

EMOTION REGULATION AND VICARIOUS RESPONSES

The role of cognitive emotion regulation on the vicarious emotional response

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Abstract

Perceiving another in need may provoke two possible emotional responses: empathic concern and personal distress. This research aims to test whether different emotion regulation strategies (i.e., reappraisal and rumination) may lead to different vicarious emotional responses (i.e., empathic concern and personal distress). In this sense, we hypothesized that reappraisal may lead to a greater feeling of empathic concern, whereas rumination may lead to a higher feeling of personal distress. To test the hypotheses we used experimental instructions (Study 1) and a priming procedure (Study 2) to manipulate the emotion regulation strategies. The results supported our hypotheses. Furthermore in the rumination condition the emotional experience was described as being more negative and more highly arousing than in the reappraisal condition. We discuss the effect of these two forms of cognitive emotion regulation on empathic concern and personal distress.

Keywords: emotion regulation; rumination; reappraisal; empathic concern; personal distress.

The role of cognitive emotion regulation on the vicarious emotional response

When perceiving another in need a person may experience different emotional responses towards the victim/s. Two of the most common emotional reactions are empathic concern and personal distress (see Batson, 2011). These two emotional reactions differ in their focus (i.e., other-oriented and self-oriented, respectively) and may lead to different motivations to help (i.e., altruism and egoism, respectively) (see Batson, 2011; Davis, 1994). Apart from these dissimilarities, empathic concern and personal distress may have different correlates on behavior as well. Empirical studies have shown relationships between personal distress and a host of social and psychological difficulties, including deficits in self-regulation (Eisenberg et al., 1996; Guthrie et al., 1997; Valiente et al., 2004), low emotional regulation and greater negative affect (Eisenberg & Okum, 1996). Conversely, empathic concern has more positive effects as it is related to moral reasoning (Hoffman, 2001), prosocial behavior (Eisenberg & Miller, 1987) and a more adaptive form of emotion regulation (Eisenberg & Fabes, 1992).

A variety of personal, social, and contextual/situational factors may influence the likelihood of an observer experiencing personal distress rather than empathic concern when witnessing another in need. These include the degree to which the observer identifies with the suffering person, the meaning assigned to the vicarious distress or the attribution of responsibility for the pain (Batson, 2011; Decety, 2011; Decety & Lamm, 2009). Eisenberg and Eggum (2009) suggest that some important predictors of personal distress are high affective arousal and weak emotional regulation. Thus, when facing someone in distress without adequate regulation of the vicarious emotional response the observer is likely to become over-aroused and experience personal distress (Eisenberg & Eggum, 2009). Feeling personal distress may lead the

1 observer to turn away or escape the situation when it is easy to do so and hence, not
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3 help the needy other (Batson, 2011). Thus, people who do have effective strategies for
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5 modulating their vicarious emotional experience of another's distress may be able to
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7 stay empathically engaged without experiencing personal distress and the consequences
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9 of it (Decety & Lamm, 2009; Eisenberg & Eggum, 2009).
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13 **Cognitive emotion regulation: reappraisal and rumination**

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16 The different processes a person may use to change or modify their emotional
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18 experience and the expression of it are labelled as *emotion regulation* (see Gross, 2007).
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20 These processes to alter the emotional experience can be either explicit, (i.e., implying a
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22 conscious effort to alter the emotional response) or implicit (i.e., involving an automatic
23
24 form of regulation) (for a review see Gyurak, Gross & Elkin, 2011). Both, implicit and
25
26 explicit emotion regulation may lead to different emotion responses depending on the
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28 strategy or action used by a person in order to change their own mood. These strategies
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30 may be attentional (e.g., focusing on a certain aspect of a situation), cognitive (e.g.,
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32 appraising the situation from another perspective) or behavioural (e.g., avoiding the
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34 situation) (Gross, 2007).
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40 Most literature has focused on comparing reappraisal (adaptive) and expressive
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42 suppression (maladaptive), as both strategies have an effect on the physiological
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44 experience (Gross, 1998, 1999; Koval, Butler, Hollenstein, Lanteige & Kuppens, 2014;
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46 Memedovic, Grisham, Denson & Moulds, 2010). It is important to note that these two
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48 emotion regulation strategies differ from each other, as reappraisal targets emotion
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50 regulation through a change in the cognitive response, whereas suppression targets
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52 emotion regulation through changes in the expressive response. Although previous
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54 research has highlighted the adaptive value of reappraisal against the maladaptive value
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1 of suppression, very little research has compared reappraisal against other maladaptive
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4 *cognitive* strategies (Cohen, Daches, More & Henik, 2014; Garnefski & Kraaij, 2007).
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6 *Rumination* is one of the most studied forms of maladaptive cognitive emotion
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8 regulation, and it is defined as the tendency to repetitively focus on the experience of
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10 negative emotion and its causes and consequences (Nolen-Hoeksema, Wisco &
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12 Lyubomirsky, 2008; Trapnell & Campbell, 1999; Watkins, 2008). Although individuals
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14 report that they engage in rumination to understand the sources of their distress
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16 (Papageorgiou & Wells, 2003), experimental studies have shown that rumination
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18 increases negative mood-congruent thinking and drives away social support (for a
19
20 review see Lyubomirsky & Tkach, 2004). Moreover, rumination prospectively predicts
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22 symptoms and diagnoses of anxiety and depression (see Nolen-Hoeksema et al., 2008).
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24 Conversely, *Reappraisal* involves reframing emotional events so as to decrease their
25
26 emotional impact (Gross, 1998b). Thus, through reappraisal an individual may decrease
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28 their own emotion experience in a negative emotion eliciting contexts, and does so
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30 without appreciable physiological costs (see Gross, 2001). Together, experimental and
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32 correlational studies suggest that reappraisal is associated with experiencing less
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34 negative emotions and experiencing greater positive emotions, without maladaptive
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36 physiological responds (see Gross and John, 2003).
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45 Cohen et al. (2014) have shown the close link between reappraisal and
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47 rumination through the processing of negative content. The ability to inhibit such
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49 negative content makes a difference between both strategies of cognitive emotion
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51 regulation, as reappraisal is linked to the ability to inhibit negative emotional content,
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53 whereas rumination is related to impairment of that inhibition.
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57 **Emotion regulation of vicarious emotional responses**

