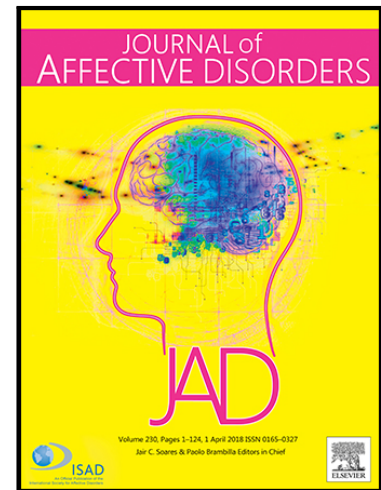


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A metacognitive model of self-esteem

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### Highlights

- Self-critical rumination and negative metacognitions about self-critical rumination are predictive of self-esteem when controlling for affect, levels of self-criticism and general metacognitions
- The process of self-critical rumination, driven and maintained by metacognitions, partially mediates the relationship between depression and self-esteem

ACCEPTED MANUSCRIPT

## A metacognitive model of self-esteem

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**Abstract**

**Background:** In the current study, we aimed to test a metacognitive model of self-esteem grounded in the Self-Regulatory Executive Function model of psychopathology. **Method:** A convenience sample of 346 community participants were recruited and completed a battery of online questionnaires that measured self-esteem, self-criticism, self-critical rumination, metacognitions about self-critical rumination, generic metacognitions and negative affect. Initially, we tested a series of hypotheses to establish the relationships between the study variables. We then conducted a path analysis to test a metacognitive model of self-esteem, where the process of self-critical rumination and its associated metacognitive beliefs was hypothesized to mediate the relationship between affect and self-esteem. **Results:** Self-critical rumination and its associated negative metacognitions, levels of depression and self-criticism independently predicted self-esteem. However, the multicollinearity between rumination and metacognitions suggests that one might not exist without the other. Additionally, a path analysis revealed that the study data was a very good fit to the proposed metacognitive model of self-esteem. **Conclusion:** The metacognitive model of self-esteem presented in this paper may be used to generate novel interventions to improve self-esteem and decrease self-critical rumination.

Key words: self-critical rumination; self-criticism; metacognition; self-esteem.

## 1 Introduction

### 1.1 Definition of Self-Esteem

The study of self-esteem dates back to the early foundations of the field of psychology (Baumeister, Campbell, Krueger, & Vohs, 2003; Crocker & Luhtanen, 2003; Park & Crocker, 2013). Historically, self-esteem was considered to be an indication of one's perceived ability to achieve certain life goals (James, 1890). As the evaluative aspect of the self, it now represents the extent to which one likes oneself (Brown, 2014; Brown & Marshall, 2006). This evaluative component is composed of two distinct dimensions: competence and worth, where the competence-based dimension refers to one's evaluations regarding efficacy and capabilities, and the worth-based dimension refers to the sense of value one receives by being accepted by others (Cast & Burke, 2002; Gecas, 1982; Tafarodi & Swann, 1995) from which one develops a sense of self-acceptance.

Self-esteem can, at times, become contingent on specific domains whereby an individual only feels 'good enough' when a particular standard of excellence or expectation is met and can be affected negatively by setbacks or failures (Crocker, Luhtanen, Cooper, & Bouvrette, 2003; Deci & Ryan, 1995; Kernis & Goldman, 2006; Park & Crocker, 2013). When standards are not met, however, an individual might find the situation threatening to their sense of self, which leads to emotional dysregulation and higher levels of self-criticism (Baumeister, Heatherton, & Tice, 1993; Borton, Crimmins, Ashby, & Ruddiman, 2012; Lambird & Mann, 2006).

### 1.2 Models of Self-Esteem

The mechanisms and utility of self-esteem have been postulated by several theories in order to explain why human beings engage in critical self-evaluation (Moller, Friedman, & Deci, 2006; Zeigler-Hill, 2013). Sociometer theory, for example, states that an individual's state self-esteem contains cognitive and affective elements in order to act as an internal index or

marker of the degree to which the individual is being included or excluded by others (Leary, Tambor, Terdal, & Downs, 1995). According to sociometer theory, the human motivation to develop and maintain high self-esteem is intimately connected with the basic need to be included. Repeated rejection by others, whether real or imagined, can then lead to lower self-esteem (Leary et al., 1995).

Terror management theory (TMT), on the other hand, suggests that one of the functions of human culture is to provide individuals with a sense of being a valuable participant in a meaningful existence (Greenberg et al., 1992; Greenberg & Simon, 1995; Pyszczynski & Kesebir, 2013). According to TMT, self-esteem acts as a buffer to protect one from the existential anxiety that results from the awareness of eventual death by serving as an indicator of how well an individual is living up to cultural norms and standards (Greenberg & Simon, 1995; Zeigler-Hill, 2013).

### **1.3 Self-Esteem and Psychopathology**

Although the precise reasons for global self-judgment are contested, these different models suggest that the function of self-esteem is to help regulate personal and social behavior in order to develop a sense of purpose and connection with others (Mruk, 2013; Tafarodi & Swann, 2001). When these criteria are not met, one's sense of self-worth diminishes, resulting in low self-esteem, which represents a persistent, negative and derogatory image of the self (Campbell et al., 1996).

Low self-esteem has been viewed as a symptom or associated feature of several emotional and personality disorders (Fennell, 1998; O'Brien, Bartoletti, & Leitzel, 2006; Zeigler-Hill, 2011). The Diagnostic and Statistical Manual of Mental Health Disorders 5 (DSM-5; American Psychiatric Association, 2013) associates low self-esteem, negative self-evaluation and high levels of self-criticism with 21 different disorders, as either diagnostic or associative features, risk factors or consequences. This includes, but is not limited to,

depression, anorexia nervosa, bulimia nervosa, sexual dysfunction and avoidant personality disorder. Research exploring the longitudinal relationship between self-esteem and both depression and anxiety have demonstrated that self-esteem can be both a product of, and cause of, emotional distress (Kuster, Orth, & Meier, 2012; Shahar & Davidson, 2003; Sowislo & Orth, 2013).

In recent years there has been an increase in the number of studies measuring the effectiveness of interventions designed to increase low self-esteem (Chadwick, Smyth, & Liao, 2014; Horrell et al., 2014; Kolubinski, Frings, Nikčević, Lawrence, & Spada, 2018; Neacșu, 2013; Pack & Condren, 2014; Waite, McManus, & Shafran, 2012). In the Cognitive-Behavioral model of low self-esteem, Fennell (1997) uses the term ‘the bottom line’ to describe an individual’s persistent schematic belief of being flawed or less than adequate.

#### **1.4 Self-Criticism and Self-Critical Rumination**

Self-criticism features in Fennell's (1997) model of self-esteem when negative schemas are activated by threatening situations. It is an intense and persistent form of internal dialogue that expresses hostility toward the self when one is unable to attain one’s own high standards (Shahar, 2015). It is a distinct, but related, construct to self-esteem (Dunkley & Grilo, 2007) and it has been identified as a transdiagnostic risk factor for several mental health disorders, including mood disorders, anxiety disorders, eating disorders and personality disorders, as well as impairments in long-term adjustment (Blatt, D’Afflitti, & Quinlan, 1976; Shahar, 2015; Warren, Smeets, & Neff, 2016; Zuroff, Koestner, & Powers, 1994).

