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Self-compassion and attention: self-compassion facilitates disengagement from negative stimuli

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ABSTRACT

Self-compassion is a healthy way of relating to the self, and helps to mitigate negative emotions during difficult experiences. Through four studies, we explored the influence of induced self-compassion on affect-biased attention (measured using a dot-probe task) among undergraduates after negative aspects of the self were made salient. We manipulated self-compassion through a writing task and compared its effects on the dot-probe task against a control (studies 1 and 2), self-esteem and emotion disclosure (study 3), and happiness condition (study 4). Prior to the self-compassion induction, feelings of inadequacies (studies 1, 3 and 4), or shame (study 2) were first elicited among participants. The self-compassion condition yielded faster negative disengaging relative to all comparison conditions across all studies. Our studies provide strong evidence that self-compassion does have an effect on automatic, antecedental emotional regulation processes, especially negative disengaging, following the experience of inadequacy, and even a more intense feeling of shame.

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regulation

Self-compassion, defined as a frame of mind that accepts oneself despite all its limitations (Neff, 2003a), has gained increasing recognition as vital to one's mental health and well-being. It comprises three inter-connected elements: extending care and understanding toward oneself (self-kindness), recognising that all humans share the same failings (common humanity), and being aware of the present without obsessing about personal limitations (mindfulness; Neff & Pommier, 2012; Leary et al., 2007; Shepard & Cardon, 2009). Understanding self-compassion is important considering the growing prevalence of psychological disorders linked to self-criticism such as depression and anxiety. For instance, a survey that spans 400 colleges around the world found more and more students suffering various psychological problems, with anxiety and depression as top concerns (Mistler, Reetz, Krylowicz & Barr, 2012). Additionally, research studies also found harsh self-judgement and feelings of inadequacy to be critical in contributing to workplace stress, be it among blue- and white-collar employees (Clarke & Cooper, 2003), or among health care professionals (Firth-Cozens, 1987).

Self-compassion is thought to mitigate feelings of inadequacies and enable people to relate to themselves in a kind and healthy manner (Mills, Gilbert, Bellew, McEwan & Gale, 2007). Indeed, it is associated with many psychological benefits. It is linked to better emotional well-being (Neff, Rude, & Kirkpatrick, 2007; Shapiro, Astin, Bishop, & Cordova,

2005). It also predicts lower levels of mood disturbances such as depressive (Gilbert et al., 2011; Raes, 2011) and anxiety symptoms (Costa & Pinto Gouveia, 2011; van Dam, Sheppard, Forsyth, & Earleywine, 2011), as well as lower levels of stress (Birnie, Speca, & Carlson, 2010).

However, research on the basic and automatic cognitive processes associated with self-compassion is very scarce. In particular, there is a dearth in research on what forms of fundamental, early-attentional responses towards affectively-valenced stimuli (known as *affect-biased attention*) that self-compassion could possibly elicit. Affect-biased attention is the selective attention process (Corbetta & Shulman, 2002) by which one's visual system is tuned to favor certain affectively positive or negative stimuli (Todd, Cunningham, Anderson & Thompson, 2012). There are four types of affect-biased attention responses: positive and negative orienting refers to the speed at which one orients attention toward positive and negative affective stimuli respectively, whereas positive and negative disengaging refers to the ease in which one disengages away from positive and negative affective stimuli respectively. Given that self-compassion is essentially a reaction towards affectively charged occurrences (e.g., experiences of personal inadequacy), one can expect its effect to manifest early in the perceptual-cognitive mechanism in which a response, whether to engage or disengage, is needed towards affective targets. In a study by Gerber and Anaki (2019), priming

participants with a word related to death led participants with low trait self-compassion to display attentional avoidance to subsequent threat stimuli. This avoidance was not demonstrated among participants with higher trait self-compassion. This provides preliminary evidence that individual differences in self-compassion may implicate selective attentional processes.

Another reason why an investigation of the effect of self-compassion on affect-biased attention is important is that affect-biased attention can affect psychological health outcomes. Attentional biases toward negative stimuli are linked to a range of anxiety (Ashley, Honzel, Larsen, Justus, & Swick, 2013; Koster, Crombez, Verschuere, & De Houwer, 2004; Mathews & Klug, 1993) and depressive (Bradley, Mogg, & Lee, 1997; Gotlib, Krasnoperova, Yue, & Joormann, 2004) disorders. Also, trait anxiety is associated with difficulties in disengaging attention from threatening stimuli (Salemink, Hout, & Kindt, 2007). Research on self-compassion has focused on down-stream outcomes such as emotional feelings and depressive and anxiety symptoms both in the clinical and non-clinical population (MacBeth & Gumley, 2012; Shapira & Mongrain, 2010), but it remains unclear how these relationships can be explained. What might explain, for instance, how self-compassion enables individuals to mitigate depression and anxiety symptoms in the face of negative personal experiences (e.g., Diedrich, Grant, Hofmann, Hiller & Berking, 2014)?

While we are not testing mental health outcomes in this research, we like to posit that affect-biased attention could be one of the critical stages early in the causal-chain that mediates the effect of self-compassion on psychological health. That is, as a starting stage towards overcoming an affective condition, the ability to decouple from distressful stimuli and/or the ability to focus on pleasant ones is likely crucial. Indeed, affect-biased attention has been theorized to be an antecedent and reflexive form of emotion regulation that helps in modulating emotional responses (Mauss, Cook & Gross, 2007). For instance, if one's visual filters are more selective to notice happy versus sad faces in a crowd, one is less likely to experience negative feelings in a stressful situation (Todd et al., 2012). Providing clear evidence that self-compassion can affect affect-biased attention would be an important step towards understanding the downstream outcomes of self-compassion.

In our research, affect-biased attention was measured using the validated emotional dot-probe task (MacLeod, Matthews, & Tata, 1986). On each trial, two pictures (one emotionally-valenced and one neutral) are simultaneously presented in two areas on the screen. Pictures rather than words were employed as emotional stimuli because they tend to be more affectively evocative

Mogg, Mathews, Bird, & Macgregor-Morris, 1990). Next, the picture pair would be removed and a dot would appear in place of one of them. Participants are required to indicate the location of the dot as quickly as possible. Hence, faster orienting toward emotional stimuli will result in faster responses to dots replacing the location of emotional stimuli and slow disengagement will result in slower responses to dots replacing neutral stimuli in the presence of emotional stimuli.

A significant number of studies that examined emotional responses toward negative events suggest the potential of self-compassion in helping individuals to decouple from negative experiences. For instance, self-compassion is negatively associated with rumination (Neff, 2003a; Neff & Vonk, 2009; Odou & Brinker, 2014; Raes, 2010; Samaie & Farahani, 2011). Rumination involves fixated attention on unwanted thoughts which the person is unable to remove his or her focus from (Brinker & Dozois, 2009; Odou & Brinker, 2014). Neff et al. (2007) demonstrated that increases in self-compassion over a one-month period predicted reduced rumination. Specifically, undergraduates who completed a three-week Gestalt two-chair intervention were found to experience increases in self-compassion that in turn predicted reduction in rumination. In this intervention, clients are assisted by the therapist to challenge their self-critical beliefs, thereby allowing them to become more empathic toward themselves. Another self-compassion intervention, comprising self-compassion journaling and loving kindness meditation, was also found to result in decreased rumination in comparison to a control intervention where only time management skills were taught (Smeets, Neff, Alberts, & Peters, 2014). In sum, these findings concur that self-compassion helps prevent an excessive dwelling on negative experiences, suggesting, at the level of automatic attentional process, the prediction that self-compassion should facilitate the disengaging from negative emotional stimuli.

