Interrelationships between self-criticism, self-compassion, resilience and perceived stress:

What role does a self-compassionate or self-critical attitude play in the resilience towards stress?

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Abstract

Purpose: The aim of this study was to investigate what role a critical or compassionate attitude towards the self plays in an individual's capacity to be resilient towards stress. This was done by researching resilience's mediating or moderating roles in the relationship between self-criticism and perceived stress and self-compassion and perceived stress. Findings were expected to serve both the conceptualization of the constructs in literature and research as well as inform the therapeutic practice about how we can better equip individuals against daily as well as major life stressors. Such information is especially relevant in recent 'third wave' therapies in which more positive concepts such as self-compassion and resilience emerged as central promising backbones that showed individuals profiting from lower relapse rates, greater effects of therapy and higher well-being. It was expected that resilience would mediate or moderate the relationships of interest. **Methods**: Eighty-four participants, predominantly German, with a mean age of $M = 24.48$, $SD = 8.23$ participated in an online survey with four self-report scales. Self-criticism was measured by the Forms of Self-criticising/Attacking and Self-reassuring (FSCRS), self-compassion was measured by the Self-compassion Scale (SCS), perceived stress was measured by the Perceived Stress Scale (PSS) and resilience was measured by the Brief Resilience Scale (BRS). Bootstrapping analyses with Hayes' PROCESS SPSS macros were used to test resilience as mediator and moderator in two simple mediation and two simple moderation models. **Results**: Resilience was identified as a mediator in the relationship between self-compassion and perceived stress, but not in the relationship between self-criticism and perceived stress. Still, self-criticism was a significant predictor of perceived stress. No moderating roles of resilience were identified. **Conclusions:** The results are expected to serve the understanding of how more self-compassionate individuals show such increased therapeutic benefits – by being more resilient towards stress. It appears that self-compassionate individuals bid defiance to negative self-evaluation by mindfully reassuring themselves of their own capabilities in the face of stress as well being more accepting towards failure showing resilience towards stress. The identified interrelationships pinpoint towards fostering self-compassionate stances in therapy with a special focus on conquering self-critical attitudes. That way it can be expected to serve both: The effects of therapy as well as the prevention of relapse. Such expectations are supported by the various links research has established between i.e. lower relapse rates, increased effects of therapy and increased well-being that were connected to higher self-compassion and to greater resilience towards stress.

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1. Introduction

Psychological stress is considered one of the most central predictors of health and mental health implications. Stress and stressful life events have been linked to major depressive disorder and depressive symptoms in general, psychological stress is an active component in many psychological disorders such as in anxiety disorders, and research related psychological stress to an increased risk for coronary artery disease and cardiovascular diseases with evidence emerging for the role of stress in many more diseases (i.e. see American Psychiatric Association, 2013, pp. 189-234; Bovier, Chamot, & Perneger, 2004; Cohen, Janicki-Deverts, & Miller, 2007; Connor et al., 2007; Hammen, 2005).

Psychological stress is said to occur when "(…) an individual *perceives* [emphasis added] that environmental demands tax or exceed his or her adaptive capacity" (Cohen, Janicki-Deverts, & Miller, 2007, p. 1685). What we experience as stress is thus greatly dependent on what we perceive as stressful and how capable we perceive ourselves to manage it. That *perceived stress* is the feelings and thoughts we have about how much stress we are put under at a certain moment or in a certain period. Rather than an objective, quantitative entity of the amount, frequency or level of stressful events happening to a person, perceived stress is the subjective, qualitative feelings someone has, their appraisal, about the stress they are put under and their ability to handle such (Cohen, Kessler, & Gordon, 1997; Phillips, 2013). As such, perceived stress can greatly vary per individual; what person A might perceive as highly stressful, might be something that leaves person B only slightly touched. But how come that what leaves some shattered, shows others barely touched?

Cohen, Kessler, and Gordon (1997) proposed a heuristic model integrating different perspectives on stress. It illustrates the path by which the stress we perceive can ultimately result in increased risks for both physical and psychiatric diseases dependent on whether we perceive something as stressful or benign (see figure 1). Whereas our appraisal of the demands we are put under is our perception of the *external* pressure we are confronted with, our appraisal of our adaptive capacities is directed *internally*; it is concerned with our perception of our own capacities to thrive in the face of this stressor (Cohen, Kessler, & Gordon, 1997).
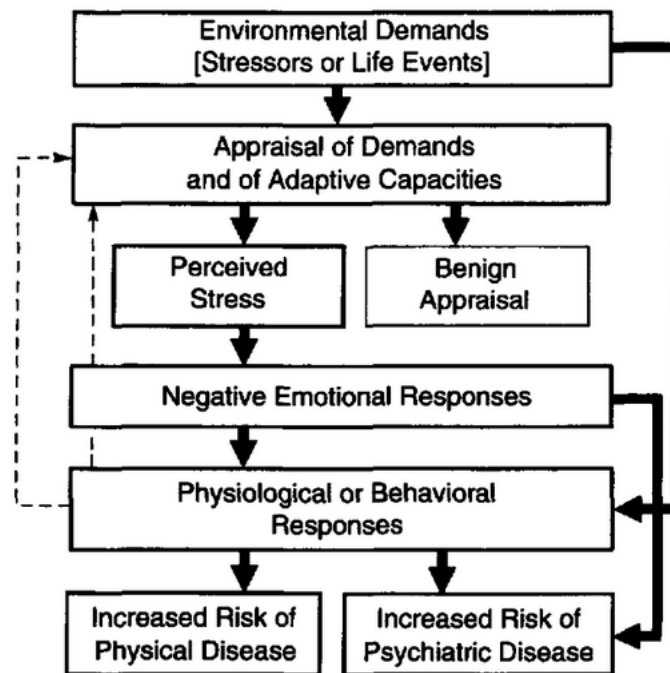
Figure 1. A heuristic model of the stress process designed to illustrate the potential integration of the environmental, psychological, and biological approaches to stress measurement. Adapted from "Measuring Stress: A Guide For Health and Social Scientists" by S. Cohen, R. C. Kessler, and L. U. Gorden, 1997, p. 11. Copyright [1997] by Oxford University Press.

Such adaptive capacities that might help Person B to thrive when Person A struggles, stand in the centre of attention in a paradigm shift in psychology in the recent decades. Positive psychology, the study of strengths and talents, where a preoccupation with the individual's well-being and resources stands in focus, has begun to spread its roots in literature and research in the recent decades (Bohlmeijer & Westerhof, in press; Richardson & Waite, 2002; Seligman & Csikszentmihalyi, 2014; Seligman, 2002). In light of a focus on how people manage to deal with various forms of adversity, what strengths and resources they draw on when facing stress and alike, the concept of *psychological resilience* has emerged prominent. Psychological resilience describes the human capacity to 'bounce back' in the face of and shows to buffer against adversity. Such adversity may range from daily stressors up to other significant sources of stress such as trauma, tragedy, threat and loss (Fletcher & Sarkar, 2013; Pooley & Cohen, 2010). Higher resilience has demonstrated to help dealing with stress and enhance psychological well-being whereas lower resilience was associated with higher risk of onset of and relapses in psychological disorders (Smith & Hollinger-Smith, 2015; Smith & Yang, 2017; Souri & Hasanirad, 2011; Southwick, Litz, Charney, & Friedman, 2011).

