 2004). It is also in line with the self-construal theory (Markus & Kitayama, 1991), which suggests that individuals from an individualistic culture are more likely to see themselves as independent, pursue goals of self-fulfilment and value their internal feelings (Singelis, 1994).

However, our findings contrast with previous research which did not detect cultural differences in the association between self-compassion and depressive symptoms (Neff et al., 2008). There were sample differences between these two studies. Neff et al. (2008) included an older sample of young adults, undergraduate students, aged 19.8 to 21.4 years. Differences in the developmental stages of participants might account for the differences in the findings across these two studies, as in early adolescence, self-compassion may still be developing (Muris et al., 2016), but this cannot explain why cultural differences would be observed in early adolescence but not in early adulthood. It is possible that being a student, as the majority of participants in Neff et al. (2008)'s study were, away from the family environment and required to become more independent, is a universal, cross-cultural experience, and so may help to explain Neff's findings of no cultural differences in these relationships. Also, Neff et al. (2008) did not report results of measurement invariance tests, which are important in cross-cultural comparisons of the strength of associations (Chen, 2008; Milfont & Fischer, 2010).

Positive parenting and friendships explained greater amounts of the variance in depressive symptoms among Chinese as compared to UK adolescents, supporting our hypotheses and replicating previous research into cultural differences in the family (Greenberger et al., 2000) and peer relationships (Dekovic et al., 2002). Social context and relationships are essential to the individual in interdependent, collectivistic cultures that strive for social harmony (Markus & Kitayama, 1991). Cultural differences in parenting behaviour could be rooted in filial piety as a core value in the Chinese culture (Ho, 1996). Perceived

parental warmth was positively correlated with children's filial piety, life satisfaction and self-esteem (Leung et al., 2010). Collectivistic culture may sensitise adolescents to interpersonal relationships by the high value it places on the significance of others' feelings and evaluations (Markus & Kitayama, 1991). The importance of interpersonal factors could be an important consideration for culturally adapted intervention development, as previous research shows a social support group was more effective than a behavioural activation group for Chinese adolescents suffering from depression and anxiety (Zhang et al., 2019). The latter is commonly regarded as a gold standard intervention for depression in Western settings. Notably, Zhang et al. (2019) found that the social support group treatment approach effectively reduced negative automatic thoughts and increased behavioural activation.

Whereas the cultural differences in the association between parenting and positive friendships were only marginally significant and have not been previously identified, future research should explore this relationship in more depth. Fewer conflicts were negatively related to positive parenting in the UK but not in the Chinese sample, where the effect of parenting on conflicts was fully mediated by self-compassion (β = 0.121, SE = .04, p < .01). The path from parenting to conflicts via self-compassion is in line with our hypothesis that, based on attachment theory, internal working models of the self are shaped by caregiver experience, and these internal working models, in turn, affect interpersonal relationships (Ainsworth et al., 2015). This pathway in the Chinese sample is in line with an interdependent self as postulated by the self-construal theory (Markus & Kitayama, 1991).

The absence of a significant association between parenting and conflicts in the Chinese sample is surprising, as it was observed in the UK sample. Cultural variations in parenting behaviours (Ho et al., 2008; Zhang et al., 2017) may explain these differences. The assessment of parenting behaviour is based on Western conceptualisations of parenting and may have missed behaviours that are more important to parenting in China such as high

expectations and strict control (Ho et al., 2008; Zhang et al., 2017), which were not assessed in the current study. Future studies could broaden the measurements to assess these different perspectives. Finally, our results regarding the variable conflicts should be considered with caution because we did not establish measurement invariance.

4.5.4 Implications

Our findings highlight the importance of the perception of the self in an interpersonal context in adolescent depression and thus support and extend assumptions of the interpersonal model of youth depression (Rudolph et al., 2008). Although the interpersonal model explained the development of youth depression as a function of parental and friendships relationships, it only partially accounts for the role of the self in forming interpersonal relationships as acknowledged in developmental theories such as attachment theory (Ainsworth et al., 2015). We explored the role of self-compassion within the interpersonal model and suggested it could be crucial to understand the contribution of parental and friend relationships to adolescent depressive symptoms. The cultural differences in our study suggest that it is important to consider culture when developing interventions that aim to prevent or treat depression in young people in different contexts. Overall, we concluded that self-compassion could be a useful therapeutic target for interventions designed to treat or prevent adolescent depression in both cultures.

4.5.5 Strengths and limitations

There are several strengths to our study, including its basis in developmental theory with pre-specified hypotheses, reliable and valid measures, and moderately large samples. By establishing the psychometric properties of the measurements and including the measurement constructs in our SEMs, we attempted to reduce measurement errors that could have been induced by using short forms of all scales to reduce the assessment burden (Cole & Preacher,

2014). Additionally, we established measurement invariance across groups (Boer et al., 2018; Milfont & Fischer, 2010; Stevanovic et al., 2017) to ensure reliable and valid measurements that function well across cultures (Stevanovic et al., 2017).

However, there are several limitations that should be noted. We were unable to replicate the self-compassion construct despite using the most appropriate items available to us. The current self-compassion scale (Chinese version) was validated in a young adult sample (Chapter 2), and its findings could have limitations for an adolescent sample. Although we tried to mitigate this limitation by checking for adolescent-friendly wording, the validation should have ideally included younger adolescents, which was, however, not feasible considering the constraints of time and resources within the PhD projects. There are ongoing psychometric debates about whether a cultural adaption is needed to study self-compassion in Chinese samples (e.g., Neff et al., 2019). Although the construct of the full version of the self-compassion scale has been replicated in many countries in adults, there are identification problems of the measurement construct in specific cultures, notably China and Japan (Neff et al., 2019; Tóth-Király & Neff, 2020). The developmental trajectory and profile of self-compassion require fuller understanding, potentially in tandem with the study of the developmental trajectory of other components of social cognition, such as, empathy, which is important to self-compassion but is not fully developed in adolescence (Van der Graaff et al., 2014). Future research could use the new youth version self-compassion scale (Neff et al., 2020).

Secondly, it should be cautious about interpreting the cultural difference in the path models. We could not study cultural differences in the role of conflicts across countries because we could not establish measurement invariance for this variable. Conflicts were only assessed by three items and only using self-report. To clarify the association between self-compassion and friendships, it is important to conduct future studies with a clear and

replicated construct of self-compassion and a longer measurement of friendships with multiple informants. For the other variables, we established partial metric measurement invariance. Given the problematic measurement invariance in self-compassion (Tóth-Király & Neff, 2020), future studies could explore and replicate these cultural differences again.

Thirdly, parenting behaviour was assessed in adolescence, whilst our theory was based on attachment theory which stresses early family relationships. We cannot draw conclusions about the direction or temporal order of our associations given the cross-sectional design, and future research should use a longitudinal design. The proposed direction of the associations was theoretically informed by an attachment perspective (Ainsworth et al., 2015), but this is not the only possible pathway between psychosocial factors and adolescent depressive symptoms. For example, youth depressive symptoms can erode peer relationships (Kochel et al., 2017) and the sense of oneself (Sowislo & Orth, 2013). Future longitudinal research should investigate these alternative path models.

Fourth, we did not control demographic characteristics (e.g., gender and family socioeconomic status, SES) in SEM as we did not have specific hypotheses for the covariates (Carlson & Wu, 2012) and lacked the relevant data. Although adolescents are considered able to reliably report depressive symptoms and parenting (Moretti et al., 1985; Parent et al., 2014), the fact that we only used self-report could have led to bias, in particular with respect to reporting friendships. Additionally, because we were only able to acquire self-report measures, we did not assess SES because of known problems such as high levels of invalid and missing data when adolescents are invited to self-report it (Wardle et al., 2002). Future studies could collect data from multiple informants and on more demographic characteristics.

Lastly, all schools were recruited in one geographical area in each country, so our findings may not generalise to other geographic areas. Also, this may limit the generalizability of findings in other cultural backgrounds.

4.6 Conclusions

These findings provide a preliminary understanding of the association between parenting, self-compassion, friendships and depression in adolescents from two cultures. Our findings suggest that self-compassion may be a useful therapeutic target to improve close friendships as an important aspect of social functioning and mental health among adolescents and that cultural adaptions accounting for interpersonal factors may be required when designing psychological interventions for different contexts or populations.

4.7 Supplementary Materials for Study 3

4.7.1 Validity of measurements

All scales or questionnaires were originally developed and validated in English. We identified existing Chinese versions through our research networks. Research on the psychometric properties of these translated measures was still a work in progress in some cases. Also, all questionnaires used in this study are either the short version [e.g. the Short Form of Self-compassion Scale (Raes et al., 2011) and the Short Mood and Feelings Questionnaire (Angold et al., 1995)] or a purposefully selected set of subscales from the original scale (e.g. the Alabama Parenting Questionnaire (Shelton et al., 1996) and the Network of Relationships Inventory (Furman & Buhrmester, 2010). We used short scales instead of long or full versions to minimize assessment time and thus reduce the burden on our participants. Due to limited evidence of the psychometric properties of our measures of parenting, self-compassion, and friendship, we conducted a series of statistical analyses to check the validity of the measurements in both the UK and Chinese samples.

The following section first gives a brief introduction of the original questionnaires, including the relevant theoretical background. We then describe theoretically and empirically informed measurement models via confirmatory factor analysis (CFA) for every construct/latent variable in both samples that we assessed. We applied CFAs to provide evidence for putative latent factors (i.e., positive parenting behaviour, self-compassion, friendship and depressive symptoms) which could be used in later the structural equation modelling (SEM) as a general factor. To account for this, one-factor higher-order models and bifactor models with one general factor were tested. The hierarchical models were investigated before the bifactor models to check if the measures follow the suggested factor structure. If the hierarchical models were not supported, the bifactor models would be

considered as another option to justify the general factor (Rodriguez et al., 2016). It should be noted that intercorrelated factor models were first tested before checking the hierarchical models because the relevant theoretical backgrounds of the variables (i.e., positive parenting behaviour, self-compassion and friendship) indicated a multidimensional definition.

Positive parenting behaviour. The Alabama Parenting Questionnaire (APQ, Shelton et al., 1996) is a 42-item scale that assesses different parenting practices. Its short-form has 15 items (Scott et al., 2011) and retained the original five subscales (poor monitoring and supervision, inconsistent discipline, corporal punishment, involvement and positive parenting techniques) as indicated by CFA (Scott et al., 2011). For the current study, we chose 12 items from four subscales (excluding the subscale of corporal punishment[1]) of the brief APQ. For the Chinese version, the author tailored the words based on the traditional Chinese version of parent-report APQ provided by So (via personal communication) and picked the corresponding items in the brief version of APQ.

There are different scoring approaches for the short APQ. Some studies directly calculated the score of the subscales (Guo et al., 2016), whereas others combined the subscales (Williamson et al., 2017). We defined our positive parenting as a general factor indicated by the items we selected because of theoretical and empirical considerations. Positive parenting practices involve multiple facets such as praise, involvement, good quality of supervision and discipline (Sanders, 2012), and previous research supported a latent variable *positive parenting* indicated by warm parenting, consistent parenting, low angry parenting and parent self-efficacy (Phillipson & McFarland, 2016).

Four models were tested to examine the potential factor structures in our study. Firstly, as the original construct of the brief scale (Scott et al., 2011), 4-factor intercorrelated model was tested with the four factors praise, poor supervision, involvement, and inconsistent

discipline. Although this model had acceptable model fits in both samples (Table S4.1), the factor named "inconsistent discipline" was not associated with other factors in the UK sample (Table S4.2). Although theoretically important, we excluded the three items describing inconsistent discipline from our analysis because reliability analysis revealed low internal consistency in both samples (α = .54/.40, UK/Chinese sample). Next, the 3-factor intercorrelated model with the remaining 9 items was investigated and achieved a good model fit in both samples (Table S4.1). The factor loadings ranged from .55 to .95 in the UK sample and from .42 to .97 in the Chinese sample (Table S4.2). Because of the establishment of the 3-factor intercorrelated model, its higher-order model was examined. CFA results showed a good model fit in the UK sample, but there was a problem of the model identification in the Chinese sample (Table S4.1). Thus, the bifactor model with three specific factors was investigated and provided support in both samples (Table S4.1) with factor loadings on the general factor ranging from .55 to .93 in the UK sample and from .28 to .66 in the Chinese sample. However, the three specific factors of the original scale were not established in both samples suggesting that parenting behaviour was best explained as a latent variable indicated by nine items in both samples.

Friendships. Twelve items were chosen from the Network of Relationships Inventory (NRI) to measure friendship. There are three different versions of NRI, NRI-Social Provisions Version, NRI-SPV (Furman & Buhrmester, 1985), NRI-Behavioral Systems Version, NRI-BSV (Furman & Buhrmester, 2009), and NRI-Relationship Qualities Version, NRI-RQV (Buhrmester & Furman, 2008). These questionnaires are used to assess different types of interpersonal relationships, including friendship. Researchers commonly select one or more sub-scales to measure individual relationships based on their interests (Furman & Buhrmester, 2010). To reduce the burden and to tap into intimate friendship, e.g., fewer conflicts, more disclosure, and receiving and offering supports, we selected the following

dimensions to assess the relationship with participants' most important friend: conflict, intimate disclosure, seeks safe haven and provides secure base. The conflict dimension asks about arguments in the relationship. Intimate disclosure assesses the closeness of the relationship. The provides a secure base subscale asks how much caregiving or social support research participants give to that person. The seeks safe haven subscale assesses how much research participants require care or social support from their friends. For the Chinese version, the corresponding items were chosen from Liu's translated version (2015).

There are different ways to score or use the NRI in research. Some studies directly used the single subscale (Wood et al., 2017), whereas others combined the subscales, for example, based on the results of exploratory factor analysis (EFA), combining several subscales (Bagwell et al., 2005), or combining the negative subscales as negative qualities of friendships and the positive dimensions as positive qualities of friendships (La Greca & Harrison, 2005). In our study, we aimed to justify one latent variable of friendships indicated by the items we chose. To verify this, CFA was conducted to explore a series of potential models.

Five measurement models were tested. First, a 4-factor intercorrelated model with conflict, intimate disclosure, seeks safe haven and provides secure base and its higher-order model were checked. Unfortunately, in the British sample, the conflict dimension did not load on the higher-order factor (Table S4.4). Given the good reliability of conflict in both samples (α = .89 /.73, British/Chinese), we kept this subscale as a factor in the model, and CFA results indicated acceptable model fits in both samples (Table S4.3). The remaining nine items were used to define latent variable *positive friendship quality*. Thus, the 3-factor intercorrelated model with intimate disclosure, seeks safe haven and provides secure base, its higher-order model and its bifactor model were assessed (Table S4.3, S4.4). To check if there

is a significant difference between intercorrelated model and bifactor model 2, the chi-square difference test was conducted. The results showed that the model fit of the bifactor model was significantly different compared to the intercorrelated model, $\Delta\chi^2$ (6) = 48.218, $p < .001$ in the UK sample, and $\Delta\chi^2$ (6) = 15.232, $p < .05$ in the Chinese sample. Although the specific factors were not replicated in the bifactor model (Table S4.4), results supported a general factor, *positive friendship qualities,* which was best explained as a latent variable indicated by nine items in both samples.

Self-compassion. The Self-compassion Scale (Neff, 2003) has been widely used in research to assess self-compassion across different cultures (Neff et al., 2019). Since the development of its original 26-item version, there has been a rich scientific debate about the construct and its psychometric definition. Self-compassion was defined as a multi-faceted construct that has six components, self-kindness, self-judgment, common humanity, isolation, mindfulness and overidentification, which operate as a system (Neff, 2003, 2016). From this perspective, the SCS is conceptualized as having six specific subscales (factors) and one general factor. Other researchers have argued from the perspective of the social mentalities theory (Gilbert, 2005) that the six SCS subcomponents could be mapped onto two latent factors, a safeness system, which is closely related to self-compassion, and a threat-defence system related to self-coldness (Brenner et al., 2017; Gilbert, 2005).

Although Neff et al. (2019) used 20 samples to argue that there is strong evidence for the six specific factors and one general factor structure, they also suggested that the construct of the SCS should be carefully checked in specific cultures (e.g., China and Japan)[3] and populations. Adolescents are one specific population for which self-compassion is less well understood (Tóth-Király & Neff, 2020), but increasingly of interest given its great potential in preventing mental health problems (Bluth et al., 2016). At the time of study planning, there

was only one adolescent version of the SCS available (Stolow et al., 2016). In this version, the wording was tailored for younger sample by Amy Saltzman (Stolow et al., 2016), and Stolow et al. (2016) checked the psychometric properties of this adolescent version, including factor structure and reliability.

In addition to the original long-form, a 12-item short form of the SCS (SCS-SF, Raes et al., 2011) was developed that retained the six subscales and includes two items per dimension. It replicated the six-factor higher-order model followed Neff (2003)'s theory (Raes et al., 2011). Raes et al. (2011) suggested that scoring SCS-SF as a total score is a reliable alternative to the long-form. To date, there is limited research using the SCS-SF in adolescent samples. Because our samples were teenagers in early adolescence, we used item wordings for our English version from the above-mentioned adolescent version of the SCS (Stolow et al., 2016) for the respective SCS-SF items.

For the Chinese version, we identified many different Chinese versions/translations currently used in ongoing research. Within our research networks, we contacted research teams that had published three papers on adolescent self-compassion in comparable samples (mean age around 13 years old) (Jiang et al., 2016; Jiang, You, Ren, et al., 2017; Jiang, You, Zheng, et al., 2017). Unfortunately, none of these studies was directly related to psychometric properties. However, there is a separate study about the psychometric properties of the Chinese version of self-compassion scale (Zhao et al., submitted). They performed a back translation, including bilingual interpreters and mental health researchers and edited several words of the original version. Since Zhao et al. (submitted)'s study focused on the psychometric properties of the full Chinese version of SCS with a slightly older sample (young adults with mean age is around 19 years old), we separately conducted the factor analysis of the short form applied in this study.

In line with previously investigated conceptualizations and established factor structures, we tested several different models. Firstly, we examined the six-factor intercorrelated model. Contrary to our expectation, this model solution had an identification issue in both samples (Table S4.5). Next, its higher-order model (one higher-order model with six lower-order factors) was investigated. However, the model fits in both samples were not acceptable. Following Neff's (2016) recommendation of using the bifactor model over the higher-order model because self-compassion is theoretically defined as a system where six dimensions cooperated as a system (Neff, 2016), we examined a bifactor model with six specific factors. This model fit was not acceptable in both samples.

The proposed six-factor structure of self-compassion was surprisingly not replicated in the current study, which may indicate that self-compassion has not yet developed well or fully crystallized in young adolescents, in particular the positive dimensions (e.g., self-kindness, common humanity and mindfulness) (Muris et al., 2016). Inspired by the social mentalities theory (Gilbert, 2005) described above, we examined a series of two-factor models.

Firstly, the two-factor intercorrelated model was checked. The model fit in both samples was poor, and consequently, the model fits of its higher-order model were not acceptable in either sample (Table S4.5). However, its bifactor model has an acceptable model fit in both samples (Table S4.5). All factor loadings of the general factor in both samples were significant. The factor loadings ranged from .26 to .68 in the UK sample and ranged from .15 to .67 in the Chinese sample. As for the specific factors, only the factor loading of item 12 was not significant in the UK sample (see Table S4.6). In the Chinese sample, all factor loadings of the specific factors were significantly positive, except items 11 and 12. The absolute value ranged from .26 to .68 in the UK sample and from .21 to .62 in the Chinese

sample (Table S4.6). Despite odd factor loadings for items 11 and 12, the model fit was acceptable; hence we used the bifactor model with general factor as the measurement construct. However, when we ran the correlation of all the measurements, we noticed that in the UK sample correlation value between self-compassion and the depressive mood was -.98. This extremely high correlation between self-compassion and depressive mood indicated that the bifactor model with two specific models of self-compassion could not be discriminated from depressive mood. The high correlation value indicated that the bifactor model with two specific factors might be misspecified.