On the other hand, the relation between self-compassion and the other three indices of affect-biased attention are very much unclear. First, trait anxiety has been found to be unrelated to negative orienting (e.g., Salemink et al., 2007). Since self-compassion is negatively associated with anxiety (Costa & Pinto Gouveia, 2011; Van Dam et al., 2011), it is plausible that self-compassion may also not predict negative orienting. However, the validity of this assumption can be questioned. Second, research studies demonstrate that a self-compassion induction does not significantly increase positive affect compared to a control group in the face of a negative experience, though it does decrease negative affect (e.g., Breines & Chen, 2012). This suggests that the value of self-compassion in the face of negative

experiences lies in its inherent ability to mitigate negative emotions, as opposed to raising positive emotions. In other words, there may be a possibility that self-compassion does not influence positive orienting/disengaging, though this is speculative. Taken together, there is no strong basis to postulate a relationship between self-compassion and negative orienting, positive orienting, and positive disengaging.

The current research

The current research explores the effect of self-compassion on automatic affect-biased attention. We hypothesized that self-compassion should facilitate negative disengaging. No predictions were made for the other indices of affect-biased attention since their associations with self-compassion were very much unclear, and we examined them in an exploratory fashion. Four experimental studies were conducted. In all studies, self-compassion was induced by getting participants to write about a negative personal event in an accepting and forgiving manner, using a tested induction method (Leary et al., 2007). Participants then performed the dot-probe task and the effects on this task by the self-compassion induction were examined. Across different studies, we ruled out several competing hypotheses. In study 2, we investigated whether the effect of self-compassion first found in study 1 would be different if participants recalled a more intense negative experience, one that evoked strong feelings of shame. Studies 3 and 4 compared the effects of self-compassion to an emotion disclosure and self-esteem condition (study 3) as well as a happiness condition (study 4) respectively. Across studies, we also examined whether the effects of self-compassion would remain controlling for other variables known to also predict affect-biased attention, including depressive, anxiety, and stress symptoms.

Power considerations

A-priori power analysis (using GPower) was conducted to estimate the required sample size for the four studies. Since there are no studies to our knowledge that examine the effects of self-compassion on emotional attention, we draw reference from two sets of meta-analysis relevant to these variables. In the first meta-analysis, Zessin, Dickhauser and Garbade (2015) examined the relationship between self-compassion and well-being. As part of their analysis, they examined studies that induced self-compassionate feelings in a manner similar to our study (i.e., writing a self-compassionate letter to oneself after recalling negative personal experiences). Additionally, since these studies demonstrated that self-compassionate feelings can mitigate negative emotional

responses, this might also suggest the potential of induced self-compassion in influencing subsequent emotional attention in our study. The analysis found a large effect size ($g = 0.90$). The second meta-analysis demonstrated a significant difference between depressed and non-depressed samples in emotional attention using the dot-probe task (Peckham, McHugh, & Otto, 2010). Self-compassion has been demonstrated to be consistently, strongly, and negatively associated with depression (Raes, 2010); also, the analysis employed the same outcome measure as our study. Therefore, the findings provide some basis to suggest that self-compassion may have an influence on emotional attention in the dot-probe task. This analysis yielded a moderate effect size ($d = 0.52$). Note however the limitation that both meta-analyses provide only broad estimations because neither is directly relevant to our studies: one involved studies on self-compassion predictors but not attention bias as outcome, the other involved studies on attention bias as outcome but not self-compassion as predictors. A power analysis based on effect sizes taken from these two meta-analyses estimated that 21–60 participants per condition should be employed for studies 1, 2 and 4 (experimental; 2 conditions), while 17–49 participants per condition should be employed for study 3 (experimental; 3 conditions), assuming the standard alpha level of .05 and 80% power. We aimed for these N s to the extent that participants are available, and if the research pool offered more participants, we collected more until the pool was exhausted. In all cases, the data was analyzed only after all available participants were recruited. In sum, there is adequate power for all studies. Beside sample size, we further ensured power by using a variety of procedures that reduce noise, including multiple trials, valid and strong induction and measurement methods, clear and standardized instructions, and controlled and isolated settings (see Asendorpf et al., 2013; Ledgewood, Soderberg, & Sparks, 2017, for ways to increase power).

Study 1

Because self-compassion is most relevant in situations that elicit self-criticism (Leary et al., 2007), participants were first prompted to identify an issue that made them feel inadequate. Then, some participants were directed to write contents designed to elicit self-compassion related thoughts whereas others were asked to write neutral contents. Additionally, we measured global affect, depression, anxiety and stress. Since global affect, depressive and anxious symptoms, and stress may influence attention to specific stimuli (Becker & Leininger, 2011), we examined if self-compassion has a unique

contribution to affect-biased attention controlling for these variables.

Methods

Participants

A total of 64 undergraduates (42 females, 22 males; mean age = 20.55, $SD = 1.82$) enrolled in an introductory Psychology module from the National University of Singapore (NUS) participated for course credits. After obtaining informed consent, they were randomly assigned to either the self-compassion ($n = 31$) or control ($n = 33$) condition.

Procedure

Participants first completed questionnaires including the Positive and Negative Affect Scale (PANAS) and the Depression, Anxiety and Stress Scale (DASS). These measures served two purposes. First, it enabled us to further confirm that the experimental assignment was random. Second, given that these constructs were commonly found to bias attention on dot-probe tasks (e.g., Koster et al., 2004), it was necessary to examine whether the effect of the self-compassion manipulation would be independent of these variables. Next, they completed a practice block of the dot-probe task, followed by the self-compassion manipulation, and then the actual blocks of the dot-probe task. Manipulation of self-compassion occurred after the practice block but before the actual blocks so that undiluted effects of the induction could be captured during the actual trials.

The practice block comprised 14 neutral-neutral picture pairs. There were four actual test blocks with 24 picture pairs per block, and these picture pairs were configured as follow: neutral-neutral (32 pairs), positive-neutral (32 pairs), and negative-neutral (32 pairs). Both practice and actual trials consisted of three non-overlapping steps: (1) a 1000 ms fixation cross appearing in the center of the screen; (2) the two picture stimuli simultaneously presented on the left and right of the screen for 500 ms, the typical exposure duration found to yield reliable results (e.g., Mogg et al., 2004; Palermo & Rhodes, 2007; Staugaard, 2009); (3) a dot appearing in either the left or right picture location, which remained until the participant responds. Participants were tasked to indicate the location of the dot as quickly and as accurately as possible, by pressing 'z' or '/' if the dot appeared on the left or right respectively. During the practice block, feedback was provided, with '!' to indicate inaccurate responses, and warnings of 'please try to respond faster' and 'please wait for the pictures to appear before responding' for responses above 2000 ms and below 200 ms respectively. Instructions for the actual blocks were identical except that no feedback was provided. The

reaction time (RT) between the appearance of the dot and participants' response was recorded. The number and location of positive and negative pictures were counterbalanced across the actual blocks so as to ensure an equal number of positive, negative and neutral pictures in the left and right locations. Also, there were an equal number of positive, negative and neutral pictures replaced versus not replaced by the dot-probe.

The experimental manipulation first required participants to recall and write in detail a personal issue that made them feel inadequate or bad about themselves. They were given a few examples of such issues (namely, a failure, humiliation, rejection, physical appearance, studies, relationships, personal traits, habits). Next, they completed the PANAS for the second time, the purpose of which was to ensure that the recounting of their negative personal issue had produced the corresponding changes in mood relative to the first PANAS rating. Following that, participants assigned to the self-compassion condition were instructed to write a short essay designed to elicit self-compassion. Adapting the procedure from Leary et al. (2007), they were asked to think about an imaginary friend who was unconditionally loving and accepting, and were given the following instruction: 'Write a letter to yourself from the perspective of this imaginary friend, focusing on the perceived inadequacy that you talked about. What would this friend say to you about your "flaw" from the perspective of unlimited compassion, kindness, understanding and warmth? What would this friend write in order to remind you that you are only human, that all people have both strengths and weaknesses, and how other people also experience similar issues?' Those assigned to the control condition were asked to write about their daily routine and the things they tended to do on a typical day. Across all four studies, participants in the self-compassion and comparison conditions were given the same duration of time to write their narratives.

Participants then completed the actual blocks of the dot-probe task. Next, participants completed two measures as part of our multi-method approach for manipulation check. One measure was a self-report self-compassion item. The other measure was the PANAS, which they completed for the third time. If the self-compassion induction was effective, we should find stronger improvement in participants' mood from the second to the third PANAS rating in the self-compassion condition relative to the neutral condition. Finally, participants were probed for suspicion and debriefed.

