A self-compassion intervention for healthy adolescents: Can it enhance self-compassion and reduce social comparison?

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Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Overview

This thesis is concerned with adolescent mental health and wellbeing. It is presented in three parts.

Part One: Literature Review. A systematic review of 20 studies, both cross-sectional and longitudinal, that investigated the relationship between school-related stress and depressive symptoms in adolescents. Significant positive relationships were found between school-related stress and depressive symptoms; however, the causal direction of this relationship is questionable as most studies were cross-sectional. Additionally, a number of studies found effects of moderating and mediating factors, such as gender. Further high-quality, longitudinal studies need to be conducted to assess the strength and direction of this relationship.

Part Two: Empirical Paper. This consisted of an exploratory randomised control study to investigate the effectiveness of a three session self-compassion psychoeducation group with an imagery task, compared to a psychoeducation group alone or control group. It was conducted as a joint project with another UCL Clinical Psychology Doctorate student (Tweed, 2019). Improvements in self-compassion and social comparison were found in the psychoeducation group, but not the psychoeducation and imagery group. Within the imagery group there was evidence that the greater the ability of the participants to vividly imagine the imagery task, the greater the improvements they experienced. Acceptability feedback of the intervention sessions was positive, although there were questions regarding the acceptability of inter-session tasks.

Part Three: Critical Appraisal. A reflection and appraisal focused on the empirical paper. This includes methodological and practical issues encountered during the study alongside consideration of wider issues relating to school-based research.

Impact Statement

This thesis consists of a systematic review and empirical paper which have potential implications to guide future school-based research into adolescent wellbeing. Furthermore, they have implications outside academia with regards to supporting and promoting adolescent mental health in schools.

With regards to utility within academia, the systematic review explored the nature of the relationship between school-related stress and depressive symptoms in adolescents. The findings of this review highlighted the dearth of research in this area within the UK and the need for further research to investigate the impact of school-related stress on the wellbeing of adolescents in the British education system. Due to differences in education systems across countries, findings from international studies may not be applicable to UK school systems. This review also emphasised the need for greater methodological rigour within this field and further longitudinal research to draw stronger conclusions regarding the direction and strength of the relationship between school-related stress and depressive symptoms. The aim is to publish these findings in a peer-reviewed journal to aid dissemination to a wider academic audience.

The empirical paper from this thesis investigated the effectiveness and acceptability of a brief self-compassion psychoeducation intervention with an imagery task compared to the psychoeducation intervention alone or control group. The study aimed to explore the impact of the intervention on self-compassion and negative social comparison in healthy adolescents. Through this study the researchers identified various issues with conducting school-based research, and it is hoped that highlighting these may aid other novice researchers aiming to recruit adolescent participants through schools. This thesis will be made available to other researchers through UCL Discovery.

Additionally, this thesis has the potential to be useful beyond the academic setting. Evidence from the systematic review that school-related stress and depressive symptoms are related could lead to schools revising within-school systems that may increase academic pressure on adolescents. Furthermore, the review identified potential protective and risk factors to this relationship, which could provide a focus for clinicians working with adolescents who are experiencing high levels of school-related stress. Alternatively, schools may want to implement universal interventions that focus on some of these factors as a preventative measure.

The findings from the empirical paper suggest that universal self-compassion-based interventions could be useful for adolescents, improving their self-compassion and reducing negative social comparison. The important aspect of the intervention appeared to be the psychoeducative element and such sessions appear to be acceptable to adolescents. The one-hour session structure means that the intervention would be feasible to be delivered within a school environment. To encourage the sustainability of the intervention within the three schools where the study was conducted the materials used were made available to them following data analysis. A major success of this project with regards to impact is that two of the schools have plans to utilise the intervention materials as part of their PSHE programme going forwards. This was following staff receiving very positive feedback from participants in the intervention groups and researchers sending a summary of the findings.

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Part One: Literature Review

Exploring the relationship between school-related stress and depressive symptoms in adolescents

Abstract

Aims: There has been increasing concern in recent years about an adolescent mental health crisis. A number of causal factors have been suggested, one being school-related stress (SRS). This review aimed to explore the nature of the relationship between SRS and depressive symptoms in secondary school-age adolescents and assess the quality of these studies.

Method: A systematic review and narrative synthesis were conducted for studies investigating the relationship between SRS and depressive symptoms. PsycINFO, ERIC and Web of Science were searched from years 2000 to 2018 and reference searches were also conducted, resulting in 343 citations.

Results: Twenty studies from 19 papers met inclusion criteria, containing both cross-sectional and longitudinal designs. The studies varied in their quality with sampling appearing a relative strength, but a number of studies lacking sufficient consideration of extraneous variables to draw strong conclusions. All studies found a positive relationship between increased SRS and depressive symptoms; however, the causal direction of this relationship is questionable as most studies were cross-sectional. A number of studies found effects of moderating and mediating factors and there was some evidence that the relationship may also be affected by gender and education system.

Conclusions: This review suggests that there is a positive relationship between increased SRS and depressive symptoms. However, the direction and strength of this relationship is questionable due to reliance on cross-sectional studies and evidence that there are a wide range of other factors that may also have an effect. Thus, further longitudinal research with greater methodological rigour needs to be conducted to strengthen conclusions.

1. Introduction

Young people's mental health in Britain has become a focus in recent years, with reports of "adolescent mental health in crisis" (Gunnell, Kidger, & Elvidge, 2018) and stories of increased rates of self-harm, suicide, anxiety and depression being frequently reported in the national press (Badshah, 2018; Bulman, 2018; Campbell, 2018).

The prevalence of specific mental health conditions amongst young people in the UK is not measured regularly (Hagell, Coleman, & Brooks, 2015). However, the recent NHS Digital Survey (Sadler et al., 2018) found that around 9% of 11 to 16 year olds were experiencing an emotional disorder, and this was more common in females than males (10.9% compared to 7.1%). These findings are supported by a report from the Millennium Cohort Study (Patalay & Fitzsimons, 2017), which found that at age 14 almost one in every four females (24%) and one in ten males (9%) reported high levels of depressive symptoms. The report suggests that in this cohort of young people born in 2000 and 2001 this equates to around 67,000 males and 166,000 females nationally. Combined with this are indications that such emotional difficulties are increasing. The NHS Digital study (Sadler et al., 2018) found that across development (from 5 to 15 years old) emotional disorders have become more common, with an increase from 3.9% in 2004 to 5.8% in 2017. This was in contrast to behavioural and hyperactivity disorders which have remained broadly stable since 2004. Other studies have found that this increase is particularly noticeable amongst young females (Bor, Dean, Najman, & Hayatbakhsh, 2014; Fink et al., 2015). This increasing trend appears to be common across developed countries, with global studies finding the burden of mental health difficulties, particularly anxiety and depression, has increased from 1990 to 2010, with the largest increase typically in adolescents and young adults (Bor et al., 2014; Murray et al., 2012).

With depressive symptoms, such as feeling down, sad or worthless and social withdrawal, being amongst the most prevalent symptoms reported amongst children and adolescents (Fergusson, Horwood, Ridder, & Beautrais, 2005) the current review will focus on this indicator of mental health.

The increase in mental health issues amongst young people is particularly concerning given reports that 79% of Child and Adolescent Mental Health Services (CAMHS) are imposing restrictions or thresholds on referrals (Children's Commissioner for England, 2016). Furthermore, the long-term negative impact of adolescent mental health difficulties on educational attainment, adult mental and physical health, employment and life satisfaction are well researched (Fletcher, 2010; Patel, Flisher, Hetrick, & McGorry, 2007; Roza, Hofstra, van der Ende, & Verhulst, 2003). This highlights the need to not only provide timely intervention for adolescents with mental health issues but also the need to better understand the underlying risk and precipitating factors relating to young people's mental health.

The current generation of young people face a wide range of new pressures and challenges. Today's youth have grown up experiencing the effects of the 2008 Great Recession such as increased income inequality, unemployment and the impact of governmental "austerity measures". This may affect young people's family situation, their future job prospects and their ability to access mental health services. For example over one in five trusts either froze or cut their CAMHS budgets every year between 2010 and 2015 (Young Minds, 2016). Today's young people are also experiencing greater social pressures, including the surge in popularity of, and access to, social media, which has been linked with mental health issues in young people (McCrae, Gettings, & Purssell, 2017; Nesi & Prinstein, 2015) and changing cultural expectations, such as the increasing sexualisation of young people, particularly females, which has also been found to have a negative impact on young people's mental health (Bailey, 2011). Finally, there has been a change in the school climate in recent years. An increased emphasis on educational outcomes

and accountability (Hutchings, 2015) and less focus and provision for young people's mental health and wellbeing (Young Minds, 2017) would understandably impact on young people. A heavy focus on high-stakes testing can lead to increased stress and burnout in young people (Denscombe, 2000; McDonald, 2001; Salmela-Aro & Tynkkynen, 2012) and has been linked with poor mental health outcomes, particularly for females (Suldo, Shaunessy, & Hardesty, 2008; West & Sweeting, 2003).

1.1. Focus of this review

These many factors are too wide reaching to be considered within the scope of this systematic review, thus the focus will be on school-related stress (SRS). Stress is commonly defined as the feelings experienced when a person perceives the demands of a situation to exceed their internal and external resources for coping (Lazarus & Folkman, 1984). Thus SRS can be thought of as when students perceive their academic demands to exceed their coping abilities. SRS is a broad concept that encompasses various sources of stress linked to education. There is widespread agreement within the literature that SRS incorporates academic stress. This includes stress that results from workload, self-expectations of performance and finding curricula challenging (Ang & Huan, 2006a; Byrne, Davenport, & Mazanov, 2007; Helms & Gable, 1989; Li, Shang, Wang, & Siegrist, 2010; Liu & Lu, 2012; Murberg & Bru, 2004; Robinson, Garber, & Hilsman, 1995; Thai, 2010; Yoo & Min, 1998). There is also broad consensus that teachers can be perceived as a source of stress due to their expectations of student performance, their interactions with students and the limits they place on students' freedom (Ang & Huan, 2006a; Byrne, et al., 2007; Gonzales, Gunnoe, Samaniego, & Jackson, 1995; Helms & Gable, 1989; Robinson, et al., 1995; Rudolph, Kurlakowsky, & Conley, 2001). Other aspects incorporated in some models of SRS are related to the school itself, such as environment (for example school being very large and noisy) or schedule (for

example conflict between school demands and leisure time or compulsory attendance) (Robinson, et al., 1995; Byrne, et al., 2007; Yoo & Min, 1998). There is less agreement as to whether peers should be incorporated as a source of SRS with few SRS measures including stress from peer interactions (Helms & Gable, 1989; Robinson, et al., 1995). School burnout is a related concept that refers specifically to exhaustion due to school demands, cynicism and detached attitude towards school and feelings of inadequacy as a student (Salmela-Aro, Kiuru, Pietikäinen, & Jokela, 2008). It can be seen as a result of declining energy resources in the context of increasing school demands (Salmela-Aro & Tynkkynen, 2012). There is debate in the literature around how distinct burnout is from depression. The concepts certainly share similar characteristics, as can be seen when comparing symptoms of burnout (Salmela-Aro, et al., 2008) and depression (Beck, Steer & Brown, 1996). Exhaustion is similar to the fatigue experienced in depression; sense of detachment could be considered analogous to the social withdrawal experienced in depression and feelings of inadequacy could be thought to mirror the sense of failure often experienced when depressed. However, there are also significant conceptual differences. Burnout is a social construct experienced as a result of interpersonal and organisational structures. In contrast, depression reflects personal distress, which may impact on interpersonal or organisational functioning, but embodies an individual's particular cognitions and affect (Leiter & Durup, 1994). Confirmatory factor analysis has been found to support the idea that depression and burnout are distinct concepts (Leiter & Durup, 1994).

Across education systems worldwide, as adolescents progress through their schooling, there are increased academic demands and more formal classroom settings. The OECD has found that the pressure to get higher marks and concerns about receiving poor grades are often the most common sources of stress reported by school-age adolescents (OECD, 2017). Despite this, authors, such as Hagell

(2012) argue that there is very little robust data on the long-term consequences of school stress.

1.2. Previous reviews

There are limited previous relevant reviews conducted in this field. One previous systematic review by Kidger, Araya, Donovan and Gunnell (2012) investigated the effect of the school environment on the emotional wellbeing of adolescents. The researchers were interested in whether interventions aiming to improve the school environment had an effect on the emotional health of adolescents and whether there was evidence of an association between school environment and adolescent emotional health. They focused on randomised control trials (RCTs) and cohort studies as they wanted to be able to establish the direction of any causal relationships. They identified 30 papers which reported 23 cohort studies and nine papers which reported five RCTs. Two non-RCTs found some evidence that a supportive school environment improved student emotional health, whilst three RCTs did not. Only six of the papers provided analysis of the impact of school-level factors and none of these found any effect. Findings from the review suggested that school connectedness and teacher support predicted emotional health, however methodological shortcomings across the papers were common.

A more recent review by Walburg (2014) identified and reviewed sixteen studies related to school-related burnout and academic stress among high school students. Seven of the studies were cross-sectional, six longitudinal, and three were testing the validity of measures for, or goodness of fit of models of, school burnout. The review highlighted risk factors for burnout, such as being female, negative school climate, poor family relationships and being on an academic rather than vocational track. The review also highlighted consequences of burnout in this population, including school dropout, academic underperformance and mental

health implications of higher somatic and depressive symptoms. However, little attention was paid to the quality of the studies reported.

1.3. Current review

This review aims to specifically explore the nature of the relationship between SRS and depressive symptoms in secondary school-age adolescents. In addition to this, and extending Walburg's (2014) review, it aims to comment on the quality of the studies and therefore the strength of the conclusions drawn from this body of literature.

2. Method

2.1. Search strategy

The literature was systematically searched to identify published papers, written in English, which looked at the relationship between SRS and depression in adolescents. The electronic databases PsycINFO, ERIC and Web of Science were searched up until 27th July 2018. Studies published before 2000 were excluded to ensure that only studies relating to contemporary education systems were included. This is illustrated by significant reforms in various education systems, such as the introduction of more exams in England by splitting A-Levels into AS and A-Levels in 2000 (QCA, 1999); reforms in Norway in 1994 and 1997 increasing the length of compulsory education and providing all adolescents with a right to a three years of upper secondary education, either vocational or academic (OECD, 1998); and broadening of the curriculum in Singapore from 1997 and decentralising accountability structures (OECD, 2011). Each database was searched using three groups of search terms (see Table 1), which were linked by the 'AND' function to enable identification of papers containing all three group aspects. The search terms

within each group were linked by the 'OR' function to enable the identification of papers containing any of the terms in each group. Both thesaurus and text word searches were carried out on PsycINFO and ERIC, where this feature is available. In addition to electronic searches, backward handsearching for relevant papers was conducted by searching the references of the final papers included in the review.

Table 1. *Search terms used*

School-based stress	Depression	Adolescents
Academic stress	Depress*	Secondary school student*
Academic pressure		High school student*
School pressure		Middle school student*
School stress		Junior high school student*
School-related stress		Adolescen*
Exam pressure		Youth
Exam stress		Teen*
School demands		
High stakes exam*		
School exam*		
Academic burnout		
School burnout		

*indicates terms that were truncated to allow for multiple endings of the word

2.2. Inclusion and exclusion criteria

Studies were included in the review if they met the requirements of the following inclusion and exclusion criteria.

2.2.1. Inclusion criteria

- Published in English
- Published in a peer reviewed journal
- Reported data from adolescents (aged 11-18 years old) in secondary education or equivalent (e.g. middle or high school)
- Included a measure of depressive symptoms as an outcome
- Included a measure of school-based stress (including school burnout)
- Investigated the relationship between these two variables

2.2.2. Exclusion criteria

- Studies collecting only qualitative data

2.3. Study selection

A detailed summary of the study selection process is outlined in Figure 1. Searching the relevant electronic databases produced an initial list of 343 papers, which once duplicates were removed, left 270 unique citations. These titles and/or abstracts were read to assess their relevance to the review. This resulted in 33 potential papers being retained. Following this, the full-text was obtained for these papers, one paper was unobtainable and so excluded. The remaining 32 full papers were assessed against the inclusion and exclusion criteria. Five papers were excluded for not having a specific measure of depressive symptoms; two papers were excluded due to the analysis in the paper having an insufficient focus on SRS; and eight papers were excluded as they did not specifically look at SRS as a predictor of depression. These studies often looked at depression or SRS as mediators or predictors for other unrelated factors, such as school achievement. Following this, 17 papers remained to be included in the review. Two further papers were found

through handsearching of the reference lists of the included papers. This gave a final total of 19 papers to be included in the literature review.

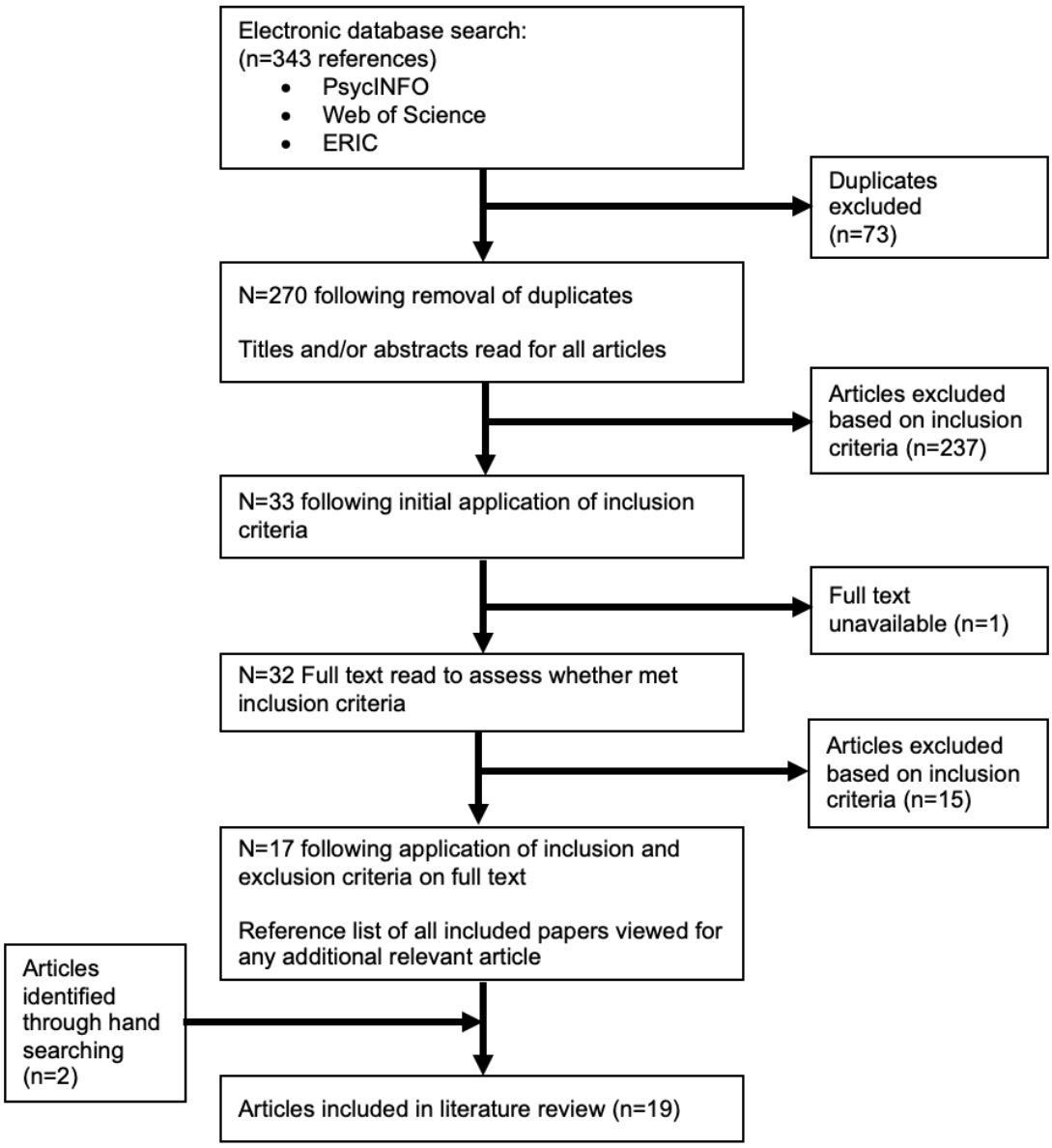

Figure 1. The process of selecting studies for the review

3. Results

3.1. Quality appraisal

There are numerous quality appraisal tools available to use in systematic reviews, but few that are applicable to both cross-sectional and longitudinal studies. The Newcastle-Ottawa Scale (NOS; Wells et al., 2000) was selected as it was developed for assessing the quality of non-randomised studies and has been adapted for use with cross-sectional and cohort studies.

The NOS offers a star rating system based on participant selection, comparability and outcome measurement. The original scales for cross-sectional and cohort studies have been adapted to assess the studies specific to this review (see Appendix A). In this adapted NOS questions considered not be relevant to the current review were removed. Additionally, questions relating to sample size and non-respondents (as used in the cross-sectional NOS) were included for cohort studies due to the use of self-report measures across the studies. Finally, the NOS requires the reviewer to decide acceptable response and attrition rate cut offs. For this review 80% and 25%, respectively, were agreed.

A rating system, based on the original NOS scoring system, for the quality of studies was devised for cross-sectional and longitudinal studies included in the review.

3.1.1. Cross-sectional studies

The adapted NOS assessed three aspects of the studies, selection, comparability and outcome. Selection (scoring up to nine stars) graded the studies on the representativeness of the sample, sample size, response rate and quality of tools used to assess SRS and depression. Studies could be awarded one star for each aspect of selection, that is, representativeness, sample size and adequate response rate (more than 80%) and up to two stars for each measurement tool used (two

stars for validated measures, one star for non-validated measures that are adequately described for replication). Comparability (scoring up to two stars) assessed studies on their attempts to control for confounding variables and up to two stars could be awarded if more than one potential confound was considered. Finally, in the cross-sectional studies, outcome (scoring up to three stars) graded the studies on their statistical analysis and methods used to account for missing data. Studies were awarded one star for appropriate use and reporting of statistical tests. Finally, they could be awarded up to two stars for providing details on the amount of missing data and methods used to account for this, one star if they only provided one of these aspects or no stars if missing data was not referred to. For cross-sectional studies the adapted NOS scoring system required good quality studies to score five stars or above for selection, as well as, one or two stars for comparability and two or three stars for outcome. Fair quality studies needed to score three or four stars for selection along with one or two stars for comparability and two or three stars for outcome. Poor quality studies scored less than four stars for selection or no stars for comparability or zero to one star for outcome. Based on this rating system four of the thirteen cross-sectional studies were classified as good quality, three as fair and six as poor (see Table 2).

Table 2. *Quality appraisal of cross-sectional studies in the review based on the NOS*

Authors	Selection (/9)	Comparability (/2)	Outcome (/3)	Overall Rating
Ang & Huan (2006)	★★★★★★★☆☆	☆☆	★☆☆	
Chen, Chou, Tzeng, Chang, Kuo, Pan, Yeh, Yeh & Mao (2015)	★★★★★☆☆☆☆	☆☆	★☆☆	
Deardorff, Gonzales & Sandler (2003)	★★★★★★★★☆	★☆	★★☆	
Feurer & Andrews (2009)	★★★★☆☆☆☆☆	★★	★☆☆	
Guo, Yang, Cao, Li & Siegrist (2014)	★★★★★★★☆☆	★★	★★☆	
Jayanthi, Thirunavukarasu & Rajkumar (2015)	★★★☆☆☆☆☆☆	☆☆	★☆☆	
Liu & Lu (2012)	★★★★★☆☆☆☆	★☆	★★★	
Moksnes, Espnes & Haugan (2014)	★★★★★★☆☆☆	★☆	★☆☆	
Moksnes, Lohre, Lillefjell, Byrne & Haugan (2016)	★★★★★☆☆☆☆	★☆	★☆☆	
Nguyen, Dedding, Pham, Wright & Bunders (2013)	★★★★★★☆☆☆	☆☆	★★★	
Park & Chung (2014)	★★★☆☆☆☆☆☆	☆☆	★☆☆	
Sund, Larsson & Wichstrom (2003)	★★★★★★☆☆☆	★☆	★★★	
Zhang, Li, Gong & Ungar (2013)	★★★★★☆☆☆☆	☆☆	★☆☆	

Note-  = Poor quality study;  = fair quality study;  = good quality study

3.1.1.1. Selection

A relative strength of the cross-sectional studies was the large sample sizes the studies obtained. Most randomly selected either the schools or the participants, or had included an entire target population through including all students within a

number of schools or year groups. Two lower scoring studies (Jayanthi, Thirunavukarasu, & Rajkumar, 2015; Park & Chung, 2014) did not provide details of the selection method used, whilst Feurer and Andrews' (2009) study and Ang and Huan's (2006b) used convenience sampling within only one school.