Another prominent concept in positive psychology is *self-compassion*. Self-compassion is said to involve three core themes: (1) a kindness and understanding towards the self in times of pain or failure rather than a self-critical stance, (2) seeing the common humanity in suffering and seeing own experiences as "part of a larger human experience rather than seeing them as isolating" (Werner et al., 2012; p. 544), and (3) a mindful awareness of distressing thoughts and feelings without overidentifying with them (Werner et al., 2012). Self-compassionate individuals seem to bid defiance to suffering and failure with non-judgmental warmth and understanding for themselves, an approach that also involves acknowledging and accepting the own imperfection (MacBeth & Gumley, 2012; Thompson & Waltz, 2008; Werner et al., 2012). Consequently, being self-compassionate also means "(…) supporting yourself through adversity (…)" (Bohlmeijer & Hulsbergen, 2018, p. 92).

Self-compassion has long been neglected in research. That is despite its central, anti-pathogenic role in treatments for depression, anxiety and trauma and its promising links to well-being and resource building that buffer against relapse and increase long-term effects of therapy (Gilbert, 2010; Hofmann, Sawyer, Witt, & Oh, 2010; Raes, 2011). In the last decade, self-compassion has developed into a central theme in emergent promising treatments of the so-called 'third wave' of cognitive behavioural therapies (CBTs), such as in compassion-focused therapy (CFT) and acceptance and commitment therapy (ACT) (MacBeth & Gumley, 2012).

In contrast, often conceptualized as the counterpart to self-compassion, stands *self-criticism*. Self-criticism is defined as a form of negative self-judgement and self-evaluation. It reflects a critical, harsh stance towards the self, characterized by frequent feelings of shame, fear of being disapproved and criticized, and self-loathing (Warren, Smeets, & Neff, 2016). Self-criticism has long received consistent amounts of attention in research (Gilbert & Irons, 2009; Longe et al., 2010; Whelton & Greenberg, 2005; Zuroff, Santor, & Mongrain, 2005). Self-critical characteristics in an individual showed high pathogenic potential. High levels of self-criticism have been linked to various psychopathologies amongst which are depression, social anxiety, self-harm and post-traumatic stress disorder (Babiker & Arnold, 1997; Cox, Fleet, & Stein, 2004; Cox, MacPherson, Enns, & McWilliams, 2004; Gilbert & Irons, 2009; Iancu, Bodner, & Ben-Zion, 2015; Luyten et al., 2007; Neff, 2003b; Zuroff & Mongrain, 1987).

Self-criticism and self-compassion are often pictured as different parts of the same medal, constituting opposing ends on the same continuum. This conceptualization mainly relies on the constructs' ascribed characteristics. A person that is highly self-critical is said to be unable to generate feelings of warmth, acceptance, liking and reassurance towards himself or herself; qualities that define a self-compassionate person (Gilbert & Irons, 2009; Whelton &

Greenberg, 2005; Zuroff, Santor, & Mongrain, 2005). As such, therapists often propose the two concepts as antidotes and the third wave therapies often focus especially on individuals who feel and act very shameful and self-critical towards themselves, trying to introduce a more self-compassionate stance (i.e. Gilbert & Irons, 2005; Gilbert & Irons, 2009; McKay & Fanning, 2016). Yet, reducing levels of self-criticism does not automatically imply self-compassionate characteristics in the individual (Gilbert & Irons, 2009). Moreover, self-criticism and self-compassion have been strongly negatively correlated in multiple studies in both clinical and non-clinical samples (i.e. Castilho, Pinto-Gouveia, & Duarte, 2015b; Neff, 2016). Concluding, it can be said that despite literature pinpointing into a conceptualization of the two constructs as part of the same medal, research has not yet clarified whether self-criticism and self-compassion fall onto one continuum or are distinctively different concepts (Fritzsche, 2016).

All three concepts, resilience, self-compassion and self-criticism, have shown to be important predictors of how we deal with stress and adversity on their own. Whereas self-criticism has often shown to entail pathogenic qualities making individuals more vulnerable towards stress, self-compassion has shown to equip individuals with buffering and resilient capacities against stress in general and mental health issues in particular. Prior research has long suggested that "compassion is a promising construct for understanding vulnerability and resilience in mental health" (MacBeth & Gumley, 2012, p. 545), has linked explanatory value of self-compassion to the understanding and increase of resilience to stress, and described self-compassion as a resilience mechanism (Feldman & Kuyken, 2011; Gilbert, 2010; MacBeth & Gumley, 2012; Trompetter, de Kleine, & Bohlmeijer, 2017).

1.1 Research question and hypotheses

Despite research and literature pinpointing towards meaningful interrelationships between the concepts, no study, to my knowledge, has yet brought all concepts together and looked for what role a compassionate or critical attitude towards the self plays in an individual's capacity to show resilience in the face of stress. Therefore, this study set out to identify interrelationships between all concepts to answer the research question of whether resilience is a mediator or moderator in the relationship between self-compassion and perceived stress and self-criticism and perceived stress. Findings are expected to deliver insight into what makes some individuals more and others less resilient towards stress and to inform practice on how we can better equip individuals against daily as well as major life stressors. Theoretical as well as practical psychological grounds are expected to be served as findings may contribute to the central goal of psychotherapy – helping the individuals help themselves. It is expected that 1)

resilience is a mediator or a moderator in the relationship between self-compassion and
perceived stress and 2) resilience is a mediator or a moderator in the relationship between self-
criticism and perceived stress.

Two simple mediation models were tested with self-criticism once as the independent
variable and the other time with self-compassion as the independent variable, perceived stress
as the dependent variable and resilience as the mediator. The other two models tested simple
moderation with self-criticism once as the independent variable and the other time with self-
compassion as the independent variable, perceived stress as the dependent variable and
resilience as the moderator. The figures below give an overview over the two simple mediation
models (figures 2A and 2B) and the two simple moderation models (figures 2C and 2D) that
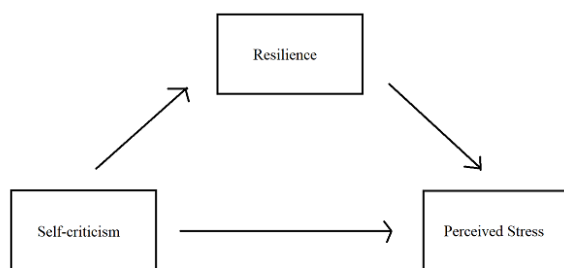were tested.