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1 Eisenberg and collaborators have largely investigated how emotion regulation is
2 associated with vicarious emotional responses (e.g., Eisenberg, Shea, Carlo, & Knight,
3 1991). To assess emotion regulation, Eisenberg and colleagues use an index of *effortful*
4 *control*, which is defined as “the efficiency of executive attention, including the ability
5 to inhibit a dominant response and/or to activate a subdominant response, to plan, and to
6 detect errors” (see Rothbart & Bates, 2006, p. 129). Thus, this index involves the ability
7 to shift the attention, emotional and behavioural inhibition, to modulate emotion and
8 behaviour if necessary. A higher score on this index represents greater emotion
9 regulation. Through physiological measures (e.g., Fabes, Eisenberg & Eisenbud, 1993),
10 self-reports (e.g., Eisenberg et al., 1996; Eisenberg & Okun, 1996; Murphy, Shepard,
11 Eisenberg, Fabes & Guthrie, 1999; Okun, Shepard & Eisenberg, 2000) and situational-
12 behavioural measures (e.g., Eisenberg, Michalik, Spinrad, Kupfer, Valiente, Hofer, et
13 al., 2007) Eisenberg and collaborators showed that empathic concern is linked to a
14 higher control of emotional responses, whereas personal distress is related to low
15 control. However, higher control is not always equivalent to adaptive emotion
16 regulation, as the index they use to assess emotion regulation encompasses strategies
17 that have been considered as more adaptive (i.e., attention shift, distracting) and less
18 adaptive (i.e., emotional suppression) at the same time. Hence, more research is needed
19 to disambiguate the relationship between empathic concern and personal distress with
20 adaptive and maladaptive forms of emotion regulation. Furthermore, this line of
21 research did not test the effect of cognitive strategies on the vicarious response when
22 facing someone in distress but the effect of suppression or inhibition, which is a
23 completely different type of emotion regulation.

24 On the other hand, other studies have focused on the relationship between
25 cognitive emotion regulation strategies and vicarious responses but analysing
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1 independently the effect of a concrete strategy on the vicarious emotional response.
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3 Regarding rumination, Joireman, Parrott & Hamersla (2002) focused on the relationship
4 between two different forms of this strategy, namely on self-reflection (i.e., self-
5 attention motivated by epistemic curiosity) and self-rumination (i.e., neurotic self-
6 attention motivated by threats, losses or injustices to the self) and personal distress and
7 empathic concern. Results showed that whereas personal distress was linked to self-
8 rumination, empathic concern was linked to self-reflection. Concerning reappraisal,
9 Lamm, Batson & Decetey (2007) compared the effectiveness of that strategy to lessen
10 personal distress when perceiving another in pain. Results showed that those under the
11 reappraisal condition instructions showed lower personal distress than those under the
12 no-instructions condition.
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27 **The present research**