Chen et al. (2015) was the only study not to use self-report measures to assess SRS. They classified their Taiwanese participants into groups of differing stress levels depending on their school grade and thus their proximity to the college entrance exam (presumed to be a source of stress) taken in Grade 3. They generated four groups: Grade 1 (furthest from taking the entrance exam), Grade 2, Grade 3T (closest to taking the entrance exam) and Grade 3S (entrance exam already successfully taken). Although this may be a more objective method to operationalise SRS, it is impossible to know whether all participants would have perceived the exam to be stressful. The remaining studies provided descriptions of the stress measure used, with the highest scoring studies using validated and reliable measures and reporting relevant data on these (Ang & Huan, 2006; Deardorff, Gonzales, & Sandler, 2003; Feurer & Andrews, 2009; Guo, Yang, Cao, Li, & Siegrist, 2014; Nguyen, Dedding, Pham, Wright, & Bunders, 2013).

All the cross-sectional studies in this review used self-report measures to assess depressive symptoms and again, the lower scoring studies provided little or no description of the measure used, whilst higher scoring studies referred to well-validated and reliable measures, suitable for the culture the study was conducted in. Only one study (Jayanthi et al., 2015) used additional methods to verify the self-reported symptoms of depression. Participants who scored within the clinical range for depression following a screening tool were assessed by a psychiatrist to confirm clinically significant levels of depression. The remaining participants became the control group and were only assessed through self-report data. The lack of verification of levels of depression in other studies may be due to the inclusion of

large non-clinical samples where interest was in the presence of depressive symptoms rather than clinical levels of depression.

As all the studies used at least one self-report measure, response rate is an important factor to consider in assessing the quality of these studies. A low response rate could significantly impact on the representativeness of the sample. Unfortunately, response rate was a noticeable limitation of the selection section of the appraisal, with six of the 13 studies not reporting a response rate (Ang & Huan, 2006b; Feurer & Andrews, 2009; Jayanthi et al., 2015; Liu & Lu, 2012; Park & Chung, 2014; Zhang, Li, Gong, & Ungar, 2013) and two studies obtaining a low response rate (less than 80%). Nguyen et al. (2013) obtained a response rate of only 33% and Moksnes, Lohre, Lillefjell, Byrne and Haugan (2016) obtained 67%. Even of the five studies that reported acceptable response rates, only Sund, Larsson, and Wichstrom (2003) compared the non-responder and responder groups to review if and how the groups differed.

3.1.1.2. Comparability

This was the weakest section of the appraisal. It is important for cross-sectional studies to consider and attempt to control extraneous variables that may impact on depressive symptoms to enhance the validity of the studies. However, only two studies scored highly on this section (Feurer & Andrews, 2009; Guo et al., 2014), and six studies provided no details of attempts to control for other possible variables. Jayanthi et al. (2015) identified a number of potential confounding variables (including gender, type of school and age) but provided no attempts in statistical analysis to control for these. The strongest studies used statistical methods to control for other potential variables affecting depressive symptoms. Guo et al. (2014) controlled for factors thought to be associated with the school environment and depressive symptoms, as well as including age and gender as covariates. Feurer and Andrews (2009) ensured their analysis included gender and

age as possible confounding variables. The remaining studies attempted to control for one other factor in their analysis, including ethnicity (Deardorff et al., 2003), class group (Liu & Lu, 2012), age (Moksnes, Espnes and Haugan, 2014) and gender (Sund et al., 2003). This variety of factors highlights the number of potential variables that could influence the relationship between SRS and depressive symptoms. Thus, so few of the studies considering the impact of no more than one factor raises questions about the validity of these findings.

3.1.1.3. Outcome

There was good reporting of statistical tests across studies, apart from Guo et al. (2014) where it was not always clear what analysis had been conducted and there was inconsistent reporting of significance levels.

Reporting of missing data, which is important due to the use of self-report measures in the studies, and how this was managed was inconsistent. Eight studies did not provide any information on missing data, which may lead us to question whether their findings are based on sufficient data. Only three studies provided information on how much data was missing and how they accounted for this in their analysis (Guo et al., 2014; Liu & Lu, 2012; Sund et al., 2003). These studies reported low levels of missing data and managed this either through excluding the participants from analysis (Guo et al., 2014; Sund et al., 2003) or through statistical means (Liu & Lu, 2012). The remaining two studies either explained how missing data was managed in analysis but did not state how much data was missing (Deardorff et al., 2003) or provided unclear descriptions about the amount of missing data (Nguyen et al., 2013).

3.1.2. Longitudinal studies

For longitudinal studies the adapted NOS assessed the same three aspects as for the cross-sectional studies: selection, comparability and outcome. The criteria for selection (up to nine stars) and comparability (up to two stars) were identical to those used to assess the cross-sectional studies. Within the assessment of outcome (out of five stars), in addition to grading the statistical test used and how missing data was accounted for, the longitudinal studies were also assessed on length of follow-up and adequacy of follow-up. Studies were allocated one star for follow-up occurring at least three months after baseline assessments and an additional star for no or minimal participant attrition (less than 25%). For longitudinal studies the adapted NOS scoring system required good quality studies to score five or more stars for selection, as well as, one or two stars for comparability and four or five stars for outcome. Fair quality studies needed to score three to four stars for selection along with one or two stars for comparability and three or four stars for outcome. Poor quality studies scored less than three stars for selection or no stars for comparability or zero to two stars for outcome. Based on this rating system two of the seven longitudinal studies were classified as good quality, four as fair quality and one as poor quality (see Table 3).

Table 3. *Quality appraisal of longitudinal studies in the review based on the NOS*

Authors	Selection (/9)	Comparability (/2)	Outcome (/5)	Overall Rating
Murberg & Bru (2005)	★★★★★★☆☆☆	★★	★★★☆☆	
Rudolph, Lambert, Clark & Kurlakowsky (2001)	★★★★★★★☆☆	★☆	★★★☆☆	
Salmela-Aro, Savolainen & Holopainen (2009) STUDY 1	★★★★★☆☆☆☆	★☆	★★★★☆	
Salmela-Aro, Savolainen & Holopainen (2009) STUDY 2	★★★★★☆☆☆☆	★☆	★★★☆☆	
Salmela-Aro & Upadyaya (2014)	★★★★★☆☆☆☆	☆☆	★★★☆☆	
Undheim & Sund (2005)	★★★★★★★☆☆	★★	★★★★★	
Wang, Chow, Hofkens & Salmela-Aro (2015)	★★★☆☆☆☆☆☆	★★	★★★★☆	

Note-  = Poor quality study;  = fair quality study;  = good quality study

3.1.2.1. Selection

As with the cross-sectional studies most studies scored highly in this section, with the exception of Wang, Chow, Hofkens, & Salmela-Aro (2015). All but this study provided details of their sampling method, using random sampling or including the total population of students from a variety of schools. All the studies recruited large samples of over 300 participants increasing the likely representativeness of the samples.

All of the studies used self-report measures to assess depressive symptoms and SRS. They all scored reasonably as they described the measure used, however few provided information on their validity and reliability. This meant that only

Undheim and Sund (2005) and Rudolph, Lambert, Clark and Kurlakowsky (2001) scored maximum stars for the measures used, and this was only for the depression scale. Both studies failed to report validity and reliability data for their SRS measure.

Response rates were reported by all but one study (Wang et al., 2015). Only one study (Salmela-Aro & Upadyaya, 2014) reported an unacceptable response rate (less than 80%), as they had a response rate of 65% from one of the nine schools in the study.

3.1.2.2. Comparability

These longitudinal studies reported more attempts to control for possible other factors affecting results than the cross-sectional studies. Salmela-Aro & Upadyaya's (2014) study was the only one to not report any attempts to control extraneous variables. This study collected different measures at different time points (time point 1: study and personal resources and study demands; time point 2 and 3: engagement with school work and school burnout; time point 4: depressive symptoms and life satisfaction). As a result, the researchers were unable to control for baseline depressive symptoms or school burnout when conducting their analysis reducing the validity of the study and the conclusions drawn from it. Contrastingly, most studies used statistical means to control for depressive symptoms at the initial time point when looking at the prospective relationship between stress and depressive symptoms. Two studies considered wider factors that may impact on depressive symptoms, such as socioeconomic status (SES) (Undheim & Sund, 2005; Wang et al., 2015). Undheim and Sund (2005) also controlled for the role of ethnicity and parental divorce.

3.1.2.3. Outcome

There was good reporting of statistics across the studies, with appropriate statistics used and reported in sufficient detail. However, the adequacy of follow-up varied,

with only three studies reporting low attrition rates, less than 25% (Murberg & Bru, 2005; Rudolph et al., 2001; Undheim & Sund, 2005). Rudolph et al. (2001) and Undheim and Sund (2005) further examined how participants that dropped out differed to those who remained in the study. Of the remaining four studies, the two Salmela-Aro, Savolainen, & Holopainen (2009) studies had higher attrition rates (over 30%) but reported how groups of completers and non-completers differed. Two studies either did not mention attrition (Salmela-Aro & Upadyaya, 2014) or provided an unclear and inadequate explanation (Wang et al., 2015).

Once again, accounting for missing data was variable, with three studies not mentioning it at all (Murberg & Bru, 2005; Rudolph et al., 2001; Salmela-Aro, Savolainen, et al., 2009 - Study 2), two studies accounting for missing data, but not reporting the amount of missing data (Salmela-Aro, Savolainen, et al., 2009 - Study 1; Salmela-Aro & Upadyaya, 2014) and two studies providing a full account of amount of missing data and how this was managed in analysis (Undheim & Sund, 2005; Wang et al., 2015).

3.1.3. Summary

This quality appraisal highlights that there are a few good quality studies conducted in this area. The studies are mostly of a fair quality and certainly amongst cross-sectional studies there is a concerning number of poor-quality studies.

Similar methodological strengths and limitations were highlighted from the cross-sectional and longitudinal studies. The strengths of these studies included large representative samples, measures described to a level which means replicability is possible, reasonable response rates, when reported, and good reporting of statistical analyses. However, there were also significant limitations including a lack of measurement and control of other variables that could impact on the relationship between SRS and depressive symptoms (particularly amongst cross-sectional studies). There was also a lack of consistency in reporting missing

data, response rates and follow up rates across the studies. Considering that all the studies relied upon self-report measures the reporting of these data is important in being able to assess to the quality of these studies.

3.2. Summary of studies

A total of 20 studies from 19 papers were included in this review. Three studies used data from the Fin Edu Study, a longitudinal study from 2004 tracking a cohort of 14-year-old students in comprehensive schools in a city in Finland (Salmela-Aro, Savolainen, et al., 2009; Salmela-Aro & Upadyaya, 2014; Wang et al., 2015). Another two studies used data from the same longitudinal study in Norway (Sund et al., 2003; Undheim & Sund, 2005) . A summary of the extracted data, relevant to the current review, can be found in Tables 4 and 5.

3.2.1. Design

Thirteen studies used cross-sectional methods (see Table 4) and seven used a longitudinal design (see Table 5). Most studies (17/20) used observational and self-report methods, asking participants to complete specific measures either at one time point (cross-sectional) or multiple (longitudinal) and looking at the association between these variables. Three of the cross-sectional studies (Chen et al., 2015; Feurer & Andrews, 2009; Jayanthi et al., 2015) looked at differences between naturally occurring groups of adolescents. Chen et al. (2015) investigated whether prevalence of depressive symptoms changed depending on the grade adolescents were in and whether they were approaching (high stress condition) or had already been successful in their college entrance exam (low stress condition). Feurer and Andrews (2009) compared the difference in self-reported SRS and depressive symptoms in adolescents with a diagnosed learning disability and those without.

Finally, Jayanthi et al. (2015) compared differences in SRS between students who met diagnostic criteria for depression and those who did not.

3.2.2. Samples

The studies were from a variety of different countries: mainly Scandinavian and South East Asian countries, but also China, India, USA and Canada. The sample sizes were large, exceeding 300 participants in all but Feurer and Andrews' (2009) study, with gender splits, where stated, tending to be fairly equal. With regards to age of participants, few studies examined the relationship between school-stress and depressive symptoms across the span of adolescence. Ang and Huan (2006b), Moksnes, Espnes and Haugan (2014), and Moksnes et al. (2016) included participants from 12 or 13 years old to 18, whilst Deardorff et al. (2003) had a slightly younger focus of 10 to 16 year olds. Most of the studies tended to focus on early, middle or late adolescence. However, two studies (Jayanthi et al., 2015; Park & Chung, 2014) did not report an age range or mean age of participants in their study and eight studies did not report an age range, often referring instead to the school grades of the participants. This made comparison between study samples difficult as the range of different countries meant that grading systems were not necessarily comparable.

3.2.3. Measures used

The vast majority of studies (19/20) used self-report questionnaires to measure SRS, with only Chen et al. (2015) using a different method, whereby a presumed objective stressor (the proximity to an upcoming exam) was used. There was a heterogenous group of measures used to assess SRS with the School Burnout Inventory (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009) and Adolescent Stress Questionnaire (Byrne et al., 2007) being the most commonly used. Liu & Liu (2012), Murberg and Bru (2005) and Sund et al. (2003) developed their own measures of

SRS for their studies. The measure developed by Sund et al. (2003), the Early Adolescence Stress Questionnaire, was subsequently used with Undheim and Sund's (2005) study. Studies also varied as to whether the measure specifically focused on SRS or whether it was a subscale from a more general adolescent stress questionnaire.

Once again, all of the studies used self-report measures of depressive symptoms. However there was less variation in the number of different questionnaires used, with the Children's Depression Inventory (Kovacs, 1992), Beck Depression Inventory (Beck, Steer, & Brown, 1996), Center for Epidemiological Studies Depression Scale (Radloff, 1977) and the Depression Scale (Salokangas, Stengard, & Poutanen, 1994) being most frequently used. The studies varied as to whether they used the entire measure or one or more sub-scales from within the measure (see Tables 4 and 5). Two studies used less well-established measures of depressive symptoms, which may affect the validity of the measure of this construct. Moksnes et al. (2014; 2016) justify their use of Byrne et al.'s (2007) depression measure as it is designed to assess levels of non-clinical depression and includes items informed by the Diagnostic and Statistical Manual – Fourth Edition TR (American Psychiatric Association, 2000) and the Zung Self-Rating Depression Scale (Zung, 1965). This depression measure was also designed to be used alongside the Adolescent Stress Questionnaire (Byrne et al., 2007), which the Moksnes et al. (2014; 2016) studies utilise.

This review extracted details of additional measures used by 11 studies, where they have investigated the role of mediating or moderating factors. These additional questionnaires measured suicidal ideation (Ang & Huan, 2006b), control beliefs (Deardorff et al., 2003), achievement orientation (Liu & Lu, 2012), sense of coherence (Moksnes, Espnes, et al., 2014), life satisfaction (Moksnes, Lohre, et al., 2014), family resilience (Park & Chung, 2014), peer caring, self-awareness (Zhang et al., 2013), coping styles (Murberg & Bru, 2005), self-regulatory beliefs, academic

engagement (Rudolph et al., 2001), study demands (Salmela-Aro & Upadyaya, 2014), teacher support and grade achievement (Undheim & Sund, 2005).

Table 4. *Details of cross-sectional studies included in review with quality appraisal ratings*

Authors	Country	N	Sample Age (yrs) Range (mean)	Gender	Response Rate (%)	Relevant Measures (school-related stress/depressive symptoms/other)
Ang & Huan (2006b) ★	Singapore	1108	12-18 (14.33)		ns	♦ Academic Expectations Stress Inventory[1] ◆ Children's Depression Inventory[2] ♦ Suicidal Ideation Questionnaire – Junior High School Version[3]
Chen, Chou, Tzeng, Chang, Kuo, Pan, Yeh, Yeh & Mao (2015) ★	Taiwan	757	16-18 (ns)		97.2	School-related stress – N/A ♦ Beck Depression Inventory-II[4] (Chinese version)
Deardorff, Gonzales & Sandler (2003) ★	USA	445 Inner city adolescents	10-16 (13.35)		90	◆ Multicultural Events Scale for Adolescents[5] ♦ Children's Depression Inventory[1] ◆ The Mastery Scale[6] - *measure of control beliefs*
Feurer & Andrews (2009) ★	Canada	87 LD=38; Non-LD=49	14-19 (LD=15.68; Non-LD =16.58)	 LD Non-LD	ns	◆ School Situation Survey[7] ♦ Beck Depression Inventory-II[4]
Guo, Yang, Cao, Li & Siegrist (2014) ★	China	1774	ns (16)		88.6	♦ Effort-Reward Imbalance at School[8] ♦ Center for Epidemiological Studies Depression Scale for Children[9] (Chinese version) Data on smoking, alcohol consumption, physical activity & socioeconomic status collected
Jayanthi, Thirunavukarasu & Rajkumar (2015) ★	India	1120 D=560 ND=560	ns (ns)	ns	ns	♦ Educational Stress Scale[10] ♦ MINI-Kid[11] & Beck Depression Inventory-II[4]

Authors	Country	N	Sample Age (yrs) Range (mean)	Gender	Response Rate (%)	Relevant Measures (school-related stress/depressive symptoms/other)
Liu & Lu (2012) ★	China	368	ns (16.76)		ns	♦ Academic stress questionnaire[12] ◆ Children's Depression Inventory[2] (Chinese Version) ◆ 23-item measure of student perceptions of school climate[13, 14]
Moksnes, Espnes & Haugan (2014) ★	Norway	1183	13-18 (ns)		98.4	♦ Adolescent Stress Questionnaire[15] (Norwegian version) ♦ Depression Scale[15] ◆ Orientation to Life Questionnaire[16] - *measure of sense of coherence*
Moksnes, Lohre, Lillefjell, Byrne & Haugan (2016) ★	Norway	1239	13-18 (15)		67	◆ Adolescent Stress Questionnaire[15] (Norwegian version) ♦ Depression Scale[15] ♦ Satisfaction with Life Scale[17] (Norwegian Version)
Nguyen, Dedding, Pham, Wright & Bunders (2013) ★	Vietnam	1161	15-19 (16.1)		33	♦ Educational Stress Scale for Adolescents[18] ♦ Center for Epidemiology Studies Depression Scale[9]
Park & Chung (2014) ★	Korea	664	ns (ns)		ns	♦ Daily Hassles Coping scale[19] ◆ Center for Epidemiology Studies Depression Scale[9] (Korean Version) ◆ Resiliency Questionnaire[20]
Sund, Larsson & Wichstrom (2003) § ★	Norway	2465	12.5-15.7 (13.7)		88.3	♦ Early Adolescence Stress Questionnaire[21] ♦ Mood & Feelings Questionnaire[22]
Zhang, Li, Gong & Ungar (2013) ★	China	1297	ns (8th G=13.9 9th G=14.8)		ns	◆ Adolescent Self-Rating Life Events Checklist[23] ♦ Center for Epidemiologic Studies Depression Scale[9] (Chinese Version) ◆ Resilience Assessment Module[24] (Chinese Version)

Note-

§ studies using same data set

Good quality study

Fair quality study

Poor quality study

G - Grade

LD – Learning disability; Non-LD – Non-learning disability

D – Depressed; ND – Non-depressed

ns – not stated

Female

Male

Full measure used

Subscale of measure used

Modified version of measure used

Footnotes -

1 Ang & Huan, 2006a
2 Kovacs, 1992
3 Reynolds, 1988
4 Beck et al., 1996
5 Gonzales, Gunnoe, Samaniego, & Jackson, 1995
6 Pearlin & Schooler, 1978
7 Helms & Gable, 1989
8 Li, Shang, Wang, & Siegrist, 2010
9 Radloff, 1977
10 Sun, Dunne, Hou, & Xu, 2011
11 Sheehan, Shytle, Milo, Lecrubier, & Hergueta, 2005
12 Liu & Lu, 2012
13 Brand, Felner, Shim, Seitsinger, & Dumas, 2003
14 Cemalcilar, 2010
15 Byrne et al., 2007
16 Antonovsky, 1987
17 Diener, Emmons, Larsen, & Griffin, 1985
18 Thai, 2010
19 Yoo & Min, 1998
20 Based on Boehm, Wertlieb, & Dori, 2007; Kim, 2001
21 Sund et al., 2003
22 Angold, 1989
23 Liu et al., 1997
24 California Department of Education, 2003

Table 5. *Details of longitudinal studies included in review with quality appraisal ratings*

Authors	Country	N	Sample at T1 Age (yrs) Range (mean)	Gender	Relevant Measures (school-related stress/depressive symptoms/other)	Follow Up (months after T1)	Attrition (%)
Murberg & Bru (2005) ★	Norway	327	13-16 (ns)		♦ 17 items covering stressful situations[1] ◆ Hopkins Symptoms Checklist[2] ◆ Adolescent Orientation for Problem Experiences[3] - *measure of coping style*	T2: 12	6
Rudolph, Lambert, Clark & Kurlakowsky (2001) ★	USA	329 MST =187 No MST= 142	ns (11.3)		♦ Chronic Strain Questionnaire for Children[4] ◆ School Hassles Questionnaire[5] ◆ Abbreviated version of Children's Depression Inventory[6] ◆ Perceived Control Scale[7] - *measure of self-regulatory beliefs* ♦ Academic Helplessness Scale[8] - *measure of academic engagement*	T2: 6-7	18
Salmela-Aro, Savolainen & Holopainen (2009) STUDY 1 * ★	Finland	658	ns (15)		♦ School Burnout Inventory[9] ♦ Depression Scale[10]	T2: 4 T3: 12	31
Salmela-Aro, Savolainen & Holopainen (2009) STUDY 2 ★	Finland	474	ns (16.51)		♦ School Burnout Inventory[9] ♦ Depression Scale[10]	T2: 12 T3: 24	33
Salmela-Aro & Upadyaya (2014) * ★	Finland	1709	ns (15.47)		♦ School Burnout Inventory[9] ♦ Depression Scale[10] ♦ Study Demands[11]	T2:12 T3:24 T4:48	ns

Authors	Country	N	Sample at T1 Age (yrs) Range (mean)	Gender	Relevant Measures (school-related stress/depressive symptoms/other)	Follow Up (months after T1)	Attrition (%)
Undheim & Sund (2005) § ★	Norway	2465	12.5-15.7 (13.7)		◆ Early Adolescence Stress Questionnaire[12] ♦ Mood & Feelings Questionnaire[13] Data about school grade and teacher support (assessed through two questions) collected	T2: 12	4
Wang, Chow, Hofkens & Salmela-Aro (2015) * ★	Finland	362	ns (15.98)		♦ School Burnout Inventory[9] ◆ Depression Scale[14]	T2: 12 T3: 24	ns

Note-

§ - studies using same data set

* - studies using Fin Edu data set

★ Good quality study

★ Fair quality study

★ Poor quality study

MST - Middle School Transition

No MST - No Middle School Transition

ns - not stated

T- Time point

Female

Male

♦ Full measure used

◆ Subscale of measure used

◆ Modified version of measure used

Footnote-

1 Murberg & Bru, 2004
2 Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974
3 Patterson & McCubbin, 1987
4 Rudolph, Kurlakowsky, & Conley, 2001
5 Robinson, Garber, & Hilsman, 1995
6 Kovacs, 1981
7 Weisz, Southam-Gerow, & McCarty, 2001
8 Nolen-Hoeksema, Girgus, & Seligman, 1992
9 Salmela-Aro, Kiuru, et al., 2009
10 Salokangas et al., 1994
11 Salmela-Aro & Upadyaya, 2014
12 Sund et al., 2003
13 Angold, 1989
14 Salokangas, Poutanen, & Stengård, 1995

3.3. Summary of findings

Based on the quality appraisal the main focus of this section will be the results of the studies rated as fair or good quality. The quality of the studies referred to below are indicated by coloured stars as in Tables 1 and 2.

3.3.1. Cross-sectional studies

3.3.1.1. Relationship between SRS and depressive symptoms

All the cross-sectional studies that ran correlational analyses (9/13 studies) found a significant positive correlation between SRS and depressive symptoms, with the strength varying from weak to moderate. This relationship was found across studies using generic SRS measures, such as in Sund et al.'s (2003★) study where a significant moderate positive correlation was found between SRS and depressive symptoms. Similarly, Deardorff et al.'s (2003★) study found a weak significant positive correlation between depressive symptoms and SRS occurrence, frequency and impact. Comparable relationships were found in studies looking at specific subscales of SRS. For example, a significant moderate positive correlation was found between stress from school attendance, school/leisure conflict, school performance and depressive symptoms (Moksnes et al., 2014★) and significant weak positive relationships were found between stress from homework and depressive symptoms, as well as stress from lack of achievement and depressive symptoms (Liu & Lu, 2012 ★). Feurer and Andrews (2009★) investigated SRS and depressive symptoms amongst students with and without diagnosed learning disabilities. They found significant moderate positive relationships between each of the SRS variables (stress from peer interactions, teacher interactions, academic work and academic self-concept) and depression scores for the total sample and for each group.

Ten of the thirteen studies also used further analysis, such as structural equation modelling (SEM), multiple or logistic regression to further analyse the direct relationship between SRS and depression. It is noted that the term prediction is commonly used in cross-sectional regression models and is used here but is not meant to imply causative prediction. Most of these studies found an association or predictive relationship between SRS and depressive symptoms. For example, Guo et al. (2014★) found SRS was significantly associated with depressive symptoms. Liu and Lu (2012★) used SEM to identify two latent subgroups (significant effects and non-significant effects group). The significant effects group, which incorporated 90% of participants, was significantly associated with stress from lack of achievement positively predicting depressive symptoms. This relationship was not apparent in the non-significant effects group.