Because there is limited research on SCS-SF psychometric properties, we decided to run bifactor exploratory factor analyses (EFA) to explore the measurement construct in the current study in the UK sample (Table S4.7, S4.8). The bifactor EFA was conducted with the orthogonal bi-cf-quartimax rotation applied (Muthén, 2018). We set the number of specific factors from two to six. The results of EFA indicated that compared with the bifactor model with two specific factors, the model fit of the model with three specific models was significantly better. However, compared with the model with four, five or six specific factors, the model fit of the three specific factor model solution was not significantly different suggesting a bifactor structure with three specific factors (Table S4.7). All items had significant factor loadings on the general factor (range from .35 to .74, table 8). Item 1, 7, 8 were loaded on the specific factor one. Item 2 to item 10 were loaded on the specific factor two. Item 3, 7, 11 and 12 were loaded on the specific factor three (Table S4.8). To confirm these EFA results, CFA was conducted in the Chinese sample. The model fit was acceptable, χ^2=113.368, df = 38, p < .001, CFI =.967, TLI =.942, RMSEA =.059, SRMR =.029. The factor loadings of the general factor were significant (ranged from .20 to .71), but the specific factors were not fully replicated in the Chinese sample, for example, the specific factor one and three were not replicated in the Chinese sample (Table S4.9). Given that we focused on

the general factor of self-compassion in our SEM, and we did not intend to interpret the specific factors, we accepted the bifactor model with three specific factors as the measurement construct in our study. We have added a critical discussion of the SCS construct in our main manuscript.

Depressive symptoms. The short mood and feelings questionnaire (SMFQ, Angold et al., 1995) was used in the study to assess the level of depressive symptoms. It is widely used in the assessment of depressive symptoms in children and adolescents across cultures (Stevanovic et al., 2017). The SMFQ has always been considered as a one-factor model (13 items loaded on one factor), and this model was previously supported by CFA (Messer et al., 1995). Also, there is evidence that the one-factor model was replicated in the Chinese sample (Cheng et al., 2009).

In the current study, the CFA results support the one-factor structure. The model fits were acceptable in both samples, χ^2=207.578, df = 65, p < .001, CFI =.984, TLI =.981, RMSEA =.072, SRMR =.042 in the UK sample, and χ^2=269.819, df = 65, p < .001, CFI =.962, TLI =.954, RMSEA =.074, SRMR =.053 in the Chinese sample. All factor loadings were significant. In the UK sample (Table S4.10), the factor loadings ranged from .65 to .93, and in the Chinese sample, the factor loadings ranged from .56 to .83.

Note.

1. For ethics requirement as we would not be able to act on disclosure of corporal punishment
2. Because there were three factors, the intercorrelated model and its higher-order model is equivalent from the perspective of the model fit. Also, the intercorrelated model is nested in the bifactor model. Thus, using the bifactor model and intercorrelated model were used to do the chi-square difference test.

3. In Neff et al. (2019) ’s study, the construct of SCS was not replicated in the Chinese and Japanese sample.

Table S4.1 Model fit parameters of the latent variable parenting behaviour in both samples

Model	UK sample						Chinese sample					
	χ^2	d	CF	TL	RMSEA[9	SR	χ^2	d	C	TL	RMSEA[	SR
4-factor	116.7	4				.040	117.	4	.9	.98	.050[.039,	.038
3-factor		2	1.0	1.0	<.001[.00	.016	59.1	2	.9	.99	.051[.035,	.031
3-factor higher-		2	1.0	1.0	<.001[.00	.016	59.1	2	.9	.99	.051[.035,	.031
Bifactor model with		1	1.0	1.0	<.001[.00	.014	42.6	1	.9	.98	.049[.030,	.026

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA= root mean square error of approximation; CI = confidence interval; SRMR = root mean square residual and standardized root mean square residual. * <.05; **<.01; ***, <.001. a. Heywood case in the model, model identification issues.

4-factor intercorrelated model indicated that there are four factors named praise, involvement, poor supervision and inconsistent discipline and correlated with each other.

3-factor intercorrelated model indicated that there are three factors named praise, involvement, and poor supervision and correlated with each other.

3-factor higher-order model indicated that there are three lower-order factors named praise, involvement, and poor supervision and these three factors loaded on one higher-order model named positive parenting.

Bifactor model with 3 specific factors indicated that there are three specific factors named praise, involvement, and poor supervision, and there is one general factor named positive parenting indicated by 9 items.

Table S4.2 Factor loadings of parenting behaviour in both samples for all models

Items or factors	4-factor intercorrelated model		3-facor intercorrelated model		3-factor higher-order model		Bifactor model			
	UK	**China**	**UK**	**China**	**UK**	**China**	**UK**		**China**	
							SF	GF	SF	GF
PR										
Item 1	.875***	.709***	.875***	.706***	.875***	.706***	-.057	.900***	.457***	.531***
Item 9	.947***	.960***	.947***	.969***	.947***	.968***	.112	.925***	.777***	.607***
Item 10	.829***	.872***	.829***	.865***	.829***	.865***	.358	.816***	.656***	.548***
PS										
Item 3	.520***	.782***	.551***	.799***	.551***	.799***	.470***	.261***	.516***	.471***
Item 7	.737***	.589***	.707***	.585***	.707***	.585***	.625***	.324***	.603***	.280***
Item 11	.773***	.567***	.779***	.554***	.779***	.554***	.710***	.354***	.540***	.270***
IN										
Item 4	.802***	.576***	.802***	.577***	.985***	.577***	.495**	.698***	-.691	.658***
Item 6	.697***	.414***	.697***	.418***	.462***	.418***	.224	.621***	.134	.475***
Item 11	.639***	.389***	.639***	.383***	.883***	.383***	.315**	.553***	.070	.420***
ID										
Item 2	.514***	.506***								
Item 5	.557***	.239***								
Item 12	.666***	.753***								
Factors										

PR&PS	.454***	.349***	.454***	.349***		
PR&IN	.870***	.613***	.870***	.746***		
PR&ID	.019	-.345***				
PS&IN	.407***	.613***	.408***	.612***		
PS&ID	.446***	.180*				
IN&ID	-.032	-.261***				
PR					.985***	.652***
PS					.462***	.535***
IN					.883***	1.143***
ID						

Note. PR = Praise; PS= Poor Supervision; IN = Involvement; ID = Inconsistent discipline * <.05; **<.01; ***, <.001.
SF = Specific factors; GF=general factor.
4-factor intercorrelated model indicated that there are four factors named praise, involvement, poor supervision and inconsistent discipline and correlated with each other.
3-factor intercorrelated model indicated that there are three factors named praise, involvement, and poor supervision and correlated with each other.
3-factor higher-order model indicated that there are three lower-order factors named praise, involvement, and poor supervision and these three factors loaded on one higher-order factor named positive parenting.
Bifactor model with 3 specific factors indicated that there are three specific factors named praise, involvement, and poor supervision, and there is one general factor named positive parenting indicated by 9 items.

Table S4.3 Model fit parameters of friendship in both samples

Model	UK sample						Chinese sample					
	χ^2	df	CFI	TLI	RMSEA[90% C.I.]	SRMR	χ^2	df	CFI	TLI	RMSEA[90% C.I.]	SRMR
Friendship												
4-factor intercorrelated model	120.728***	48	.995	.993	.060[.047, .074]	.031	122.730***	48	.985	.980	.052[.041, .064]	.031
4-factor higher-order model	126.628***	50	.995	.993	.061[.048, .074]	.037	129.008***	50	.985	.980	.053[.042, .064]	.035
3-factor intercorrelated model	106.323***	24	.994	.991	.091[.073, .109]	.022	97.129***	24	.981	.972	.073[.058, .089]	.028
3-factor higher-order model	106.323***	24	.994	.991	.091[.073, .109]	.022	97.129***	24	.981	.972	.073[.058, .089]	.028
Bifactor model with 3 specific factors	48.499***	18	.998	.996	.062[.040, .084]	.014	89.028***	18	.982	.963	.083[.066, .101]	.026
Conflict												
One factor with 3 indicators	<.001***	0	1.000	1.000	<.001[.000, .000]	.001	<.001***	0	1.000	1.000	<.000[.000, .000]	<.001

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA= root mean square error of approximation; CI = confidence interval; SRMR = root mean square residual and standardized root mean square residual. * <.05; **<.01; ***, <.001.

4-factor intercorrelated model indicated that there are four factors named conflict, intimate disclosure, seeks safe haven and provides secure base and correlated with each other.

4-factor higher-order model indicated that there are four lower-order factors named conflict, intimate disclosure, seeks safe haven and provides secure base and these four factors loaded on one higher-order factor named friendship.

3-factor intercorrelated model indicated that there are three factors named intimate disclosure, seeks safe haven and provides secure base and correlated with each other.

3-factor higher-order model indicated that there are three lower-order factors named intimate disclosure, seeks safe haven and provides secure base and these three factors loaded on one higher-order factor named positive quality of friendship.

Bifactor model with 3 specific factors indicated that there are three specific factors named intimate disclosure, seeks safe haven and provides secure base, and there is one general factor named positive quality of friendship indicated by 9 items.

Table S4.4 Factor loadings of friendship in both samples

Item or factors	Model 1		Model 2		Model 3		Model 4		Model 5				Model 6	
	UK	China	UK	China	UK	China	UK	China	UK		China		UK	China
									SF	GF	SF	GF		
IM														
Item 2	.839***	.670***	.838***	.669***	.839***	.672***	.839***	.672***	.541***	.719***	.520***	.449***		
Item 4	.866***	.821***	.866***	.821***	.866***	.818***	.866***	.819***	.273***	.789***	.537***	.583***		
Item 6	.916***	.859***	.917***	.859***	.917***	.860***	.917***	.860***	.416***	.810***	.649***	.592***		
SS														
Item 7	.590***	.794***	.890***	.794***	.890***	.793***	.890***	.793***	.108	.882***	.002	.801***		
Item 9	.944***	.829***	.944***	.830***	.944***	.828***	.944***	.828***	.035	.944***	.259	.795***		
Item 11	.948***	.720***	.948***	.720***	.948***	.723***	.948***	.723***	.177	.941***	.364	.684***		
SB														
Item 8	.734***	.747***	.736***	.749***	.736***	.753***	.736***	.753***	.380***	.573***	.389***	.608***		
Item 10	.896***	.738***	.896***	.734***	.896***	.726***	.896***	.726***	.523***	.656***	.468***	.573***		
Item 12	.872***	.683***	.872***	.686***	.872***	.690***	.872***	.690***	.772***	.609***	.465***	.541***		
CF														
Item 1	.927***	.916***	.931***	.928***									.930***	.931***
Item 3	.829***	.850***	.828***	.838***									.829***	.836***
Item 5	.961***	.566***	.958***	.565***									.958***	.561***
Factor														
SS & IM	.882***	.677***			.882***	.677***								

SB & IM	.649***	.548***			.649***	.549***	
SB & SS	.728***	.776***			.728***	.776***	
CF & IM	-.052	.086					
CF & SS	.029	.152**					
CF & SB	.092	.246***					
Higher order factor by							
IM			.886***	.689***		.887***	.691***
SS			.996***	.968***		.995***	.979***
SB			.732***	.808***		.731***	.793***
CF			.022	.187***			

Note. IM = Intimate disclosure; SS = seeks safe haven; SB= provides secure base ; CF = Conflict; SF = Specific factors; GF=general factor. * <.05; **<.01; ***, <.001.
Model 1: 4-factor intercorrelated model indicated that there are four factors named conflict, intimate disclosure, seeks safe haven and provides secure base and correlated with each other.
Model 2: 4-factor higher-order model indicated that there are four lower-order factors named conflict, intimate disclosure, seeks safe haven and provides secure base and these four factors loaded on one higher-order factor named friendship.
Model 3: 3-factor intercorrelated model indicated that there are three factors named intimate disclosure, seeks safe haven and provides secure base and correlated with each other.
Model 4: 3-factor higher-order model indicated that there are three lower-order factors named intimate disclosure, seeks safe haven and provides secure base and these three factors loaded on one higher-order factor named positive quality of friendship.
Model 5: Bifactor model with 3 specific factors indicated that there are three specific factors named intimate disclosure, seeks safe haven and provides secure base, and there is one general factor named positive quality of friendship indicated by 9 items.
Model 6: Conflict one factor model with 3 indicators.

Table S4.5 Model fit parameters of self-compassion CFA results

Model	UK sample						China sample					
	χ^2	df	CFI	TLI	RMSEA90% C.I.	SRMR	χ^2	df	CFI	TLI	RMSEA90% C.I.	SRMR
Model 1	151.586^{***a}	45	.966	.950	.075 [.062, .088]	.043	90.353^{***b}	45	.980	.971	.042 [.029, .055]	.030
Model 2	614.860***	48	.819	.751	.167 [.156, .179]	.083	386.212***	48	.850	.794	.111 [.101, .122]	.060
Model 3	209.954***	53	.950	.937	.084 [.072, .096]	.043	179.968***	53	.944	.930	.065 [.055, .075]	.040
Model 4	301.131***	54	.921	.903	.104 [.093, .116]	.057	358.705***	54	.865	.835	.099 [.090, .109]	.060
Model 5	614.860***	48	.819	.751	.167 [.156, .179]	.083	386.213***	48	.850	.749	.111 [.101, .122]	.060
Model 6	90.027***	42	.985	.976	.052 [.037, .067]	.025	105.057***	42	.972	.956	.051 [.039, .064]	.029
Model 7 (EFA results)	53.415*	38	.995	.991	.031 [.001, .049]	.018	113.368***	38	.967	.942	.059 [.047, .072]	.029

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA= root mean square error of approximation; CI = confidence interval; SRMR = root mean square residual and standardized root mean square residual.* <.05; ***, <.001; a. b. Heywood case in the model, model identification issues.

Model 1: 6-factor intercorrelated model indicated that there are six factors named self-kindness, self-judgment, common humanity, isolation, mindfulness and overidentification and correlated with each other.

Model 2: 6-factor higher-order model indicated that there are six lower-order factors named self-kindness, self-judgment, common humanity, isolation, mindfulness and overidentification, and these six factors loaded on one higher-order factor named self-compassion.

Model 3: 2-factor intercorrelated model indicated that there are two factors named positive components of self-compassion and negative components of self-compassion and correlated with each other.

Model 4: 2-factor higher-order model indicated that there are two factors named positive components of self-compassion and negative components of self-compassion, and these two factors loaded on one higher-order factor named self-compassion.

Model 5: Bifactor model with 6 specific factors indicated that there are six specific factors named self-kindness, self-judgment, common humanity, isolation, mindfulness and overidentification, and there is one general factor named positive quality of friendship indicated by 12 items.

Model 6: Bifactor model with 2 specific factors indicated that there are six specific factors named positive components of self-compassion and negative components of self-compassion, and there is one general factor named positive quality of friendship indicated by 12 items.

Model 7: Bifactor model with 3 specific factors (EFA results) indicated that there are six specific factors named specific factor 1, specific factor 2, and specific factor 3, and there is one general factor named positive quality of friendship indicated by 12 items.

Table S4.6 Factor loadings of self-compassion in both samples

Item or factors	Model 1		Model 2		Model 3		Model 4		Model 5				Model 6			
	UK	China	UK	China	UK	China	UK	China	UK		China		UK		China	
									SF	GF	SF	GF	SF	GF	SF	GF
Item																
Item 2	.644***	.555***	.504***	.530***	.529***	.567***	.766***	.810***	.420***	.408***	.199*	.496***	.525***	.258***	.361***	.384***
Item 6	.644***	.555***	.824***	.580***	.780***	.657***	.754***	.630***	.343***	.666***	.192*	.543***	.489***	.557***	.615***	.326***
Item 11	.859***	.682***	.585***	.688***	.842***	.557***	.888***	.793***	.435***	.741***	.495***	.472***	.264**	.795***	-.214*	.613***
Item 12	.859***	.682***	.860***	.676***	.844***	.551***	.828***	.544***	.434***	.742***	.498***	.464***	.155	.871***	-.314*	.643***
Item 5	.631***	.544***	.604***	.650***	.579***	.485***	.574***	.468***	.420***	.455***	.426***	.390***	.567***	.288***	.410***	.264***
Item 10	.631***	.544***	.659***	.455***	.608***	.369***	.596***	.361***	.410***	.497***	.445***	.273***	.473***	.379***	.377***	.154***
Item 4	.629***	.670***	.542***	.636***	.517***	.640***	.516***	.616***	.343***	.466***	.234**	.599***	.373***	.392***	.227**	.608***
Item 8	.629***	.670***	.731***	.706***	.681***	.714***	.681***	.691***	.301***	.629***	.219**	.664***	.682***	.436***	.319***	.665***
Item 3	.736***	.629***	.717***	.595***	.688***	.587***	.672***	.561***	.492***	.538***	.384***	.476***	.556***	.411***	.452***	.345***
Item 7	.736***	.629***	.755***	.666***	.698***	.660***	.679***	.630***	.481***	.566***	.370**	.533***	.518***	.449***	.577***	.347***
Item 1	.697***	.665***	.730***	.668***	.711***	.631***	.710***	.607***	.257***	.675***	.349***	.568***	.475***	.551***	.361***	.576***
Item 9	.697***	.665***	.666***	.662***	.660***	.636***	.659***	.620***	.274***	.616***	.351***	.562***	.495***	.494***	.296***	.587***
Factor																
SK			.809***	.936***												
SJ			.863***	.686***												

CH	.753***	.600***		
IS	.860***	.941***		
MI	.750***	.801***		
OI	.925***	.850***		
PC			.545***	.689***
NC			.856***	.642***

Note. SK=Self-kindness, SJ=Self-judgment, CH=Common humanity, IS=Isolation, MI=Mindfulness and OI= overidentification; PC= positive components of self-compassion, and NC = Negative components of self-compassion. * <.05; **<.01; ***, <.001. SF = Specific factors; GF=general factor.
Model 1: 6-factor intercorrelated model indicated that there are six factors named self-kindness, self-judgment, common humanity, isolation, mindfulness and overidentification and correlated with each other.
Model 2: 6-factor higher-order model indicated that there are six lower-order factors named self-kindness, self-judgment, common humanity, isolation, mindfulness and overidentification, and these six factors loaded on one higher-order factor named self-compassion.
Model 3: 2-factor intercorrelated model indicated that there are two factors named positive components of self-compassion and negative components of self-compassion and correlated with each other.
Model 4: 2-factor higher-order model indicated that there are two factors named positive components of self-compassion and negative components of self-compassion, and these two factors loaded on one higher-order factor named self-compassion.
Model 5: Bifactor model with 6 specific factors indicated that there are six specific factors named self-kindness, self-judgment, common humanity, isolation, mindfulness and overidentification, and there is one general factor named positive quality of friendship indicated by 12 items.
Model 6: Bifactor model with 2 specific factors indicated that there are six specific factors named positive components of self-compassion and negative components of self-compassion, and there is one general factor named positive quality of friendship indicated by 12 items.