Measures

Global positive and negative affect. In all three time-points where participants completed the 20-item PANAS, participants rated their current feelings

(Watson, Clark & Tellegan, 1988) on a 5-point scale that ranged from 1 (*very slightly or not at all*) to 5 (*extremely*). Respective items were averaged to give global positive and negative affect for each time-point. See Table 1 for the Cronbach's alphas.

Depression, anxiety and stress. Participants rated the 42-item DASS (Lovibond & Lovibond, 1995) by indicating the extent to which each item applied to them 'over the past week' on a 4-point scale ranging from 1 (*did not apply to me at all*) to 4 (*applied to me very much, or most of the time*). Example items included 'I felt I wasn't worth much as a person' (depression), 'I felt I was close to panic' (anxiety) and 'I found it difficult to relax' (stress). Past research has found strong evidence of the psychometric strengths of the DASS (Antony, Bieling, Cox, Enns & Swinson, 1998). Respective items were averaged to create scores for depression, anxiety, and stress (see Table 1 for the Cronbach's alphas).

Reported self-compassion. No validated state self-compassion scale that could serve as manipulation check exists.¹ Participants rated the extent to which they felt 'a sense of understanding and warmth towards oneself', on a 5-point scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Given that this newly constructed item was not validated, we supplemented our manipulation check by analysing the changes in current mood that should result from the manipulation, and also by conducting a content analysis of the recall narratives (to be described).

Dot-probe pictorial stimuli. Thirty-two negative (e.g., a sick man on a hospital bed), 32 positive (e.g., a laughing child), and 128 neutral (e.g., a lady using the computer) pictures were obtained from the International Affective Picture System (IAPS; Lang, Bradley & Cuthbert, 2008), which is a database of pictures with normative ratings of valence and arousal. Using the valence and arousal ratings from the IAPS manual (Lang et al., 2008), we conducted independent samples *t*-tests to ascertain that the selected positive ($M = 7.31$, $SD = .36$) and negative ($M = 2.64$, $SD = .31$) pictures were significantly different from each other on emotional valence $t(62) = 55.22$, $p < .001$, $d = 13.90$, but comparable to each other (positive: $M = 5.12$, $SD = .39$; negative: $M = 5.23$, $SD = .39$) on arousal, $t(62) = -1.21$, $p = .23$, $d = .28$. At the same time, both positive and negative pictures were significantly different from neutral pictures (valence: $M = 5.04$, $SD = .25$; arousal: $M = 3.15$, $SD = .53$) respectively on emotional valence [$t(158) = 41.77$, $p < .001$, $d = 7.32$ (positive vs neutral); $t(158) = -46.48$, $p < .001$, $d = 8.52$ (negative vs neutral)]

and arousal [$t(158) = 19.76$, $p < .001$, $d = 4.23$ (positive vs neutral); $t(158) = 20.98$, $p < .001$, $d = 4.47$ (negative vs neutral)].

Coding of narratives

We conducted a content analysis of the recall narratives that assessed activation of self-compassion concepts so as to further evaluate the effectiveness of our manipulation. We coded the narratives for attributes associated (e.g., self-kindness, mindfulness) and not associated (e.g., self-judgement, rumination) with self-compassion based on the literature. According to the self-compassion literature, feeling self-compassionate involves understanding oneself (self-kindness), recognizing that everyone has shortcomings (common humanity), acknowledging personal difficulties without getting fixated on them (mindfulness), seeking personal growth (growth), and having the freedom to make personal choices and measure one's self-worth (autonomy/internal locus of evaluation). In contrast, self-compassion is not associated with criticizing oneself (self-judgement), thinking that suffering is a solitary experience (self-isolation), ruminating/suppressing negative experiences (rumination/suppression), denying responsibility for personal wrongdoing (denial), and expressing anger at others (anger at others). If self-compassion had been primed, the self-compassion narratives should contain more self-compassion than non-self-compassion attributes. Two coders independently coded every narrative on each attribute ('1' as present, '0' as absent) after receiving training on the coding procedures (see Table 2 for the attributes and summarized coding instructions). Across all four studies, coders agreed on 97.9% (study 1), 97.7% (study 2), 96.8% (study 3) and 97.6% (study 4) of their codes for self-compassion attributes and 100% (studies 1 and 2), 95.3% (study 3) and 95.1% (study 4) for non-self-compassion attributes. Scores from both coders were averaged and are presented in Table 3. For a more parsimonious analysis, respective scores were averaged to give *self-compassion attributes* and *non-self-compassion attributes*.

Results

Manipulation checks

A series of ANOVA revealed that the self-compassion and comparison conditions did not differ on pre-manipulation global positive affect, global negative affect, as well as depressive, anxious, and stress symptoms, all $F(1, 62) < .40$, $ps > .60$, $ds < .60$ (see Table 1 for descriptive statistics). These findings revealed that there are no systematic differences between the two conditions on these variables.

Table 1. Means, SDs, F Statistics and Cronbach's alpha of depression, anxiety, stress and affect.

	Depression			Anxiety			Stress					
	M	SD	F value and sig	Alpha	M	SD	F value and sig	Alpha	M	SD	F value and sig	Alpha
					Study 1				Study 1			
Self-comp Control	5.23	14.75	F(1, 62) = .07, p = .79, d = .54	.87	5.39	12.06	F(1, 62) = .20, p = .66, d = .22	.87	-3.42	12.99	F(1, 62) = .09, p = .77, d = .19	.88
Self-comp Control	2.93	9.54	F(1, 44) = .92, p = .34, d = .85	.92	1.04	11.81	F(1, 44) = .71, p = .40, d = .40	.83	-2.94	10.83	F(1, 44) = 3.63, p = .06, d = .29	.90
Self-comp	5.51	12.04	F(2, 141) = .74, p = .48, $\eta^2 = .01$	.95	.22	20.70	F(2, 141) = .10, p = .91, $\eta^2 = .001$	.87	-2.60	18.73	F(2, 141) = 1.36, p = .26, $\eta^2 = .02$	.91
Self-est Emo dis	5.26	13.70			2.23	15.75			-1.49	18.71		
	-1.93	13.40			5.37	15.64			.71	17.17		
Self-comp Happiness	-6.19	12.44	F(1, 47) = 3.15, p = .08, d = .46	.93	-2.45	9.34	F(1, 47) = 2.50, p = .12, d = .002	.81	1.90	13.37	F(1, 47) = .72, p = .40, d = .41	.92
Positive affect												
Pre-manipulation			Pre-manipulation (after neg recall)			Post-manipulation						
M	SD	F value and sig	Alpha	M	SD	F value and sig	Alpha	M	SD	F value and sig	Alpha	
Self-comp Control	24.29	8.10	F(1, 62) = .02, p = .88, d = .04	.88	24.26	8.19	F(1, 62) = .04, p = .84, d = .05	.91	24.45	8.03	F(1, 62) = .04, p = .85, d = .05	.87
Self-comp Control	24.00	7.66			23.85	7.98			24.06	7.89		
Self-comp	26.35	9.30	F(1, 44) = 2.10, p = .16, d = .43	.90	25.96	10.31	F(1, 44) = 1.85, p = .18, d = .40	.92	26.43	7.51	F(1, 44) = 2.16, p = .15, d = .43	.80
Self-comp	22.70	7.75			22.13	8.71			22.48	10.50		
Self-comp	24.73	8.24	F(2, 141) = .31, p = .74, $\eta^2 = .004$	.86	24.60	8.70	F(2, 141) = .11, p = .90, $\eta^2 = .002$	.92	25.46	7.91	F(2, 141) = .26, p = .78, $\eta^2 = .004$	.91
Self-est Emo dis	24.17	7.26			24.08	7.49			24.38	7.43		
	25.38	7.08			25.35	7.18			24.92	6.90		
Self-comp Happiness	22.24	5.65	F(1, 46) = .18, p = .67, d = .12	.91	21.96	5.98	F(1, 46) = .19, p = .67, d = .12	.88	22.20	6.44	F(1, 46) = .97, p = .33, d = .28	.84
	23.09	8.11			22.87	8.54			24.17	7.45		
Negative affect												
Pre-manipulation			Pre-manipulation (after neg recall)			Post-manipulation						
M	SD	F value and sig	Alpha	M	SD	F value and sig	Alpha	M	SD	F value and sig	Alpha	
Self-comp Control	12.45	2.94	F(1, 62) = .34, p = .56, d = -.15	.86	13.26	4.08	F(1, 62) = .03, p = .87, d = -.04	.86	12.23	2.81	F(1, 62) = 3.30, p = .07, d = -.46	.88
Self-comp Control	12.97	4.00			13.45	5.03			13.91	4.38		
Self-comp	17.87	4.27	F(1, 44) = .96, p = .33, d = -.29	.80	19.17	5.25	F(1, 44) = .33, p = .57, d = -.09	.89	13.26	4.34	F(1, 44) = 5.35, p = .03, d = -.68	.90
Self-comp	19.43	6.35			20.26	7.37			16.57	5.30		
Self-comp	18.02	7.31	F(2, 141) = 1.18, p = .31, $\eta^2 = .02$	.85	18.50	8.35	F(2, 141) = 1.16, p = .32, $\eta^2 = .02$	.87	17.46	6.88	F(2, 141) = .12, p = .89, $\eta^2 = .002$	.87
Self-est Emo dis	16.25	5.94			16.58	6.54			16.88	6.24		
	16.29	6.01			16.52	6.66			17.38	6.22		
Self-comp Happiness	13.68	4.18	F(1, 46) = 2.12, p = .15, d = -.42	.84	13.96	4.99	F(1, 46) = 1.64, p = .21, d = -.37	.88	13.32	4.78	F(1, 46) = 2.72, p = .11, d = -.47	.80
	15.78	5.77			16.09	6.47			16.17	7.08		

