



**MAJOR RESEARCH PROJECT**

**LITERATURE REVIEW:**

Self-Compassion and Depressive Rumination: A Systematic Review

**EMPIRICAL PAPER:**

Self-Compassion, Goal Pursuit and Well-Being

Submitted by Emma Sewter, to the University of Exeter  
as a thesis for the degree of Doctor of Clinical Psychology, May 2019.

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### **Author's Declaration**

The systematic literature review was completed independently by the author. In terms of the empirical work, participant recruitment and data collection (using an online survey platform) was carried out jointly by the author and another DClInPsy trainee, Mandeep Bachu. His project utilised different measures for the project titled "Goal flexibility as a Predictor of Depression, Rumination and Homesickness". All other aspects of the study were completed by the author including data entry, analysis and write up.

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**SCHOOL OF PSYCHOLOGY**  
**DOCTORATE IN CLINICAL PSYCHOLOGY**

**LITERATURE REVIEW**

**Self-Compassion and Depressive Rumination: A Systematic Review**

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### **Abstract**

In recent years, studies in the mental health literature have examined the relationship between self-compassion and depressive rumination. Both of these constructs are highly relevant to thinking about the self that occurs when people experience stress or negative affect. The current review aimed to synthesise studies which explored the nature of the relationship between self-compassion and depressive rumination. A comprehensive literature search was conducted using five databases: PsycINFO, Medline Ovid, Web of Science, Embase and Scopus. The search yielded thirteen independent studies which met the inclusion criteria. These primarily used cross-sectional designs with non-clinical samples. A narrative synthesis of these studies provided consistent support for a negative association between self-compassion and depressive rumination. Furthermore, a preliminary meta-analysis found a moderate effect size for the relationship between self-compassion and depressive rumination. This association was fairly consistent across different types of studies. Self-compassion and depressive rumination are clearly related but also have some non-overlapping features. Future research could utilise longitudinal and experimental designs, as well as focus on the examination of possible moderators and mediators of this relationship. Further research is also needed to determine whether self-compassion has a causal influence on depressive rumination. This would help gain a more complete understanding of the nature of the relationship between self-compassion and depressive rumination. Nevertheless, self-compassion may be a pertinent treatment target to impede the cycle of depressive rumination.

**Keywords:** Self-compassion; rumination; brooding; reflection; systematic review.

## Introduction

The construct of self-compassion has attracted increasing theoretical and empirical interest, specifically in relation to mental health (Neff, 2003a; Trompetter, de Kleine, & Bohlmeijer, 2017). Several interventions for psychological difficulties are incorporating a focus on cultivating self-compassion (e.g., Compassion Focused Therapy [Gilbert, 2005], Mindful Self-Compassion program [Neff & Germer, 2013]), due to its association with positive psychological outcomes (Neff, Kirkpatrick, & Rude, 2007). Conversely, depressive rumination as a construct has been related to negative psychological outcomes (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). In recent years, studies have examined the relationship between self-compassion and depressive rumination (e.g., Raes, 2010). Both constructs are highly relevant to thinking about the self that is present when people experience stress or negative affect. As there has yet to be a systematic review within this area, the current review sought to explore the nature of the relationship between self-compassion and depressive rumination.

## Self-Compassion

Different conceptualisations of self-compassion have been suggested, including evolutionary (Gilbert, 2010) and social psychological approaches (Neff, 2003a). Gilbert (2010) has defined self-compassion as the ability to be kind towards the self during times of difficulty, focusing on the interplay between three emotion-regulation systems. These are commonly known as the 'threat', 'drive' and 'soothing' systems. The threat system is designed for the detection of danger and the engagement of survival mechanisms. The drive system is linked to motivation and reward and motivates us to seek out, pursue and

acquire important resources. Lastly, the soothing system helps to restore balance and feelings of calmness, contentment and safety. Gilbert (2010) proposes that self-compassion deactivates the threat system and activates the soothing system.

Neff's (2012) definition focuses on self-compassion being a healthy attitude and relationship with oneself, which is relevant when considering how we relate to ourselves in times of perceived inadequacy, failure or personal suffering. According to Neff (2003a), self-compassion consists of three main facets, with each having a positive and negative pole representing compassionate versus uncompassionate behaviour. Self-kindness involves being understanding, supportive and gentle towards oneself, rather than harshly judgmental and critical. Common humanity entails an awareness that suffering and feelings of inadequacy are part of a shared human experience, rather than a feeling of being isolated by one's imperfections. Finally, mindfulness involves being aware of one's present moment experience in a balanced way, rather than over-identifying with one's emotions and thoughts. In combination, these facets represent a self-compassionate frame of mind. Based on this theoretical definition, Neff developed a trait Self-Compassion Scale (SCS; Neff, 2003b), with the majority of research on self-compassion conducted using this measure.

Growing evidence supports the benefits of self-compassion for subjective well-being and mental health (Warren, Smeets, & Neff, 2016; Zessin, Dickhäuser, & Garbade, 2015). A meta-analysis by MacBeth and Gumley (2012) found a large effect size ( $r = -.54$ ) for the relationship between self-compassion and psychopathology (defined by aggregating anxiety, depression and stress measures). Other research findings have demonstrated self-compassion to be positively correlated with measures of happiness, life-

satisfaction, optimism and positive affect (Barnard & Curry, 2011; Neff et al., 2007). Additionally, research has shown that self-compassion interventions can produce improvements in mood, lead to reductions in depression and anxiety, and positively impact physiological responses to stress (Arch et al., 2014; Gilbert & Procter, 2006).

## **Rumination**

According to the Oxford English Dictionary, the word “ruminate” comes from the Latin word “ruminare”, meaning “to chew over again”. Researchers have offered a diverse range of accounts for rumination, some conceptualise it as adaptive, whereas others see it as a negative and unhelpful construct, associated with psychological distress (Martin & Tesser, 1996; Nolen-Hoeksema, 1991). For the most part, however, the literature has generally focused on a more restricted conceptualisation of rumination as a maladaptive cognitive process associated with negative mood. The definition that has received the most empirical attention is based on the Response Styles Theory (RST; Nolen-Hoeksema, Morrow, & Fredrickson, 1993). This refers to rumination as a stable, trait-like mode of responding to emotional distress. It involves repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms (Nolen-Hoeksema, 1991).

According to RST, depressive rumination biases thinking negatively and interferes with adaptive cognitive strategies, such as problem-solving, thus maintaining and increasing depressive symptoms (Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008; Spasojević & Alloy, 2001). It is often characterised by evaluative thinking, with the person asking themselves ‘why’

type questions, such as “Why did that happen to me?” (Papageorgiou, 2006; Watkins, 2010). Depressive rumination is commonly assessed using the Ruminative Response Scale (RRS), a subscale of the Response Style Questionnaire (RSQ; Treynor, Gonzalez, & Nolen-Hoeksema, 2003), as well as the related Rumination on Sadness Scale (RSS; Conway, Csank, Holm, & Blake, 2000). The RRS has been criticised for items that overlap symptoms of depression, potentially inflating the measured relationship between depression and rumination (Smith & Alloy, 2009; Treynor et al., 2003). To address this, Treynor et al. (2003) removed confounding depressive symptom related items and a two-factor solution of rumination was found for the remaining items, named brooding and reflective pondering. Brooding is symptom-focused, involving dwelling on the negative and self-blame, while reflective pondering captures a more curious and open style of thinking about the self. In general, brooding has been implicated as the more maladaptive form of rumination, as it is associated with an increased risk of depression (Schoofs, Hermans, & Raes, 2010).

### **Aims of the Present Review**

The current review aims to synthesise studies which explore the nature of the relationship between self-compassion and depressive rumination. For the purpose of this review, self-compassion will be defined in its broadest sense of holding a compassionate attitude to the self during times of stress and difficulty. As discussed, there are varying conceptualisations of self-compassion but all of them contain this core aspect, whereas others are more specific to individual conceptualisations (e.g., common humanity versus isolation in Neff’s model,

2003a). Thus, the review will focus on studies that address at least this core component.

What individuals do when they are sad/depressed may be particularly relevant to self-compassion. Therefore, the review focuses specifically on depressive rumination, rather than more general rumination. Depressive rumination seems at odds with the self-nurturing and balanced response to distress coming from a highly self-compassionate frame of mind. This is particularly true of the brooding subcomponent, which is thought to be more maladaptive due to self-evaluation and negative focus. Furthermore, self-compassion likely facilitates having a compassionate and soothing response to distress, instead of having a blaming or self-critical reaction, common with depressive rumination (Nolen-Hoeksema et al., 2008). Self-compassion and rumination are probably not completely overlapping, as depressive rumination is a thinking style, while self-compassion is an attitude towards the self. Self-compassion is also related to more positive ways of thinking, which is not necessarily the opposite of the negative ways of thinking that are present in depressive rumination.

The review is interested in all aspects of the relationship between self-compassion and depressive rumination and will include studies examining association (cross-sectional and longitudinal), causation (experimental) and mediators and moderators. It will look to establish the direction and magnitude of the relationship and if the association is consistent across populations. The review will include studies that looked at depressive rumination as a unitary construct and also those that looked at subcomponents of depressive rumination. It will also examine the relationship between subscales of self-compassion and depressive rumination if a study has examined the overarching

construct of self-compassion. Additionally, a preliminary meta-analysis will be run as a supplementary step to provide greater clarity on the magnitude of the relationship. Thus, this review will focus on the following question: What is the nature of the relationship between self-compassion and depressive rumination?

## **Method**

This review complies with the latest Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines (PRISMA-P: Moher et al., 2015).

### **Eligibility Criteria**

Eligible studies were determined using the PICOS (participants, intervention/exposure, comparator, outcome, study design) criteria, outlined in Table 1. There are a number of different rumination measures but not all fit the definition of depressive rumination, as they do not specifically ask people what they do when they are in a sad/depressed mood. The review focuses on studies that measure the overarching construct of self-compassion but will also examine subscales of self-compassion if a study has examined the overarching construct. All quantitative study designs were appropriate, as the review is interested in all aspects of the relationship.

Table 1

*PICOS Criteria*

	Inclusion Criteria	Exclusion Criteria
Population	Human participants including non-clinical and clinical populations.	Studies with samples of children or adolescents (i.e., participants aged under 18 years old).
Intervention/Exposure	Validated measures and interventions that measure/target compassionate attitudes to self during times of difficulty. Can be measured as a trait or state. Subscales of self-compassion will be examined where a study has examined the overarching construct of self-compassion. Most prominent measure: Self-Compassion Scale (SCS; Neff, 2003b). Also, Self-Reassurance Scale (Gilbert, Clarke, Hempel, Miles, & Irons, 2004).	Studies analysing only self-criticism, self-esteem, self-acceptance or more general compassion (e.g., compassion to others). Studies that have only analysed the common humanity, self-kindness and/or mindfulness facets of Neff's model (2003a).
Comparator	Intervention studies may include an active control, passive control or no control condition.  Correlational studies will be included where there is no comparator.	None.
Outcome	Includes a standardised and validated measure of depressive rumination (or its subcomponents) as defined by Nolen-Hoeksema (1991) as a response style that involves repetitive thoughts on the causes, consequences and implications of sad/depressed mood. Can be measured as a trait or state. Most prominent	Measures of rumination and repetitive thinking style which do not specifically ask people what they do when they are in a sad/depressed mood, e.g., the Ruminative Thinking Scale (RTS; Brinker & Dozois; 2009) and the Rumination and Reflection Questionnaire (RRQ; Trapnell &

	measure: Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). Also, the Rumination on Sadness Scale (Conway et al., 2000).	Campbell, 1999). Measures of negative thoughts that are not clearly repetitive (e.g., negative automatic thoughts).
Study Design	Longitudinal or cross-sectional, experimental or non-experimental designs. A study qualified as experimental if either self-compassion or depressive rumination was directly manipulated and the other variable was measured subsequently as the dependent variable.  Must have an explicit analysis of the relationship between self-compassion and depressive rumination, (i.e., experimental manipulation, correlation cross-sectionally or change longitudinally).	Qualitative studies and case studies. Review papers. Measures of exposure and outcome administered cross-sectionally post-intervention.
Additional Criteria	Primary research published in a peer-reviewed journal.	Not published in English. Reviews, commentaries, dissertations, book chapters, conference abstracts, study protocols, unpublished manuscripts.

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### Search Strategy

The search terms were generated from scoping searches, theoretical understanding of the constructs and through discussion with researchers in the field. Search terms were combined with Boolean operators and truncated terms were denoted by \*, searching all possible endings from that stem (see Table 2). The following electronic databases were searched, from their inception to December 2018: PsycINFO, Medline Ovid, Embase, Web of Science and

Scopus. To supplement this, Google Scholar was used to search for peer-reviewed articles available online but not yet indexed on databases. Articles by key authors in the relevant fields (Neff, Gilbert and Nolen-Hoeksema) were manually checked. References of included articles were screened to identify additional results not retrieved in the initial searches.

Table 2

*Search Terms*

Concept	Terms
Self-compassion	"self-compassion*"
	"self compassion*"
	"self-kind*"
	"self kind*"
	"self-sooth*"
	"self sooth*"
	"self-reassur*"
	"self reassur*"
	"self-empathy"
	"self empathy"
	"self-comfort*"
	"self comfort*"
	Depressive rumination
"brood*"	
"reflect*"	
"repetit*"	
"perseverat*"	

**Study Selection**

Databases were searched by title and abstract. Microsoft Excel was used to combine results and remove duplicates. Titles and abstracts for these records were reviewed against the eligibility criteria and studies progressed to

the full-text screening stage if they either met inclusion criteria or it was not clear whether they should be excluded. An independent rater reviewed six randomly selected studies at the full-text screening stage and made an independent decision as to whether the study should be included/excluded based on the PICOS criteria. Inter-rater agreement was 100%, yielding a kappa coefficient of 1.0 (McHugh, 2012). Figure 1 summarises the search and screening process.

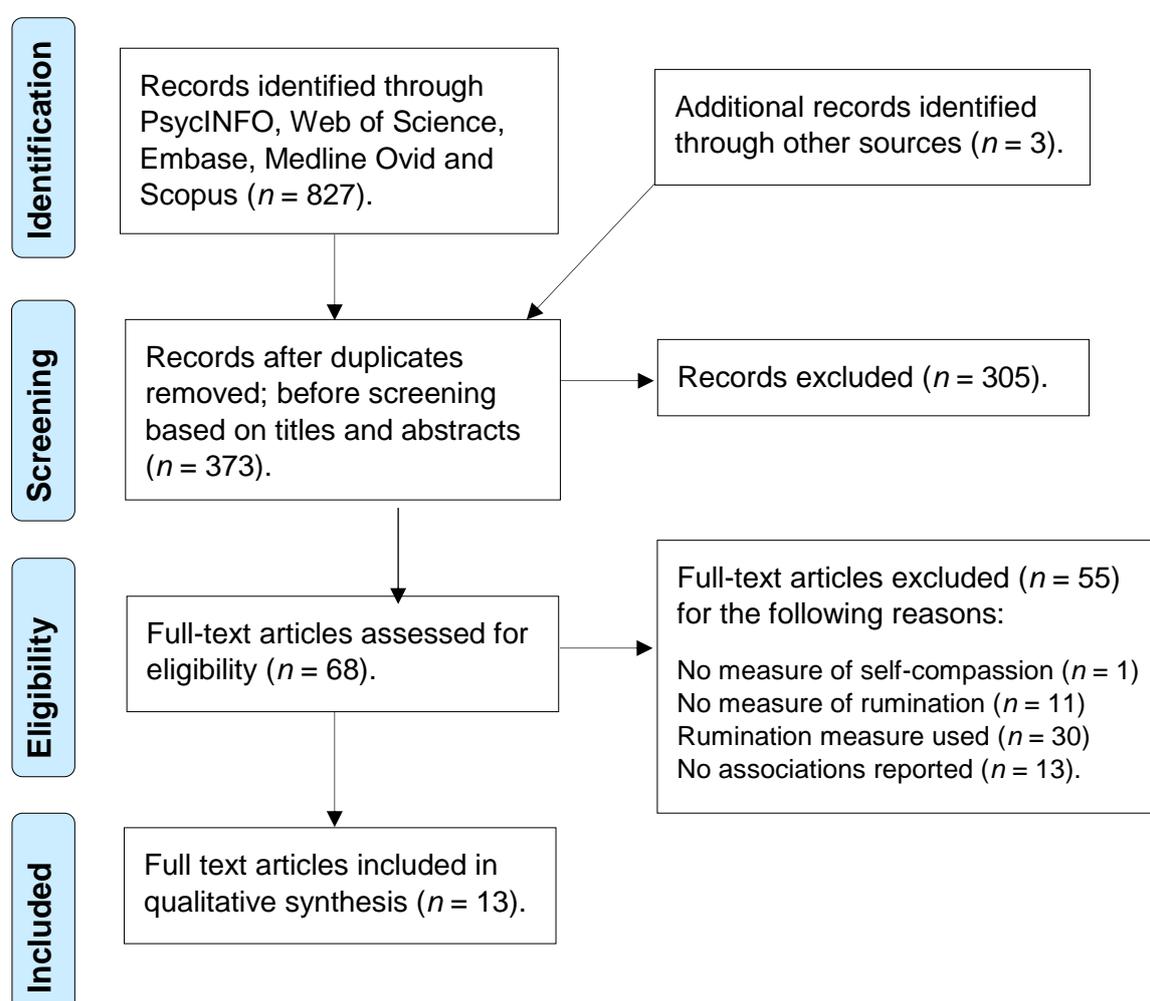


Figure 1. PRISMA flowchart of the screening process for included articles.