Recent research, however, has started to explore the role that the process of rumination plays in maintaining levels of self-critical thinking (Kolubinski, Nikčević, Lawrence, & Spada, 2016; Manfredi et al., 2016; Smart, Peters, & Baer, 2016). Rumination is the process of perseveratively thinking about one’s emotions or problems without actively problem-solving or changing the circumstances for the better (Nolen-Hoeksema, Wisco, &

Lyubomirsky, 2008; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). The process of rumination can be applied to content-based thoughts related to anger, depression, post-event processing, and worry, which in turn can impact behavior and intensity of affect (Baer & Sauer, 2011; Brozovich & Heimberg, 2011, 2013; Bushman, Bonacci, Pedersen, Vasquez, & Miller, 2005; Rector, Antony, Laposa, Kocovski, & Swinson, 2008; Sukhodolsky, Golub, & Cromwell, 2001; Treynor et al., 2003).

Smart et al. (2016) postulated that self-critical rumination is the process of focusing attention specifically on self-critical thoughts and past instances of failure rather than attempting to improve oneself or one's circumstances. This is in accordance with previous research that has found that individuals with high levels of self-criticism are less likely to engage in problem-solving and are more likely to feel helpless or hopeless in stressful situations (Dunkley & Blankstein, 2000; Flett, Hewitt, Blankstein, Solnik, & Van Brunschot, 1996).

### **1.5 Metacognitions and the Self-Regulatory Executive Functioning Model**

A theoretical framework that could be used to explain the process of self-critical rumination and its role in the maintenance of low self-esteem is the Self-Regulatory Executive Function (S-REF) model described by Wells and Matthews (1994, 1996). The core premise of the S-REF model is that psychological dysfunction can occur when there are errors, biases or distortions in the monitoring and controlling mechanisms that shape and guide cognitive processes, such as attention, problem-solving, knowledge acquisition, etc. The S-REF model postulates that emotion-related processing comprises of three interacting levels of cognitive processes that serve as an architecture for conceptualising psychopathology: automatic processes; voluntary, conscious processes; and stored knowledge or self-beliefs.

The first level contains a stimulus-driven network of automatic processing units that is highly reflexive and requires very little attentional demands. Much of the information



processed on this level is largely done outside of conscious awareness, but can at times intrude into consciousness on a cognitive, emotional or physiological level (Wells, 2000).

The second level of the S-REF model includes online, controlled processes that are involved in the conscious appraisal of events and the executive control of one's thoughts and actions (Wells, 2000). This level requires greater attentional resources, exists in varying degrees of conscious awareness and the processing is primarily voluntary in order to manage cognitive intrusions. When functioning optimally, S-REF periods are short. However, psychological distress is linked to the voluntary activation of a particularly toxic style of thinking, consisting of worry and rumination, an over-developed sense of threat and unhelpful coping mechanisms, such as thought suppression and avoidance. This style of thinking is referred to as the Cognitive Attentional Syndrome (CAS).

The third level of the S-REF model contains metacognitive knowledge that are stored in long-term memory, based on how one learns to monitor and control cognitive processes. The metacognitive beliefs that one holds about such psychological processes as attention and memory, and the strategies that one employs in order to control them, play a central role in the activation and maintenance of emotional distress by activating and maintaining the CAS.

Cartwright-Hatton and Wells (1997) distinguish between five categories of metacognitions in their Metacognitions Questionnaire:

- 1) Positive beliefs that justify the activation of the CAS (e.g. 'Worry will help me to solve problems' or 'Rumination will help me understand why I feel this way').
- 2) Negative beliefs that specific thoughts or engaging in the CAS is either potentially dangerous or uncontrollable. These beliefs become self-fulfilling and maintain the CAS activation ('If I don't stop worrying, I will go mad' or 'I can't stop ruminating once I start').

- 3) The level of cognitive confidence one has in their own memory ('I have little confidence in my memory for places/actions/names').
- 4) Beliefs regarding the need to control thoughts, which are separate to the belief that thoughts are uncontrollable.
- 5) The degree to which one is aware of their own thinking process; known as cognitive self-consciousness.

A recent meta-analysis and a recent systematic review have both demonstrated that these five categories of metacognitions are widely endorsed by individuals experiencing psychological distress and substance misuse (Hamonniere & Varescon, 2018; Sun, Zhu, & So, 2017). On this basis, the S-REF model has been proven useful to help understand the processes involved in problem drinking (Caselli & Spada, 2013; Spada & Wells, 2006), problem gambling (Spada, Giustina, Rolandi, Fernie, & Caselli, 2014), nicotine use (Nikčević et al., 2017), procrastination (Fernie, Bharucha, Nikčević, Marino, & Spada, 2017; Fernie & Spada, 2008) and depressive rumination (Papageorgiou & Wells, 2001b, 2001a), with particular interest in the role that negative metacognitive beliefs play in maintaining psychological distress. According to the S-REF model, holding positive beliefs about the CAS will lead to its activation, whereby an individual will start to worry or ruminate, rather than problem-solve or appropriately assess one's current level of risk. If, however, one also maintains contradictory negative metacognitive beliefs about the danger or uncontrollability of worry or rumination, that will lead to greater levels of distress and maintain the CAS.

### **1.6 Metacognitions about Self-Critical Rumination**

Using the metacognitive profiling interview developed by Wells (2000), Kolubinski and colleagues (2016) interviewed individuals with low self-esteem and a self-acknowledged propensity to be self-critical about their perceptions of, and experience with, their self-critical thoughts. In doing so, they identified positive metacognitions (e.g., 'Repeatedly reviewing

how I should have acted differently in the past shows that I care about the outcome’) and negative metacognitions (e.g., ‘I am incapable of distancing myself from thoughts about not being good enough’). Some of these beliefs were similar in nature to those found in depressive rumination (Papageorgiou & Wells, 2001a, 2001b).

Kolubinski and colleagues (2017) demonstrated that both positive and negative metacognitions are predictive of self-critical rumination when controlling for affect, levels of self-criticism, self-esteem and the generic metacognitions described above, whereby both positive and negative metacognitions were endorsed highly among those who engage in self-critical rumination. They also concluded that there is a very strong positive relationship between the process of self-critical rumination and the associated negative metacognitions; thus providing further support for the S-REF model proposed by Wells and Matthews (1994, 1996).

### **1.7 Study Objectives and Hypotheses**

The aim of the current study is to test a metacognitive model of self-esteem. Previous research has demonstrated the role that rumination plays in worsening symptoms of depression and that rumination mediates the relationship between self-criticism and depression (Papageorgiou & Wells, 2001a, 2003; Spasojević & Alloy, 2001). Previous research also suggests that depression and anxiety are both causes of and consequences of low self-esteem (Sowislo & Orth, 2013). What is less clear, however, is the impact that rumination in general, and self-critical rumination specifically, might have on levels of self-esteem and whether that process can mediate the relationship between affect and self-esteem.

In the current metacognitive model of low self-esteem we propose that self-critical thoughts and negative affect are mutually reinforcing. In Fennell’s cognitive model, it follows that one’s self-criticism and low mood serve to perpetuate a vicious cycle. In accordance with the various models that stem from the S-REF model (Fernie et al., 2017; Papageorgiou &

Wells, 2003; Wells, 2009), if an individual holds positive metacognitions about self-critical rumination, then they will also be more likely to engage with, and dwell on, their self-critical thoughts. The presence of negative metacognitions regarding the danger and uncontrollability of these thoughts or of the ruminative process then become active, locking in a process of self-critical rumination that then affects levels of self-esteem, reinforcing Fennell's schematic 'bottom line'.

In other words, when negative emotions arise, the presence of self-critical thoughts can lead to self-critical rumination if there are justifications for doing so. When such a process becomes active, attention will be drawn towards past instances of failure or mistakes. If, simultaneously, that individual also holds a belief that they are unable to shift their own attention away from such thoughts, or that those thoughts are dangerous in some way, then that belief will become self-fulfilling and they will be unable to divert their attention to a more innocuous stimulus. Getting caught up in thoughts of negative self-evaluation and dwelling on past mistakes over time will then have a negative impact on one's global self-esteem. In the case of self-critical rumination, an individual would be better served to consider the learning lessons from mistakes and reflecting on the past in order to either problem-solve in the present or plan for the future instead of dwelling on past mistakes or failures.