Table 2. Summary of instructions to coders.

Attributes	Instruction
Self-compassion	
Self-kindness	'1 if person offers words of self- acceptance, care, understanding, forgiveness or appreciation to the self.
Sense of common humanity	'1 if person communicated a recognition of the shared human experience – that they are not alone in their struggles and that all humans are fallible/experience struggles too.
Mindfulness	'1 if person demonstrated awareness of personal struggles without obsessively fixating on negativity, nor avoiding/suppressing it.
Internal locus of evaluation/ autonomy	'1 if person mentioned about making personal choices and not measuring their self- worth according to the standards of others (i.e., comparing self with others), or approval of others, or relying on grades/performances etc. to feel better about the self.
Personal growth	'1 if person sought self-improvement, or expresses desire for better well- being or growth, or expressed what he/she has learnt through difficult experiences etc.
Non- Self-compassion	
Self-judgement	'1 if person criticized himself/herself severely or punished himself/herself for failures or weaknesses.
Self- isolation	'1 if person talked about him/her being the only one dealing with the mentioned inadequacies/sufferings, and that others are better off/do not experience these. Or, displayed a wanting to be alone and away from others.
Rumination/suppression	'1 if person talked obsessively about negative aspects about the self, or mentioned about avoiding/suppressing/ distracting/distancing the self from negativity as a way of dealing with it.
Denial/Self- indulgence	'1 if person denied responsibility for something wrong that he/she had done, or expressed a desire to continue with actions/thoughts that cause harm to self or others.
Anger at others	'1 if person displayed anger or hatred towards someone.

For each attribute, a score of '0' was assigned if the person did not demonstrate the attribute.

Table 3. Content coding of recalled narratives.

	Self-compassion attributes ¹		Non-self-compassion attributes ²	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Study 1				
Self-compassion	3.78	1.11	.03	.18
Control	0.00	0.00	0.00	0.00
Study 2				
Self-compassion	3.72	1.16	0.00	0.00
Control	0.00	0.00	0.00	0.00
Study 3				
Self-compassion	2.56	1.34	.23	.64
Self-esteem	1.08	.86	.22	.40
Emotion disclosure	.55	1.25	1.27	.97
Study 4				
Self-compassion	3.74	.97	.06	.22
Happiness	.28	.67	.09	.42

¹Self-compassionate attributes coded include self-kindness, common humanity, mindfulness, growth and self-determination.

²Non-self-compassionate attributes coded include self-judgement, self-isolation, rumination/suppression, self-indulgent and anger at others.

NB: We ran additional manipulation checks with only the contents directly related to the six dimensions of self-compassion (i.e., self-compassionate attributes: self-kindness, common humanity and mindfulness; non-self-compassionate attributes: self-judgement, self-isolation and rumination/suppression) yielding the same pattern of findings as the original content analyses. Specifically, across all studies, the self-compassion narratives scored higher on self-compassion attributes than non-self-compassion attributes, all $ps < .05$. Also, more self-compassion attributes were detected in the self-compassion condition than in the comparison conditions, all $ps < .05$.

Next, we ascertained that the recounting of participants' negative personal issues produced the corresponding changes in mood relative to the first affect rating at the start of the session. We found no significant differences in reported levels of positive affect, $F(1, 63) = .62, p = .44, d = .08$, but a significant difference in negative affect, $F(1, 63) = 11.76, p = .001, d = .38$, after the negative-self recall (but before the experimental manipulation), indicating that the negative recall

elicited increased negative affect. Additionally, the reported levels of positive affect, $F(1, 62) = .04, p = .84, d = .09$, and negative affect, $F(1, 62) = .03, p = .87, d = .04$, after the negative-self recall across the two conditions did not differ significantly from each other. This demonstrates that the negative recall elicited negative emotions consistently across both conditions.

Importantly, various findings together demonstrated that the experimental manipulation was effective. First, the single-item on self-compassion confirmed that participants from the self-compassion condition reported greater feelings of self-compassion as compared to those from the control conditions $F(1, 61) = 18.21, p < .001, d = .90$. Second, the reduction in negative affect pre- and post-manipulation (i.e., between the second and third PANAS measurement) was greater for the self-compassion compared to the control condition $F(1, 62) = 17.23, p < .001, d = 1.03$. No significant effects were found for positive affect $F(1, 61) = .001, p = .98, d = .006$. Third, content analysis of the recall narratives revealed some evidence that self-compassion concepts were more strongly activated in the self-compassion condition (Table 3). The self-compassion narratives scored higher on self-compassion attributes than non-self-compassion attributes, $F(1, 29) = 322.95, p < .001, d = 35.54$. Also, more self-compassion attributes were detected in the self-compassion condition than in the control conditions $F(1, 61) = 382.81, p < .001$. One potential limitation was that since participants from the control condition were asked to recall their daily routine, they were unlikely to think of events that would involve self-compassionate attributes. This limitation will be

addressed in subsequent studies, where the self-compassion narratives would be compared to self-esteem, self-disclosure and happiness narratives.

Preparation of dot-probe data

Across all studies, the RT data was prepared in a manner recommended and practised in the dot-probe literature (e.g., Koster et al., 2004; Salemink et al., 2007). First, trials with errors were discarded (study 1, 2, 3, and 4: 2.84%, 1.98%, 3.89%, and 2.47% of the data). Next, RTs less than 200 ms and greater than 2000 ms were excluded so as to eliminate anticipatory responses (study 1, 2, 3, and 4: 0.96%, 1.41%, 0.95%, and 1.02%) and distracted/delayed responses (study 1, 2, 3, and 4: 1.48%, 1.88%, 2.31%, and 1.67%). To reduce outliers, RTs more than three *SDs* above and below each individual mean were eliminated (study 1, 2, 3, and 4: 1.36%, 1.21%, 1.20%, and 1.45%). The raw RTs were then normalized using logarithmic transformation for subsequent analyses. In all studies, the raw scores were presented for ease of interpretability.