Figure 2A: Tested simple mediation model with self-criticism as the
independent variable (IV), perceived stress as the dependent variable
(DV) and resilience as the mediating variable (MV).

Figure 2B: Tested simple mediation model with self-compassion as the
independent variable (IV), perceived stress as the dependent variable
(DV) and resilience as the mediating variable (MV).
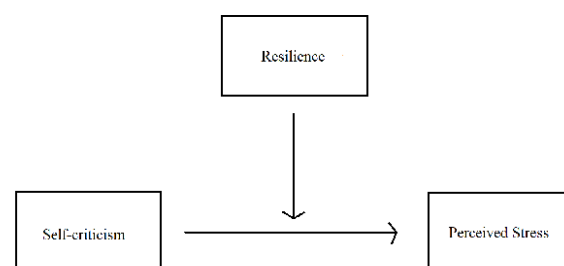
Figure 2C: Tested simple moderation model with self-criticism as the
independent variable (IV), perceived stress as the dependent variable
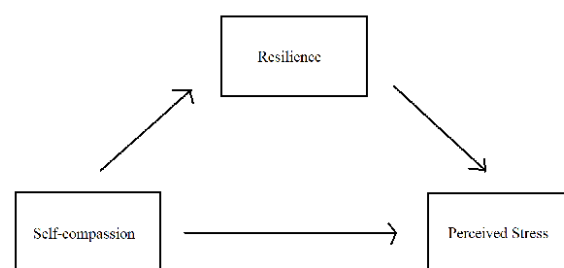(DV) and resilience as the moderating variable (MV).
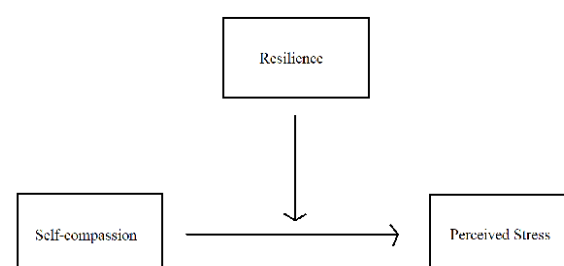
Figure 2D: Tested simple moderation model with self-compassion as the
independent variable (IV), perceived stress as the dependent variable
(DV) and resilience as the moderating variable (MV).

Figures 2A-2D. The tested simple mediation and moderation models.

2. Methods

2.1 Design

A cross-sectional online study design with four self-report scales as well as some
demographics (i.e. age, gender and nationality) has been used (see appendices A-G). In total,
four variables were included: Self-criticism, self-compassion, perceived stress and resilience.

The independent variables were self-criticism and self-compassion, the dependent variable was perceived stress, and resilience was tested as a mediator and moderator in different simple mediation and moderation models.

The study has been set up in Qualtrics. Data was gathered through spreading the link to the survey online on popular social media platforms such as Facebook by which a (virtual) snowball sampling process was initiated. Further, participants were recruited through the University of Twente's online system 'SONA systems' which rewards a participating student with SONA study points required to be obtained by the student. Participation was fully voluntarily. The survey was also optimized for mobile phone usage. Qualtrics explicitly allows for the option to fully anonymize data and to not collect IP addresses, an option that was used in this study. The Behavioural, Management and Social Sciences (BMS) Ethics Committee of the University of Twente has ethically approved the study.

2.2 Participants

A minimum of 80 participants was determined beforehand orientating at the number of variables (i.e. four) involved (Field, 2013). No specific target population was aimed at. Eighty-four (54.80% female, 45.20% male) participants with an age range of 18 to 65 ($M = 24.48$, $SD = 8.23$) took part in this online survey. The sample was predominantly German (91,70% German, 6.00% Dutch, 2.40% Other). Thirty-four (40.48%) participants were recruited through the University of Twente's online platform SONA systems. The remaining participants were gathered through spreading the link to the survey on social media and through (virtual) snowball sampling. Fourteen (14.29%) responses were deleted before analyses due to partial completion.

2.3 Materials

2.3.1 Self-criticism. Self-criticism was measured using the Forms of Self-criticising/Attacking and Self-reassuring (FSCRS) by Gilbert et al. (2004), a 22-item scale where participants respond to a series of questions with a probe statement ("When things go wrong for me …") indicating their feelings about the statement on a five-point Likert-scale ranging from 0 ("Not at all like me") to 4 ("Extremely like me"). The FSCRS uses a three-factor model distinguishing reassured-self (RS) and two types of self-criticism, inadequate-self (IS) and hated-self (HS), a model that received confirmation from follow-up factor analyses (Kupeli et al., 2013). For this study, a total self-criticism score was obtained by reversing the scores on the items on the reassured-self (RS) scale as done before in other studies (e.g. Fritzsche, 2016). Adding up all three subscale total scores then led to a total score range of 0-

88 where higher scores indicated higher self-criticism. The FSCRS' subscales demonstrated high internal reliability in multiple studies, ranging from α = .85 to .91 (Baião, Gilbert, McEwan, & Carvalho, 2015; Gilbert et al., 2004, Kupeli et al., 2013). In this study, the overall reliability of the scale proved to be good with α = .88. Further, good construct validity as well as divergent and convergent validity was demonstrated in multiple studies (Castilho, Pinto-Gouveia, & Duarte, 2015b; Gilbert et al., 2004; Halamova, Kanovský, & Pacúchová, 2017).

     2.3.2 Self-compassion. Self-compassion was assessed by using the Self-compassion Scale (SCS) by Neff (2003a), a 26-item five-point Likert-scale that ranges from 1 ("Almost never") to 5 ("Almost always"). The SCS differentiates six subscales (i.e. self-kindness, self-judgement, common humanity, isolation, mindfulness, over-identification) supported by factor analyses (Neff, Whittaker, & Karl, 2017). As recommended by the author, a total self-compassion score was calculated by reversing the scores on the negative subscales' items (i.e. subscales self-judgment, isolation, over-identification) before calculating subscale means, which could then be turned into a grand mean of all subscales (Neff, 2003a). Scoring resulted in a total score range of 1.00 – 5.00 where a total score between 1.00 and 2.50 indicated low self-compassion, a score between 2.50 and 3.50 indicated moderate self-compassion and a score between 3.50 and 5.00 indicated high self-compassion (Neff, 2020). The SCS has demonstrated high reliability throughout a variety of samples with Cronbach's alphas ranging from .77 to .93 for the respective subscales (e.g. Allen, Goldwasser, & Leary, 2012; Deniz, Kesici, & Sümer, 2008; Neff, 2003a; Werner et al., 2012). In this study, the overall reliability of the scale proved to be excellent with α = .91. Further, construct validity and convergent validity have been demonstrated in various studies (e.g. Castilho, Pinto-Gouveia, & Duarte, 2015a; Deniz, Kesici, & Sümer, 2008; Neff, 2003a; Neff, 2016).