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30 Previous research aimed at differentiating between empathic concern and
31 personal distress has focused on the different types of motivation underlying the helping
32 behaviour or the attentional focus (Batson, 1991, 2011; Davis, 1994). However, little is
33 known about the different emotion regulation mechanisms or processes that lead an
34 individual to feel either empathic concern or personal distress when perceiving the same
35 emotional stimuli or target (Batson, 2011). As pointed out by various authors
36 (Eisenberg & Eggum, 2009; Hoffman, 1982) the level of arousal and how this arousal is
37 controlled seems to make a difference between the two aforementioned vicarious
38 emotions. Thus, the aim of this research is to shed light on the cognitive emotion
39 regulation process underlying the vicarious emotional experience when perceiving
40 someone in need. Namely, we aim to investigate whether when perceiving a target in
41 need the emotional experience towards that target may be different depending on the
42 cognitive emotion regulation strategy used. Hence, our studies contribute to the existent
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1 literature in different ways. Firstly, we compare two different forms of cognitive
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3 emotion regulation (i.e., reappraisal vs. rumination) whereas most studies have focused
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5 on comparing reappraisal against suppression (e.g., Gross, 1998b). In this sense, most
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7 previous research has overlooked the comparison between reappraisal and other
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9 maladaptive forms of emotion regulation, such as rumination. Therefore our research
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11 aims to test further the potential distinct effects of different cognitive emotion
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13 regulation strategies (i.e., reappraisal and rumination), which have been defined as
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15 adaptive and maladaptive, respectively. Secondly, we are testing the effect of those
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17 cognitive emotion regulation strategies on the vicarious emotional response (i.e.,
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19 empathic concern vs. personal distress). In this sense our study compares for the first
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21 time the effect of inducing two different forms of cognitive emotion regulation, as
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23 previous studies have only focused on either reappraisal or rumination (Joireman et al.,
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25 2002; Lamm et al., 2007). Finally, we test at the same time the effect of using explicit
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27 versus implicit emotion regulation strategies, as previous research has only focused on
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29 one possible form of emotion regulation (e.g., Gross, 1998b; Williams, Bargh, Nocera
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31 & Gray, 2009). Thus, the obtained results may help to better understand the underlying
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33 cognitive emotion regulation processes that may lead to an individual experiencing
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35 either empathic concern or personal distress. While previous research has focused on
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37 the different motivation linked to empathic concern and personal distress (i.e., altruism
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39 and egoism, respectively) or attentional focus (i.e., other-oriented vs. self-oriented,
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41 respectively; see Batson, 2011 for a review), this study tests the different effect that two
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43 cognitive emotion regulation strategies may have on the vicarious emotional response .
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45 To this aim, in Study 1 we will study this effect through manipulating explicit cognitive
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47 emotion regulation strategies (i.e., use of instructions), whereas in Study 2 we will study
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1 this effect through manipulating implicit cognitive emotion regulation strategies (i.e.,
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3 priming).
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7 **Study 1**

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9 In Study 1 we compared the emotional response (i.e., empathic concern and
10 personal distress) depending on the type of explicit cognitive emotion regulation
11 strategy that participants were asked to follow (i.e., reappraisal vs. rumination). We
12 used instructions to manipulate the conscious emotion regulation strategy, as this
13 procedure has been widely used before in different studies (Gross, 1998b; Richards,
14 Butler & Gross, 2003; Taut, Renner & Baban, 2012) to test the effect of explicit
15 emotion regulation. Based on the notions that (1) reappraisal and rumination are
16 respectively adaptive and less adaptive forms of emotion regulation respectively (for a
17 review see Gross, 2007) and (2) that empathic concern has been linked to adaptive
18 emotion regulation whereas personal distress has been linked to less adaptive emotion
19 regulation (e.g., Eisenberg & Fabes, 1992) we hypothesized that: participants in the
20 reappraisal instructions condition will report higher empathic concern, less arousal and a
21 more pleasant experience, whereas participants in the rumination instructions condition
22 will report higher personal distress, higher arousal and a more unpleasant experience.
23 Concerning the manipulation-check items we expect that participants in the reappraisal
24 condition will report having mainly positive thoughts and consider different
25 perspectives, whereas participants in the rumination condition will report having mainly
26 negative thoughts and be focused on their feelings.
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53 **Method**

54 **Participants**

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1 One-hundred and twenty people (68% women and 32% men), aged between 18
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3 and 60 years ($M = 25.34$, $SD = 10.68$), agreed to participate. They were divided in two
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5 groups randomly ($n = 60$): Reappraisal instructions and Rumination instructions
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7 condition. Convenience sampling at several libraries was used. We chose the libraries to
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9 make sure we could have access to a non-undergraduate sample (even though it may not
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11 be representative of the general population) and to guarantee a setting where
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13 participants could read and concentrate on the different tasks.
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18 **Procedure**

19 Participants were asked to collaborate in this study, approximately 87% agreed
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21 to do so. Participants were alone in the reading room of the library and a research
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23 assistant approached and asked them to evaluate a photograph, as a cover story. After
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25 signing the consent form participants were given a booklet which consisted of an
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27 introduction to the study, followed by further instructions depending on the condition
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29 there were in (either Reappraisal instructions or Rumination instructions). The
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31 researcher was blind to the experimental condition.
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38 Reappraisal instructions were as follows: “Everybody tries to control their
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40 emotions on some occasions. For example, we may control our emotions because we
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42 think that they are inappropriate to the situation or to ourselves. REAPPRAISAL is one
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44 emotion regulation strategy that has been extensively investigated. This strategy
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46 involves thinking about what happens in a different way, by changing the mindset and
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48 by making a different interpretation of the event. Please use the reappraisal strategy
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50 while in the study”.
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55 Rumination instructions were as follows: “Everybody tries to control their
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57 emotions on some occasions. For example, we may control our emotions because we
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1 think that they are inappropriate to the situation or to ourselves. RUMINATION is one
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4 emotion regulation strategy that has been extensively investigated. This strategy
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6 involves thinking repetitively about the experienced feelings and thoughts related to
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8 those feelings, by focusing the attention on one's own emotions. Please use the
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10 rumination strategy while in the study".