Table S4.7 Model comparison of self-compassion EFA results

Model	χ^2	df	*p*	Compared model	χ^2	df	*p*
2 specific factors	66.667	33	.001				
3 specific factors	27.095	24	.300	2 specific factors	36.498	9	<.001
4 specific factors	13.811	16	.613	3 specific factors	12.919	8	.115
5 specific factors	10.427	9	.317	4 specific factors	4.311	7	.743
6 specific factors	.813	3	.846	5 specific factors	9.932	6	.128

Table S4.8 Factor loadings of self-compassion bifactor model with three specific factors (EFA)

Item	General factor	Specific factor 1	Specific factor 2	Specific factor 3
Item 1	.644*	.444*	-.096	.083
Item 2	.346*	.039	.520*	-.004
Item 3	.572*	-.116	.357*	-.224*
Item 4	.516*	-.007	-.269*	.039
Item 5	.388*	-.017	.535*	.014
Item 6	.609*	-.099	.394*	.090
Item 7	.622*	-.325*	.271*	-.185*
Item 8	.624*	.350*	-.277*	.044
Item 9	.657*	.070	-.349*	.043
Item 10	.463*	.110	.367*	.023
Item 11	.735*	.084	-.073*	.404*
Item 12	.736*	.068	.009	.471*

Note. * <.05; ** <.01; ***, <.001

Table S4.9 Factor loading of bifactor model of self-compassion with 3 specific factors (CFA)

UK				China			
Specifc factor		**General factor**		**Specific factor**		**General factor**	
S1				**S1**			
Item 1	.515***	Item 1	.660***	Item 1	.294	Item 1	.600***
Item 7	-.300***	Item 2	.295***	Item 7	-.046	Item 2	.407***
Item 8	.313***	Item 3	.482***	Item 8	.261	Item 3	.370***
S2		Item 4	.529***	**S2**		Item 4	.651***
Item 2	.528***	Item 5	.331***	Item 2	.345***	Item 5	.299***
Item 3	.440***	Item 6	.565***	Item 3	.429***	Item 6	.379***
Item 4	-.193***	Item 7	.577***	Item 4	-.028	Item 7	.387***
Item 5	.569***	Item 8	.652***	Item 5	.358***	Item 8	.705***
Item 6	.470***	Item 9	.686***	Item 6	.577***	Item 9	.680***
Item 7	.363***	Item 10	.409***	Item 7	.552***	Item 10	.201***
Item 8	-.243***	Item 11	.798***	Item 8	-.082	Item 11	.483***
Item 9	-.282***	Item 12	.796***	Item 9	-.176**	Item 12	.475***
Item 10	.443***			Item 10	.343		
S3				**S3**			
Item 3	.247***			Item 3	.060		
Item 7	.387***			Item 7	.069		
Item 11	-.359***			Item 11	.427		
Item 12	-.276***			Item 12	.552		

Note. * <.05; **<.01; ***, <.001; S1= Specific factor 1; S2 = Specific factor 2; S3= Specific factor 3.

Table S4.10 Factor loading of depressive symptoms

Countries	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13
UK	.832***	.784***	.652***	.648***	.930***	.690***	.724***	.904***	.679***	.864***	.859***	.832***	.896***
China	.709***	.691***	.728***	.734***	.828***	.555***	.573***	.824***	.738***	.689***	.770***	.800***	.803***

Note. ***, <.00

5 Multifactorial Developmental Pathways of Adolescent Depressive Symptoms (Study 4)

Developmental pathway of depressive symptoms via parenting, self-evaluation and peer relationships in young people from 3 years old to 17 years old: Evidence from ALSPAC

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5.1 Abstract

Background Although self-evaluation and interpersonal factors have previously been theoretically and empirically linked to depression in young people, there is a need to understand the multifactorial developmental pathways that explain how these factors predict depression because it would help to inform intervention targets. **Methods** Using structural equation modelling, this study explored whether self-evaluation and interpersonal factors were associated with adolescent depressive symptoms in a population-based sample (n=11,921) from the Avon Longitudinal Study of Parents and Children (ALSPAC) across four development stages: early and late childhood and early and middle adolescence from 3 to 17 years old. **Results** Early positive parenting predicted self-esteem, fewer peer difficulties, positive friendship quality and fewer depressive symptoms in late childhood development outcomes. Higher self-esteem and less negative self-concept mediated the effect of early positive parenting to reduced depressive symptoms in middle adolescence. The hypothesised erosion pathway from depressive symptoms in late childhood via higher levels of negative self-concept in early adolescence to depressive symptoms in middle adolescence was confirmed. Also, peer difficulties played a mediation role in developing depressive symptoms. Contrary to the hypothesis, low quality friendships were longitudinally associated with more depressive symptoms. A developmental pathway was supported in which more positive parenting in early childhood led to fewer peer difficulties in late childhood and to less negative self-concept in early adolescence, which in turn predicted fewer depressive symptoms in middle adolescence. **Conclusions** Positive parenting, social relationships and self-evaluation. The social-developmental origin of youth depressive symptoms was supported via the effect of peer difficulties in late childhood on self-evaluation in early adolescence. **Keywords** parenting; self-evaluation; peer relationships; depressive symptoms; developmental pathway

5.2 Introduction

Depression in adolescence affects adult employment, relational function and mental health (Clayborne et al., 2019; Horwood et al., 2016). Thus, it is critical to understand the developmental pathway of adolescent depressive symptoms, which has also been linked with maladjustment in adulthood (Aalto-Setälä et al., 2002). Among the factors studied to explain adolescent depression, self-evaluation as indicated by self-esteem (Sowislo & Orth, 2013), interpersonal factors such as the experience of being parented in childhood (Clayborne et al., 2020) and friendships (Schwartz-Mette et al., 2020) have been linked to depressive symptoms, but there is limited research examining the potential developmental pathways of adolescent depressive symptoms involving all these factors. Understanding such a developmental pathway could identify targets for intervention and prevention of depression. Therefore, the current study aims to explore the developmental pathway across different developmental periods.

Evidence is emerging to support the role of these factors in the generation of depressive symptoms among adolescents. Negative self-evaluation is a risk factor of depressive symptoms (Orchard & Reynolds, 2018); self-evaluation is defined as the way individuals evaluate themselves, including worth, attributes (Brown et al., 2001). Self-evaluation can be assessed as self-esteem, referring to one's evaluation of worth (Orth & Robins, 2014) and self-concept, referring to how young people see themselves (Marsh & Shavelson, 1985). The vulnerability model and the scar model provided opposite theoretical explanations for the association between self-evaluation and depressive symptoms (Sowislo & Orth, 2013). Specifically, the vulnerability model states that negative self-evaluation is the cause of depression, whereas the scar model stated that depression leads to negative self-evaluation. Although empirical studies have supported both models, the evidence for the vulnerability model is currently stronger (Orth & Robins, 2013). Given the importance of self-evaluation

for depression; worthlessness and self-criticism are key symptoms and persistent vulnerability factors (Association, 2013; LeMoult et al., 2017); it is critical to understand the developmental pathway of depressive symptoms related to self-evaluation. It is also helpful to understand the development of self-evaluation and interpersonal factors (i.e., early positive parenting and peer relationships) because they are closely intertwined (Ainsworth et al., 2015; Harris & Orth, 2019; Harter, 2008, 2012; Krauss et al., 2020). However, there is limited research exploring the longitudinal association between self-evaluation and depressive symptoms from an interpersonal perspective.

First, positive parenting in early life is considered the origin of self-evaluation via the development of Internal Working Models about the self and others as postulated in attachment theory (Ainsworth et al., 2015). Children whose parents were warm and sensitive to their needs in early life are more likely to develop a positive self-evaluation, for example, they are loveable. Supporting this, parental warmth predicted self-esteem in Mexican-origin youth from age 10 to 16 (Krauss et al., 2020). However, a recent systematic review (Clayborne et al., 2020) found that limited research has explored the association between positive childhood parenting and adolescent depression, but longitudinal studies are scarce as most of the evidence was from cross-sectional studies or covered only a limited developmental period with only two studies supporting the significant association between positive parenting in childhood and depression in adolescence (Feng et al., 2009; Williams et al., 2016).

Positive parenting was also hypothesised as a predictor of peer relationships via the same internal working models of self and others (Ainsworth et al., 2015), which supports the Interpersonal Model of Youth Depression. The latter is a developmental pathway from early family disruption via relationship disruption to depression (Rudolph et al., 2008). Although the association between parenting and peer relationships was supported by several studies

(Cook et al., 2012; Lim, 2020; Llorca et al., 2017), the majority of studies investigated parenting in late childhood or adolescence rather than focusing on early life parenting. Thus, the evidence supporting the assumptions of attachment theory is scarce.

Peer relationships may play a role in self-esteem (Harris & Orth, 2019) and depressive symptoms (Rudolph et al., 2008). Peer relationships extend from peer difficulties (defined as having problems getting along with peers) to positive friendship qualities (defined as feeling support from friends, comfortable talking problems with friends and happy with friendships). Three different longitudinal associations have been hypothesised between peer relationships and youth depression, with empirical support for each. The interpersonal risk model posits that poor interpersonal relationships cause youth depression (Kochel et al., 2012), and indeed conflicts with friends were found to predict depressive symptoms (Yang et al., 2020). The symptoms-driven model states that youth depression erodes interpersonal relationships (Kochel et al., 2012), and depressive symptoms predict peer rejections (Krygsman & Vaillancourt, 2017; Yang et al., 2020). The transactional model suggests that depression and interpersonal relationships influence each other (Kochel et al., 2012) as was supported by bidirectional links between depressive symptoms and peer victimisation, peer acceptance and support by friends (Forbes et al., 2019; Reijntjes et al., 2010; Yang et al., 2020).

There are reciprocal associations between self-evaluation and interpersonal relationships (Harris & Orth, 2019; van Geel et al., 2018) but no consistent evidence supporting the causal direction regarding the association between self-evaluation, interpersonal relationships and depressive symptoms. For example, self-esteem mediated the association between peer victimisation and depression in a one-year longitudinal study (Nepon et al., 2020). Furthermore, the indirect pathway from self-evaluation to depressive symptoms via peer relationships was hypothesised (Orth et al., 2018; Zhao et al., submitted), indicating that negative self-evaluation may cause maladaptive social interactions and poor interpersonal

relationships, and this may lead to depression. However, a recent study found an indirect pathway from self-esteem to peer victimisation via depressive symptoms in adolescents from 12 to 17 years old (Saint-Georges & Vaillancourt, 2020).

Taken together, theory and empirical evidence suggests cross-sectional and longitudinal associations between self-evaluation, interpersonal factors and depressive symptoms. However, because self-evaluation and peer relationships are reciprocally associated with each other, it is as yet unclear whether there is a developmental pathway from childhood experience of parenting to adolescent depression involving self-evaluation and peer relationships. There is cross-sectional evidence for an extended Interpersonal Model of Youth Depression in which a healthy self-evaluation, fostered by early positive parenting, would prevent depressive symptoms via adaptively using social support, such as friend support (Zhao et al., submitted). Additional, if partial support comes from a 6-year longitudinal study in which self-esteem was a mediator from dysfunctional parenting to peer attachment with three-time points (Lim, 2020). However, Lim (2020) did not assess depression. There is also evidence for a different developmental trajectory between self-evaluation and peer relationships, as poor peer relationships are the origin of negative self-evaluation (Cole et al., 2014). Given the uncertain developmental pathway between self-evaluation, peer relationships, and depressive symptoms, it is important to assess self-evaluation, peer relationships and depressive symptoms at several different time points through childhood and adolescence. This study, therefore, aims to explore the developmental pathway of depressive symptoms across four developmental stages using the Avon Longitudinal Study of Parents and Children (ALSPAC) database (Figure 5.1). ALSPAC can be considered a population-based database involving children born between 1991 and 1992 in Avon, England. Specifically, we plan to include parenting at early childhood, and self-evaluation at late

childhood and early adolescence, peer relationships and depressive symptoms in late childhood and early and middle adolescence.

In addition to the simple pathways (1) via self-evaluation based on the vulnerability model and (2) via peer relationships based on the interpersonal risk model, the current study proposed several additional pathways from parenting in early childhood. Specifically, two pathways were hypothesised suggesting that potential risk factors contribute to depressive symptoms: (3) via low self-esteem in late childhood to poor peer relationships in early adolescence (i.e., peer difficulties and low positive friendship quality); (4) via poor peer relationships in late childhood and then negative self-concept. Two further pathways were hypothesised suggesting that depression erodes the functions in other domains: (5) via depressive symptoms in late childhood then negative self-concept; (6) via depressive symptoms in late childhood then poor peer relationships.

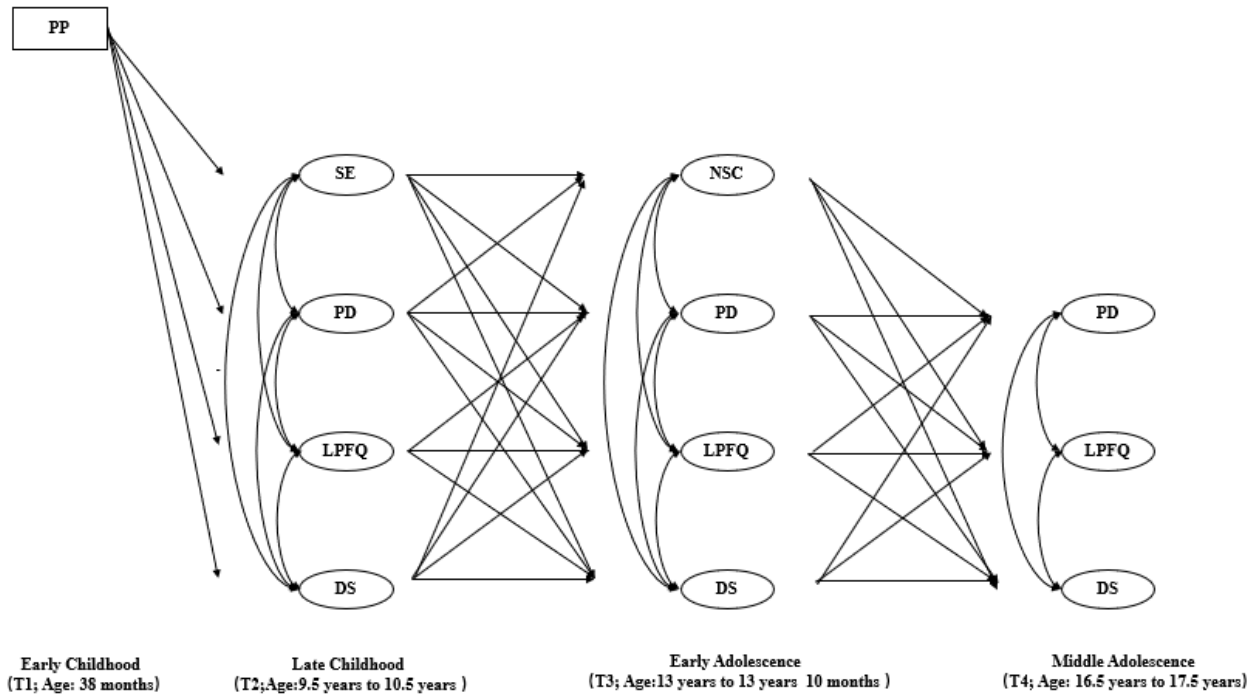

Figure 5.1 The hypothesized pathway model. Note. PP = mother parenting practice; SE = self-esteem; NSC = negative self-concept; PD = peer difficulties; LPFQ = low positive friendship quality; DS = depressive symptoms. We also predicted that parenting practice would have a direct association with the development outcome in early adolescence and middle adolescence. Also, self-esteem would have a direct association with the development outcome in middle adolescence

5.3 Methods

5.3.1 Participants

Data were from the Avon Longitudinal Study of Parents and Children (ALSPAC) (http://www.alspac.bris.ac.uk). Pregnant women whose estimated delivery date fell between 1 April 1991 and 31 December 1992 and living in one of the three health administration districts Southmead NHS District Health Authorities (DHA), Frenchay DHA and Bristol and Weston DHA (Boyd et al., 2013) were invited. In total, 15247 eligible pregnant women were enrolled in ALSPAC (detailed recruitment flow diagram, please see Boyd et al., 2012), and 15645 children were in the database. In this study, 11921 children were included because there were 3724 cases missing on all variables. Ethical approval was obtained from the ALSPAC Law and Ethics Committee and the Psychology Ethics Committees of the University (eCLESPsy001234 v2.1).

5.3.2 Measures

A detailed justification of the measures and procedures to establish its psychometric properties using confirmatory factor analysis (CFA) can be found in the supplementary material. Roughly, there were four-time waves across four developmental stages (Table 5.1 for accurate assessment time of variables): T1 indicated early childhood (i.e., 38 months); T2 indicated late childhood (i.e., 9.5 years to 10.5 years); T3 indicated early adolescence (i.e., 13 years to 13 years 10 months); T4 indicated middle adolescence (i.e., 16.5 years to 17.5 years).

Mother-reported parenting practice. Mother-reported mother parenting score at T1 was provided by the ALSPAC team. Based on the ALSPAC manual (ALSPAC, 2004), the score was calculated based on the sum of the frequency of ten parenting activities with children, including, bath, feed, sing, play with toys etc., on a 4-point Likert scale (from "often" 1 to "never" 4). When calculating the score, the ALSPAC team reversed the scores

(never “0” to often “3”), and the total sum of mother parenting score ranged from 0 to 30, and a higher score means better parenting practice.

Self-evaluation. Self-evaluation was assessed by self-esteem at T2 and self-concept at T3. For self-esteem, seven items were selected from the Self-Description Questionnaire (Marsh, 1990). Children were requested to use a five-point Likert scale from 1 “not true” to 5 “true” to rate items (e.g., “In general, I like the way I am”). Scores ranged from 5 to 35, and higher scores indicated higher levels of self-esteem. For self-concept, nine items were selected for this study from Self-Image Profile (Butler, 2001) based on words previously used in a self-referential task for the study of self-compassion developed by Kirschner (2016). Children were asked to use a 5-point Likert scale from 1 (always) to 5 (never) to rate a list of words to describe themselves (e.g., “kind”) at T3. Scores ranged from 8 to 40. The original data was reversed-scored, and higher scores indicated negative self-concept. The internal consistency for self-esteem and self-concept were .77 and .66, respectively.

Peer relationships. There are two variables assessing peer relationships at T2, T3 and T4; child-reported positive friendship quality and mother-reported peer difficulties. For positive friendship quality, three items (e.g., “talk about problems”) from the Cambridge Hormones and Moods project Friendship questionnaire (Goodyer et al., 1989) were rated on a 4-point scale from 1 (most of the time) to 4 (not at all). Higher scores indicated higher levels of poorer positive quality of friendships. Peer difficulties were assessed by a 5-item peer difficulties subscale (e.g., “picked on or bullied by other children”) from the parent-report Strengths and Difficulties Questionnaire (Goodman, 1997) on a 3-point scale from 0 (not true) to 2 (true). Scores ranged from 0 to 10, and higher scores indicated more peer difficulties. Internal consistency was α=.63/.65/.58 for peer difficulties, and α=.48/.44/.71 for friendships T2/T3/T4.

Depressive symptoms. Child-reported depressive symptoms were assessed by the 13-item short Mood and Feelings Questionnaire (SMFQ) (Angold et al., 1995) at T2, T3 and T4. SMFQ assessed the frequency of depressive symptoms (e.g., "I felt lonely") in the past 2 weeks on a 3-point scale from 0 ("not true") to 2 ("true"). The score of SMFQ ranged from 0 to 26, and higher scores indicated high levels of depressive symptoms. Internal consistency was α=.80/.87/.91, T2/T3/T4.

5.3.3 Statistical analyses

SPSS 25.0 was used for internal consistency. MPlus 8.4 was used for data analysis (Muthén, 2018). There was substantial attrition in ALSPAC for children from 3 years to 17 years. Therefore, the full completed case analysis (FCC, *n*=1292) is more likely to suffer from selection bias because the pattern of missing data is not missing completely at random (Table S5.12). Although data reported via Likert-type scales should be treated as ordinal data for which the weighted least squares mean and variance adjusted estimation (WLSMV) in Mplus was recommended (Muthén, 1984), robust maximum likelihood (MLR) estimation and full information maximum likelihood (FIML) were used for data analysis to allow missing data management for the primary analyses (Chen et al., 2020) whilst accounting for the non-normal distribution (Little, 2013).

The following data analyses were conducted. First, confirmatory factor analysis (CFA) was used to confirm the measurement constructs (for more details, see session 5.7.1). We established one-factor structures for self-esteem, peer difficulties, friendships and depressive symptoms and a bifactor model for self-concept.

Second, a series of nested models were computed using longitudinal CFA to establish the measurement invariance (MI) across measurement waves (Widaman et al., 2010). We established partial scalar MI of peer difficulties and depressive symptoms, and we did not establish measurement invariance of positive friendship quality (more details see session

5.7.2). In order to understand the potential impact of partial MI, we compared the main findings with the analysis in which we robustly constrained the factor loading and intercepts following previous recommendations (Chen, 2008). These comparisons revealed that our findings are stable.