     2.3.3 Perceived Stress. Perceived stress was measured by using the Perceived Stress Scale (PSS) by Cohen and Williamson (1988), a 10-item scale in form of a five-point Likert-scale ranging from 0 ("Never") to 4 ("Very often"). For scoring, as the authors recommended, the scores on items 4, 5, 7 and 8 were reversed. A total score was obtained ranging between 0-40. Scores ranging between 0-13 were considered low perceived stress, scores between 14-26 were considered moderate perceived stress and scores between 27-40 were considered high perceived stress (Cohen & Williamson, 1988). The PSS is one of the most widely used measures of perceived stress and has shown acceptable to good reliability in a great variety of studies with Cronbach's alphas ranging from .74 to .91 (Lee, 2012; Roberti, Harrington, & Storch, 2006). In this study, the overall reliability of the scale proved to be good with α = .86. The PSS

has further proven to be a valid instrument in multiple settings (Lee, 2012; Roberti, Harrington, & Storch, 2006; Remor, 2006).

2.3.4 Resilience. Lastly, resilience was assessed by using the Brief Resilience Scale (BRS) by Smith et al. (2008), a 6-item scale in form of a five-point Likert-scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"). As recommended by the authors, items 2, 4 and 6 were reversed and the total sum score was divided by the number of items to get an average response score between 1.00 and 5.00. A score between 1.00 and 2.99 indicated low resilience, a score between 3.00 and 4.30 indicated normal resilience and a score between 4.31 and 5.00 indicated high resilience (Smith et al., 2008). The BRS has demonstrated to be a reliable and valid tool showing acceptable to good reliability throughout a great variety of samples ($\alpha = .80$ to .91) as well as convergent and discriminant predictive validity (Amat et al., 2016; Chmitorz et al., 2018; Rodríguez-Rey, Alonso-Tapia, & Hernansaiz-Garrido, 2016; Smith et al., 2008). In this study, the overall reliability of the scale proved to be good with $\alpha = .80$.

2.4 Procedure

In the survey, first, an introduction was given to the participants that informed about the use of their data, the approximate duration and general instructions on how to fill in the survey (see appendix A). Before the questions started, the participant was given an informed consent that had to be signed by mouse click (see appendix B). After some short demographic questions, the survey started with the Forms of Self-criticising/Attacking and Self-reassuring (FSCRS) that measured self-criticism, followed by the Self-Compassion Scale (SCS) that measured self-compassion, followed by the Perceived Stress Scale (PSS) that measured perceives stress and closed by the Brief Resilience Scale (BRS) that measured resilience (see appendices C-G). For each questionnaire, brief information on how to correctly fill it in was provided to the participant. Further, the web-survey allowed for the option to go back to previously answered questions so that participants could reconsider their answers before their data would be saved at the end of the survey.

2.4 Data analysis

Four models in total were tested as visualized in the introduction (see 1.1). The data was analyzed using IBM SPSS Statistics 24. Descriptive statistics were obtained to give an impression of the data. Bivariate Pearson correlations between all constructs were established to give an impression of the interrelationships.

Mediation and moderation were tested with multiple regression analyses using bootstrapping with the PROCESS 3.2 macro for SPSS by Hayes (2012) that uses unstandardized coefficients. The bootstrapping method, in contrast to traditional methods, resamples the original dataset with replacement thousands of times by drawing random samples from the original data to create simulated samples. In doing so, bootstrapping does not make assumptions about the sample's distribution, in contrast to traditional methods usually assuming normal distribution (Hayes, 2012). By using this procedure to test all paths the model offers, bootstrapping can unveil all interrelationships between the variables involved. Bootstrapping, especially through Hayes' PROCESS, has established to be the up-to-date method to test mediation and moderation by performing multiple analyses steps in one program (Hayes, 2012).

Bootstrap samples were set to 5,000 and 95-% bootstrap confidence intervals were used to indicate significance of the indirect effects through the mediator. Following Hayes (2012), mediation is present if the confidence interval of the indirect effect, that is the effect of the independent variable on the dependent variable through the mediator, does not include zero. Moderation is said to be present if the interaction effect that the analysis produces is significant and if its confidence interval does not include zero.

3. Results

3.1 Preliminary analyses

The scores of the participants are given in table 1 below. Applying the scales' cut-off categories leaves us with the following impressions: Self-criticism as measured by the FSCRS falls slightly below figures found in a comparable study by Fritzsche (2016) that established an overall mean of $M = 39.00$. Self-compassion as measured by the SCS suggests an overall 'moderate' self-compassion of the sample with $M = 3.22$ falling between the cut-offs of 2.50 and 3.50 for 'moderate' self-compassion (Neff, 2020). The sample's overall perceived stress score falls into the category 'moderate' perceived stress with $M = 17.77$ scoring within the cut-off of 14-26 (Cohen & Williamson, 1988). Lastly, the sample's overall resilience score with $M = 3.37$ falls into the category 'normal' resilience which ranges from 3.00 to 4.30 (Smith et al., 2008).

3.1.1 Correlations among variables. Bivariate Pearson correlational analyses showed that all variables are strongly significantly associated at the level of $p < 0.01$ (see table 1 below).

Table 1

Correlations among self-criticism, self-compassion, perceived stress and resilience

		Mean	SD	1	2	3	4
1	Self-criticism	28.35	12.04				
2	Self-compassion	3.22	0.63	-.83**			
3	Perceived Stress	17.77	6.72	.67**	-.53**		
4	Resilience	3.37	0.72	-.61**	.52**	-.51**	

Note. N = 84.