In order to establish the credibility of this model, several hypotheses were tested. First, it was expected that levels of self-esteem will be negatively correlated with negative affect, self-criticism, self-critical rumination, as well as both generic metacognitions and those associated with self-critical rumination. Furthermore, these variables should all be positively correlated with each other. Secondly, self-critical rumination should predict levels of self-esteem when controlling for levels of negative affect and self-criticism. Lastly, previous research found that levels of self-critical rumination and associated metacognitions did not

predict levels of emotional distress when controlling for generic metacognitions (Kolubinski et al., 2017). In order to ascertain whether this is true with respect to self-esteem, we hypothesized that self-critical rumination, and its associated metacognitions, should predict levels of self-esteem whilst controlling for generic metacognitions. Based on the outcomes arising from the testing of these hypotheses, a path analysis would be conducted to test the metacognitive model of self-esteem (see Figure 1 for the initial proposed model).

## 2 Method

### 2.1 Participants

A sample of 346 community participants (235 females; mean age = 42 years [SD = 12.12; range 18 to 75 years]) completed a battery of online questionnaires once outliers and non-completers were removed. Participants were required to: (1) be at least 18 years of age; and (2) be able to understand and communicate in English. The ethnic background of participants was heavily skewed, with 89.6% reporting their ethnicity as Caucasian, followed by 4.3% Asian, 1.4% Mixed Race, 1.2% Black, 1.2% Other and 2.3% Not Stated.

### 2.2 Self-report Measures

#### 2.2.1 Self-esteem.

The Rosenberg Self-Esteem Questionnaire (RSES; Rosenberg, 1965) is a widely-used measurement of self-esteem. It is a 10-item measure using a 4-point Likert scale and scores range either between 0-30 or 10-40, depending on whether the scale runs from 0 to 3 or 1 to 4. Self-esteem is considered to be 'low' if the total scores falls approximately two standard deviations below the mean (Pack & Condren, 2014; Schmitt & Allik, 2005). The RSES has demonstrated good reliability and validity across many sample groups (Robinson, Wrightsman, & Andrews, 1991).

### **2.2.2 Self-criticism.**

The Depressive Experiences Questionnaire Self-Criticism 6 (DEQ-SC6; Rudich, Lerman, Gurevich, Weksler, & Shahar, 2008) is a 6-item measure derived from the Depressive Experiences Questionnaire (Blatt et al., 1976) and uses a 7-point Likert scale to assess levels of self-criticism. The DEQ-SC6 demonstrates acceptable levels of reliability and validity (Rudich et al., 2008).

### **2.2.3 Self-critical rumination.**

The Self-Critical Rumination Scale (SCRS; Smart, Peters, & Baer, 2015) assesses the ruminative process associated with self-critical thoughts. This is a 10-item measure that uses a 4-point Likert scale, has excellent internal consistency and correlates highly with measures of self-criticism as well as measures of rumination (Smart et al., 2016). It should be noted, however, that whilst the scale contains items such as *'I often worry about all of the mistakes I have made'* and *'My attention is often focused on aspects of myself that I'm ashamed of'* which are a reflection of the process of self-critical rumination, it also contains three items that assesses a belief about the lack of control over one's thoughts, which is the definition of a negative metacognition (e.g., *'Sometimes it is hard for me to shut off critical thoughts about myself'*). For the purposes of this study, we initially removed the three metacognitive items (#3, 4, 7) in order to better distinguish between self-critical rumination and the metacognitions related to it. The resulting 7 questions of the modified version of the SCRS (SCRS-M) still maintained excellent reliability ( $\alpha = .911$ ) and correlated very strongly with the original 10-item version ( $r = .99, p < .001$ ).

### **2.2.4 Metacognitions.**

#### **2.2.4.1 Generic metacognitions.**

The Metacognitions Questionnaire 30 (MCQ-30; Wells & Cartwright-Hatton, 2004) is a 30-item measure that assesses generic metacognitions in psychopathology using a 4-point Likert

scale. Five factors are assessed, which include: (a) positive beliefs about worry (POS); (b) negative beliefs about thoughts concerning danger and uncontrollability (NEG); (c) levels of cognitive confidence (CC); (d) beliefs about the need to control thoughts (NC); and (e) cognitive self-consciousness (CSC). For the purposes of this study, we opted to use the MCQ-30 as opposed to other measures of metacognition in order to compare the two-factor MSCRQ (see below) to the five factors that it measures. The MCQ-30 has demonstrated good internal consistency and convergent validity and has acceptable test-retest reliability (Spada, Mohiyeddini, & Wells, 2008; Wells & Cartwright-Hatton, 2004).

#### ***2.2.4.2 Metacognitions about self-critical rumination.***

The Metacognitions about Self-Critical Rumination Questionnaire (MSCRQ; Kolubinski et al., 2017) is a 10-item measure using a 4-point Likert scale to assess the positive (MSCRQ-P) and negative (MSCRQ-N) metacognitions associated with self-critical rumination. The 4 and 6-item subscales have demonstrated acceptable and good reliability, respectively, and are both predictive of the process of self-critical rumination. The MSCRQ-N has a particularly strong relationship with the SCRS.

#### **2.2.5 Negative affect.**

The short form of the Depression Anxiety Stress Scales (DASS-21; Antony, Bieling, Cox, Enns, & Swinson, 1998) is a 21-item measure using a 4-point Likert scale that assesses general symptoms of psychopathology. The DASS-21 distinguishes between depression, physiological arousal and psychological agitation. It has acceptable reliability and has been validated using clinical and non-clinical populations. It contains three orthogonal factors (depression (DASS-D), anxiety (DASS-A) and stress (DASS-S) as well as an overall factor of psychological distress (DASS-T) (Henry & Crawford, 2005). For the purposes of this study, we used each of the three subscales. We used the stress subscale as a control, expecting that it would have neither a direct nor indirect effect on self-esteem when

accounting for levels of depression. We hypothesized that the indirect effect of the anxiety subscale on self-esteem would not be significant, as the variance would be accounted for by the depression subscale. However, previous research suggests that there still will be a direct relationship between anxiety and self-esteem (Iancu, Bodner, & Ben-Zion, 2015; Sowislo & Orth, 2013). Lastly, the depression subscale was expected to have both a direct effect on self-esteem as well as an indirect effect via the mediators.

### **2.3 Procedure**

Ethical approval for this study was received by the London South Bank University Research Ethics Committee. Participants were recruited via the Internet by posting a hyperlink to the study on various websites targeting individuals with low self-esteem and/or high in self-criticism as well as members of the general public. The study was also advertised at a London university where students were asked to volunteer their time for credit. An additional recruitment strategy involved emailing a hyperlink to the online questionnaires to individuals on the authors' email contact lists and asking recipients to forward this on to others on their contact lists, in attempt to create a viral-like spread.

Potential participants were directed to the study website containing the battery of questionnaires. The first page of this provided information regarding the purpose of the study, how responses were anonymized, and that consent would be assumed once participants click on the 'submit' button upon completion of the battery of questionnaires. The pages following this information contained a series of questions to ascertain participants' demographic details. Participants were not required to record their names.