## **Data Extraction**

A standardised form was created in Microsoft Excel to extract data of interest from the included studies. This included: author, year of publication, design, sample size, study population, the measure of self-compassion and depressive rumination and main findings.

## **Evaluation Criteria**

The Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (QAT-OC) was used to assess the quality of cross-sectional and longitudinal studies. This provides a quality rating of 'good', 'fair' or 'poor' based on a set of 14 criteria (NHLBI, 2014). The Quality Assessment Tool for Quantitative Studies (QAT-QS; The Effective Public Health Practice Project, 1998) was used to assess studies in which the variables of interest were manipulated. This provides a methodological rating of 'weak', 'moderate' or 'strong', based on eight areas of quality. A different tool was used for experimental studies, as the QAT-QS has specific questions relating to randomisation and manipulation. These tools were used to inform discussion of the quality of the articles rather than to exclude studies. An independent rater assessed the quality of three included studies, to ensure consistent and reliable application of the tools. There was no disagreement as to the quality of the selected studies, yielding a kappa coefficient of 1.0 (McHugh, 2012).

## **Results**

Thirteen articles met the inclusion criteria, a summary of these studies is presented in Table 3.

Table 3

*Summary of Articles*

Reference	Design	Sample	Measures	Main Findings	Strengths and Limitations	Quality Rating
Bakker, Cox, Hubley, & Owens (2018)	Cross-sectional, online.	100 (70f) community clinical sample (history of recurrent depression) in the USA. $M = 38.6$ years ( $SD = 12.1$ ).	SCS RRS: 5 brooding items	SC was significantly negatively correlated with brooding ( $r = -.44$ ). When brooding, experimental avoidance and acceptance were included, only brooding significantly mediated the link between SC and depressive symptoms. Brooding rumination significantly mediated the link between the positive subscales of SC and depressive symptoms.	Strengths: Clinical sample. Explored the mediating effects of brooding rumination.  Limitations: No sample size justification or power calculation. Predominately female sample. Reported not being able to check participants were accurately interpreting screening questions for recurrent depression (i.e., did not utilise a clinician interview in the measurement of recurrent depression). Current depression status unclear.	QAT-OC: Fair
Flett, Haghbin, &	Cross-sectional,	214 (152f) students from first-	SCS	SC was significantly	Strengths: Large sample size.	QAT-OC: Fair

Pychyl (2016)	online.	and second-year introductory psychology courses at a Canadian University. $M = 20.2$ years.	RRS: 5 brooding items	negatively correlated with brooding rumination ( $r = -.39$ ).	Limitations: No sample size justification or power calculation.	
Hasking, Boyes, Finlay-Jones, McEvoy, & Rees (2018)	Cross-sectional, online.	415 (317f) undergraduate psychology students. Australia. $M = 21.0$ years ( $SD = 6.0$ ).	SCS-SF RTQ	SC was significantly negatively correlated with rumination ( $r = -.55$ ). SCS subscales: self-kindness ( $r = -.32$ ), common humanity ( $r = -.21$ ) and mindfulness ( $r = -.24$ ) were significantly negatively correlated with rumination. Self-judgement ( $r = .56$ ), isolation ( $r = .57$ ) and over-identification ( $r = .64$ ) were significantly positively correlated with rumination.	Strengths: Large sample size. Examined particular subscales of self-compassion.  Limitations: No sample size justification or power calculation. Predominately female sample. Reported Cronbach's alphas for SCS subscales to be between .53 - .83, suggesting poor internal consistency.	QAT-OC: Fair
Ilyas & Aslam	Cross-sectional.	61(20f) older adults take from	SCS	SC was significantly	Strengths: Non-western culture	QAT-OC: Poor

(2018)		different old-homes of Rawalpindi, Pakistan. $M = 70.8$ years ( $SD = 8.2$ ). Participants with severe physical and psychological issues were excluded from the study.	RRS: 10-items Urdu translated versions of the scales were used (using a translation and back translation method).	negatively correlated with rumination ( $r = -.68$ ). SC partially mediated the relationship between rumination and depression ( $b = -.40$ ).	sample. Explored the mediating effects of SC.  Limitations: No power calculation and small sample size. Measures were administered orally in Urdu. The validity of the translated scales is difficult to ascertain. It is not explicitly reported whether any participants were excluded based on inclusion/exclusion criteria. Used subscales of RRS to measure rumination and depression.	
Imtiaz & Kamal (2016)	Cross-sectional.	209 (70f) older adults in Pakistan. $M = 66.4$ years ( $SD = 6.4$ ).	SCS RRS: 22-items Urdu translated versions of the scales were used (using a translation and back translation method).	SC was significantly negatively correlated with rumination ( $r = -.43$ ). SCS subscales: self-judgement ( $r = .54$ ), isolation ( $r = .53$ ) and over-identification ( $r = .53$ ) were	Strengths: Non-western culture sample. Looked at total SCS score and the subscale scores with rumination.  Limitations: No power calculation. Only 209 of 380 participants approached took	QAT-OC: Poor

				positively correlated with rumination. There were no significant correlations between self-kindness ( $r = -.05$ ), common humanity ( $r = .08$ ) or mindfulness ( $r = -.03$ ) with rumination. Step-wise regression analysis for predicting rumination through SC dimensions: self-judgement positively explained 30% variance in rumination scores, isolation 9% more variance, over-identification 3% and common humanity 2%.	part, so the sample may not be representative. Measures implemented inconsistently across study participants (some responded through interview and some returned via the post). The validity of the translated scales is difficult to ascertain.	
Krieger, Altenstein, Baettig, Doerig, &	Cross-sectional.	142 (79f) clinically depressed patients seeking psychotherapeutic	SCS RRS: symptom-focused (8-items)	SC was significantly negatively correlated with	Strengths: Clinical sample. Limitations: No	QAT-OC: Fair

Holtforth (2013)		treatment at a university-based outpatient clinic in Germany, who were already enrolled in a clinical trial. $M = 40.6$ years ( $SD = 11.3$ ).	and self-focused (9-items).  German translations of these scales were used.	symptom-focused rumination ( $r = -.19$ ). There was no significant correlation between SC and self-focused rumination ( $r = -.16$ ). Symptom-focused rumination significantly mediated the relationship between SC and depressive symptoms, $ab = -.06$ , 95% CI $[-.12, -.00]$ . With respect to self-focused, this was not the case, $ab = -.02$ , 95% CI $[-.07, .00]$ .	power calculation reported. Cronbach's alpha for symptom-focused was .70 and .67 for self-focused, suggesting mediocre internal consistency.	
Neff (2003b) Study 2	Cross-sectional.	232 (145f) undergraduate students from an educational psychology subject pool. Southwestern University, USA. $M = 21.3$ years ( $SD = 3.7$ ).	SCS  RRS: 22-items	SC was significantly negatively correlated with rumination ( $r = -.50$ ).	Strengths: Large sample size.  Limitations: No sample size justification or power calculation. Did not report on the internal consistency of scales in this study.	QAT-OC: Fair

Neff, Kirkpatrick, & Rude (2007) Study 2	Longitudinal.	40 (38f) undergraduate students from an educational-psychology subject pool. Southwestern University, USA. <i>M</i> = 21.1 years ( <i>SD</i> = 1.1).	SCS RRS: 10-items	Changes in SC were significantly negatively correlated with changes in rumination over a one-month period ( $r = -.40$ ) but not after controlling for changes in anxiety: $r = -.20$ , $p < .10$ .	Strengths: Measured and adjusted for anxiety.  Limitations: No power calculation and small sample size. Did not report on the internal consistency of scales in this study.	QAT-OC: Fair
Proeve, Anton, & Kenny (2018)	Cross-sectional analysis (at the start of uncontrolled pre-post design).	32(19f) community clinical sample with clinically diagnosed depressive or anxiety disorders in a mindfulness-based cognitive therapy programme. Delivered through a public mental health clinic in Australia. <i>M</i> = 49.8 years ( <i>SD</i> = 13.6).	SCS: separated into self-compassion (13-items) and self-coldness factors (13-items) based on previous factor analysis (Brenner, Heath, Vogel, & Credé, 2017). RRS: 22-items	Pre-treatment, SC was significantly negatively correlated with rumination ( $r = -.41$ ). Self-coldness was significantly positively correlated with rumination ( $r = .78$ ).	Strengths: Clinical sample.  Limitations: No power calculation and small sample size. Attrition of eligible participants was almost 44%. Unclear whether the factor analysis would replicate in this sample.	QAT-OC: Fair
Raes (2010)	Cross-sectional.	271 (214f) first-year psychology undergraduates at the University of Leuven, Belgium. <i>M</i> = 18.1 years ( <i>SD</i> = 1.3).	SCS RRS: 10 rumination items (separately for brooding and reflection).	SC was significantly negatively correlated with brooding ( $r = -.55$ ) and reflection ( $r = -.19$ ). Brooding	Strengths: Large sample size. Looked at and distinguished between brooding and reflection. Explored the mediating effects of	QAT-OC: Fair

			Dutch translations of scales were used. In the Dutch version of SCS, two items were dropped from the original 26-item scale due to translation difficulties.	significantly mediated the link between SC and depressive symptoms, $b = -.07$ , 95% CI [-.10, -.04]. Reflection and worry did not. Brooding and worry significantly mediated the link between SC and anxiety symptoms, $b = -.06$ , 95% CI [-.09, -.03] and $b = -.08$ , 95% CI [-.15, -.05]. Reflection did not.	rumination.  Limitations: No power calculation. Predominately female sample. The validity of the translated scales is difficult to ascertain.	
Robins, Keng, Ekblad, & Brantley (2011)	Cross-sectional analysis (at the start of a RCT).	41 (20f) community sample of adults in the USA. $M = 46.3$ years ( $SD = 13.0$ ).	SCS RRS: 22-items	SC was significantly negatively correlated with rumination ( $r = -.51$ ).	Strengths: Clear aims and exclusion criteria.  Limitations: No power calculation reported and small sample size. Did not report on the internal consistency of scales in this study.	QAT-OC: Fair
Smeets, Neff, Alberts, & Peters	RCT 3-week SC intervention.	49 female undergraduate psychology students at a	SCS-SF RRS: 5 brooding items	Pre-intervention SC was significantly negatively	Strengths: Experimental design. Provided a clear description of	QAT-QS: Strong

(2014)		European university. $M = 20.0$ years ( $SD = 1.3$ ). $N = 27$ in SC intervention and $N = 22$ in time management control group.	Dutch versions of measures used.	correlated with rumination ( $r = -.38$ ). Increase in SC significantly predicted a reduction in rumination, $B = -.16$ , $SE = .04$ , $\beta = -.60$ , $R^2 = .36$ . The SC group evidenced significantly greater decreases in rumination, $d = 1.19$ and significantly greater gains in SC compared to the control group, $d = .70$ .	the content of the SC intervention. Looked at the relationship between constructs over time.  Limitations: No power calculation reported and small sample size. Generalisability reduced as all participants were female psychology students. No follow-up measurements.	
Yang, Fletcher, Whitehead, & Murray (2018)	Cross-sectional.	372 (297f) first-year undergraduate students. Australia. $M = 35.5$ years ( $SD = 10.7$ ).	SCS RRS:10-items	SC was significantly negatively correlated with rumination ( $r = -.36$ ).	Strengths: Large sample size.  Limitations: No power calculation reported.	QAT-OC: Fair

*Note.*  $N$  = number of participants;  $f$  = female;  $r$  = Pearson correlation coefficient;  $d$  = Cohen's  $d$ ; RCT = Randomised Control Trial; SC, Self-Compassion; SCS, Self-Compassion Scale; SCS-SF, Self-Compassion Scale-Short Form; RSQ, Response Styles Questionnaire; RRS, Ruminative Response Scale; RTQ, Repetitive Thinking Questionnaire; QAT-OC, Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies; QAT-QS, Quantitative Assessment Tool for Quantitative Studies.

## Overview of Selected Studies

Studies were published within a 16-year period, from 2003 to 2018. The eligible studies yielded a total of 2,178 participants (1,490 females; 68.4%), with sample sizes ranging from 32 to 415. Studies were predominantly cross-sectional, with two utilising cross-sectional analysis at the baseline phase of experimental studies ( $n = 11$ ), one longitudinal and one experimental. Ten were conducted with non-clinical populations: university students ( $n = 7$ ), general community ( $n = 1$ ) and older adults ( $n = 2$ ); whereas three studies were with clinical samples. Four studies were conducted in the USA, one in Canada, three in Australia, two in Pakistan and three in Europe (Belgium, Germany and unspecified).

Most studies were of fair quality ( $n = 10$ ), two were of poor quality, while the experimental study was strong. The main limitations of the studies were small sample sizes (5 had 61 or fewer participants), so low statistical power to detect effect sizes below medium (Cohen, 1992), lack of power analysis reporting, high proportions of female participants and not controlling for possible confounders.

**Measurement of self-compassion.** Eleven studies assessed trait self-compassion with the SCS (Neff, 2003b), whilst two used the SCS-SF (Raes, Pommier, Neff, & Van Gucht, 2011). The SCS-SF is reported to have a near-perfect correlation with the original SCS (Raes et al., 2011). Twelve studies calculated a total score for the SCS or SCS-SF. Proeve et al. (2018) created subscales for 'self-compassion' and 'self-coldness' by combining the self-kindness, common humanity and mindfulness, and self-judgement, isolation and over-identification subscales respectively. Two studies reported

associations between depressive rumination and self-compassion at the subscale level. One study used the German version of the SCS, two used the Dutch version and two used Urdu translated versions. The reliability of scales was generally good, apart from Hasking et al. (2018) who used the SCS-SF both as a total score and at a subscale level. Neff et al. (2018) recommend against using the SCS-SF to examine the six components separately because subscales on the shorter measure have poor reliability. Three studies did not report on the internal consistency of the measures in their sample.

**Measurement of depressive rumination.** All studies measured depressive rumination as a trait. The majority of studies ( $n = 12$ ) used some derivative of the RRS (Nolen-Hoeksema & Morrow, 1991). Four used the full 22-item measure, four used the 10-item measure (three as a total score and one as two separate scores) and three used only the 5 brooding items. One study used the RRS but distinguished between self-focused and symptom-focused rumination. One study used the Repetitive Thinking Questionnaire (RTQ), a 10-item measure that assesses participants tendency to think negatively when feeling distressed (McEvoy, Mahoney, & Moulds, 2010). One study used a German translation of the RRS, two used Dutch translations of the 10-item measure and brooding items and two used Urdu translated versions of the RRS and 10-item measure. The reliability of scales was generally good, apart from Krieger et al. (2013) who used a German translated version and a different way of partitioning items on the RRS.

## Evidence from Non-Clinical Samples

### University students.

**Cross-sectional studies.** Five studies were cross-sectional. Neff (2003b) conducted the first study investigating the relationship between self-compassion and depressive rumination in the USA, using the SCS and RRS, reporting a large negative correlation between the two constructs. Similarly, Hasking et al. (2018) found that the SCS-SF was strongly negatively correlated with scores on the RTQ in an Australian sample. Furthermore, they found that the RTQ was significantly negatively correlated with the positive subscales (small to medium effects) and significantly positively correlated with the negative subscales (all large effects). However, as noted previously, the SCS-SF is not recommended for examining the subcomponents separately (Neff et al., 2018) and Hasking et al. (2018) reported the subscales to have poor internal consistency. In Australia, Yang et al. (2018) found a medium-sized negative relationship between the SCS and the 10-item RRS, as did Flett et al. (2016) using the SCS and the brooding subscale in their sample of Canadian students. Raes (2010) conducted the only study to look separately at brooding and reflection and was the first researcher to publish the mediating effects of rumination in the relationship between self-compassion and depression, amongst Belgian undergraduates. Both reflection and brooding were significantly correlated with the SCS. However, brooding had a large effect size and reflection a small effect size. When mediational analyses were performed, brooding but not reflection was shown to partially mediate the relationship between self-compassion and both anxiety and depression.