The positive (negative) orienting index was calculated by subtracting the mean RT for positive (negative) pictures from the mean RT (raw scores) for neutral pictures:

$$\text{Positive(negative)orientingindex} = dN, N - d\text{Pos(Neg)}, N$$

dN,N stands for dots replacing neutral pictures in the presence of other neutral pictures, and *dPos(Neg),N* for dots replacing positive (negative) pictures in the presence of neutral pictures. A positive score on the orienting index indicates faster response to dots appearing at the location of the positive (negative) picture relative to neutral picture. The higher the score, the faster one orients attention to positive (negative) pictures.

To compute the positive (negative) disengaging index, the mean RT for neutral pictures in the presence of neutral pictures was subtracted from the mean RT for neutral pictures in the presence of positive (negative) pictures:

$$\text{Positive(negative)disengagingindex} = dN, \text{Pos(Neg)} - dN, N$$

dN,Pos(Neg) represents dots replacing neutral pictures in the presence of positive (negative) pictures. A positive score indicates slower responses to neutral pictures in the presence of positive (negative) pictures relative to neutral pictures. The higher the score, the slower one disengages attention away from positive (negative) pictures.

Main analyses

The descriptive statistics for the four attentional indexes for all studies are presented in Table 4. A series of

ANOVAs revealed firstly that negative disengaging was significantly lower (i.e., faster negative disengaging) in the self-compassion condition as compared to the control condition, $F(1, 62) = 6.89, p = .01, d = .66$. Positive orienting was significantly higher (i.e., faster positive orienting) in the self-compassion condition than the control condition, $F(1, 62) = 4.61, p = .04, d = .54$. In contrast, the two conditions did not differ on positive disengaging, $F(1, 62) = .57, p = .45, d = .19$, and negative orienting, $F(1, 62) = .76, p = .39, d = .22$.

We next tested whether the differences found for negative disengaging and positive orienting would remain when controlling for global affect, depression, anxiety, and stress. With regard to global affect, we analysed only the first and second PANAS scores and not the third given that the latter was assessed after the dot-probe tasks. Across studies 1 to 4, positive and negative affect items from the first and second PANAS were respectively averaged since they were strongly correlated (all $r_s > .80, p < .001$). Two regression analyses were conducted, one on negative disengaging and the other on positive orienting as outcome. They were regressed onto condition (dummy coded), average global positive affect, average global negative affect, depression, anxiety, and stress. Condition remained predictive only of negative disengaging, $b = 7.52, SE = 3.34, \Delta F(1, 56) = 5.06, p = .03$, and not positive orienting scores, $b = -1.04, SE = 3.87, \Delta F(1, 56) = .07, p = .79$.

Study 2

Study 1 demonstrated that the induction of a self-compassionate mind-set yielded faster negative disengaging compared to a control condition when a sense of self-inadequacy was made salient, and this effect remained after controlling for variables known to predict affect-biased attention. In study 2, we sought to replicate this effect, while continuing to explore the effects on the other affect-biased attention indices, but went beyond study 1 by investigating whether the effect would be different if a more intense negative experience was made salient, specifically one that involves shame. Shame is a particularly painful self-conscious emotion. When feeling shame, individuals see themselves as damaged or flawed, and imagine others to reject or attack them (Kelly, Carter, Zuroff, & Borairi, 2013; Pinel, 1999; Tangney & Dearing, 2002). In contrast, inadequacy may or may not involve such a strong sense of condemnation by others. We expected self-compassion to be effective also at reducing the detrimental effects of shame. The self-critical nature of shame is inconsistent with self-kindness and the recognition that everyone shares similar

Table 4. Means and standard deviations of reaction time variables.

	Positive- Neutral				Negative- Neutral				Neutral- Neutral	
	Positive		Neutral		Negative		Neutral		Neutral	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Study 1										
Self-comp	366.38	31.53	368.19	32.51	366.22	27.18	364.59	31.96	371.61	28.06
Control	379.72	31.89	376.78	34.83	375.03	30.27	378.95	34.08	377.87	33.96
Study 2										
Self-comp	365.71	23.29	365.71	28.15	367.61	32.51	358.30	28.06	368.65	29.06
Control	367.99	23.25	362.50	29.93	366.05	30.02	365.65	24.54	362.14	24.57
Study 3										
Self-comp	363.44	35.05	366.35	42.35	368.73	46.43	362.14	38.89	368.96	34.05
Self-est	369.58	36.92	373.35	48.16	372.61	43.68	375.75	36.60	374.84	38.96
Emo dis	371.07	46.46	369.85	43.65	363.77	44.90	378.26	43.79	369.14	45.66
Study 4										
Self-comp	370.16	38.22	365.88	37.84	366.42	36.71	360.56	31.94	363.97	34.79
Happiness	371.66	40.01	368.48	38.47	374.62	34.55	377.00	36.65	372.15	34.71

	Positive Orient		Negative Orient		Positive Disengage		Negative Disengage	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
	Study 1							
Self-comp	5.23	14.75	5.39	12.06	-3.42	12.99	-7.03	12.27
Control	-2.06	12.36	2.83	11.47	-1.08	11.83	1.08	12.43
Study 2								
Self-comp	2.93	9.54	1.04	11.81	-2.94	10.83	-10.65	12.16
Control	-5.85	11.00	-3.91	13.03	.36	12.24	3.51	11.57
Study 3								
Self-comp	5.51	12.04	.22	20.70	-2.60	18.73	-6.81	15.47
Self-est	5.26	13.70	2.23	15.75	-1.49	18.71	.91	15.46
Emo dis	-1.93	13.40	5.37	15.64	.71	17.17	9.12	16.29
Study 4								
Self-comp	-6.19	12.44	-2.45	9.34	1.90	13.37	-3.42	14.70
Happiness	.49	16.59	-2.47	12.23	-3.68	14.11	4.85	13.82

Values reported are in milliseconds.

Positive (Negative)- Neutral:

Positive (negative) – reaction time to dot replacing positive (negative) picture;

Neutral – reaction time to dot replacing neutral picture in the presence of positive (negative) picture.

Neutral- Neutral: Neutral – reaction time to dot replacing neutral picture, in the presence of another neutral picture.

Values reported are in milliseconds.

Positive (Negative) Orient: The higher the score, the faster one orients one's attention to positive (negative) stimuli.

Positive (Negative) Disengage: The higher the score, the slower one disengages one's attention away from positive (negative) stimuli.

experiences, both of which are characteristic of self-compassion (Neff, 2003b). Indeed, self-compassion has been demonstrated to be negatively associated with trait shame (Reilly, Rochlen, & Awad, 2013). In study 2, we asked participants to first describe a shame experience and then, as in study 1, prompted them to write a self-compassionate letter or a neutral passage. We predicted that self-compassion would still lead to faster negative disengaging.

Methods

Participants

Forty-seven NUS undergraduates participated for a small monetary compensation. These participants (27 females, 20 males; mean age = 22.48, *SD* = 1.92) were randomly assigned to either the self-compassion (*n* = 24) or control (*n* = 23) condition.

Procedure and materials

As with study 1, participants first completed the PANAS and DASS, followed by a practice session of the dot-probe task. Next, they recalled and described in detail 'one of the most upsetting experiences of your life, in which you felt ashamed of yourself or that you blame yourself for'. They then completed the PANAS the second time. Next, participants from the self-compassion and control condition wrote a self-compassionate letter and about their daily routine, respectively, as described in study 1. All participants then went through the actual session of the dot-probe task. Before debrief, they completed the PANAS and rated the same state self-compassion item.

Results

Manipulation checks

Across all pre-manipulation measures (i.e., global positive affect, global negative affect, depression, anxiety,

and stress symptoms), no significant differences between the self-compassion and control conditions were found: all $F(1, 44) < 3.70$, $ps > .05$, $ds < .85$ (see Table 1). We found a significant difference in reported positive affect, $F(1, 45) = 5.41$, $p = .03$, $d = .37$, and negative affect $F(1, 45) = 20.46$, $p < .001$, $d = .83$ before and after the negative recall, confirming that there was an increase in global negative affect and decrease in global positive affect after the recall of shame. Additionally, the reported levels of positive affect, $F(1, 44) = 1.85$, $p = .18$, $d = .40$ and negative affect, $F(1, 44) = .33$, $p = .57$, $d = .17$, after the negative-self recall (but before the experimental manipulation) between the two conditions did not differ from each other.