Next, structural equation modelling (SEM) with latent factors was used to explore the longitudinal association between parenting, self, interpersonal relationships and depressive symptoms. Mediation analysis explored the indirect effects of self-evaluation and peer relationships on depressive symptoms in mid-adolescence.

We evaluated the model fit for CFA and SEM based on a joint consideration of the value of chi-square/degree of freedom (χ^2/df , ≤5), the values of root mean square error of approximation (RMSEA, ≤.08), standardised root mean square residual (SRMR, ≤.06), comparative fit index (CFI, ≥.90) and Tucker-Lewis index (TLI, ≥.90) following standard recommendations (Hu & Bentler, 1999; Marsh et al., 2005).

5.4 Results

5.4.1 Results of structural equation modelling

Descriptive statistics of correlation between variables Table 5.1. The model fit of the pathway model (Figure 5.2) was acceptable: χ^2 (2934) =12946.91, p < .001, CFI =.908, TLI =.903, RMSEA =.017, SRMR =.034.

For the cross-sectional associations, as illustrated in Figure 1, we found as hypothesised that low self-esteem was associated with low friendship quality, peer difficulties and depressive symptoms at T2. Similar findings related to negative self-concept were found at T3, that negative self-concept was positively associated with low friendship quality, peer difficulties and depressive symptoms. As for interpersonal relationships, peer

difficulties were positively correlated with depressive symptoms, and low friendship quality was positively correlated with depressive symptoms at T2, T3 and T4. Also, peer difficulties were positively linked with low positive friendship quality at T2, T3 and T4.

As for the stability of peer difficulties, friendships and depressive symptoms, mother-reported peer difficulties were moderately stable across time points (β= .65/.64, T2 to T3/T3 to T4), and child-reported friendship quality was stable at a small level across time points (β= .33/.25, T2 to T3/T3 to T4). Similarly, depressive symptoms were stable at small level across time points (β= .27/.32, T2 to T3/T3 to T4).

The effect of parenting was supported with T1 higher mother parenting scores predicting higher self-esteem, fewer peer difficulties, more positive friendship quality and fewer depressive symptoms at T2, but oddly, higher parenting scores predicted lower quality of friendships at T4 (|β|s <= .10).

The effect of self was supported with the finding that T2 self-esteem predicted fewer depressive symptoms at T3 and T3 self-concept predicted T4 depressive symptoms. Also, self-esteem predicted T4 depressive symptoms. However, contrary to the hypothesis, low friendship quality at T2 and T3 predicted *fewer* depressive symptoms T3 and T4, respectively. Peer difficulties predicted depressive symptoms at T3 and T4, but the longitudinal association between interpersonal factors and depressive symptoms were small magnitude (|β|s < .10). It is important to note that T2 depressive symptoms predicted negative self-concept and low friendship quality and more peer difficulties at T3, while T3 depressive symptoms did not significantly predict any variables at T4.

As for the longitudinal association between self and interpersonal relationship, self-esteem and self-concept positively predicted friendship quality at T3 and T4, respectively, but the effect on peer difficulties was only demonstrated for self-concept. Also, self-esteem

directly influenced T4 friendships. T2 peer difficulties predicted negative self-concept but friendship quality did not predict self-concept.

Table 5.1 Correlation table

	SE	SC	PD_T1	PD_T2	PD_T3	LPFQ_T1	LPFQ_T2	LPFQ_T3	DS_T1	DS_T2	DS_T3
PP	.10	-.07	-.10	-.08	-.06	-.06	-.07	**<.01**	-.05	**<.01**	**-.02**
SE	-	-.29	-.26	-.20	-.18	-.23	-.20	-.16	-.30	-.19	-.19
SC		-	.27	.32	.31	.16	.40	.30	.26	.55	.38
PD_T1			-	.70	.53	.30	.24	.21	.33	.19	.15
PD_T2				-	.67	.34	.32	.23	.31	.20	.18
PD_T3					-	.24	.29	.29	.24	.19	.23
LPFQ_T1						-	.40	.22	.36	.09	.08
LPFQ_T2							-	.34	.25	.27	.12
LPFQ_T3								-	.14	.17	.23
DS_T1									-	.31	.27
DS_T2										-	.43
DS_T3											-

Note. Correlations are standardised. N = 11921. PP =mother parenting practice; SE =self-esteem; NSC = negative self-concept; PD = peer difficulties; LPFQ = low positive friendship quality; DS =depressive symptoms; Numbers in bold means non-significance; ps <=.001

PP assessed at 3 years 2 months; SE assessed at 9 years 7 months; SC assessed as 13 years 10 months; PD_T1 assessed at 9 years 7 months; PD_T2; 13 years 1 month; PD_T3 assessed at 16 years 6 months; LPFQ_T1 assessed at 10 years 6 months; LPFQ_T2 assessed at 13 years 6 months; LPFQ_T3 assessed at 17 years 6 months; DS_1 assessed at 10 years 6 months; DS_2 assessed at 13 years 6 months; DS_3 assessed at 16 years 6 months.

5.4.2 Mediation analysis of indirect pathways

Possible indirect pathways to T4 depressive symptoms were identified and statistically assessed in the model. Several pathways were found to be statistically significant (Table 5.2). The direct effect from T1 parenting to T4 depressive symptoms was not significant, but seven indirect pathways were supported. Also, we explored the pathway from the T2 variables to T4 depressive symptoms. Two indirect pathways from T2 self-esteem were supported. Three indirect pathways from T2 friendship quality were supported. Three indirect pathways were supported from T2 peer difficulties. Only two indirect pathways from T2 depressive symptoms were supported.

Table 5.2 Indirect pathways of depressive symptoms at T4

Indirect paths		Standardised Coefficients		95% CI	
Predictor	Mediator(s)	β	SE	LL	UL
From parenting practice (T1) to depressive symptoms(T4)					
PP(T1)→	SE(T2)→	-.008**	.002	-.013	-.003
PP(T1)→	SE(T2)→SC(T3)→	-.003***	.001	-.005	-.002
PP(T1)→	PD(T2)→SC(T3)→	-.003**	.001	-.005	-.001
PP(T1)→	PD(T2)→PD(T3)→	-.005**	.002	-.008	-.001
PP(T1)→	SE(T2)→DS(T3)→	-.003***	.001	-.005	-.001
PP(T1)→	PD(T2)→DS(T3)→	-.003**	.001	-.004	-.001
PP(T1)→	DS(T2)→DS(T3)→	-.004**	.015	-.006	-.001
Effects from self-esteem(T2) to depressive symptoms (T4)					
SE(T2)→	SC(T3)→	-.036***	.008	-.052	-.020
SE(T2)→	DS(T3)→	-.032***	.007	-.045	-.019
Effects from friendships(T2) to depressive symptoms (T4)					
FQ(T2)→	FQ(T3)→	-.023*	.010	-.044	-.003
FQ(T2)→	PD(T3)→	.010**	.004	.003	.017
FQ(T2)→	DS(T3)→	-.018**	.007	-.032	-.005
Effects from peer difficulties (T2) to depressive symptoms (T4)					
PD(T2)→	SC(T3)→	.030***	.008	.015	.046
PD(T2)→	PD(T3)→	.048**	.015	.019	.078
PD(T2)→	DS(T3)→	.028***	.008	.014	.043
Effects from depressive symptoms (T2) to depressive symptoms (T4)					
DS(T2)	SC(T3)	.030**	.009	.011	.048
DS(T2)	DS(T3)	.085***	.011	<.001	.009

Note: N = 11921. PP indicated mother parenting practice; SE indicated self-esteem; SC indicated self-concept; PD indicated peer difficulties; FQ indicated positive friendship quality; DS indicated depressive symptoms; *, p <.05; **, p <.01; ***, p <.001

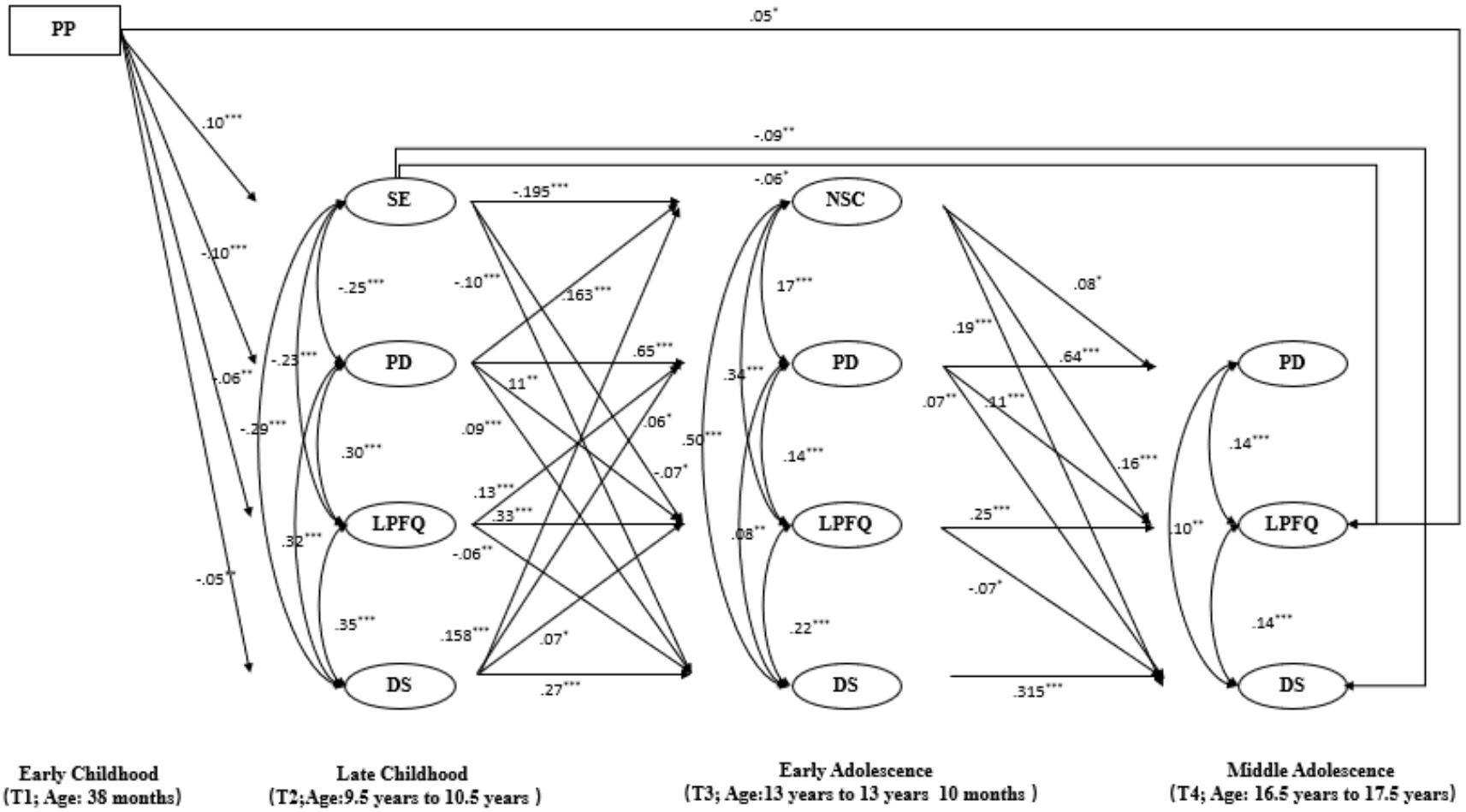

Figure 5.2. The pathway model: beta values are standardised. N = 11921. PP = mother parenting practice; SE = self-esteem; NSC = negative self-concept; PD = peer difficulties; LPFQ = low positive friendship quality; DS = depressive symptoms; *, p <.05; **, p <.01; ***, p <.001;

5.5 Discussion

We aimed to investigate a psychosocial developmental pathway of depressive symptoms, including early parenting, self-evaluation and peer relationships across childhood to middle adolescence. Our findings supported several pathways from parenting to depressive symptoms, via self-evaluation only (i.e., via self-esteem only and via self-esteem and self-concept); via peer relationships only (i.e., via peer difficulties only and via friendships and peer difficulties), via early-onset depressive symptoms (i.e., via depressive symptoms only and via depressive symptoms and self-concept), and via peer relationships and then self-concept, which are supported by theories and current literature. Contrary to our hypothesis, low positive friendship qualities negatively predicted depressive symptoms. Also, we found that negative development outcomes (e.g., low self-esteem, low positive friendship qualities, and peer difficulties) in late childhood negatively played a role in depressive symptoms in middle adolescence via depressive symptoms in early adolescence.

Our findings are in line with attachment theory (Ainsworth et al., 2015; Thompson, 2008) that positive parenting in early childhood predicted self-esteem, peer relationships and depressive symptoms in late childhood and supports the notion that early responsive and warm parenting practices may have an important role in facilitating children's positive and healthy self-evaluation, promoting good quality of peer relationships, and preventing depressive symptoms. Our results are also consistent with previous findings of significant effects of parenting on self-esteem (Lim, 2020), peer attachment (Llorca et al., 2017) and childhood depression (McLeod et al., 2007). There could be different explanations for the relatively small variance of positive parenting in explaining child development and the absence of direct effects of depressive symptoms in adolescence. Secure attachment in early life alone may exert only a small protective effect, in particular, if the child experiences adversity later in life, and these adversities may have a stronger impact. (Baumeister et al.,

2001). Also, it has been previously suggested that that the experience of positive parenting has less impact than the experience of negative parenting (Clayborne et al., 2020; McLeod et al., 2007), thus with time passing, there may be no direct impact of positive parenting on the depressive symptoms. The small effect size and the absence of a direct effect on depressive symptoms in adolescence alternatively may be due to methodological issues. We only have one measure of parenting from one parent; children may experience alternative parenting styles with different parents (Simons & Conger, 2007), and parenting practice may vary as the demands of child development may pose different challenges at different periods of development (Steinberg & Silk, 2002). Additionally, the mother-reported parenting measurement was based only on a total score, and we had no access to the individual items to assess its psychometric properties, and this may have caused the limitation of psychometric properties (McNeish & Wolf, 2020). Given the benefits of facilitating positive parenting on child development (Sanders et al., 2014), the parenting at later stages may be important as well (e.g., Zhao et al., submitted), future studies could use repeated measures of parenting (both negative and positive) with a shorter time interval to explore the effect of parenting on child development.

Our findings of the effect of self-evaluation on depressive symptoms are consistent with literature and theories (Sowislo & Orth, 2013). First, the developmental pathway of depressive symptoms in middle adolescence via self-esteem in late childhood and self-concept in early adolescence supported the vulnerability model (Sowislo & Orth, 2013), while controlling for concurrent peer relationships. Besides, self-esteem has a direct impact on depressive symptoms in middle adolescence. Second, our findings of the indirect effect of depressive symptoms in late childhood had on depressive symptoms in middle adolescence via self-concept in early adolescence supported the scar model. However, due to the limitation of the assessment of self-evaluation (i.e., different measurements, self-esteem in

late childhood and self-concept in early adolescence), we cannot further explore which effect is stronger. In brief, our findings suggested that across childhood and adolescence, when controlling the influence of interpersonal relationships, the association between self-evaluation and depressive symptoms may be reciprocal.

Our findings of the effect of peer relationships on depressive symptoms overall supported the interpersonal risk model (Kochel et al., 2012), which was indicated by the pathway only via peer difficulties and the pathway via friendships in late childhood and peer difficulties in early adolescence. Also, our findings did not support the symptoms-driven model that the depressive symptoms did not consistently predict peer difficulties or friendships across childhood to adolescence.

Surprisingly, the effect of friendships on depressive symptoms was contrary to theories and literature (Rudolph et al., 2008; Schwartz-Mette et al., 2020; Yang et al., 2020) that lower friendship quality predicted *fewe*r depressive symptoms. However, others have reported similar findings in both cross-sectional and longitudinal studies; we found that best friendship quality was associated with higher depressive symptoms in adolescents from China and the UK (Zhao et al., submitted). Similarly, two studies of adolescents with suicidal thoughts found the same longitudinal association as in the current study (Kerr et al., 2006; Miller et al., 2014). These studies suggest that friendship quality may not play a protective role in relation to depressive symptoms. It could be possible that given a high level of intimacy, young people's depressive symptoms might influence their friends affect (Schwartz-Mette & Smith, 2018); for instance, if adolescents talk about problems excessively. Friendship network and friend selection studies may be helpful to understand the inconsistent findings between cross-sectional and longitudinal associations detected in our study. The cross-sectional association suggest that low friendship quality is an interpersonal risk factor that leads to youth depressive symptoms, as the interpersonal risk model stated

(Kochel et al., 2012). However, children with depressive symptoms are more likely to be socially excluded (Cheadle & Goosby, 2012), while environmental changes such as the transition to secondary school may lead to new friendships. Based on empirical studies from friend selection, children tend to make friends with similar characteristics (Goodreau et al., 2009). Thus, children with higher levels of depressive symptoms may move into a friendship network with a higher level of depressive symptoms.

Positive parenting predicted better friendships in late childhood, but it predicted low quality friendships in middle adolescence (Figure 5.2). These surprising findings could be related to the limited measurement invariance of the friendship measures in the current study. To address this, we followed previous suggestions of dealing with partial measurement invariance (Chen, 2008). We re-ran the whole model specified that friendships are invariant across time, with similar findings, which suggest that measurement variance was not the explanation for this surprising finding.

Lastly, self-evaluation predicted friendships and peer difficulties from late childhood to middle adolescence, and peer difficulties in late childhood were negatively associated with self-concept in adolescence, which is partially consistent with the impact of interpersonal relationships on self-perception (Harter, 2008, 2012) and empirical evidence (Harris & Orth, 2019; Lim, 2020). However, we could not provide further evidence regarding the associations' direction because ALSPAC used different self-evaluation measures in late childhood (represented by self-esteem) and early adolescence (represented by self-concept). To explore the direction of the association, further research needs longitudinal research with repeated measures.

We found an additional pathway from parenting to depressive symptoms in middle adolescence via peer difficulties in late childhood and self-concept in early adolescence. This pathway could be considered as the social-developmental origin of negative self-evaluation

of depressive symptoms in adolescence (Brummelman & Thomaes, 2017), which is consistent with previous research (Cole et al., 2014). This may suggest that during childhood, interpersonal environments play a critical role in self-evaluation because children are more likely to evaluate themselves via others' feedback, such as peers (Harter, 2012).

Although there are several strengths of the study, such as, using a population-based study, including several key developmental stages, applying SEM, some limitations should be noted. First, the child-reported friendships suffered from low internal consistency, and the evidence of the measurement invariance was weak, as discussed above. Although we followed previous suggestions to include mother-reported peer difficulties as another form of peer relationships and apply SEM and to address the problem of unreliable measurement of friendships (Cole & Preacher, 2014), future studies should use more reliable measurements to explore the role of peer relationships in depressive symptoms again. Besides, multiple informants for the same construct of peer relationships could be used to get accurate data of the peer relationships in future studies (La Greca & Harrison, 2005).

Second, the assessment of depressive symptoms in ALSPAC is using the SMFQ. Although SMFQ is a reliable scale for adolescents to report depression, it is not a clinical diagnosis tool. Thus, our findings cannot be generalised in clinical groups. Additionally, attrition is the limitation of ALSPAC data. Despite the use FIML as a robust and recommended approach to manage missing data (Enders & Bandalos, 2001), special concerns of missingness of SMFQ in ALSPAC were highlighted (Kwong, 2019). It is likely to have been worst amongst those with more depressive symptoms, thus attrition limited our power. Previous work suggests that the missingness of ALSAC would underestimate the prevalence of psychiatric disorders but would not necessarily affect the relationships between variables (Wolke et al., 2009).

Third, we could not provide strong evidence of the association of interpersonal relationships and self-evaluation on depressive symptoms or the directions of hypotheses directions because we did not have repeated measures of self-evaluation and parenting, and we did not have enough time-points. Further studies could apply a more rigorous cross-lagged panel design (e.g., repeated measures with more time points with shorter assessment intervals) to explore the hypothesised pathway again.