However, Deardorff et al. (2003★) whose study focused specifically on inner city adolescents in the USA found a different pattern from SEM. Although overall stress score, which included school stress, had a significant positive path to depressive symptoms, school stress on its own was not a significant predictor of depressive symptoms. It maybe that these findings differ to those above due to the specific population studied in this paper; inner-city adolescents may be more likely to experience greater stress from peers and family, which were found to have positive paths to depressive symptoms, than from SRS compared to adolescents in a different context. Additionally, Sund et al. (2003★) conducted a multiple regression and found the sum of stressful events, which included school stress, was the second most powerful predictor of depressive symptoms. However, they did not look at SRS as an individual predictor. Thus, it may be that the other sources of stress (family – physical health, major events, chronic stress; friends; miscellaneous) played a greater predictive role than SRS.

3.3.1.2. Mediators and moderators

A number of studies used statistical methods to examine possible mediators and moderators of the relationship between SRS and depressive symptoms. One study found that control beliefs (the extent to which a person believes they have control over their life) were a significant negative partial mediator of the relationship between overall stress (including SRS) and depressive symptoms with inner-city adolescents (Deardorff et al., 2003★). Guo et al. (2014★) found that family SES significantly moderated the association between school stress and depressive symptoms, with a stronger association between SRS and depressive symptoms for participants with a low SES, compared to high. The same study also found no moderating effect of age or health related behaviours, such as smoking or drinking alcohol. Another study measured sense of coherence (an individual's resources and disposition that enable them to manage and resolve stress (Eriksson & Lindström, 2006) and found that it did not moderate the relationship between school-based stress and depressive symptoms (Moksnes et al., 2014★).

Other variables found to partially negatively mediate the relationship between SRS and depressive symptoms were life satisfaction (weakly) (Moksnes et al., 2016★) and family resilience (Park & Chung, 2014★). Ang and Huan (2006b★) found depressive symptoms to be a partial mediator between academic stress and suicidal ideation in Singaporean adolescents. Zhang et al. (2013★) found that the association between academic pressure and depression was less apparent when students had higher levels of peer caring relationships, or self-awareness. However, these findings are weak or from studies that scored poorly on the quality appraisal and so these results should be considered with caution.

3.3.1.3. Group differences

A number of studies investigated possible gender differences in the relationship between SRS and depressive symptoms, with evidence suggesting females are more vulnerable to the negative impacts of SRS. Although Moksnes et al. (2014★) found some SRS sub-scales showed no gender differences. For example, they reported that stress from school performance was a significant predictor for depression in both genders, even when controlling for age and participants' sense of coherence. Other sources of SRS, such as school attendance or school/leisure conflict were significant predictors of depression for females, but not males. Two further studies found that female participants who experienced high levels of SRS were more likely to experience high levels of depressive symptoms than their male counterparts (Jayanthi et al., 2015★; Liu & Lu, 2012★). Sund et al. (2003★) was the only study to report the inverse and find that SRS and depressive symptoms were significantly more strongly correlated amongst male compared to female participants.

One study (Feurer & Andrews, 2009★) investigated differences between participants with and without learning disabilities. They found that stress from peer interactions, teacher interactions, academic work and academic self-concept were all significant predictors of depression for participants without a learning disability. However for those with a learning disability, only academic and peer interaction stress were significant predictors of depressive symptoms.

Table 6. *Summary of results from cross-sectional studies including quality appraisal ratings*

Authors	Relationship between stress and depression	Other mediating/moderating factors	Group differences
Ang & Huan (2006b) ★	BC • Academic stress & depressive symptoms ●○○	MR • Depression ● between academic stress & suicidal ideation • Approximately 74% of the total effect of academic stress on suicidal ideation is mediated by depressive symptoms.	
Chen, Chou, Tzeng, Chang, Kuo, Pan, Yeh, Yeh & Mao (2015) ★			• Highest depression scores reported in Grade 3T (high stress group), lowest in Grade 3S (low stress group) ▽ • Significantly higher depressive symptoms in group 3T (high stress group) than Grade 1 and 3S (low stress group) • Grade 2 students also significantly higher depression scores than Grade3S
Deardorff, Gonzales & Sandler (2003) ★	BC • School stress occurrence & depressive symptoms ●○○ • School stress frequency & depressive symptoms ●○○ • School stress impact & depressive symptoms ●○○ SEM • Overall stress ✹ • School stress ☼	SEM • Control beliefs ● between overall stress & depressive symptoms • Use of frequency and impact measures of stress produced equivalent mediation models	
Feurer & Andrews (2009) ★	BC • For total sample & each group (LD & non-LD): Peer interaction & depression ●●○ Teacher interaction & depression ●●○ Academic stress & depression ●●○ Academic self-concept & depression ●●○ MR • Peer interaction, teacher interaction, academic stress & academic self-concept ✹ • These factors accounted for 59% of the total variance in depression		BC • Strongest relationships: LD group: academic stress & depression Non-LD group: teacher interaction stress & depression MR • LD group: academic & peer interaction stress were significant predictors of depression. All 4 stressors accounted for 54% of total depression variance ▽ • Non-LD group: All 4 SRS variables were significant predictors of depression & accounted for 68% of total depression variance

Authors	Relationship between stress and depression	Other mediating/moderating factors	Group differences
Guo, Yang, Cao, Li & Siegrist (2014) ★	LR • School related stress ▲	LR • Age, gender, grade and health related behaviours ◇ • Family SES ◆	LR • Stronger association between SRS and depressive symptoms for participants with low socioeconomic status ▽
Jayanthi, Thirunavukarasu & Rajkumar (2015) ★	BC • Academic stress & level of depression ●●○ LR • High levels of academic stress ▲		• Late adolescence, being female, attending a government school had a significant association with academic stress in the depressed group. ▽ ▽ ▽
Liu & Lu (2012) ★	BC • Stress from homework & depressive symptoms ●○○ • Stress from lack of achievement & depressive symptoms ●○○ SEM • Identified 2 latent subgroups: 1) 90% of participants Stress from lack of achievement ✹ stress from homework ☼ 2) 10% of participants Stress from lack of achievement or homework ☼		SEM • Being female & perceiving academic achievement was emphasised in classroom predicted membership to subgroup 1 ▽ • Peer relationships, teacher relationships & disciplinary harshness did not predict subgroup membership ▽
Moksnes, Espnes & Haugan (2014) ★	BC • School attendance & depressive symptoms ●●○ • School/leisure conflict & depressive symptoms ●●○ • School performance stress & depressive symptoms ●●○ MR • School performance stress ✹ when controlling for sense of coherence & age.	MR • Sense of coherence ◇	BC • Females: Age & depression ●○○ Age & all school-related stress scales ●○○ ▽ • Males Age & depression ○○○ Age & school performance stress ●○○ MR • Stress from school attendance & school/leisure conflict predicted levels of depression for females but not males ▽

Authors	Relationship between stress and depression	Other mediating/moderating factors	Group differences
Moksnes, Lohre, Lillefjell, Byrne & Haugan (2016) ★	BC • School performance stress & depression ●●○ • Teacher interaction stress & depression ●●○ SEM • School performance stress ✹ when teacher interaction stress controlled for • Teacher interaction stress ☼ when school performance stress controlled for	SEM: • Life satisfaction ● of relationship between school performance stress & depressive symptoms (weak)	
Nguyen, Dedding, Pham, Wright & Bunders (2013) ★	LR • High educational stress ▲ • educational stress was one of two strongest factors		
Park & Chung (2014) ★	SEM • Academic stress ✹	SEM • Family resilience ● between academic stress & depression	
Sund, Larsson & Wichstrom (2003) § ★	BC • School stress & depressive symptoms ●●○ MR • Overall stress ✹ • Overall stress 2nd most powerful predictor of depressive symptoms		BC • Depressive symptoms were significantly more strongly correlated with SRS among males than females ▼
Zhang, Li, Gong & Ungar (2013) ★	BC • Academic pressure & depression ●●○ MR • Academic pressure ✹	MR • Peer caring ◆ (not significant) • Self-awareness ◆ (not significant)	

Note

§ studies using same data set

★ - Good quality study

★ - Fair quality study

★ - Poor quality study

BC - bivariate correlation

MR - multiple regression

LR - logistic regression

SEM - structural equation modelling

●○○ Significant weak positive correlation

●●○ Significant moderate positive correlation

○○○ No significant correlation

☼ Not a significant predictor of depressive symptoms

✹ Significant predictor of depressive symptoms

▲ Significantly increased risk of depression

◆ Negative moderating effect

◆ Positive moderating effect

◇ No moderating effect

● Partial mediator

▽ No gender difference

▼ Gender difference

▼ Other demographic difference

▼ School environment difference

3.3.2. Longitudinal studies

3.3.2.1. Cross-sectional findings

All studies that examined the cross-sectional relationship between SRS and depressive symptoms found a significant moderate positive correlation (Murberg & Bru, 2005★; Rudolph, Lambert, et al., 2001★; Undheim & Sund, 2005★; Wang et al., 2015★). Furthermore multiple regression analysis from one study showed the largest contribution to the variance of depressive symptom levels at baseline was from SRS (Undheim & Sund, 2005★). This was a greater predictor than gender, class wellbeing or teacher support.

3.3.2.2. Predictive relationship between SRS and depressive symptoms

There were mixed results with regards to the predictive relationship between SRS and depressive symptoms in the longitudinal aspects of the studies. Most studies found that SRS could predict later depressive symptoms. Murberg and Bru (2005★) and Salmela-Aro, Savolainen, et al. (2009) in studies 1★ and 2★ found that school stress/burnout at time point one predicted depressive symptoms one year later. Wang et al. (2015★) implemented latent growth curve modelling and found depressive symptoms were positively associated with school burnout across time points.

However, other findings suggest the predictive relationship between these variables is more complicated. Salmela-Aro, Savolainen, et al.'s (2009★) first study with Finnish 15-year olds found the inverse was also true, that depressive symptoms at baseline predicted burn out one year later. However, it appeared that burnout predicted depressive symptoms more strongly than vice versa, as they found that burnout scores at time point two (one year after baseline) predicted depressive symptoms a year later, but not the converse.

Their second study, with older Finnish adolescents found that burnout predicted depressive symptoms at the next time point across all three time points, but did not find the same reciprocal relationship between depressive symptoms and burnout, reinforcing the premise that burnout is predictive of depressive symptoms, but not vice versa (Salmela-Aro, Savolainen, et al., 2009★). Furthermore, Salmela-Aro and Upadyaya, (2014★) found school burnout positively predicted depressive symptoms two years later. However, this study is less methodologically sound than the studies discussed previously in this section.

Only one study, Undheim and Sund (2005★), found no longitudinal relationship between SRS and depressive symptoms. This study showed that school stress at time point one was not a significant predictor of depressive symptoms one year later, however, their study did find gender differences at the longitudinal level (see group differences below).

3.3.2.3. Mediators and moderators

Fewer mediators and moderators were investigated in the longitudinal studies. One study examined the role of maladaptive self-regulatory beliefs (decreased perceptions of academic control and importance), academic disengagement and SRS in relation to depressive symptoms across a seven-month period (Rudolph, Lambert, et al., 2001★). They found that SRS at time point two was associated with depressive symptoms and that maladaptive self-regulatory beliefs at time point one predicted later SRS. This relationship was partially mediated by academic disengagement, with greater disengagement leading to increased SRS. They also found that maladaptive self-regulatory beliefs were associated with greater depression at time point one.

Salmela-Aro and Upadyaya (2014★) found that school burnout mediated the relationship between study demands at baseline and depressive symptoms four

years later. However, this study did not control for depressive symptoms at baseline, so it would be questionable to draw strong conclusions from this.

The final study to investigate the role of moderators found a weak but significant association between aggressive coping styles and the magnitude of the positive relationship between stress and depressive symptoms (Murberg & Bru, 2005★).

3.3.2.4. Group differences

A number of studies investigated gender differences in the relationship between SRS and depressive symptoms, however, findings were mixed. Three studies found no gender difference in the longitudinal relationship between SRS and depression (Salmela-Aro, Savolainen, et al., 2009 - studies 1★ and 2★; Salmela-Aro & Upadyaya, 2014★). However, these studies used the same data set. Although Undheim and Sund (2005★) found no gender differences at a cross-sectional level, they found that at longitudinal level baseline school stress in females was one of four significant predictors of depressive symptoms one year later. No such relationship was found for males, where the only significant predictor of depressive symptoms one year later was the baseline depressive symptom scores.

The studies in this review spanned different countries and thus different school systems. Two studies, therefore, examined the impact of different educational experiences on the relationship between SRS and depressive symptoms. Rudolph et al. (2001★) investigated the role of maladaptive self-regulatory beliefs on SRS and depressive symptoms. This USA-based study compared groups of adolescents who experienced a school transition to middle school at 11 years old and those who did not. They found that maladaptive self-regulatory beliefs only predicted SRS and depressive symptoms in the group of

adolescents who experienced school transition. Thus remaining in the same school appeared to provide a protective factor.

Two Finnish studies examined the influence of educational track on the relationship between school burnout and depression (Salmela-Aro, Savolainen, et al., 2009 - Studies 1★ and 2★). In Finland adolescents attend comprehensive secondary education until the end of ninth grade, when they transition to post-comprehensive education. This requires adolescents to choose between pursuing a vocational or academic education. In both studies differences were found in the predictive relationship of school burnout and depression for those on an academic educational track compared to those on a vocational path. However, these findings were somewhat contradictory. In Study 1, with mid-adolescents it was found that the impact of SRS was greater amongst those on an academic track, with strong cross-lagged cumulative cycles between school burnout and depressive symptoms. Thus increased burnout at baseline predicted greater depressive symptoms at time point 2, which predicted higher burnout at the final time point. This effect was not found amongst participants on a vocational track. However, in Study 2, with older adolescent participants cross-lagged effects between school burnout and depressive symptoms were found in both the vocational and educational track and conversely to Study 1, the effects were slightly stronger for the vocational group. Additionally, there were no cumulative cycles found between burnout and depressive symptoms amongst either group.

Table 7. *Summary of results from longitudinal studies including quality appraisal ratings*

Authors	Relationship between school stress and depressive symptoms	Other mediating/moderating factors	Group differences
Murberg & Bru (2005) ★	BC • T1: Stress & depressive symptoms ●●○ MR • T1 SRS ✹	MR • Participants with an aggressive coping style were more prone to a relationship between SRS and depressive symptoms (weak association)	
Rudolph, Lambert, Clark & Kurlakowsky (2001) ★	BC • T1 & T2: School hassles & depressive symptoms ●●○ • T1 & T2: academic chronic strain & depressive symptoms ●●○ SEM • T1 school hassles & academic chronic strain ✹ • T1 Maladaptive self-regulatory beliefs predicted T2 SRS	SEM • Relationship between T1 maladaptive self-regulatory beliefs, SRS & T2 depressive symptoms partially mediated by academic disengagement.	Multigroup comparison analyses ▼ • Maladaptive self-regulatory beliefs were more strongly predictive of increased perceptions of SRS and depressive symptoms with participants who experienced a transition to middle school, compared to those who remained in the same school.
Salmela-Aro, Savolainen & Holopainen (2009) STUDY 1 *★	SEM • T1 depression symptoms ✹ (at T2) • T1 burnout ✹ (at T2) • T2 burnout ✹ (at T3) • T2 depressive symptoms ✹ (at T3)		SEM ▽ ▼ • Academic track of education: cross-lagged cumulative cycles found – T1 burnout predicted T2 depressive symptoms, which predicted T3 burnout. Also, T1 depressive symptoms predicted T2 burnout, which predicted T3 depressive symptoms • Vocational track of education: No cross-lagged effects as above.
Salmela-Aro, Savolainen & Holopainen (2009) STUDY 2 ★	SEM • School burnout and depressive symptoms were positively associated at each time point, but this weakened toward T3 • T1 burnout ✹ (at T2) • T2 burnout ✹ (at T3) • Depressive symptoms ✹		SEM ▽ ▼ • No significant difference between participants on educational or vocational track
Salmela-Aro & Upadyaya (2014) *★	SEM • T3 school burnout ✹ (at T4)	SEM • School burnout partially mediates the relationship between study demands at T1 and depressive symptoms at T4.	▽

Authors	Relationship between school stress and depressive symptoms	Other mediating/moderating factors	Group differences

Undheim & Sund (2005) § ★	BC
	• T1 & T2: SRS & depressive symptoms ●●○
	MR
	• T1: SRS was strongest predictor of depressive symptoms
	• T1 SRS ☼ (at T2)
			MR
			• Cross-sectional level ▽
			• Longitudinal level: ▽
			  • Male: T1 depressive symptoms predicted depressive symptoms at T2
			  • Female: T1 depressive symptoms, SRS, teacher support & grades predicted depressive symptoms at T2
			  • T1 depressive symptoms significantly stronger predictor for females than males

Wang, Chow, Hofkens & Salmela-Aro (2015) * ★	BC • T1, T2, T3: school burnout & depressive symptoms ●●○ • Burnout & depressive symptoms across time points ●●○ SEM • Longitudinal positive association between both the intercept of depressive symptoms and school burnout and between the slope of depressive symptoms and the slope of school burnout		

Note

* studies using Fin Edu data set
§ studies using same data set
★ Good quality study
★ Fair quality study
★ Poor quality stud
T1- Time point 1, T2-Time point 2, T3-Time point 3, T4-Time point 4
SRS- school related stress
BC - bivariate correlation
MR - multiple regression
SEM - structural equation modelling

●○○ Significant weak positive correlation
●●○ Significant moderate positive correlation
○○○ No significant correlation
☼ Not a significant longitudinal predictor of depressive
Significant longitudinal predictor of depressive symptoms
Not a significant longitudinal predictor of school burnout
Significant longitudinal predictor of school burnout

▽ No gender difference
▽ Gender difference
▽ Other demographic difference
▽ School environment difference
▽ No school environment difference

4. Discussion

4.1. Overview

This review aimed to explore the nature of the relationship between SRS and depressive symptoms in secondary school-age adolescents. In addition to this it intended to comment on the quality of the studies in this area and therefore the strength of the conclusions drawn from this body of literature. The final review included 20 studies from 19 papers, 13 of which were cross-sectional and seven which were longitudinal in design.

4.2. Methodological strengths and limitations of studies

Across the studies, the samples tended to be an area of strength. The vast majority of studies used large samples which often maximised the likelihood of gaining a representative sample through random sampling or including a whole population across multiple schools within a region. However, the demographics of these large samples were not always sufficiently well reported in the papers. Reporting of participants' school grade, rather than the mean age or age range, made the comparison of samples more difficult. Two of the studies were interested in specific target populations: inner city adolescents (Deardorff et al., 2003★) and adolescents with learning disabilities (Feurer & Andrews, 2009★). Thus, these studies have more limited generalisability with regards to their findings. A final strength of the samples in these studies were the high response rates. However, in studies where response rates were low it was rare that the researchers analysed differences between groups of responders and non-responders.

One issue with the depressive symptoms and stress data collected is that most of the studies relied upon self-report data alone. Although adolescents have been found to give valid self-reports, they are also subject to response effects (Crockett, Schulenberg, & Petersen, 1987). Furthermore, disclosure of sensitive

personal information, such as depressive symptoms or experiences of stress, may result in under reporting (Hunt, Auriemma, & Cashaw, 2003). Thus, triangulation from parental or teacher reports or interviews with the participants would have strengthened the validity of the data. One study did validate the presence of clinical depression through use of psychiatrists, but only for participants who met clinical cut-off at screening (Jayanthi et al., 2015★). Thus any under-reporting of symptoms in the non-depressed group would have gone unverified.

A further strength was that the vast majority of measures used were well-described and the good quality studies used well-validated and reliable measures. This was more frequently the case for depression measures than for measures of SRS. There was also less variation in depression measures used across the studies, compared to those measuring stress. This may be due to a greater availability of well-known depression measures that are reliable and well-validated with adolescents and across different countries due to the large body of research in this area. The range of different tools used to measure stress raises an issue when comparing findings from the different studies. SRS is a broad concept, incorporating different sources (relationships with teachers, homework, academic expectations, pressure to perform). Thus the use of different measures means that the studies may have been investigating different aspects of SRS, reducing the validity of drawing comparisons across studies. However, the studies are drawn from numerous countries, where school-systems vary, and the sources of SRS may differ. Therefore, perhaps it is more meaningful for different countries to use different measures of SRS that are valid in their culture.

A significant limitation across the studies, but of particular pertinence to the cross-sectional studies, is the lack of consideration of variables, other than SRS, which may affect depressive symptoms. Very few studies attempted to control for the impact of other variables and the variables that were considered are limited. It is vital for the development of high-quality research in this area that consideration is

given to the wide-ranging factors that can impact on adolescents' mood, including school-based (environment, bullying) and non-school based (peer and family factors, demographics, social media). There is growing evidence that low SES makes young people more vulnerable to mental health issues (Patalay & Fitzsimons, 2017; Sadler et al., 2018; World Health Organisation, 2014). However, only a minority of the studies in this review considered the impact of SES.

A further issue with the studies in this review is related to missing data. As all the studies used self-report data, the likelihood of missing data is high, yet numerous studies did not clearly report the amount of data missing or how this was managed in relation to the analyses. Therefore conclusions drawn from these studies need to be considered with greater scepticism. Despite this issue, a strength of the longitudinal studies was the length of follow-up, all provided a reasonable length between time points. Most studies allowed for one year, with the longest follow up being four years after baseline measures.

4.3. Main findings

A positive relationship between SRS and depressive symptoms exists, both in cross-sectional and longitudinal studies. The studies included in the review originate from a range of geographical locations suggesting this phenomenon is cross-cultural and can be found across different educational systems. However, the causal direction of this relationship is questionable from cross-sectional studies and SRS could lead to increased depressive symptoms, or experiencing depression may increase levels of SRS. Additionally, the strength of this relationship is unclear as the studies in this review only considered a limited number of factors that might also affect depressive symptoms, such as SES, perception of academic achievement or having a learning disability. The findings of this review suggest that the relationship between SRS and depressive symptoms is not unequivocal and there is great potential for a range of mediating and moderating factors to impact on this

relationship. Factors such as lacking sense of control, low SES, and aggressive coping were found to be linked with an increased relationship between SRS and depressive symptoms, whilst life satisfaction, family resilience, peer caring and self-awareness were found to be protective factors. However, there was great variation as to the strength of these associations and little overlap in the factors these studies investigated, thus it is difficult to draw any firm conclusions.

There were inconsistent findings around whether gender affects the relationship between SRS and depression. The evidence suggests that if there is an effect of gender females tend to show a stronger relationship between SRS and increased depressive symptoms than males (Moksnes et al., 2014★; Undheim & Sund, 2005☆). Although there is evidence that females may be more prone to SRS (OECD, 2017) it is important not to overstate the role of SRS in these suggested gender differences. We need to also consider other factors that impact more on adolescent females, such as their early sexualisation and the high and conflicting cultural expectations that are placed upon them (Bailey, 2011; Wisdom, Rees, Riley, & Weis, 2007), which may also influence depressive symptoms. Furthermore, none of the studies accounted for gender or sexuality issues that adolescents may face, which are linked with higher levels of depression, self-harm and suicidal ideation (Stonewall, 2017).

There is some evidence from this review that education system may influence relationship between SRS and depressive symptoms. Transition from one school to another for young adolescents may increase the likelihood of negative outcomes (Rudolph et al., 2001★) and that mid-adolescents in an academic environment may be more likely to experience depressive symptoms related to school burnout than those on a vocational track (Salmela-Aro, Savolainen, et al., 2009 - Study 1☆). However, this relationship did not seem to exist as strongly in older adolescents (Salmela-Aro, Savolainen, et al., 2009 - Study 2★). Additionally,

these findings about educational experience come from single studies within this review and thus require further investigation.

4.4. Future research

There is a need for more longitudinal studies to establish the direction of the relationship between SRS and depressive symptoms. Furthermore, studies should incorporate measurement of a wider range of factors that could be linked with adolescent depression. There could be value in short-term, longitudinal studies that examine whether SRS and depressive symptoms co-vary across an academic year and the cumulative effects on of this on wellbeing. Although studies have already been conducted across the world, many of the studies are focused in Scandinavian countries, where there is less focus on, and far fewer, standardised exams. It would be useful to investigate the effects of SRS in countries, such as the UK, where school-systems are reliant on more frequent high-stakes testing through teachers' performance-related pay, publication of school performance league tables and determining students' future academic study. These factors may well increase the levels of SRS adolescents experience.

Future research should aim to improve on the limitations highlighted earlier in this review. Therefore, further studies should aim to collect data from multiple sources, rather than self-report alone and ensure greater methodological rigour, such as reporting missing data, non-respondents and attrition rates. Finally, the development of a good standardised measure of SRS, ideally valid across different cultures, could significantly improve research in this area.

4.5. Clinical implications

With evidence of increasing adolescent mental health issues and pressures around service provision (Children's Commissioner for England, 2016; Fink et al., 2015; Sadler et al., 2018), awareness of the potential role of SRS in mental health issues,

such as depression, is useful. Such findings, as demonstrated in this review, could encourage revision of within-school systems that may increase pressure on adolescents. For example, the way in which teachers use fear appeals (highlighting the need to avoid the negative consequences of failing) to motivate students to work harder for exams (Putwain, Remedios, & Symes, 2016). Additionally, the role of the classroom environment and emphasis that is placed on academic achievement, which can increase stress and depressive symptoms (Liu & Lu, 2012).