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13 After reading the instructions, all participants were presented with a picture
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15 (taken from López-Pérez, Ambrona, Gregory, Stocks and Oceja, 2013; Study 1) which
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17 depicted a sick child in a hospital bed with a facial expression of pain. We chose to
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19 present only a picture without text as previous research on emotion has shown that the
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21 single use of images is enough to provoke an emotional response (e.g., Lang, Bradley &
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23 Cuthbert, 1999; Öhman, 1986). Moreover, previous research has shown that displaying
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25 pictures is sufficient to provoke a vicarious emotional response (e.g., Derbyshire,
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27 Osborn & Brown, 2013; Gu & Han, 2007; López-Pérez et al., 2013).

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30 After seeing the picture, participants completed three different measures: A short
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32 version of the Empathic Response Scale (Batson, Fultz and Schoenrade, 1987; Spanish
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34 version by Oceja and Jimenez, 2007); the Affect Grid (Russell, Weiss & Mendelsohn,
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36 1989; Spanish version by Hurtado de Mendoza, Fernández-Dols, Parrott & Carrera,
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38 2010); and finally four manipulation-check items. Once the measures were completed
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40 the participants were debriefed.

41 42 43 44 45 46 47 **Measures**

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50 *The Empathic Response Scale* (Batson, Fultz and Schoenrade, 1987; Spanish
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52 version by Oceja and Jimenez 2007). The version used is formed by 12 emotional
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54 terms, with a 7-point Likert response format (from 1 = not at all to 7 = extremely). This
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56 scale was used to assess situational empathic concern (i.e., calculated by averaging
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58 participants' responses to the following terms: *warmth, softhearted, tenderness, moved,*
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1 *compassionate*, and *sympathetic*; $\alpha = .78$ in this study) and personal distress (i.e.,
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3 calculated by averaging participants' responses to the following terms: *upset*, *grief*,
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5 *sorrow*, *distressed*, *worried*, and *anxious*; $\alpha = .77$ in this study)
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8 *The Affect Grid* (Russell, Weiss & Mendelsohn, 1989; Spanish version by
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10 Hurtado de Mendoza, Fernández-Dols, Parrott & Carrera, 2010), which assesses two
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12 dimensions of affect: pleasure-displeasure and arousal-sleepiness. Participants have to
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14 place one checkmark in the grid indicating how they felt while watching the stimuli.
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16 The scores for both axes range from -4 (displeasure pole and sleepiness pole) to +4
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18 (pleasure pole and arousal pole)
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23 *Four manipulation-check items* to assess whether the instructions worked out as
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25 expected, where participants were asked to what extent while seeing the picture *they*
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27 *had positive thoughts*, *negative thoughts*, *took different perspectives* or *thought about*
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29 *their feelings*. Each item was answered in a 7-point Likert scale (from 1 = not at all to 7
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31 = extremely).
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35 **Results and Discussion**

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37 There were no gender differences on key dependent variables, so this factor will
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39 not be discussed further. Please see Table 1 for the descriptive statistics of all the
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41 dependent variables.
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45 *Differences of the emotional experience using the core affect structure.* We
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47 analyzed the differences in the dimensions of arousal and emotional valence depending
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49 on the experimental condition (Rumination vs. Reappraisal instructions). Regarding
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51 arousal participants reported higher arousal in the rumination condition ($M = 0.88$, $SD =$
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53 1.83) than in the reappraisal condition ($M = 0.02$, $SD = 1.81$); $t(118) = -2.60$, $p = .01$, d
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55 $= .48$. The same pattern was true for the emotional valence dimension, reporting higher
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1 displeasure ($M_s = -1.70$ and -0.32 ; $SD_s = 1.61$ and 1.90 ; $t(118) = 4.31$, $p < .001$, $d =$
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4 $.79$), as it was expected.

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6 *Differences in empathic concern and personal distress.* We conducted the same
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8 independent samples t-test and the analysis yielded a difference for both emotions.
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10 Thus, participants reported higher empathic concern in the reappraisal condition ($M =$
11 4.37 , $SD = 1.30$) compared to the rumination condition ($M = 3.69$, $SD = 0.95$); $t(118) =$
12 3.27 , $p < .001$, $d = .60$, as it was expected. Regarding personal distress, participants
13 reported a higher score in the rumination condition ($M = 3.61$, $SD = 1.31$) compared to
14 the reappraisal condition ($M = 2.68$, $SD = 1.05$); $t(118) = -4.28$, $p < .001$, $d = .78$. In this
15 study empathic concern and personal distress correlated positively in the rumination
16 condition ($r(60) = .42$, $p < .001$) but they did not in the reappraisal condition ($r(60) =$
17 $.11$, $p = .40$).

