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The Role of Acute Pain in the Elicitation of Empathy

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Abstract

The Role of Acute Pain in the Elicitation of Empathy
By Allison E. Meyer

Empathy is the capacity to understand vicariously the physical or emotional or emotional experiences of another person and is crucial to human relationships. It comprises three components: an affective response, cognitive perspective-taking and regulation of vicarious emotion. A high degree of empathy for others' pain may result in pain for oneself, and evidence suggests that the affective component of empathy may be related to pain at a neural level. It was hypothesized that participants assigned to the pain condition would report stronger feelings of empathy for another person than those assigned to the control condition. It was also hypothesized that dispositional empathy and emotion regulation skills would relate to reports of state empathy and personal distress. To test these hypotheses, adult females (n = 30) were randomly assigned to either the pain or no-pain condition. Pain was induced using the cold pressor task, in which participants are asked to submerge their hand in a cold-water bath for thirty seconds after they first report feeling pain. After participating in the experimental conditions, the participants viewed a brief video clip of a character experiencing physical pain, all participants reported feelings of empathy and personal distress. Results did not support the hypotheses. There were no significant differences in empathy between condition, and participants assigned to the pain condition reported significantly lower levels of personal distress. Regression analyses did not provide support for the notion that dispositional empathy or emotion regulation skills impact state empathy or level of personal distress following participation in the experimental conditions. Attention processes may account for the differences in personal distress across the conditions. Findings, study limitations, and implications are discussed.

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Table of Contents

The Role of Acute Pain in the Elicitation of Empathy

Empathy is the capacity to understand vicariously the emotional or physical experiences of another person. Research on the multifaceted construct of empathy investigates both the phenomenon of empathy and the ways in which it prompts compassionate responses to others' distress (Batson, 2009).

Philosophers, and more recently psychologists, have studied empathy extensively, exerting great effort towards crafting less fragmented definitions of this complex construct (Batson, 2009). Developmentalists have argued for empathy's rudimentary presence in early infancy, and other research has made a case for the heritability of dispositional empathy (Hoffman, 2001; Knafo et al., 2009). Hoffman's (2001) theory on moral development notes empathy's elicitation of prosocial behavior, suggesting that empathy is key to justice-driven principles, caring, and moral judgment. More recently, social neuroscientists have attended to the neural basis of empathy using functional imaging and PET scanning (e.g. Jackson & Decety, 2006). Additionally, the examination of basic neural mechanisms has prompted extensive research into the role of empathy's precursors in social functioning of non-human animals (Preston & de Waal, 2002).

Empathy is an important and significant element in many human relationships. In particular, empathy appears to play a critical role in the bond between therapists and patients; e.g., meta-analyses show empathy to be a moderately strong predictor of therapy outcome (Elliott, Bohart, Watson, & Greenberg, 2011). Conversely, the essentiality of empathy is most evident when it is pervasively absent. For example, individuals with disorders such as autism, psychopathy, and conduct disorder, which are linked to empathy deficits, demonstrate fairly

severe social impairments (Clark, Winkielman, & McIntosh, 2008; Decety, Michalska, & Akitsuki, 2008; Lovett & Sheffield, 2007).

Empathy provides adaptive information about potentially dangerous events and facilitates compassion and caring responses among people living in a community (Goubert, Craig, & Buysee, 2009). This is true across both positive and negative human experiences, but it is particularly salient when considering empathy for another person's pain, which is generally associated with the elicitation of caretaking responses. The experience of pain often includes visceral displays demonstrating that it comprises both physical and emotional elements. In fact, the communication of pain, which demands attention and prioritizes healing, may facilitate survival (Williams, 2002). In summary, empathy, specifically for pain, is essential for human moral development, the facilitation of relationships, and even for survival.