Furthermore, this review has highlighted the role of possible protective factors, such as family resilience, self-awareness and peer caring, and risk factors, such as maladaptive self-regulatory beliefs, that could the impact levels of SRS. Targeting these factors could become part of the focus for clinicians working with adolescents who are experiencing high levels of SRS or schools could implement workshops around some of these factors as a preventative measure. Such school-based interventions would dovetail well with the increasing interest for universal adolescent mental health interventions that aim to build resilience and strengthen protective factors (Windle, 2011).

Finally, at a macro-level this review suggests there may also be a need for governments to review the education systems and the value that is placed on academic attainment that leads to adolescents experiencing high levels of SRS (OECD, 2017).

4.6. Limitations of review

This review is novel in collating the findings and assessing the quality of research in this area, however it also faces a number of limitations. Primarily, as the data is mostly from cross-sectional studies it is impossible to claim with any certainty the direction of the relationship between SRS and depressive symptoms. It may be that those who are experiencing depression also experience increased stress at school as a result of their depressive symptoms, such as poor sleep, lethargy and low

mood. There are also many other moderators of this relationship, a limited number of which were investigated in these studies, despite some of this data being relatively easy to collect. For example, neurodevelopmental differences, such as autism or ADHD diagnoses, could have been obtained from teachers or self-report. Considering the increased risk of co-morbid depression in these individuals (Chronis-Tuscano et al., 2010; Strang et al., 2012) and that aspects of school, such as social or organisational demands, may be particularly stressful for them this would be useful data to collect in large scale studies such as those in this review.

Additionally, this review has been conducted at a UK-based research institute, yet none of the studies in the review were conducted in the UK. Thus, there is a question as to whether the findings of the study could be generalised to UK schools due to differences in the education systems around the world.

Finally, this review only included published papers and excluded any grey or unpublished literature. This was done to ensure the quality of studies being reviewed. However, in the process of conducting the literature search I was aware of excluding potentially relevant grey literature. Furthermore, the nature of journals to publish positive findings means that there is a likelihood of unpublished studies with non-significant findings inevitably being excluded from this review.

4.7. Conclusions

From this review it can be concluded that there is a link between increased SRS and depressive symptoms. This appears to be a cross-cultural phenomenon and there is some evidence that this relationship is more prevalent in females. The evidence for direction of causality from longitudinal studies suggests that SRS leads to depression rather than vice versa, however most studies in this review were cross-sectional. Thus interpretations around causation should be made with caution. Additionally, the relationship between SRS and depressive symptoms is potentially

moderated and mediated by other factors, as shown in a number of studies in this review.

This body of literature benefits from large, representative samples across a variety of cultures. However, studies in this review did not control for a sufficient range of other factors, such as peer, family or socio-demographic factors, which may also feed into depressive symptoms. Therefore only circumspect conclusions can be made around the strength of the relationship between SRS and depressive symptoms.

Further longitudinal research, which takes into account a greater variety of variables affecting adolescent depression, is needed in this important area. This would enable the development a stronger evidence base to guide educational policy, teaching staff and parents as to whether school-systems, high pressured environments and high-stakes exams are significantly negatively impacting on the mental health of adolescents.

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Part Two: Empirical Paper

A self-compassion intervention for healthy adolescents: Can it enhance self-compassion and reduce social comparison?

Abstract

Aims: This study aimed to investigate the effectiveness of a brief self-compassion psychoeducation intervention with an imagery task compared to a psychoeducation alone or control group. It aimed to enhance self-compassion and reduce negative social comparison in healthy adolescents, whilst also examining the relationship between use of social networking sites (SNS) and degree of negative social comparison.

Method: Participants (aged 16-18 years) were recruited from schools and randomly allocated to one of three conditions (control; psychoeducation alone; psychoeducation with imagery). Participants completed measures of self-compassion, social comparison and SNS usage at three timepoints (baseline, post-intervention, two-week follow-up). Those in the intervention groups attended three psychoeducation sessions. Those in the imagery group also completed a self-compassionate imagery task at each session. Participants were encouraged to practice the imagery or a noticing task daily, depending on their experimental group.

Results: An interaction with a large positive effect size was found between baseline and post-intervention timepoints in the psychoeducation group compared to control. Benefits to the psychoeducation group were maintained at follow-up. However, no main effect of condition or time was found for either social comparison or self-compassion data. Post-hoc analysis found a moderate positive effect size for social comparison scores in the psychoeducation group between baseline and follow-up. Counter to predictions no relationship was found between passive SNS usage and social comparison. However, a relationship was found between imagery vividness and change in social comparison scores.

Conclusions: Self-compassionate psychoeducation was effective in increasing self-compassion and reducing negative social comparisons in healthy adolescents without the need for an imagery intervention. Additionally, imagery vividness is associated with reduction in negative social comparison. However, the strength of these conclusions is limited by under-recruitment and thus underpowered analysis.

1. Introduction

1.1. Adolescence

Adolescence is a period of significant physical, neurological and psychological development (Blakemore & Choudhury, 2006; Coleman, 2010). It is characterised psychologically by shifts in self-identity, self-consciousness and cognitive flexibility (Rutter & Rutter, 1993) alongside increasing independence, with a reduction in reported closeness and time spent with parents and an increase in time spent alone or with friends (Larson & Richards, 1991). With greater emphasis on peer relations, adolescence is also a time of greater sensitivity to peer rejection and acceptance (Brown, 2004; Steinberg & Morris, 2001). Therefore adolescents are prone to engage in increased self-evaluation and social comparison with peers as they develop their sense of self and find their position in the social hierarchy (Brown & Lohr, 1987). Although this is a typical developmental process it can have negative consequences.

1.2. Social comparison & negative consequences

According to social comparison theory (Festinger, 1954) humans have an innate drive to evaluate their abilities and opinions by comparing themselves to others, as a process of learning to define the self. Gilbert (1997) has elaborated on this suggesting social approval, acceptance and support provided evolutionary advantages, such as care, protection, support and opportunities to reproduce. As a result, humans wish to gain, and fear losing, attractiveness in the minds of others (Gilbert, 2000). Negative social comparison, where individuals perceive themselves to be lacking in valued traits, will lead to a sense of inferiority and thoughts and feelings that others view them negatively (external shame) (Gilbert, 2000). This experience of existing in a negative way in the minds of others can lead to an

internal shaming process, which involves harsh self-blaming and self-criticism (Gilbert, 1998). Thus negative self-comparison is linked with increased self-criticism.

Self-criticism and shame have been found to be associated with various mental health issues in adolescents, including depression, anxiety (Cunha, Matos, Faria, & Zagalo, 2012) and self-harm (Xavier, Pinto Gouveia, & Cunha, 2016). Thus reducing negative social comparison could potentially improve psychological wellbeing and reduce mental health issues amongst adolescents.

More frequent negative social comparisons and thus greater self-criticism and shame amongst adolescents could be related to the growing societal emphasis on materialism, objectification and success. For example, the pressure of high-stakes exams from an education system driven by increasing accountability measures (Hutchings, 2015) and greater societal demands, particularly for adolescent females, to look a certain way (Clay, Vignoles, & Dittmar, 2005). Furthermore, today's adolescents are the first generation to grow up with social networking sites (SNS) and the perpetual availability of social interaction and thus social comparisons.

1.3. The role of social networking sites

Social networking sites (SNS) have been defined by Ellison & Boyd (2013) as sites where users have a continuously changing personal profile; a publicly visible list of the user's connections (their social network); and a feed of frequently updated content. The feed is primarily populated by posts from the individual and their social network with platform algorithms playing an increasing role in what users see to boost engagement (Lipsman, Mudd, Rich, & Bruich, 2012). These sites provide ample opportunity for social comparison, but such user-controlled platforms tend to emphasise the positive aspects of a poster (Qiu, Lin, Leung, & Tov, 2012) leading to greater likelihood of negative social comparison by the viewer. This is particularly

important to consider with adolescents, who are the largest consumer of SNS (Office for National Statistics, 2017) and tend to engage in increased self-evaluation and social comparison (Brown & Lohr, 1987). Thus, when on SNS and presented with idealised posts from others, adolescents may be more likely to engage in negative social comparison and self-criticism.

Despite media outlets propagating ideas, such as “Facebook Depression” (Guernsey, 2014), the research evidence examining the effects of SNS on young people appears to be much more inconclusive. Findings from cross-sectional and longitudinal studies have suggested a link between increased SNS usage and poorer wellbeing and mental health in adolescents and young adults (for example, Kalpidou, Costin, & Morris, 2011; Kross et al., 2013; Blomfield Neira & Barber, 2014; Hanna et al., 2017). Yet, other studies have found an association between SNS usage and improved life satisfaction in college students (Valenzuela, Park, & Kee, 2009), decreased loneliness and increased self-esteem in undergraduates (Gonzales & Hancock, 2011; Pittman & Reich, 2016).

These inconsistent findings have led to researchers considering what factors may mediate the link between SNS use and psychological outcomes. A recent critical review (Verduyn, Jonides, & Kross, 2017) has suggested *how* individuals engage with SNS may be key to understanding its effects. This review differentiated between active and passive SNS use. Active usage refers to activities that involve direct exchanges with others (for example, Direct Messaging someone on Twitter or commenting on another person’s post on Facebook) and non-targeted broadcasts (for example, posting a status update on Facebook or Tweeting). Thus, during active use information is produced on SNS, whilst passive use involves the consumption of content. For example, monitoring other people’s lives through viewing their posts on SNS without engaging in direct exchanges with others. Verduyn et al. (2017) propose that active and passive use of SNS are associated with different outcomes in wellbeing. Active use of SNS leads to increased social

capital and social connectedness, leading to enhanced subjective wellbeing. Passive use of SNS leads to upward social comparison and envy, leading to a decrease in subjective wellbeing. This suggests that social comparison may be a mediator between SNS use and poorer psychological wellbeing. Thus reducing negative social comparison could potentially improve psychological wellbeing and reduce mental health issues amongst adolescents.

1.4. Self-compassion

Self-compassion is defined as an approach to one's pain and suffering that exemplifies kindness and warmth, rather than self-judgment or criticism. It is characterised by seeing one's experiences as part of a common humanity and being mindful of one's feelings rather than over-identifying with them (Gilbert, 2010; Neff, 2003a). It has been found to be associated with improved aspects of psychological wellbeing including higher levels of positive affect, optimism and happiness (Neff, Kirkpatrick, & Rude, 2007) as well as reduced levels of stress, depression and anxiety in adults and adolescents (Bluth & Blanton, 2014; Neff & McGehee, 2009). Self-compassion has also been found to be a negative predictor for high levels of social comparison (Neff & Vonk, 2009). Thus self-compassion may be an "antidote" to negative social comparison and its consequences. Neff and Vonk's (2009) research was a large-scale study with over 2,000 adult participants measuring social comparison and self-compassion at a single time-point with no intervention. Thus the current study aimed to build on this initial finding in an adolescent population as there is increasing evidence that self-compassion is a modifiable trait that can be enhanced through learning and practising self-compassion skills (Albertson, Neff, & Dill-Shackleford, 2015; Kowalski, Mosewich, Crocker, & Delongis, 2013; Matos et al., 2017; Neff & Germer, 2013; Smeets, Neff, Alberts, & Peters, 2014).

With the growth of the positive psychology movement there has been increased interest in developing interventions to enhance self-compassion within healthy adult populations (for example, Kowalski et al., 2013; Matos et al., 2017; Neff & Germer, 2013; Smeets et al., 2014). Although there is a paucity of this research amongst healthy adolescent populations, initial findings appear promising. Two studies have found that with brief group interventions adolescents experienced a significant reduction in stress, anxiety, depression and negative affect; as well as increased resilience (Bluth & Eisenlohr-Moul, 2017; Bluth, Gaylord, Campo, Mullarkey, & Hobbs, 2016).

None of these current studies have investigated whether self-compassion interventions reduce negative social comparison. Considering the mediating role social comparison appears to have with psychological wellbeing and passive SNS this is worthy of further investigation.

1.5. Compassion focused imagery (CFI)

Imagery is used as a therapy aid within a number of different modalities (Hackmann, 2005; Holmes & Hackmann, 2004). There is evidence that directed imagining and recall has an effect on neurophysiological processes (George et al., 1995) and results in similar brain activity to that produced in direct perception of external sensory stimuli (Gonsalves et al., 2004). Therapeutically there is evidence that mental imagery (MI) can be more powerful than verbal work alone (Singer, 2006; Stopa, 2009). MI is a key component in Compassion Focused Therapy (CFT), proposed to stimulate the affiliative and soothing brain systems (Lee, 2005). This enhances patterns of positive affect that lead to feelings of safeness, reassurance and wellbeing, reducing levels of shame and self-criticism (Gilbert, 2010). Neuroscience studies have shown the ability to visualise compassionate images can have considerable benefits, physiologically and psychologically (Lutz, Brefczynski-

Lewis, Johnstone, & Davidson, 2008; Pace et al., 2009). Such compassionate images are often used to generate a different, kinder perspective. There is some evidence that self-compassionate MI involving a perspective shift, from giving compassion to others, to receiving compassion, can be as effective in reducing shame and self-criticism and increasing self-compassion, as a self-compassionate virtual reality intervention (Holden, 2015). Thus a compassionate MI task that involves perspective shifting may enhance self-compassion.

1.6. Current study

With adolescence being a period of development when social comparison is highly likely (Brown & Lohr, 1987) and evidence suggesting type of SNS usage affects the psycholgoical effects it has (Verduyn et al., 2017) the current study will investigate whether there is a relationship between passive SNS use and increased negative social comparison in older adolescents. Furthermore, research has shown that increased self-compassion is linked with reduced levels of negative social comparison (Neff & Vonk, 2009) and MI can enhance compassionate responses (Gilbert, 2010; Lee, 2005). Therefore this study will investigate whether a brief self-compassion psychoeducation group with MI (PE+MI) is more effective at reducing negative social comparison and increasing self-compassion in adolescents than a self-compassion psychoeducation (PE) intervention or control group.

1.7. Hypotheses

H1. Individuals who are low in self-compassion are expected to have high levels of negative social comparison.

H2. There will be an association between passive use of SNS and greater negative social comparisons.

H3. There will be an increase in self-compassion and a reduction in negative social comparison in both interventions (PE and PE+MI) compared to the control group.

H4. There will be a greater decrease in negative social comparison and increase in self-compassion in the PE+MI intervention compared to the PE intervention.

H5. There will be a greater decrease in the association between passive use of SNS and negative social comparisons in the PE+MI intervention compared to the PE intervention.

H6. For individuals in the PE+MI group, there will be an association between frequency that the MI intervention is practised and increase in self-compassion and decrease in negative social comparison.

H7. Similarly, those who are able to recall the compassionate MI more vividly and with greater focus at the end of the intervention will show greater changes in self-compassion and social comparison.

2. Method

2.1. Design

This was an exploratory randomised control study that utilised a 3x3 (Condition x Time) group comparison mixed design. Participants who opted in were randomly allocated to one of three conditions (control; self-compassion psychoeducation (PE) group; self-compassion psychoeducation and mental imagery (PE+MI) group). Observations were taken at three timepoints (baseline, post-intervention and two-week follow-up) and the dependent variables were measures of self-compassion, social comparison and use of SNS. As this was a joint project with Riona Tweed

(see Appendix B for further details) measures of self-criticism and mood were also included.

2.2. Participants

Participants were 51 healthy adolescents sampled from Years 12 and 13 across three London secondary schools. Participants met inclusion criteria of being aged 16-18 years old and were excluded if they were currently accessing psychological therapy. All participants were assumed to be fluent in reading and speaking English as they were completing A-Level or BTEC courses, which specify entry requirements of GCSE Grade of 4 or 5 in English.

Of the participants 12 (24%) were male, 39 (76%) were female. The mean age was 16.5 years, with most participants 16 years old (n=30; 59%) and fewer aged 17 (n=17; 33%) or 18 years old (n=4; 8%). With regards to ethnicity, 22 (41%) participants identified as White, 17 (33%) Asian/Asian British, 7 (14%) Black/Black British, 2 (4%) mixed White and Asian, 2 (4%) mixed White and Black and 1 (2%) Arab.

Participants who were allocated to intervention groups had good attendance to sessions, with 90% attending all three sessions, and the remaining 10% missing one session.

2.3. Power analysis

A previous meta-analysis of 14 self-compassion studies conducted with healthy adults reported a large effect size for negative association with psychopathology (MacBeth & Gumley, 2012), but fewer such studies have been conducted with adolescent populations. Neff and McGehee (2009) reported moderate to large effect sizes in associations between self-compassion and greater feelings of social connectedness and less depression and anxiety for college-age and high-school

age adolescents. A pilot study of a 6-week mindful self-compassion intervention found small to medium effect sizes for improved self-compassion and social connectedness, decreased stress, depression and anxiety symptoms (Bluth et al., 2016). These studies have not specifically investigated the effect of self-compassionate imagery. Based on these research findings but considering the exploratory nature of the current study and the need for clinical and research utility it was decided that detection of a small to medium effect size would be appropriate. A sensitivity test carried out using G Power (Faul, Erdfelder, Lang, & Buchner, 2007) gave an estimated sample size of 72 participants to provide 80% power with an alpha level of 0.05 for a group comparison mixed design, to detect a small to medium effect size (Cohen's f=0.17).

2.4. Ethical considerations

All procedures and materials for this study were approved through the UCL Division of Psychology and Language Sciences ethics committee (see Appendix C). Both researchers had Disclosure and Barring Service clearance to work with young people. Online informed consent was obtained from all participants prior to them completing baseline measures. As participants were at least 16 years old there was no need to seek parental consent. However, good practice recommends encouraging participants of this age to discuss research participation with their parent/guardian (The British Psychological Society, 2014). Therefore, information sheets for parents/guardians were provided to participants or emailed by the school to all parents/guardians of students in Years 12 and 13. One school requested additional parental consent be sought. This was obtained via signed paper slips returned to researchers by session 1.

All measures and materials used were considered innocuous, but researchers reminded participants that they could withdraw from the study at any

point without needing to give a reason. All data from the measures was anonymised and any personal identifiable information was kept confidential and stored securely. Following completion of the study all participants were emailed a debrief sheet (see Appendix D) and those who opted for it were emailed a summary of the results (see Appendix E).

2.5. Measures

2.5.1. Baseline, post intervention and follow-up measures

Self-compassion Scale (Neff, 2003). Participants completed the 26-item Self-Compassion Scale (SCS), which assesses positive and negative aspects of the three main components of self-compassion to generate an overall self-compassion score. The positive items reflect the subscales of self-kindness, common humanity and mindfulness. The negative items reflect opposing subscales of self-judgement, isolation and over-identification, respectively. Responses are given on a 5-point scale from 1 (almost never) to 5 (almost always) with negative sub-scale items reverse scored. Mean scores on the subscales are averaged to create an overall self-compassion score between 1 and 5. The SCS has high internal consistency (Cronbach's α=.93) and has been demonstrated to have convergent validity and discriminate validity (Neff, 2003). The measure has been validated on adolescents with good overall Cronbach's Alpha (.88) and its subscales were adequate (ranging between .70 and .79) (Cunha, Xavier, & Castilho, 2016).

Social Comparison Scale (Allan & Gilbert, 1995). This measures self-perceptions of social rank and relative social standing. It includes 11 bipolar constructs with a semantic differential methodology. Participants compare themselves to others and rate themselves along a ten-point scale, where one indicates a self-perception of being much inferior to others, whilst ten indicates a self-perception of being much superior. Lower scores indicate feelings of inferiority

and negative social comparisons. The scale has been found to have good reliability with student populations (Cronbach's α=.91) (Allan & Gilbert, 1995).

Social Networking Site Usage (see appendix F). Previous research into SNS usage has predominantly focused on Facebook use and amount of time spent on SNS. However, with adolescents now preferring alternatives to Facebook (Miller, 2013) and ways of engaging with SNS changing, this study aimed to investigate the ways in which adolescents engage with this media. Therefore, a novel measure was developed by the researcher. This measure consisted of ten items, the first five assessing active use of SNS (with higher scores indicating more active use, range = 5-25) and the second five assessing passive use (with higher scores indicating more passive use, range = 5-26). The passive and active use subscale scores are combined to generate a total SNS usage score ranging from 10 to 51. Response options are given on a Likert scale and are based on previous research into adolescent SNS usage (e.g. Ofcom, 2016, 2017). Feedback on the appropriateness of questions and response options was sought during the focus group (see below). The Cronbach's Alpha for the scale with the current sample suggests acceptable internal consistency (α=.66).

As this was a joint project two additional measures, the Positive and Negative Affect Schedule (Watson, Clark, & Tellegan, 1988) and the Depressive Experiences Questionnaire for Adolescents (Fichman, Koestner, & Zuroff, 1994) were also used (see Tweed, 2019).

The above measures were set up and completed using the online platform Research Electronic Data Capture (REDCap).

2.5.2. Imagery task measures

Imagery Vividness. After each MI practice participants were asked to report on the extent to which they could (1) hear the voice of the image, (2) see the facial

expressions of the image, (3) visualise the gestures of the image, (4) picture the image interacting with them, (5) give compassion and (6) receive compassion. Responses were recorded on a five-point scale based on the Vividness of Visual Imagery Questionnaire (Marks, 1973) with lower scores indicating greater imagery vividness. Scores from the six questions were combined to produce a total imagery vividness score.

Ability to Focus. Participants were asked "How easy did you find it to stay focused during the imagery task?". Responses were required on a five-point scale ranging from 1 (I wasn't able to focus at all) to 5 (I was able to focus for the duration)

2.5.3. Acceptability of intervention

Participants in the PE and PE+MI group were asked to complete an anonymous feedback form (see Appendix G) at the end of the final session. This asked for participants' experience of how interesting, useful and applicable they found the sessions, measured on a scale of 1 (not at all) to 5 (very), and how likely they would be to recommend the sessions to another young person, 1 (extremely unlikely) to 5 (extremely likely).

2.6. Procedure

2.6.1. Development of materials and measures

2.6.1.1. Focus group

As the study involved the development of a self-compassion intervention, MI task and the SNS usage measure a focus group was conducted with adolescents to ensure these were relevant and acceptable to the population. Fourteen adolescents (three male and eleven female) from Years 12 and 13 attended. Informed consent for participation was obtained at the start of the session (see appendix H).

The session was structured to gain the attendees' opinions (via written and verbal feedback) on various aspects of the study. Feedback was sought on the poster advertisement; the relevance of scenarios devised for the MI task; and the clarity of questions and appropriateness of response set range in the SNS usage measure. Additionally, questions were asked about television programmes and SNS the adolescents used so relevant examples could be incorporated into the intervention.

2.6.1.2. Psychoeducation group materials

For the self-compassion psychoeducation intervention three sessions were developed based on Neff and Gilbert's self-compassion and compassion research (e.g. Gilbert, 2010; Neff, 2003a) as well as recent research on adolescent socio-emotional and brain development (e.g. Blakemore, 2008; Blakemore & Choudhury, 2006). Each session had a different focus: (1) introduction to compassion and self-compassion; (2) self-criticism and self-compassion; (3) negative social comparisons and self-compassion. Prior to running the sessions materials were reviewed by a researcher in the field of self-compassion and adolescence and amendments were made based on her feedback.