Importantly, in order to demonstrate that the shame recall elicited stronger shame and overall affective distress than the inadequacy recall in study 1, we compared the levels of shame (one of the negative affect items in PANAS) and global negative affect (excluding the shame item) measured after the respective recalls between studies 1 and 2. The shame recall indeed elicited more feelings of shame $F(1, 108) = 37.38$, $p < .001$, $d = .71$ and greater negative feelings in general $F(1, 109) = 11.70$, $p = .001$, $d = 1.17$ compared to the inadequacy recall. There were however no significant differences in global positive affect $F(1, 108) < .001$, $p = .99$, $d < .001$.

Self-compassion. We next tested whether the self-compassion condition exhibited greater activation of self-compassion than the control condition using the same three approaches in study 1. First, feelings of self-compassion experienced by participants from the self-compassion condition were reported to be greater than those from the control condition $F(1, 44) = 15.08$, $p < .001$, $d = 1.15$. Second, levels of negative affect post-manipulation was significantly lower in the self-compassion compared to control condition $F(1, 44) = 5.35$, $p = .03$, $d = .68$. No significant effects were found for positive affect $F(2, 44) = 2.16$, $p = .15$, $d = .43$. Third, self-compassion concepts were found to be more strongly activated in the self-compassion condition based on content analysis of the recall narratives (Table 2). The self-compassion narratives scored higher on self-compassion attributes than non-self-compassion attributes, $F(1, 22) = 237.73$, $p < .001$. Also, more self-compassion attributes were detected in the self-compassion condition than in the control condition $F(1, 44) = 15.08$, $p < .001$, $d = 1.15$ (see Table 3). In sum, the evidence suggests that the participants in the self-compassion condition generated thoughts that were consistent with known attributes of self-compassion, and less so for participants in the control condition.

Main analyses

Replicating study 1, negative disengaging was significantly lower in the self-compassion condition than the control condition, $F(1, 45) = 5.99$, $p < .001$, $d = 1.19$ (see Table 4 for means). Positive orienting was also higher in the self-compassion condition than the control condition, $F(1, 45) = 8.57$, $p < .001$, $d = .85$. There was no significant difference between conditions in positive disengaging, $F(1, 45) = .96$, $p = .33$, $d = .29$, and negative orienting scores, $F(1, 47) = 1.86$, $p = .18$, $d = .40$. Repeating the same regression analyses in study 1, we found that condition remained predictive of both negative disengaging, $b = 13.85$, $SE = 4.08$, $\Delta F(1, 38) = 11.51$, $p = .002$, and positive orienting, $b = -6.94$, $SE = 3.16$, $\Delta F(1, 38) = 4.83$, $p = .03$, over and above global affect, depression, anxiety and stress.

Study 3

Studies 1 and 2 consistently demonstrated that the induction of a self-compassionate mind-set yielded faster negative disengaging compared to a control condition. On the other hand, the effects on the other attention outcomes were either not consistent (positive orienting) or consistently non-existent (positive disengaging and negative orienting). Study 3 extended the findings in two ways. First, the differential effects between the self-compassion and control groups on negative disengaging could be attributed to the expression of emotions through writing. Indeed, emotion disclosure has been demonstrated to alleviate negative emotions (Kahn, Achter, & Shambaugh, 2001; Saxena & Mehrotra, 2010). Hence, it is important to establish that the effect of self-compassion on negative disengaging is not solely attributed to the catharsis behind emotional disclosure.

Second, it is also plausible that this effect of self-compassion is due to an increase in self-esteem that results from writing the self-compassionate letter. Some studies have found moderate correlations between self-compassion and self-esteem (Neff, 2003a; Leary et al., 2007; Neff et al., 2007), suggesting that the effect found here of self-compassion could be confounded by self-esteem. However, studies have also found that self-compassion induction, compared to a self-esteem induction, led to lower negative emotional responses when negative aspects of oneself were made salient (Leary et al., 2007). Given the overlap between self-compassion and self-esteem, it was important to test for differential effects between these constructs on affect-biased attention.

Study 3 addressed these issues by randomly assigning participants to three conditions – self-compassion,

emotion disclosure, and self-esteem.² If the self-compassion condition yielded a different effect on negative disengaging from the other two conditions, it could be concluded that self-compassion produces an effect that is unique from emotion disclosure or self-esteem. The other three attention bias outcomes were also included for exploratory purposes.

Methods

Participants

A total of 144 undergraduates from NUS participated in the study for partial fulfilment of their course requirement. These participants (101 females, 43 males; mean age = 20.00, $SD = 1.28$) were randomly assigned to either the self-compassion ($n = 48$), self-esteem ($n = 48$), or emotion disclosure ($n = 48$) condition.

Procedures and materials

As with study 1, participants first completed a series of questionnaires that included the PANAS and DASS, followed by a practice session of the dot-probe task. Next, they recalled a negative personal experience as described in study 1, and then completed the PANAS the second time. Participants then completed a short essay designed to elicit self-compassion, self-esteem or emotion disclosure, depending on which condition they were randomly assigned to. In the self-compassion condition, participants were asked to write a self-compassionate letter to oneself (Leary et al., 2007). In the self-esteem condition, participants were asked to 'write down your positive characteristics to affirm yourself that you are competent despite your inadequacies. Elaborate on how this "flaw" is not your fault, and interpret this "flaw" in a way that will make you feel better about yourself.' Participants from the emotion disclosure condition were asked to describe their current thoughts and emotions. The self-esteem and emotion disclosure inductions are also adapted from that designed by Leary et al. (2007). Next, all participants went through the actual session of the dot-probe task. Before debrief, they completed the PANAS the third time and the same state self-compassion item. They also completed the 20-item State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991) ($\alpha = .78$) for manipulation check purposes, a 5-point scale from 1 (*not at all*) to 5 (*extremely*).

Results

Manipulation checks

There were no differences between the three conditions on pre-manipulation global positive affect, global negative affect, depression, anxiety, and stress symptoms, all $F(2, 141) < 1.40$, $ps > .30$ (see Table 1). We found no

significant decrease in global positive affect $F(1, 143) = 1.05$, $p = .31$, but a significant increase in negative affect $F(1, 143) = 7.38$, $p = .007$ after the negative-self recall (but before the experimental manipulation). Additionally, global positive affect, $F(2, 141) = .11$, $p = .90$ and negative affect, $F(2, 141) = 1.16$, $p = .32$, after the negative-self recall (but before the experimental manipulation) between the three conditions did not differ significantly from each other, confirming that the negative recall elicited negative emotions consistently across all conditions.

Self-compassion. First, the single-item measure of self-compassion confirmed that participants from different conditions experienced different extent of self-compassionate feelings $F(2, 141) = 32.19$, $p < .001$, $\eta^2 = .46$. Specifically, participants from the self-compassion condition experienced greater feelings of self-compassion as compared to those from the self-esteem ($p = .002$, 95% CI [.18, .91]) and emotional disclosure ($p < .001$, 95% CI [.87, 1.59]) conditions. Second, the reduction in negative affect pre- and post-manipulation (i.e., between the second and third PANAS measurement) was significantly different between conditions $F(2, 141) = 8.40$, $p < .001$. Specifically, post-hoc analysis showed self-compassion to elicit a greater decrease in negative affect compared to the self-esteem ($p = .02$, 95% CI [-2.46, -.21]) and emotion disclosure ($p < .001$, 95% CI [-3.02, -.77]) conditions. No significant effects were found for positive affect $F(2, 141) = 2.33$, $p = .10$. Third, content analysis showed that self-compassion concepts were more strongly activated in the self-compassion condition (Table 3). The self-compassion narratives scored higher on self-compassion attributes than non-self-compassion attributes, $F(1, 41) = 74.21$, $p < .001$, $d = 1.36$. Also, there was a significant interaction effect between condition (self-compassion vs self-esteem vs control) and attribute (self-compassion vs non-self-compassion), $F(2, 128) = 38.14$, $p < .001$, $\eta^2 = .60$. Post hoc tests using Tukey HSD³ revealed that more self-compassion attributes were detected in the self-compassion condition than in the self-esteem ($p < .001$, 95% CI [.90, 2.07]) and emotional disclosure ($p < .001$, 95% CI [1.42, 2.61]) conditions (see Table 3). At the same time, fewer non-self-compassion attributes were detected in the self-compassion condition than in the emotion disclosure condition ($p < .001$, 95% CI [-1.40, -.68]), but the number of non-self-compassion attributes did not differ between the self-compassion and the self-esteem condition ($p = 1.00$, 95% CI [-.35, .36]).