Processes and Definitions

The experience of empathy is at the dynamic center of bottom-up and top-down sources of information (Decety & Lamm, 2006). In this context, "bottom-up" influences refer to characteristics of the person in pain or the context in which the painful stimulus occurs, whereas "top-down" influences refer to characteristics of the observer. Bottom-up influences, which include facial and verbal pain expressions and contextual pain cues, affect the degree of experienced empathy. Distressed facial and body expressions that clearly and automatically communicate pain most strongly elicit others' empathic responses (Goubert et al., 2005, 2009). Additionally, top-down influences, such as learning experiences (e.g., habituation), pain catastrophizing, and attentional processes, are important in modulating feelings of empathy (Goubert et al., 2005, 2009; Hein & Singer, 2008). Both groupings of factors affect the experience of empathy, which may be crucial to the individual's behavioral response (Batson,

2009). The bottom-up and top-down processing models contribute to and correspond somewhat roughly with the most peripheral conceptualizations of empathy: embodied simulation and effortful cognitive perspective-taking. Embodied simulation is posited to operate through the mechanism between perception and action, where a "covert mimicry process is responsible for shared affect and feelings between self and other" (Decety & Jackson, 2006, p. 55). These continuously operating automatic processes are important to the topic of the current project; however, due to the nature of this study and limited evidence of their workings at the conscious level, they will receive only brief mention here. Rather, this study will investigate the relatively macro-level process of *mentalizing*; i.e., the "top-down process whereby the subject effortfully tries to represent the state of the other" (Preston et al., 2007, p. 255). Mentalizing includes both cognitive and affective components. Mentalizing and embodied simulation interact to allow the observer to experience vicariously the thoughts and feelings of another person.

Components of Empathy

Prevailing conceptualizations of empathy (see Decety & Jackson, 2006; Eisenberg & Eggum, 2009) posit three essential, neuroanatomically-based subprocesses: (a) an affective response to another person's experience, (b) the cognitive process of taking that person's perspective, and (c) the regulation of high levels of vicarious emotion in order to limit personal distress (i.e., emotion regulation). The most complete conceptualizations of empathy include all three components; however, their relative importance varies within different theories.

Affective Response. First, most definitions suggest that the empathizer's affective response is essentially isomorphic to the other person's state, or at very minimum, more similar to the other's circumstances than to those of the self (de Vignemont & Singer, 2006; Decety & Lamm, 2006; Preston & de Waal, 2002). This first component "includes shared representations

between the self and others and relies on automatic perception and action coupling or activation of emotions" (Eisenberg and Eggum, 2009, p. 72). Of the three components of empathy, the affective response relies most heavily on bottom-up processes. In one study using fMRI, participants received painful stimuli; subsequently, they observed signals indicating that their partner received the same painful stimuli. The "self" condition and the "other" condition prompted parallel activation of brain areas, a result suggesting that shared affective experiences are represented in common areas (Singer et al., 2004). In this way, the affective empathic response may rely upon shared representations of the experience of physical or emotional pain.

Cognitive Perspective. Second, a comprehensive definition of empathy must include the cognitive awareness of separateness of the self and other (Eisenberg & Eggum, 2009) as well as the conscious ability to take the other person's perspective. This cognitive capacity is important because the individual must consciously understand that the affective state is experienced vicariously through another person, rather than emanating from within the self. The experience of empathy without this understanding would be more properly termed *emotional contagion* (Decety & Jackson, 2006; Hein & Singer, 2008). Young infants, for example, do not have the cognitive capacity to differentiate themselves from another person; thus, others' distress can become their own. As children develop the cognitive ability to recognize distress as emanating from another person, they become more empathetic and, in turn, become better able to mobilize prosocial behaviors (Hoffman, 2001).

Emotion regulation. Third, the capacity to regulate one's own emotions is an important component of the empathy process. That is, the observer must first be able to recognize that his or her experience of negative affect is vicarious (rather than directly due to experiencing the painful stimulus) and must then be able to downregulate his or her own affect in order to provide

an empathic response to the other person. Emotion regulation, in this context, can be defined as the "process used to soothe personal distress at the other's pain or discomfort, making it possible to mobilize compassion and helping behavior for the other" (Elliott et al., 2011). Eisenberg and Eggum (2009) reiterate this point, noting that "self-regulation allows one to inhibit one's own perspective and evaluate the perspective of another" (p. 73).

Emotion regulation serves as the pivot point at the tenuous border between feeling vicarious arousal and experiencing personal distress at the other's pain (Eisenberg & Eggum, 2009). This distinction is crucial because although empathy is thought to trigger altruistic motivation, personal distress often leads to egoistic responses (Batson, Early, & Salvarani, 1997; Eisenberg et al., 1994). Thus, the emotion regulation process is predicated upon the cognitive awareness of the distinction between the self and the other.