2.6.1.3. Self-compassionate imagery task

The researchers devised a script (see appendix I for example female friend script) for the self-compassionate MI task. This was based on the script used in Holden's (2015) thesis. The script was developed from CFT theory and practice, aiming to develop sensitivity to and awareness of the presence of suffering and a commitment to alleviate it (Gilbert, 2010; Gilbert & Choden, 2013). The script asked participants to imagine being compassionate to a friend who was upset using a three-stage compassionate response. This involved (1) validating the friend's distress, (2) redirecting the friend's attention, and (3) memory activation of receiving

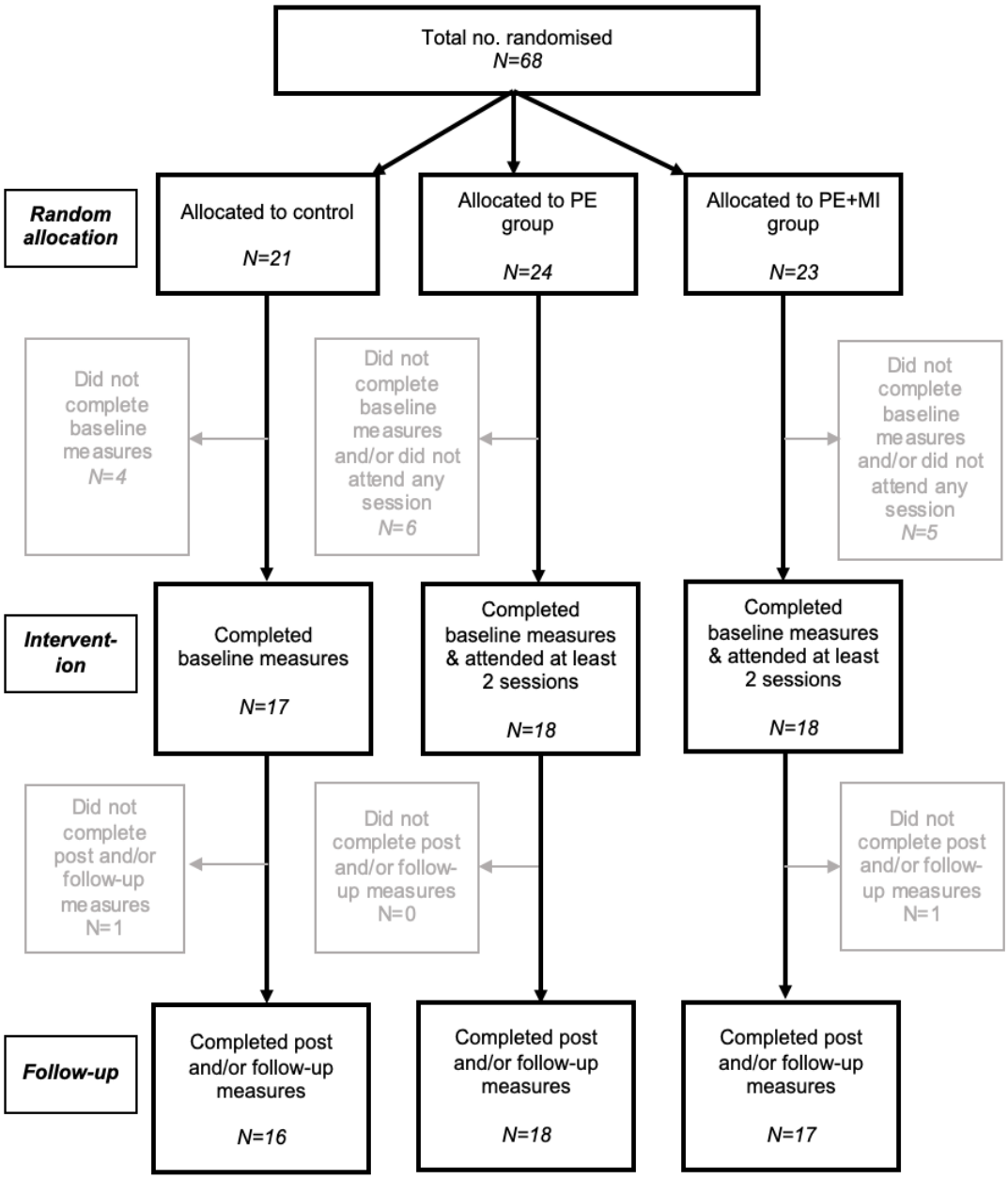
compassion. The imagery script then involved a perspective shift, where participants imagined taking their friend's position. An embodiment phase, where participants engaged in imagined movements from their new perspective, was used to help enhance the experience of perspective shift. Finally, the script instructed participants to imagine receiving the compassionate response that they had initially delivered to their friend. A different scenario was developed for each of the sessions based on feedback from the focus group. Week 1: "Your friend is upset because they feel they did not do as well as their peers in their exams"; week 2: "Your friend has been dumped by his or her partner and is really upset"; Week 3: "Your friend is really upset as they have received some nasty messages from others in your year group". A male friend and female friend version of the scripts were recorded and saved onto MP3 players.

2.6.2. Participant recruitment

Schools were recruited through the researchers' personal links and the study was advertised from the start of the academic year (September 2018). Advertisements consisting of posters and staff promotion and aimed to encourage participation by students who self-identified as self-critical or experiencing negative social comparison. The researchers delivered an information session at each school summarising the rationale for the study, advantages and disadvantages of taking part and briefly what taking part would entail. As an incentive for participation, students who participated were entered into a prize draw for high street shopping vouchers. Students who were interested took a participant and parent/guardian information sheet (See appendices J and K) and could sign up to the study at the end of the session or by emailing the researchers within one week. Students who opted into the study were randomly allocated to one of three conditions (control, PE or PE+MI). Participants within each school were assigned a number and online randomisation software was used to allocate the numbers to three groups. See

Figure 1 for details of participant recruitment and retention. All participants were emailed with details of the group they were allocated to along with a personal link to online consent forms and baseline measures. For those allocated to the intervention groups information about when and where the sessions would take place was also included.

Figure 1. CONSORT diagram of randomisation recruitment process and participant retention



2.6.3. Testing procedure

2.6.3.1. Control group

Participants completed the consent form online, prior to completing the baseline measures and providing demographic details. Measures were completed at three time points, baseline, post-intervention (three weeks after baseline) and follow-up (five weeks after baseline). A link was emailed to participants when the measures were due to be completed.

2.6.3.2. Intervention groups

The intervention ran at the same time each week, over three sessions each lasting up to one hour. All participants completed consent forms and baseline measures online prior to the first session and provided anonymised demographic data at session 1. The same online measures were completed after sessions two and three and at follow-up, two weeks after the final session. Participants were prompted to complete the measures through an email link. Participants were also sent a text reminder on the morning of each session.

Participants in both groups received the same psychoeducation material. Any participants who missed a session were provided with paper or electronic copies of the session materials and were given a brief summary of the session by the researchers. Participants in both interventions completed feedback on their experience of the group at the end of session 3.

Participants in the PE+MI group completed an additional 12-minute imagery task, listening on individual MP3 players, towards the end of each session. In the first session, the researchers explained the rationale for using imagery and reviewed the imagery instructions verbally with the group (see appendix L). Following completion of the imagery task, participants were asked to complete the vividness and focus measures.

2.6.3.3. Inter-session tasks

Participants in the PE group were emailed a personal link to a five- to ten-minute daily practice, where they were required to apply their learning from the session. See appendix M for the three inter-session tasks.

Participants in the PE+MI group were encouraged to complete a shorter (eight minute) version of the MI task practiced in session that week. This excluded the embodiment phase but was otherwise identical to the task practised in session. Participants were emailed a personal daily link to the shortened MI practice and were asked to complete the vividness and focus measures afterwards.

2.7. Statistical analysis

2.7.1. Missing and excluded data

In total 51 participants attended the sessions, completed baseline measures and either post-intervention or follow-up measures (see Figure 1). Of these 43 completed the measures at all three time points, with the remaining eight completing baseline and follow-up, but not post-intervention measures. There were no missing data points on any measures, however five participants' SCS data (one from PE group, four from PE+MI group) were excluded from analyses involving SCS as there was a question to the validity of the responses at all three time points. Additionally one PE group participant's follow-up SCS data was excluded for the same reasons. In these cases, the same mid-point response for all SCS items was given, which the researchers thought was unlikely to be a genuine response. This meant sample size used in analysis of SCS data was smaller than in the analysis of Social Comparison Scale data.

2.7.2. Assessment of normality

An assessment of the normality of the data overall and across groups and timepoints was conducted using skewness and kurtosis data as well as results from Shapiro-Wilk's test (given the small sample size). Visual inspection of histograms for normality was not heavily relied upon due to the small sample size and therefore the increased likelihood of distributions appearing non-normal. Unless otherwise mentioned in the results, all analyses met relevant statistical assumptions. Where violations of normality occurred, transformations were attempted to rectify this. Stem and leaf plots were used to identify outliers. However, outliers were not Winzorised as it has been argued that Winzorising data points means statistical analysis is based on values that should have been provided, rather than those actually obtained (Tukey, 1960).

2.8. Testing hypotheses

To address the study's hypotheses the following analyses were conducted using SPSS Version 25:

1. To test the predictions that low self-compassion and negative social comparison are linked (H1), and that negative social comparison and passive SNS usage are associated (H2) two separate correlational analyses were conducted using the baseline data from the relevant measures or subscales.
2. Prior to conducting ANOVA analyses on SCS and Social Comparison Scale data to investigate change over time and interactions three separate one-way ANOVAs were run on baseline data and age to detect any baseline differences between the three conditions (control, PE or PE+MI).
3. Two separate 3x3 mixed ANOVAs were conducted to investigate change over time and interactions for SCS and Social Comparison data (H3 and

H4). These were run with time (baseline, post, follow-up) as a within-subjects variable and condition (control, PE or PE+MI) as a between-subjects variable.

4. Keeping in mind the exploratory nature of this study, post-hoc comparisons were conducted in the absence of a statistically significant main finding. These tests have greater power to find potential differences across time points and between conditions. Where multiple testing could result in inflation of type I error the Bonferroni correction was used.
5. Effect sizes were calculated using partial eta-squared for findings from ANOVAs and Cohen's *d* for post-hoc comparisons.
6. To investigate whether there was the predicted association between imagery vividness or focus at final session and change in self-compassion and social comparison after intervention (H7), two separate correlational analyses were run. These used the imagery vividness total score and focus score at session 3 alongside change (baseline to follow up) in SCS and Social Comparison Scale score.

Note that no analyses were run to investigate H5 and H6 due to lack of sufficient data.

3. Results

3.1. Participant characteristics at baseline

A summary of participant characteristics at baseline is provided in Table 1. More females than males participated in the study, which is not surprising considering one participating school was a female single sex establishment. This pattern was repeated across the three groups. Mean and median baseline scores for the sample as a whole

were in the mid-range for each measure (SCS M=2.64, SD=.48; Social Comparison Scale M=54.41, SD=13; SNS Total Usage Mdn=22, range=10, 33).

One-way ANOVAs were conducted to examine the baseline data for any significant differences between the three conditions. These identified no difference between the groups in terms of age ($F(2, 40)=1.02$, $p=.371$), baseline SCS score ($F(2, 35)=2.76$, $p=.08$) or Social Comparison Scale score ($F(2, 40)=1.22$, $p=.306$).

Table 1. *Baseline characteristics of participants who provided valid data at baseline and post-intervention or follow-up*

	Total	Control	PE	PE+MI
N	51	16	18	17
Gender (M/F)	12/39	2/14	4/14	6/11
(%)	(24%/76%)	(13%/87%)	(22%/78%)	(35%/65%)
Mean Age	16.5	16.63	16.39	16.47
(SD)	(.64)	(.62)	(.70)	(.62)
Mean Social Comparison Scale	54.41	58.63	50.83	54.24
(SD)	(13)	(11.56)	(13.94)	(12.95)
Mean Self-Compassion Scale *	2.64	2.83	2.53	2.55
(SD)	(.48)	(.34)	(.51)	(.56)
Median Total SNS Usage	22	22	23	20
(Range)	(10,33)	(11, 29)	(13, 31)	(10, 33)
Median Passive SNS Usage	11	11	10.5	10
(Range)	(5,17)	(5, 15)	(7,17)	(5, 15)
Median Active SNS Usage	10	10	11.5	10
(Range)	(5,19)	(6, 16)	(5, 18)	(5,19)

Notes -

*Excluding 5 participants who provided invalid data at baseline (1 from PE group; 4 from PE+MI group)

3.2. Relationships amongst baseline measures

3.2.1. Hypothesis 1: Individuals who are low in self-compassion are expected to have high levels of negative social comparison

To test this hypothesis a Pearson's correlational analysis was conducted on the baseline self-compassion and social comparison data. Correlational analysis found a

moderate positive relationship between baseline SCS and social comparison score, $r(47)=.41$, $p=.004$.

3.2.2. Hypothesis 2: There will be an association between passive use of SNS and greater negative social comparisons

To test this a Spearman's rank order correlation was conducted on the passive use sub-scale of the SNS usage measure and social comparison scores at baseline. This analysis found no significant relationship between the variables, $r_s(51)=-.08$, $p=.56$.

3.2.3. Summary

These analyses suggest that H1 is supported as participants who had lower SCS scores scored lower on the Social Comparison Scale (indicating more negative social comparisons). However, H2 was not supported, as there was no relationship found between increased passive use of SNS and more negative social comparisons. As H2 was not supported no further analysis was done to investigate H5 (a greater decrease in the association between passive use of SNS and negative social comparisons would occur in the PE+MI group compared to the PE or control group) due to H5 being dependent on H2.

3.3. Self-compassion & social comparison: Effects of time and interactions

Two separate 3x3 mixed ANOVAs (see Table 2) were conducted to investigate change over time and interactions for self-compassion and social comparison data. This was to identify if there was evidence to support H3 (there will be an increase in self-compassion and a reduction in negative social comparison in both interventions compared to the control group) and H4 (there will be a greater increase in self-compassion and decrease in negative social comparison in the PE+MI intervention compared to the PE intervention). The ANOVAs were run across the three time

points (baseline, post intervention and follow-up) and the three experimental groups (control, PE group and PE+MI group).

An assessment of the normality of the SCS and Social Comparison Scale scores for each condition at the three time points were completed. In the SCS data a Shapiro-Wilk's test identified non-normally distributed data for the control group at baseline ($W(16)=.824$, $p=.006$). This was the only condition and time point identified as being non-normally distributed. ANOVA analyses are considered robust to violations of normality and non-parametric tests are associated with a loss of statistical power (Harwell, Rubinsteing, Hayes, & Olds, 1992), which would be an issue considering small sample sizes in the groups in this study. Furthermore, studies using simulated data have demonstrated that non-normally distributed data does not bias ANOVA results (Schmider, Ziegler, Danay, Beyer, & Buhner, 2010). Thus an ANOVA was used in analysis, despite violations of normality, but results should be interpreted with caution. Social Comparison scale data from the PE group at baseline was negatively skewed, so a reflection and log transformation were conducted on all the groups and time points within this data set. Although this corrected the initial skewness, it caused further violations of normality in other groups, thus it was decided to accept the initial normality violation and consider results with caution.

In addition to this, two outliers were identified in the SCS PE condition at baseline (values of 1.52 and 3.58) and one outlier was identified in the social comparison PE group at baseline (value of 16). However, these were not Winzorised as justified in the method.

3.3.1. Self-compassion: Hypotheses 3 & 4: There will be an increase in self-compassion in both interventions (PE and PE+MI) compared to the control group and the increase in self-compassion will be greater in the PE+MI intervention compared to the PE intervention

There was no main effect of Time ($F(2, 34)=1.79$, $p=.18$) or Condition ($F(2, 35)=.29$, $p=.75$). However a significant interaction between Time and Condition ($F(4, 70)=4.13$, $p=.005$) was found with a large effect size ($\eta_{2p}=.19$). Bonferroni-corrected post-hoc comparisons found that this interaction was driven by a significant increase in the PE group SCS scores between baseline ($M=2.41$, $SD=.48$) and post-intervention ($M=2.76$, $SD=.7$, $p=.007$, 95% CI [-.62, -.08], Cohen's $d=.92$), which had a large effect size, and a non-significant decrease in SCS score in the control group between baseline ($M=2.83$, $SD=.34$) and post-intervention ($M=2.63$, $SD=.42$, $p=.14$).

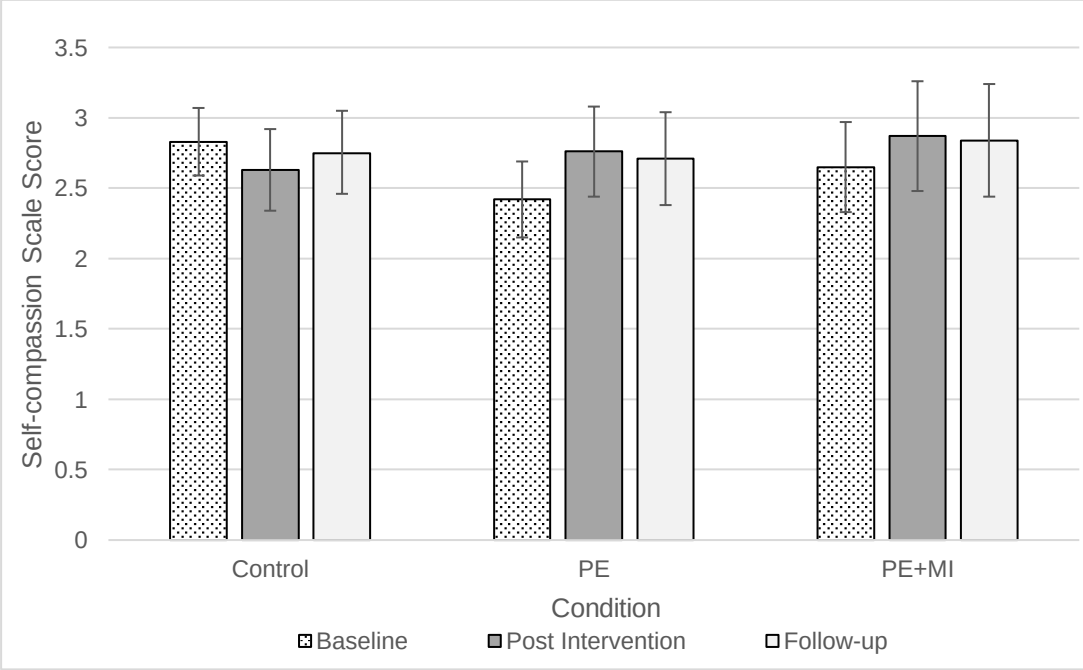


Figure 2. Mean Self-Compassion Scale scores for each condition across timepoints with error bars representing 95% confidence intervals

Bonferroni-corrected post-hoc analysis found no other significant effects. Trends in the data can be seen in Figure 2. The non-significant reduction in SCS score for the PE group from post-intervention ($M=2.76$, $SD=.7$) to follow-up ($M=2.71$, $SD=.73$, $p\sim1$), suggests that the gains made from the intervention were maintained. A similar increase was seen within the PE+MI group from baseline ($M=2.65$, $SD=.65$) to post-

intervention (*M*=2.87, *SD*=.62), but this did not reach significance (*p*=.31). Once again, a non-significant reduction in SCS score from post-intervention to follow-up (*M*=2.84, *SD*=.63, *p*~1) was observed. In the control group, no significant changes across timepoints were indicated, but an inverse trend to the intervention groups was seen whereby SCS scores initially decreased between baseline (M=2.83, SD=.34) and post-intervention (*M*=2.63, *SD*=.42) and then increased at follow-up (*M*=2.75, *SD*=.4).

3.3.2. Social comparison: Hypotheses 3 & 4: There will be decrease in negative social comparison in both interventions (PE and PE+MI) compared to the control group and the decrease in negative social comparison will be greater in the PE+MI intervention compared to the PE intervention

Analysis found no main effect of Time ($F(2, 39)=2.08$, $p=.14$), Condition ($F(2,40)=.14$, $p=.87$) or interaction between Time and Condition ($F(4, 80)=1.13$, $p=.35$).

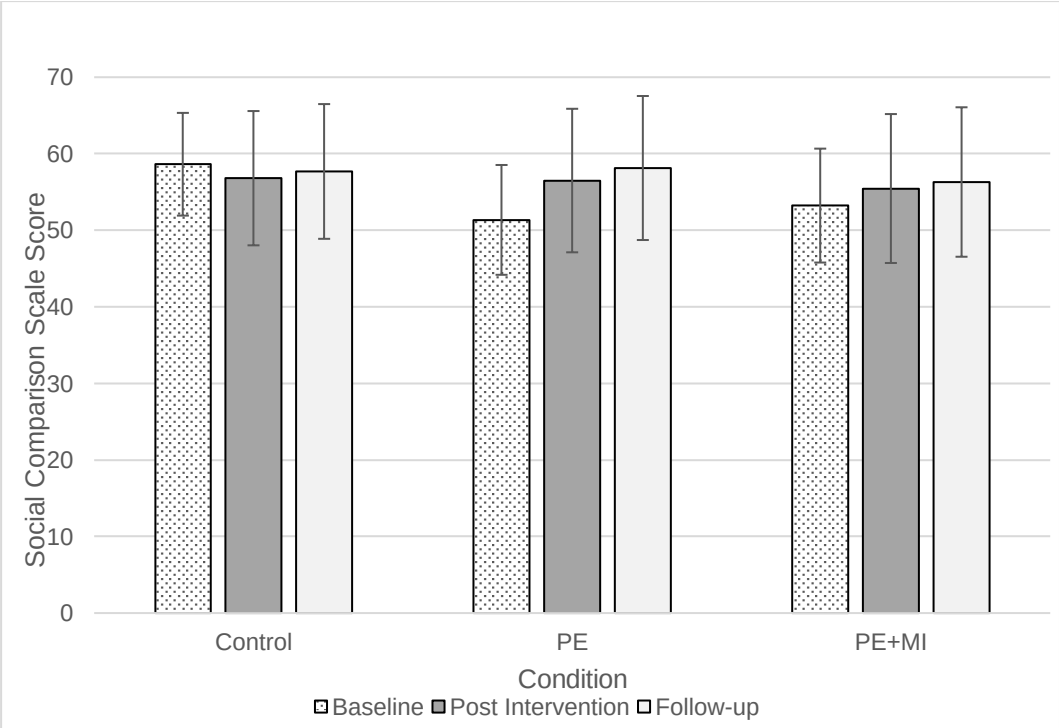


Figure 3. Mean Social Comparison Scale scores across conditions and timepoints with error bars representing 95% confidence intervals

Bonferroni-corrected post-hoc comparisons indicated a significant increase in Social Comparison Scale score in the PE group between baseline (*M*=51.36, *SD*=14.9) and follow-up (*M*=58.14, *SD*=19.59, *p*=.04) with a moderate effect size (95% CI [-13.37, -.21], Cohen's *d*=.69). Although none of the other post-hoc comparisons were significant, the data shows a similar trend to the SCS data. Figure 3 illustrates how scores in the control group reduced between baseline (*M*=58.63, *SD*=11.55) and post-intervention (*M*=56.81, *SD*=17.51), whilst the imagery (baseline: *M*=53.23, *SD*=13.44; post: *M*=55.46, *SD*=14.41) and psychoeducation group scores increased (baseline: *M*=51.36, *SD*=14.9; post: *M*=56.5, *SD*=19.54). However, the change was not statistically significant. Additionally, unlike in the self-compassion data, the follow-up scores show a trend of improvement from the post-intervention scores.

Table 2. *Summary of 3x3 mixed ANOVA results*

	Self-compassion Scale				Social comparison Scale			
Source	***df*** **(*df* error)**	***F***	***p***	**ES**	***df*** **(*df* error)**	***F***	***p***	**ES**
Time	2 (34)	1.79	.18		2 (39)	2.08	.14	
Condition	1 (35)	.29	.75		2 (40)	.14	.87	
Time* Condition	4 (70)	4.13	.005*	.19	4 (80)	1.13	.35	

Notes –
ES - Effect size – partial eta-squared
* significant at p<.05

3.3.3. Summary

These findings suggest that H3 (there will be an increase in self-compassion and a reduction in negative social comparison in both interventions compared to the control group) is only partially supported. From the self-compassion data there was a significant interaction with the PE group showing a significant increase in scores from baseline to post-intervention, whilst the control group showed a non-significant decrease in their scores. However, no significant increase was detected in the imagery group. Although there was a trend towards increased scores between baseline and follow-up in both the PE and PE+MI groups, whilst the control groups scores decreased, this did not reach significance.

From the social comparison data, the only significant change indicated was in the psychoeducation group, where an increase in scores (indicating a reduction in negative social comparison) between baseline and follow-up was found. No significant change in scores was detected in the imagery or control group.

The findings did not support the prediction that there would be a greater increase in self-compassion and decrease in negative social comparison in the PE+MI group compared to the PE group (H4).

3.4. Mental imagery task data

This analysis focused on participants in the PE+MI intervention.

3.4.1. Hypothesis 6: There will be an association between frequency that the MI intervention is practised and increase in self-compassion and decrease in negative social comparison

Only nine of the 17 participants completed the inter-session imagery practice at least once outside of the sessions, thus it was decided further analysis of this association would lack meaning due to lack of power. However, a table of the mean change in Self-Compassion and Social Comparison Scale scores from baseline to follow-up is shown in Appendix D. This shows little difference in the change on the SCS between participants who did not complete any practice outside of sessions and those who did (see Appendix N). Participants who completed at least one inter-session practice showed a larger mean increase in their Social Comparison Scale scores (i.e. a decrease in negative social comparison) compared to those who completed none. However due to the small sample and associated lack of power no further analysis was conducted to test whether differences were significant.

3.4.2. Hypothesis 7: For individuals in the PE+MI group, those who are able to recall the compassionate MI more vividly and with greater focus at the end of the intervention will show greater changes in self-compassion and social comparison

To test this hypothesis four Spearman's rank order correlations were conducted. These correlations examined the relationship between Session 3 Imagery Vividness Total and Ability to Focus scores and change in SCS and Social Comparison Scale scores from baseline to follow-up.

A significant moderate negative correlation was found between Imagery Vividness Total at session 3 and change in Social Comparison Scale score,

r_s(17)=-.54, p=.03. So, participants who experienced the imagery task at session 3 as most vivid (low score on vividness scale), also had the greatest increase in their social comparison scores, indicating reduced negative social comparison.

No other significant correlations were found between variables (see Table 3). However, the negative correlation between Imagery Vividness Total and SCS narrowly misses significance, r_s(13)=-.55, p=.051. Thus there is a near significant trend that participants who experienced the imagery task at session 3 as most vivid, also had the greatest increase in their self-compassion.