The findings highlighted the importance of self-evaluation and social relationships in young people's depressive symptoms. The findings supported the social-origin developmental pathway of self in young people's depressive symptoms (Brummelman & Thomaes, 2017; Cole et al., 2014), and promoting parents' positive parenting practice and healthy peer relationships in childhood is not only beneficial for preventing depressive symptoms but also helpful to develop a positive and healthy self in adolescence. Thus, future prevention programs for depression in young people could be designed based on different developmental needs. For example, for children, parenting programmes for parents and peer support programmes would be more beneficial for preventing children's depressive symptoms and promoting a healthy self-concept. For adolescents, some intervention or prevention related to self-perception (e.g., enhancing self-esteem, cultivating self-compassion) could be critical in adolescence.

5.6 Conclusion

The mediation effect of self-evaluation and peer difficulties supported the vulnerability model and interpersonal risk model of youth depression. The erosive effect of childhood depression on self-concept in early adolescence was supported, which is in line with the scar model of self-evaluation. The social-developmental origin of youth depressive symptoms was supported via the effect of peer difficulties in late childhood on self-evaluation in early adolescence.

5.7 Supplementary Materials for Study 4

5.7.1 CFA Results of Measurements

Construct of self-esteem For self-esteem, the model fit of the factor structure using MLR estimator is acceptable (χ^2 = 313.61, *df* = 14, *p* <.001, CFI = .95, TLI = .92, RMSEA[90% CI] = .05[.05, .06], SRMR = .03). The standardised factor loadings were all significant (Table S5.1).

Table S5.1 Factor loadings for self-esteem (standardised)

	Item1	Item2	Item3	Item4	Item5	Item6	Item7
Factor loading	.43	.55	.68	.39	.55	.73	.62

Construct of self-concept. Self-concept was assessed using the Self-Image Profile (Butler, 2001). Participants were requested to use a 5-point Likert scale (from 1 always, to 5 never) to rate a list of words to describe themselves, and the words were listed below: *kind, friendly, funny, helpful, hardworking, talkative, confident, sporty, intelligent, be fun to be with, good looking, lazy, annoying, moody, shy, cheeky, loud, sarcastic/bitchy, bossy, short tempered, easily bored, different from others, mess about, and worry a lot.*

I tried to map the items from the Self-Image Profile (Butler, 2001) on a list of self-compassionate/positive and self-critical /negative self-referential words (Kirschner, 2016) to tap into self-compassion as closely as possible. The word list of the self-referential task was developed by Kirschner (2016), and it contained 38 positive affiliative and 38 negative affiliative words. The words were listed below (alphabetical order): *adorable, afraid, alert, alone, angry, balanced, bright, calm, capable, carefree, controlling, creative, curious, depressed, detached, discouraged, distressed, docile, easy-going, embarrassed, excluded, friendly, frustrated, gentle, grateful, happy, healthy, helpless, honest, hopeful, hostile, imaginative, inferior, insecure, joyful, kind, lively, lonely, loved, loyal, lucky, mindful, moody,*

nervous, peaceful, protected, proud, rejected, respectful, rigid, rude, sad, satisfied, scornful, secure, self-critical, selfish, stupid, supported, suspicious, tender, tense, thoughtful, tranquil, ugly, uncertain, uneasy, unfortunate, unhappy, unpopular, unsupported, upset, useless, warm-hearted, wise, worried.

As for picking items, the first author (MZ) picked up potential items from the Self-Image Profile (Butler, 2001) based on the self-referential task (Kirschner, 2016). Then, co-authors (AK and TF) were invited to check if the items from the Self-Image Profile (Butler, 2001) matched the meaning of the adjective word list (Kirschner, 2016). Lastly, the first author (MZ) used two thesaurus webs to double-check the match (https://www.thesaurus.com/ and https://www.merriam-webster.com/thesaurus).

The pilot list (14 words) was listed below. There are 7 words that can be identified as self-compassionate/positive self-referential words and 7 words that can be identifies as self-critical/negative self-referential words. Words in bracket are from the self-referential task (Kirschner, 2016): *Kind (kind), happy(happy), friendly(friendly), helpful (thoughtful), confident (secure), intelligent (wise), good looking (ugly), moody, shy (suspicious), cheeky(rude) , sarcastic/bitch (hostile), bossy (controlling), short-tempered (angry), worry a lot (worried).*

After selecting the words (14 items) above, CFA was used to explore the model structure. There is limited empirical evidence for the psychometric properties of the Self-Image Profile (Butler, 2001). Based on the items listed above, the words can be roughly divided into positive adjectives and negative self-referential adjectives. To follow the factor structure of self-compassion identified in Study 3 and the suggestion by Neff and the colleagues (2019) as closely as possible, I hypothesised a bifactor factor structure with one general factor representing self-concept and with two specific factors, positive self-referential adjectives and negative self-referential adjectives (Figure S5.1).

The model fit of the factor structure with all 14 words was not acceptable (Table S5.2) and its standardised factor loadings were listed in the table. I decided to omit problematic items (e.g., factor loading is not significant) to improve the overall model fit of the factor structure. Based on Model 1, for the general factor, the factor loading of "cheeky" was not significant. Although "confident" was not significantly loaded on the specific factor either, I only used the general factor in the final structural equation model, and I only omitted one problematic word for one step. Thus, cheeky was omitted, and I checked the model fit of Model 2 with the rest of 13 words. However, the model fit of the model was still unacceptable. Again, I repeated the step to omit the items, and until Model 6, the model fit was acceptable (Table S5.3 for factor loadings)

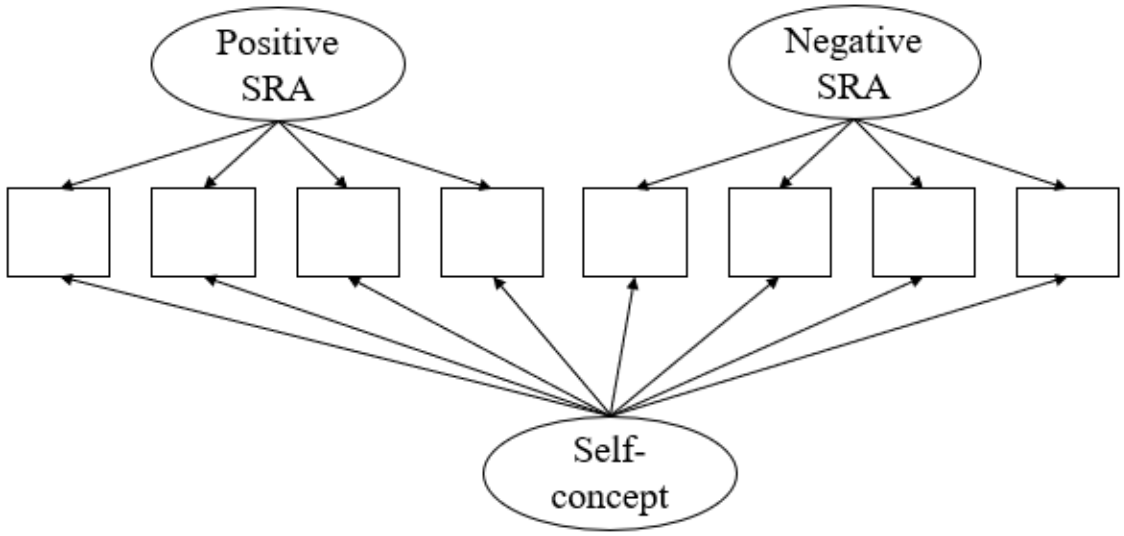

Figure S5.1 *Bifactor Model Diagram of Self-Concept*
Note. Positive SRA= self-compassionate/positive self-referential adjectives; Negative SRA= self-critical/negative self-referential adjectives

Table S5.2 Model fit of self-concept bifactor model

Model	MLR					
	χ^2	df	CFI	TLI	RMSEA[90% CI]	SRMR
Model1	5451.30***	63	.86	.80	.111[.109, .114]	.06
Model2	4942.35***	52	.86	.79	.112[.114, .120]	.06
Model3	2352.21**	42	.93	.88	.089[.086, .092]	.04
Model4	1784.24**	33	.94	.90	.088[.084, .091]	.04
Model5	1393.14**	25	.95	.91	.090[.085, .093]	.04
Model6	486.12***	18	.98	.96	.060[.057, .066]	.02

Note. Model1. 14 items; Model 2. 13 items; Model 3. 12 items; Model 4. 11 items; Model5, 10 items; Model 6, 9 items.

Table S5.3 Standardised Factor loading of self-concept with different models

		Kind	Happy	friendly	helpful	confident	intelligent	Good-looking	moody	shy	cheeky	Sarcastic	Bossy	Short-temptered	worry
Model1	GF	.33	.57	.40	.25	.74	.35	.48	.44	.57	***-.004***	.24	.16	.36	.50
	SF_PS	.80	.41	.71	.57	***.003***	.21	.08							
	SF_NS								.46	-.15	.56	.65	.67	.60	.13
Model2	GF	.33	.57	.40	.24	.73	.35	.48	.44	.58	-	.26	.16	.36	.50
	SF_PS	.80	.41	.71	.57	***.01***	.21	.08							
	SF_NS								.47	-.18	-	.59	.70	.62	.13
Model3	GF	.33	.45	.35	.21	-	.22	.28	.66	.37	-	.52	.50	.65	.56
	SF_PS	.77	.50	.74	.58	-	.31	.23							
	SF_NS								.12	-.48	-	.39	.45	.34	-.29
Model4	GF	.65	.74	.68	.48	-	.40	.46	.40	-	-	.30	.20	.38	.28
	SF_PS	.62	***.06***	.41	.37	-	***-.02***	-.17							
	SF_NS								.49	-	-	.56	.68	.61	.25
Model5	GF	.42	.41	.39	.28	-	-	.21	.21	-	-	.50	.48	.67	.37
	SF_PS	.72	.49	.73	.55	-	-	.28							
	SF_NS								.58	-	-	.55	.45	.26	***.004***
Model6	GF	.81	.82	.77	.55	-	-	.32	.35	-	-	.28	.19	.35	-
	SF_PS	.44	-.40	.16	.27	-	-	-.10							
	SF_NS								.50	-	-	.58	.68	.63	-

Note. Number in bold means not significant; GF = general factor; SF_PS = specific factor, positive self-referential adjectives; SF_NS=specific factor, negative self-referential adjectives;

Construct of friendships Friendships was assessed by five questions from the Cambridge Hormones and Moods project Friendship questionnaire (Goodyer et al., 1989, 1990). The model fit of the one-factor structure with five observed variables (items from friendship questionnaire) was not acceptable (Table S5.4). Thus, we decided to omit potential problematic items and not to follow the original suggestion that an overall friendships score was computed by five questions (listed below) and response choices based on ALSPAC manual:

F_1: "Are you happy with the number of friends you have?"

T2 choices: very happy, quite happy, quite unhappy, unhappy, no friends, and don't know;

T3 choices: very happy, quite happy, quite unhappy, unhappy, and no friends;

T4 choices: very happy, quite happy, quite unhappy, unhappy, no friends, and don't know.

F_2: "How often do you see you friends outside of school?"

T2 choices: Almost everyday, more than 1/week, once per week, less than 1/week, hardly ever, nerve, and don't know;

T3 choices: Almost everyday, more than 1/week, once per week, less than 1/week, hardly ever, and nerve;

T4 choices: Almost everyday, more than 1/week, once per week, less than 1/week, hardly ever, nerve, and don't know.

F_3: "Do you think that your friends understand you?"

T2 choices: Most of the time, sometimes, not often, not at all, and don't know;

T3 choices: Most of the time, sometimes, not often, and not at all;

T4 choices: Most of the time, sometimes, not often, not at all, and don't know.

F_4: "Do you talk about your problems with your friends?"

T2 choices: Most of the time, sometimes, not often, not at all, and don't know.

T3 choices: Most of the time, sometimes, not often, and not at all;

T4 choices: Most of the time, sometimes, not often, not at all, and don't know.

F_5: "Overall, how happy are you with your friends?"

T2 choices: very happy, quite happy, quite unhappy, unhappy, no friends, and don't know;

T3 choices: very happy, quite happy, quite unhappy, unhappy, and no friends;

T4 choices: very happy, quite happy, quite unhappy, unhappy, no friends, and don't know.

Using SPSS, we checked the internal consistency of these 5 items. We found the internal consistency of these five questions was quite low (Cronbach's Alpha = .37(T2)/ .42(T3) /.74(T4)). In particular, the item "see friends outside of school" was not reliable as the analysis indicated that if the item omitted, the α would increase considerably, although the α was still not ideal (Table S5.5). We think maybe when adolescents were young, they cannot really decide if they can see their friends outside school, thus, this item does not reliably contribute to good friendships. Additionally, based on the results of CFA (Table S5.4), we decided to omit the item "Are you happy with the number of friends you have" based on both theoretical and statistical reasons. From a theoretical perspective, there are three important indicators of friendships, the number of friends, positive qualities of friendships and negative qualities of friendships (Schwartz-Mette et al., 2020), thus the number of friends may be not theoretically in the same latent variable with the other three questions which indicate positive qualities of friendships. From the statistical perspective, after the item was omitted, the model fits of CFA were considerably improved and are now acceptable. Although the internal consistency of the three items was not high, the model fits of the CFA were acceptable at late childhood, early adolescence, and late adolescence and across three times (Table S5.4 for model fit, Table S5.6 for factor lodgings). I decided to continue using a latent variable approach in the SEM rather than summing the score as it has been shown that this can address the issue of low Cronbach's Alpha (Cole & Preacher, 2014).

Construct of peer difficulties. Model fit of the construct of peer difficulties at each time point could be seen in Table S5.7, and the model fit was acceptable. Standardized factor loadings can be seen in Table S5.8.

Construct of depressive symptoms. The acceptable model fit of the construct of depressive symptoms at each time point could be seen in Table S5.9. Standardized factor loadings can be seen in Table S5.10.

5.7.2 Measurement Invariance

After establishing the measurement constructs, longitudinal CFA was conducted to explore the measurement invariance (MI) of the measurements (Liu et al., 2017). There are different levels of MI, such as configural invariance (unconstrained factor loadings and intercepts), metric invariance (only constrained factor loadings), and scalar invariance (constrained factor loadings and intercepts). In the current study, we tried to establish the scalar invariance. Due to the big sample size, we did not use the Chi-square difference test to interpret the measurement invariance because it is too sensitive to be significant when using a big sample, and we used the change of CFI (<.01) and RMSEA (<.01) as cutoff points (Putnick & Bornstein, 2016).

Table S5.4 Model fit parameters of the latent variable *friendships* using MLR

Model	MLR					
	χ^2	d	CFI	T	RMSEA[90	SRM
Model 1 (5						
T2 (n=7444)	491.8	5	.76	.5	.11[.11, .12]	.05
T3(n=6109)	160.0	5	.93	.8	.07[.06, .08]	.04
T4(n=4096)	554.4	5	.86	.7	.16[.15, .18]	.06
Model 2 (4						
T2 (n=7444)	555.2	2	.68	.0	.19[.18, .21]	.05
T3(n=6109)	115.2	2	.94	.8	.10[.09, .11]	.04
T4(n=4096)	514.6	2	.83	.5	.25[.23, .27]	.07
Model 3 (4						
T2(n=7432)	13.46*	2	.99	.9	.03[.02, .04]	.01
T3(n=6108)	12.66*	2	.99	.9	.03[.02, .05]	.01
T4(n=4094)	98.71*	2	.96	.8	.11[.09, .13]	.03
Model 4 (3						
T2(n=7431)	<.001	0	1.00	1.	<.001	<.001
T3(n=6108)	<.001	0	1.00	1.	<.001	<.001
T4(n=4093)	<.001	0	1.00	1.	<.001	<.001

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA= root mean square error of approximation; CI = confidence interval; SRMR = root mean square residual and standardized root mean square residual. * <.05; **<.01; ***, <.001. n=sample size. T2 indicated friendships assessed in late childhood; T3 indicated friendships assessed in early adolescence T4 indicated friendships assessed in middle adolescence.
Model 1 indicated that there are 5 items assessing number of friends, see friends, be understood by friends, talk problem, and happy with friends.
Model 2 indicated that there are 4 items assessing number of friends, be understood by friends, talk problem, and happy with friends.
Model 3 indicated that there are 4 items assessing see friends, be understood by friends, talk problem, and happy with friends.
Model 4 indicated that there are 3 items assessing be understood by friends, talk problem, and happy with friends.

Table S5.5 If the item was omitted, Cronbach's Alpha of friendships

	Cronbach's Alpha (5 items)	F_1	F_2	F_3	F_4	F_5
T2	.37	.30	.52	.25	.28	.29
T3	.42	.31	.54	.35	.39	.30
T4	.74	.68	.76	.68	.70	.66

Note. T2 indicated friendships assessed in late childhood; T3 indicated friendships assessed in early adolescence T4 indicated friendships assessed in middle adolescence.
F_1 indicated “Are you happy with the number of friends you have”; F_2 indicated “How often do you see you friends outside of school (work)”; F_3 indicated “Do you think that your friends understand you”; F_4 indicated “Do you talk about your problems with your friends”; F_5 Indicated “Do you talk about your problems with your friends”.

Table S5.6 Factor loading of friendships

	Model 1 (5 items)			Model 2 (4 items)			Model 3 (4 items)			Model 4 (3 items)		
MLR	T2	T3	T4	T2	T3	T4	T2	T3	T4	T2	T3	T4
F_1	.55	.66	.74	.55	.65	.75	-	-	-	-	-	-
F_2	.10	.16	.44	-	-	-	.07	.15	.44	-	-	-
F_3	.42	.36	.61	.41	.35	.60	.65	.53	.76	.65	.54	.83
F_4	.35	.30	.51	.35	.30	.50	.52	.46	.65	.52	.46	.63
F_5	.68	.79	.84	.68	.81	.84	.39	.52	.63	.39	.50	.59

Note. T2 indicated friendships assessed in late childhood; T3 indicated friendships assessed in early adolescence T4 indicated friendships assessed in middle adolescence.
F_1 indicated "Are you happy with the number of friends you have"; F_2 indicated "How often do you see you friends outside of school (work)"; F_3 indicated "Do you think that your friends understand you"; F_4 indicated "Do you talk about your problems with your friends"; F_5 Indicated "Do you talk about your problems with your friends".
Model 1 indicated that there are 5 items assessing number of friends, see friends, be understood by friends, talk problem, and happy with friends.
Model 2 indicated that there are 4 items assessing number of friends, be understood by friends, talk problem, and happy with friends.
Model 3 indicated that there are 4 items assessing see friends, be understood by friends, talk problem, and happy with friends.
Model 4 indicated that there are 3 items assessing be understood by friends, talk problem, and happy with friends.

Table S5.7 Model fit parameters of peer difficulties

Model	MLR					
	χ^2	df	C	TL	RMSEA[90%CI]	SRMR
T2(n=8104)	140.36*	5	.9	.89	.06[.05, .07]	.03
T3(n=7078)	117.52*	5	.9	.91	.06[.05, .07]	.03
T4(n=5692)	68.87***	5	.9	.90	.05[.04, .06]	.03

Note. CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA= root mean square error of approximation; CI = confidence interval; SRMR = root mean square residual and standardized root mean square residual. * <.05; **<.01; ***, <.001.