**Longitudinal studies.** In the USA, Neff et al. (2007) conducted the only longitudinal study and reported the correlation between change in depressive rumination and change in self-compassion associated with participating in a Gestalt two-chair exercise. They found a medium-sized negative correlation between change in SCS scores over a month-long interval with changes in scores on the 10-item RRS. However, when controlling for changes in anxiety this association was no longer significant, suggesting the relationship may be explained by anxiety or negative affect. It is unclear to what extent the scores were stable (i.e., participants who were low at time 1 were low at time 2).

**Experimental studies.** Smeets et al. (2014) conducted the only experimental study, comparing scores on the SCS-SF with the brooding RRS items at the beginning of a self-compassion intervention. They found a medium-sized negative correlation between the constructs and that an increase in self-compassion significantly predicted decreases in brooding. The self-compassion group reported greater increases in self-compassion (large effect size) and significantly greater decreases in rumination (medium-sized effect), compared to the control group. As the self-compassion intervention appears to directly target self-compassion, this gives stronger weight to self-compassion affecting brooding. However, the study did not include follow-up measures, so conclusions cannot be drawn about the duration of intervention effects. Also, it is unclear whether the intervention would have been effective for male students, as only female students took part.

To summarise, studies in university samples found moderate to strong associations between self-compassion and the overall construct of depressive

rumination or the brooding subscale. The one study that looked at the reflection subscale separately suggested this has a weaker relationship with self-compassion. The correlations were fairly consistent even though studies had differing limitations, increasing support of an actual relationship.

### **Non-clinical adult samples.**

All three studies were cross-sectional. In a small sample of US community adults, Robins et al. (2011) found a large negative correlation between the SCS and RRS. Two studies explored the constructs with older adults, using Urdu translated versions of measures in Pakistan. Ilyas and Aslam (2018) found a large negative correlation between the SCS and 10-item RRS ( $r = -.68$ ). Translation and cultural factors may potentially confound these findings and perhaps reduce the distinction between the constructs. They also found that self-compassion partially mediated the relationship between rumination and depression. Imtiaz and Kamal (2016) found a medium-sized negative relationship using the SCS and RRS. Looking at the individual self-compassion subscales they found that depressive rumination was strongly positively correlated with self-judgement, isolation and over-identification. No significant associations were found between self-kindness, mindfulness or common humanity and the RRS. This suggests that the positive and negative poles of the SCS may be distinctive and not just opposites. Stepwise regression analysis found that self-judgement, isolation, over-identification and common humanity significantly predicted RRS scores. However, this regression method has been criticised as small random variations in the data can drastically change the solution (Field, 2013).

In summary, studies looking at non-clinical adult samples found moderate to strong associations between self-compassion and depressive rumination. Ilyas and Aslam's (2018) study has an unusually large effect size, perhaps due to the methodological quality or translation difficulties.

### **Evidence from Clinical Samples**

Three studies were conducted with clinical populations. Krieger et al. (2013) looked at depressed outpatients using German translated versions of the SCS and RRS, distinguishing between self-focused and symptom-focused rumination. Symptom-focused but not self-focused rumination was significantly negatively associated with self-compassion, although the effect sizes were both small. The somewhat novel way<sup>1</sup> the authors formulated these subdimensions creates some doubt as to whether this is a meaningful subdivision of depressive rumination. Mediation analysis showed only symptom-focused rumination to mediate the relationship between self-compassion and depression. Bakker et al. (2018) correlated scores on the SCS with brooding in American participants with recurrent depression, finding a medium-sized negative correlation. However, it is ambiguous whether any effect here is due to participant's past or current depression. In support of Raes (2010) and Krieger et al. (2013), mediation analysis showed brooding to significantly mediate the link between self-compassion and depressive symptoms. Proeve et al. (2018) explored relationships using the SCS, separated into self-compassion and self-coldness

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<sup>1</sup> Subdivided as: the symptom-focused scale comprising of 8-items assessing the tendency to think about the experience of the mood disturbance symptoms and the self-focused scale comprising of 9-items assessing the tendency to ruminate about the self in response to low mood.

factors, and RRS scores for a small sample of Australian patients with clinically diagnosed depressive or anxiety disorders. At pre-treatment, self-compassion items were moderately negatively correlated ( $r = -.41$ ). Self-coldness strongly positively correlated with depressive rumination ( $r = .78$ ), suggesting they are almost measuring the same construct.

To summarise, studies looking at clinical samples found small to large associations between self-compassion and depressive rumination. The association appears to be similar in clinical samples and non-clinical samples, suggesting a similar relationship across the spectrum of rumination and self-compassion levels, although the evidence is limited.

### **Supplementary Meta-Analysis**

As sufficient homogeneity among the methods was found, the decision was made to perform a post-hoc meta-analysis. First, a meta-analysis was conducted on all studies ( $k = 13$ ). An average of each of the two effect sizes (using Fisher's  $r$ -to- $z$  transformation) from Raes (2010) and Krieger et al. (2013) were used. Separate analyses were then performed to look at studies using (i) the 22-item RRS ( $k = 4$ ) and (ii) the 10-item RRS ( $k = 3$ ), which is less confounded with depressive symptoms. Additionally, as depressive rumination has been subdivided into brooding and reflection, it was pertinent to identify if these have similar relationships with self-compassion. However, only brooding was included ( $k = 4$ ), as only one study looked at reflection separately. As Proeve et al. (2018) created subscales for self-compassion and self-coldness, in the current meta-analyses the self-compassion subscale was used as a proxy for the total score (see Macbeth & Gumley, 2012). There were too few studies to meta-analyse correlations with separate self-compassion subscales.

Meta-analyses were conducted in jamovi (2018; version 0.9) using Hedges' method assuming a random-effects model. This provides a more conservative estimate of effects, assuming that the true effects vary between studies. An aggregated effect size, weighted by sample size, was computed to provide an overall effect size across studies. Heterogeneity of effect sizes among studies was computed using the  $Q$  and  $I^2$  statistics. A significant  $Q$  statistic suggests that the distribution of effect sizes around the mean is greater than would be predicted from sampling error alone and  $I^2$  provides an estimate of the proportion of variance in the aggregate effect size that is attributable to between-study variance (Huedo-Medina, Sánchez-Meca, Marín-Martínez, & Botella, 2006). These analyses are summarised in Table 4.

Table 4

*Random Effects Meta-Analysis Results*

Analysis	$K$	$N$	$r$	95% CI	$Z$	$P$	$Q$	$I^2$
All measures	13	2178	-.44	-.50, -.38	-14.9	<.001	39.40	60.01
RRS: 22-items	4	514	-.47	-.54, -.40	-13.6	<.001	1.15	0.00
RRS: 10-items	3	473	-.49	-.68, -.29	-4.9	<.001	15.09	80.45
RRS: brooding items	4	634	-.48	-.54, -.42	-15.7	<.001	6.02	0.00

Note.  $K$  = number of studies;  $N$  = total sample size;  $r$  = mean Pearson correlation coefficient (effect size); 95% CI = lower and upper confidence interval for effect size,  $Z$  = Wald-Test;  $p$  = statistical significance;  $Q$  = Hedges' test of heterogeneity;  $I^2$  = study variance (%), interpreted as: 0% indicating homogeneity, 25% small, 50% medium and 75% large heterogeneity.

All aggregated random effects estimates for the relationship between self-compassion and depressive rumination ( $r = -.44$  to  $-.49$ ) exceeded Cohen's (1992) convention for a medium effect size. Heterogeneity was significant for the overall and RRS: 10-items meta-analyses. Figure 2 provides a graphical summary of the overall meta-analysis. The forest plots for the additional meta-analyses are provided in Appendix A.

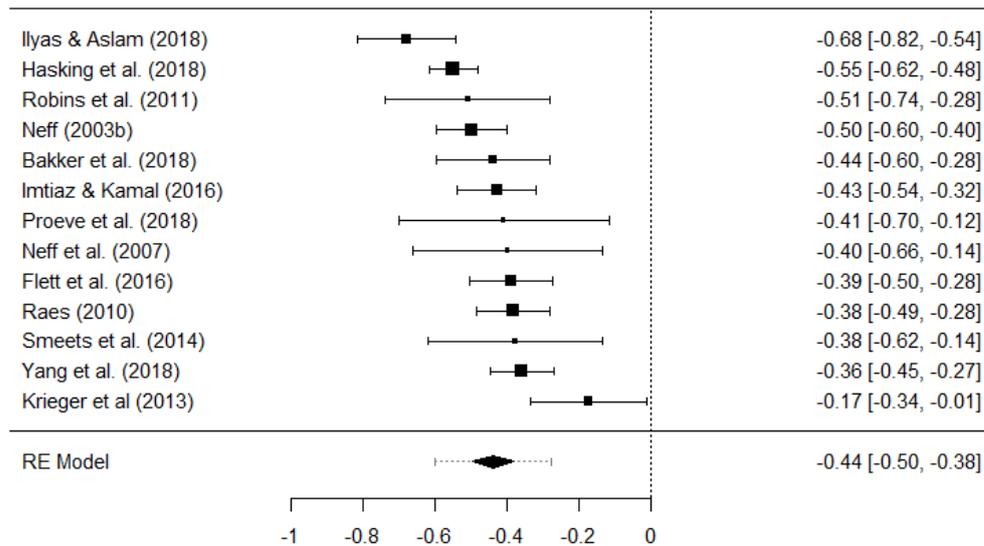


Figure 2. Forest plot for all studies exploring the relationship between self-compassion and depressive rumination.

Sterne et al. (2011) caution against using funnel plots to examine asymmetry when the number of studies included in a meta-analysis is less than 10, as the statistical power is too low. A funnel plot with all studies is included for the meta-analysis; however, considering the small number of studies this should still be interpreted with caution. The funnel plot appears approximately symmetrical, meaning publication bias might be considered unlikely.

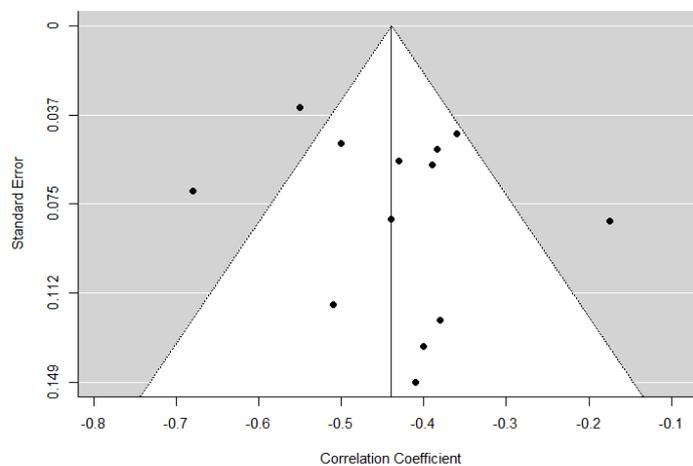


Figure 3. Funnel plot for all studies exploring the relationship between self-compassion and depressive rumination.

## Discussion

This review summarises evidence on the nature of the relationship between self-compassion and depressive rumination. The included studies consistently reported a significant negative relationship between the constructs, with preliminary meta-analyses finding a moderate effect size. This is similar to the meta-analysis coefficient reported by MacBeth and Gumley (2012), examining self-compassion and psychopathology ( $r = -.54$ ). The correlation between self-compassion and depressive rumination is not large enough to indicate that these are measuring the same construct but suggests significant overlap. Therefore, self-compassion and depressive rumination are clearly related. It is unclear whether this is causal (due to the lack of experimental evidence), due to an association that is attributable to other variables or due to content overlap.

Across the studies there was consistency in the definition of self-compassion, owing to the universal use of either the SCS or SCS-SF and on the whole, these were found to be reliable for the included studies. However, the SCS does not measure interpersonal and motivational aspects of self-compassion (such as attachment or taking action), emphasised in some conceptualisations (e.g., Gilbert, 2010). There is ongoing debate as to whether a total SCS score or separate scores representing compassionate versus uncompassionate self-responding should be used (Costa, Marôco, Pinto-Gouveia, Ferreira, & Castilho, 2016). However, most researchers agree it is acceptable and meaningful to use a total score (Neff, Whittaker, & Karl, 2017; Neff et al., 2018). Nevertheless, this draws attention to the need for further scrutiny of how self-compassion is measured. Although some limitations were acknowledged for the two studies looking at the self-compassion subscales,

both reported stronger associations between rumination and the negative components compared to the positive components. This was also found by Proeve et al. (2018), who separated the SCS into self-compassion and self-coldness factors. Theoretically, over-identifying with painful thoughts and emotions is consistent with a ruminative, self-focused process and self-judgement resembles the self-blame and self-attacking nature of the brooding subcomponent of depressive rumination. The isolation subscale and RRS also both contain items about feeling alone. This indicates that content overlap between the constructs could partly be driving the correlation.

Although self-compassion and depressive rumination share conceptual features, there are also some important distinctions. Self-compassion is an intentional attitude and act of kindness to the self (Neff, 2003a), whereas rumination is a thinking style that is habitual, automatic, repetitive and lacking in flexibility (Nolen-Hoeksema, 1991). Moreover, depressive rumination is focused on the cognitive aspects of distress, whereas self-compassion broadens awareness to the bodily and emotional aspects. The uncontrollable/repetitive characteristics of depressive rumination are not directly referred to in self-compassion, which may explain why the correlation between self-compassion and rumination is not larger. Although Gilbert's (2010) model postulates that self-compassion and rumination are linked due to rumination overstimulating the threat system, it would be valuable for theorists to integrate these constructs more fully. Future research would also benefit from the use of other assessment measures of self-compassion, such as the Self-Reassurance Scale (Gilbert et al., 2004).

The majority of studies used some derivative of the RRS. It could be argued that studies using the 10-item measure are better at capturing the true

relationship between self-compassion and depressive rumination, as the 22-item measure may be confounded with negative mood itself (Treyner et al., 2003). Negative mood is known to be correlated with self-compassion, so it may artificially increase the size of the self-compassion/rumination correlation. As brooding is thought to be particularly toxic (i.e., self-attacking) and is more diluted in the 22-item measure, the correlation between self-compassion and the 10-item measure might be expected to be stronger. However, there were not enough studies to determine this.

This review was interested in the relationship between self-compassion and the subcomponents of depressive rumination. However, only one study isolated the constructs of brooding and reflection (Raes, 2010), finding a large effect size between brooding and self-compassion and a small effect size between reflection and self-compassion. This adds to the evidence base of the multidimensional nature of depressive rumination, suggesting brooding is not self-compassionate and reflection may have little relation with self-compassion. However, future research is needed to determine whether this can be replicated in other studies and different populations. Additionally, the differences in the relationship with brooding versus reflection suggest that this is not just due to content overlap with negative mood.

### **Limitations and Recommendations for Future Research**

The populations included were mainly students, with only three clinical samples and an over-representation of females, limiting the generalisability of the findings. The relationship does not seem to vary between clinical and non-clinical groups, suggesting that the association may be continuous across the continuum of distress. However, there are not enough studies to confirm this.

Due to the prevalence of cross-sectional designs, this review was more able to report on the strength of the correlation between self-compassion and depressive rumination, rather than examine causality. Cross-sectional analysis does not allow temporal sequencing to be established. Therefore, further longitudinal and experimental research should be conducted to determine whether low self-compassion is a risk factor for depression or vice versa. Conceptually, one might expect self-compassion to be causally linked to less rumination, as self-compassion is thought to increase one's ability to tolerate negative emotions and respond with self-kindness. Consequently, self-compassion is likely to reduce the deployment of maladaptive emotion-regulation strategies, such as rumination. Equally, lower levels of depressive rumination may facilitate a compassionate stance towards oneself, as if the self is not immersed in negative self-thoughts this could enable the person to be more detached and objective.

The only experimental study had promising results, suggesting that a self-compassionate intervention significantly decreased depressive rumination compared to the control intervention (Smeets et al., 2014). Experimental designs are needed to understand whether this relationship is due to self-compassion reducing negative affect, and therefore reducing rumination, or because self-compassion changes attitudes to self, which might overlap less with rumination. Interestingly, Smeets et al.'s (2014) self-compassionate intervention did not change positive and negative affect, suggesting that self-compassion and rumination are not correlated purely due to overlapping affect.