Empathy and Pain

A high degree of empathy for others' pain may result in pain for oneself, and some evidence suggests that the affective component of the empathy response may be related to pain at a neural level. Specifically, similar neural networks are activated for both the perception of pain and the actual experience of pain; thus, in perceiving others' pain, the observer's neural network simulates an actual pain experience (Decety & Jackson, 2006). There is disagreement, however, as to whether empathy for others' pain recruits the entire pain matrix or only the affective portion (Cheng et al., 2008; Loggia, Mogil, & Bushnell, 2008; Singer et al., 2004).

Some experimental evidence supports the assertion that empathic responses to others' pain include some physical sensation of the other's pain. In one study, Loggia and colleagues (2008) found strong relationships between empathy state and pain perception. Individuals were randomized into a "high empathy" or a "low empathy" condition; they found that those inducted

into the high empathy state later experienced painful stimuli more intensely and more unpleasantly than those in the low empathy state (Loggia, Mogil, & Bushnell, 2008). The results highlight a link between feelings of empathy for another and enhanced sensations of pain. This study demonstrates most clearly the first component of empathy: an affective, often isomorphic, response to others' experiences through the perspective-taking process.

Dispositional empathy

Two other top-down processes may affect individuals' responses to others' pain: habituation to empathic experiences and individual dispositional empathy. First, several studies have shown that repeated exposure to others' pain facilitates habituation to the emotional experience and, thus, an attenuated empathy response over repeated exposures. In a randomized experiment, Prkachin and colleagues (2004) randomized participants to one of four groups that varied in the number of exposures to one-second clips of facial expressions of pain. Results showed that participants who saw more clips of strong pain later became more conservative regarding those facial expressions they identified as exhibiting pain (Prkachin, Mass, & Mercer, 2004). Similarly, medical professionals exhibit the same habituation to observing others in pain. Pillai Riddell and colleagues (2007) evaluated the extent to which pediatricians, nurses, and parents differentially evaluated the amount of pain experienced by babies receiving immunization injections. Results showed that pediatricians estimated less pain in response to needle injections than parents. The authors interpreted the results as indicating that the professional caregivers underestimated the infants' experience of pain as a result of repetitive exposure to infants in pain as compared to the parents (Pillai Riddell & Craig, 2007). These results suggest that emotion regulation skills may play a crucial role in habituation to the affective experience of watching others in pain. Taken together, these studies support the idea

that consistent exposure to others' pain makes one less sensitive to painful expressions and perhaps overall to the emotional experience.

Some evidence suggests that empathy can be thought of as both a state and a trait variable. That is, level of empathy may be specific to a particular experience (i.e., state empathy); however, individuals appear to possess a predisposition toward feelings of empathy (i.e., trait empathy) (Knafo et al., 2009). Thus, any state experience of empathy seems to occur against a dispositional background. In a sample of patients with congenital insensitivity to pain, those with the highest self-reported dispositional empathy demonstrated the greatest sensitivity to facial expressions of pain (Danziger, Prkachin, & Willer, 2006). Additionally, those with higher dispositional levels of empathy estimate others to be experiencing greater pain than those with lower dispositional empathy (Green, Tripp, Sullivan, & Davidson, 2009). In turn, the dispositional characteristics also may affect the experience of pain itself. Shafi and Selsor (2007) found that state and trait empathy were positively correlated to self-reported pain ratings. In sum, the three components of empathy comprise an affective response, cognitive processing, and emotion regulation. High states of empathy are connected to the experience of pain. Additionally, other factors, such as habituation to others' pain and dispositional empathy, affect one's response to others in pain.

Justification for the current study

As noted earlier, prior studies suggest that individuals habituate to others' pain over time, resulting in correlated decreases in empathic responding (Prkachin et al., 2004; Danziger, et al., 2006). Conversely, those with higher dispositional empathy, compared to those with lower dispositional empathy, usually estimate others to be experiencing greater pain (Green et al., 2009). In the same way, it would be expected that those with higher dispositional empathy might

respond more strongly to others' pain; if there is an interaction of trait and state empathy, this response would be even stronger after experiencing a personally painful stimulus.