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30 *Manipulation-check measures.* For the items referring to the emotional valence
31 of thoughts we obtained the expected pattern. In this sense, for the item “have mainly
32 negative thoughts” participants in the rumination condition scored higher ($M = 4.85$, SD
33 $= 1.54$) compared to the participants in the reappraisal condition ($M = 3.83$, $SD = 1.63$);
34 $t(118) = -3.51$, $p < .001$, $d = .64$. Finally, for the item “have mainly positive thoughts”
35 participants in the reappraisal condition scored higher ($M = 4.73$, $SD = 1.26$) compared
36 to the participants in the rumination condition ($M = 4.05$, $SD = 1.72$); $t(118) = 2.49$, $p =$
37 $.01$, $d = .46$. For the items related to the focus of the thought the expected pattern was
38 obtained. Thus, for the item “think about the picture from different perspectives”
39 participants in the reappraisal condition ($M = 4.37$, $SD = 1.35$) scored higher than
40 participants in the rumination condition ($M = 3.05$, $SD = 1.35$); $t(118) = 5.50$; $p < .001$,
41 $d = .95$. Finally, for the item “think about how I was feeling” participants in the
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1 ruminant condition ($M = 5.12, SD = 1.37$) scored higher than participants in the
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3 reappraisal condition ($M = 2.47, SD = 1.22$) $t(118) = -11.23; p < .001, d = 1.8$.
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6 **Study 2**

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9 In study 1 we asked participants to regulate their emotional experience following
10 a set of instructions, that is, to use an explicit emotion regulation strategy. The results
11 obtained may be explained due to the demand characteristics, that is, participants may
12 have tried to change their behavior to fit in the experiment's purpose (Lasa, 1997). As
13 this is a confounding variable (Kantowitz, Roediger & Elmes, 2001; Nichols & Maner,
14 2008), in this study we used a priming procedure to avoid such effect (Blumer, 1969;
15 Lofland, 1967; Schatzman & Strauss, 1973). Using a priming effect we wanted to
16 manipulate implicit cognitive emotion regulation strategies (i.e., reappraisal vs.
17 rumination) and tested its effects on the vicarious emotional responses. Priming emotion
18 regulation has been widely used to study the effect of different emotion regulation
19 strategies (Mauss et al., 2007; Scrull & Wyer, 1979; Williams et al., 2009). In this study
20 participants were asked to complete a word search puzzle to prime the different
21 cognitive emotion regulation strategies (i.e. Reappraisal vs. Rumination).
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41 Based on the assumptions described in Study 1 and given that previous research
42 found no difference between the use of explicit and implicit manipulation of emotion
43 regulation (e.g., Williams et al., 2009) we predicted the same pattern of results obtained
44 in Study 1.
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51 **Method**

52 **Participants**

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54 One-hundred and twenty participants (54% women and 46% men) agreed to
55 participate in this study (60 were randomly assigned to the reappraisal-priming
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1 condition and the other 60 were randomly assigned to the rumination-priming
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3 condition), age ranged between 18 to 62 years ($M = 28.36$, $SD = 12.64$). As in the
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5 previous study we used opportunity sampling in several libraries.
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8 9 **Procedure**

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12 *Design of the material.* To prime an implicit emotion regulation strategy we
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14 asked participants to complete a word search puzzle. This task was based on a previous
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16 study where participants were primed to use a reappraisal strategy through searching
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18 different words or expressions (see Williams et al., 2009). Based on that research, we
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20 created another five words-expressions for the rumination prime condition. We
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22 conducted a categorization task to test with ten independent judges (8 females; age
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24 range from 20 to 42; $M = 23.65$, $SD = 3.18$) to test to what extent the designed words-
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26 expressions were linked to the concept of rumination. Thus, the independent judges
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28 were provided with the definitions of reappraisal, rumination and “other” category (i.e.,
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30 a category that does not include the other two previous definitions) and the 5 words-
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32 expressions initially defined as belonging to rumination, so for every word-expression
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34 they could select the category in which the word-expression should be placed (i.e.,
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36 reappraisal, rumination or other). Results showed that four words were categorized by
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38 all the judges (100%) as belonging to rumination: *repetitive thought*, *reflection*,
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40 *retrospection* and *dwell on feelings*. Eight out of the ten judges categorized *recall* in the
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42 rumination category, whereas the other two placed it in the category “other”. Despite
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44 this, we considered 80% sufficient enough to conduct the study using all those words as
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46 primes. For the reappraisal condition we took the five words-expressions that Williams
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48 et al. (2009) used in their study (i.e., *reassessed*, *perspective*, *appraised again*, *carefully*
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50 *analyzed* and *strategy*).
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1 *Application of the study.* Participants were asked to collaborate, in which
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3 approximately 82% agreed to do so. There were 60 booklets for each condition (120
4 total) in a random order. The researchers were blind to the experimental condition.
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6 Participants were informed that the purpose of the study was to evaluate a photograph
7 through different questionnaires. After signing the informed consent participants filled
8 out a booklet which consisted of an introduction to the study, followed by the word
9 search puzzle task containing words-expressions to prime either reappraisal or
10 rumination. After that, participants were presented the same picture as in Study 1. Then,
11 they completed the same measures used in Study 1. Once the measures were completed
12 the participants were debriefed.
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25 **Results and Discussion**