Research could further examine whether depressive rumination and self-compassion are independent predictors of psychopathology. The studies that used mediation analysis found that depressive rumination explained additional

variance in clinical symptoms beyond self-compassion. This suggests they are partially separate concepts that have distinct consequences in terms of psychological distress and that there are two different mechanisms that need to be addressed in therapy. Therefore, it would be beneficial for more studies to look at the effects of therapy on these constructs and also to identify the 'active' components of self-compassion, given its multidimensional nature.

In two of this paper's meta-analyses, the relationship between self-compassion and depressive rumination was characterised by a high level of heterogeneity, suggesting moderators could be influencing the strength of this relationship. None of the studies investigated potential moderators, such as demographics, religious beliefs and clinical symptoms. Cultures that are influenced heavily by Buddhism have shown higher levels of self-compassion (e.g., Thailand; Neff, Pisitsungkagarn, & Hsieh, 2008) and females have been found to engage in more brooding rumination (Johnson & Whisman, 2013) and have lower levels of self-compassion (Yarnell & Neff, 2013). However, there are no obvious moderators that would be expected to influence the strength of the association between self-compassion and rumination. MacBeth and Gumley (2012) found that age, gender, clinical status and study population did not significantly influence the relationship between self-compassion and psychopathology in their meta-analysis. Future research could explore possible moderators.

The studies showed a lack of consideration of the role of potential confounders or whether the relationship between self-compassion and depressive rumination is explained by a third variable. For example, other associated states or traits, such as self-esteem, happiness or mindfulness, could at least partly explain the relationship between the constructs. Only Neff

et al. (2007) reported that when they controlled for changes in anxiety, the relationship between self-compassion and depressive rumination was no longer significant. This could mean that anxiety was both causing people to be more ruminative and making people less self-compassionate, or it could indicate that negative affect explains the association between self-compassion and rumination. However, it is difficult to distinguish between these concepts because they overlap different affective and cognitive aspects. Additionally, as anxiety was not manipulated, it could also be correlated with another causal factor. Identifying key mediators may help to determine the core link between the constructs and to understand whether self-compassion overlaps with other variables/processes in explaining clinical outcomes.

Although findings support the use of the SCS and RRS in different cultures, translations may be biased by cultural factors or by the translation quality, potentially confounding these findings. There were not enough studies to deduce whether the relationship between self-compassion and depressive rumination may work differently in different populations. It could be that more collectivist (e.g., China) compared to individualist (e.g., USA) cultures put less emphasis on self-compassion, so in these populations there might be a weaker relationship between the constructs, as people are not expected to be as self-compassionate. However, in Western cultures self-compassion can have negative connotations, as it can be confused with self-pity and self-indulgence or thought to undermine motivation (Gilbert, McEwan, Matos, & Ravis, 2011). This may weaken the correlation with rumination. Therefore, it would be pertinent to explore these relationships in more diverse cultures.

The exclusive use of self-report measures is a methodological limitation. Self-report requires accurate self-awareness (which may itself be related to self-

compassion), may be prone to social desirability and correlations may be inflated because of shared method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Future research that uses other assessment measures (e.g., clinical interviews or implicit measures) would reduce some of these biases. Additionally, future research could develop a reliable state measure of self-compassion to assess the present moment impact of adopting a more self-compassionate stance. It would also be beneficial to know about the within-person relationship between self-compassion and depressive rumination. Studies could examine whether people are ruminating when they are also less self-compassionate, using ecological momentary assessment. This would provide a more nuanced understanding of these processes for individuals over time.

Finally, there were some limitations of the review itself. Studies were not included unless published in a peer-reviewed journal, meaning unpublished research and grey literature were excluded. Thus, the review could be susceptible to publication bias given that significant findings are more likely to be published (Sutton, 2009). The review defined rumination as described by Nolen-Hoeksema (1991). However, greater resources would have enabled a wider review to be conducted looking at different conceptualisations of rumination. If self-compassion is related to more general rumination, it would provide further evidence for the association not being due to negative affect but due more to the repetitive thinking style.

### **Clinical Implications**

This review provides clear evidence of a relationship between self-compassion and depressive rumination. Clinicians should be aware of this

relationship when working with clients and understand that the two constructs tend to correlate inversely. Therefore, if a client reports excessive rumination, a clinician can reasonably expect them to have low self-compassion, and vice versa. Although conclusions about causation are difficult to make, if evidence emerges to suggest a causal link, it could be hypothesised that strengthening self-compassion in people vulnerable to depressive rumination could be a potential protective strategy. This is important, as depressive rumination puts people at high risk of developing depression (Spasojević & Alloy, 2001). Within the model of compassion-focused therapy, rumination could activate the threat-based system of emotion-regulation (Gilbert, 2010). Training clients in self-compassion could impede this and potentially provide an alternative to depressive rumination. This training might need to be done when vulnerable clients are in a more positive mood, as it might prove difficult otherwise. Correspondingly, interventions designed to reduce rumination, such as rumination-focused cognitive behaviour therapy (Watkins, 2010), may also have an effect on self-compassion. Given the high incidence of self-critical and shaming thoughts in depressive rumination, this approach may also be an effective intervention to enable clients to be more self-compassionate. Additionally, clients could be provided with psychoeducation on ruminating in a more neutral/reflective way, which may not deteriorate self-compassion, given that we are all likely to ruminate occasionally. As the association was similar in non-clinical and clinical samples, it suggests these constructs are important across the general population.

## Conclusions

To the author's knowledge, this paper provides the first systematic review of the relationship between self-compassion and depressive rumination. These findings suggest that higher levels of self-compassion are associated with lower levels of depressive rumination, across a range of (mostly non-clinical) samples. The meta-analysis found an overall estimate of the relationship between self-compassion and depressive rumination of  $r = -.44$ . This correlation is not large enough to indicate that self-compassion and depressive rumination are measuring the same construct but suggests significant overlap. This overlap is likely to be partly due to content overlap and the fact that both constructs draw on items that are related to distress. However, studies indicate that self-compassion and rumination independently predict clinically relevant outcomes, suggesting they may involve different and important processes. Future research could establish the nature of this association in longitudinal and experimental studies, as well as focusing on the examination of possible moderators and mediators. This would develop a more complete understanding of the nature of the relationship between self-compassion and depressive rumination.

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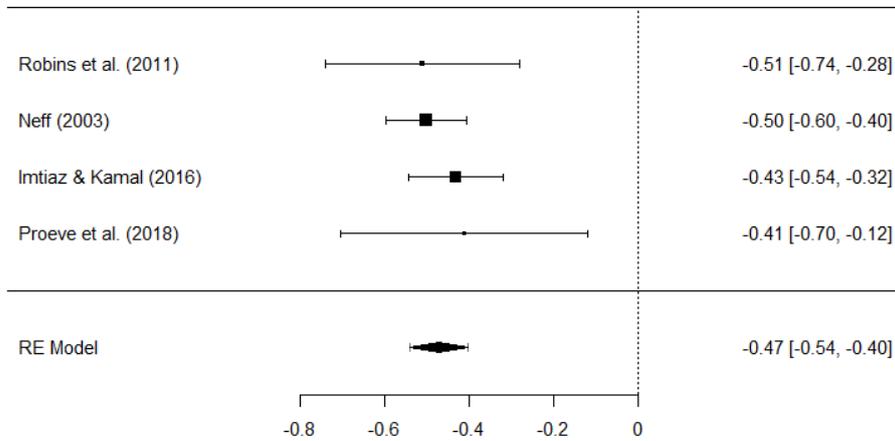
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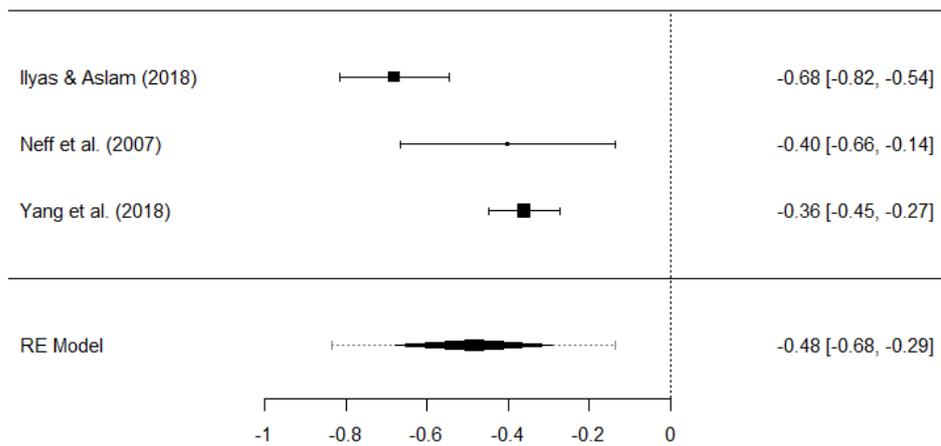
## Appendices

### Appendix A: Additional Forest Plots

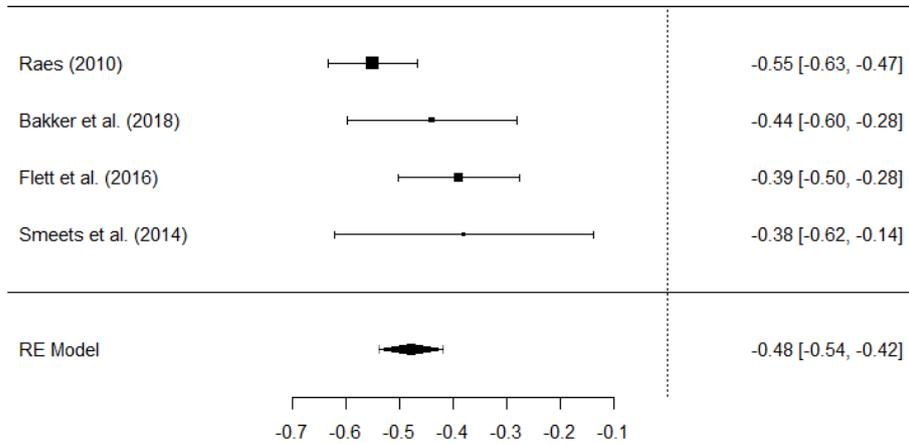
#### RRS: 22-items



#### RRS: 10-items



#### RRS: 5 brooding items



## Appendix B: Submission Guidance for Clinical Psychology Review

### Guide for Authors

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

#### **Ensure that the following items are present:**

All necessary files have been uploaded:

*Manuscript:*

- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
- Indicate clearly if color should be used for any figures in print

*Graphical Abstracts / Highlights files* (where applicable)

*Supplemental files* (where applicable)

Further considerations

- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)
- A competing interests statement is provided, even if the authors have no competing interests to declare
  - Journal policies detailed in this guide have been reviewed
- Referee suggestions and contact details provided, based on journal requirements
- Ensure manuscript is a comprehensive review article (empirical papers fall outside the scope of the journal)
- Ensure that reviews are as up to date as possible and at least to 3 months within date of submission

#### **Article structure**

Manuscripts should be prepared according to the guidelines set forth in the Publication Manual of the American Psychological Association (6th ed., 2009). Of note, section headings should not be numbered.

Manuscripts should ordinarily not exceed 50 pages, *including* references and tabular material. Exceptions may be made with prior approval of the Editor in Chief. Manuscript length can often be managed through the judicious use of appendices. In general the References section should be limited to citations actually discussed in the text. References to articles solely included in meta-analyses should be included in an appendix, which will appear in the on line version of the paper but not in the print copy. Similarly, extensive Tables describing study characteristics, containing material published elsewhere, or presenting formulas and other technical material should also be included in an appendix. Authors can direct readers to the appendices in appropriate places in the text.

It is authors' responsibility to ensure their reviews are comprehensive and as up to date as possible (at least to 3 months within date of submission) so the data are still current at the time of publication. Authors are referred to the PRISMA Guidelines (<http://www.prisma-statement.org/statement.htm>) for guidance in conducting reviews and preparing manuscripts. Adherence to the Guidelines is not required, but is recommended to enhance quality of submissions and impact of published papers on the field.

#### **Appendices**

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

**Essential title page information**

*Title.* Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. **Note: The title page should be the first page of the manuscript document indicating the author's names and affiliations and the corresponding author's complete contact information.**

**Abstract**

A concise and factual abstract is required (not exceeding 200 words). This should be typed on a separate page following the title page. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. References should therefore be avoided, but if essential, they must be cited in full, without reference to the reference list.

**Keywords**

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

**Abbreviations**

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

**Acknowledgements**

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

**Footnotes**

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

**Electronic artwork***General points*

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.

**Figure captions**

Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

**Tables**

Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate

results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

### **References**

Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 1-4338-0559-6, copies of which may be ordered from <http://books.apa.org/books.cfm?id=4200067> or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK. Details concerning this referencing style can also be found at <http://humanities.byu.edu/linguistics/Henrichsen/APA/APA01.html>

### **Citation in text**

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

### **Reference style**

References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication. **References should be formatted with a hanging indent (i.e., the first line of each reference is flush left while the subsequent lines are indented).**



**SCHOOL OF PSYCHOLOGY**  
**DOCTORATE IN CLINICAL PSYCHOLOGY**

**EMPIRICAL PAPER**

**Self-Compassion, Goal Pursuit and Well-Being**

Trainee Name: **Emma Sewter**

Primary Research Supervisor: **Dr Nick Moberly**

Senior Lecturer, University of Exeter

Secondary Research Supervisor: **Dr Alicia Smith**

Research Tutor, University of Exeter

Target Journal: **Self and Identity**

Word Count: 7998 words (excluding abstract, table of contents, list of tables, list of figures, references, footnotes, appendices)

**Submitted in partial fulfilment of requirements for the Doctorate Degree in  
Clinical Psychology, University of Exeter**

### **Abstract**

This study explored associations between trait self-compassion, goal motives, goal progress and well-being (life satisfaction, positive affect and negative affect) in an undergraduate sample. Self-compassion has been associated with many indices of well-being. However, surprisingly little research has investigated the pathways through which self-compassion and well-being are connected. Exploring the process of goal pursuit could provide a viable way of understanding how self-compassion may translate to well-being, as goals are important for providing purpose and direction in life. Thus, this study examined how self-compassion might help students adjust to the challenges of starting university. It set out to test two proposed mediation models: i) whether intrinsic and identified motives and goal progress mediate self-compassion's relationship with change in life satisfaction and positive affect from the beginning to the end of the first term and ii) whether introjected and external motives mediate self-compassion's relationship with change in negative affect from the beginning to the end of the first term. First-year undergraduates completed self-report questionnaires online at the beginning, middle and end of their first term of university. Results indicated that higher levels of self-compassion were associated with higher levels of life satisfaction and positive affect and lower levels of negative affect at the beginning, middle and end of the first term. The study did not find support for prospective associations between self-compassion and changes in life satisfaction or positive affect. Self-compassion significantly predicted relative reductions in negative affect at the middle of term but was not significantly related to change in negative affect at the end of term. Self-compassion was negatively associated with introjected and external motives but no relationships were found between self-compassion and intrinsic and

identified motives or goal progress. No support was found for the proposed mediation models. Conceptually, the non-significant findings suggest that self-compassion is more relevant to understanding negative experiences than to goal striving itself. Future research could investigate the negative association between self-compassion and introjected and external motives in more detail, with future experimental work determining whether self-compassionate manipulations could reduce people pursuing goals for controlled reasons.

**Keywords:** Self-compassion; goal motives; goal progress; well-being.

## Introduction

Starting university is often an exciting time but it can also be highly daunting and stressful. It is a period of substantial transition involving simultaneous changes in responsibility, routine, lifestyle and identity (Gall, Evans, & Bellerose, 2000; Terry, Leary, & Mehta, 2013). At university, students are required to pursue and achieve meaningful goals, both academic and social, as well as cope with their emotional responses to success and disappointment. Consequently, adjusting to university life is recognised as challenging students' sense of well-being (Neely, Schallert, Mohammed, Roberts, & Chen, 2009). Well-being has been defined as an individual's satisfaction with life and the experience of positive affect and the absence of negative affect (Diener, 2000). One construct that has spurred increasing interest in relation to well-being, and that may be relevant to students adapting to university life, is self-compassion.

Self-compassion entails holding a kind and caring attitude towards oneself when challenged with perceived inadequacies or hardship (Neff, 2003a). Neff (2003a) proposes three interrelated facets of self-compassion, each of which has a positive and negative pole representing compassionate versus uncompassionate behaviour. Self-kindness is the tendency to treat oneself with care and understanding, rather than being judgmental or critical in times of suffering. Common humanity involves an awareness that suffering and feelings of inadequacy are part of a shared human experience, rather than a feeling of being isolated by one's imperfections. Finally, mindfulness describes having a balanced awareness of negative thoughts and feelings, so that painful thoughts are neither exaggerated nor suppressed. Taken together, these components create a self-compassionate frame of mind, enabling us to manage

our emotions when faced with difficulties (Neff et al., 2018). The majority of research on self-compassion has used the Self-Compassion Scale (SCS; Neff, 2003b), which is based on Neff's aforementioned definition. However, there are also other conceptualisations of self-compassion, such as Gilbert's (2005) evolutionary model which focuses on the interplay between three emotion-regulation systems, named the 'threat', 'drive' and 'soothing' systems.