Painful stimuli may increase the response of those higher in dispositional empathy. First, "prior experiences with particular pain situations lead to more elaborate representations of those situations in observers, so that empathic responses are readily elicited when another person is perceived to be in a similar situation" (Goubert et al., 2009, p. 159). In this way, it might be expected that a particular stimulus-induced pain experience might enhance the state feelings of empathy and that this effect would be strongest among those who are higher in trait empathy.

Research Questions and Hypotheses

Does experiencing pain affect one's feelings of empathy for another?

1a: Participants assigned to the pain condition will report more empathy than those assigned to the no-pain condition.

1b: Participants assigned to the pain condition will report more personal distress than those assigned to the no-pain condition.

How do individuals' emotion regulation skills and dispositional empathy moderate situational empathy and personal distress?

2: Participants who report higher dispositional empathy will also report higher state empathy.

3: Participants with greater emotion regulation skills will experience less personal distress for the character in the stimulus video than those with fewer emotion regulation skills.

Method

Participants

The sample (n = 30) comprised female young adult college students (M_{age} = 19.8, range: eligible subjects were ages 18 to 25 years old). The sample was 36.7% Caucasian, 40.0% Asian, and 20% African American. Participants were recruited using flyers posted across the university campus and electronic message boards as well as from the introductory psychology subject pool. All participants were compensated either monetarily ($15) or with partial course credit. For safety reasons, individuals were excluded from participation if they had a history of fainting, cardiovascular disease, a reliance on opiate medications, a diagnosis of Raynaud's disease, an open cut or sore on nondominant hand, or a fracture on their nondominant limb. The Emory University Institutional Review Board approved all study procedures. Participants provided written informed consent at the time of the experiment. All data were collected at Emory University's Briarcliff campus.

Measures

Interpersonal Reactivity Index (IRI: Davis, 1983). The IRI is a 28-item self-report measure of *dispositional* empathy that comprises four discrete subscales: empathetic concern, perspective taking, personal distress, and fantasy. Responses are indicated on a scale from 1 ("Does not describe me very well") to 5 ("Describes me very well"). The four scales demonstrate satisfactory internal reliabilities (alphas range from .71 to .77) and satisfactory test-retest reliabilities (ranging from .62 to .71). The IRI assesses both cognitive and affective components of empathy, and it has been used in several key studies exploring the relationship between pain and empathy (e.g. Lamm, Batson, & Decety, 2007; Loggia et al., 2008, Singer et al., 2004).

Difficulties in Emotion Regulation Scale (DERS**:** Gratz & Roemer, 2004). The DERS is a 36-item self-report measure that comprises six subscales (with shortened subscale titles indicated parenthetically): nonacceptance of emotional responses (Nonacceptance), difficulties

engaging in goal-directed behavior (Goals), impulse control difficulties (Impulse), lack of emotional awareness (Awareness), limited access to emotion regulation strategies (Strategies), and lack of emotional clarity (Clarity). Participants rate their experience on a scale from 1 ("almost never") to 5 ("almost always"). Higher scores indicate greater difficulties with emotion regulation. In a population of undergraduate students, the DERS demonstrated high internal consistency (alphas range from .76 to .89), good test-retest reliability (ρI = .88), as well as adequate construct and predictive validity (Gratz & Roemer, 2004).

Measures of Empathy and Personal Distress (Batson et al., 1997). This instrument is a 14-item self-report measure that comprises two factors: empathy and personal distress. Respondents rate the extent to which they experienced 14 emotions while watching the film on a scale from 1("not at all") to 7 ("extremely").

[*]**Mind in the Eyes Task** (MIE: Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). This forced-choice task comprises 36 black and white photographs of the eye region of a person's face. The instructions ask the participant to choose one word from four options that best describes what each person in the picture is thinking or feeling after she views each of the photographs. The total score is the sum of the correct ratings for the 36 photographs. Higher scores indicate greater mentalizing skills; i.e., the ability to attribute mental states to another person.