### **2.4 Data Analysis**

Correlation analyses were conducted in order to test the associations between the variables of interest followed by a hierarchical regression analysis using SPSS (version 21; IBM Corp, 2012). Path analysis (i.e., structural equation modelling for observed variables) was used to



examine the pattern of relationships observed using the Lavaan package (Rosseel, 2012) for R (R Core Team, 2013). A single observed score for each construct was included in the model. Specifically, the covariance matrix of the observed variables was analyzed with the Maximum Likelihood method estimator. A bootstrap approach (1000 bootstrap samples) was used to calculate bootstrapped confidence intervals (95%) to test for hypothesized mediations. To evaluate the goodness of fit of the model the  $R^2$  of each endogenous variable and the total coefficient of determination (TCD; Bollen, 1989; Jöreskog & Sörbom, 1996) were considered.

### 3 Results

#### 3.1 Distribution of Data and Bivariate Correlations

A series of Shapiro-Wilk normality tests indicated that all of the variables were non-normally distributed at the  $p < .001$  level. Three tests were performed to test the relationship between self-esteem and age, gender and ethnicity. Although there was a weak correlation between age and self-esteem ( $r = .144$ ,  $p < .01$ ), a Mann-Whitney U test and Kruskal-Wallis test indicated that there was no significant difference between either gender or ethnicity, respectively, and levels of self-esteem.

Table 1 shows the means, standard deviations and bivariate correlations between the variables included in the study. Approximately half of the sample indicated that they have low self-esteem and the other half either moderate or high self-esteem. Similarly, approximately half of the sample scored in the non-clinical range with respect to levels of depression, anxiety and stress and the other half score across the mild, moderate and severe ranges. All correlations were conducted using Spearman's Rho. As expected, all of the study variables were correlated with each other in the hypothesized directions. In particular, strong negative correlations were found between self-esteem and most of the other variables of

interest. Moreover, a very strong positive correlation was found between self-critical rumination and negative metacognitions about self-critical rumination ( $r=.81$ ,  $p<.001$ ).

### 3.2 Assessing Multicollinearity

Due to the high correlations listed above, the Variance Inflation Factors (VIF) were calculated for all predictor variables prior to a hierarchical regression analysis. No VIF exceeded the cut-off of 10, although the modified version of the Self-Critical Rumination Scale exceeded 5.0 (Max = 5.118), on 7 of 12 occasions, suggesting that some multicollinearity may be present (Kutner, Nachtsheim, & Neter, 2004; Sheather, 2009). The original 10-item SCRS, however, resulted in VIFs between 5.5 and 5.8 when all but two predictor variables were used as the criterion (MSCRQ-N and DEQ-SC6), which questions the overlap in variance between self-critical rumination, its negative metacognitions and self-criticism.

Despite not exceeding the VIF cut-off of 10, a principle components analysis was conducted on the MSCRQ, DEQ-SC6 and the original version of the SCRS using SPSS (version 21; IBM Corp, 2012) in order to ascertain whether it would be accurate to treat self-criticism, self-critical rumination and the associated metacognitions about self-critical rumination as separate constructs in the metacognitive model of self-esteem. We used an Oblimin rotation to account for the correlation between the factors (Osborne, 2015) and following a parallel analysis, we determined that there were three factors represented by the questionnaires, accounting for 61% of the variance. The MSCRQ-P and DEQ-SC6 stood alone as separate factors, but the items of the MSCRQ-N and SCRS loaded unequivocally on the same factor. Considering this result, and the fact that the original SCRS contained metacognitive items, we decided that it would be prudent to combine the scores of these two questionnaires and to treat them as a single construct for the metacognitive model of self-esteem. This was confirmed after re-calculating the Variance Inflation Factors. After

combining the two questionnaires, no VIF exceeded 4.0 (Max = 3.8), suggesting an absence of multicollinearity.

### 3.3 Hierarchical Regression with the RSES as Outcome Variable

A six-step hierarchical regression analysis was conducted with RSES as the outcome variable for two reasons. First, to ascertain whether age continued to be a predictor of self-esteem when accounting for the variables of interest. Second, in order to test the second and third hypotheses of this study (see Table 2). Age was entered as the predictor variable on the first step. The variables of interest for the metacognitive model of self-esteem were then entered in the order that they appear in the model in order to ascertain if they maintained significance when controlling for preceding and succeeding variables. The DASS-21 factors (Depression, Anxiety and Stress) were entered on the second step, followed by self-criticism (DEQ-SC6) on the third step. Positive metacognitions about self-critical rumination (MSCRQ-P) were entered on the fourth step, followed by the combination of self-critical rumination (SCRS) and negative metacognitions about self-critical rumination (MSCRQ-N) on the fifth step. Finally, five general metacognitions (MCQ-30) were entered on the sixth step. Each of the first five steps resulted in a significant increase in variance, resulting in a model that accounted for 63.4% of the variance of self-esteem scores. When controlling for levels of depression and stress, however, age and anxiety were not significant predictors of self-esteem ( $B=.019$ , n.s.;  $B=-.077$ , n.s.) and MSCRQ-P was no longer a significant predictor of self-esteem once the SCRS and MSCRQ-N combined score was entered on the following step ( $B=-.022$ , n.s.). The addition of the MCQ-30 on the sixth step did produce a significant increase in the level of variance ( $R^2$  change=.012,  $p<.05$ ). However, the sub-scale of cognitive self-consciousness was the only one to demonstrate an unexpected positive relationship with self-esteem when controlling for the other variables ( $B=.195$ ,  $p<.05$  [LL=.066, UL=.324]).

### 3.4 Path analysis of the Metacognitive Model of Self-Esteem

The tested model included the measures of depression, anxiety and stress, self-criticism, self-critical rumination, positive and negative metacognitions about self-criticism and self-esteem. As mentioned previously, the scores on the SCRS and MSCRQ-N were combined into one composite score. Also, as self-criticism appears to be both a separate construct and a significant predictor of self-esteem when controlling for other variables, we decided to test both the direct and indirect effects that it has on self-esteem (see Figure 2). Results showed that path coefficients were significant at  $p < .001$ . As shown in Figure 3, symptoms of depression and stress were found to be positively and directly associated with levels of self-criticism, which, in turn, were positively associated with positive metacognitions about self-critical rumination. These were positively associated with self-critical rumination & negative metacognitions about self-critical rumination and this was negatively associated with self-esteem. Along with the direct paths, three significant indirect relationships were found; specifically, the indirect link between self-criticism and self-esteem via self-critical rumination and its associated metacognitions ( $\beta = -.11$ ,  $p < .001$ ), positive metacognitions about self-critical rumination and self-esteem via self-critical rumination and associated negative metacognitions ( $\beta = -.28$ ;  $p < .001$ ) and the link between symptoms of depression and self-esteem via all of the mediators ( $\beta = -.02$ ;  $p < .01$ ). The indirect links between anxiety and self-esteem and stress and self-esteem were not significant ( $\beta = 0.001$  and  $0.002$ , respectively; n.s), despite the significant correlation between levels of stress and self-criticism mentioned above.

The squared multiple correlations for the endogenous variables were used to determine how much variance was explained for each of them based on the proposed model. The model accounted for 53.7% of the variance of the outcome variable (self-esteem), Less variance was explained for levels of self-criticism (39%) and other predictors (i.e. 15% for positive

metacognitions about self-critical rumination and 26% for self-critical rumination and associated negative metacognitions combined) by the proposed model. Finally, the total amount of variance explained by the model ( $TCD=.46$ ) indicated a good fit to the observed data. In terms of effect size,  $TCD=.46$  corresponds to a correlation of  $r=.68$ . According to Cohen's (1988) traditional criteria for evaluating effect sizes, this is a large effect size.