There is accumulating evidence supporting the benefits of self-compassion for subjective well-being and mental health outcomes (Neff, 2009). Cross-sectional research using the SCS shows that self-compassion is negatively associated with depression, anxiety, stress, rumination and fear of failure. Conversely, it is positively associated with optimism, happiness, social connectedness, life-satisfaction and positive affect (Barnard & Curry, 2011; Neff, Rude, & Kirkpatrick, 2007). Meta-analyses indicate a large positive relationship ( $r = .47$ ) between self-compassion and well-being (Zessin, Dickhäuser, & Garbade, 2015) and a large inverse relationship ( $r = -.54$ ) between self-compassion and psychopathology, defined by aggregating anxiety, depression and stress measures (MacBeth & Gumley, 2012). Additionally, research has shown that self-compassion interventions can produce improvements in mood, lead to reductions in depression and anxiety and positively impact physiological responses to stress (Arch et al., 2014; Gilbert & Procter, 2006). Therefore, there is a consensus in the empirical literature that self-compassion is associated with many indices of well-being. However, the underlying mechanisms and processes by which self-compassion exerts its protective effects are not yet well understood (Raes, 2010).

Exploring the process of goal pursuit could provide a viable way of understanding how self-compassion may translate to well-being, as goals are

important for providing purpose, meaning and direction in life (Dickson, Moberly, & Kinderman, 2011). The successful pursuit of goals has been consistently related to subjective well-being. For example, a recent meta-analysis found a significant medium-sized association between successful goal striving and subjective well-being (Klug & Maier, 2015). Research has shown that well-being is influenced by many aspects of goal pursuit, including goal progress, goal motives and response to setbacks (Brunstein, 1993; Emmons, 1996; Sheldon & Elliot, 1999; Wrosch, Scheier, Miller, Schulz, & Carver, 2003). Higher perceived rates of goal progress are related to positive affect, whereas lower perceived rates are related to negative affect (Carver & Scheier, 1998; Moberly & Watkins, 2010). Self-compassion may help people to deal emotionally with setbacks on the path to goal attainment. Following negative events, individuals high in trait self-compassion have been found to form more accurate appraisals and self-evaluations, without unrealistically enhancing or deprecating the self (Leary, Tate, Adams, Allen, & Hancock, 2007). This may be beneficial for setting more realistic goals, as well as providing more accurate feedback on subjective goal progress.

Self-compassion may also be related to the reasons people have for pursuing goals. Ryan, Sheldon, Kasser and Deci (1996) have argued that differentiating why people pursue goals is critical in determining well-being outcomes. Self-Determination Theory (Ryan & Deci, 2000) provides a framework to understand motivation and maintains that motives vary in the degree to which they are autonomous or controlled. A person may pursue a goal purely for the fun and enjoyment it provides (intrinsic reasons), or because they freely value the goal as important and because it reflects their interests (identified reasons). These both represent autonomous motives, as the

motivation for the goal is highly internalised. Alternatively, a person may pursue a goal to avoid the shame, guilt or anxiety that they would feel if they did not (introjected reasons), or engage in actions to facilitate some external outcome, such as gaining a reward or to avoid an external punishment (external reasons). These both represent controlled motives, as the motivation underlying the goal is not fully internalised and is derived from external demands. External and introjected motives are potentially problematic, as in both cases the person does not fully satisfy their psychological need for autonomy. According to Self-Determination Theory, the pursuit of autonomous goals will enhance well-being, as these are aligned with the person's true self, values and interests. Conversely, the pursuit of controlled goals may thwart well-being, as they do not accurately reflect the values and interests of the person and are likely to generate intrapersonal conflict (Thomsen, Tønnesvang, Schnieber, & Olesen, 2011). Autonomous motives have been related to goal progress, goal persistence and positive affect, while controlled motives have been associated with less effort, negative affect and have been found to be either negatively or unrelated to goal progress (Koestner, Otis, Powers, Pelletier, & Gagnon, 2008; Ryan & Deci, 2000; Sheldon & Elliot, 1998, 1999). Sheldon and Houser-Marko (2001) found that students starting the term with goals that matched their implicit values and interests were better able to attain these goals over the term, which in turn led to increased adjustment. Thus, having goals that are self-concordant, i.e., goals that are intrinsically rewarding or hold personal value, maximises the benefit of goal-attainment on well-being.

Self-compassion may be associated with effective goal pursuit, by promoting more autonomous motives and adaptive responses to failure. The mindful facet of self-compassion may help an individual maintain awareness of

what is meaningful to them when striving for goals, thus facilitating intrinsic and identified motives (Brown & Ryan, 2003). Sheldon and his colleagues found that people work longer and harder on goals that reflect their true self, meaning that they are more likely to be attained (Sheldon & Elliot, 1998, 1999; Sheldon & Houser-Marko, 2001). Therefore, it is likely that higher self-compassion will predict goal progress. In addition, the facets of self-kindness and common humanity may enable a more balanced stance, resulting in an individual not feeling the need to avoid negative self-judgements, thus reducing introjected motives. The link with autonomous motives may partly explain why self-compassion is associated with well-being. In line with this, Hope, Koestner, and Milyavskaya (2014) examined the role of trait self-compassion in students' goal pursuit and well-being across the first-year of university. They found that self-compassion was associated with more autonomous and less controlled motives for goals. More specifically, they found that self-compassion moderated the relationship between autonomous goal motivation and negative affect, such that autonomous motivation was especially related to low negative affect for students who were high in self-compassion. However, one unexplored avenue of research that builds on the work by Hope et al. (2014), would be to investigate whether goal motives *mediate* the link between trait self-compassion and change in well-being. Based on the reviewed literature, it is reasonable to expect that self-compassion would promote better adjustment to university, by facilitating students to pursue goals for more autonomous motives rather than controlled motives, which in turn would be associated with well-being outcomes over the first university term.

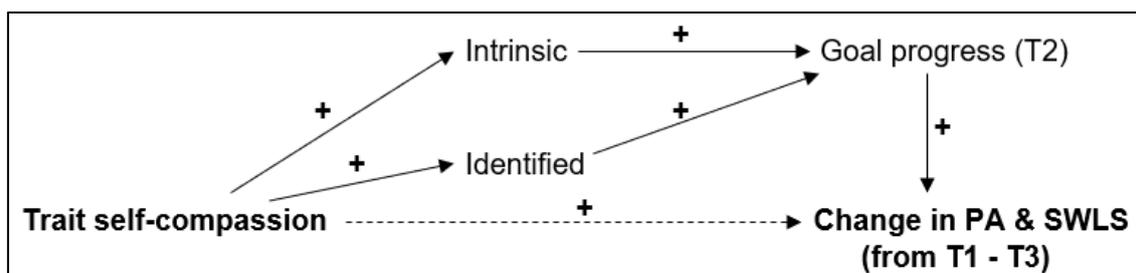
The current study will investigate the relationships between new undergraduates' trait self-compassion, goal motives, goal progress and well-

being, with three time points of data collection – the beginning (T1), middle (T2) and end (T3) of the first term. Subjective life satisfaction and positive and negative affect will be used as indicators of well-being. A recent meta-analysis of the motivation scales suggested the use of individual regulation subscales (intrinsic, identified, introjected and external), rather than collapsing them into autonomous and controlled scales (Howard, Gagné, & Bureau, 2017). Therefore, the study will analyse these as individual variables.

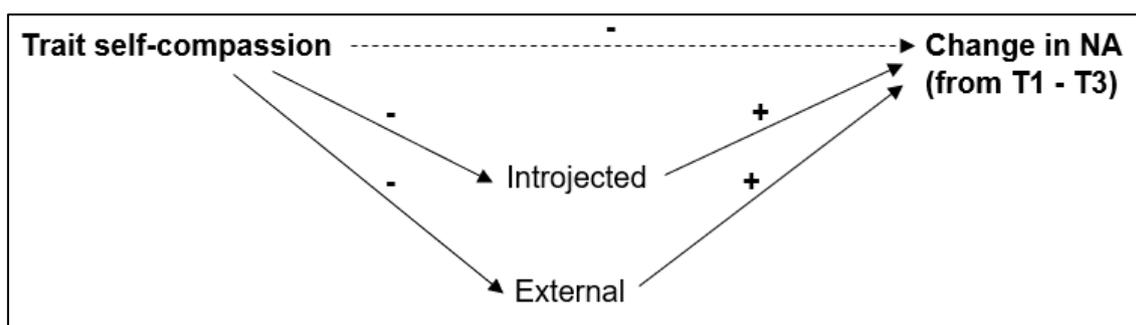
In light of the theoretical and research considerations reviewed, this study aims to explore two proposed mediation models (see Figure 1 and 2) to understand the theoretical mechanisms between trait self-compassion, goal motives, goal progress and well-being. To date, there has been little published on the potential pathways through which self-compassion may lead to higher subjective well-being. Additionally, previous studies have tended to examine the emotional and cognitive correlates of self-compassion (e.g., Bakker, Cox, Hubley & Owens, 2018; Raes, 2010); rather than the motivational correlates, which will be explored in this study. Having a better theoretical understanding of these relationships could help explain why students lacking self-compassion might have difficulties in goal pursuit, in an environment where goal attainment is particularly salient. Understanding the mechanisms that facilitate well-being in the student population is of great importance, as it is recognised that the number of students disclosing mental health difficulties on arrival at university has surged (Thorley, 2017). Students vary in their ability to adjust to and cope with the new challenges of starting university. Those who adapt successfully to their new academic and social environment are more likely to persist in university and ultimately earn a degree (Tinto, 2006). Therefore, this study is

interested in predicting change in well-being over the first term of university (i.e., who adapts effectively to university).

The hypothesised models propose that self-compassionate first-year undergraduates are more likely to pursue intrinsic and identified goal motives and less likely to pursue external and introjected goal motives, at the start of their first term. They are then more likely to report subjective goal progress at the middle and end of the first term because having self-concordant (i.e., intrinsically rewarding and personally meaningful) goals has been repeatedly shown to predict better goal progress (Koestner et al., 2008). By contrast, individuals lacking in self-compassion are more likely to pursue goals for introjected and external reasons, without necessarily making progress on them. It is implicit in the model that progress is related to life satisfaction and positive affect, and that progress is predicted by intrinsic and identified but not introjected and external motives (Ryan & Deci, 2000; Sheldon & Elliot, 1998, 1999). As the challenges of university life (e.g., assignments, disputes) are likely to accumulate over the first term, as well as looking at baseline correlations the study is interested in knowing whether self-compassion predicts well-being change over time. A decline in well-being may be expected, as adjusting to a new environment can be stressful (Conley, Kirsch, Dickson, & Bryant, 2014) but this may be less pronounced for students with high self-compassion.



*Figure 1.* Proposed mediation model of how change in positive affect (PA) and life satisfaction (SWLS) from the beginning to the end of term (T1 - T3) may be predicted by self-compassion, based on the proposed hypotheses.



*Figure 2.* Proposed mediation model of how change in negative affect (NA) from the beginning to the end of term (T1 - T3) may be related to self-compassion, based on the proposed hypotheses.

### Research Questions

1. Is trait self-compassion associated with goal progress and well-being indicators?
2. Is trait self-compassion associated with more intrinsic and identified motives and less introjected and external motives for goals?
3. Do motives for goals and goal progress partially mediate the relationship between trait self-compassion and change in well-being indicators?

### Hypotheses

1. For the relationship between trait self-compassion and the well-being indicators, it was predicted that:

- a) Trait self-compassion will be positively associated with life satisfaction (T1, T2 & T3) and change in life satisfaction from (i) the beginning to the middle of term and (ii) the beginning to the end of the first term at university.
  - b) Trait self-compassion will be positively associated with positive affect (T1, T2 & T3) and change in positive affect from (i) the beginning to the middle of term and (ii) the beginning to the end of the first term at university.
  - c) Trait self-compassion will be negatively associated with negative affect (T1, T2 & T3) and change in negative affect from (i) the beginning to the middle of term and (ii) the beginning to the end of the first term at university.
2. Higher trait self-compassion will be associated with stronger intrinsic and identified motives for goals and weaker introjected and external motives for goals.
  3. Higher trait self-compassion will be associated with higher levels of goal progress at the middle and end of the first term at university, whilst controlling for goal importance.
  4. The positive association between trait self-compassion and goal progress (T2 & T3) will be partially mediated by stronger intrinsic and identified motives for goals, whilst controlling for goal importance.
  5. For the association between trait self-compassion and the well-being indicators, it was predicted that:
    - a) The association between trait self-compassion and change in life satisfaction from the beginning to the end of term will be partially

mediated by stronger intrinsic and identified goal motives and goal progress at time 2, whilst controlling for goal importance.

- b) The association between trait self-compassion and change in positive affect from the beginning to the end of term will be partially mediated by stronger intrinsic and identified goal motives and goal progress at time 2, whilst controlling for goal importance.
- c) The association between trait self-compassion and change in negative affect from the beginning to the end of term will be partially mediated by stronger introjected and external motives for goals, whilst controlling for goal importance.

## Method

### Design

A longitudinal design with three time points was used to explore associations between trait self-compassion, goal motives, goal progress and well-being. An online survey methodology was used at the beginning, middle and end of the first term of university.

### Participants

Two hundred and nineteen first-year undergraduate students were recruited from the University of Exeter (176 women, 43 men,  $M = 18.8$  years,  $SD = 1.7$ , range = 17-36). The sample was 74% white, 12% Chinese, 10% Asian/Asian British, 2% mixed/multiple ethnic groups and 2% other. Participants were remunerated with course credits or £15. Recruitment took place through the Psychology Research Participation Scheme and via posters around the university campus.

## Power Analysis

Using the statistical package G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007), it was calculated that for correlation analyses, a sample size of 84 was required to detect a medium effect ( $r = .3$ ), with a power of .80 and an alpha level of .05; a medium effect was chosen as a reasonable approximation in the absence of comparable research in the area. The recommended sample size to detect a medium effect with a power of .80 in a bias-corrected bootstrap test of mediation was 71 (Fritz & MacKinnon, 2007). A minimum sample of 84 participants was therefore required in order to achieve sufficient power for all hypotheses.

## Measures

**Self-compassion.** The Self-Compassion Scale (SCS; Neff, 2003b) was used to assess trait self-compassion (Appendix A). This is a 26-item self-report inventory related to “how I act towards myself in difficult times”, consisting of six subscales: self-kindness, self-judgement, common humanity, isolation, mindfulness and over-identification. Each item is rated on a five-point Likert scale, from ‘*almost never*’ to ‘*almost always*’. The self-judgment, isolation, and mindfulness subscales are reverse scored. Means are calculated for each subscale and a grand mean is calculated for a total self-compassion score, ranging from 1 to 5. Higher mean total scores indicate higher self-compassion. Sound psychometric properties have been reported, including high internal consistency, good test-retest reliability and predictive, convergent and discriminant validity (Neff, 2003b; Neff et al., 2007). The Cronbach’s alpha for this sample was .89.

**Personal goals.** Instructions for eliciting goals were based on those developed by Emmons (1986). Participants were asked to generate four personal goals by completing the stem: 'I typically try to...'. They were asked to identify goals that are high in personal importance and meaning, are challenging and which require ongoing effort, with examples provided. Full instructions are included in Appendix B.

**Goal motives.** Goal motivation was measured using Ryan and Connell's (1989) reasons for personal goal pursuit, which assess four types of motivation spanning the continuum of self-determination. The participant was asked 'to what extent are you pursuing this goal....' for each of the following four motives: (i) 'because of the fun and enjoyment which the goal will provide, i.e., while there may be many good reasons for this striving, the primary "reason" is simply your interest in the experience itself' (intrinsic reasons); (ii) 'because you really believe that it is an important goal to have, i.e., this goal may have been once taught to you by others, but you now endorse it freely and value it wholeheartedly' (identified reasons); (iii) 'because you would feel ashamed, guilty or anxious if you didn't, i.e., you feel you ought to have this striving' (introjected reasons) and (iv) 'because somebody else wants you to or thinks you ought to, or because you'll get something from somebody if you do' (external reasons). Each reason was rated on a 6-point scale from '0' (*not at all*) to '5' (*extremely*).