Experimental Tasks

Cold pressor task. As a pain stimulus, the cold pressor task has been successfully used in both adult and children populations (Von Baeyer, Chambers, Piira, Trapponotto, & Zeltzer, 2005). Participants in the cold pressor task are asked to place their unclenched nondominant

[*] Although this measure was administered, the results were not analyzed in the current project.

hand into a container of cold water maintained at 4 degrees Celsius. They are instructed to verbally report to the experimenter when they first experience pain. Thirty seconds after the first report of pain, the experimenter instructs participants to remove their hand. However, participants could choose to remove their hand before the thirty seconds elapsed. This paradigm assures that all participants experience the painful stimulus for an equal time period.

Video stimulus. The video stimulus used in this study is a one-minute video clip that was excerpted from the movie, *Unbreakable.* It depicts an older male character as he falls down a long flight of stairs and grimaces in pain.

Procedure

In advance of the experimental session, the researcher contacted each potential participant and described the inclusion and exclusion criteria to her. All participants provided written informed consent and confirmed their eligibility at the beginning of the experiment. All study procedures were carried out by the principal investigator on this project.

Eligible participants were randomly assigned, by alternating between the two conditions: pain or control. First, all participants completed the IRI and the DERS. Next, the participants received standardized instructions and completed the Mind in the Eyes Task (Baron-Cohen et al., 2001). This computer task comprised 36 black and white photographs of the eye region of the face.

After completing the MIE, the researcher instructed participants assigned to the pain condition to place their hand in a cold-water bath and to report when they first experienced pain. Immediately after the participant's withdrawal of her hand from the cold water, the researcher offered the participant a towel to dry her hand. The participant was then reminded of the video clip. After completing the questionnaires, control participants, who did not undergo the cold

pressor test, received immediate notification of the video clip. All participants watched the video stimulus and then completed the self-report measure of situational empathy (Batson et al., 1997). Finally, the participants were compensated and debriefed regarding the experiment. The entire length of the experimental session was approximately thirty minutes.

Results

Baseline measures

There were no significant differences between the experimental groups on any of the baseline measures (IRI, DERS, MIE), suggesting that random assignment was effective (all $p > .05$). See Table 2 for complete listing of means, standard deviations, and p-values. One-way ANOVA analyses showed that there were no differences between ethnic groups on measures of either empathy ($F(2, 23) = .362$, $p = .700$) or personal distress ($F(2,23) = .186$, $p = .832$). There were no missing data.

Outcome measures

The results of the experiment did not support either Hypothesis 1a or 1b. There were no significant differences in reported empathy between the control and experimental (cold pressor) conditions ($t = -.232$, $p = .818$). When the "warm" item was removed from the empathy subscale, the difference remained nonsignificant ($t = -.322$, $p = .750$). This ancillary analysis was conducted because, due to the content of the cold pressor task and the temperature outside, many participants seemed to confuse physical and emotional feelings of warmth. Measures of personal distress were significantly lower in the cold pressor condition than the control condition ($t = -2.684$, $p = .012$).

Dispositional Empathy and Emotion Regulation

To analyze the relationship between state and trait empathy within and across conditions, the Empathic Concern score was entered into the first step of a regression equation with Batson empathy score as the predicted variable. All results were nonsignificant across conditions (b =.259, $t(28) = 1.419$, $p = .167$), and within groups for both the cold pressor ($b = .441$, $t(13) = 1.772$, $p = .100$) and control conditions ($b = .032$, $t(13) = .116$, $p = .909$).

To analyze the relationship between emotion regulation skills and personal distress within and across conditions, the DERS total score was entered in the first step of a linear regression equation using Batson personal distress as the predicted variable. This produced no significant results either across conditions ($b = -.268$, $t(28) = -1.474$, $p = .152$), for the cold pressor condition ($b = -.173$, $t(13) = -.632$, $p = .538$), or for the control condition ($b = .-029$, $t(13) = -.104$, $p = .919$).

Discussion

Evaluation of Hypotheses

Neither component of the first hypothesis was supported by the results. Across the experimental groups, reported empathy was not significantly different. The differences in personal distress were significant in the opposite direction predicted; i.e., participants in the control condition reported higher personal distress than those in the cold pressor condition. Regression analyses to investigate the relationship between dispositional and state empathy produced no significant findings, and thus failed to support the second hypothesis. Finally, the third hypothesis, predicting a relationship between emotion regulation skills and personal distress was not supported by the regression analyses.