## 4 Discussion

### 4.1 Addressing the Aims of the Study

The primary aim of this study was to test a metacognitive model of self-esteem based on the S-REF model proposed by Wells and Matthews (1994, 1996). This model has been applied to several areas of study, involving psychopathology, problematic behavior and health conditions (Ferne et al., 2017; Fernie, Spada, Chaudhuri, Klingelhofer, & Brown, 2015; Marino et al., 2016; Nikčević et al., 2017; Papageorgiou & Wells, 2003; Spada, Caselli, Nikčević, & Wells, 2015; Spada, Caselli, & Wells, 2009; Spada et al., 2014; Wells & Sembi, 2004).

Prior to evaluating this model, we found evidence to support most of the hypotheses that were outlined at the outset of the study. Firstly, RSES scores were negatively correlated with all of the other measures of interest in the moderate to high range. Each of the other variables were all positively inter-correlated. Secondly, the regression analysis indicated that self-critical rumination was a significant predictor of self-esteem when controlling for age, levels of depression, anxiety, stress and self-criticism. Thirdly, this significance was maintained after entering generic metacognitions. Unlike earlier models based on the S-REF model (Caselli & Spada, 2013; Fernie et al., 2017; Papageorgiou & Wells, 2003; Wells, 2009), the process of rumination and the associated negative metacognitions were so highly correlated that they were treated as a single construct in the path analysis. These results suggest two crucial findings. First, that both self-critical rumination and its associated

metacognitions might play a significant role in predicting low self-esteem. **Second, that self-critical rumination might not exist without negative metacognitions regarding the danger and uncontrollability of that process.**

Our model proposed that negative affect should be at least partially associated with self-esteem through self-criticism and the associated process of self-critical rumination, where an individual dwells on past mistakes, aspects of their character that they do not like or how they are not 'good enough'. Self-critical thoughts, when combined with positive metacognitions about engaging with those thoughts would then lead to the process of rumination, instead of assessing their validity or engaging in either problem-solving or learning. Furthermore, simultaneously endorsing negative metacognitive beliefs about the danger and uncontrollability of these thoughts means that they will become active when rumination starts and the individual will feel compelled to treat them as facts and will be unable to shift their focus away from them. Prolonged exposure to such negative self-evaluation over time then decreases levels of self-esteem. In other words, being self-critical is not enough to explain the presence of low self-esteem but believing that one is incapable of detaching from such thoughts and that it would be detrimental to think about oneself in such a way could have a negative impact on one's sense of overall self-worth.

Self-determination theory (SDT) is an approach to human motivation that has identified three innate psychological needs that appear to be essential for facilitating optimal functioning and well-being: competence (feeling capable in one's environment), relatedness (connection and support from significant others) and autonomy (having an internal locus of control and agency over one's circumstances) (Grolnick & Beiswenger, 2006; Ryan & Deci, 2000). According to SDT, people rate how their behavior measures up to these core needs, which may be met through the process of self-concordant goals (Sheldon & Elliot, 1999). Self-esteem is then seen as a by-product of need deprivation or conflict (Mruk, 2013; Ryan &

Brown, 2003). Self-esteem can therefore be thought of as an outcome of the presence of metacognitive beliefs and associated control strategies that become active when those needs are not met. We now have evidence to suggest that our proposed model of self-esteem is a good fit with the data obtained by this study.

The potential **co-occurrence of self-critical rumination and negative metacognitive beliefs** was addressed by treating the two measures as indicators of a single construct. This could suggest that the process of self-critical rumination does not exist without the endorsement of negative metacognitions. The fact that Smart et al. (2016) originally constructed a single-factor questionnaire that contained items that were metacognitive in nature only serves to highlight this close association. Additionally, Kolubinski and colleagues (2016) found that metacognitive beliefs about uncontrollability were unanimously described by participants with low self-esteem.

Interestingly, despite a negative zero-order correlation between cognitive self-consciousness and self-esteem, which suggested that individuals with low self-esteem maintained a greater level of awareness of their thinking processes, cognitive self-consciousness became a positive predictor of self-esteem when controlling for self-criticism, self-critical rumination and affect. Future research may wish to further explore this relationship.

Using a similar self-report method as in this study, Kuster et al. (2012) showed that the process of ruminating on oneself partially mediated the relationship between self-esteem and depression at several-week intervals, but the relationship was not reciprocal. The direction that this relationship takes, whether low self-esteem leads to the development of negative affect or if negative affect can have a negative impact on self-esteem is central to the debate between the *vulnerability* and *scar* models, respectively (Coyne & Whiffen, 1995; Lewinsohn, Steinmetz, Larson, & Franklin, 1981; Orth, Robins, & Meier, 2009; Orth,

Robins, Meier, & Conger, 2016; Shahar & Davidson, 2003; Shahar & Henrich, 2010). A meta-analysis comparing the longitudinal research supporting both models determined that there is evidence to suggest that both models had significant effects, although the vulnerability model (i.e., the effect of self-esteem on depression) was significantly higher (Sowislo & Orth, 2013). This could, however, be an indication of a circular relationship between the two constructs, even if one direction has a greater impact than the other.

It should be noted, however, that the rumination measure used by Kuster et al. (2012) involved a focus on the self that was not necessarily critical in nature. Self-rumination in that study was measured with the Rumination and Reflection Questionnaire (RRQ) developed by Trapnell and Campbell (1999), who defined the process as a “neurotic category of self-attentiveness defined as recurrent thinking or ruminations about the self, prompted by threats, losses, or injustices to the self” (p. 292). As a result, the RRQ contains items such as, “Often I’m playing back over in my mind how I acted in a past situation” and “I often find myself reevaluating something I’ve done”. The measure of self-critical rumination, however, contains items including, “I criticize myself a lot for how I act around other people” and “I spend a lot of time thinking about how ashamed I am of some of my personal habits” (Smart et al., 2016). It could be argued that being critical of oneself in a ruminative manner might affect one’s sense of self-worth more than merely focusing attention on oneself.

To date, very little research has been conducted on self-critical rumination. Although a case has been made for the distinction on theoretical grounds, its empirical distinction from the Trapnell and Campbell model of rumination still needs to be ascertained (Moreira & Canavarro, 2018; Schiller, Hammen, & Shahar, 2016). Previous research has already highlighted that the process of rumination is a significant risk factor to the development of depression (Nolen-Hoeksema, 1991; Papageorgiou & Wells, 2003), where an individual will dwell on why they are depressed in hope that doing so will lead to greater understanding of



their symptoms. Neither self-critical rumination nor the associated negative metacognitions were significant predictors of negative affect when controlling for generic negative metacognitions (Kolubinski et al., 2017). This suggests that the process of self-critical rumination may mediate the relationship between depression and self-esteem, but this relationship may not be reciprocal. It could be that self-critical rumination mediates the relationship between depression and self-esteem, but another mechanism, perhaps self-focus or self-brooding without a critical component, could mediate the effect of self-esteem on depression.

This study also raises the question of whether the relationship between anxiety and self-esteem exists when controlling for levels of depression. Longitudinal research studying the relationship between anxiety and self-esteem has been limited. The meta-analysis by Sowislo & Orth (2013) discussed earlier examined the literature on the relationship between self-esteem and anxiety and suggested that anxiety and self-esteem might have a circular impact on one another. We hypothesized that self-critical rumination would not mediate the relationship between anxiety and self-esteem, but we did expect there to be a direct effect. According to the regression and path analysis conducted in this study, however, only depression appears to have both a direct relationship with self-esteem as well as an indirect effect through the mediators. This suggests that the depressive aspect of emotional distress is more likely to be related to self-esteem than is anxiety. At this time, however, we cannot comment on the reciprocal relationship.