**Goal importance.** Goal importance was assessed using a single item: 'How important is this striving to your life, i.e., how committed are you to

working towards this striving?' (Emmons, 1986). This was rated on a 6-point scale from '0' (*not at all*) to '5' (*extremely*).

**Goal progress.** At T2 and T3, participants were reminded of the personal goals they had chosen and for each they were asked about their perceived progress using a single item: 'To what extent do you feel you have made progress on this goal?' This was rated on a 7-point scale, from '1' (*not at all*) to '7' (*very much*) (Moberly & Watkins, 2010).

**Well-being.** Subjective life satisfaction was measured using the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), which measures the cognitive element of well-being. It consists of five statements which participants rate on a 7-point scale, from '*strongly disagree*' to '*strongly agree*'. Higher scores represent higher levels of life satisfaction. The average life satisfaction score in developed nations is reported to be between 20-24. The scale has been shown to be a valid and reliable measure of life satisfaction (Pavot, Diener, Colvin, & Sandvik, 1991). Cronbach's alphas for this sample were high (T1 = .81; T2 = .82; T3 = .87). See Appendix C.

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) measures the affective/emotional aspects of well-being using two mood scales: positive affect (PA) and negative affect (NA). It contains 20 words describing different feelings or emotions, rated on a 5-point scale from '0' (*very slightly or not at all*) to '4' (*very much*). Total scores are calculated for each scale by summing all the 10-items, ranging from 10 to 50. Higher scores indicate more positive and negative affect. Norms of positive affect ( $M = 33.3$ ,  $SD = 7.2$ ) and for negative affect ( $M = 17.4$ ,  $SD = 6.2$ ) are presented for a non-

clinical undergraduate sample. The PANAS has been shown to be a reliable and valid measure (Crawford & Henry, 2004; Watson et al., 1988). Cronbach's alphas for this sample were high for both PA (T1 = .84; T2 = .89; T3 = .88) and NA (T1 = .82; T2 = .87; T3 = .86). See Appendix D.

## **Procedure**

Ethical approval was obtained from the University of Exeter (Appendix E). First-year undergraduates were recruited to complete three surveys over their first term at university. Data were collected securely using the online survey provider Qualtrics™ (<http://www.qualtrics.com>, 2018). The survey link was shared on the Psychology Research Participation Scheme website and via an email to interested students. Survey 1 was completed within the first month of students commencing university. Participants first read a study information page and indicated their informed consent (Appendix F and G), before proceeding to the package of questionnaires. The surveys were administered as part of a larger questionnaire battery, meaning some other self-report measures were collected that were not used in this thesis, as they addressed a different research question. Measures included: demographics, SCS, personal goals, goal motives, PANAS and SWLS. Survey 1 was estimated to take 20-30 minutes. Participants were asked to provide their email address at each time point to collate repeated responses and so they could be automatically emailed a link to the second and third surveys, approximately one and two months respectively after completion of survey 1. These included measures of goal progress, PANAS and SWLS and were estimated to take 10 minutes. Following completion, participants were directed to the debrief page (Appendix H).

## **Analytic Strategy**

Statistical analyses were performed using IBM SPSS Statistical Software version 25.0, and the PROCESS macro for SPSS (Hayes, 2013). Following data cleaning, correlation analyses were conducted to test the first hypothesis that (a) scores on the SCS would be positively associated with scores on SWLS, (b) scores on the SCS would be positively associated with scores on the PA and (c) scores on the SCS would be negatively associated with scores on NA. Hierarchical multiple regressions were run to test whether SWLS, PA and NA at T2 and T3 were associated with self-compassion, after controlling for T1 scores. For the second hypothesis, correlation analyses were conducted to explore the association between self-compassion and the four goal motives. Additionally, a hierarchical multiple regression was run to identify unique relationships between any of the goal motives and self-compassion, after controlling for goal importance. To test hypothesis three, two hierarchical multiple regressions were run to see whether goal progress at T2 or T3 was significantly associated with self-compassion, after controlling for goal importance. For hypotheses four and five, mediation analyses were planned using the PROCESS macro (Hayes, 2013), which generates bootstrap confidence intervals to estimate indirect effects. Indirect effects were estimated using 95% bias-corrected and accelerated bootstrap confidence intervals (BCa CIs) based on 5,000 resamples. The indirect effect is deemed significant if the 95% BCa CI does not span zero (Hayes, 2013). This non-parametric resampling method is recommended over the causal steps method (Baron & Kenny, 1986) as it has greater power and involves fewer assumptions (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

## Results

### Data Screening

219 participants provided data at T1, 206 at T2 and 199 at T3, a retention rate of 91%. Pilot testing identified cut-off points for unacceptably short survey completion times, indicating non-conscientious responding. A 10-minute cut-off was set for survey 1 and 4.5 minutes for surveys 2 and 3, removing 20 ineligible participants. The data was screened for univariate and multivariate outliers using boxplots, scatterplots, z-scores and Mahalanobis distance (Tabachnick & Fidell, 2007). One significant univariate outlier was identified and removed from the data set. In tests of normality, none of the variables exhibited significant skewness. The final sample consisted of 197 participants (160 females) for analysis at T1 (age range = 17-36 years,  $M = 18.8$ ,  $SD = 1.8$ ), 184 at T2 (152 females, age range = 17-36 years,  $M = 18.7$ ,  $SD = 1.8$ ) and 177 at T3 (145 females, age range = 17-36 years,  $M = 18.7$ ,  $SD = 1.8$ ). T-tests were used to compare whether non-completers and ineligible participants differed on baseline variables compared to completers. None of these were statistically different.

### Descriptive Statistics

Descriptive statistics are presented in Table 1 with bivariate correlations between variables shown in Table 2. Repeated-measures ANOVAs were conducted to compare well-being scores over time. Life satisfaction showed a significant main effect for time,  $F(2, 352) = 4.14$ ,  $p = .02$ ,  $\eta_p^2 = .02$ . Post-hoc analysis using Bonferroni adjustment revealed the only significant pairwise comparison was T3 scores being significantly lower than T2 ( $p = .02$ ). Positive affect showed a significant main effect for time,  $F(2, 352) = 21.80$ ,  $p = .001$ ,  $\eta_p^2$

= .11. Post-hoc analysis revealed that scores at T2 ( $p = .001$ ) and T3 ( $p = .001$ ) were significantly lower than T1. For negative affect, Mauchly's test indicated that the assumption of sphericity had been violated,  $\chi^2(2) = 11.16$ ,  $p = .004$ . Therefore, degrees of freedom were corrected using Huyhn-Feldt estimates ( $\epsilon = .95$ ). There was a significant main effect for time,  $F(1.90, 334.99) = 38.75$ ,  $p = .001$ ,  $\eta_p^2 = .18$ . Post-hoc analysis revealed that scores at T2 ( $p = .001$ ) and T3 ( $p = .001$ ) were significantly lower than T1.

Table 1

*Descriptive Statistics for Variables*

Measures	<i>M (SD)</i>
SCS	2.71 (0.55)
Goal importance	3.60 (0.66)
Intrinsic motives	2.72 (0.92)
Identified motives	3.98 (0.66)
Introjected motives	2.86 (1.08)
External motives	1.77 (1.24)
T2 goal progress	4.55 (1.00)
T3 goal progress	4.50 (1.07)
T1 SWLS	23.81 (5.60)
T2 SWLS	23.76 (5.35)
T3 SWLS	22.95 (5.66)
T1 PA	34.60 (6.42)
T2 PA	32.58 (7.19)
T3 PA	31.99 (6.73)
T1 NA	26.69 (7.19)
T2 NA	22.71 (7.49)
T3 NA	22.38 (7.01)

*Note.* SCS = Self-Compassion Scale. SWLS = Satisfaction with Life Scale. PA = Positive Affect. NA = Negative Affect. T1:  $n = 197$ , T2:  $n = 184$ , T3:  $n = 177$ .

Table 2

*Pearson Product-Moment Correlations between Measures*

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. SCS	-																
2. Importance	.12	-															
3. Intrinsic	.08	.34***	-														
4. Identified	.04	.55***	.24**	-													
5. Introjected	-.23**	-.16*	.10	.12	-												
6. External	-.20**	-.02	.09	-.01	.43***	-											
7. T2 progress	.13	.20**	.16*	.09	-.07	-.11	-										
8. T3 progress	.12	.25**	.22**	.17*	-.03	-.12	.55***	-									
9. T1 SWLS	.42***	.16*	.19**	.15*	-.01	-.06	.17*	.17*	-								
10. T2 SWLS	.34***	.20**	.08	.10	-.09	-.12	.36***	.35***	.70***	-							
11. T3 SWLS	.31***	.13	.14	.09	-.03	-.05	.28**	.40***	.69***	.74***	-						
12. T1 PA	.24**	.33***	.25**	.21**	-.01	.03	.13	.15*	.49***	.38***	.35***	-					
13. T2 PA	.24**	.29***	.25**	.21**	-.03	-.01	.41***	.33***	.41***	.56***	.43***	.64***	-				
14. T3 PA	.20**	.26***	.26**	.24**	.02	-.08	.32***	.48***	.43***	.44***	.49***	.58***	.71***	-			
15. T1 NA	-.30***	-.04	-.02	.00	.26**	.26**	-.07	-.16*	-.31***	-.38***	-.29***	-.11	-.16*	-.12	-		
16. T2 NA	-.30***	-.08	-.02	-.06	.16*	.29***	-.21**	-.27**	-.36***	-.46***	-.39***	-.10	-.21**	-.13	.57***	-	
17. T3 NA	-.17*	-.10	-.07	-.15*	.06	.26**	-.22**	-.35***	-.25**	-.35***	-.37***	-.13	-.24**	-.23**	.51***	.70***	-

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

## Hypothesis 1

Bivariate correlations between self-compassion and well-being variables are shown in Table 2. Self-compassion was significantly positively correlated with life satisfaction and positive affect at T1, T2 and T3. Self-compassion was significantly negatively correlated with negative affect at T1, T2 and T3. These findings support hypotheses 1a) (i), 1b) (i) and 1c) (i).

A series of hierarchical regressions were used to examine whether self-compassion predicted changes in well-being, from the beginning to the middle and the end of term respectively (Table 3). In the first block of each regression, the measure of the outcome variable at T1 (e.g., T1 SWLS) was entered, with self-compassion entered in the second block. Entering the baseline scores for the dependent variables in block 1 enables self-compassion to be used to predict residual change in the dependent variable. Self-compassion was not significantly related to change in life satisfaction or positive affect at T2 or T3. Self-compassion was significantly negatively related to change in negative affect at T2 but not significantly related to change in negative affect at T3. These findings largely fail to provide support for hypotheses 1a) (ii), 1b) (ii) and 1c) (ii).

Table 3

*Results of Hierarchical Regression for Changes in Well-being*

Dependent variable	$\Delta R^2$	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>
T2 SWLS	.00	.33	.56	.03	.59	.56
T3 SWLS	.00	.17	.61	.02	.29	.78
T2 PA	.01	1.04	.75	.08	1.39	.17
T3 PA	.01	.90	.77	.07	1.17	.25
T2 NA	.02	-1.86	.86	-.14	-2.16	.03
T3 NA	.00	-.06	.87	-.01	-.06	.95

*Note.* Results for the second block, controlling for T1 measure.

## Hypothesis 2

Bivariate correlations between self-compassion and goal motives are shown in Table 2. Self-compassion was significantly negatively correlated with introjected and external motives but was not significantly related to intrinsic or identified motives. Therefore, this provides mixed support for hypothesis 2.

To see if any goal motives uniquely relate to self-compassion, a hierarchical regression model was constructed. After entering goal importance, the four goal motives jointly explained significant additional variance in self-compassion,  $\Delta R^2 = .08$ ,  $F(5, 191) = 3.84$ ,  $p = .003$ . As predicted, introjected motives predicted significant unique variance in self-compassion,  $B = -.12$ ,  $SE(B) = .04$ ,  $\beta = -.23$ ,  $p = .004$ ). No other motive did: intrinsic,  $B = .04$ ,  $SE(B) = .04$ ,  $\beta = .06$ ,  $p = .39$ ; identified,  $B = -.04$ ,  $SE(B) = .07$ ,  $\beta = -.05$ ,  $p = .57$ ; external,  $B = -.04$ ,  $SE(B) = .03$ ,  $\beta = -.09$ ,  $p = .23$ .

## Hypothesis 3

Two hierarchical regressions were run to examine whether self-compassion predicted goal progress at T2 or T3, controlling for goal importance. Contrary to prediction, self-compassion was not significantly related with T2 goal progress ( $B = .16$ ,  $SE(B) = .13$ ,  $\beta = .09$ ,  $\Delta R^2 = .01$ ,  $p = .22$ ) or T3 goal progress ( $B = .17$ ,  $SE(B) = .14$ ,  $\beta = .09$ ,  $\Delta R^2 = .01$ ,  $p = .24$ ).

## Hypothesis 4

Hypothesis 4 predicted that the relationship between trait self-compassion and goal progress would be mediated by more intrinsic and identified reasons for goals. As the study did not provide support for an association between (i) self-compassion and goal progress, or (ii) self-

compassion and intrinsic or identified motives, there was no effect to be mediated and so there was no support for this hypothesis. Therefore, the mediation analysis was not run. However, to examine whether motives uniquely predicted goal progress after controlling for self-compassion, two hierarchical regressions were run predicting goal progress at T2 and T3. In the first block, goal importance and self-compassion were entered, with the four goal motives entered into the second block. No goal motives predicted T2 progress (Table 4). Goal importance predicted goal progress but was only a trend after including goal motives. Intrinsic motives were positively related to T3 progress; no other motives were significant (Table 5). Again, goal importance predicted goal progress but was only a trend after including goal motives. Because self-compassion did not predict intrinsic motives, these results are consistent with the lack of evidence that goal motives mediate between self-compassion and goal progress.

Table 4

*Results of Hierarchical Regression for T2 Goal Progress*

		<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	Importance	.29	.11	1.92	2.63	.009
	SC	.16	.13	.09	1.24	.22
Step 2	Importance	.27	.14	.18	1.97	.05
	SC	.10	.14	.05	.71	.48
	Intrinsic	.13	.09	.12	1.52	.13
	Identified	-.04	.13	-.03	-.32	.75
	Introjected	-.06	.08	-.06	-.76	.45
	External	-.06	.07	-.08	-.92	.36

Note.  $R^2 = .05$  for step 1 ( $p = .01$ ),  $\Delta R^2 = .02$  for step 2 ( $p = .37$ ).

Table 5

*Results of Hierarchical Regression for T3 Goal Progress*

		<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	Importance	.39	.12	.24	3.25	.001
	SC	.17	.14	.09	1.17	.24
Step 2	Importance	.27	.15	.17	1.81	.07
	SC	.11	.15	.06	.76	.45
	Intrinsic	.19	.09	.16	2.10	.04
	Identified	.06	.14	.04	.44	.66
	Introjected	-.01	.08	-.01	-.10	.92
	External	-.10	.07	-.12	-1.42	.16

Note.  $R^2 = .07$ . for step 1 ( $p = .002$ ),  $\Delta R^2 = .04$  for step 2 ( $p = .16$ ).

**Hypothesis 5**

Hypotheses 5a and 5b predicted that the association between self-compassion and change in life satisfaction (5a) and change in positive affect (5b) from the beginning to the end of term would be partially mediated by stronger intrinsic and identified motives and T2 goal progress, whilst controlling for goal importance. As the study did not provide support for a relationship between self-compassion and either (i) intrinsic and identified motives (see hypothesis 2, page 79), or (ii) change in well-being from the beginning to the end of term (see hypotheses 1a (ii) and 1b (ii), page 78), the mediation analysis, and therefore these hypotheses, were not supported.

Hypothesis 5c predicted that the relationship between self-compassion and change in negative affect from the beginning to the end of term would be partially mediated by stronger introjected and external motives, whilst controlling for goal importance. Although the previous analysis (page 78) showed that self-compassion did not predict change in negative affect from the beginning to the end of term, self-compassion was correlated with introjected and external motives. For a strong mediator, it is possible that there is greater power to detect the indirect effect than to detect the total effect (Hayes & Rockwood,

2017). Therefore, a hierarchical regression analysis was run predicting T3 negative affect using the predictors T1 negative affect, self-compassion, goal importance (in the first block) and the four motives (in the second block; Table 6) to examine whether path b was significant for controlled motives. Again, self-compassion did not predict change in negative affect from T1 to T3. External motives were significantly positively related to T3 negative affect, after controlling for self-compassion and the other goal variables.