Interpretation of Results

The data show that those in the cold pressor condition reported less personal distress than those in the control condition. The cold pressor participants' attention to the video stimulus may have been diverted by painful and numb sensations in their hand. Top-down cognitive processes, such as attention, have been reported to affect feelings of empathy (Goubert et al., 2005; Hein & Singer, 2008). It remains unclear, however, as to why there was a significant difference in personal distress but not in empathy across the conditions. It would be expected that attention processes would modulate both empathy and personal distress. Perhaps the Batson empathy subscale was not as sensitive to variation, as indicated by the absence of correlation with any of the baseline measures.

It also seems that empathic responses are prone to habituation (Prkachin et al., 2006). In this way, the study attempted to use painful experiences to dishabituate lessened empathic responses towards others' pain. However, one possible interpretation of the data would suggest that the painful cold pressor task was not salient enough to enhance the attenuated empathic response. The concept of the "empathy gap," which suggests that individuals underestimate others' visceral drives, becomes useful in this context. (Nordgren, Banas, & MacDonald, 2011).

Additionally, the limited construct validity of the measures potentially accounts for the lack of significant findings from the regression analyses to support the second and third hypotheses. Although, dispositional empathy has been conceptualized as a unitary measure, the IRI did not allow a composite score and therefore did not provide a clear measure of the construct. Doubt about the IRI's clarity of construct is buoyed by the lack of significant inter-correlations among its subscales. Additionally, the Batson empathy and personal distress scale does not seem to capture well the three components of empathy (affective response, cognitive

process, and emotion regulation) described earlier. The instruments for both the baseline and outcome measures may have obscured any real effects of the painful stimulus.

Strengths and limitations

There was at least one strength of the study. To the author's knowledge, this study was novel in its attempt to examine the effect of immediate pain on feelings of empathy. In this way, it provides pilot data about a relationship previously untested in a laboratory setting. However, several limitations merit mention. The dispositional empathy and the outcome measures were limited in utility and precision. First, by its lack of composite scale, the IRI scale was insufficient for the needs of the study and did not offer a clear measure of the dispositional empathy construct. Second, the outcome measures of empathy and personal distress did not seem to fully capture the three components of empathy as described in the introduction. The original experiment using the Batson scale did not provide reliability or validity properties. In addition, reliance upon a single outcome measure also did not allow for checks of the manipulation effectiveness. Such information might have provided data for more nuanced interpretations. In sum, the weaknesses of the measures chosen may have contributed to the failure to find significant results. Next, generalizability of results is limited by the small sample size, which consisted only of female undergraduates. Given the limited scope and timeframe of the study, this relatively homogenous sample did eliminate some confounding variables. Additionally, the small sample size failed to provide adequate power to investigate the chosen number of variables.

Components of empathy such as softheartedness, compassion, and sympathy, are socially desirable traits. Thus, demand characteristics may have influenced the results. All efforts were made to limit demand effects by following a script and providing limited information about

constructs under inquiry. The written informed consent stated that we would be asking about "certain kinds of emotions" rather than "empathy and personal distress." However, since the experimenter was not blinded to the hypotheses of the study, demand characteristics still represent a threat to internal validity.

Finally, the list of limitations provides insight into the complexities and obstacles a young researcher encounters. Much of this project's undertaking became a lesson in how not to conduct research. The following things were learned by the investigator: constructs should be clearly defined, the measures must be chosen carefully, and data analysis plans should be should thoroughly articulated. Each step in the process is important to collect quality data and should not be rushed. I also discovered the pitfalls in the process of culling research literature into testable hypotheses and translating the hypotheses into actual methods. A seemingly straightforward experiment requires extraordinary integration of theory, supporting data, and creativity. I came to understand the necessity of working at a level of analysis congruent with the methodology. Good research requires more patience, forethought and conversation than the investigator anticipated.