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27 There were no gender differences on key dependent variables, so this factor will
28 not be discussed further. Please see Table 2 for the descriptive statistics of all the
29 dependent variables.
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35 *Differences of the emotional experience in the core affect structure.* We
36 analyzed the differences in the dimensions of arousal and emotional valence depending
37 on the experimental condition (Rumination vs. Reappraisal priming). Regarding arousal
38 participants reported a higher score in the rumination priming condition ($M = 0.68$, SD
39 $= 1.86$) than in the reappraisal priming condition ($M = -0.52$, $SD = 1.57$); $t(118) = -3.82$,
40 $p < .001$, $d = .70$. For the emotional valence dimension the same pattern was true,
41 reporting higher displeasure ($Ms = -1.43$ and -0.18 ; $SDs = 2.18$ and 1.88 ; $t(118) = 3.36$,
42 $p < .001$, $d = .62$), as it was expected.
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54 *Differences in empathic concern and personal distress.* Participants reported
55 higher empathic concern ($\alpha = .82$) in the reappraisal priming condition ($M = 5.07$, $SD =$
56 1.14) compared to those in the rumination priming condition ($M = 4.69$, $SD = 1.04$);
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1 $t(118) = 2.26, p = .02, d = .42$, as it was expected. Regarding personal distress ($\alpha = .79$),
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3 participants reported a higher score in the rumination priming condition ($M = 3.26, SD$
4
5 $= 1.31$) compared to those in the reappraisal priming condition ($M = 2.36, SD = 0.92$);
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7 $t(118) = -4.33, p < .001, d = .79$, as it was expected. In this study empathic concern and
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9 personal distress correlated positively in the rumination priming condition ($r(60) = .40, p$
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11 $< .001$) but they did not in the reappraisal priming condition ($r(60) = -.14, p = .29$).
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16 *Manipulation-check measures.* For the items referring to the emotional valence
17
18 of thoughts we obtained the expected pattern. For the item “have mainly negative
19
20 thoughts” participants reported a higher score in the rumination priming condition ($M =$
21
22 $4.30, SD = 1.84$) compared to the reappraisal priming condition ($M = 3.58, SD = 1.41$);
23
24 $t(118) = -2.39, p = .01, d = .44$. For the second item “have mainly positive thoughts”
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26 participants reported a higher score in the reappraisal priming condition ($M = 4.78, SD$
27
28 $= 1.75$) compared to those in the rumination priming condition ($M = 3.52, SD = 2$);
29
30 $t(118) = 3.69, p < .001, d = .68$. For the items related to the focus of the thought we
31
32 obtained the expected pattern as well. Thus, for the item “think about the picture from
33
34 different perspectives” participants in the reappraisal condition ($M = 3.82, SD = 1.52$)
35
36 scored higher than participants in the rumination condition ($M = 2.98, SD = 1.42$);
37
38 $t(118) = 3.10, p < .01, d = .57$. Finally, for the item “think about how I was feeling”
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40 participants in the rumination condition ($M = 3.95, SD = 2.26$) scored higher than
41
42 participants in the reappraisal condition ($M = 2.85, SD = 1.70$); $t(118) = -3.01, p < .01, d$
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44 $= .55$.
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52 **General Discussion**

53
54 Empathic concern and personal distress are distinct vicarious emotional
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56 responses that arise when perceiving another in need or distress (Batson, 2011).
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58 Previous research has linked those emotional experiences with emotion regulation (e.g.,
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1 Eisenberg et al., 1996; Joireman et al., 2002; Lamm et al., 2007). However, no previous
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3 research has investigated the effect of two cognitive emotion regulation strategies (i.e.,
4
5 reappraisal vs. rumination) in the vicarious emotional experience. Results from Study 1
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7 and 2 supported our hypotheses, showing that whereas reappraisal led to higher
8
9 empathic concern, rumination led to higher personal distress. These results are coherent
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11 with previous research which links empathic concern with adaptive emotion regulation
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13 strategies such as self-reflection or better emotion control, and personal distress with
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15 less adaptive strategies such as rumination or lower emotion control (e.g., Eisenberg &
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17 Fabes, 1992; Joireman et al., 2002). These results seem to support Eisenberg's
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19 (Eisenberg et al., 2006) and Hoffman's (1982) theories regarding the role of arousal on
20
21 the vicarious emotional experience. These authors argue that if over-arousal happens or
22
23 the arousal is interpreted as negative then personal distress is more likely to occur. From
24
25 our results, reappraisal may lessen the arousal felt while watching the picture or allow a
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27 positive interpretation of it, whereas rumination would lead to the opposite occurring.
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29 This opens an interesting venue to continue studying the underlying mechanisms
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31 involved in the relationship between those cognitive emotion regulation strategies and
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33 the vicarious emotional responses.
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43 In our studies we did not find gender differences for the key dependent
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45 variables. This result could be due to the effect of the experimental manipulation and
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47 the small sample size used to run the comparison, after splitting by gender and by the
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49 experimental condition. However we acknowledge that future studies should be
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51 conducted to test gender differences as previous research has found differences between
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53 women and men in the use of rumination (e.g., Garnefski, Teerds, Kraaij, Legerstee &
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55 Vand der Kommer, 2004), reappraisal (e.g., McRae, Oschner, Mauss, Gabrieli & Gross,
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1 2008) and on self-reported vicarious emotional responses (e.g., Eisenberg & Lennon,
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4 1983).