Table S5.8 Factor loading of peer difficulties

	MLR				
Time point	Item 1	Item 2	Item 3	Item 4	Item 5
T2	.41	.52	.66	.49	.51
T3	.48	.51	.66	.55	.49
T3	.50	.54	.55	.42	.49

Note. All factor loadings were significant $p < .001$

Table S5.9 Model fit parameters of depressive symptoms

Model	MLR					
	χ^2	df	CFI	TLI	RMSEA[90%CI]	SRMR
T2(n=7409)	834.11***	65	.93	.92	.04[.04, .04]	.03
T3(n=6076)	1262.00***	65	.93	.91	.06[.05, .06]	.04
T4(n=5093)	1736.86***	65	.92	.90	.07[.07, .07]	.05

Note. All factor loadings were significant $p < .001$

Table S5.10 Factor loading of depressive symptoms

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13
MLR													
T2	.48	.33	.35	.25	.68	.48	.44	.66	.36	.62	.63	.61	.53
T3	.60	.39	.31	.30	.78	.61	.47	.77	.55	.70	.73	.70	.69
T4	.63	.57	.44	.45	.83	.60	.50	.80	.72	.71	.75	.75	.81

Note. All factor loadings were significant $p < .001$

Table S5.11 The results of measurement invariance

Model	χ^2	*df*	CFI	TLI	RMSEA [95%CI]	Model Comparison	ΔCFI	Δ RMSEA	Decision
$Model_{PD\_1}$	443.74^{***}	72	.967	.952	.024[.022, .026]				
$Model_{PD\_2}$	634.18^{***}	80	.951	.936	.028[.026, .030]	$Model_{PD\_1}$ vs $Model_{PD\_2}$	-.016	.005	Reject
$Model_{PD\_2a}$	537.57^{***}	79	.959	.946	.025[.023, .027]	$Model_{PD\_1}$ vs $Model_{PD\_2a}$	-.008	.001	Accept
$Model_{PD\_3}$	887.72^{***}	86	.929	.913	.032[.030, .034]	$Model_{PD\_3}$ vs $Model_{PD\_2a}$	-.030	.007	Reject
$Model_{PD\_3a}$	711.02^{***}	85	.945	.932	.029[.027, .030]	$Model_{PD\_3a}$ vs $Model_{PD\_2a}$	-.014	.004	Reject
$Model_{PD\_3b}$	630.89^{***}	84	.952	.940	.027[.025, .029]	$Model_{PD\_3b}$ vs $Model_{PD\_2a}$	-.007	.002	Accept
$Model_{FQ\_1}$	24.26^{***}	15	.998	.995	.009[.000, .015]				
$Model_{FQ\_2}$	238.83^{***}	19	.948	.902	.037[.033, .042]	$Model_{FQ\_1}$ vs $Model_{FQ\_2}$	-.050	.028	Reject
$Model_{FQ\_2a}$	72.08^{***}	18	.987	.975	.019[.015, .024]	$Model_{FQ\_1}$ vs $Model_{FQ\_2a}$	-.011	.010	Reject
$Model_{FQ\_2b}$	35.64^{***}	17	.996	.991	.012[.006, .017]	$Model_{FQ\_1}$ vs $Model_{FQ\_2b}$	-.002	.003	Accept
$Model_{FQ\_3}$	54.82^{***}	19	.992	.984	.015[.011, .020]	$Model_{FQ\_2b}$ vs $Model_{FQ\_3}$	-.006	.006	Accept
$Model_{D\_1}$	5134.52^{***}	660	.926	.917	.028[.027, .029]				
$Model_{D\_2}$	5814.17^{***}	684	.915	.908	.029[.029, .030]	$Model_{D\_2}$ vs. $Model_{D\_1}$	-.011	.001	Reject
$Model_{D\_2a}$	5526.07^{***}	683	.920	.913	.029[.028, .029]	$Model_{D\_2}$ vs. $Model_{D\_2a}$	-.006	.001	Accept
$Model_{D\_3}$	6357.35^{***}	706	.906	.902	.030[.030, .031]	$Model_{D\_3}$ vs. $Model_{D\_2a}$	-.020	.001	Reject
$Model_{D\_3a}$	6081.43^{***}	705	.911	.906	.030[.029, .020]	$Model_{D\_3a}$ vs. $Model_{D\_2a}$	-.009	.001	Accept

Note. ModelPD_x indicated peer difficulties; ModelFQ_x indicated friendships; ModelD_x indicated depressive symptoms

5.7.3 Missing data analysis

This section presents the results related to missing data in the current study. I created a new variable of full completed cases to label whether the participant has missing data ("having missing data labelled" as 1, "no missing data" labelled as 0). There are 1292 participants among 15645 participants without any missing data in all 80 items which assessed in the current study. Then we explored if the variables in the pathway models could predict later whether the participant is in the full completed case (Table S5.12). Based on the regression results, we can know that the missing pattern is not completely at random.

Table S5.12 Regression results

Predictors	*β*	Estimated S.E.	*p*
Mother parenting_T2	**-.032**	.008	<.001
Self-esteem_T2	.002	.011	.850
Peer difficulties_T2	**.066**	.028	.021
Friendships_T2	.014	.017	.417
Depressive symptoms_T2	.018	.011	.102
Self-concept _T3	.028	.019	.137
Peer difficulties_T3	**-.091**	.046	.048
Friendships_T3	**.048**	.018	.009
Depressive symptoms_T3	-.017	.013	.212
Peer difficulties_T4	**.066**	.030	.027
Friendships_T4	**-.029**	.013	.030
Depressive symptoms_T4	**.032**	.011	.004

Note. N=15645; Numbers in bold were significant.

6 General Discussion

This thesis examines a theory-informed developmental pathway model of adolescent depressive symptoms including self-perception and social factors to identify their role and to provide targets for intervention. This chapter explores the rationale behind the research and the key findings from each study, and then the implications of the findings from theoretical, psychometric and clinical perspectives. In this chapter, I summarise the rationale behind the research and the key findings from each study. Then, I discuss the implications of the findings from theoretical, psychometric and clinical perspectives. At the end, I discuss the limitations of the current thesis and provide future directions.

6.1 Summary of the rationale

Major depressive disorder (MDD) is a widely-prevalent chronic mental disorder (de Graaf et al., 2012) and a leading cause of disability that often begins in adolescence (Kovacs et al., 1984). The prevalence of adolescent depressive symptoms is increasing worldwide (Ang et al., 2019; Dardas et al., 2018; Keyes et al., 2019), and depressive symptoms in adolescence are associated with depression in later life (e.g., Fergusson et al., 2005). Only cognitive behavioural therapy (CBT) and interpersonal psychotherapy show evidence as effective treatment in young people with depression (Weersing et al., 2017). However, few children and adolescents have access to these evidence-based interventions (Gee et al., 2020). A better understanding of the factors that influence the onset of these symptoms might reveal additional therapeutic targets. The thesis set out to investigate the theoretically informed model in Figure 1 (Please see the 1.5)

Based on the internal working models of attachment theory (Ainsworth et al., 2015), I was particularly interested in how positive parenting behaviours play a role in young people's depressive symptoms via the formation of children's self-perception and relationships with peers. This was examined in Study 3 and study 4.

Next, from the perspective of the erosion effect of depressive symptoms on development, I hypothesised that depressive symptoms caused by psychosocial factors such as lack of positive parenting behaviours may impede the development of self-perception and peer relationships. This was examined in Study 4. The relationships between self-perception and social relationships may be transactional, and this was explored in Study 3 and Study 4. Finally, there may be important cultural differences in child development and mental health (Gibbons & Poelker, 2019; Polanczyk et al., 2015). I hypothesised that self plays a more important role in child development in an individualistic culture, and social factors play a more important role in a collectivistic culture (Markus & Kitayama 1991). I examined these hypotheses in Study 3.

Before examining these hypotheses, it was important to explore the assessment of self-compassion in a collective culture because there are assessment issues such as the definition and assessment debate in self-compassion. Thus, I explored self-compassion in the Chinese sample in Study 1 and Study 2and its structure and measurement invariance in Study 3.

6.2 Summary of findings

Study1 and Study 2 In light of previous inconsistent findings on its psychometric properties and in order to improve cross-cultural measurement of the new multifaceted concept self-compassion, we conducted research that investigated validity and reliability of the Self-compassion scale – Chinese version (SCS-C, Study 1) and explored specific features of different self-compassion components in Chinese young adults (Study 2). Two samples were recruited [Sample 1, N = 465, 141 males, Mean age (M age) = 20.26; Standard Deviation (SD age) = 2.18; Sample 2, N = 392, 71 males; 317 females. M age = 18.97; SD age = .98] to examine factor structure of the SCS-C using Confirmatory Factor Analyses (CFA) and Exploratory Structural Equation Modeling (ESEM). Although ESEM supported the six-factor structure when problematic items were omitted, stronger evidence for a novel four-factor structure of the SCS-C was revealed with self-kindness, common humanity,

mindfulness and uncompassionate self-response. Omega coefficients of the bifactor models suggested that it is not appropriate to use the SCS total score in Chinese samples without checking the factor structure. However, high factor determinacy and construct replicability indicated that the general factor of SCS-C could be used in a structural equation modelling context for both four-factor and six-factor structures. In the qualitative focus group study (Study 2), we identified that Chinese participants may have a different understanding of some dimensions of the SCS-C than those identified in previous Western research. In particular, participants valued what can be described as benign self-criticism and self-reflection. Participants' view of self-compassion dimensions can be described as dialectical in that they reflected both negative and positive perceptions in each factor rather than suggesting purely negative and purely positive dimensions. There was also great overlap in the understanding of the negative dimensions (self-judgment, isolation, overidentification). This helps to understand some of the problems encountered with establishing the factor structure in Study 1. Studies 1and 2 together suggest that when using the existing SCS-C in path models, researchers should use a latent variable approach and establish the measurement construct rather than sum scores of the scale or subscales without checking the factor structure in future empirical studies. Also, the SCS-C needs to be revised, and we proposed ways forward for future research.

Study 3 This study examined a theoretically and empirically informed model of the associations between parenting, self-compassion and friendships to explain depressive symptoms among adolescents in the UK and China and explored whether cultural differences existed in these relationships. Structural equation modelling revealed that positive parenting was associated with greater self-compassion, positive friendship quality, and with fewer depressive symptoms in both samples. Additionally, we confirmed a negative association between self-compassion and depressive symptoms. The pathway from positive parenting to

lower depressive symptoms via higher self-compassion was also corroborated in both cultures. Contrary to our hypothesis, positive quality of friendship was associated with higher depressive symptoms in both countries. Conflicts were associated with more depressive symptoms in the Chinese sample only. Finally, the association between self-compassion and depressive symptoms was greater in the UK sample, whereas in the Chinese sample, interpersonal factors were more strongly associated with self-compassion and depressive symptoms.

Study4 aimed at understanding some key hypotheses of the pathway model in a longitudinal design. This addressed the need to understand the multifactorial pathways that explain how these factors are associated with depressive symptoms. Using structural equation modelling, this study explored pathways of adolescent depressive symptoms via self-evaluation (self-esteem and self-concept) and interpersonal factors (i.e., positive parenting, positive quality of friendships, and peer difficulties) in a population-based sample of 11,921 children across four development stages: early childhood (i.e., 38 months), late childhood (i.e., 9.5 years to 10.5 years), early adolescence (i.e., 13 years to 13 years 10 months), and middle adolescence (i.e., 16.5 years to 17.5 years) from 3 to 17 years old. Because self-compassion was not assessed in the ALSPAC study, a related variable self-evaluation was defined that included positive self-concept, based on self-identifying compassionate words. Positive parenting at age 3 years predicted late childhood development outcomes, i.e., self-esteem, fewer peer difficulties, positive friendship quality and fewer depressive symptoms. Higher self-esteem in late childhood and less negative self-concept in early adolescence mediated the effect of positive parenting in early childhood on fewer depressive symptoms in middle adolescence. The hypothesised pathway from depressive symptoms in late childhood via negative self-concept in early adolescence to depressive symptoms in middle adolescence was confirmed. Similarly, peer difficulties played a mediating role in the development of

depressive symptoms, but the indirect pathway from early-onset depressive symptoms via later peer difficulties was not supported. Contrary to the hypothesis, low positive friendship quality negatively predicted depressive symptoms, but the longitudinal associations were small in magnitude. More importantly, a developmental pathway was supported in which more positive parenting in early childhood led to fewer peer difficulties in late childhood and to more positive self-concept in early adolescence which in turn predicted fewer depressive symptoms in middle adolescence.

6.3 Theoretical implications

6.3.1 The role of the self-perception in depressive symptoms

The findings suggest that self-compassion and self-esteem play protective roles in young people's depressive symptoms, which confirms previous research (Orth et al., 2008; Pulmer et al., 2020). Adolescents with higher self-esteem and self-compassion tend to have fewer depressive symptoms, which is supported by the findings from the cross-sectional studies in China and the UK (Study 3) and the longitudinal ALSPAC study (study 4). These findings support the vulnerability model (Beck, 1967) that self-related variables contribute to depressive symptoms. For example, low levels of self-esteem or self-compassion are associated with rumination (e.g., Neff & Vonk, 2009), and rumination is associated with depression in young people (Rood et al., 2009). Furthermore, individuals with low levels of self-esteem or self-compassion are also more likely to develop problematic social responses such as rejection sensitivity and excessive reassurance-seeking (Orth et al., 2008). I also found evidence (Study 4) supporting the Scar model (Shahar & Davidson, 2003) that early-onset depressive symptoms in late childhood erode self-concept in early adolescence and then have an impact on depressive symptoms in middle adolescence. This model shows that depression erodes how individuals think about themselves (Zeigler-Hill, 2011), and this erosion may be via interpersonal interactions (Orth et al., 2008). For example, individuals

with high levels of depression are more likely to be socially isolated, which indicates a lack of social support from which to develop their self-perception (Orth et al., 2008). Although the two models indicated different directions of the association between self-perception and depressive symptoms, both emphasise the role of interpersonal relationships in the association.

However, because different measurements were used to assess self-perception in the ALSPAC study (Study 4), we cannot statistically determine which has a greater effect size. Although previous studies have found that the vulnerability model has a greater effect size than the Scar model (Sowislo & Orth, 2013; Steiger et al., 2015), the longitudinal association between self-perception and adolescent depression may be bidirectional, and Zeigler-Hill (2011) argues that the two models are not mutually exclusive. Future studies could further explore if self-perception and depressive symptoms are related.

6.3.2 The role of the social factors in depressive symptoms

Parenting. The findings suggest that positive parenting in childhood (Study 4) and adolescence (Study 3) has a protective role in adolescent depressive symptoms (Clayborne et al., 2020; McLeod et al., 2007) and extend the existing evidence into cross-cultural comparison and longitudinal analysis. The effect in Study 4 was found only to last until late childhood, while evidence of the direct effect of early positive parenting on adolescent depression is limited (Clayborne et al., 2020). This may suggest that the internal working models shaped by early parenting behaviours might only exert their influence in childhood. Due to the social and biological changes in adolescence, children's attachment systems developed by early family experience will change (Allen & Miga, 2010). There is also an assumption that attachment figures will shift from parents to peers during adolescence and that young people are more likely to seek support and security from their peers as a result (Nickerson & Nagle, 2005). These changes in attachment may then cause changes in internal

working models, which may explain why parents have less influence in adolescence. To understand the role of parenting, further studies should use repeated measures of parenting practice during childhood and adolescence. It may also be helpful to include attachment measurements to explore the theoretical assumptions regarding the change of attachment.

Peer relationships. This thesis explores the role of peer relationships in the development of depressive symptoms in young people with a particular focus on peer difficulties (Study 4) and friendships (Study 3 and Study 4). Because I did not establish the measurement invariance of friendships across childhood and adolescence in Study 4, which is common that friendships are unstable from a long-term perspective (Gifford-Smith, 2003), I included mother-reported peer difficulties as an indicator of interpersonal relationships.

Across Study 3 and Study 4, the role of friendships in depressive symptoms is inconsistent. In the cross-sectional study (Study 3), a positive association between positive friendship quality and depressive symptoms was found in the UK and Chinese samples. However, I did not replicate the cross-sectional findings in the cross-sectional associations (Study 4), but positive friendship quality was negatively associated with depressive symptoms, which is in line with the protective role of friendships in depression (Schwartz-Mette et al., 2020). Longitudinally, in Study 4, friendship quality was positively associated with depressive symptoms. The inconsistency suggests that the association between friendships and depressive symptoms may depend on the context of the friendships.

The positive association in Study 3 could be explained by co-rumination and depression contagion in 'best' friendships. Previous research suggests that, especially for best friendships, adolescents with higher intimacy (an indicator of positive friendship qualities) tend to co-ruminate with their best friend (Spendelow et al., 2017), and are more likely to be affected by depressive symptoms from their best friend (Giletta et al., 2012). Although both studies assessed positive friendship quality, in Study 4, the friendships assessed were general,

not the best friendships assessed in Study 3. The cross-sectional association between friendship and depressive symptoms was in line with the assumption of a protective role of healthy interpersonal relationships in preventing depression. The longitudinal association in Study 4 may indicate that adolescents with high depressive symptoms may change their friends into ones who are similar to them, such as being depressed. Previous research has found that adolescents tend to choose friends who are similar to themselves (Goodreau et al., 2009). Young people who are vulnerable to depression may tend to befriend similarly vulnerable young people, and depression in one may adversely influence depression in the other. Many studies now use network analysis to explore the association between friendships and depression (Giletta et al., 2012; Rosenquist et al., 2011) and suggest that depression can travel in social networks (Rosenquist et al., 2011). Future studies could explore the association while considering children's social networks, which may help understand the friendship context.

This thesis provides preliminary evidence supporting the interpersonal risk model that mother-reported peer difficulties longitudinally have an impact on depressive symptoms in adolescents aged 9 to 17 (Study 4). However, this does not rule out other theoretical models such as symptom-driven theory (Kochel et al., 2012) as the findings from empirical studies of the association between peer relationships and depressive symptoms are inconsistent (Forres et al., 2018; Sentse et al., 2016) and the data were reported by mothers, which is a research limitation.

6.3.3 The association between self and social relationships

Study 4 found that positive parenting influences self-perception via peer difficulties, confirming earlier studies (Cole et al., 2014), the social-origin development of self-perception proposed by Brummelman and Thomaes (2017) and Harter (2008; 2012)'s assumption that early parenting practice and social interaction with friends shape how children think about

themselves. This also aligns with Study 3 also found that parenting practice plays a role in adolescent self-compassion.

This thesis provides evidence for the role of self in social relationships with a significant association between self-compassion and lowering conflict with the best friend (Study 3), and higher self-esteem in late childhood and less negative self-concept in early adolescence predicting better friendships in adolescence (Study 4). These findings support the theoretical assumption that self-perception can shape social relationships in line with self-verification theory (Swann & Read, 1981), which states that people prefer that others' perceptions of themselves are coherent with their self-perception; thus, self-perception would affect how people interact with others and influence social relationships. Also, Gilbert (2005)'s tripartite model of affect regulation theory could give the explanation, which indicates that when an individuals' soothing system activates, suggesting that they are self-compassionate (Kirschner et al., 2019), they are more likely to feel social connectedness and develop healthy relationships.

The findings suggest that self and social relationships influence each other throughout child development. Early parenting experience builds children's perceptions of an early internal working model of the self based on attachment theory (Ainsworth et al., 2015). With the development of cognition (e.g., the development of perspective-taking) and the changes of the social environment (e.g., spending more time with peers), self-perception could be reshaped or rebuilt through late childhood and early adolescence via social comparison with peers (Harter, 2008, 2012; Lapan & Boseovski, 2017). Once adolescents develop a stable self-perception (e.g., accurate self-evaluation), it will guide them to behave or respond in a way that conforms with their own perception, and this would influence their social environment, such as allowing them to get along with peers similar to themselves, which is in line with self-verification theory (Swann & Read, 1981).

6.3.4 The role of cultural differences in depressive symptoms

By identifying cultural differences in the role of parenting, friendships and self-compassion in adolescent depressive symptoms between the UK and Chinese samples, this thesis supports self-construal theory (Markus & Kitayama, 1991). Study 3 found that self-compassion explained the higher variance of depressive symptoms in the UK than in the Chinese sample. Conversely, in the Chinese sample, parenting and friendships explained a higher variance of depressive symptoms. Similar cultural differences were found in the association between parenting and self-compassion. These findings align with previous empirical studies which reported that self-related variables play a more important role in adolescent depressive symptoms in individualist cultures (Choi & Choi, 2016; Strewart et al., 2004), while social relationships are more important in collectivist cultures (Greenberger et al., 2000).