$**p < .01$

3.2 Mediation and moderation analyses

3.2.1 Mediation with self-criticism as the predictor. Bootstrapped mediation analysis for the first mediation model (see figure 2A in 1.1) showed the following results: The first model with self-criticism predicting resilience (path *a*) was significant overall and self-criticism could account for 37.80% of the explained variance in resilience, $R^2 = .378$, $F_{1, 82} = 49.79$, $p < .001$. In this model, self-criticism was negatively associated with resilience, $a = -0.037$, $p < .001$. In the second model, self-criticism and resilience together had a significant effect on perceived stress and could account for 46.60% of the explained variance in perceived stress, $R^2 = .466$, $F_{2, 81} = 35.40$, $p < .001$. However, in that model where resilience predicted perceived stress, path *b* was not significant, $b = -1.471$, $p > .05$. The direct effect of self-criticism on perceived stress with the mediator resilience included (path *c*) was significant, $c = 0.320$, $p < .001$. Further, the total effect of self-criticism on perceived stress was significant $(0.375, p < .001)$ and could explain 45.10% of the variance in perceived stress, $R^2 = 0.451$, $F_{1, 82} = 67.30$, $p < .001$. However, the indirect effect of self-criticism on perceived stress mediated by resilience (path $c' = a \cdot b$) included a zero in its confidence interval, suggesting no mediation effect of resilience in this model, $c' = 0.054$, 95-% CI [-0.013, 0.121]. Figure 3 shows all interrelationships that the bootstrapping analysis revealed.
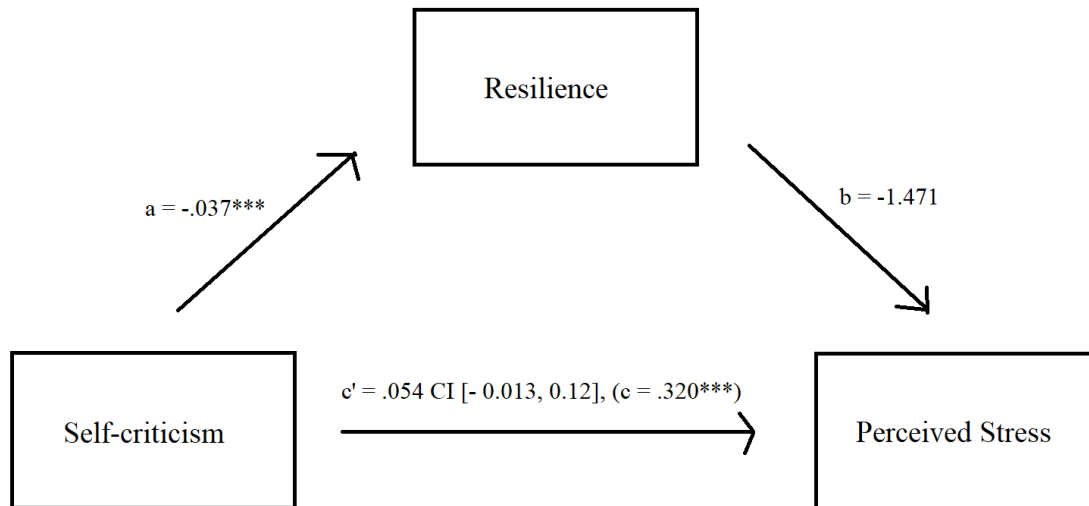
Figure 3. Interrelationships revealed through PROCESS mediation analyses with resilience as the mediator between self-criticism and perceived stress.

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

3.2.2 Mediation with self-compassion as the predictor. Bootstrapped mediation analysis for the second mediation model (see figure 2B in 1.1) showed the following results: The first model with self-compassion predicting resilience (path *a*), was significant overall and self-criticism could account for 27.50% of the explained variance in resilience, $R^2 = 0.275$, $F_{1, 82} = 31.17$, $p < .001$. In this model, self-compassion was positively associated with resilience, $a = 0.605$, $p < .001$. In the second model, self-compassion and resilience together had a significant effect on perceived stress and could account for 35.40% of the explained variance in perceived stress, $R^2 = .354$, $F_{2, 81} = 22.17$, $p < .001$. In that model (path *b*), resilience was negatively associated with perceived stress, $b = -3.006$, $p < .01$. The direct effect of self-compassion on perceived stress with the mediator resilience included (path *c*) was significant, $c = -3.818$, p < .01. Further, the total effect of self-compassion on perceived stress was significant (= -5.636, $p < .001$) and could explain 27.80% of the variance in perceived stress, $R^2 = 0.278$, $F_{1, 82} = 31.53$, $p < .001$. Lastly, the indirect effect of self-compassion on perceived stress mediated by resilience (path $c' = a \cdot b$) did not include a zero in its confidence interval suggesting a significant mediation effect of resilience in this model, $c' = -1.818$, 95-% CI [-3.150, -0.695]. Figure 4 shows all interrelationships that the bootstrapping analysis revealed.
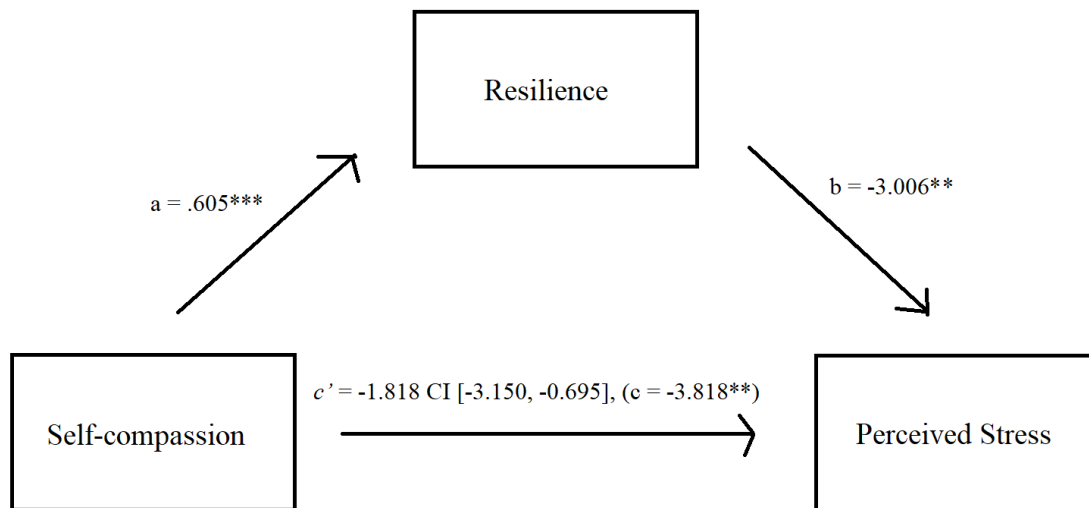
Figure 4. Interrelationships revealed through PROCESS mediation analyses with resilience as the mediator between self-compassion and perceived stress.

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

3.2.3 Moderation with self-criticism as the predictor. All interrelationships that the moderation analysis revealed are displayed in table 2.

Table 2
Interrelationships revealed through PROCESS moderation analysis with self-criticism as the predictor

	Perceived Stress			
	b	$SE_{B(HC4)}$	t	p
Self-criticism	0.328	0.060	5.445	0.000
Resilience	-1.546	0.855	-1.808	0.074
I-SCS-R [c]	0.057	0.104	0.550	0.584

Note. [a] $N = 84$. [b] $R^2 = 0.473$, $F_{3,80} = 20.136$, $p < 0.001$. [c] Interaction term between self-criticism and resilience.

Bootstrapped moderation analyses revealed that the model (see figure 2C in 1.1) was significant overall and could account for 47.30% explained variance, $R^2 = 0.473$, $p < .001$. However, the analyses revealed that the interaction effect was not significant, Interaction $b = 0.057$, $p > .05$. Further, the 95-% confidence interval crossed zero, pointing against resilience as a moderator in this model, CI [-0.150, 0.265]. Figure 5 below shows that different levels of

resilience had no significant impact on the level of perceived stress when self-criticism was set as the predictor.