Table 6

*Results of Hierarchical Regression for T3 NA*

		<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Step 1	T1 NA	.50	.07	.51	7.41	.001
	SC	.05	.87	.00	.05	.96
	Importance	-.81	.69	-.08	-1.18	.24
Step 2	T1 NA	.48	.07	.50	7.15	.001
	SC	-.06	.87	-.06	-.07	.95
	Importance	.44	.85	.04	.52	.60
	Intrinsic	-.28	.52	-.04	-.53	.60
	Identified	-1.62	.82	-.15	-1.99	.05
	Introjected	-.84	.48	-.13	-1.75	.08
	External	1.06	.41	.19	2.58	.01

Note.  $R^2 = .27$ . for step 1 ( $p = .001$ ),  $\Delta R^2 = .29$ . for step 2 ( $p = .001$ ).

The significance of the indirect effect via external and introjected motives was tested using a bootstrapping approach with 5,000 resamples. Although self-compassion did not predict change in negative affect from T1 to T3, for a strong mediator it is possible that there is greater power to detect the indirect effect than to detect the total effect (Hayes & Rockwood, 2017). No significant indirect effects were found for external motives when putting the other goal motives and goal importance as covariates (indirect effect:  $b = -.20$ ,  $SE = .24$ , 95% CI [-0.70, 0.27]). No significant indirect effects were found for introjected motives when putting the other goal motives and goal importance as covariates

(indirect effect:  $b = .24$ ,  $SE = .21$ , 95% CI [-0.03, 0.75]). Therefore, there is no evidence that external or identified motives mediated between self-compassion and change in negative affect from the beginning to end of term, meaning hypothesis 5c is not supported.

## Discussion

This study investigated the relationships between trait self-compassion, goal motives, goal progress and well-being in an undergraduate sample. The study set out to test two proposed mediation models: i) whether intrinsic and identified motives and goal progress mediate self-compassion's relationship with change in life satisfaction and positive affect from the beginning to the end of the first term of university and ii) whether introjected and external motives mediate self-compassion's relationship with change in negative affect from the beginning to the end of the first term at university.

Life satisfaction significantly reduced between the middle and end of term, while positive and negative affect both significantly reduced between the beginning and middle, and beginning and end, of term. However, the changes in the positive indicators were small, suggesting the term was not as stressful for students as expected (Conley et al., 2014). Decreasing scores on both positive and negative affect could suggest that students are experiencing increasing exhaustion and flat affect.

As hypothesised, self-compassion was positively associated with life satisfaction and positive affect, and negatively associated with negative affect, at the beginning, middle and end of term. These findings are consistent with considerable previous research (Gunnell, Mosewich, McEwen, Eklund, & Crocker, 2017; Zessin et al., 2015). However, contrary to hypothesis, the study

did not find support for prospective associations between self-compassion and adaptive changes in life satisfaction or positive affect. Self-compassion significantly predicted relative reductions in negative affect at time 2 but was not significantly related to change in negative affect at time 3. These findings largely fail to support the predictions and are in contrast to previous research (Gunnell, et al., 2017; Hope et al., 2014). A difference between this study and the published research is the timeframe over which they were conducted. Hope et al. (2014) found that across the first *year* of university, students with higher self-compassion experienced favourable changes in life satisfaction, identity development and affect. However, they comment that although the results were statistically significant, the effect sizes were modest. Gunnell et al. (2017) found that change in self-compassion was associated with change in both positive and negative affect over a five-month period. The current study's failure to replicate the findings discussed above could be due to the shorter time period, such that self-compassion has less time to exert an influence. Additionally, a contributory factor could be that the first term may not be as relevant for self-compassion as other time periods, perhaps because academically there is less pressure, such as no exams taking place. As the current study had a larger sample size than both Hope et al. (2014) and Gunnell et al. (2017) and therefore greater power, it is unlikely that the failure to replicate findings is due to low statistical power.

There was mixed support for the relationship between self-compassion and goal motives (hypothesis 2). As predicted, higher self-compassion was associated with less introjected and external motives; however, no relationship was found between self-compassion and intrinsic and identified motives. This is surprising given that Hope et al. (2014) found a significant positive relationship between self-compassion and autonomous motives. Additionally, self-

compassion has been associated with mastery goal setting (Neff, Hsieh, & Dejitterat, 2005), which is aligned with more self-determined motivation and negatively associated with performance goals that are linked to the desire to enhance one's self-image. Theoretically, it was thought that the mindful facet of self-compassion would help individuals maintain awareness of what is meaningful to them when striving for goals (Brown & Ryan, 2003), so that self-compassionate people would be more attuned to authentic desires of the self. However, no support for this was found. When looking at goal motives, only introjected motives were found to have a unique relationship with self-compassion. Theoretically, it makes sense that this could be the strongest relationship because a core component of self-compassion is self-kindness, which represents the ability to be kind and caring to ourselves rather than excessively self-critical (Neff, 2003a). Self-compassionate people may feel less guilt and shame (Gilbert, 2010), so are less likely to strive for goals that avoid these feelings. This suggests that the self-compassionate relationship with pursuing goals could be more about affective reactions than motivation.

Contrary to hypothesis 3, self-compassion was not related to goal progress at either the middle or end of term. Theoretically, it was thought that self-compassionate people have more realistic standards, such that they report greater progress during the term and monitor their goals in a non-judgemental way, rather than being excessively critical. Self-criticism has been related to increased procrastination and negatively associated with goal progress (Powers, Koestner, & Zuroff, 2007). Although Hope et al. (2014) found a significant positive relationship between self-compassion and goal progress at one month, they found they were unrelated at three and five months. This suggests that self-compassion might not be relevant to goal progress over the

time periods studied and that self-compassion might be more related to reactions to goal progress rather than goal progress itself.

Hypothesis 4 predicted that the relationship between self-compassion and goal progress would be mediated by more intrinsic and identified motives. As the study did not provide support for an association between self-compassion and goal progress, or between self-compassion and intrinsic or identified motives, there was no support for this hypothesis. Similarly, as the study did not provide support for a relationship between self-compassion and change in life satisfaction or positive affect from the beginning to the end of term, the mediation analyses for hypotheses 5 a) and 5 b) were not run. As self-compassion was correlated with introjected and external motives, the study tested the proposed mediation model, hypothesis 5 c). However, there was no support for introjected and external motives partially mediating the association between self-compassion and change in negative affect from the beginning to the end of term. Overall, these null findings suggest that self-compassion may have more affective consequences than motivational/volitional ones.

It may be that self-compassion has a stronger association with the type of goal (e.g., social goals, threat-avoidance goals) rather than the goal motive. Gilbert's (2010) conceptualisation of self-compassion proposes that when the drive system is balanced with the soothing and threat systems, it guides us towards important life goals. Self-compassion may be related to an imbalance of social goals (soothing system) and avoidance goals (threat system). This study did not examine goal content, but the findings for controlled motives are in line with self-compassion being inversely related to threat. Social goals may predict greater well-being due to satisfaction of the intrinsic need for relatedness (Self-Determination Theory; Ryan & Deci, 2000). In summary, self-compassion

could be more relevant to the relatedness pathway (i.e., social connectedness) than the autonomy pathway (i.e., the perception of acting volitionally) to well-being.

### **Limitations and Future Directions**

The study used a range of reliable and valid measures to capture the variables of interest; however, these are self-report in nature, relying on participants to have insight into their motives for goals and internal experiences. Social desirability, interpretation and memory bias may have influenced these results. However, the SCS has been shown to have no correlation with social desirability (Neff, 2003b). Also, there is a lack of non-self-report methods to assess these constructs and often these cannot be measured using observable behaviour. An online survey methodology was chosen to recruit a large sample. Although participants with unacceptably short survey times were not included in the analysis, the study could have included trick questions in the surveys, to see whether participants were properly paying attention and improve the quality of the data. Although the longitudinal design of this study was a strength, it was based on a relatively short duration between time points, possibly reducing the likelihood of seeing changes in well-being. Future studies could examine more time points to identify key timeframes for providing university students with support. Another possible limitation is the method used for eliciting goals may have promoted abstract goals that were not sufficiently contextualised for the university environment. It may be that more situational goals would be more strongly associated with well-being over the first term of university.

While it was disappointing that the study found no support for the proposed mediation models, researchers should explore other theoretically

relevant models to help identify key mechanisms that could help support university students' well-being. For example, as discussed earlier, it would be worth exploring whether self-compassionate people have more social goals, which may predict greater well-being due to satisfaction of the intrinsic need for relatedness (Ryan & Deci, 2000). Additionally, it might not just be the absence of self-compassion that is relevant to well-being but also fear of self-compassion (Gilbert, 2010). Self-compassion can have negative connotations, as it can be confused with self-pity and self-indulgence or thought to undermine motivation (Gilbert, McEwan, Matos, & Ravis, 2011). This might be particularly pertinent to students entering the highly competitive university environment. Fear of self-compassion might block activities that could lead to positive affect, self-enhancement and engaging in compassionate experiences.

There may have been relevant covariates that were not included, such as the related constructs of neuroticism and self-esteem, which could then be statistically distinguished from self-compassion. It would be worth investigating the negative associations between self-compassion and introjected and external motives in more detail. For example, are these relationships explained by the fact that people high in self-compassion experience less guilt and shame (Proeve, Anton & Kenny, 2018; Wasylikiw, MacKinnon & MacLellan, 2012), or are these variables associated for other reasons? It would also be interesting to explore whether using experimental manipulations of self-compassion can change controlled motives over time.

### **Clinical Implications**

The present research is somewhat limited in suggesting clinical implications due to finding a lack of support for the proposed mediation models.

Nevertheless, it has implications in terms of what students may be experiencing at different periods of university. When comparing the baseline well-being scores to the reported population means described earlier, the means of the current sample for life satisfaction were similar to population means, positive affect was similar to student population means but negative affect was higher than student population means. This suggests higher levels of negative affect at the start of university. University professionals should take note of this, as negative affect has been related to anxiety and depression (Watson, Clark, & Carey, 1988; Young, Sandman, & Craske, 2019). High negative affect at the beginning of term suggests that there is a lot of stress around starting university and new students should be equipped with tools that help them manage high levels of negative affect and promote well-being across this challenging developmental transition.

Higher levels of self-compassion were associated with higher levels of life satisfaction and positive affect and lower levels of negative affect. Findings also indicate that students lacking self-compassion may be striving for controlled reasons, which may set them up to experience negative affect. Therefore, it is worthwhile for tutors and university counsellors/clinical psychologists to know that students who are low in self-compassion may be striving for avoidance/introjected reasons, making it important to assess goal motivation directly. Poor motivation for academic work could be addressed by self-compassionate interventions to help reduce controlled motives for striving that tend to be associated with distress and not progress (Ryan & Deci, 2000; Thomsen et al., 2011). This might also be coordinated with an awareness of how students with low self-compassion might respond to negative feedback on academic work with more controlled motives for striving, which are not

associated with progress (Sheldon & Elliot, 1998, 1999). Although these findings cannot support causal relationships, supporting students to foster greater self-compassion, such that they experience greater perceptions of autonomy, relatedness and competence, might also be beneficial for goal pursuit.

### **Conclusions**

This study explored associations between trait self-compassion, goal motives, goal progress and well-being in an undergraduate sample, setting out to test two proposed mediation models. Higher levels of self-compassion were associated with higher levels of life satisfaction and positive affect and lower levels of negative affect at the beginning, middle and end of the first term of university. The study did not find support for prospective associations between self-compassion and changes in life satisfaction or positive affect. Self-compassion significantly predicted relative reductions in negative affect at the middle of term but was not significantly related to change in negative affect at the end of the first term. Self-compassion was negatively associated with introjected and external motives but no relationships were found between self-compassion and intrinsic and identified motives or goal progress. No support was found for the proposed mediation models. Conceptually, the non-significant findings suggest that self-compassion is more relevant to understanding responses to negative experiences than to goal striving itself.

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## Appendices

### Appendix A: Self-Compassion Scale

SCS (Neff, 2003)

#### HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

- | Almost<br>never<br>1 | 2 | 3 | 4 | Almost<br>always<br>5 |   |
|----------------------|---|---|---|-----------------------|---|
| _____                |   |   |   |                       | 1. I'm disapproving and judgmental about my own flaws and inadequacies.   |
| _____                |   |   |   |                       | 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.                                      |
| _____                |   |   |   |                       | 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.             |
| _____                |   |   |   |                       | 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world. |
| _____                |   |   |   |                       | 5. I try to be loving towards myself when I'm feeling emotional pain.   |
| _____                |   |   |   |                       | 6. When I fail at something important to me I become consumed by feelings of inadequacy.                              |
| _____                |   |   |   |                       | 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.         |
| _____                |   |   |   |                       | 8. When times are really difficult, I tend to be tough on myself.   |
| _____                |   |   |   |                       | 9. When something upsets me I try to keep my emotions in balance.   |
| _____                |   |   |   |                       | 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people. |
| _____                |   |   |   |                       | 11. I'm intolerant and impatient towards those aspects of my personality I don't like.                                |
| _____                |   |   |   |                       | 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.                          |
| _____                |   |   |   |                       | 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.                      |
| _____                |   |   |   |                       | 14. When something painful happens I try to take a balanced view of the situation.                                    |
| _____                |   |   |   |                       | 15. I try to see my failings as part of the human condition.  |
| _____                |   |   |   |                       | 16. When I see aspects of myself that I don't like, I get down on myself.   |
| _____                |   |   |   |                       | 17. When I fail at something important to me I try to keep things in perspective.                                     |
| _____                |   |   |   |                       | 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.                 |
| _____                |   |   |   |                       | 19. I'm kind to myself when I'm experiencing suffering.   |
| _____                |   |   |   |                       | 20. When something upsets me I get carried away with my feelings.   |
| _____                |   |   |   |                       | 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.                                       |
| _____                |   |   |   |                       | 22. When I'm feeling down I try to approach my feelings with curiosity and openness.                                  |
| _____                |   |   |   |                       | 23. I'm tolerant of my own flaws and inadequacies.  |
| _____                |   |   |   |                       | 24. When something painful happens I tend to blow the incident out of proportion.                                     |
| _____                |   |   |   |                       | 25. When I fail at something that's important to me, I tend to feel alone in my failure.                              |
| _____                |   |   |   |                       | 26. I try to be understanding and patient towards those aspects of my personality I don't like.                       |

## Appendix B: Goal Instructions

### Personal goal strivings

#### Instructions

This study is interested in your pursuit of personal goals that are important and meaningful to you. These are defined as things that you are typically or characteristically trying to do. We might call these objectives “strivings”. Here are some examples of strivings:

- I typically try to eat a healthy diet.
- I typically try to spend more time studying.
- I typically try to be physically attractive to others.
- I typically try to convince others I am intelligent.
- I typically try to seek new and exciting experiences.
- I typically try to avoid feeling inferior to others.
- I typically try to avoid being noticed by others.

Note that these strivings are phrased in terms of what a person is “trying” to do, regardless of whether the person is actually successful. For example, a person might be “Trying to get others to like me” without necessarily being successful.

These strivings may be fairly broad, such as “try to make others happy” or more specific, such as “try to make my boyfriend more confident.” Also note that the strivings can be either positive or negative. That is, they may be about something you typically try to obtain or keep, or things that you typically try to avoid or prevent. For example, you might typically try to obtain attention from others, or you might typically try to avoid calling attention to yourself.

You can see that this way of describing yourself is different from using trait adjectives (friendly, intelligent, honest). We do not want you to use trait adjectives. Since you may have never thought of yourself in this way before, think carefully about what I am asking you to do before you write anything down.

**In this initial session, we would like you to think about 4 goal strivings that you are currently working on.**

Please keep your attention focused on yourself. Do not mentally compare the things that you typically do with what other people do. Think of yourself and your purposes alone. Be as honest and as objective as possible. Do not give simply socially desirable strivings or strivings which you think you “ought” to have.

You might find it useful to think about your goals in different domains of your life: work and study, home and family, social relationships, and leisure/recreation. Think about all of your desires, goals, wants, and hopes in these different areas.

**Take your time with this task; spend some time thinking about your goals before you begin. You will be asked to think about these at the two follow-up timepoints.**

## Appendix C: Satisfaction with Life Scale

(SWLS; Diener, Emmons, Larsen, & Griffin, 1985).

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding. The 7-point scale is as follows:

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

\_\_\_\_\_ In most ways my life is close to my ideal.

\_\_\_\_\_ The conditions of my life are excellent.

\_\_\_\_\_ I am satisfied with my life.

\_\_\_\_\_ So far I have gotten the important things I want in life.

\_\_\_\_\_ If I could live my life over, I would change almost nothing.