The absence of significant cultural differences in the effect of positive parenting on friendships between samples was surprising but could be explained by the variables I chose to focus on, which reflect close relationships. When explaining such close relationships, the assumptions of self-construal theory (Markus & Kitayama, 1991) may not apply because close relationships are important in both cultures. Parents and the best friend are the main social support for development and wellbeing in both cultures, and good, close relationships bring personal benefits, which is also in line with independence (Oyserman et al. 2002).

In summary, the self-construal theory (Markus & Kitayama, 1991) could be a suitable theoretical framework for explaining cultural differences in adolescent depressive symptoms. However, when examining associations that involve variables related to close social relationships, the theory may have limited value.

6.4 Psychometric considerations

This thesis found an assessment issue of self-compassion in adolescents, particularly in

the Chinese sample. In Study 1 and 3, I did not replicate the original factor structure in the Chinese young adults and adolescents from the UK and China. This indicated that when using the Chinese version of the self-compassion scale and the short version of self-compassion in young people, thoroughly exploring the psychometric properties in the empirical sample is important. If researchers fail to replicate the factor structure or suffer low reliability, applying a structural equation modelling approach is critical.

Although friendships are a multidimensional concept, negative and positive friendship qualities played differential roles. In Study 3, items from negative and positive friendship quality did not load on the same latent variable. In study 4, the number of friends and positive friendship quality did not load well on the same latent variable. This is in line with empirical studies, which have found that negative and positive friendship quality play different roles (e.g., La Greca & Harrison, 2005). Future studies may thus treat and assess these aspects of friendships separately rather than summing a total score.

Another implication from the cross-cultural and longitudinal is that future studies should thoroughly explore measurement invariance following previous recommendations (Chen, 2008). Applying a latent variable approach rather than using sum scores would also be recommended in cross-cultural and longitudinal studies because of low reliability or limited evidence of factor structure in some situations (Cole & Preacher, 2014). For example, questionnaires may lack psychometric evidence in a different culture or have a different factor structure from the original version (Study 1 and Study 2). Short-form questionnaires are more likely to be used in child and longitudinal cohort research (Study 3 and Study 4) to reduce families' and children's burdens.

6.5 Clinical implications

Although the participants in the studies were not clinical samples, the thesis included cross-cultural samples and a population-based dataset. The findings are not only theoretically

relevant but also have clinical implications. They highlight the role of healthy self-perception and social relationships in preventing depression in young people and point to cultural differences that these factors may affect.

Improving self-esteem and cultivating self-compassion could be a mechanism for preventing depression in children and young people. For example, CBT in young people is beneficial for self-esteem (Taylor & Montgomery, 2007). A mindful self-compassion intervention (Bluth et al., 2016) has also proven its effectiveness in adolescents in increasing self-compassion and reducing depressive symptoms by building a non-judgement internal voice and understanding the common humanity, thus developing a self-kindness response when facing certain difficult situations (Bluth, 2017). In addition to focusing on increasing self-esteem or self-compassion, the programmes could also help young people to make an accurate and healthy self-evaluation, such as working on the social comparison process. McCarthy and Morina (2020) found that social comparison of self is associated with depression. In clinical sessions, it has been found that the social comparison process is sensitive to CBT interventions in adults and can predict treatment outcomes in a clinical adult sample (Koerner et al., 2013).

This thesis also provides evidence for the social-origin developmental pathway of self in preventing depressive symptoms, which has practice implications for focusing on promoting healthy peer relationships in childhood. Further interventions could focus on helping children to develop the social skills needed to establish a healthy peer environment. The findings support the interpersonal risk model (Patterson & Capaldi, 1990) that mother-reported peer difficulties are longitudinally associated with depressive symptoms in children between 9 and 17 years old. Therefore, teachers and parents should be sensitive towards children's peer difficulties and intervene in peer problems to prevent or reduce depressive symptoms. For example, in the school setting, a peer relationship check-in/check-out programme could be

implemented to identify any peer difficulties. Current check-in/check-out programmes mostly focus on improving academic performance and reducing problem behaviours (Todd et al., 2008; Turtura et al., 2014). Increasing interpersonal skills is an important direction for preventing or intervening in depression in young people. Interpersonal psychotherapy skills training in adolescents has shown its effectiveness on depression by improving communication and interpersonal problem-solving skills (Young et al., 2019; Young et al., 2016). Anti-bullying programmes could also help in alleviating peer difficulties (Arseneault, 2018). Given that friendships may have negative effects on young people, such training could increase young people's awareness of the pitfalls of engaging in co-rumination or the negative impact from close friendships.

This thesis also supports the vital role of parenting in child development and parenting-based intervention could help prevent child depression. Currently, the majority of evidence-based parenting programmes such as the Triple P-Positive Parenting program (Sanders, 2012; Sanders et al., 2014) and the Incredible Years Parenting programme (Webster-Stratton et al., 2011) are designed to reduce children's behavioural problems. Given the findings that parenting can shape later peer relationships and how children think about themselves, it is important to add content to let parents know of the effect of their parenting practices on children's internal working models, not only for the children's behaviour but also for their self-perception and social relationships. For example, parental praise as a form of positive parenting plays a role in children's development, but inflated praise may impede their healthy self-perception (Amemiya & Wang, 2018; Brummelman et al., 2017). Thus, when future interventions or treatments are developed or assessed, the effect of parenting on children's self-perception and social relationships could be considered.

Lastly, this thesis highlights the cultural differences in adolescent depressive symptoms. The findings indicate that self-related variables play a significant role in an individualistic

culture, and social-related variables play a more important role in a collectivistic culture. Thus, social and clinical services should be aware of the cultural difference in children's mental health and work on the culture-adaptation intervention. Increasing evidence supports that culturally adapted intervention is more effective (Van Mourik et al., 2017). Raising the awareness of cultural differences and identifying their potential impacts are vital for adapting intervention or therapy. This thesis provides empirical evidence regarding the multifactorial model involving self, peer and parent-related variables through a cultural lens. This should prompt future programmes to focus on microsystems rather than exclusively on individuals following theoretical models (Bronfenbrenner, 1979) and researcher's suggestions (Greenberg et al., 2001). In practice, clinical professionals should be aware of the effect of other microsystems such as family, peers and society culture.

6.6 Limitations of this thesis

There are several limitations in assessment, research design, and potential research bias.

Assessment. Firstly, there are limitations on the assessment of self-related variables and interpersonal relationships in this work. There are unsolved issues with the factor structure of the self-compassion scale which was inconsistent with the original theoretical factor structure (Neff, 2003) in the Chinese (Study 1) and adolescent samples (Study 3). This suggests that there may be a different understanding of self-compassion in Chinese culture, and early adolescents may not have a solid self-compassion concept. Due to variable availability, I was unable to rely on the self-compassion scale (Neff, 2003) in Study 4 because it did not assess self-compassion. I tried to retrieve a self-concept variable that contained self-compassionate self-referential words (Kirschner, 2016), which allowed me to assess self-concept/self-perception rather than self-compassion as defined by Neff (2003). The common denominator between self-concept as assessed in ALSPAC and self-compassion is self-evaluation, and previous research has found that self-compassion requires individuals to have an accurate

self-evaluation (Leary et al., 2007). The findings related to self-compassion in Study 3 and Study 4 may be be tapping more into positive self-evaluation/self-perception in adolescents when researchers interpret the results.

Friendships and peer relationships are complex and multidimensional concepts (Berndt, 2002), but this study focused only on positive friendship quality such as intimacy and seeking support (Study 3 and Study 4) and peer difficulties assessed by SDQ (Study 4). Thus, the findings may be limited to the specific domains of interpersonal relationships. Further studies are encouraged to examine the hypothesised model in other perspectives of interpersonal relationships such as negative friendship quality and peer social status. Second, even though I included mother-reported peer difficulties in Study 4, I did not use multiple informants to report the same variables related to interpersonal relationships (Study 3 and Study 4). Although adolescents are a good source for reporting their peer relationships, their reports may be affected by social desirability (La Greca & Harrison, 2005). Previous research has suggested that it is better to include multiple informants to assess interpersonal relationships (La Greca & Harrison, 2005). Future studies could draw on other sources such as parent, peer-nominated and teacher reports when assessing interpersonal relationships.

Research design. There were two main design limitations in this thesis. First, I did not collect enough data regarding participant demographic variables, such as family socioeconomic status (SES). This was to reduce the response time for participants. Given that I do not have hypotheses regarding demographic variables, I did not include the covariate variables in the studies as Carlson and Wu (2012) suggested. Lacking the information for detailed demographic variables made it hard to show how the samples could represent the population in Studies 1, 2 and 3. In Study 4, it limited the possibility of using multiple imputations to deal with missing data, which may introduce some biases given the high dropout rate of ALSPAC data (Wolke et al., 2009).

Second, although I proposed the hypothesis and tried to understand the potential cultural differences between individualist and collectivist cultures in young people's depressive symptoms, there is no specific culture-related dimension assessed, such as interdependence and independence. Thus, the findings related to cultural differences only indicated potential differences between the two countries and limited the sample to a homogenous group rather than accounting for heterogeneity with each culture (Oyserman et al., 2002). For example, how independence or interdependence levels were associated with psychosocial factors and depression cannot be tested in the thesis. This could be a future direction.

Another limitation is that for Study 4, I had no comparable dataset from a sample in collectivist cultures, and future studies could consider used a longitudinal database from a collectivist culture. This limitation of culture also applies to Studies 1 and 2 where I did not have a sample from individualist cultures as the evidence of the factor structure of self-compassion in English-speaking samples is strong (Neff et al., 2020; 2019). All findings were compared to the original definition of self-compassion (Neff, 2003). Future studies could replicate Study 2 in a group of participants from individualist cultures such as the UK, which could be beneficial for the definition of self-compassion.

Researcher bias in a qualitative study. In many qualitative studies, researcher bias cannot be avoided in the data analysis. Having been born and raised in a collectivist culture, my cultural background may have introduced bias to the thematic analysis in study 2, such as having a preconditioned assumption in coding (Norris, 1997). Although other researchers reviewed the coding and themes, this bias should be borne in mind when reviewing the focus group findings. The focus group study's sample size was also small, and the participants were undergraduate students, and so the results could be limited to the understanding of self-compassion in a sample of undergraduate students. The findings from the focus group study

can only be preliminary evidence to inspire future studies.

6.7 Future directions

This section suggests two avenues for future study.

The proposed multifactorical model in Figure 1. The first avenue is about exploring the associations between psychosocial factors and young people's depression in three directions: exploring the developmental trajectory of peer relationships, self-perception and depression with covariate variables; exploring the role of potential moderators in the proposed model; and examining the cultural similarities and cultural differences of the hypothesised model.

There were several gaps in the hypothesised model (Figure 1) that have not been addressed. One of the main findings supported a social-origin development of self-perception in young people with depression. However, the evidence related to the association between self-perception and interpersonal relationships in depression is unclear, especially in the middle to late adolescence. The associations between self-perception, interpersonal relationships and depression were hypothesised to be reciprocal. There is a need for future research to examine this reciprocal model in other databases. For example, the Millennium Cohort Study (MCS) could be used to replicate the developmental pathway with repeated measures of child-parent relationships from childhood to adolescence and self-esteem across adolescence. The measurement of depression during adolescence in MCS was the same as used in this thesis.

Previous studies have also shown the effect of family socioeconomic status (SES) on psychosocial factors and adolescent depression (Bradley & Corwyn, 2002). Future studies could control some demographic variables after understanding the associations between them. Future studies could also explore the potential moderators in the hypothesised model (Figure 1). For instance, the interpersonal model of youth depression suggested that gender

may play a moderation role in the association between interpersonal factors and young people's depression (Rudolph et al., 2008). Future studies could explore the moderation effect of gender. Multiple group analyses could be used to explore the developmental pathways' differences between boys and girls.

Finally, to explore if developmental pathways are valid in other cultures, future research could use databases from other cultural groups. After thoroughly understanding the pathway models via secondary data analysis, longitudinal cross-cultural empirical studies could be conducted to explore specific hypotheses related to cultural differences and a specific cultural dimension.

Self-compassion in young people: From a developmental perspective. The second issue relates to the understanding of self-compassion from a developmental perspective. First, a clear definition of self-compassion should be given, especially if it is conceptualised as an emotional regulation ability or a form of healthy self-perception. Although a youth version of the self-compassion scale has been developed, its psychometric properties still need to be supported by more evidence (Neff et al., 2021). The youth version of the self-compassion scale is based on Neff's (2003) definition, which has six subscales, but the wording and the item numbers of the subscales are different from the original self-compassion scale. The youth version's factor structure should be thoroughly examined. How young people understand and interpret self-compassion should also be explored, given that adolescence is a transition period.

After addressing the issue with definition and assessment, more research should be conducted regarding self-compassion in young people. We do not know how self-compassion develops during adolescence, especially when children or adolescents can understand common humanity. Given that young people are still developing during adolescence, especially in emotion regulation and social cognition, we do not know if adolescents' self-

compassion is stable. Finally, the origin of self-compassion should be further explored, including the role that peers play in the development of self-compassion, and if self-esteem is a precondition for the development of self-compassion.

7 Conclusions

This research found that positive parenting, self-esteem, self-compassion and fewer peer difficulties play a protective role in adolescent depression, but the role of friendships in depressive symptoms is unclear. The social-origin development of self-perception was supported; positive parenting and peer relationships predicted how children think about themselves. During adolescence, self-perception was associated with social relationships. Cultural differences in the development of young people's depressive symptoms indicated that social relationships were more important in a collectivist culture, but self-compassion is more important in an individualist culture.

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Appendix for Study 1

CLES – Psychology
Psychology
College of Life and Environmental Sciences
University of Exeter
Washington Singer Building
Perry Road
Exeter
EX4 4QG
Web: www.exeter.ac.uk

CLES – Psychology Ethics Committee

Dear Mengya Zhao

Ethics application - eCLESPsy000310
Psychometrics of the Chinese Version of Self-Compassion Scale in Young Adults

Your project has been reviewed by the CLES – Psychology Ethics Committee and has received a Favourable opinion.

The Committee has made the following comments about your application:

- Please view your application at https://eethics.exeter.ac.uk/CLESPsy/ to see comments in full.
If you have received a Favourable with conditions, Provisional or unfavourable outcome you are required to re-submit for full review and/or confirm that committee comments have been addressed before you begin your research.

If you have any further queries, please contact your Ethics Officer.

Yours sincerely

Date: 20/04/2021

CLES – Psychology Ethics Committee

Recruiting online sample

PARTICIPANT INFORMATION SHEET

Title: Revising self-concept scale Chinese version – an online survey

Principal Researcher: Mengya Zhao (email: mz311@exeter.ac.uk)
Supervisor: Dr Anke Karl

This is Mengya, a PhD student at the University of Exeter, UK. You are invited to participate in a study aiming to revise the Chinese version of a self-concept scale that requests you to complete an online questionnaire, which will take no more than 15 minutes.

What is the purpose of the study?

The purpose of this study is to revise the Chinese version of a new self-concept scale and test the scale's reliability and validity. The study is part of a PhD project being carried out by the Principal Researcher (Mengya Zhao).

Am I required to take part?

It is entirely up to you if you wish to take part. If you do decide to take part, you are free to change your mind at any time and can withdraw during the study. If you decide not to take part after you have started the study, any data collected from you will no longer be included in the results of the study and will instead be destroyed.

What does participation involve?

If you think that you would like to take part and would like to know more, you can contact the Principle Researcher who will try to answer any questions you have via email (at the beginning of the page).

In order to take part in this study we ask you to complete an online questionnaire, which will take no more than 15 minutes, asking you questions related self-concept, emotion regulation and social connectedness.

Expenses and payments:

There is no payment for taking part in this study. Your participation is voluntary. However, you will get 5 yuan as a token of thanks after you finish the survey.

Are there disadvantages of taking part in this study?

There are no known disadvantages associated with taking part in the study.

Will my taking part in the study be kept confidential?

All information which is collected from you during the research would be kept strictly confidential within the limits of the law. In accordance with British Psychological Society research guidelines, all data for the study will be securely stored away for 20 years and will be destroyed after this time.

What will happen with the results?

It is planned that the results will be written up in order to inform clinicians and researchers who are interested in this area. If you would like to obtain a copy of the findings, we will be more than happy to send them to you when they become available (Please contact the researcher via email).

Who has reviewed this study?

This study has been reviewed and approved by the School of Psychology Ethics Committee, University of Exeter (Lisa Leaver, L.A.Leaver@exeter.ac.uk). If you have any questions or complaint about this research, please contact Lisa or the researchers.

Consent

I understand that my participation is voluntary and that I am free to withdraw from the study at any time without giving any reason. I understand that all data will be coded with a participant number and remain completely anonymous to all except the research team for this study. All data collected will be treated completely confidential.

I wish to take part in this study: Yes or No

PARTICIPANT DEBRIEFING SHEET

Title: Revising self-concept scale Chinese version – an online survey

Principal Researcher: Mengya Zhao (email: mz311@exeter.ac.uk)
Supervisor: Dr Anke Karl

Thank you for participating in this study – your time and effort is very much appreciated! You can read this sheet to learn more about our research. As stated in the information sheet, this study aims to revise the Chinese version of a new self-concept scale, the self-compassion scale originally developed by Neff (2003) and test its reliability and discriminant validity.

'**Self-compassion'** can be considered as being kind and being nice to ourselves when we face some bad things, such as bad emotions, failing in the exam, have bad relations with friends. Mostly, we are tending to blame ourselves when bad thing happened, like why other students can get a higher score in exam, why not me? However, self-compassion will provide you an acceptance and open mind to face bad things in daily life, and you will feel that it is okay for them to occur, and we are not alone in experiencing them. More importantly, self-compassion also requests you using a balance way to think about the bad thing and help you to improve yourself. Overall, self-compassion can help you to avoid abandoning yourself into bad emotions and have a better way to think about yourself.

We request you to finish four scales (beside self-compassion scale), which assessed your social desirability, self-criticise, social connectedness and emotion regulation based on the theory of self-compassion construction. We hypothesised that self-compassion should be positively linked to social connectedness and emotion regulation but negatively associated with self-criticise.

Contact Details:

If you require further information or would like to ask any questions, please do not hesitate to contact the Principal Researcher. Additionally, if you are concerned about any ethical issues please contact the Chair of Exeter University's Ethics Committee Lisa Leaver (l.a.leaver@exeter.ac.uk).

INFORMATION SHEET

Title: Revising Chinese version of self-concept scale

Principal Researcher: Mengya Zhao (Email: mz311@exeter.ac.uk)
Supervisor: Dr Anke Karl

My name is Mengya Zhao and I am a PhD Student at the University of Exeter. You are invited to participate in a study that aims at revising the Chinese version of a new self-concept scale. Specifically, your participation involves completing a number of questionnaires twice within a three week period.

What is the purpose of the study?

The purpose of this study is to revise the Chinese version of a new self-concept scale. The study is part of a PhD project being carried out by the Principal Researcher (Mengya Zhao).

Am I required to take part?

It is entirely up to you if you wish to take part. If you do decide to take part, you are free to change your mind at any time and can withdraw during the study.

What does participation involve?

If you think that you would like to take part and would like to know more, you can contact the Principle Researcher who will try to answer any questions you have via email (at the beginning of the page).

In order to take part in this study we ask you at time 1 to complete a number of questionnaires, which will take no more than 15 minutes. After three weeks, at time 2, we will ask you to complete one of the scales from today's questionnaire which only contains 26 items. We hope you can attend both two assessments but if you change your mind, you are free to withdraw from the study at any time.

Expenses and payments:

The participation is voluntary and there is no payment for taking part in this study. However, 4 pens would be provided as a token of thanks for your supporting (3 pens for this questionnaire, and 1 pen for the last assessment after three weeks).

Are there disadvantages of taking part in this study?

There are no known disadvantages associated with taking part in the study.

Will my taking part in the study be kept confidential?

All information which is collected from you during the research would be kept strictly confidential within the limits of the law. You will be allocated your own unique study code

number, ensuring that all information that you give will contain the number rather than your actual name. Identifiable information will be stored in a locked cabinet and only the researchers of this project will have access to it. In accordance with British Psychological Society research guidelines, all data for the study will be securely stored away for 20 years and will be destroyed after this time.