#### **4.2 Clinical Implications**

Studies exploring the impact of CBT on raising levels of self-esteem has been positive to date (Chadwick et al., 2014; Horrell et al., 2014; McManus, Waite, & Shafran, 2009; Neacșu, 2013; Pack & Condren, 2014; Rigby & Waite, 2006). Many of these interventions use cognitive and behavioral strategies to challenge content-based thoughts and predictions and

alter self-defeating patterns of behavior based on the model described by Fennell (1997) and have shown a strong effects in raising levels of self-esteem (Kolubinski et al., 2018).

However, we propose that treatments based on our model could also have a significant impact. The model presented in this paper is grounded in S-REF theory from which Metacognitive Therapy (MCT) is derived. MCT is a form of psychological therapy that aims to reduce symptoms of psychological distress by targeting and removing the Cognitive Attentional Syndrome (CAS). The CAS contains toxic and perseverative forms of thinking, such as rumination, worry and persistent threat-monitoring, as well as control strategies, such as thought suppression and distraction (Wells, 2009). Rather than focusing on the content of one's thoughts, as is found in Cognitive-Behavioral Therapy (Beck, Rush, Shaw, & Emery, 1979) and Rational-Emotive Behavior Therapy (Ellis, 1995; Ellis & Bernard, 1985), MCT aims to remove the CAS by focusing on the metacognitive beliefs that activate and drive it. The contradictions inherent in the justifications (positive metacognitions) and belief about danger and uncontrollability (negative metacognitions) are highlighted and modified through a series of Socratic questions and metaphors. Using the established techniques of Detached Mindfulness (Gkika & Wells, 2015; Wells, 2005) and the Attention Training Technique (Fergus & Bardeen, 2016; Fergus, Wheless, & Wright, 2014; Knowles & Wells, 2018; Murray, Scott, Connolly, & Wells, 2018), clients develop a more flexible approach to their negative intrusive thoughts and are taught novel ways of responding to them without engaging with them. **If the process of self-critical rumination can be construed as primarily a metacognitive process, due to its strong association with negative metacognitive beliefs, and low self-esteem can be thought of as a result of long periods of self-critical rumination, then MCT could have an invaluable impact for individuals regularly beat themselves up following a mistake, failure or rejection.**

Although the research into the efficacy of MCT is still in its infancy and CBT is a well-established form of psychological treatment, a recent meta-analysis has suggested that MCT may yield higher effect sizes than CBT in the treatment of anxiety and depression (Normann, Van Emmerik, & Morina, 2014), both of which contain a ruminative component (Nolen-Hoeksema et al., 2008; Papageorgiou & Wells, 2003; Rector et al., 2008). One study has already demonstrated that group MCT can be effective in raising levels of self-esteem for individuals with major depressive disorder (Farahmand, Hassanzadeh, Mirzaian, Bordbar, & Feizi, 2014) and the model that we propose could further the theoretical understanding of that effect for individuals who are self-critical. By challenging both positive and negative metacognitions and practicing detached mindfulness and attention training, the CAS configuration activated in response to self-critical thoughts could be targeted with the aim of reducing self-critical rumination. Rather than forcing oneself to dwell on past mistakes and failures out of a belief that these thoughts are uncontrollable, these individuals can learn to reflect on past mistakes, learn from them and problem-solve.

### **4.3 Limitations**

There are several limitations to consider when interpreting the results of this study. First, as the data was collected through self-report questionnaires, biases, context effects, social desirability and poor recall may impact measurement error. Second, a cross-sectional design was employed, which limits the causal inferences made here. Third, the use of self-report measures brings into question whether we have accurately been able to measure the constructs that we are setting out to measure. Fourth, due to the overlap in ruminative content, further research will be required to determine if self-critical rumination is significantly different from depressive rumination or if the former is merely a subset of the latter. Regardless, we have ascertained a lower limit of the impact of rumination on self-esteem. If depressive rumination and self-critical rumination were in fact a single construct,

that could only be ascertained by improving the effect of the current model of self-esteem. Fifth, demographic composition of the sample was heavily skewed, where the sample reported was 68% female and 90% Caucasian. Further research will be required to ascertain whether the conclusions derived in this study could be replicated across other demographic groups. Sixth, the study recruited a convenience sample on the Internet and potential confounding variables, such as nationality, socio-economic status and education were not controlled for.

#### **4.4 Conclusions**

Despite the limitations listed above, this study presents significant evidence for a novel and clinically relevant metacognitive model of self-esteem based on the S-REF model, from which interventions based on MCT can be derived. We argue that one's level of self-esteem is affected by the individual's willingness to engage with the self-critical thoughts that most people experience, coupled with a persistent belief that it is impossible to stop once started. This engagement might significantly impact the person's ability to learn from past mistakes and improve performance in the long-term or decrease their ability to maintain social connections, which are the two key factors involved in self-esteem and could feed back into levels of depression. Further research could help improve our understanding by exploring the role that self-critical rumination might play in the areas of perfectionism and social competence.

#### **Contributors**

Authors A and D designed the metacognitive model of self-esteem and organised data collection. Author A conducted the literature, the preliminary analysis and wrote the first draft. Author B conducted the path analysis and Author C provided critical suggestions to the format of the paper.

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**Conflicts of Interest**

There are no conflicts of interest by any author pertaining to this research.

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## A metacognitive model of self-esteem

Table 1: Means, standard deviations and bivariate correlations.

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. RSES	26.44	7.55													
2. Age	42	12.12	.14**												
3. DASS-D	14.14	6.51	-.71**	-.15**											
4. DASS-A	11.47	4.63	-.53**	-.16**	.64**										
5. DASS-S	15.35	5.51	-.62**	-.25**	.79**	.70**									
6. DEQ-SC6	26.92	9.70	-.66**	-.21**	.61**	.45**	.60**								
7. SCRS-M	17.83	6.37	-.78**	-.23**	.74**	.58**	.70**	.77**							
8. MSCRQ-P	8.12	2.91	-.39**	-.08	.33**	.40**	.38**	.38**	.48**						
9. MSCRQ-N	13.69	4.86	-.71**	-.17**	.67**	.55**	.64**	.64**	.81**	.46**					
10. MCQ-30 (POS)	10.40	4.40	-.27**	-.15**	.29**	.31**	.41**	.32**	.37**	.50**	.37**				
11. MCQ-30 (NEG)	13.91	5.84	-.63**	-.14**	.67**	.64**	.70**	.58**	.73**	.42**	.75**	.39**			
12. MCQ-30 (CC)	12.20	5.07	-.29**	-.00	.29**	.34**	.29**	.27**	.31**	.13**	.37**	.09*	.33**		
13. MCQ-30 (NC)	11.47	4.35	-.50**	-.05	.67**	.47**	.58**	.48**	.58**	.42**	.68**	.39**	.69**	.34**	
14. MCQ-30 (CSC)	15.81	4.76	-.31**	-.09	.36**	.39**	.46**	.36**	.46**	.36**	.50**	.35**	.57**	.22**	.56**

*n* 346; \**p* < .05; \*\**p* < .01.

Note: RSES = Rosenberg Self-Esteem Scale; Age = Age in years; DASS-D = Depression, Anxiety Stress Scale-21 (Depression); DASS-A = Depression, Anxiety Stress Scale-21 (Anxiety); DASS-S = Depression, Anxiety Stress Scale-21 (Stress); DEQ-SC6 (Depressive Experiences Questionnaire-Self-Criticism 6); SCRS-M = Modified version of the Self-Critical Rumination Scale; MSCRQ-P = Metacognitions about Self-Critical Rumination Scale (Positive); MSCRQ-N = Metacognitions about Self-Critical Rumination Scale (Negative); MCQ-30 (POS) = Metacognitive Questionnaire-30 (Positive); MCQ-30 (NEG) = Metacognitive Questionnaire-30 (Negative); MCQ-30 (CC) = Metacognitive Questionnaire-30 (Cognitive Confidence); MCQ-30 (NC) = Metacognitive Questionnaire-30 (Need for Control); MCQ-30 (CSC) = Metacognitive Questionnaire-30 (Cognitive Self-Consciousness); *n* = 346.