Figure 5. A depiction of the interaction in a Johnson-Neyman plot at different levels of the moderating variable resilience where self-criticism was set as the independent variable and perceived stress as the dependent variable.

3.2.4 Moderation with self-compassion as the predictor. All interrelationships that the moderation analyses revealed are displayed in table 3.

Table 3
Interrelationships revealed through PROCESS moderation analyses with self-compassion as the predictor

	Perceived Stress			
	B	$SE_{B(HC4)}$	t	p
Self-compassion	-3.806	1.336	-2.850	0.006
Resilience	-3.090	0.820	-3.769	0.000
I-SCS-R [c]	-0.635	2.008	-0.316	0.753

Note. [a] $N = 84$. [b] $R^2 = 0.355$, $F_{3,80} = 10.049$, $p < 0.001$. [c] Interaction term between self-compassion and resilience.

Bootstrapped moderation analyses revealed that the fourth model (see figure 2D in 1.1) was significant overall and could account for 35.50% explained variance, $R^2 = 0.355$, $p < .001$. However, the analyses revealed that the interaction effect was not significant, Interaction $b = -0.635$, $p > .05$. Further, the 95-% confidence interval crossed zero, pointing against resilience as a moderator in this model, CI [-4.630, 3,361]. Figure 6 below shows that different levels of resilience had no significant impact on the level of perceived stress when self-compassion was set as the predictor.
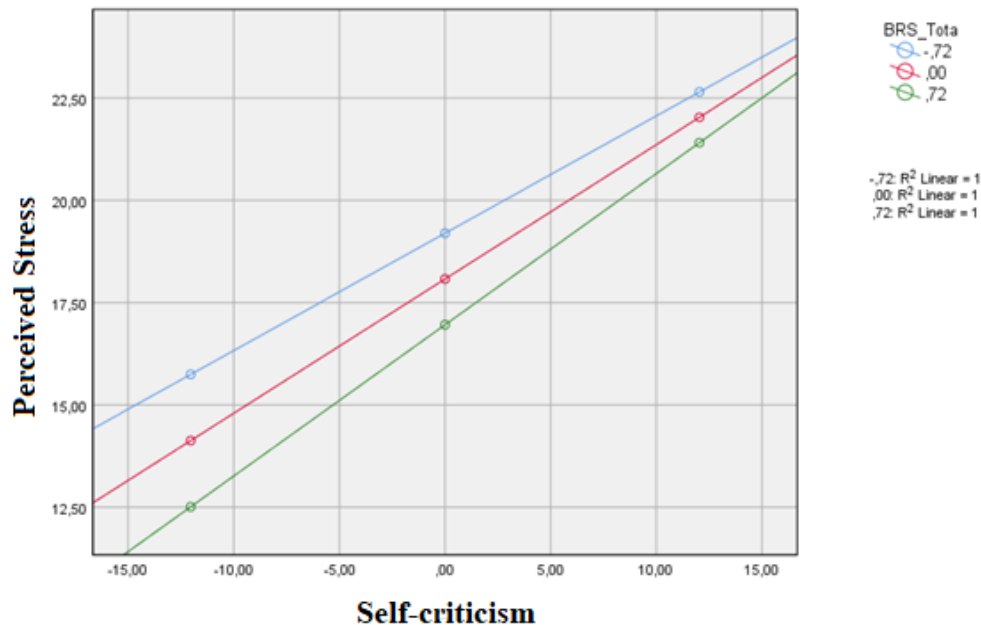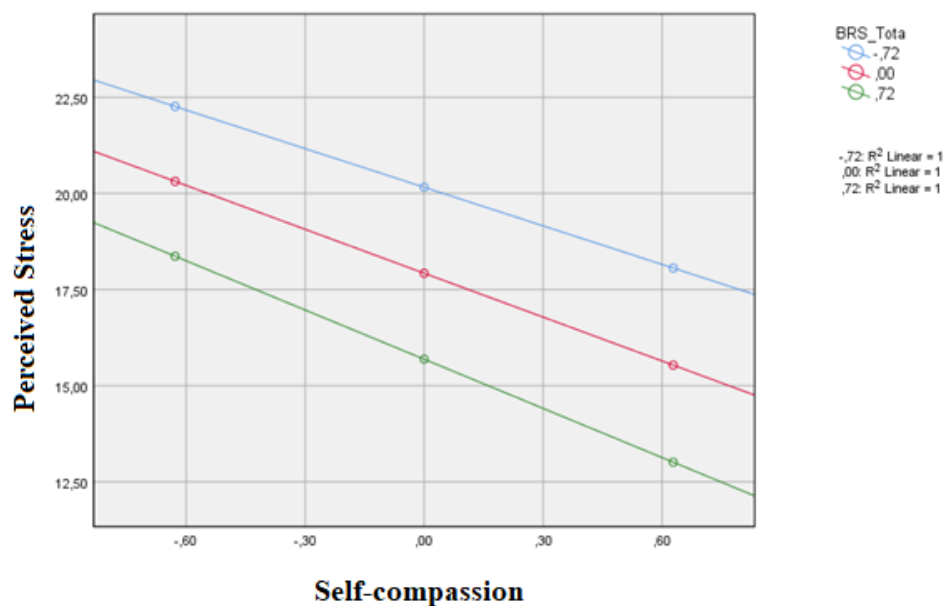

Figure 6. Note. A depiction of the interaction in a Johnson-Neyman plot at different levels of the moderating variable resilience where self-compassion was set as the independent variable and perceived stress as the dependent variable.

4. Discussion

The aim of this study was to identify interrelationships between self-criticism, self-compassion, resilience and perceived stress. The results showed that self-compassion, self-criticism and resilience all appeared as significant predictors of perceived stress on their own. By testing for resilience's mediating or moderating roles in the relationship between self-criticism and perceived stress and self-compassion and perceived stress, it was expected to identify what role a compassionate or a critical attitude towards the self plays in an individual's capacity to show resilience towards stress. The results of the analyses suggest that resilience is a mediator in the relationship between self-compassion and perceived stress, but not in the

relationship between self-criticism and perceived stress. Further, no moderating roles of resilience were identified.

4.1 Resilience as a mediator between self-compassion and perceived stress

An understanding for why resilience appeared to mediate the relationship between self-compassion and perceived stress may lie in the model of Cohen, Kessler and Gorden (1997) cited earlier in the introduction (see figure 1). As discussed in the introduction, the authors depicted pathways by which the confrontation with a stressor leads one to weigh the appraisal of demands (i.e. external demands we perceive to be put under) against one's adaptive capacities (i.e. internal capacities we perceive to have allowing us to manage said demands). Our perception of what weighs heavier then determines whether we perceive a stressor as stressful or benign. If we perceive the stressor as highly stressful, negative emotional responses may trigger certain physiological and behavioural responses leading to an increased risk of both psychiatric and physical diseases (see figure 1 in the introduction); consequences of stress that have long been established in research (see introduction).