Self-esteem. Different conditions experienced different extent of state self-esteem, $F(2, 141) = 35.40$, $p < .001$, $\eta^2 = .33$. Reported levels of state self-esteem was higher in the self-esteem condition relative to the emotional

disclosure condition ($p < .001$, 95% CI [9.42, 17.50]). The self-esteem condition also yielded a higher state self-esteem score compared to the self-compassion condition ($p = .34$, 95% CI [-6.46, 1.62]), though this did not reach statistical significance. This is not surprising, as research has demonstrated that self-compassionate individuals are more likely to feel self-validated as well (Neff, 2003a).

Emotional orienting and disengaging

Negative disengaging differed significantly across the three conditions, $F(2, 141) = 12.30$, $p < .001$, $\eta^2 = .15$ (see Table 4 for means). Post-hoc comparisons showed that participants in the self-compassion ($p < .001$, 95% CI [-23.55, -8.32]) and self-esteem ($p = .03$, 95% CI [-15.82, -6.60]) conditions had significantly lower negative disengaging scores compared to those in the emotional disclosure condition. Importantly, the self-compassion condition produced a significantly lower level of (i.e., faster) negative disengaging than the self-esteem condition ($p = .046$, 95% CI [-15.34, -11.1]). Additionally, significant between-condition differences were observed for positive orienting, $F(2, 141) = 5.02$, $p = .01$, $\eta^2 = .07$. Specifically, positive orienting was higher in the self-compassion ($p = .02$, 95% CI [1.13, 13.76]) and self-esteem ($p = .02$, 95% CI [.87, 13.51]) conditions than the emotional disclosure condition. However, the self-compassion and self-esteem conditions did not differ significantly from each other in positive orienting ($p = .995$, 95% CI [-6.07, 6.57]). Finally, the three conditions did not differ on positive disengaging, $F(2, 141) = .412$, $p = .66$, $\eta^2 = .006$ and negative orienting, $F(2, 141) = 1.05$, $p = .35$, $\eta^2 = .01$.

In order to examine whether condition remained predictive of negative disengaging and positive orienting, controlling for levels of global positive and negative affect, depression, anxiety and stress, the same regression analyses in study 1 was conducted. The self-compassion, self-esteem and emotional disclosure conditions were dummy-coded 1, 1, -2 (for the positive orienting analysis) and -2, 1, 1 (for the negative disengaging analysis) respectively. Conditions remained predictive of both negative disengaging, $b = -3.93$, $SE = .99$, $\Delta F(1, 135) = 15.77$, $p < .001$, and positive orienting, $b = 2.46$, $SE = .81$, $\Delta F(1, 135) = 9.15$, $p = .003$ over and above the afore-mentioned covariates.

Study 4

The final study was aimed at ruling out the effects of positive mood in an experimental manner. Happy moods may influence attentional bias. Since self-compassion has been found to be associated with happiness and positive moods (Shapira & Mongrain, 2010), it is important to examine whether self-compassion affects

negative disengaging differently from happy feelings. While studies 1 to 3 demonstrated that the effects of self-compassion on negative disengaging remained after controlling for global positive affect, an experimental demonstration where global happy feelings are also induced would more clearly test this objective.

Methods

Participants

A total of 49 undergraduates from NUS participated for course credits. Participants (30 females, 19 males; mean age = 20.82, $SD = 1.34$) were randomly assigned to either the self-compassion ($n = 25$), or happiness ($n = 24$) condition.

Procedures and materials

As with study 1, participants first completed the PANAS and DASS, followed by a practice session of the dot-probe task. Next, they recalled a negative personal experience, and completed the PANAS the second time. Participants from the self-compassion condition wrote a self-compassionate letter to themselves. On the other hand, participants from the happiness condition were asked to recall and describe in detail '*an experience that made you very happy*'. All participants then went through the actual session of the dot-probe task. Before debrief, they completed the PANAS, state self-compassion item, and rated the extent to which they '*feel happy*' on a 5-point Likert scale from 1 (*not at all*) to 5 (*extremely*).

Results

Manipulation check

There were no differences between the self-compassion and happiness conditions on pre-manipulation global positive affect, global negative affect, depression, anxiety, and stress symptoms, all $F(1, 46) < 3.20$, $ps > .05$, $ds < .50$ (Table 1). We found no significant difference in global positive affect $F(1, 47) = 2.47$, $p = .12$, $d = .25$, but a significant difference in global negative affect $F(1, 47) = 4.81$, $p = .03$, $d = .49$ before and after the negative recall, confirming that there was an increase in negative feelings after the negative recall. Additionally, positive affect, $F(1, 46) = .19$, $p = .67$, $d = .12$ and negative affect, $F(1, 46) = 1.64$, $p = .21$, $d = .37$ after the negative-self recall (but before the experimental manipulation) between the two conditions do not differ significantly from each other.

Self-compassion. Participants from the self-compassion condition reported greater feelings of self-compassion as compared to those from the happiness condition $F(1,$

46) = 8.68, $p = .01$, $d = .86$. Second, participants from the self-compassion condition reported a greater reduction in negative affect pre- and post-manipulation compared to those from the control condition $F(1, 46) = 3.05$, $p = .09$, $d = .50$ albeit at marginal significance. The increase in positive affect pre- and post-manipulation was marginally greater for the happiness than self-compassion condition $F(1, 46) = 3.23$, $p = .08$, $d = .51$. Third, the self-compassion recall narratives scored higher on self-compassion attributes than non-self-compassion attributes, $F(1, 24) = 296.12$, $p < .001$, $d = 2.03$. Also, more self-compassion attributes were detected in the self-compassion condition than in the happiness condition $F(1, 46) = 202.84$, $p < .001$, $d = 4.21$ (Table 3).

Happiness. Participants' self-reported feelings of happiness did not differ significantly between the happiness ($M = 3.44$, $SD = .77$) and self-compassion ($M = 3.52$, $SD = .73$; $F(1, 46) = .14$, $p = .71$, $d = .11$) conditions. This is consistent with research findings that self-compassionate individuals are likely to be happy as well (Shapira & Mongrain, 2010).

Emotional orienting and disengaging

Negative disengaging was significantly lower in the self-compassion condition than the happiness condition, $F(1, 47) = 4.10$, $p = .049$, $d = .58$ (see Table 4). However, there were no significant differences between the two conditions on positive orienting, $F(1, 47) = 2.56$, $p = .12$, $d = .46$, positive disengaging, $F(1, 47) = 2.02$, $p = .16$, $d = .41$, and negative orienting, $F(1, 47) = .00$, $p = .99$, $d = .002$. Finally, the differences between the two conditions on negative disengaging remained after controlling for global positive and negative affect, depression, anxiety and stress, $b = -10.27$, $SE = 5.05$, $\Delta F(1, 39) = 4.14$, $p = .049$.

General discussion

Through a series of four studies, we examined the effects of induced self-compassion on affect-biased attention after negative aspects of oneself are made salient. We hypothesized that self-compassion should facilitate negative disengaging, while no predictions were made for the other indices of affect-biased attention. Supporting predictions, manipulated self-compassion was found to have a consistent and unique effect on negative disengaging across all studies. On the other hand, no consistent and significant effects were found for the rest of the affect-biased attention indices. The results show that inducing a self-compassionate mindset enables one to disengage from negative stimuli more easily relative to all the comparison conditions. This ease of disengaging from negative stimuli may possibly be an

important process underlying the faster recovery from negative emotions demonstrated by past research. Arch and colleagues (2014) demonstrated that individuals who were administered a brief training in self-compassion experienced higher levels of heart-rate variability (associated with the ability to self-soothe) during the recovery phase after a stressful situation relative to the control groups. This ability to recover relatively quickly from negative emotions is indicative of a greater ease in decoupling from negative thoughts and emotions associated with the difficult event.