Future research

First, in light of the literature about habituation to pain, future research should account for participants' previous pain experiences, both chronic and acute, to determine the ways in which they interact with pain thresholds, empathy, and personal distress. Individuals with significant exposure to or experiences of pain may have become habituated to the empathic experience, which could account for some variability. Future studies could also attempt to use more precise and varied outcome measures in order to further delineate the constructs of empathy and personal distress. Psychophysiological instruments, instead of single-source self-report measures, could

potentially address a distinct but complimentary dimension. Additionally, future research should integrate other empathy-eliciting stimuli to see if the participants' responses vary by congruence or incongruence of the age, ethnicity, and status of the person experiencing pain. As suggested by the significant correlation between dispositional fantasy and situational personal distress, a less dramatized video stimulus or the use of a confederate may produce different findings.

Implications and Conclusion

This study examined the effects of recent acute pain on feelings of empathy. Although the study did not find the hypothesized differences in empathy across the experimental groups, those who experienced pain reported feeling significantly less personal distress. This was viewed as an attentional function produced by the study conditions. Neither the second nor third hypotheses were supported. Attention processes may account for the significant difference in personal distress across the conditions. Ultimately, the study did not provide evidence to support the assertion that individual pain enhances empathy for others undergoing similar experiences.

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Tables and Graphs

Table 1
Pearson Bivariate Correlation Matrix[a]

	IRI Perspective taking	IRI Fantasy	IRI Empathic Concern	IRI personal distress	DERS Impulse	DERS Awareness	DERS Strategy	DERS Clarity	DERS Goals	DERS Acceptance	Batson Personal Distress	Batson Empathy
IRI Perspective taking	1											
IRI Fantasy	-.049	1										
IRI Empathic Concern	.081	.394*	1									
IRI Personal Distress	-.036	-.015	-.074	1								
DERS Impulse	.102	-.005	-.326	.524**	1							
DERS Awareness	.146	-.284	-.194	-.144	-.352	1						
DERS Strategy	-.058	-.069	-.036	.494**	.698**	-.340	1					
DERS Clarity	-.192	.156	-.329	.072	.331	.137	-.029	1				
DERS Goals	-.097	.430*	.181	.279	.509**	-.573**	.539**	.044	1			
DERS Acceptance	.129	.087	-.081	.067	.531**	-.050	.429*	.393*	.274	1		
Batson Personal Distress	.110	.389*	.315	-.103	-.283	.114	-.394*	.038	-.056	-.085	1	
Batson Empathy	.124	.249	.259	-.097	-.053	-.156	-.082	-.127	.134	-.244	.491**	1

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
[a] n =30

Table 2
Means and Variances of Baseline Measures

Measure	Both Conditions [a]		Cold Pressor [b]		Control [b]		Difference in Means between Cold Pressor and Control Condition [c]	
	M	*SD*	*M*	*SD*	*M*	*SD*	*t*	*p*
IRI Subscales								
Perspective taking	18.03	3.791	17.67	4.15	18.40	3.501	-.523	.605
Fantasy	20.33	4.729	20.53	4.868	20.13	4.749	.228	.821
Empathic concern	21.97	3.728	21.73	3.863	22.20	3.707	-.338	.738
Personal distress	12.27	4.331	12.27	4.399	12.27	4.415	.000	1.000
DERS subscales								
Impulse	10.53	4.584	12.07	5.763	9.00	2.299	1.91	.066
Awareness	13.23	4.651	12.13	3.962	14.33	5.150	-1.311	.200
Strategy	17.47	7.094	19.60	8.440	15.33	4.806	1.700	.100
Clarity	10.83	3.354	10.93	3.750	10.73	3.035	.161	.874
Goals	15.83	4.742	16.80	5.267	14.87	4.103	1.121	.272
Acceptance	12.97	5.149	14.07	5.021	11.87	5.208	1.178	.249

[a] n=30
[b] n=15
[c] df=28

Table 3
Means and Variances of Measures of Situational Empathy and Personal Distress

Measure	Both Conditions [a]		Cold Pressor Condition [b]		Control condition [b]	
	M	*SD*	*M*	*SD*	*M*	*SD*
Batson Overall	4.22	1.029	3.89	1.20	4.54	.724
Batson Personal Distress	4.66	1.208	4.12	1.297	5.20	.850
Batson Empathy	3.63	1.159	3.58	1.271	3.68	1.079

[a] n=30
[b] n=15