Table 3. *Spearman's correlational analysis between imagery vividness or ability to focus in session 3 and change in self-compassion and social comparison scores (from baseline to follow-up)*

	Imagery vividness			**Ability to focus**		
	N	***rs***	***p***	**N**	***rs***	***p***
Self-compassion	13	-.55	.051	13	.40	.17
Social comparison	17	-.54	.03*	17	.22	.39

Notes -
* significant at p<.05

3.4.3. Summary

There was insufficient data to investigate H6 (that those who practised the MI task more frequently would experience greater gains from the intervention), but mean change scores, from baseline to follow-up, comparing participants who did not the inter-session task compared to those who did suggests that there was potentially some benefit gained through practice. However, this data lacked sufficient power for any meaningful further analysis. H7 was partially supported as participants who

reported greater imagery vividness at session 3 also showed a greater reduction in their levels of negative social comparison. There was also an encouraging trend towards those reporting greater imagery vividness at session 3 experiencing greater increase in their self-compassion. However, no significant correlations were found between ability to focus and change in self-compassion or negative social comparison, counter to predictions.

3.5. Acceptability data

The 35 participants who attended the intervention sessions provided feedback on the acceptability of this brief self-compassion intervention (see Table 4).

Table 4. *Summary of responses to acceptability of intervention questionnaire*

	Not at all	**Not very**	**Not sure**	**Quite**	**Extremely**
Sessions interesting	0 (0%)	1 (3%)	2 (6%)	18 (51%)	14 (40%)
Sessions useful	0 (0%)	0 (0%)	9 (26%)	17 (48%)	9 (26%)
Sessions applicable to you	0 (0%)	0 (0%)	6 (17%)	17 (49%)	12 (34%)
	Extremely unlikely	**Quite unlikely**	**Not sure**	**Quite likely**	**Extremely likely**
Likelihood of recommending sessions to another young person	0 (0%)	0 (0%)	6 (17%)	15 (43%)	14 (40%)

Feedback was generally positive, with participants reporting the sessions were quite or extremely interesting (91%) and that they were quite or extremely applicable to the participants (83%). There was a slightly less positive response to whether the sessions were useful to the participants, with 75% reporting the sessions were extremely or quite useful, whilst more than in the previous questions were unsure about the utility (26%). Despite this, the vast majority of the participants were quite or extremely likely to recommend the group to another young person (83%).

Further, evidence regarding the acceptability of the intervention potentially comes from the completion of inter-session tasks. Those in PE Group had a greater overall compliance rate with inter-session tasks (40%) compared to the PE+MI group (19%). Participants could complete practice up to six times each week, but mean weekly compliance was low amongst both groups, with lower completion amongst the PE+MI (M=1.12) group than PE group (M=2.41). Sixty-one percent of the PE group completed over 30% of the inter-session practices, whilst only 29% of the PE+MI group achieved this.

4. Discussion

4.1. Main findings

4.1.1. Effectiveness and acceptability of intervention

This exploratory research with healthy adolescents aimed to investigate the effects of a brief self-compassionate MI task. Based on research regarding the effectiveness of MI in enhancing the therapeutic effects of self-compassion (Gilbert, 2010; Lee, 2005; Shapira & Mongrain, 2010) predictions were made that a self-compassionate MI task would enhance the effects of a psychoeducation intervention, leading to greater self-compassion and reduced negative social comparisons, compared to self-compassion PE alone or control group. Counter to predictions, PE+MI was found to be no more effective in improving self-compassion or reducing negative social comparisons than PE alone or control.

The study found that the PE group showed an increase in self-compassion scores with a large effect size, from baseline to post-intervention, compared to the control group and these gains were maintained at two-week follow-up. The PE group also showed a reduction with a moderate effect size in their levels of negative social comparison from baseline to follow-up. Trends in the data suggested

improvement in both self-compassion and levels of negative social comparison for PE and PE+MI conditions compared to control, but these did not reach significance.

With regards to acceptability of the three-session intervention, the low attrition rate from session one onwards and positive feedback at the final session suggest the intervention was acceptable. However, there are questions over the acceptability of the MI and inter-session task. These issues are explored below.

There is evidence from adult populations that brief psychoeducational self-compassion interventions can be effective at enhancing self-compassion (Smeets et al., 2014). This does not, however, explain why the PE+MI group, who experienced the same psychoeducation sessions did not show a similar increase in self-compassion and decrease in social comparison as the PE group.

The PE sessions may have been more acceptable and therefore effective, than the PE+MI. Within sessions, anecdotally, researchers were unsure as to how engaged participants were in the MI task, noticing some participants appearing to finish the task early, before the full 12 minutes of the MI recording had run, or not appearing focused and this being reported on the post-MI measures. Similar issues have been noted with CFI tasks, where participants have complained of boredom and fatigue during the repetition of an MI task (Rockliff, Gilbert, McEwan, Lightman, & Glover, 2008). That study was with a non-clinical adult sample completing a 5-minute MI task, therefore the current study's requirement of adolescents to concentrate for a 12-minute MI task may have been too demanding. Furthermore, there may have been acceptability issues with the inter-session tasks. Large variations have been found in the time spent practicing compassionate MI when healthy adult participants were given the freedom to choose (McEwan & Gilbert, 2016). This has led to the suggestion that CFT may be more acceptable to individuals in a clinical setting, where interventions are expected (Leaviss & Uttley, 2014). However, the current study findings suggest that the type and/or length of the inter-session task may impact on the acceptability. Inter-session practice was more

frequent and more likely in the PE group compared to the PE+MI group, possibly because the tasks were less arduous, for example, noticing and writing briefly about when they had witnessed self-compassion, compared to an 8-minute MI task.

Although the PE inter-session tasks were designed to be innocuous, they may have enhanced participants' self-compassion and reduced their negative social comparisons. The tasks have some similarities with other "light touch" interventions that have been found to be effective, such as monitoring of mood and brief practices from the BodiMoji App (Franko et al., 2016) and online self-compassion diary exercises (Shapira & Mongrain, 2010). Most effective intervention studies designed to enhance self-compassion include experiential exercises and/or mindfulness meditations, alongside psychoeducation, so it is difficult to identify which is the active ingredient. However, there is some evidence that psychoeducation-based self-compassion interventions can be effective in improving self-compassion, optimism and reducing self-criticism and rumination (Mosewich, Crocker, Kowalski, & DeLongis, 2013; Smeets et al., 2014). Therefore in line with this study's findings it may be sufficient to provide psychoeducation about self-compassion to produce some change for non-clinical groups.

One final issue to consider in explaining these findings is that the PE group's baseline SCS and Social Comparison Scale score was lower than the control or PE+MI groups. Although analysis detected no difference between the conditions on these baseline scores, this lower starting point may have contributed to significance in the SCS Condition and Time interaction with the control group and the significant increase in Social Comparison Scale score from baseline to follow-up.

4.1.2. Utility of MI task

It was not possible to examine the utility of the inter-session MI practice with regards to outcomes for self-compassion and social comparison due to low completion

rates. Research that has found positive effects of CFI with non-clinical groups reported higher compliance with inter-session practice (Kelly, Zuroff, Foa, & Gilbert, 2010; McEwan & Gilbert, 2016) than reported in this study. Therefore, lack of practice may in part explain the reduced impact of the PE+MI condition.

The current study found that vividness of MI was linked to reduced negative social comparison, but the relationship with self-compassion narrowly missed significance. As this is correlational analysis it is not possible to identify causal pathways. Previous research has shown that self-compassion imagery interventions are more effective for those who experience more vivid imagery (Kelly et al., 2010), suggesting greater imagery vividness may lead to greater gains for participants. However, trait characteristics may also influence ability to engage in compassionate MI. Studies have shown that people who experience high levels of self-criticism find it harder to generate vivid self-compassionate imagery compared to those with low levels of self-criticism (Gilbert, Baldwin, Irons, Baccus, & Palmer, 2006; Gilbert & Irons, 2004). Thus it maybe that participants who were more self-critical at baseline and so experienced more negative social comparisons, were less able to generate vivid imagery and benefit from this intervention. No relationship was found between ability to focus during the intervention and change in self-compassion or social comparison scores, suggesting that ability to focus was not linked to change in outcome measures.

4.1.3. SNS use & social comparison

No association was found between passive SNS usage and levels of negative social comparison, contradicting H2. However, findings from studies examining the effects of SNS are inconclusive with some studies finding that passive use of SNS does not result in greater negative social comparison (Lin & Utz, 2015; Verduyn et al., 2015). Furthermore, there are a multitude of individual differences that research suggests can moderate the relationship between SNS usage and its effects. These include,

social comparison orientation, popularity and gender (Nesi & Prinstein, 2015; Vogel, Rose, Okdie, Eckles, & Franz, 2015) . Thus the lack of findings in the current study may reflect a genuine lack of relationship between passive SNS use and social comparison or a lack of accounting for moderating factors.

4.1.4. Relationship between self-compassion and social comparison

The current study found a moderate relationship between lower levels of self-compassion and greater negative social comparison. Self-compassion has been linked with reduced social comparison in adults (Neff & Vonk, 2009) thus a similar findings amongst adolescents is unsurprising. Although this correlation cannot demonstrate a causal effect, previous research with healthy adults suggests that increases in self-compassion are linked to reduced consequences of negative social comparison, such as self-criticism and shame (Johnson & O'Brien, 2013; Matos et al., 2017). Furthermore, adolescence is a period when social comparison and peer feedback are integral to the self-evaluations young people make (Harter, 1999) thus it appears as though enhancing self-compassion could soothe the high levels of negative social comparison adolescents are more prone to experience.

4.2. Limitations

The study has several limitations. Firstly, there were significant issues relating to the study's power. Difficulties with recruitment and then obtaining complete data from participants, meant that the study was underpowered. A power analysis had suggested recruiting 72 participants, meaning the analysis of data from the 51 participants recruited may fail to detect the possibly small effects expected from an exploratory study such as this. Furthermore, non-normality of the data within some of the groups has affected the degree of certainty with which conclusions can be drawn. However, these violations of normality may be the result of the small sample.

Thus a larger sample would have resulted in more powerful analysis and confidence in the findings. The PE+MI group in particular was affected by lack of power and excluded data, thus in some analyses only nine participants' data could be included. This is a significant limitation of the study and affects the power and conclusions that can be drawn. The researchers attempted to recruit another school, once it became apparent that the study would be underpowered, but these attempts were unsuccessful. However, even if the target sample size had been met, the small sample from a limited number of schools would still have limited generalisability of the findings to a wider population.

Further limitations regarding this study come from the sample. The researchers targeted advertising and promotion of the study towards highly self-critical adolescents and those who felt they experienced excessive negative social comparisons. However, the mean baseline SCS and Social Comparison Scale scores suggest that the sample did not reflect this. Evidence suggests that those who are highly self-critical show greater improvements in symptoms following self-compassion interventions than those low in self-criticism (Kelly et al., 2010; Shapira & Mongrain, 2010). Thus many of the participants in the study may not have benefitted as much as the target population may have. This limitation could have been avoided by screening participants' levels of self-compassion prior to accepting them for the study. This was considered by the researchers, however, due to time constraints and the possible negative impact on recruitment it was decided against.

Potential contamination through participants sharing materials with friends who were in another condition is an added limitation. Participants were reminded each session not to share materials or discuss the intervention until their involvement in the study was complete. However, there could be no guarantee that participants adhered to this request. In future, researchers may wish to randomly allocate an individual school to each of the three conditions, rather than applying all three conditions within each school. This would avoid potential contamination;

however, care would need to be taken to ensure comparability across the three schools recruited.

Another limitation is the study's reliance on self-report data. All of the measures used within the study are susceptible to error based on the participants' understanding of the questions, social desirability bias and introspective ability. The exclusion of some self-compassion data due to possible issues of validity raises the question as to the acceptability and comprehensibility of the SCS for at least some of the participants in the study. Objective physiological measures, such as heart rate variability or cortisol levels, could have been used instead of self-report measures to assess changes in self-compassion. Such techniques have been used in previous studies to detect activation of the "soothing affect system" in compassion (Cosley, McCoy, Saslow, & Epel, 2010; Matos et al., 2017; Rockliff et al., 2008). Furthermore, there are significant limitations with using self-report data to obtain valid measurement of SNS use, as such data is unreliable (Scharkow, 2016). A mobile phone application that measures SNS usage would have produced accurate data, however would have potentially raised further ethical and practical issues. There may also be issues with using the Social Comparison Scale (Allan & Gilbert, 1995) in this study, as it has not been validated with adolescents. There is an Adolescent Social Comparison Scale (Irons & Gilbert, 2005), which the researcher initially planned to use. However, concerns about the validity of the scale meant a decision was made to use the original adult version.

Finally, there were limitations relating to the acceptability and practicality of the sessions and inter-session tasks. Firstly, it is possible that there were differences in the delivery of psychoeducation materials between the PE and PE+MI groups due to the practicalities of conducting research within a tight school schedule. Both interventions ran within a one-hour timeslot, with the PE sessions due to be shorter than the PE+MI, who had the additional MI task each week. However, often sessions started late due to researchers not having immediate

access to facilities and participants arriving late from previous lessons. This is likely to have had more of an effect on the PE+MI sessions, where it was difficult to fit the material in to a session shorter than one hour. Thus some of the activities may have been elaborated less than in the PE group. Furthermore, there are questions regarding the acceptability of the inter-session task. Across both groups overall completion was less than 50%, but was particularly poor for the PE+MI group. As a result of this it was not possible to explore if inter-session task completion was associated with gaining greater benefits from the sessions. Anecdotally, researchers experienced some participants commenting that the PE+MI inter-session task felt very repetitive, as it was the same clip each day. To ameliorate this, a shorter version of the MI task could have been developed with different scenarios every couple of days.

4.3. Implications for future research

To enable stronger conclusions to be drawn regarding the effectiveness of brief self-compassion interventions with healthy adolescents future studies should aim to address the major limitations of this study. A larger sample would generate a more powerful study and allow stronger conclusions to be drawn. As this is an exploratory area of research future studies may benefit from screening participants prior to accepting them to identify a cohort who are high in self-criticism and negative social comparison. This would increase the likelihood of detecting an effect of the intervention. This would also be useful in investigating whether hypotheses from this study are more applicable to vulnerable adolescents, rather than the general population. For example, perhaps passive SNS usage is linked to greater negative social comparison amongst more self-critical adolescents. To enhance acceptability of the MI task and practice, a shorter version could be used in future studies. Also, greater parity between the PE and PE+MI groups could be generated by including a

control MI practice for the PE group. This would enable further investigation as to what the key components maybe in bringing about change, as well as removing potential confounds around length of intervention session and differences in acceptability of inter-session practice.

The current study focused on whether a self-compassion intervention can reduce negative experiences of adolescence, such as negative social comparison. However, it would be equally useful to see if such interventions enhance aspects of wellbeing associated with adolescence, such as such as social connectedness and ability to cope with academic failure.

4.4. Clinical implications

The increased prevalence of mental health issues in adolescents in England in recent years (Sadler et al., 2018) and limited access to Child and Adolescent Mental Health Services (Children's Commissioner for England, 2016) means schools are holding increased responsibility for adolescent mental health and wellbeing. As a result, schools are investing more in universal interventions that enhance protective factors and increase resilience in their students (Mackenzie & Williams, 2018). Thus, this study is well placed to add to the growing body of research in this area with the unique perspective of examining what the active ingredients of an intervention are. The findings from this study suggest that universal self-compassion-based interventions could be useful for adolescents, improving their self-compassion and reducing their levels of negative social comparison. The important aspect of the intervention appears to be the psychoeducative element and such sessions appear to be acceptable to adolescents in terms of how interesting, useful and applicable to them they are. The findings suggest the imagery component of such a brief intervention is unnecessary to bring about change in self-compassion or social comparison and that adolescents maybe less motivated to

practise MI outside of sessions. A purely psychoeducation group would make the intervention more accessible to schools, not having to set-up and invest in equipment needed to run the MI component. However, there was some evidence that greater improvement in negative social comparison was seen amongst those who reported greatest imagery vividness during the MI task. Therefore it could be that self-compassionate MI is helpful to some adolescents. Despite the possible utility of this intervention in schools it is important to consider these conclusions with caution due to the methodological limitations identified above.

4.5. Conclusion

This brief self-compassion psychoeducation intervention was effective in increasing self-compassion and reducing negative social comparisons amongst healthy adolescents without the need for a self-compassionate MI intervention. Additionally, an association was found between vividness of MI and reduction in negative social comparison. The intervention was deemed acceptable by the adolescents who participated, but the strength of the conclusions drawn is limited by under-recruitment and thus underpowered analysis.

The findings from this study add to a growing body of literature regarding the utility of self-compassion amongst adolescents. This study is unique in examining the role that MI may play in enhancing self-compassion and in investigating the effect of self-compassion on social comparisons, which impact on adolescents' self-evaluations. The increasing demand from schools to find evidence-based interventions that enhance young people's wellbeing highlights the need for further research into the potential role such self-compassion interventions could have in reducing vulnerability to mental health issues in adolescence.

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Part Three: Critical Appraisal

1. Introduction

In this appraisal I will focus on reviewing the empirical paper. I will begin by considering the professional and personal experiences I have had that led to my interest in adolescent mental health and this research project. I will then reflect on design decisions related to the measures chosen before considering the practicalities of conducting research in a school. This includes issues faced in recruitment of schools and the potential influence of the research context. Finally, I reflect on the wider issues regarding research within schools and adolescent development that have occurred to me during the research process.

2. Situating myself in the research

Prior to working within a mental health context, I was a secondary school teacher. My experiences of working within an education setting have greatly influenced my clinical and research interests as a Trainee Clinical Psychologist. In teaching I worked with young people struggling with a range of difficulties, from more typical adolescent experiences, such as difficult peer relationships to significant clinical mental health issues. I witnessed the impact for nearly all students of the stress of academic demands and high-stakes exams, where year on year expectations from Ofsted were that achievement would improve. This was a pressure undoubtedly experienced by the staff and passed on to the students. Reflecting on these experiences at the time I felt helpless in how to support young people facing the difficulties of both typical and atypical adolescence in a context that put so much pressure on them. As a result of these experiences, when it came to choosing a research project for my thesis, I was keen to find one that involved consideration of adolescent mental health and wellbeing. Thus I was drawn to conduct a joint project with Riona, as she wanted to develop a brief group-based intervention to enhance self-compassion in adolescents.

3. Design decisions

In the design of any empirical research there are inevitably compromises to be negotiated between what would be optimal from a validity perspective to draw firm conclusions, and what is practically feasible in the scope of the project (Barker, Pistrang, & Elliott, 2002).

In the process of designing and conducting the study a number of potential issues arose regarding the measures used. Firstly, participant completion of the Self-Compassion Scale (SCS; Neff, 2003) led to questions regarding its acceptability or comprehensibility in this study. Six participants completed it in a way that appeared invalid (i.e. providing the same middle response for each item across each time point). It was not possible to find out from the participants why they had completed the scale as they did therefore I put forward some hypotheses here. The 26-item scale was the longest measure used in this study, and it may be that on seeing its length some participants lost motivation and did not complete it properly. However, it was the first measure participants completed in the online battery and all the following measures appeared to be completed appropriately. It would seem strange for boredom effects to be present so early on in the measures and then disappear. Another possibility is the comprehensibility of the scale. Although the SCS has been validated on adolescents (Cunha et al., 2016) we did not screen participants' language ability due to all the participants being enrolled in A-Level or BTEC courses, which require English GCSE Grade 4. However, it may be that participants with a specific learning difficulty or lower English ability struggled to understand some of the concepts in the scale. Upon reflection, it would have been useful to check the acceptability of the length and comprehensibility of all the measures used at the focus group prior to the research being undertaken.

There were also issues relating to the use of the Social Comparison Scale (Allan & Gilbert, 1995), which has been validated on young adults and clinical

groups (Allan & Gilbert, 1995; Gilbert & Allan, 1998), but not adolescents. Initially I had decided to use the Adolescent Social Comparison Scale (Irons & Gilbert, 2005), however prior to data collection, I realised there were potential validity issues with this measure. The scale is adapted from the adult Social Comparison Scale and is made up of a list of similar bipolar constructs, where participants respond along a 10-point scale as to how they feel about themselves compared to friends. Lower scoring responses indicate a feeling of inferiority and more negative comparison and higher scoring responses indicate a feeling of superiority and more positive comparison. In reviewing the scale after piloting the battery on myself I realised that some constructs appeared to be reversed, for example “compared to your friends how much do you feel left out?” with “less left out” (a positive social comparison) scoring 1 and “more left out” (a negative social comparison) scoring 10. However, the scale scoring instructions did not suggest any items should be reverse scored. On other items it was not clear which end of the bipolar construct would be considered the more positive comparison, for example “compared to your friends how quiet are you?” or “how different are you?”. Thus I was left wondering about the validity of the scale and could find no papers highlighting these issues. Therefore I decided to use the more well-established adult version of the scale, which has been validated on university students.

4. Practicalities of research

4.1. Recruitment of schools

Having previously worked as a teacher and maintained links with staff I worked with I did not foresee recruitment of schools to be a particular issue. Nevertheless, the experience of school recruitment has made me extremely appreciative of the links I was able to use and grateful to the staff who invested their time in the study. Initial contact with schools, to begin the recruitment process, was made in October 2017,

nearly a full year before we planned on running the intervention. We aimed to recruit three schools, hoping to recruit 30 participants from each school. I approached seven schools through links I had, and although all were interested, only four were in a position to support the project and we eventually only met with three as these schools all agreed to participate in the study at the first meeting. Having an awareness of the demands placed on students and teachers across Years 12 and 13 (the A-Level course) meant I had thought carefully about how to make the intervention acceptable to schools. I believe this helped us recruit the schools we met with alongside the research evidence for enhancing self-compassion and the staff having the vision and experience to see the potential utility of the intervention, having supported adolescents struggling with high levels of self-criticism and social comparison. To enhance the feasibility and acceptability of the project we proposed running the study early in the academic year, before focus on university applications and A-Level exams grew and running the intervention during lunch times to avoid students missing lessons. In addition to these suggestions, Riona and I were willing to be flexible to meet the needs of the different schools. For example, despite no research requirement to gain parental consent, one school stated they required this for the intervention to proceed. Although we were concerned that needing parental consent may be a barrier to recruitment, we worked with the school to find the most practical way of managing this process. Ultimately, looking at participant numbers across the schools, requiring parental consent did not appear to affect recruitment and we obtained a similar sample size from each school.

Although we successfully recruited the number of schools we aimed for, we overestimated how many students we would be able to recruit from each school. We had aimed to recruit 30 participants from each school but managed only around 20. Thus it may have been useful to have recruited a fourth school initially. However, considering the schools' preferred timetable of completing the study early in the academic year (before the end of October 2018) and the constraints around the time

Riona and I had available to deliver the intervention (two days a week) running the intervention in a fourth school simultaneously would have been incredibly difficult to manage. As a result, when we realised the study was underpowered in October 2018, we attempted to recruit one further school. We approached nine schools, including the previous schools that had been interested and some schools where we had more tenuous links. However, we had a much lower response rate with most schools not responding to our emails. My link to the fourth school who had previously been interested (the headteacher) had left, another school responded stating they had already committed to two other research projects this academic year and could not stretch to a third, whilst a third responded saying that due to restructuring they were not in a position to help. This experience has highlighted to me the need to approach schools well in advance of when the research needs to be conducted and the potential need to consider under recruitment at the planning stage of the study. We could have tried to recruit a fourth school as a potential reserve when recruiting the initial three schools. It would also seem that recruitment was most successful in schools where I had a strong personal link to a member of staff in the middle or senior leadership team. This is likely to be because in addition to them knowing the researcher to be a reliable and responsible professional, it meant there was a member of staff who held sufficient responsibility in the school to take the research forwards.

4.2. Influence of research context

One reflection I had from running the study across different schools was the different levels of apparent engagement from students at different schools. The experience Riona and I had was that students from School One were more actively engaged and interested in the material than the other two schools. Research suggests that context can be an important factor in influencing human behaviour (Darley & Batson, 1973; Hartshorne, May, & Shuttleworth, 1930) and so I wondered

if, as the research took place in the students' school, within school time, using materials often used in lessons (PowerPoints and handouts) and with an adult (a position of authority) running the session, that the sessions emulated the dynamics within the lessons in the school. School One, where participants appeared more engaged and vocal, was a selective girl's school. As such, the students were all academic high achievers and they acknowledged that they were often told this by their teachers. These students may have had more encouragement or expectations from teachers to express their ideas in lessons and thus had more confidence in the group discussions that took place in the intervention sessions. In comparison, the two other schools were mixed comprehensives where teachers would have to tailor lessons to a broader range of abilities. Perhaps in this environment students face less expectation or encouragement to discuss or question material taught to them.

I was also aware that the context of conducting research in schools could influence my behaviour as well, leading me to adopt a "teacher" role again. This may in some ways have enhanced the sessions I ran, such as experience in delivery of information to adolescent audiences and being more comfortable managing apparent disinterest with a group of adolescents. However, I was also aware that adopting a "teacher" role could increase the distance between myself as a researcher and the participants. An important part of face-to-face research is bridging the researcher-participant boundary to ensure effective communication (Ryan & Golden, 2006). Thus I was careful to reflect on how I was being received by the participants and tried to be less formal than I would have been in a teacher role. For example, I shared personal experiences of social comparisons I made as an adolescent to aid psychoeducation and deferred to participants as experts in their experiences rather than hold onto the expert position as a teacher.