Importantly, our studies rule out alternative explanations that the effect of self-compassion on faster negative disengaging could also be attributed to the feelings of self-esteem, happiness, and sense of catharsis arising from writing the self-compassionate letter. When comparing the effects of induced self-compassion to state self-esteem, happiness, and emotion disclosure conditions, self-compassion was found to facilitate a greater ease in negative disengaging compared to all comparison conditions. First, the self-esteem condition may have prompted participants to engage in self-serving biases (i.e., by reinforcing their own positive attributes while attributing blame to other people or situations), while the self-compassion condition prompted participants to acknowledge their inadequacies. Studies concur that self-compassion may encourage reduced defensiveness to self-evaluative threat as compared to self-esteem (Arimitsu & Hofmann, 2015). Indeed, inducing state self-compassion is found to be more effective in mitigating negative emotions compared to state self-esteem, when negative aspects of oneself are made salient (Neff et al., 2007; Reis et al., 2015). Second, according to McGuirk, Kuppens, Kingston, and Bastian (2018), it is possible for the promotion of happiness to lead individuals to feel threatened by their existing negative emotional states. In other words, participants in our happiness condition may attempt to seek positive emotions without addressing the unresolved feelings of inadequacies from the negative recall. This discrepancy between how they think they should feel and how they actually feel may compel them to repetitively fixate on their distress (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). On the other hand, the self-compassion induction promotes an acceptance of negative feelings, and hence may reduce the compulsion to ruminate (Odou & Brinker, 2014). Third, consistent with our findings, studies demonstrate that inducing self-compassion via writing is more beneficial in reducing negative feelings compared to written emotion disclosure (Leary et al., 2007; Reis et al., 2015). Indeed, emotion disclosure promotes a sense of catharsis through the expression of one's thoughts and feelings (Sloan & Marx, 2006), but

do not seek to frame these thoughts and feelings in a manner that conveys unconditional understanding to oneself, nor to reframe the negative event in the context of common humanity.

Taken together, our findings demonstrate that the greater ease of negative disengaging elicited by the self-compassion induction can be mainly attributed to self-compassion, instead of enhanced feelings of self-esteem, happiness and catharsis that may arise from the induction.

Implications

Cognitive-emotional patterns. Empirical studies in self-compassion research have tended to focus primarily on downstream emotional processes, such as overt emotion regulation and emotional responses to negative events. Researchers have not explored the more basic, and possibly more fundamental cognitive mechanisms underlying these processes. Examining basic cognitive-emotional processes such as emotional attention is important, since it is involved in everyday situations, and regulates the rest of the processes from perception to learning to memory (Estes, 2014). Our study responds to this theoretical gap by affording a better understanding of the cognitive-emotional patterns underlying self-compassion. Based on our findings, self-compassion possibly facilitates the cognitive flexibility to disengage away from negative thoughts or events.

Relations to psychopathology. The strong and consistent finding that self-compassion facilitates faster negative disengaging also sheds light on the common mechanisms underlying psychopathology and deficient self-compassion. A substantial amount of empirical research has established the strong association between self-compassion and depression, anxiety and stress (see MacBeth & Gumley, 2012 for a meta-analysis). For instance, Raes (2010) found that the association between self-compassion and depression is mediated by rumination. Since rumination may be indicative of difficulties decoupling from negativity, it is plausible that negative disengaging may be a possible mediator underlying the relationship between self-compassion and psychopathology. Future studies may examine this.

Emotion regulation among the non-psychiatric population. Additionally, our findings suggest that self-compassion may be an effective emotion regulation strategy (Finlay-Jones, Rees, & Kane, 2015) that attenuates feelings of self-inadequacy and shame. Additionally, writing a self-compassionate letter is sufficient to temporarily reduce negative emotions – regular writing exercises may have longer term benefits on the well-

being of both the normal (Mosewich, Kowalski, Sabiston, Sedgwick, & Tracy, 2011) and psychiatric (Shapira & Mongrain, 2010) population. Future research may compare the differential effects between self-compassion and other emotion regulatory strategies such as reappraisal, in influencing affect-biased attention.

Attention training. Importantly, it may be promising to promote emotional well-being by helping individuals deficient in self-compassion learn to disengage from negative stimuli with greater ease. One example of such attention training utilizes the dot-probe task – during the training, one's attention is drawn away from the negative stimuli and redirected toward the adjacent neutral stimuli by having the probe appear consistently behind the location of the neutral stimuli. Empirical studies demonstrated that eight sessions of attention training (15–20 minutes each) resulted in an attenuated attention bias to negative stimuli and reduced anxiety symptoms compared to a control group (Amir, Beard, Burns, & Bomyea, 2009; Schmidt, Richey, Buckner, & Timpano, 2009). Attention training is valuable since affect-biased attention requires less cognitive effort to enact than other regulatory strategies, and is especially useful when rapid responses are required (Wadlinger & Isaacowitz, 2011). Hence, there is potential in coupling clinical treatments with attention training for individuals with low self-compassion. When these individuals learn to automatically disengage from negative stimuli, this enhanced attentional flexibility may facilitate them to decouple from self-critical thoughts and events more easily.

Limitations

First, the exclusive use of undergraduates in the current study is a drawback due to the limited ability to generalize the findings to the general population. Specifically, it is possible for the impact of self-compassion to change with age (Neff & Pommier, 2012). Future research may be conducted on samples of varying ages. Since there may exist cultural differences with how people respond to emotional stimuli, the arousal and valence ratings of pictures taken from the IAPS manual (Lang et al., 2008) may not necessarily apply to our predominantly Singaporean sample.

There are also areas of improvement pertaining to the manipulation. Feelings of inadequacies were elicited via recall in our study, which most likely has a lesser impact compared to real-world circumstances. Future studies may administer a more realistic negative experience by for instance, introducing an actual social evaluative threat to trigger greater emotional reactions. Additionally, the self-compassion manipulation required participants to respond

to three prompts in a single entry, raising the possibility that participants may not expound on all prompts sufficiently. Future iterations may require participants to respond to each prompt one at a time, along with a minimum word count requirement, to ensure that each component of self-compassion is adequately tapped on.

Finally, by comparing a self-compassion condition with neutral control, self-esteem, emotion disclosure, and happiness conditions, our study demonstrated that self-compassion facilitates negative disengaging. At the same time, it is also plausible that it is a non-self-compassionate mindset that increases engagement and rumination toward negative stimuli. Future studies can compare a self-compassion with a self-critical condition to elucidate this.

Conclusion

Despite the limitations, the current research is one of the first to examine affect-biased attention in self-compassion. Findings across all four studies concur that the attentional process most crucial to self-compassion is the ease of disengaging away from negative stimuli. Importantly, negative disengaging may be one of the processes underlying the efficacy of self-compassion over self-esteem, happiness and emotion disclosure interventions in contributing to positive emotional outcomes. In conclusion, these findings are theoretically important as it highlights the more antecedental cognitive-emotional and regulatory processes underlying self-compassion. At the same time, these findings may better inform clinical interventions directed at enhancing self-compassion and mitigating negative emotional experiences.

Notes

1. The state self-compassion scale used in Breines and Chen's (2012) paper was not employed in our study since to our knowledge, it has yet to be validated.
2. Since studies 1 and 2 have ascertained the differential effects of self-compassion compared to a neutral condition, we did not include a neutral condition in our experimental design of studies 3 and 4.
3. All post-hoc tests in this study were conducted using Tukey HSD. We did not use Bonferroni correction as it is unnecessarily conservative and often fail to detect real differences (Lee & Lee, 2018). Nonetheless, when conducted with Bonferroni correction, findings remain significant (except for the comparison between self-esteem and self-compassion in negative disengaging, which remains marginally significant; $p = .053$).

Disclosure statement

No potential conflict of interest was reported by the authors.

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