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6 Previous research has used either explicit or implicit manipulations to induce a
7
8 specific emotion regulation strategy (e.g., Richards et al., 2003; Williams et al., 2009).
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10 However, in our study we used both types of manipulations to study the possible effect
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12 of reappraisal and rumination on the vicarious emotional response. Results from both
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14 studies suggest that both types of manipulation worked equally well to induce the
15
16 expected emotion regulation strategy. Furthermore, this was confirmed when comparing
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18 data from both studies (i.e., averaging empathic concern and personal distress to create a
19
20 unique emotional response variable) and showing that only the type of emotion
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22 regulation (rumination vs. reappraisal) was significant ($F(1, 236) = 14.71, p = .001$) but
23
24 not the type of manipulation (implicit vs. explicit; $F(1, 236) = .16, p = .70$) or the
25
26 interaction ($F(1, 236) = .001, p = .98$). This result is in line with previous research
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28 which suggested that the same results should be expected when using implicit or
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30 explicit manipulations to induce a certain emotion regulation strategy (Williams et al.,
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32 2009).
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40 One question that arises from our results is the causal direction of the emotion
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42 process, that is, whether the emotion regulation or the vicarious emotional response
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44 comes first. Based on Gross' model of emotion regulation (see Gross, 2007) reappraisal
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46 and rumination constitute response-focused strategies, that is, strategies adopted after an
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48 emotional response has already been generated. Following this logic, in our studies
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50 reappraisal and rumination would affect the emotional response. However, other authors
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52 suggest (e.g., Schipper & Petermann, 2013) that vicarious emotional responses affect
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54 the type of emotion regulation strategy adopted. From this perspective, empathic
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56 concern and personal distress would trigger specific strategies of emotion regulation.
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1 The design of our studies allow testing Gross' model (2007) as we induced a certain
2 emotion regulation strategy and tested its effect on the emotional experience. However,
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4 the second line of research should be tested in the future so as to better establish a
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6 plausible explanation of the entire emotional process and the causal direction. In this
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8 sense, experimentally inducing empathic concern and personal distress to then measure
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10 the emotional responses and the type of emotion regulation strategy adopted could
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12 throw some light on this issue.
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18 We acknowledge several limitations in the studies presented. First, it is possible
19 that our results could be explained by the benefits of reappraisal, the costs of
20 rumination, or both. Thus, a no-strategy control group would have allowed testing these
21 possible effects. According to the findings by Cohen et al. (2014) we would expect
22 participants from the control group to be closer to the rumination condition, as
23 participants from the reappraisal condition may have benefited from the inhibition of the
24 negative content of the emotional information presented. That is, people normally do
25 not inhibit the negative emotional content as it is informative, as this only happens when
26 people think about the situation from different perspectives, which may explain why the
27 participants in our studies in the reappraisal condition reported lower levels of personal
28 distress. However, future research would need to test this hypothesis further. Second,
29 as our sample population was obtained through opportunity methods, we should be
30 cautious when generalizing the results to the entire population. However it is important
31 to note that the sample population was collected from various library locations and we
32 used a large age range. Finally, we used the same stimuli for both studies, depicting a
33 child in distress. Previous research showed that witnessing a child in need or pain may
34 provoke a higher intense emotional experience, rather than when presenting an adult.
35 This may be explained due to perception of vulnerability which is appraised as a need
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1 itself (Dijker, 2001; Lishner, Batson & Huss, 2011). Future studies should test the effect
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4 when presenting an adult victim, as the type of victim has an influence on the vicarious
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6 emotional response (e.g., Lishner, Ocejda, Stocks & Zaspel, 2008).
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9 Our results highlight the importance that emotion regulation plays in the final
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11 vicarious emotional response when perceiving another in need. In this sense, most
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13 research has focused on the implications that these two responses have in the
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15 interpersonal domain, such as the influence on moral behaviour (Hoffman, 2008) or
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17 helping behaviour (Batson, 2011; Davis, 1994). However, there is scarce research
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19 focused on the role of emotion regulation processes on the experience of empathic
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21 concern or personal distress. Thus, our research contributes to the existing literature by
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23 showing the effect of adaptive vs. maladaptive cognitive emotion regulation on the
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25 vicarious emotional response. As suggested by Hoffman (1982) the way an individual
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27 regulates the arousal provoked by perceiving another in need can make a difference in
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29 the final vicarious emotional response towards the needy other. These results open an
30
31 interesting avenue to study the relationship between empathic concern and personal
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33 distress with other emotion regulation strategies, as previous studies have been focused
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35 on either the motivation linked to each emotional response or the attentional focus (see
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37 Batson, 2011 for a review). As acknowledge by Zaki & Williams (2013) emotion
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39 regulation and the vicarious emotional responses have been investigated by isolating
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41 both processes and therefore more integration is needed to better understand the whole
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43 emotional process. In this regard, our research constitutes a first step for such
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45 integration. Future research could focus on the effect of other cognitive emotion
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47 regulation strategies such as catastrophizing, negative functional reappraisal,
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49 distraction, blaming, planning or acceptance (among others) on the vicarious emotional
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51 response. Correlational studies, using the Cognitive Emotional Regulation
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1 Questionnaire (CERQ; Garnefski & Kraaij, 2007), or experimental studies could be
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3
4 beneficial to extend the knowledge in this area.
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6 Future research should consider the inclusion of a helping behaviour measure.
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8 Previous research has shown how empathic concern and personal distress may lead to
9 helping behaviour but with a different motivation (i.e., altruism and egoism,
10 respectively; Batson, 2011). Furthermore, it has also shown that when escaping from the
11 situation is easy empathic concern leads to helping behaviour, whereas personal distress
12 does not (Batson, 1991, 2011; Davis, 1994). Considering this and the fact that in our
13 research rumination led to higher personal distress and reappraisal to higher empathic
14 concern, we would expect that people who tend to ruminate more would feel higher
15 personal distress and hence, would help with the final goal to either relieve their own
16 distress or to gain a reward (i.e, with an egoistic motivation). Furthermore, we would
17 expect this helping behaviour would only happen if escaping from the situation is
18 difficult, as their final goal is not to improve the needy other's well-being. Conversely,
19 we would expect that people who tend to reappraise would feel higher empathic
20 concern, and hence would help with the final goal to benefit or improve the other
21 person's well-being without being affected by the easiness or difficulty of escaping
22 from the situation. Future research would need to test the effect of cognitive emotion
23 regulation on helping behaviour further.
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47 Besides the theoretical contribution, this research has applied implications. In
48 our research we found that depending on the emotion regulation strategy adopted, the
49 individuals' final emotional response varied. Thus, it is possible that by providing the
50 adequate training (e.g., promoting the use of reappraisal) personal distress could be
51 reduced. Also as personal distress is more likely to occur while dealing with others in
52 distress, training could be particularly helpful to those professionals who are in contact
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1 with people who are suffering on a daily basis (e.g., health professionals). These results
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3 may also have implications for clinical populations such as those who are on the autism
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5 spectrum or those who have conduct disorder. This is because these populations show a
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7 deficit in both emotion regulation and in the vicarious emotional experience when
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9 facing another in distress (e.g., Konstantareas & Stewart, 2006 and Lewis, Lamm,
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11 Segalowitz, Stieben & Zelazo, 2006; respectively). Although future work will need to
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13 address some of the questions underlined in this section, the obtained results open an
14
15 interesting venue in the integrative study of emotion regulation and vicarious emotional
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17 responses.
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Table 1