Although the positivist approach often taken by quantitative researchers attempts to control the experimental environment and minimise confounding factors (Ryan & Golden, 2006), this approach fails to acknowledge that face-to-face

research cannot take place within a vacuum and there is a dynamic that inevitably develops between participant and researcher (Finlay, 1998). Thus the difference in perceived engagement of students at the schools may have also affected how Riona and I interacted with the respective groups and led to reciprocal feedback loops. Whilst I enjoyed delivering all the sessions I ran, I particularly liked and looked forward to sessions at School One and Riona reported a similar experience. Hence it is possible that our enthusiasm and encouragement resulted in more engagement from the students, leading to our greater enjoyment of the sessions. In a similar manner to how the therapeutic relationship can enhance change in therapy (Norcross, 2002) I wonder if there is the possibility that the "common factors" of a good therapeutic alliance may have influenced how much participants felt they benefitted from the intervention. Furthermore, from educational research there is evidence that students obtain more enjoyment and learn more if they are active contributors to class discussion (Wade, 1994). Thus differences in student engagement across the schools may have impacted on the utility and effectiveness of the sessions for the participants.

5. Wider issues of research with schools

The process of and issues with recruiting schools has led me to reflect more widely on conducting research with adolescents and potential difficulties for other novice researchers. Whilst more experienced researchers may already have built up links with local schools, early career researchers may be restricted in their ability to access adolescent participants due to lack of connections. Secondary schools have the potential to be a significant resource for researchers wanting to recruit healthy adolescent populations as there is the potential to access large numbers of adolescents, with relatively easy access to parents for parental consent, where needed.

There are growing concerns about adolescent wellbeing (Patalay & Fitzsimons, 2017; Sadler et al., 2018) and the environment young people are growing up in, such as the impact of unregulated access to inappropriate material online (Daine et al., 2013; Owens, Behun, Manning, & Reid, 2012) and ever-increasing school-related stress (Hutchings, 2015). As such, there is important research that could be done in schools to help understand these issues, identify potential risk and protective factors and develop interventions to support adolescents. However, teachers and school leadership teams are already balancing multiple demands. These range from day-to-day tasks, such as planning and delivering lessons, monitoring student progress, providing pastoral support and monitoring quality of teaching and learning in the school, to overarching demands through the school year, such as meeting government achievement targets, preparation for Ofsted inspections and delivering interventions for students who are underachieving. Thus understandably, members of senior leadership teams often have little energy or capacity for encouraging or getting involved in research opportunities when they arise.

From my experience of school-based research, the majority of schools who responded were interested in the research, but it was practical factors that prevented them from becoming involved in the project. This may have various impacts on school-based research. Firstly, it may mean the type of school to get involved in research is limited, with those rated as “Good” or “Outstanding” by Ofsted potentially being involved more often as they are under less scrutiny than those that “Require Improvement” or are “Inadequate”. Additionally, research that is less demanding of staff time and resources may be more likely to be acceptable to schools. Thus cross-sectional studies making use of self-report measures may be more frequently conducted. Such studies, although useful, as seen in my literature review have significant limitations when trying to draw strong conclusions. This means more resource-heavy or school-integrated studies, such as participatory

action research (PAR), which involves incorporating participants collaboratively in the research process and generation of new knowledge (Reason & Bradbury, 2001), are less likely to be conducted in schools. This is potentially a missed opportunity as PAR could be highly relevant in educational settings and bring about more meaningful learning and change for staff and students than traditional research (Jacobs, 2016).

Studies such as my thesis, which trial a novel intervention may also be less likely to be conducted in schools due to the time and effort required on the part of senior staff to organise and run the study. However, increasingly government initiatives, such as Every Child Matters (Department for Education and Skills, 2003) and Social and Emotional Aspects of Learning (Department for Children Schools and Families, 2007), are placing more responsibility on schools to support young people's wellbeing and mental health, which means schools are looking for universal interventions, designed to prevent the occurrence of difficulties – as in an "inoculation" metaphor, to support students. Thus well-designed, rigorous studies need to be conducted on such interventions to aid schools in providing evidence-based support (Vostanis, Humphrey, Fitzgerald, Deighton, & Wolpert, 2013). Unfortunately, this appears to be an area with a dearth of research in the UK, with most studies conducted in Australia, the USA and Canada (Mackenzie & Williams, 2018). Large differences in relation to education system funding, political drivers and curriculum pressures mean it is questionable as to how generalisable findings from intervention studies conducted abroad are to interventions delivered in UK schools. One recent systematic review of universal, UK-school-based interventions to promote wellbeing has been conducted (Mackenzie & Williams, 2018). This review included UK-based studies conducted between 2000 to 2016 and found only seven studies conducted in secondary schools. These interventions covered bespoke mental health education, Cognitive Behaviour Therapy groups and mindfulness-based interventions, but none incorporated self-compassion. Furthermore, survey

data from schools in England suggest that two thirds of schools are implementing universal wellbeing interventions, but these are largely non-evidence based (Vostanis et al., 2013). Consequently there is clearly a significant need for further research to be done into wellbeing interventions in real-world settings, such as schools, to ensure that such groups are effective and not detrimental to adolescents.

In furthering the research in this area, there needs to be careful consideration about the sustainability of running such interventions. At two of the schools where our self-compassion study was conducted, staff members showed an interest in making the intervention sustainable should there be evidence that it was effective. They suggested running the intervention themselves with other year groups and asked whether they could shadow the sessions. However, due to the staff's limited availability and other demands on their time this was unable to happen. Following data analysis, the materials from the study were made available to the schools involved and Riona and I have offered advice and support should they wish to conduct the intervention again. Staff from two of the schools have contacted us as they wish to take the intervention forward as part of their Personal Social and Health Education programme, which is extremely positive. Nonetheless, it will rely on the interest and effort of these specific staff members to take this forward and there will remain a question as to the fidelity of the schools' use of materials to the original intervention.

Adolescents spend around 30 hours a week in school and so schools and their staff are well-placed to provide psychoeducation on mental health and support universal wellbeing interventions. To aid teachers in this role, since 2016 Initial Teacher Training courses have incorporated modules on mental health awareness (Department for Education, 2016) and the government have pledged that by 2020 all secondary schools will be given mental health training and have a mental health champion (Public Health England, 2017). However, these measures do not assist

school leaders in education in assessing the quality of wellbeing interventions or consideration of how to weigh up evidence for different interventions. Furthermore, despite these measures both trainee and qualified teachers still report they do not feel they have sufficient training to support or provide information for students about mental health issues (Glazzard, 2018; National Education Union, 2019). It has been suggested that currently a whole school approach to student wellbeing is undermined by lacking appropriately trained staff and adequate support in terms of staff willingness and funding for training (Mental Health Foundation, 2018; O'Reilly, Svirydzenka, Adams, & Dogra, 2018; YoungMinds, 2017). Thus there appears to be a circular issue of needing sufficiently trained staff to deliver wellbeing interventions, but that schools lack the finances and the interest from staff (possibly due to high workload) to implement training. This in itself raises further issues. If wellbeing initiatives are not embedded within a school ethos and are the responsibility of a single member of staff these interventions will only exist as long as the staff member remains at the school and will only be effective if the school allows sufficient time for interventions to be delivered as designed.

6. Conclusion

This critical appraisal has provided a useful opportunity to reflect on my experience of the research process. Although significant resistance to reflexivity remains amongst a large section of quantitative researchers (Millen, 1997), I have found the process of writing this reflective critical appraisal helpful. It has enabled me to think in greater detail about design decisions taken and how such issues could be rectified. It has also given me scope to reflect on the process of conducting research in schools and the potential impact of the researcher-participant relationship and the research context. Finally, it has provided the opportunity to consider how my experiences may relate more widely to research within schools and the systemic

barriers that may exist, which could be limiting the progress and range of research in the area of adolescent wellbeing. I hope that some of these reflections may be of use to other novice researchers in the field.

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Appendices

Appendix A: Quality Assessment Scale

ADAPTED FROM NEWCASTLE-OTTAWA QUALITY ASSESSMENT SCALE (COHORT & CROSS-SECTIONAL STUDIES)

Italics represent changes from the original assessment scale

Selection (*Max 9 stars*)

1. Representativeness of the exposed cohort
   a) Truly representative of the average *secondary school-age adolescent* in the community *
   b) Somewhat representative of the average *secondary school-age adolescent* in the community *
   c) Selected group of users (e.g. volunteers, *specific group of adolescents, such as those with a learning disability*)
   d) No description of the derivation of the cohort

2. *CRITERION (SELECTION OF THE NON-EXPOSED COHORT) REMOVED AS NOT APPLICABLE TO CURRENT REVIEW*

3. Sample size:
   a) Justified and satisfactory *
   b) Not justified

4. Non-respondents:
   a) Comparability between respondents' and non-respondents' characteristics is established, *or* the response rate is satisfactory *(>80%*) *
   b) The response rate is unsatisfactory (<*80%*), or the comparability between respondents and non-respondents is unsatisfactory
   c) No description of the response rate or the characteristics of the responders and the non-responders

5. Ascertainment of exposure *for stress, depressive symptoms & any other related factors*
   a) Validated measurement tool **
   b) Non-validated measurement tool, but the tool is available or described *
   c) No description of the measurement tool

6. *CRITERION (DEMONSTRATION THAT OUTCOME OF INTEREST WAS NOT PRESENT AT START OF STUDY) REMOVED AS NOT APPLICABLE TO CURRENT REVIEW*

Comparability (Max of 2 stars)

1. Comparability of cohorts on the basis of the design or analysis *or confounding variables controlled for (where no comparison of groups)*
   a) Study controls for *one relevant variable* *
   b) Study controls for any *relevant variable* *

Outcome (*Max of 5 stars for longitudinal studies & 3 stars for cross-sectional*)

1. *CRITERION (ASSESSMENT OF OUTCOME) REMOVED AS NOT APPLICABLE TO CURRENT REVIEW*

2. Statistical test:
   a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value) *
   b) The statistical test is not appropriate, not described or incomplete

3. *How was missing data accounted for?*
   *a) Amount of missing data stated **and** method used to account for this data in analysis described ***
   *b) Amount of missing data stated **or** method used to account for missing data in analysis described **
   c) No mention of amount of missing data or how it was accounted for in analysis

4. Was follow-up long enough for outcomes to occur (*Longitudinal studies only)*
   a) Yes (*3 months after baseline*) *
   b) No

5. Adequacy of follow up of cohorts (*Longitudinal studies only)*
   a) Complete follow up - all subjects accounted for *
   b) Subjects lost to follow up unlikely to introduce bias (small number lost, < *25%*) or description provided of those lost) *
   c) Follow up rate (<*75%)* and no description of those lost
   d) No statement

Appendix B: Details of Collaboration in a Joint Project

The empirical research reported in this thesis was conducted as part of a joint project with Riona Tweed, another trainee Clinical Psychologist at UCL. Riona's part of the research project aimed to investigate the effect of the self-compassion intervention, with and without self-compassionate imagery, on self-compassion, self-criticism and state mood. Further details on this project can be found in her thesis submission: Tweed, R. (2019). *Cultivating self-compassion and reducing self-criticism in a brief intervention for adolescents*. *Unpublished doctoral dissertation*. University College London, London.

Here details of how the research workload was allocated and the aspects conducted independenrly are provided:

Aspects of research collaborated on and how workload was divided:

- Study design - jointly
- Research governance:
    - Ethics application (Riona designed the information sheet & Zoë designed the consent form)
    - Risk assessment – Zoë
    - Funding application - Riona
- Setting up the online platform for questionnaires (REDCap) - jointly
- Development and production of session materials
    - Development and recording the script for the imagery task and the instruction sheet for this task - Riona
    - Development and production of materials for psychoeducation sessions 1 and 3 – Zoë
    - Development and production of materials for psychoeducation sessions 2 - Riona
- School recruitment - Zoë
- Focus group
    - Arranging the focus group with the school – Zoë
    - Organising content and running session - jointly
    - Collating data from focus group – Riona
- Promoting & running the study in schools
    - School 1 – Jointly (1 group each)
    - School 2 – Zoë
    - School 3 – Riona
- Data cleaning – jointly

Aspects of research undertaken independently:

- Research proposal
- Literature Review
- Selection of measures (apart from the Self-Compassion Scale)
- Data analysis
- Empirical paper write up

Appendix C: Ethical Approval for Study

UCL RESEARCH ETHICS COMMITTEE
OFFICE FOR THE VICE PROVOST RESEARCH

23rd April 2018

Dr John King
Department of Clinical, Educational and Health Psychology
UCL

Dear Dr King

Notification of Ethics Approval
Project ID/Title: 12373/001: A brief compassion-focused workshop for adolescents

I am pleased to confirm in my capacity as Joint Chair of the UCL Research Ethics Committee (REC) that the data collection element of your study has been approved by the UCL REC until **23rd June 2019**.

Ethical approval is subject to the following conditions:

Notification of Amendments to the Research
You must seek Chair's approval for proposed amendments (to include extensions to the duration of the project) to the research for which this approval has been given. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing an 'Amendment Approval Request Form'
http://ethics.grad.ucl.ac.uk/responsibilities.php

Adverse Event Reporting – Serious and Non-Serious
It is your responsibility to report to the Committee any unanticipated problems or adverse events involving risks to participants or others. The Ethics Committee should be notified of all serious adverse events via the Ethics Committee Administrator (ethics@ucl.ac.uk) immediately the incident occurs. Where the adverse incident is unexpected and serious, the Joint Chairs will decide whether the study should be terminated pending the opinion of an independent expert. For non-serious adverse events the Joint Chairs of the Ethics Committee should again be notified via the Ethics Committee Administrator within ten days of the incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol. The Joint Chairs will confirm that the incident is non-serious and report to the Committee at the next meeting. The final view of the Committee will be communicated to you.

Final Report
At the end of the data collection element of your research we ask that you submit a very brief report (1-2 paragraphs will suffice) which includes in particular issues relating to the ethical implications of the research i.e. issues obtaining consent, participants withdrawing from the research, confidentiality, protection of participants from physical and mental harm etc.

In addition, please:

- ensure that you follow all relevant guidance as laid out in UCL's Code of Conduct for Research: http://www.ucl.ac.uk/srs/governance-and-committees/resgov/code-of-conduct-research
- note that you are required to adhere to all research data/records management and storage procedures agreed as part of your application. This will be expected even after completion of the study.

With best wishes for the research.

Yours sincerely

Dr Lynn Ang
Joint Chair, UCL Research Ethics Committee

Cc: Riona Tweed & Zoe Tweedale

Appendix D: Study Debrief

Cultivating Self-Compassion Debrief

Thank you for taking the time to participate in this study.

Background to Research
Self-compassion is defined as treating oneself with kindness and warmth in the face of difficult life situations or negative self-perceptions. Research has found a link between self-compassion and wellbeing. It has been shown that self-compassion can be increased with adults, thus the aim of this study was to investigate whether compassion focused activities increase self-compassion and decrease self-criticism and negative social comparison in adolescents.

We believe this is an important area of research as adolescents can experience a range of pressures from school, friends, family, social media etc. In addition to this, adolescence is an important developmental stage with many changes occurring in the brain. The combination of these factors can make adolescents more vulnerable to negative self-talk and unfavourable self-evaluations.

Our Aims
In this study, we included three groups. There were two experimental groups; a psycho-education group that attended three workshops on self-compassion, and an imagery group that received the same psycho-education as well as completing a self-compassion imagery task. We were interested in whether the imagery task would lead to greater increases in self-compassion and greater decreases in self-criticism and negative social comparison in contrast with the psychoeducation alone. This would help us to understand the mechanism that contributes to changes in self-compassion, which has previously not been researched. We also included a control group to ensure that changes in the measures could be explained by the intervention.

We also investigated whether there was a relationship between social media usage and negative social comparison. Previous research has suggested that those who engage in passive use (using sites to look at others' profiles/posts) are more likely to make negative social comparisons than those who engage in active use (posting, commenting and sharing material). We were interested in whether increases in self-compassion (i.e. those in the experimental groups) reduced levels of negative social comparison limiting the influence of type of social media usage.

What We Measured
During the study you were asked to complete a set of questionnaires multiple times over a 5-week period. These questionnaires aimed to measure levels of *self-compassion* and *self-criticism*, *type of social comparisons made (positive vs negative), current mood state* and *use of social media (passive vs active)*. We were interested in whether any changes occurred in scores on these measures.

Prize Draw
We will be in touch in the next couple of weeks to notify winners of the One4All vouchers.

Further Resources About Self-compassion

On these websites you can find further information about self-compassion as well as exercises designed to enhance self-compassion.

The Compassionate Mind: www.compassionatemind.co.uk
Self-Compassion: www.self-compassion.org

If you would like a summary of the results, when we have completed the analysis, please email us at the addresses below

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Principal Researcher & Supervisor

Dr John King john.king@ucl.ac.uk

Appendix E: Summary of Results for Participants

LONDON'S GLOBAL UNIVERSITY

UCL

Cultivating Self-Compassion Study: Results

Our Aims

In this study, we included three groups. There was a control group and two experimental groups; a psycho-education group that attended three workshops on self-compassion, and an imagery group that received the same psycho-education and completed a self-compassion imagery task.

Hypothesis 1

We were interested in whether the imagery group would be more effective than the psycho-education at:

- increasing self-compassion
- decreasing self-criticism
- decreasing negative social comparison
- improving mood.

Hypothesis 2

We also investigated whether there was a relationship between social media usage and negative social comparison. Previous research has suggested those who engage in passive use (using sites to look at others' profiles/posts) are more likely to make negative social comparisons than those who engage in active use (posting, commenting and sharing material).

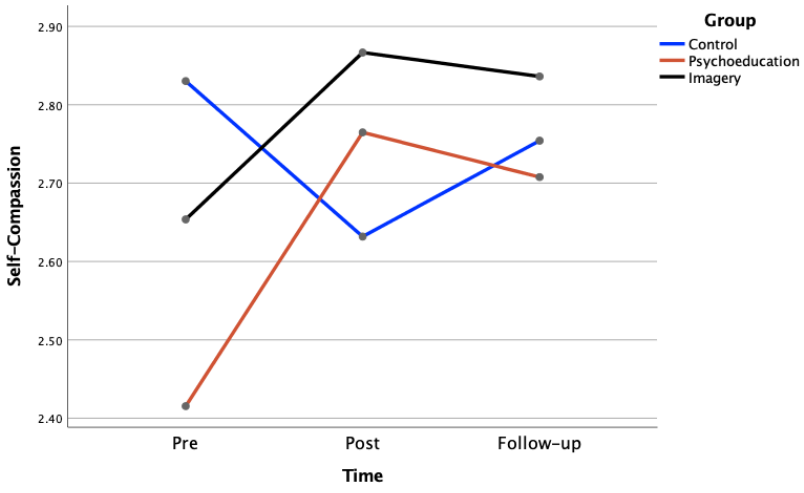
Hypothesis 3

For participants in the imagery group, we predicted that those who reported greater vividness of imagery and ability to focus would experience a greater improvement in their self-compassion and social comparison.

Results

Hypothesis 1

Counter to our predictions, the imagery group was not more effective at improving self-compassion, self-criticism, negative social comparison or mood. However, the psycho-education group did experience increases in self-compassion compared to the control group. The graph to the right shows the mean self-compassion scores for each group over the three time points (pre-, post- intervention and follow-up).



The Self-Compassion Scale measures different components of self-compassion, including positive (mindfulness, common humanity, self-kindness) and negative elements (isolation, overidentification with feelings, self-judgment). Interestingly, the imagery group enhanced the positive components, but didn't affect the negative aspects of self-compassion compared to the control group.

Additionally, in the psycho-education group, negative social comparison scores decreased over time from pre-intervention to follow-up.

Hypothesis 2
There was no significant relationship found between passive social media use and negative social comparisons.

Hypothesis 3
Participants who reported greater imagery vividness showed a greater reduction in their levels of negative social comparison. A similar relationship was found between imagery vividness and improved self-compassion, but this did not quite reach statistical significance. No relationship was found between ability to focus and self-compassion or social comparison change.

Limitations
We were unable to recruit the number of participants we had hoped for and fewer students attended the imagery group which may have affected the statistical analysis. This may mean that compassionate imagery is beneficial but we would need a larger sample to test this further.

Implications
Our findings suggest that delivering our self-compassion psycho-education intervention can have beneficial effects on self-compassion and social comparison in adolescents. We are unable to draw strong conclusions about the effectiveness of the imagery intervention but it may be more effective at enhancing positive elements of self-compassion. Finally, how vividly an individual can generate compassionate imagery is related to these improvements.

Many thanks again for all of your time and effort in making this research project possible.

Appendix F: Social Networking Site Usage Questionnaire

Confidential

Questionnaire

Please read the statements below and select the response that best fits your use of social networking sites.

Examples of social networking sites: Facebook, Instagram, Twitter, SnapChat

Private messaging services, such as WhatsApp or Signal within this measure are not considered to be social networking sites

1)	On average, how often do you post on social networking sites (e.g. update your status; tweet; post videos/photos/stories)	◯ Once a day or less ◯ 2-4 times a day ◯ 5-9 times a day ◯ 10-15 times a day ◯ Over 15 times a day
2)	On average, how often do you comment on or reply to others' posts on social networking sites (do not include liking a post)	◯ Once a day or less ◯ 2-4 times a day ◯ 5-9 times a day ◯ 10-15 times a day ◯ Over 15 times a day
3)	On average, how often do you share material (e.g. articles, videos or photos) that others have posted on social networking sites?	◯ Once a day or less ◯ 2-4 times a day ◯ 5-9 times a day ◯ 10-15 times a day ◯ Over 15 times a day
4)	On average, how many conversations (e.g. individual or group chat) do you have per day via social networking sites? (Do not include messages sent via messaging services, such as WhatsApp or Signal)	◯ One conversation or less ◯ 2-4 conversations ◯ 5-9 conversations ◯ 10-15 conversations ◯ Over 15 conversations
5)	On average, how often do you use social networking sites to search for information (e.g. a news story, product or company) that you are interested in?	◯ Never ◯ Rarely (once a month or less) ◯ Sometimes (once a week or less) ◯ Often (several times a week, but not everyday) ◯ Very frequently (once a day or more)
6)	Approximately, how much time do you spend a day browsing your newsfeeds on social networking sites without commenting?	◯ Less than 30 minutes ◯ Between 30 minutes to 1 hour ◯ Between 1 to 3 hours ◯ Between 3 to 5 hours ◯ Between 5 to 7 hours ◯ More than 7 hours
7)	Approximately, how much time do you spend a day browsing the profile/pages of friends?	◯ 0-10 minutes a day ◯ 10-30 minutes a day ◯ 30-60 minutes a day ◯ 1 - 2 hours a day ◯ More than 2 hours a day

8)	Approximately, how much time do you spend a day browsing the profile/pages of people that you do not know (e.g. celebrity or friends of friends) on social networking sites?	◯ 0-10 minutes a day ◯ 10-30 minutes a day ◯ 30-60 minutes a day ◯ 1 - 2 hours a day ◯ More than 2 hours a day
9)	On days when you post on Social Networking Sites, how often do you tend to check to see how many likes/reactions your post has received?	◯ Once a day or less ◯ 2-4 times a day ◯ 5-9 times a day ◯ 10-15 times a day ◯ Over 15 times a day
10)	On average, how often do you check how many followers/friends you have on social networking sites?	◯ Never ◯ Rarely (once a month or less) ◯ Sometimes (once a week or less) ◯ Often (several times a week, but not everyday) ◯ Very frequently (once a day or more)

Appendix G: Session Feedback Questionnaire

Cultivating Self-Compassion – Feedback Questionnaire

1. **Please rate how you found the sessions in terms of:**
   a. **How interesting you found them**

      1 2 3 4 5

      Not at all interesting Very interesting

   b. **How useful you found them**

      1 2 3 4 5

      Not at all useful Very useful

   c. **How applicable the sessions were to you**

      1 2 3 4 5

      Not at all applicable Very applicable

2. **How likely would you be to recommend these sessions to another young person?**

   1 2 3 4 5

   Extremely unlikely Extremely likely

3. **What aspects of the sessions did you find most useful?**

   _____

   _____

   _____

4. **How do you think we could improve the sessions?**

   _____

   _____

   _____

   _____

5. **Any other comments about the sessions or home practice tasks**

   _____

   _____

   _____

Appendix H: Information Sheet & Consent Form for Focus Group

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UCL

Volunteer Information Sheet for Focus Group
UCL Research Ethics Committee Approval ID Number: 12373/001

Project Title: Cultivating Self-Compassion in Adolescents
Department: Clinical, Educational and Health Psychology, University College London
Researchers: Riona Tweed (riona.tweed.14@ucl.ac.uk) Zoe Tweedale (zoe.tweedale.13@ucl.ac.uk)
Principal Researcher: Dr John King (john.king@ucl.ac.uk)

We would like to invite you to take part in a focus group for a Clinical Psychology doctorate research project. Before you decide to take part, it is important you understand why the research is being done and what participation will involve. Please take time to read the following information carefully and discuss it with others if you wish before giving consent. Ask us if there is anything that is not clear or if you would like more information. Thank you for reading this.