## A metacognitive model of self-esteem

Table 2: Seven-step hierarchical regression analysis with RSES as the outcome variable.

Model	R <sup>2</sup>	Change in R <sup>2</sup>	Coefficients <sup>a</sup>						95.0% Confidence Interval for B	
			Unstandardized Coefficients		Standardized Coefficients		t	Sig.	Lower Bound	Upper Bound
			B	Std. Error	$\beta$					
1 (Constant)	.025	.025**	22.196	1.482			14.972	.000	19.280	25.112
Age			.099	0.33	.158		2.972	.003	.033	.164
2 (Constant)	.501	.476***	38.806	1.527			25.412	.000	35.802	41.810
Age			.019	.025	.031		.778	.437	-.029	.067
DASS-D			-.598	.072	-.515		-8.290	.000	-.740	-.456
DASS-A			-.077	.094	-.047		-.820	.413	-.262	.108
DASS-S			-.251	.094	-.183		-2.682	.008	-.435	-.067
3 (Constant)	.574	.073***	42.890	1.512			28.376	.000	39.917	45.863
Age			-.001	.023	-.001		-.041	.968	-.046	.044
DASS-D			-.462	.069	-.398		-6.677	.000	-.598	-.326
DASS-A			-.124	.087	-.076		-1.418	.157	-.295	.048
DASS-S			-.078	.090	-.057		-.867	.387	-.254	.099
DEQ-SC6			-.270	.035	-.347		-7.622	.000	-.340	-.201
4 (Constant)	.579	.006*	43.589	1.538			28.338	.000	40.563	46.614
Age			.002	.023	.003		.071	.943	-.043	.046
DASS-D			-.473	.069	-.408		-6.862	.000	-.609	-.338

## A metacognitive model of self-esteem

DASS-A			-.089	.088	-.055	-1.008	.314	-.263	.085
DASS-S			-.060	.090	-.043	-.666	.506	-.236	.117
DEQ-SC6			-.252	.036	-.324	-6.944	.000	-.323	-.181
MSCRQ-P			-.223	.104	-.086	-2.151	.032	-.427	-.019
5 (Constant)	.642	.062***	44.945	1.433		31.368	.000	42.126	47.763
Age			-.011	.021	-.018	-.525	.600	-.053	.031
DASS-D			-.305	.067	-.263	-4.523	.000	-.438	-.172
DASS-A			-.047	.082	-.029	-.570	.569	-.207	.114
DASS-S			.029	.084	.021	.344	.731	-.136	.193
DEQ-SC6			-.102	.039	-.130	-2.612	.009	-.178	-.025
MSCRQ-P			.016	.101	.006	.159	.873	-.182	.215
SCRS/MSCRQ-N			-.277	.036	-.490	-7.663	.000	-.348	-.206
6 (Constant)	.654	.012*	43.373	1.521		28.521	.000	40.382	46.365
Age			-.012	.021	-.019	-.568	.570	-.054	.030
DASS-D			-.292	.068	-.252	-4.327	.000	-.425	-.159
DASS-A			-.024	.084	-.015	-.288	.774	-.190	.141
DASS-S			-.015	.086	-.011	-.175	.862	-.185	.155
DEQ-SC6			-.098	.039	-.126	-2.534	.012	-.174	-.022
MSCRQ-P			-.070	.109	-.027	-.639	.523	-.285	.145
SCRS/MSCRQ-N			-.282	.040	-.498	-6.996	.000	-.361	-.203
MCQ-POS			.068	.069	.040	.981	.327	-.068	.204
MCQ-NEG			-.092	.077	-.071	-1.194	.233	-.242	.059
MCQ-CC			-.006	.054	-.004	-.115	.909	-.113	.101
MCQ-NC			.017	.087	.010	.190	.849	-.155	.188
MCQ-CSC			.195	.065	.123	2.985	.003	.066	.324

## A metacognitive model of self-esteem

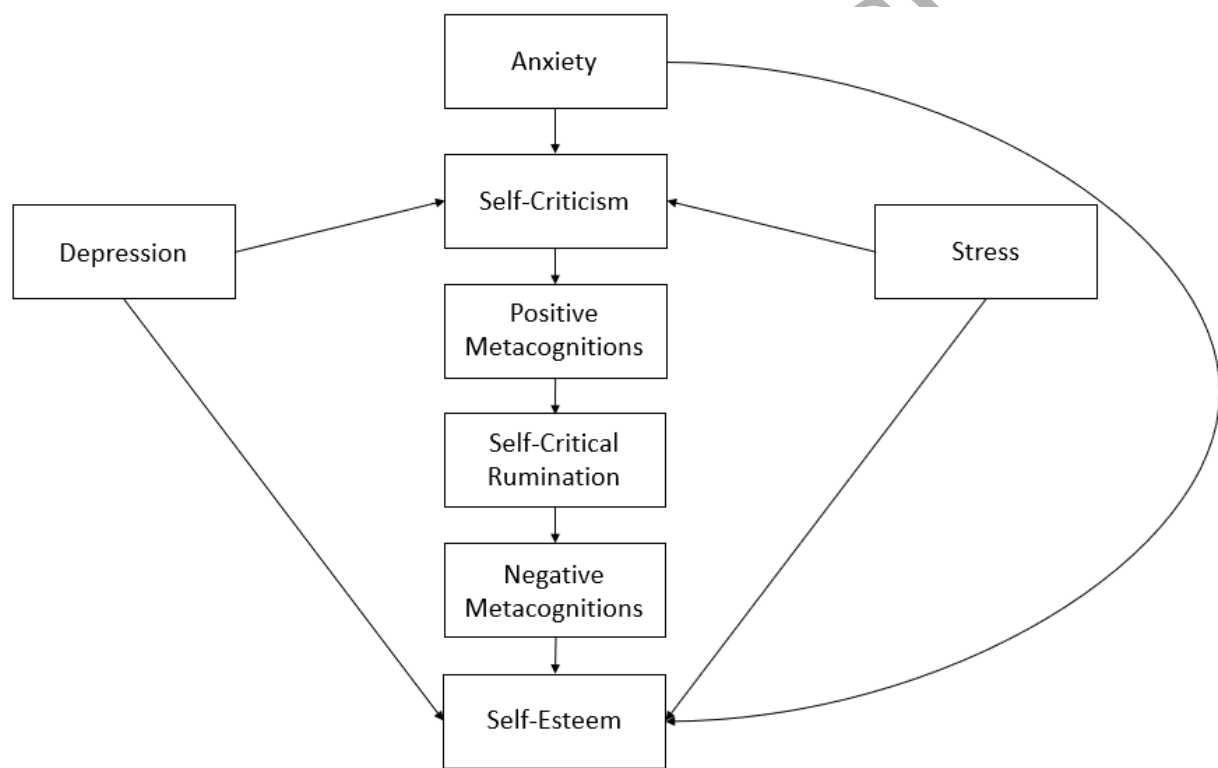
## a. Dependent Variable: RSES

Note: Age = Age in years; DASS-D = Depression, Anxiety Stress Scale-21 (Depression); DASS-A = Depression, Anxiety Stress Scale-21 (Anxiety); DASS-S = Depression, Anxiety Stress Scale-21 (Stress); DEQ-SC6 (Depressive Experiences Questionnaire-Self-Criticism 6); MSCRQ-P = Metacognitions about Self-Critical Rumination Scale (Positive); SCRS/MSCRQ-N = Self-Critical Rumination Scale & Metacognitions about Self-Critical Rumination Scale (Negative) combined; MCQ-30 (POS) = Metacognitive Questionnaire-30 (Positive); MCQ-30 (NEG) = Metacognitive Questionnaire-30 (Negative); MCQ-30 (CC) = Metacognitive Questionnaire-30 (Cognitive Confidence); MCQ-30 (NC) = Metacognitive Questionnaire-30 (Need for Control); MCQ-30 (CSC) = Metacognitive Questionnaire-30 (Cognitive Self-Consciousness); RSES = Rosenberg Self-Esteem Scale;  $n = 346$ .