Descriptive Statistics for Study 1: Mean and (Standard Deviation).

	Arousal	Valence	Empathic concern	Personal Distress	Negative thoughts	Positive thoughts	Different Perspectives	Focused on feelings
Reappraisal Condition	0.02 (1.81)	-0.32 (1.90)	4.37 (1.30)	2.68 (1.05)	3.83 (1.63)	4.73 (1.26)	4.37 (1.35)	2.47 (1.22)
Rumination Condition	0.88 (1.05)	-1.70 (1.83)	3.69 (0.95)	3.61 (1.31)	4.85 (1.54)	4.05 (1.72)	3.05 (1.28)	5.12 (1.37)

Table 2

Descriptive Statistics for Study 2: Mean and (Standard Deviation).

	Arousal	Valence	Empathic concern	Personal Distress	Negative thoughts	Positive thoughts	Different Perspectives	Focused on feelings
Reappraisal Condition	-0.52 (1.57)	-0.18 (1.88)	5.07 (1.14)	2.36 (0.92)	3.58 (1.41)	4.78 (1.75)	3.82 (1.52)	2.85 (1.70)
Rumination Condition	0.68 (1.86)	-1.43 (2.18)	4.69 (1.04)	3.26 (1.31)	4.30 (1.84)	3.52 (2)	2.98 (1.42)	3.95 (2.26)