Study Background
Self-compassion is defined as treating oneself with kindness and warmth in the face of difficult life situations or personal inadequacies. Research has found a link between self-compassion and wellbeing. Low self-compassion has been found to be related to self-criticism, mental health difficulties, and other factors including negative social comparison associated with social media use. However, growing evidence suggests self-compassion can be increased. This has been shown in compassion-focused interventions for adults. The aim of this study is to investigate whether compassion-focused interventions influence self-compassion, self-criticism and negative social comparison in adolescents.

Why have I been chosen?
We plan to recruit students who are not currently engaging with psychological therapy, between the ages of 16 and 18, to take part in the study. You have been chosen as someone who could be a potential participant in the study.

Do I have to take part?
It is up to you to decide whether to take part or not. If you decide to take part you will be given this information sheet to keep and asked to sign a consent form. You can withdraw at any time without giving a reason.

What's the focus group's purpose?
We would like to gain feedback on the materials we hope to use in this study and how we plan to advertise the project.

What will happen to me if I take part?
You will take part in a focus group with around 10-12 participants. This will involve being shown proposed materials to be used in the study and you will be asked to give feedback. The group will run for up to 90 minutes.

What are the possible disadvantages and risks of taking part?
The tasks in this group are not expected to be distressing for healthy participants. However, if at any stage you wish to leave the focus group then you may do so. If you experience distress related to the study, please inform one of the researchers.

What are the possible benefits of taking part?
Whilst there are no immediate benefits for those participating in the focus group, you will contribute to the development of a new psychological workshop for young people.

Will my taking part in this project be kept confidential?
Confidentiality cannot be guaranteed during the focus group due to the presence of other students.
However, there is no requirement for individuals to disclose any personal information. No personal data will be collected.

What will happen to the results of the focus group?
We will consider the feedback in planning the study and use it to tailor the materials accordingly.

What if there is a problem?
If you have a concern about any aspect of this study you should speak to:

Riona Tweed and Zoe Tweedale (Trainee Clinical Psychologists)
Email: riona.tweed.14@ucl.ac.uk and zoe.tweedale.13@ucl.ac.uk
or
Dr John King (Clinical Psychologist and Senior Lecturer at UCL)
Email: john.king@ucl.ac.uk)

Clinical, Educational & Health Psychology
University College London
Gower Street, WC1E 6BT
London

You should direct any complaints about your treatment during the study to Dr John King. If you are not satisfied with the handling of your complaint, you can contact the Chair of the UCL Research Ethics Committee (ethics@ucl.ac.uk).

Thank you for reading this information sheet and for considering taking part in this research study.

Data Protection Privacy Notice
Notice:
The data controller for this project will be University College London (UCL). The UCL Data Protection Office provides oversight of UCL activities involving the processing of personal data, and can be contacted at data-protection@ucl.ac.uk. UCL's Data Protection Officer is Lee Shailer and he can also be contacted at data-protection@ucl.ac.uk.

If you are concerned about how your personal data is being processed, please contact UCL in the first instance at data-protection@ucl.ac.uk. If you remain unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at: https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/

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CONSENT FORM FOR ADOLESCENTS

Please complete this form after you have read the Information Sheet, heard an explanation about the research and had an opportunity to ask any questions.

Cultivating Self-Compassion Focus Group

Department of Clinical, Educational and Health Psychology

Researchers: Riona Tweed, *Trainee Clinical Psychologist*
riona.tweed.14@ucl.ac.uk
Zoë Tweedale, *Trainee Clinical Psychologist*
zoe.tweedale.13@ucl.ac.uk

Principal Researcher: Dr John King, *UCL Senior Lecturer*
john.king@ucl.ac.uk

Data Protection Officer: Lee Shailer
Contact Details: data-protection@ucl.ac.uk

This study has been approved by the UCL Research Ethics Committee (Project ID Number: 12373/001)

Thank you for considering taking part in this focus group. Riona and Zoe will explain the aims of this focus group to you before you agree to take part. If you have any questions after reading the Information Sheet or listening to the explanation, please ask Riona or Zoe before you decide whether to take part. You will be given a copy of the Information Sheet and Consent Form to keep and refer to at any time.

I confirm that I understand by ticking each box below I am consenting to this element of the study. I understand that it will be assumed that unticked boxes mean I DO NOT consent to that part of the study. I understand that by not giving consent for any one element that I may not be considered eligible for the study.

		Tick Box
1.	I confirm that I have read and understood the Information Sheet for the above focus group. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction. I agree to take part in: - A focus group	

2.	**Use of the information for this project only** I understand that confidentiality cannot be guaranteed during the focus group due to the presence of other students. However there is no requirement for participants to disclose personal information and no personal data will be collected.	
3.	I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason.	
4.	I understand the potential risks of participating and the support that will be available to me should I become distressed during the course of the focus group.	
5.	I understand the direct and indirect benefits of participating.	
6.	I understand that the data will not be made available to any commercial organisations but is solely the responsibility of the researchers undertaking this study.	
7.	I understand that I will not be directly compensated for participation in this group.	
8.	I agree that the researchers may contact a member of the pastoral team within the school if I raise any concerns about my own wellbeing or any other student in the school with the research team.	
9.	I am aware of who I should contact if I wish to lodge a complaint.	
10.	I voluntarily agree to take part in this focus group.	

_____ _____ _____

Name of participant Date Signature

_____ _____ _____

Researcher Date Signature

Appendix I: Script for Imagery Task (Week 1)

Part 1 - Self

This exercise usually is easiest if you close your eyes. If that doesn't feel comfortable then you can softly focus your eye gaze on the floor.

Imagine the room you are sitting in now and you are alone. What can you see? What colour are the walls? Are there windows in the room? Which side of the room are the windows on? What can you see ahead of you? What is to your left? What is to your right? Take some time to familiarise yourself with the surroundings.

Imagine that your friend is sat on a chair opposite you. Try to bring the image of your friend to your mind, noticing the colour of her hair, her hair style and the colour of her eyes. Notice what your friend is wearing.

Your friend is really upset and crying. Her body is hunched up and facing down, she is looking down and holding her hands up to cover her face. Her head moves up and down slightly as she cries.

When you are ready, in your head say the first step of your compassionate response. (Pause)

Imagine your friend is absorbing what you have said, thinking about it and processing it. Imagine that she responds by moving her hands down, away from her face but she continues to cry.

Now imagine saying the second step of your compassionate response. (Pause)

Imagine your friend is absorbing what you have said, thinking about it and processing it. Imagine that she begins to sit upright a little, raises her face upwards a little and stops crying.

Now imagine saying the third step of your compassionate response. (Pause)

Imagine your friend is absorbing what you have said, thinking about it and processing it. Imagine that she responds by sitting upright and lifting her head up to look at you.

Part 2 - Embodiment phase for 'friend' (in session only)

We are now going to ask you to perform some mental imagery tasks to help you get ready for the next stage of the experiment. In this part, we would like you to imagine

that you are now your friend that you just imagined comforting. We will refer to this version of you as ‘friend you’. Take a moment to imagine this.

Try to visualise yourself as if you are watching yourself from outside your body.

First create an image in your mind’s eye of the room around you, remembering that you are now sat in your friend’s position. Imagine the room around you. Take your time to create and observe this picture in your mind.

Imagine that you are looking to your left. What can you see? Now, imagine what you could see if you were looking to your right. Imagine looking up.... and now down. Now imagine extending your arms out to your sides and moving them up and down, slowly as if you are flying. Imagine watching yourself doing this in the mirror.

Take a moment to visualise extending your arms out to either side again. Imagine looking at your right hand, as you move it up and down in your mind’s eye.

Now imagine doing the same, but with your left hand. Imagine looking up at the ceiling above you, and then down towards your body, looking at your feet. Look back at yourself in the imaginary mirror again and picture yourself stepping forward with your right foot and back again.

And now picture yourself doing the same with your left foot.

This time, imagine looking down at your right foot and taking a step forward. Then step back. And now do the same with your left foot.

Now spend a few moments visualising yourself doing some of these movements again in your mind’s eye.

Part 2 – bridge (inter-session task only)

We would now like you to imagine that you are your friend that you just imagined comforting. We will refer to this version of you as ‘friend you’. Take a moment to imagine this.

Part 3 – taking the perspective of your friend

Week 1

Continue to imagine yourself as your friend. Imagine that you have not done as well as your peers in your exams and are feeling upset. Imagine that you are now sitting in your friend’s position opposite compassionate you. In a moment you are going to

imagine yourself responding compassionately towards ‘friend you’.

When you are ready imagine compassionate you saying: “It feels awful when you don’t do as well as everyone else in your exams. It’s really upset you, hasn’t it?”

Take some time to absorb and respond to what has been said to you.

Now imagine compassionate you saying: “Sometimes when we are sad it’s helpful to think of someone who really cares about us.”

Again, take some time to absorb and respond to this.

Finally, imagine compassionate you asking: “Can you think of someone who loves you or is kind to you? What might they say to you now that would make you feel better?”

Take your time to absorb and respond to this.

You have now come to the end of the task. When you are ready open your eyes and take off the headphones.

Appendix J: Participant Information Sheet

VOLUNTEER INFORMATION SHEET

UCL Research Ethics Committee Approval ID Number: 12373/001
Project Title: Cultivating Self-Compassion
Department: Clinical, Educational and Health Psychology, University College London
Researchers: Riona Tweed (riona.tweed.14@ucl.ac.uk)
Zoe Tweedale (zoe.tweedale.13@ucl.ac.uk)
Principal Researcher: Dr John King (john.king@ucl.ac.uk)

We would like to invite you to take part in a Clinical Psychology doctorate research project. Before you decide to take part, it is important you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish before giving consent. Ask us if there is anything that is unclear or if you would like more information. Thank you for reading this.

What is the project's purpose?
Self-compassion is defined as treating oneself with kindness and warmth in the face of difficult life situations or negative self-perceptions. Research has found a link between self-compassion and wellbeing. Low self-compassion has been found to be related to self-criticism, mental health difficulties, and other factors including negative social comparison associated with social media use. However, growing evidence suggests self-compassion can be increased. This has been shown in compassion-focused interventions for adults. The aim of this study is to investigate whether compassion-focused activities influence self-compassion, self-criticism and negative social comparison in adolescents.

Why have I been chosen?
We are looking for approximately 90 healthy males and females, who are not currently engaging with psychological therapy, between the ages of 16 and 18.

Do I have to take part?
It is up to you to decide whether to take part or not. If you decide to take part, you will be given this information sheet to keep and asked to complete a consent form online. Your information is kept in confidence and your data will not be personally identifiable. You can withdraw at any time without giving a reason and without it affecting any benefits that you are entitled to.

What will happen to me if I take part?
You will be randomly allocated to one of three groups as outlined below:
1. A self-compassion information group
2. A self-compassion information and guided mental imagery group
3. Questionnaires alone

In groups 1 and 2, you will be asked to attend a session once weekly for three weeks. Before attending the first session, you will be asked to complete a consent form and several questionnaires online. These questionnaires will be repeated online before each session and two weeks after the final session. The questionnaires should take you 10-15 minutes to complete each time. The sessions will last for up to one hour and will take place in your school. The groups will include around 10 individuals. There will be small group activities but there will be no requirement to speak out in front of the group. In both groups, we will provide information on compassion, self-compassion, self-criticism and social comparison. In group 2, you will also hear an audio recording that will guide you to imagine interacting compassionately with a friend who is distressed.

In groups 1 and 2, after each session you will be asked to complete a daily homework task online for up to 10 minutes based on the content of the session. You will receive an automated email reminding you to do this.

In group 3, you will be asked to complete a consent form and several questionnaires online. These questionnaires will be repeated at two further time points; three weeks and five weeks after the first set. The questionnaires should take you 10-15 minutes to complete each time.

After completing these steps, we will provide you with debriefing information. You will be entered into a prize draw for One4All gift vouchers. There are 14 prizes ranging in value between £10 and £50.

What are the possible disadvantages and risks of taking part?
The tasks and questionnaires used in this study are not expected to be distressing for participants. However, if at any stage you wish to stop the experiment then you may do so. If you experience distress related to the study, please inform one of the researchers. If the researchers are concerned about your wellbeing they will link you in with the school pastoral team to ensure you are supported.

What are the possible benefits of taking part?
Whilst there are no immediate benefits for those participating in the project, you will learn about self-compassion and its importance. It is also hoped this work will contribute to the development of new psychological treatments.

Will my taking part in this project be kept confidential?
All the information we collect about you during the course of the research will be kept strictly confidential. You will be assigned a unique participant number so that your data is not personally identifiable. All information will be collected and stored in accordance with the Data Protection Act 1998. Only the investigators will have access to data from the study. You will not be able to be identified in any related reports or publications. Confidentiality will be respected as far as possible, unless there is evidence of potential harm to participants or others. In this instance appropriate members of the school pastoral team will be informed.

What will happen to the results of the research project?
The results of the study will be presented in two Doctorate of Clinical Psychology theses. We will disseminate results to the schools taking part and provide information on how to access these findings online.

What if there is a problem?
If you have a concern about any aspect of this study, you should speak to:

Riona Tweed and Zoe Tweedale (Trainee Clinical Psychologists) Email: riona.tweed.14@ucl.ac.uk and zoe.tweedale.13@ucl.ac.uk	Dr John King (Clinical Psychologist and Senior Lecturer at UCL) Email: john.king@ucl.ac.uk

You should direct any complaints about your treatment during the study to Dr John King. If you are not satisfied with the handling of your complaint, you can contact the Chair of the UCL Research Ethics Committee (ethics@ucl.ac.uk).

Data Protection Privacy Notice
The data controller for this project will be University College London (UCL). The UCL Data Protection Office oversees UCL activities involving the processing of personal data (for example, your name, mobile number and ethnicity). The UCL Data Protection Officer can be contacted at data-protection@ucl.ac.uk.

Your personal data will be only be processed for use in this research study. The legal basis that would be used to process your personal data will be performance of a task in the public interest. The legal basis used to process special category personal data (ethnicity) will be for scientific research or statistical purposes.

Your personal data will be processed so long as it is required for the research project. Personally identifiable information will be stored securely and deleted one year after the study has ended. Anonymised research data will be stored for up to 10 years after the study has ended.

If you are concerned about how your personal data is being processed, please contact UCL in the first instance at data-protection@ucl.ac.uk. If you remain unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at: https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/

Thank you for reading this information sheet and for considering taking part in this research study.

Appendix K: Parent/Guardian Information Sheet

PARENT/GUARDIAN INFORMATION SHEET

UCL Research Ethics Committee Approval ID Number: 12373/001
Project Title: Cultivating Self-Compassion
Department: Clinical, Educational and Health Psychology, University College London
Researchers: Riona Tweed (riona.tweed.14@ucl.ac.uk)
Zoe Tweedale (zoe.tweedale.13@ucl.ac.uk)
Principal Researcher: Dr John King (john.king@ucl.ac.uk)

We would like to invite your son or daughter to take part in a Clinical Psychology doctorate research project. 16-18-year-old individuals are able to provide consent to take part in research. However, we would recommend they discuss their decision to take part with their parent(s) or guardian(s). To facilitate this discussion, we are providing this information sheet for parents. Before a student decides to take part, it is important they understand why the research is being done and what participation will involve. Please contact us if there is anything that is not clear or if you would like more information. Thank you for reading this information sheet.

What is the project's purpose?
Self-compassion is defined as treating oneself with kindness and warmth in the face of difficult life situations or negative self-perceptions. Research has found a link between self-compassion and wellbeing. Low self-compassion has been found to be related to self-criticism, mental health difficulties, and other factors including negative social comparison associated with social media use. However, growing evidence suggests self-compassion can be increased. This has been shown in compassion-focused interventions for adults. The aim of this study is to investigate whether compassion-focused activities influence self-compassion, self-criticism and negative social comparison in adolescents.

Why has my son/daughter been chosen?
We are looking for approximately 90 healthy males and females, who are not currently engaging with psychological therapy, between the ages of 16 and 18.

Do they have to take part?
Participation is voluntary and not linked to your son/daughter's academic study. If he/she decides to take part, they will be given this information sheet to keep and asked to complete a consent form online. Participants can withdraw at any time without giving a reason and without it affecting any benefits that they are entitled to.

What will happen to my son/daughter if they take part?
Participants will be randomly allocated to one of three groups as outlined below:

1. A self-compassion information group
2. A self-compassion information and guided mental imagery group
3. Questionnaires alone

In groups 1 and 2, participants will be asked to attend a session once weekly for three weeks. Before attending the first sessions, participants will be asked to complete a consent form and several questionnaires online. These questionnaires will be repeated online before each session and two weeks after the final session. The questionnaires should take participants 10-15 minutes to complete each time. The sessions will last for up to one hour and will take place in school. Sessions are extra-curricular and will be arranged as far as possible in time outside formal lessons. The groups will include around 10 individuals. In both groups, we will provide information on compassion, self-compassion and other topics including self-criticism and social comparison. In group 2, participants will also hear an audio recording that will guide them to imagine interacting compassionately with a friend who is distressed.

In groups 1 and 2, after each session participants will be asked to complete a daily online homework task for up to 10 minutes based on the session content.

In group 3, participants will be asked to complete a consent form and several questionnaires online. These questionnaires will be repeated at two further time points; three weeks and five weeks after the first set. The questionnaires should take the participant 10-15 minutes to complete each time.

After completing these steps, participants will be provided with debriefing information and entered into a prize draw for *One4All* vouchers. There are 14 prizes ranging in value between £10 and £50.

What are the possible disadvantages and risks of taking part?
The tasks and questionnaires used in this study are not expected to be distressing for participants. However, if at any stage students wish to stop the experiment then they may do so. If participants experience distress related to the study, we ask that they inform one of the researchers. Any participant who raises concerns about their wellbeing will be linked in with the school pastoral team to ensure they are supported.

What are the possible benefits of taking part?
Whilst there are no immediate benefits for those participating in the project, they will learn about self-compassion and its importance. It is also hoped that this work will contribute to the development of novel psychological treatments.

Will my son/daughter's part in this project be kept confidential?
All information collected about participants during the course of the research will be kept strictly confidential. Participants will be assigned a unique number so their data is not personally identifiable. All information will be collected and stored in accordance with the Data Protection Act 1998. Only the researchers will have access to data from the study. Participants will not be able to be identified in any related reports or publications. Confidentiality will be respected as far as possible, unless there is evidence of potential harm to participants or others. In this instance, appropriate members of the school pastoral team will be informed.

What will happen to the results of the research project?
The results of the study will be presented in two Doctorate of Clinical Psychology theses. We will disseminate results to the schools taking part and provide information on how to access these findings online.

What if there is a problem?
If you have a concern about any aspect of this study you should speak to:

Riona Tweed and Zoe Tweedale (Trainee Clinical Psychologists) Email: riona.tweed.14@ucl.ac.uk and zoe.tweedale.13@ucl.ac.uk	Dr John King (Clinical Psychologist and Senior Lecturer at UCL) Email: john.king@ucl.ac.uk

Participants should direct any complaints about their treatment during the study to Dr John King. If they are not satisfied with the handling of their complaint, they can contact the Chair of the UCL Research Ethics Committee (ethics@ucl.ac.uk).

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Your personal data will be only be processed for use in this research study. The legal basis that would be used to process your personal data will be performance of a task in the public interest. The legal basis used to process special category personal data (ethnicity) will be for scientific research or statistical purposes.

Your personal data will be processed so long as it is required for the research project. Personally identifiable information will be stored securely and deleted one year after the study has ended. Anonymised research data will be stored for up to 10 years after the study has ended.

If you are concerned about how your personal data is being processed, please contact UCL in the first instance at data-protection@ucl.ac.uk. If you remain unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at: https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/

Thank you for reading this information sheet.

Appendix L: Instruction Sheet for Mental Imagery Task

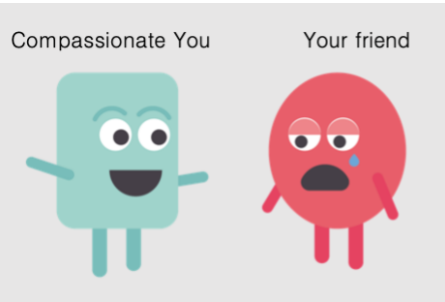
Mental Imagery Task Instruction Sheet Week 1

You are about to take part in a mental imagery (MI) task that will take approximately 10 minutes. Before you start it is essential that you read the information below carefully. If you have any questions, please don't hesitate to ask the researchers.

Context

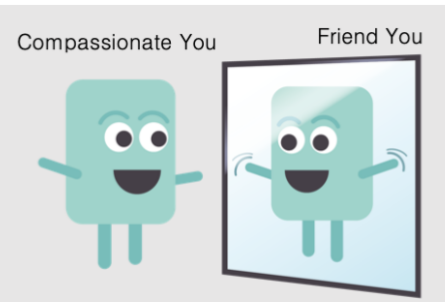
We would like you to imagine the following situation: Your friend is upset because they feel they did not do as well as their peers in their exams.

Your task is to imagine interacting compassionately with your friend, by talking to him or her in your head. When you have done this, you will be asked to imagine experiencing your compassionate interaction from your friend's perspective. During the task, you will be seated, with your eyes closed and wearing headphones. You will hear audio instructions to guide you in imagining the scenario.



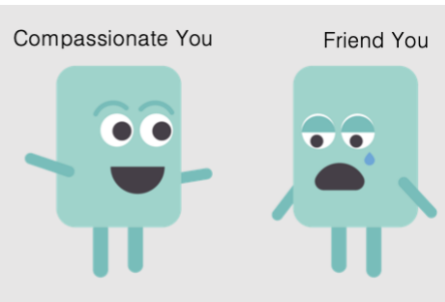
Stage 1

You will be asked to imagine the room around you. Then you will be asked to imagine your friend is seated opposite you and to interact with and comfort your friend by talking to him or her in your head. This may seem simple but many people have never been taught how to give compassion and may initially feel a little awkward doing this. Research suggests that when trying to comfort someone in this way there are three essential steps. See next page for the three-stage compassionate response.



Stage 2

The second stage involves imagining a change of perspective, from your perspective ('compassionate you') to your friend's perspective ('friend you'). You will then be asked to complete similar imagery tasks as before to familiarise yourself with the third stage of the experiment.



Stage 3

In the final stage, you will imagine experiencing your compassionate responses from your friend's perspective. We will refer to the first version of you who comforted your friend as 'compassionate you' and the other version of you sitting in your friend's position as 'friend you'.

Responding to Compassion

Research shows that when recovering from being upset, people are likely to stop crying, remove their hands away from their faces, lift their head up and then finally sit upright and make eye contact with you when they are fully comforted. However, people respond to compassion in different ways and for some this may be a slow process.

The Three-Stage Compassionate Response

Below are several sentences that you can say in your head to comfort your friend. Please take a few moments to remember these sentences. You do not need to remember them word for word, an approximate version is fine but please try to follow the script as closely as possible.

1. **Validation:** "It feels awful when you don't do as well as everyone else in your exams. It's really upset you, hasn't it?"

2. **Redirection of Attention:** "Sometimes when we are upset it's helpful to think of someone who really cares about us."

3. **Memory Activation:** "Can you think of someone who loves you or is kind to you? What might they say to you now that would make you feel better?"

When talking to your friend we would like you to **talk slowly, softly, and compassionately (in your mind)**. It is important that you **try not to rush your sentences**. Please practise repeating these phrases compassionately in your mind.

People vary in their ability to remain focused on imagery tasks and their ability to vividly imagine pictures in their mind. Please try your best and we will ask you at the end of the task to rate your focus and imagery vividness during the task.

Appendix M: Inter-session Tasks for Psychoeducation Group

Week 1:
We would like you to do a brief daily task related to today's session. Each day you will receive an email in the morning with a unique link that will allow you to log onto a website and answer the following questions:

- Have you seen any examples of self-compassion today?
- If so, what was the situation and what did you notice?
- If not, when do you think self-compassion could have been helpful for you or others?

Week 2:
We would like you to do a brief daily task related to today's session. Each day you will receive an email in the morning with a unique link that will allow you to log onto a website to complete this task.

We will show you three self-talk phrases that you need to categorise into the three emotion systems (threat, drive and soothing). Below is an example. Select your answer.

Which system do you think is biggest in each of these self-talk phrases?

Phrase	System
"I am going to work really hard to try and get a B in my Maths exam"	Soothing/Drive/Threat
"What's the point in going to that party? Nobody will want me there anyway."	Soothing/Drive/Threat
"Well I didn't make the football team this year, but I did try my best and I was out of training due to an injury so it's okay."	Soothing/Drive/Threat

Week 3:
We would like you to do a brief daily task related to today's session. Each day you will receive an email in the morning with a unique link that will allow you to log onto a website and answer the following questions:

- Give an example of a negative social comparison you noticed that day (self or others)
- What response did you notice either in you or the other person?
- How could self-compassion have helped?

Appendix N: Mean Change in Self-Compassion and Social Comparison for Mental Imagery Inter-session Task Completers vs. Non-Completers

Inter-session tasks completed	Self-Compassion Scale		Social Comparison Scale	
	N	Mean change (baseline to follow-up)	N	Mean change (baseline to follow-up)
None	7*	.12	8	1.88
At least one	6§	.39	9	5

Note:
* Excludes 1 participant who provided invalid data
§ Excludes 3 participants who provided invalid data