In looking for what determines this crucial weigh-off of being able to show resilience and deal with the stress, or not, how self-compassionate we are appears to add crucial insight. That is because resilience has been identified as a mediator in the relationship between self-compassion and perceived stress in this study. In particular, the results show that higher self-compassion was associated with higher resilience which in turn was associated with lower perceived stress. Individuals that are more self-compassionate are kinder and more understanding towards themselves, they are more accepting towards failure and pain and more mindful towards distressing thoughts and feelings. Such characteristics allow them to express more liking and reassurance towards themselves and acceptance towards failure (Bohlmeijer & Hulsbergen, 2018; MacBeth & Gumley, 2012; Thompson & Waltz, 2008; Werner et al., 2012). It may be that such characteristics assist a more self-compassionate individual to 1) reassure themselves of their own capabilities to handle the demands they are confronted with as well as 2) allow themselves to also fail and be able to accept the negative feelings that derive from such failing. Such a view is strengthened by evidence from research that sees the capacity to recruit positive emotions under stress as central components of resilience (Davidson, 2000; Fredrickson, 2001; Whelton & Greenberg, 2005). It may thus be that self-compassionate individuals are able to recruit positive emotions towards themselves, such as reassuring themselves of their capabilities, making them resilient in the face of stress.

Following this interpretation, it appears that being resilient towards stress does not only mean having the capabilities, or perceiving to have the capabilities, to deal with the demands we perceive; it appears to not be a simple weigh-off. Rather, it seems that a significant role in being resilient towards stress is reassuring yourself of your own capacities and generating acceptance towards failing and the negative feelings stress may evoke. Given what makes a self-compassionate individual self-compassionate and given what defines resilience, it is not to be expected that stress leaves the individual fully untouched and just bounces off from them. Rather, a more active process becomes apparent in which a self-compassionate individual can use more reassurance towards their own abilities as well as mindful ways of dealing with distressing thoughts and feelings that a stressor may evoke. The latter may also allow to 'bounce back', to get back on your feet from failing now and then which is one of the key ingredients of resilience (Bohlmeijer & Hulsbergen, 2018; Fletcher & Sarkar, 2013; Pooley & Cohen, 2010). Such a perspective well-resembles what Bohlmeijer and Hulsbergen (2018) framed in the following way: "Self-compassion (…) means supporting yourself through adversity (…)" (p. 92). A statement that can be modified based on this study's results in the following way: Self-compassion means supporting yourself to be resilient in the face of stress.

Consequently, the positive long-term implications that research has found for more resilient and more self-compassionate individuals, such as enhanced psychological well-being, lower relapse rates and increased long-term effects of therapy (Gilbert, 2010; Hofmann, Sawyer, Witt, & Oh, 2010; Raes, 2011), may be partly explained by this understanding. An understanding that pictures self-compassion as the mindset that facilitates being resilient towards stress, that facilitates feeling equipped against stress and that even facilitates bouncing back from failing to deal with stress.

4.2 The relationships between self-criticism, perceived stress and resilience

The high correlation that was found between self-criticism and self-compassion gave hint to both concepts falling at opposing ends of the same continuum as often argued in the literature (Gilbert & Irons, 2005; Gilbert & Irons, 2009; McKay & Fanning, 2016). As such, it was expected that resilience would play a similar, but reversed, role in the relationship between self-criticism and perceived stress as it does between self-compassion and perceived stress. It was expected that resilience would also mediate the relationship between self-criticism and perceived stress. Yet, no mediating role of resilience in the relationship between self-criticism and perceived stress was found. Still, both self-criticism and resilience were significant predictors of perceived stress with resilience adding explanatory value to the model. These

results leave implications for the interrelationships of the concepts of interest as discussed in the following.

It appears that self-compassion and self-criticism have significant explanatory value on their own. There seem to also be significant characteristics the concepts do not share when related to stress. That is because adding resilience to the model adds significant explanatory value, despite resilience not being a mediator between self-criticism and perceived stress. That means that although the proposed relationship seems to hold strong and resilience appears to play a similar role in that model, the nature of that role is not one of mediation.

The results suggest that self-criticism has a significant impact on one's perception of stress in the way that higher self-criticism predicts greater perceived stress. An individual that is more self-critical is one that is characterized by self-loathing and negative self-judgment and self-evaluation (Warren, Smeets, & Neff, 2016). Such an individual may perceive their own capacities to deal with a stressor as insufficient and the demands as simply too much to handle by them. Consequently, they would perceive more stress since their negative picture of themselves leads them to perceive the demands outweighing their ability to deal with such. Even further, research on self-criticism suggests that the very act of being self-critical can constitute an additional intrapsychic source of stress extending the external demands placed on one by a source of stress that is oneself (Whelton & Greenberg, 2005).

4.3 Resilience as no moderator

In neither model did resilience appear in a moderating role. No significant interaction effect was found, and different levels of resilience appeared to have no mentionable effect on the strengths of the relationships between self-criticism and perceived stress and self-compassion and perceived stress. That is contradictory to what was expected as resilience appeared in many moderating roles when related to stress (see i.e. Friborg et al., 2006; García-Izquierdo et al., 2018). In such studies, it was shown that different levels of resilience influenced the strength of the relationship between the studies' concepts of interest and stress. The contradictory findings may be due to different measurements and conceptualizations of resilience and stress and due to different research designs. Still, for this study, we must conclude that the role resilience plays in the relationships between self-criticism and perceived stress and self-compassion and perceived stress is better understood by mediation than moderation.

4.4 Limitations and suggestions for future research

To give a complete picture and to inform future research on the matter, some limitations are outlined. The cross-sectional design that was used gives a picture of only one moment in time. This is important to remember because cross-sectional designs cannot correct for temporal precedence. That means that we cannot say if in the mediation effect we found cause came before the effect. Meaning, we cannot control for whether the predictor variable (i.e. self-compassion) precedes the mediator (i.e. resilience) which again precedes the dependent variable (i.e. perceived stress) as in a regular mediation model. Therefore, it is advised to use a longitudinal research approach to ensure that the effects hold strong when controlled for temporal precedence.

Another limitation constitutes the (virtual) snowball sampling process used. Samples gathered by snowballing are potentially subject to numerous biases. As for example people who have more friends have higher chances to be recruited into the sample. This effect might amplify on social media platforms such as Facebook that were used since such platforms experience greater usage by younger, more technically adept users. Consequently, the sample might be more representative for characteristics shared by social media users on the absence of having a sample of greater heterogeneity. Indices for these assumptions are for example the low mean age of $M = 24.48$, $SD = 8.23$. For future studies, sampling processes that pay greater respect to the inclusion of, for example all age ranges, are advised.