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

A metacognitive model of self-esteem

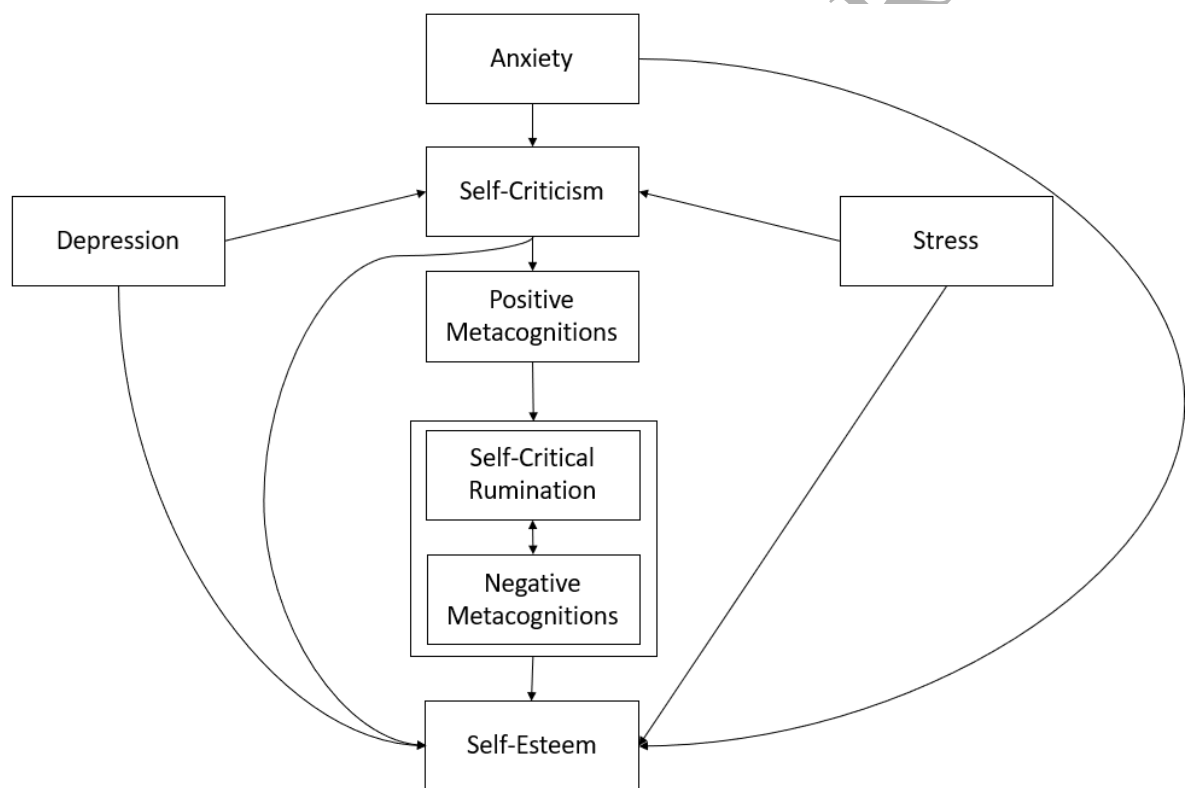
Figure 1: The initial metacognitive model of self-esteem





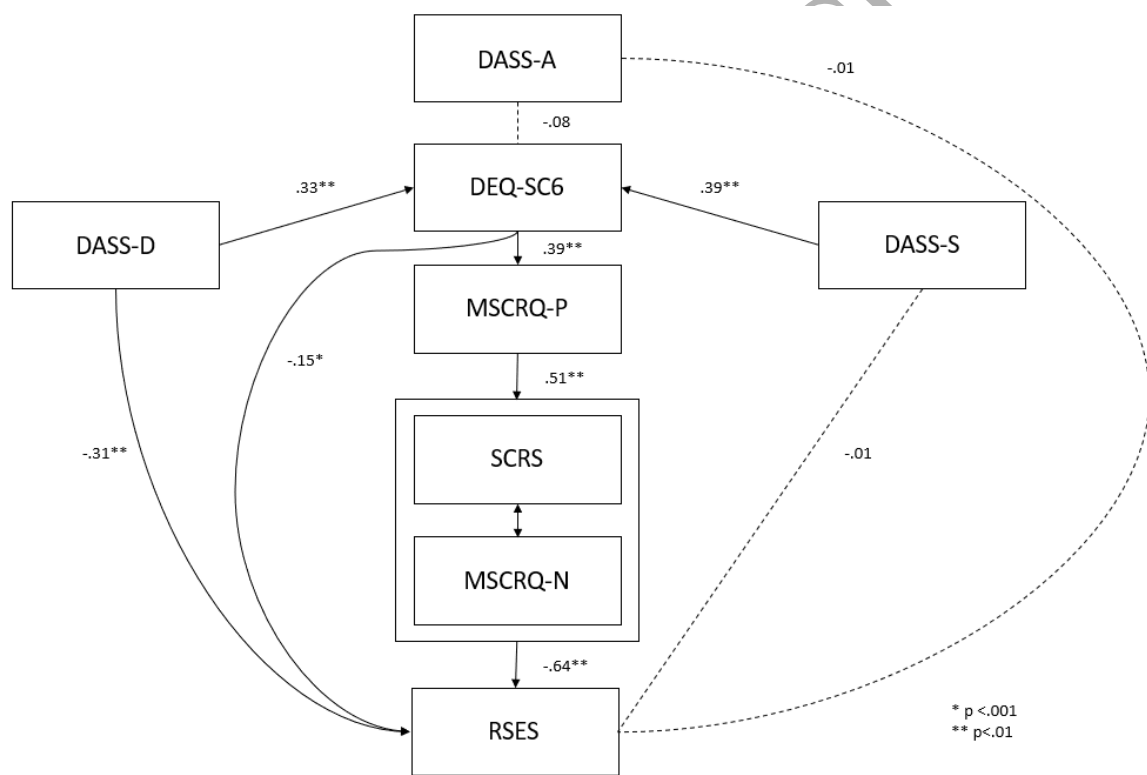
A metacognitive model of self-esteem

Figure 2: The proposed metacognitive model of self-esteem.



## A metacognitive model of self-esteem

Figure 3: Model of the inter-relationships between the study variables.



### A metacognitive model of self-esteem

Note: \* $p < .001$ ; DASS-D = Depression, Anxiety Stress Scale-21 (Depression); DASS-A = Depression, Anxiety Stress Scale-21 (Anxiety); DASS-S = Depression, Anxiety Stress Scale-21 (Stress); DEQ-SC6 (Depressive Experiences Questionnaire-Self-Criticism 6); MSCRQ-P = Metacognitions about Self-Critical Rumination Scale (Positive); SCRS = Self-Critical Rumination Scale; MSCRQ-N = Metacognitions about Self-Critical Rumination Scale (Negative); RSES = Rosenberg Self-Esteem Scale;  $n = 346$ .