What will happen with the results?

It is planned that the results will be written up in order to inform clinicians and researchers who are interested in this area. If you would like to obtain a copy of the findings, we will be more than happy to send them to you when they become available (Please contact the researcher via email). Also, the summary of the research result will be sent to each participant who is interested in the finding of research via email.

Who has reviewed this study?

This study has been reviewed and approved by the School of Psychology Ethics Committee, University of Exeter.

Contact Details:

If you are concerned about any ethical issues and any complaints of this study, please contact the Chair of Exeter University's Ethics Committee Lisa Leaver (l.a.leaver@exeter.ac.uk). If you require further information or would like to ask any questions related to the study, please do not hesitate to contact the Principal Researcher using the details at the beginning.

Consent Form

Title: Revising Chinese version of self-concept scale

Principal Researcher: Mengya Zhao (Email: mz311@exeter.ac.uk)
Supervisor: Dr Anke Karl

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Please **read the study information sheet** before completing this form.

1.	I have read and understood the Information Sheet	YES/NO
2.	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.	YES/NO
3.	I understand that the school's and participants' identities will not be revealed in any publication.	YES/NO
4.	I understood that all information collected during the course of the study will be kept strictly confidential.	YES/NO
5.	I agree to take part in the above study.	YES/NO

Your Name (please print)
.....
Signature
.....
Date
...../...../.....

Researcher Name
Mengya Zhao
Researcher Signature
.....
Date
...../...../.....

PARTICIPANT DEBRIEFING SHEET

Title: Revising self-concept scale Chinese version – an online survey

Principal Researcher: Mengya Zhao (email: mz311@exeter.ac.uk)
Supervisor: Dr Anke Karl

Thank you for participating in this study – your time and effort is very much appreciated! You can read this sheet to learn more about our research. As stated in the information sheet, this study aims to revise the Chinese version of a new self-concept scale, the self-compassion scale originally developed by Neff (2003) and test its reliability and discriminant validity.

'**Self-compassion'** can be considered as being kind and being nice to ourselves when we face some bad things, such as bad emotions, failing in the exam, have bad relations with friends. Mostly, we are tending to blame ourselves when bad thing happened, like why other students can get a higher score in exam, why not me? However, self-compassion will provide you an acceptance and open mind to face bad things in daily life, and you will feel that it is okay for them to occur, and we are not alone in experiencing them. More importantly, self-compassion also requests you using a balance way to think about the bad thing and help you to improve yourself. Overall, self-compassion can help you to avoid abandoning yourself into bad emotions and have a better way to think about yourself.

We requested you to finish three scales (beside self-compassion scale), which assessed other aspects of self-concept such as your self-esteem, self-acceptance and self-confidence. We used these self-attitude variables to determine concurrent and discriminant validity. Also, we requested you to re-do self-compassion scale in order to test the retest-reliability.

Contact Details:

If you require further information or would like to ask any questions, please do not hesitate to contact the Principal Researcher. Additionally, if you are concerned about any ethical issues please contact the Chair of Exeter University's Ethics Committee Lisa Leaver (l.a.leaver@exeter.ac.uk).

Appendix for Study 2

CLES – Psychology
Psychology
College of Life and Environmental Sciences
University of Exeter
Washington Singer Building
Perry Road
Exeter
EX4 4QG
Web: www.exeter.ac.uk

CLES – Psychology Ethics Committee

Dear Mengya Zhao

Ethics application - eCLESPsy000574
How do Chinese young adults understand self-compassion

Your project has been reviewed by the CLES – Psychology Ethics Committee and has received a Favourable opinion.

The Committee has made the following comments about your application:

- Please view your application at https://eethics.exeter.ac.uk/CLESPsy/ to see comments in full.
If you have received a Favourable with conditions, Provisional or unfavourable outcome you are required to re-submit for full review and/or confirm that committee comments have been addressed before you begin your research.

If you have any further queries, please contact your Ethics Officer.

Yours sincerely

Date: 20/04/2021

CLES – Psychology Ethics Committee

INFORMATION SHEET FOR COURSE CONVENOR
Title: Understanding of Self-Compassion in Chinese Young Adults

Principal Researcher: Mengya Zhao (Contact number: 07511757501; Email: mz311@exeter.ac.uk)
Supervisor: Dr Anke Karl (Contact number: 01392 725271; Email: a.karl@exeter.ac.uk)

My name is Mengya Zhao. I am a PhD student currently conducting some research on self-compassion in the University of Exeter, UK. I would like to invite you to help me to hand out my research information sheet and opt-out form to your students, however, before you make a decision please read this information sheet carefully. If you have any questions after reading this, please feel free to contact me directly (details above).

Summary of the research: What will the study involve?

This study aims to look at how Chinese young adults understand the concept of self-compassion and getting some qualitive feedback on the self-compassion scale which your students agreed to complete in previous research. Your students will be involved in discussing some questions with another 7 students who are willing to join our focus group interview. This focus group will take around one hour and will involve meeting at one of interview room in the building of the psychology school in Shandong Normal University. During the interview_audio-recording will be used. The study has been reviewed and passed by the University of Exeter Research Ethics Committee.

What should I do?

You are invited to hand out my research participant information sheet and opt-out form to your students in your class. If any students fill in the opt-out form, please return it to me.
Your participation is totally **voluntary**. You are free to withdraw at any time, without giving any reason.

Are there disadvantages of taking part in this study?

Being part of this research will involve your students giving up their time to answer some questions. Your students will be given the opportunity at the end of the task to discuss any difficulties or upsetting feelings and further support contact details will be provided.

Will my students' taking part in the study be kept confidential?

All information which is collected from your students during the research would be kept strictly confidential within the limits of the law. Your students will be allocated his/her own unique study code number, ensuring that all information that your students give will contain the number rather than the actual name. Identifiable information will be stored in a locked cabinet and only the researchers of this project will have access to it. Also, all recording collected from the interview will be stored in N drive which protected by the University of Exeter IT. Only the researcher can access to the N drive. In accordance with Open Access Policy, all data for the study will be securely stored away for 7 years and will be destroyed after this time.

What will happen with the results?

I am aiming to publish the work in an academic journal and upon request I can provide your students with a summary of the results. However, no individual write-up feedback will be given personally.

Who has reviewed this study?

This study has been reviewed and approved by the School of Psychology Ethics Committee, University of Exeter.

Contact Details:

If you are concerned about any ethical issues and any complaints of this study, please contact the Chair of Exeter University's Ethics Committee Lisa Leaver (l.a.leaver@exeter.ac.uk). If you require further information or would

like to ask any questions related to the study, please do not hesitate to contact the Principal Researcher using the details at the beginning.

UNIVERSITY OF EXETER
MOOD DISORDERS CENTRE

Consent Form for Course Convenor

***Title*: Understanding of Self-Compassion in Chinese Young Adults**

Researcher:
Mengya Zhao

Washington Singer Laboratories
Perry Road
Exeter
EX4 4QG
mz311@exeter.ac.uk

Supervisor:
Dr Anke Karl
Mood Disorders Centre
Washington Singer Laboratories
Perry Road
Exeter
EX4 4QG
A.Karl@exeter.ac.uk

Please **read the study information sheet** before completing this form.

1.	I have read and understood the Information Sheet for Participants.	YES/NO
2.	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.	YES/NO
3.	I agree to help to hand out the participants' information sheet and opt-form.	YES/NO

I

Name (please print)
.....
Signature
.....
Date
...../...../.....

Researcher Name
Mengya Zhao
Researcher Signature
.....
Date
...../...../.....

INFORMATION SHEET FOR PARTICIPANT

Title: Understanding of Self-Compassion in Chinese Young Adults

Principal Researcher: Mengya Zhao (Contact number: 07511757501; Email: mz311@exeter.ac.uk)
Supervisor: Dr Anke Karl (Contact number: 01392 725271; Email: a.karl@exeter.ac.uk)

My name is Mengya Zhao. I am a PhD student currently conducting some research on self-compassion in the University of Exeter, UK. You may have kindly participated in my earlier study and now I would like to invite some of you back to take part in a small follow-up study. However, before you make a decision please read this information sheet carefully. If you have any questions after reading this, please feel free to contact me directly (details above).

What is the purpose of the study?

The aim of this study is to get some feedbacks of Self-Compassion Scale. You have attended a study asking you to fill several questionnaires. In particular, you will be asked several questions regarding how you understand the items from the scale.

Summary of the research: What will the study involve?

This study aims to give some feedback on one of the scales you kindly answered a few weeks ago. We ask you to agree to be randomly selected out of a larger student group and if you are chosen to join my research, you will be invited to join one focus group interview session with up to 8 students to discuss some questions about one of the questionnaires. This focus group will take around one hour of your time and will involve meeting myself at one of interview rooms in the building of the psychology school in Shandong Normal University. During the interview, audio-recording will be used. The study has been reviewed and passed by the University of Exeter Research Ethics Committee.

Why have I been chosen?

You have been chosen because you attended a study named *Reliability and validity test of self-compassion scale in Chinese young adults*. Some students in your class who have taken part in the study has been invited to give some feedback on your understanding of the scale and the concept of self-compassion.

Do I have to take part?

This is entirely up to you. If you decide to take part you are still free to end your participation at any time and without giving a reason. A decision to stop at any time, or a decision not to take part, will not affect you.

Expenses and payments:

As a reimbursement for your time and a token of thanks for your support we will pay 10 yuan.

Are there disadvantages of taking part in this study?

Being part of this research will simply involve you giving up your time to answer some questions. When discussing the scale in more detail we will invite participants to bring to mind some previous situations in which they encountered difficulties in accomplishing things or made mistakes (e.g. failing in the exam). Whilst we will not ask you to share exact details of these situations with others, recalling them in your mind may temporarily increase unpleasant feelings. In the unlikely event that these feelings persist until after the interview we advise you to speak to the clinical psychologist to get professional help. We will also play a relaxing video at the end of group discussion to help you relax.

What are the possible advantages of taking part?

There are no direct advantages for you. However, the findings of this study will hopefully help us to understand the self-compassion in the background of Chinese culture. If you take part, we also hope that your will find the experience interesting and enjoyable.

Will my taking part in the study be kept confidential?

All information which is collected from you during the research would be kept strictly confidential within the limits of the law. Some of the things you tell us may be quoted in scientific journals, but it will be anonymous and your name will not be quoted. You will be allocated his/her own unique study code number, ensuring that all information that you give will contain the number rather than your actual name. Identifiable information will be stored in a locked cabinet and only the researchers of this project will have access to it. Also, all recording collected from the interview will be stored on safe password-protected hard drives. Only the researcher can access to the drive. In accordance with Open Access Policy, all data for the study will be securely stored away for 7 years and will be destroyed after this time.

What will happen with the results?

I am aiming to publish the work in an academic journal and upon request I can provide you with a summary of the results. However, no individual write-up feedback will be given personally.

Who has reviewed this study?

This study has been reviewed and approved by the School of Psychology Ethics Committee, University of Exeter.

Contact Details:

If you are concerned about any ethical issues and any complaints of this study, please contact the Chair of Exeter University's Ethics Committee Lisa Leaver (l.a.leaver@exeter.ac.uk). If you require further information or would like to ask any questions related to the study, please do not hesitate to contact the Principal Researcher using the details at the beginning.

UNIVERSITY OF EXETER
MOOD DISORDERS CENTRE

OPT-OUT FORM

Title: Understanding of Self-Compassion in Chinese Young Adults

Researcher:
Mengya Zhao

Washington Singer Laboratories
Perry Road
Exeter
EX4 4QG
mz311@exeter.ac.uk

Supervisor:
Dr Anke Karl
Mood Disorders Centre
Washington Singer Laboratories
Perry Road
Exeter
EX4 4QG
A.Karl@exeter.ac.uk

Please **read the study information sheet** before completing this form. Please return it to your lecturer before ending the class.

1.	I have read and understood the Information Sheet for Participants.	YES/NO
2.	I would not like to be contacted in the future to take part in the study.	YES/NO

Name (please print)
.....
Signature
.....
Date
...../...../.....

Researcher Name
Mengya Zhao
Researcher Signature
.....
Date
...../...../.....

UNIVERSITY OF EXETER
MOOD DISORDERS CENTRE

Consent Form

***Title*: Understanding of Self-Compassion in Chinese Young Adults**

Researcher:
Mengya Zhao

Washington Singer Laboratories
Perry Road
Exeter
EX4 4QG
mz311@exeter.ac.uk

Supervisor:
Dr Anke Karl
Mood Disorders Centre
Washington Singer Laboratories
Perry Road
Exeter
EX4 4QG
A.Karl@exeter.ac.uk

Please **read the study information sheet** before completing this form.

1.	I have read and understood the Information Sheet for Participants.	YES/NO
2.	I understand that my participation is voluntary and that we are free to withdraw at any time, without giving any reason.	YES/NO
3.	I understand that the school and my identities will not be revealed in any publication.	YES/NO
4.	I understood that all information collected during the course of the study will be kept strictly confidential.	YES/NO
5.	I agree to the audio-recording of the interview.	YES/NO
6.	I agree to take part in the above study.	YES/NO

Name (please print)
.....
Signature
.....
Date
...../...../.....

Researcher Name
Mengya Zhao
Researcher Signature
.....
Date
...../...../.....

Interview schedule

Participant Focus Group Schedule

Participants arrive:
They are asked to complete all consent documentation
Introduction
"Thank you for coming today.
We intend to record the conversation so that it can be later written down and studied. Your answers and ideas will be the main part of our study. Anything you say here will be held in strict confidence; we won't be telling people outside this room who said what. When you have something to say, please repeat your name each time. When we are listening to the tape again we will not be able to see who is speaking, and we'll need to be able to relate comments you made at different times. Some of the things you have said may be quoted in scientific journals, but it will be anonymous and your name will not be quoted.

First, we should introduce ourselves.

My name is Mengya Zhao and I am the current PhD student in the University of Exeter. Would you like to briefly tell us your name and something about yourself?

Thank you.

Focus group statement and questions:

Preamble:
Take a few moments to think about something important to you but you failed or did not do as well as you had expected in the past, try to remember what was going through your mind and what your 'inner voice' was saying. Discuss…

Q1. What do you think about the following statement "When I fail something important, I give myself the caring I need?"

Q2 What do you think about the following statement "When I fail something important, I try to remind myself that failures are shared by most people"?

Q3 What do you think about the following statement "When I fail something important, I try to keep my emotions in Balance"?

Q4 What do you think about the following statement "When I fail something important, I am critical about myself, like dislike my own flaws and inadequacies?"

Q5 What do you think about the following statement "When I fail something important, I tend to feel that I am the only person that ever fails at anything or gets anything wrong"?

Q6 What do you think about the following statement “When I fail something important, I tend to obsess and fixate on everything that is wrong”.

Is there anything else you would like to add about dealing with the failure?

To Close

So in summary we have said: … Did I summarize your thoughts correctly? Is there anything you would like to add?

Thank you very much your help with this. If you would like a copy of the report on this project you can send email to me.

Is there anything you would like to ask?

Thank you again. Your contribution is important and will help us all to understand how Chinese young adults understand self-compassion. Again, even at this point, you are still able to withdraw what you told us if you wish…

Given that we discuss about failure, something unpleasant, now I am going to play a video to relax ourselves.

THANK YOU EVERYONE FOR ATTENDING.

DEBRIEFING SHEET

Title: Understanding of Self-Compassion in Chinese Young Adults

Principal Researcher: Mengya Zhao mz311@exeter.ac.uk 07511757501
Supervisor: Dr Anke Karl

Thank you for participating in this study – your time and effort is very much appreciated! You can read this sheet to learn more about our research.

You have taken part in a focus group discussion which investigates how you think about self-compassion scale and how you understand self-compassion.
You were presented with a list of questions on self-compassion to discuss.

Whilst it was important to establish your personal experience and understanding of self-compassion, the similarities and differences you shared with other group members was equally valuable. At the end of the discussion/interview you were provided with the opportunity to ask questions, if you found anything distressing.

There are two main reasons why we are conducting the study:

The first reason for carrying out this study is to investigate the quality of self-compassion scale (Chinese version)
The second reason for carrying out this study is to see how Chinese young adults understand self-compassion itself.

During the discussion you may have temporarily experienced unpleasant memories and feelings. This is normal given that we invited you to recall a situation where you encountered difficulties and did not perform as well as you would have liked to. These unpleasant feelings are usually going away within a few minutes. In the unlikely event that these unpleasant feelings persist for longer until after the focus group, we advise you to seek for the professional help and talk to the counsellor or the psycgologist in the hospital.

The results of this study will not include your name or any other identifying characteristics and a summary of the findings can be sent to you, if you so wish. To receive this, please leave your name and contact details with the facilitator, who will forward it to you on completion of the study.

Contact Details:

If you require further information or would like to ask any questions, please do not hesitate to contact the Principal Researcher. Additionally, if you are concerned about any ethical issues please contact the Chair of Exeter University's Ethics Committee Lisa Leaver (l.a.leaver@exeter.ac.uk).

Appendix for Study 3

CLES – Psychology
Psychology
College of Life and Environmental Sciences
University of Exeter
Washington Singer Building
Perry Road
Exeter
EX4 4QG
Web: www.exeter.ac.uk

CLES – Psychology Ethics Committee

Dear Mengya Zhao

Ethics application - eCLESPsy000309
Exploring the association between parenting, self-compassion, friendship and mental health in adolescents

Your project has been reviewed by the CLES – Psychology Ethics Committee and has received a Favourable opinion.

The Committee has made the following comments about your application:
Nick Moberly commented, MZ: 'Please see the file attached. There are two way to get consent form. One is via online, I will create the qualtrics page for the consent form. The other one is that teacher hand out the consent form to chi ld and let child bring back to parent and then return.'

- Please view your application at https://eethics.exeter.ac.uk/CLESPsy/ to see comments in full.
If you have received a Favourable with conditions, Provisional or unfavourable outcome you are required to re-submit for full review and/or confirm that committee comments have been addressed before you begin your research.

If you have any further queries, please contact your Ethics Officer.

Yours sincerely

Date: 20/04/2021

CLES – Psychology Ethics Committee

CLES – Psychology
Psychology
College of Life and Environmental Sciences
University of Exeter
Washington Singer Building
Perry Road
Exeter
EX4 4QG
Web: www.exeter.ac.uk

CLES – Psychology Ethics Committee

Dear Mengya Zhao

Ethics application - eCLESPsy000563
Exploring the association between parenting behaviour, self-compassion, friendship, and mental health in Chinese adolescents

Your project has been reviewed by the CLES – Psychology Ethics Committee and has received a Favourable opinion.

The Committee has made the following comments about your application:
Heather O Mahen commented, This all looks good. I can only assume the informed consent and debriefing forms are okay - becau they are in Mandarin! Could you send English versions through as well please?

- Please view your application at https://eethics.exeter.ac.uk/CLESPsy/ to see comments in full.
If you have received a Favourable with conditions, Provisional or unfavourable outcome you are required to re-submit for full review and/or confirm that committee comments have been addressed before you begin your research.

If you have any further queries, please contact your Ethics Officer.

Yours sincerely

Date: 20/04/2021

CLES – Psychology Ethics Committee

Appendix for Study 4

CLES – Psychology
Psychology
College of Life and Environmental Sciences
University of Exeter
Washington Singer Building
Perry Road
Exeter
EX4 4QG
Web: www.exeter.ac.uk

CLES – Psychology Ethics Committee

Dear Mengya Zhao

Ethics application - eCLESPsy001234
The longitudinal association between parenting practice, self-concept, peer relations and depression in adolescence: Secondary data analy

Your project has been reviewed by the CLES – Psychology Ethics Committee and has received a Favourable opinion.

The Committee has made the following comments about your application:

- Please view your application at https://eethics.exeter.ac.uk/CLESPsy/ to see comments in full.
If you have received a Favourable with conditions, Provisional or unfavourable outcome you are required to re-submit for full review and/or confirm that committee comments have been addressed before you begin your research.

If you have any further queries, please contact your Ethics Officer.

Yours sincerely

Date: 20/04/2021

CLES – Psychology Ethics Committee