- 31 - 35 Extremely satisfied
- 26 - 30 Satisfied
- 21 - 25 Slightly satisfied
- 20 Neutral
- 15 - 19 Slightly dissatisfied
- 10 - 14 Dissatisfied
- 5 - 9 Extremely dissatisfied

**Appendix D: Positive and Negative Affect Schedule**

(PANAS; Watson, Clark, & Tellegen, 1988).

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate the extent you have felt this way over the past week.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely
_____ interested			_____ irritable	
_____ distressed			_____ alert	
_____ excited			_____ ashamed	
_____ upset			_____ inspired	
_____ strong			_____ nervous	
_____ guilty			_____ determined	
_____ scared			_____ attentive	
_____ hostile			_____ jittery	
_____ enthusiastic			_____ active	
_____ proud			_____ afraid	

**Appendix E: Ethics Documentation**

Application ID: **eCLESPsy000654 v2.1**  
 Title: **Goal flexibility, self-compassion as predictors of homesickness and wellbeing**

Your e-Ethics application has been reviewed by the CLES Psychology Ethics Committee.

The outcome of the decision is: **Favourable**

**Potential Outcomes**

<b><i>Favourable:</i></b>	The application has been granted ethical approval by the Committee. The application will be flagged as Closed in the system. To view it again, please select the tick box: View completed
<b><i>Favourable, with conditions:</i></b>	The application has been granted ethical approval by the Committee under the provision of certain conditions. These conditions are detailed below.
<b><i>Provisional:</i></b>	You have <b>not</b> been granted ethical approval. The application needs to be amended in light of the Committee's comments and re-submitted for Ethical review.
<b><i>Unfavourable:</i></b>	You have <b>not</b> been granted ethical approval. The application has been <b>rejected</b> by the Committee. The application needs to be amended in light of the Committee's comments and resubmitted / or you need to complete a new application.

Please view your application [here](#) and respond to comments as required. You can download your outcome letter by clicking on the 'PDF' button on your eEthics Dashboard.

If you have any queries please contact the CLES Psychology Ethics Chair:  
**Lisa Leaver** [L.A.Leaver@exeter.ac.uk](mailto:L.A.Leaver@exeter.ac.uk)

Kind regards,  
 CLES Psychology Ethics Committee

## Appendix F: Information Sheet

### PARTICIPANT INFORMATION PAGE - PLEASE READ BEFORE PROCEEDING

#### Researchers: Emma Sewter and Mandeep Bachu

Thank you for considering taking part in the following research study. Please read the following information carefully before deciding whether or not you wish to continue with participation. You can contact the researcher with any questions you may have. Contact details can be found below.

**Invitation and brief summary:** The aim of this study is to explore the relationships between trait self-compassion, goal motives, goal progress and wellbeing. Additionally, the current project will investigate how goal pursuit may predict homesickness and wellbeing in first year students moving into higher education.

**Purpose of the research:** The study is interested in exploring how trait self-compassion may help students adapt to starting university. Self-compassionate individuals may set certain goals that lead to progress, which in turn translates into benefits for wellbeing.

**Why have I been approached:** Due to the nature and focus of the study, first year undergraduate students who have joined the university are being asked to participate. Exeter University's Psychology Research Participation Scheme has facilitated promotion of the study and recruitment of participants. It is hoped that approximately 150 students will participate in the study.

**What would taking part involve?** This study is an online survey and will ask you some questions regarding a number of different areas. These include: some background information (e.g., age, sex) and some personality and mood questionnaires. You will also be asked to identify 4 goals that you will pursue over the next few weeks. You will be provided with clear instructions for doing this and you can contact the researcher with any difficulties. This survey takes approximately 30-40 minutes. Your progress will be saved automatically.

You will then be asked to carry out a follow up survey four weeks later. This will take approximately 15 minutes to complete. It will ask about progress on your goals, emotions and homesickness.

You will finally be asked to complete a follow up survey in approximately 2 months time from the start date. This will take approximately 15 minutes. Again, it will ask about progress on your goals, emotions and homesickness. For the follow up surveys, you will be contacted by email containing a link to fill in the survey. **Total participation should take around 1 hour.**

**What are the possible benefits of taking part?** While the study is unable to make promises regarding specific and direct benefits, your support and contribution may offer wider benefits to society in the form of new knowledge about adjustment to university and some indirect benefits might be foreseeable for participants.

**What are the possible disadvantages and risks of taking part?** While the study carries low risk, the questionnaires on depression and anxiety may identify unpleasant feelings. To this end, support information will be provided to all participants through the 'Contact Details of Support Organisations' information sheet. Additionally, the researcher recognises the potential burdensome requirement of having to complete questionnaires on three separate occasions during the first semester, although the second and third phases are relatively short. Furthermore, in the event that certain

questions trigger distress, you are encouraged to seek support from your personal tutor, university counselling or GP.

**What will happen if I don't want to carry on with the study?** Participation in the study is entirely optional. You can stop taking part in the study at any time without having to provide a reason and have the data that you have provided destroyed.

**How will my information be kept confidential?** The University of Exeter processes personal data for the purposes of carrying out research in the public interest. The University will endeavour to be transparent about its processing of your personal data and this information sheet should provide a clear explanation of this. If you do have any queries about the University's processing of your personal data that cannot be resolved by the research team, further information may be obtained from the University's Data Protection Officer by emailing [dataprotection@exeter.ac.uk](mailto:dataprotection@exeter.ac.uk) or at [www.exeter.ac.uk/dataprotection](http://www.exeter.ac.uk/dataprotection).

All data will be kept confidential. Your email address will be retained to send emails for the follow up surveys and for you to be entered into the prize draw; they will be deleted following contact with the winners. The anonymised raw data will be retained securely for a period of 7 years. All personal data will be stored separately from the raw data collected and will only be linked by a code number to which only the researchers have access. Confidentiality would only be broken under circumstances where you or someone else is believed to be at immediate risk.

**Will I receive any payment for taking part?** To thank you for participating in this study, those taking part through the Psychology Research Participation Scheme will receive 2 course credits for completing the study. One course credit will be given for completing the first section, 0.5 credits will be given for each of the follow-ups. Non-psychology student participants will receive £10 for their participation. All participants will also be entered into a prize draw (ten x £20 up for grabs!). You will be entered once for completing each part of the study and will therefore be entered three times for completing the entire study.

**What will happen to the results of this study?** The results of the study will be written up as part of a clinical psychology doctoral thesis and will be published via Open Research Exeter (ORE). The results from this study aim to be published in a peer reviewed journal and/or shared at relevant conferences. No personal information about participants will be included. If you would like further information on the main results of the study, please contact the lead researcher.

**Who is organising and funding this study?**

Emma Sewter - Trainee Clinical Psychologist - [es561@exeter.ac.uk](mailto:es561@exeter.ac.uk)  
Mandeep Bachu - Trainee Clinical Psychologist - [mb765@exeter.ac.uk](mailto:mb765@exeter.ac.uk)  
Dr Nick Moberly - Senior Lecturer and project supervisor - [N.Moberly@exeter.ac.uk](mailto:N.Moberly@exeter.ac.uk)  
Dr Pia Pechtel - Programme Tutor and project supervisor - [P.Pechtel@exeter.ac.uk](mailto:P.Pechtel@exeter.ac.uk)  
Dr Alicia Rossiter - Academic and Research Tutor - [A.Rossiter@exeter.ac.uk](mailto:A.Rossiter@exeter.ac.uk)

**Who has reviewed this study?**

This project has been reviewed by the Research Ethics Committee at the University of Exeter.

**Further information and contact details**

For further information regarding the study, please feel free to contact the lead researchers. If there are any aspects of the study with which you are unhappy about please contact the project supervisor or Gail Seymour, Research Ethics and Governance Manager [g.m.seymour@exeter.ac.uk](mailto:g.m.seymour@exeter.ac.uk), 01392 726621.

**Appendix G: Consent Form**

Please complete the below questions to confirm that you give your consent to complete the following study.

I confirm that I have read and understood the participant information page.
Yes
No

I understand that my information and the data I provide will be kept confidential, but that relevant sections of the data collected during the study may be looked at by members of the research team and individuals from the University of Exeter, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my responses.
Yes
No

I understand that my information and the data I provide will be kept confidential, but that relevant sections of the data collected during the study may be looked at by members of the research team and individuals from the University of Exeter, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my responses.
Yes
No

I understand that data will be stored as anonymised questionnaire responses on password-protected computer servers and that these will be stored separately from contact details (which will be deleted at the end of the study).
Yes
No

I understand that my anonymised questionnaire responses will be stored in an archive for 7 years before being deleted.
Yes
No

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without my legal rights being affected.
Yes
No

I consent to taking part in this study
Yes
No

## Appendix H: Debrief Form

### Debrief form

**Thank you very much for taking part in this research. Your time and effort are most appreciated!**

The purpose of this study was to examine the role of self-compassion, goal motives, goal progress and wellbeing.

Self-compassion involves being kind and understanding towards ourselves and not judging ourselves when we experience misfortune or personal failings. A self-compassionate attitude includes a balanced view of oneself as well as one's (negative) emotional experiences.

It is expected that people who are more self-compassionate will report higher levels of wellbeing (measured by life satisfaction and positive and negative affect). It is predicted that people who pursue goals because of the 'fun and enjoyment' or if they value the goal as 'important' (autonomous motives), compared to those that pursue goals due to 'shame or anxiety' or 'to please others' (controlled motives) will have higher self-compassion. It is predicted that less progress will be reported for goals that are pursued for controlled reasons compared to autonomous reasons. It is further predicted that attitudes towards goals will be associated with depressive symptoms, homesickness and rumination.

It is important to investigate these relationships, as having a better theoretical understanding of these mechanisms could help explain why people lacking self-compassion might have difficulties in goal pursuit. It could also further our understanding of the construct of self-compassion and improve applied efforts to implement self-compassionate interventions.

If you have any further questions about this study then please contact Emma Sewter, Mandeep Bachu or Dr Nick Moberly on the contact details below.

Emma Sewter, Trainee Clinical Psychologist, Email: [es561@exeter.ac.uk](mailto:es561@exeter.ac.uk)  
Mandeep Bachu, Trainee Clinical Psychologist, Email [mb765@exeter.ac.uk](mailto:mb765@exeter.ac.uk)  
Dr. Nick Moberly, Senior Lecturer, Email: [N.J.Moberly@exeter.ac.uk](mailto:N.J.Moberly@exeter.ac.uk), Tel:  
01392 724656

**If participation in this study has caused concern about your health or wellbeing then please contact your GP in the usual way. Contact details of support organisations have also been provided on the next page.**

## **Appendix I: Dissemination Statement**

Dissemination of the results from this study will predominantly involve presentation, journal publication and feedback on request.

### **Presentation**

Presentations have been scheduled to take place at the University of Exeter in June 2019 to disseminate the findings of this study to staff and peers.

### **Publication**

The Systematic Review will aim to be submitted to the journal 'Clinical Psychology Review'. Instructions for manuscript preparation can be found in Appendix B of the Systematic Review, page 54.

The Empirical Paper will aim to be submitted to the journal 'Self and Identity'. Instructions for manuscript preparation can be found in Appendix J, page 109.

### **Feedback to Participants**

Participants involved in this study will not be provided with feedback; however, the information and debrief pages indicate that they are able to contact the researcher should they wish to be informed as to the results of the study.

## Appendix J: Submission Guidance for Self and Identity

### Instructions for authors

Thank you for choosing to submit your paper to us. These instructions will ensure we have everything required so your paper can move through peer review, production and publication smoothly. Please take the time to read and follow them as closely as possible, as doing so will ensure your paper matches the journal's requirements. For general guidance on the publication process at Taylor & Francis please visit our [Author Services website](#).

### SCHOLARONE MANUSCRIPTS™

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This title utilises format-free submission. Authors may submit their paper in any scholarly format or layout. References can be in any style or format, so long as a consistent scholarly citation format is applied. For more detail see [the format-free submission section below](#).

### About the Journal

*Self and Identity* is an international, peer-reviewed journal publishing high-quality, original research. Please see the journal's [Aims & Scope](#) for information about its focus and peer-review policy. Please note that this journal only publishes manuscripts in English. *Self and Identity* accepts the following types of article: original articles.

### Peer Review and Ethics

Taylor & Francis is committed to peer-review integrity and upholding the highest standards of review. Once your paper has been assessed for suitability by the editor, it will then be single blind peer reviewed by independent, anonymous expert referees. Find out more about [what to expect during peer review](#) and read our guidance on [publishing ethics](#).

### Preparing Your Paper

#### Structure

Your paper should be compiled in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; declaration of interest statement; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list).

#### Word Limits

Please include a word count for your paper. There are no word limits for papers in this journal.

#### Format-Free Submission

Authors may submit their paper in any scholarly format or layout. Manuscripts may be supplied as single or multiple files. These can be Word, rich text format (rtf), open document format (odt), or PDF files. Figures and tables can be placed within the text or submitted as separate documents. Figures should be of sufficient resolution to enable refereeing.

- There are no strict formatting requirements, but all manuscripts must contain the essential elements needed to evaluate a manuscript: abstract, author affiliation, figures, tables, funder information, and references. Further details may be requested upon acceptance.
- References can be in any style or format, so long as a consistent scholarly citation format is applied. Author name(s), journal or book title, article or chapter title, year of publication, volume and issue (where appropriate) and page numbers are essential. All bibliographic entries must contain a corresponding in-text citation.
- The journal reference style will be applied to the paper post-acceptance by Taylor & Francis.
- Spelling can be US or UK English so long as usage is consistent.

Note that, regardless of the file format of the original submission, an editable version of the article must be supplied at the revision stage.

### Checklist: What to Include

1. **Author details.** All authors of a manuscript should include their full name and affiliation on the cover page of the manuscript. Where available, please also include ORCIDiDs and social media handles (Facebook, Twitter or LinkedIn). One author will need to be identified as the corresponding author, with their email address normally displayed in the article PDF (depending on the journal) and the online article. Authors' affiliations are the affiliations where the research was conducted. If any of the named co-authors moves affiliation during the peer-review process, the new affiliation can be given as a footnote. Please note that no changes to affiliation can be made after your paper is accepted. [Read more on authorship](#).
2. Should contain an unstructured abstract of 120 words.
3. **Graphical abstract** (optional). This is an image to give readers a clear idea of the content of your article. It should be a maximum width of 525 pixels. If your image is narrower than 525 pixels, please place it on a white background 525 pixels wide to ensure the dimensions are maintained. Save the graphical abstract as a .jpg, .png, or .tiff. Please do not embed it in the manuscript file but save it as a separate file, labelled GraphicalAbstract1.
4. You can opt to include a **video abstract** with your article. [Find out how these can help your work reach a wider audience, and what to think about when filming](#).
5. No more than 5 **keywords**. Read [making your article more discoverable](#), including information on choosing a title and search engine optimization.
6. **Funding details.** Please supply all details required by your funding and grant-awarding bodies as follows:  
*For single agency grants*  
This work was supported by the [Funding Agency] under Grant [number xxxx].  
*For multiple agency grants*  
This work was supported by the [Funding Agency #1] under Grant [number xxxx]; [Funding Agency #2] under Grant [number xxxx]; and [Funding Agency #3] under Grant [number xxxx].
7. **Disclosure statement.** This is to acknowledge any financial interest or benefit that has arisen from the direct applications of your research. [Further guidance on what is a conflict of interest and how to disclose it](#).
8. **Data availability statement.** If there is a data set associated with the paper, please provide information about where the data supporting the results or analyses presented in the paper can be found. Where applicable, this should include the hyperlink, DOI or other persistent identifier associated with the data set(s). [Templates](#) are also available to support authors.
9. **Data deposition.** If you choose to share or make the data underlying the study open, please deposit your data in a [recognized data repository](#) prior to or at the time of submission. You will be asked to provide the DOI, pre-reserved DOI, or other persistent identifier for the data set.
10. **Supplemental online material.** Supplemental material can be a video, dataset, files, sound file or anything which supports (and is pertinent to) your paper. We publish supplemental material online via Figshare. Find out more about [supplemental material and how to submit it with your article](#).
11. **Figures.** Figures should be high quality (1200 dpi for line art, 600 dpi for grayscale and 300 dpi for colour, at the correct size). Figures should be supplied in one of our preferred file formats: EPS, PS, JPEG, TIFF, or Microsoft Word (DOC or DOCX) files are acceptable for figures that have been drawn in Word. For information relating to other file types, please consult our [Submission of electronic artwork](#) document.
12. **Tables.** Tables should present new information rather than duplicating what is in the text. Readers should be able to interpret the table without reference to the text. Please supply editable files.
13. **Equations.** If you are submitting your manuscript as a Word document, please ensure that equations are editable. More information about [mathematical symbols and equations](#).
14. **Units.** Please use [SI units](#) (non-italicized).