4.5 Strengths of the study

One of the study's major strengths lies in the instruments used to measure the constructs of interest. Throughout, good to excellent reliability of the instruments was determined suggesting reliable data. The instruments further proved their validity in multiple settings; their widespread and also freely available use makes them comparable to other studies in the thematic field. Besides that, the survey was able to achieve a high response rate. Out of 98 participants starting the survey, 84 (85.71%) completed it fully suggesting an unobstructed participation that further supports the data's reliability.

4.6 Conclusions and implications

The study's findings leave implications for recent developments in psychotherapy, especially the third wave therapies. Identifying resilience as a mediator between self-compassion and perceived stress pinpoints towards a benefit of fostering techniques and skills in therapy that support patients' self-compassionate attitude. That is because it appears to better

equip them against future stressors by improving their resilience towards such. Next to that, self-criticism was also directly related to perceived stress. That finding further supports current developments and focuses of positive psychological interventions where third-wave therapies target especially individuals with greater self-critical attitudes to introduce more self-compassioned ones (i.e. Gilbert & Irons, 2005; Gilbert & Irons, 2009; McKay & Fanning, 2016). By fostering self-compassionate stances in therapy and by conquering self-critical attitudes, it can be expected to strengthen both: The effects of therapy as well as the prevention of relapse. Such expectations are supported by the various links research has established between i.e. lower relapse rates, increased effects of therapy and increased well-being that were connected to higher self-compassion and to greater resilience towards stress (Gilbert, 2010; Hofmann, Sawyer, Witt, & Oh, 2010; Raes, 2011).

In conclusion, we see great value in this study through serving the understanding of how more self-compassionate individuals show such increased therapeutic benefits and resistant capacities – by being more resilient towards stress. Such findings further support the effectiveness and the leitmotif of positive psychology and third wave therapies: "Treatment is not just fixing what is broken; *it is nurturing what is best* [emphasis added]" (Seligman & Csikszentmihalyi, 2014, p. 7). Understanding mechanisms of and relationships between concepts of growth and resistance such as self-compassion and resilience, and their counterparts, such as self-criticism and stress, pave the way for prevention and intervention and enable psychology to not 'just' fix what is broken, but also nurture what is best in clients. Future research is recommended to cement the findings of this study in longitudinal designs and adapted sampling designs, and to broaden the thematic field of positive psychological concepts, such as self-compassion and resilience, to support both the practical and theoretical field of psychotherapy in its recent developments.

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Appendices

Appendix A

Introductory text

Hello and welcome.

This survey collects data for a study that examines the associations between the concepts of self-criticism, self-compassion, resilience and perceived stress.

Please only participate when you are at least 18 years old and have a satisfactory command of the English language.

In this survey you will encounter a few demographic questions first, followed by four questionnaires measuring the corresponding concepts. Filling out the whole survey will take approximately 15 minutes.

Before starting, please read the informed consent carefully that you encounter on the next page and sign it per mouse click. Please read each instruction carefully before answering. When you are filling out the questions it would be recommended you do so in a quiet, neutral environment that is free of possible external influence that could affect your answer. Because the questions that are asked could be experienced as personal, it is advised to answer the questions on your own. We would like to appeal to your honesty in answering the questions. This will provide us with the best possible data for our research.

Thank you for your participation.

Christian M. Hölling

B.Sc. Psychology

M.Sc. Psychology student at the University of Twente

Appendix B

Informed consent

"By means of this I acknowledge that I have been informed in a manner obvious to me about the disposition and method of the described research. I voluntarily agree to participate in this study. I will answer all questions in a satisfactory manner and to the best of my knowledge. I am aware that I can stop my participation at any moment and or drop out of the study without giving justification. Furthermore, I am certain that the results of the study will be published anonymously and my data is handled accordingly. I am aware that no third party will have access to my data without my permission."

If you have any complaints about this research, please direct them to the secretary of the Ethics Committee of the Faculty of Behavioural Sciences at the University of Twente, Drs. L. Kamphuis-Blikman P.O. Box 217, 7500 AE Enschede (NL), telephone: +31 (0)53 489 3399; email: l.j.m.blikman@utwente.nl .

If you have any comments about this research or are interested in further information, feel free to contact the researcher.

Christian M. Hölling: c.m.holling@student.utwente.nl

( ) I have read the informed consent and agree to its terms. I am at least 18 years of age.

Appendix C

Demographic questions

Please indicate your age: 18 - 100

Gender: Female, Male, Diverse

Nationality: Dutch, German, Other

Appendix D

Self-criticism: Forms of Self-criticising/Attacking and Self-reassuring (FSCRS) by Gilbert et al. (2004)

When things go wrong in our lives or don't work out as we hoped, and we feel we could have done better, we sometimes have negative and self-critical thoughts and feelings. These may take the form of feeling worthless, useless, inferior or likewise. However, people can also try to be supportive of themselves. Below are a series of thoughts and feelings that people sometimes have. Read each statement carefully and click the number that best describes how much each statement is true for you.

1. I am easily disappointed with myself.
2. There is a part of me that puts me down.
3. I am able to remind myself of positive things about myself.
4. I find it difficult to control my anger and frustration at myself.
5. I find it easy to forgive myself.
6. There is a part of me that feels I am not good enough.
7. I feel beaten down by my own self-critical thoughts.
8. I still like being me.
9. I have become so angry with myself that I want to hurt or injure myself.
10. I have a sense of disgust with myself.
11. I can still feel lovable and acceptable.
12. I stop caring about myself.
13. I find it easy to like myself.
14. I remember and dwell on my failings.
15. I call myself names.
16. I am gentle and supportive with myself.
17. I can't accept failures and setbacks without feeling inadequate.
18. I think I deserve my self-criticism.
19. I am able to care and look after myself.
20. There is a part of me that wants to get rid of the bits I don't like.
21. I encourage myself for the future.
22. I do not like being me.

Appendix E

Self-compassion: The Self-compassion Scale (SCS) by Neff (2003a)

These questions are about how you typically act towards yourself in difficult times. Some statements may show overlap with the ones you answered before. Please read each statement carefully before answering. Indicate how often you behave in the stated manner.

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 F

Perceived stress: The Perceived Stress Scale (PSS) by Cohen and Williamson (1988)

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way.I tend to bounce back quickly after hard times.

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and "stressed"?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Appendix G

Resilience: The Brief Resilience Scale (BRS) by Smith et al. (2008)

Please indicate the extent to which you agree with each of the following statements by using the following scale:

1. I tend to bounce back quickly after hard times.
2. I have a hard time making it through stressful events.
3. It does not take me long to recover from a stressful event.
4. It is hard for me to snap back when something bad happens.
5. I usually come through difficult times with little trouble.
6. I tend to take a long time to get over setbacks in my life.