

Eliciting Empathy for Adults in Chronic Pain through Autobiographical Memory Sharing

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Summary: Two studies ($N=80$; $N=91$) investigated whether sharing an autobiographical memory increases empathy for a person experiencing chronic pain. Across studies, empathy was assessed after reading a pain-related narrative of either a 25- or 85-year-old target and again after assignment to one of two recall conditions. Conditions involved recalling a pain-related autobiographical memory (Studies 1 and 2), or as comparisons, recalling the target's pain narrative (Study 1) or recalling a character in pain from a movie (Study 2). Looking across both studies, empathy levels appear to increase after sharing an autobiographical memory but not in the comparison conditions. Increases in empathy were related to trait-level agreeableness. When target-age differences emerged (Study 2), participants felt greater empathy for the older person. Findings are discussed in terms of the function of autobiographical memory in eliciting pro-social emotions such as empathy and implications for training empathic responding. Copyright © 2012 John Wiley & Sons, Ltd.

Whether empathizing with a family member newly diagnosed with cancer or with a friend feeling down after a rough day at work, people feel for each other through empathy. The current research focuses specifically on empathy for a person perceived to be experiencing chronic pain. Understanding when and how empathy can be elicited has applications in real-world situations including formal and informal caregiving. One aim of this research is to investigate whether sharing autobiographical memories of having experienced pain might increase one's empathy for others in pain. Another aim is to examine whether the perceived age of the target person in pain (i.e., younger or older adult) affects the level of empathy that others feel toward them. To introduce the studies, we provide a brief definition of empathy. This is followed by an overview of the functional approach to autobiographical memory with emphasis on the social function, specifically how autobiographical memory sharing is theorized to elicit empathy. Potential effects of age stereotypes on empathy are then discussed, and some information on chronic pain is presented to highlight potential applications of this research in care-giving settings where people interact with individuals in pain.

Defining empathy

Although the debate continues over the specific biopsychosocial and evolutionary processes involved in empathy, it has been defined as a 'sensitivity to, and understanding of, the mental states of others' (Smith, 2006, p. 5). What does sensitivity to the mental states of others entail? The cognitive aspect of empathy involves an ability to comprehend another's state (Smith, 2006) and can be traced to Kant (1788/1949) who proposed that affect plays little role in the formation of moral behaviors. Rogers (1959, p. 210) added to this cognitive conception of empathy by explicitly including perspective-taking in his definition, 'to perceive the internal frame of reference of another person with accuracy'. The conception of empathy as an affective process originally focused on sharing

the emotional experience of another, not on perspective-taking (Hume, 1777/1966). For example, Keefe (1976) argued that empathy may have cognitive components but critically also involves an affective response.

Current conceptions of empathy have moved beyond viewing it as exclusively cognitive or affective. Instead, empathy is as an integrated process in which the following are fundamental (Decety & Jackson, 2004): (i) the cognitive ability to take the perspective of another and (ii) an affective response to another's situation. The current studies used a self-report measure that integrates cognitive and affective aspects of empathy [Interpersonal Reactivity Index (IRI); Davis, 1983]. As empathy may be considered a pro-social value, a measure of social desirability (Paulhus, 1991) was also included. Note however, that social desirability, like empathic responding, may be an aspect of social competency. That is, it may require taking others' perspectives, understanding how they will feel, and then managing one's own impression to produce a pleasing effect. We use it as a control variable in the current work but future work might more fully explore the interrelation of socially desirable responding, particularly impression management, and pro-social behavior such as empathy.

Social functions of autobiographical memory: eliciting empathy

What is the process through which empathy occurs? Ickes (1997, p. 2) stated that empathy is a 'complex psychological inference in which observation, *memory*, knowledge, and reasoning are combined to yield insights into the thoughts and feelings of others (*italics added*)'. Of these facets, the current research focuses particularly on the role of autobiographical memory in producing empathy. That is, individuals may utilize autobiographical memory to identify relevant personal experiences that provide a basis for how to understand others' states (Lockhart, 1989). A brief review of the functional approach to autobiographical memory examines how this might operate.

On the basis of previous theory (Cohen, 1998; Hyman & Faries, 1992; Pillemer, 1998), Bluck and Alea (2002) categorized

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the functions of autobiographical memory into three broad areas (i.e., self, social, directive) with one being a social function. Their conceptual model (Alea & Bluck, 2003) delineates the factors that influence the extent to which autobiographical memory serves social functions, such as eliciting empathy. According to the model, autobiographical memories serve several important social functions including (i) developing and maintaining intimacy, (ii) teaching and informing others, and (iii) eliciting and expressing empathy. Sharing autobiographical memories may elicit an empathic response from a listener if the speaker's memory engages the listener, and if the listener responds with an autobiographical memory that relates to the experience of the speaker (Pillemer, 1992). The model proposes that several factors influence how well social functions are served in a given situation. For example, the degree to which social functions (e.g., empathy) are served can depend on characteristics of both the speaker (e.g., personality) and the target (e.g., age). On the basis of this conceptual model, we predicted that sharing an autobiographical memory would increase an individual's level of empathy overall. Participants' personality traits were assessed, and the age of the target person experiencing pain was varied so as to examine any potential variations in the general effect on the basis of characteristics of the participant or target. Although one other study has examined individual differences in empathy and autobiographical memory performance (Pohl, Bender, & Lachmann, 2005), to our knowledge, this is the first study to examine whether memory sharing can serve the function of increasing empathy.

Do age stereotypes affect empathy?

Ageist stereotypes remain common and may hinder people from being responsive to older adults (McGuire, Klein, & Chen, 2008). Ageism can result in the (inaccurate) attribution of either positive or negative characteristics to persons, based solely on their age (Carstensen & Hartel, 2006; Cherry & Palmore, 2008). Older adults in chronic pain may face the ageist view that experiencing pain is normative (Gagliese & Melzack, 1997). This is consistent with lifespan theory concerning normative age-graded events and expectations (Baltes, 1997). As such, negative views of aging may influence people to feel greater empathy for older individuals in general, resulting in even higher levels of empathy toward older persons who endure the double 'misfortune' of being both old and in pain. As such, differences in empathy toward older and younger pain targets were assessed in the current research, with the expectation of higher levels of empathy toward the older target.

Application: eliciting empathy for people experiencing chronic pain

We chose to focus on empathy for persons in chronic pain because of its applied relevance. Chronic pain affects 5% to 7% of the general population (Frischenschlager & Pucher, 2002). Although people often assume that pain is tied to physiological damage, it can be the result of a combination of physical, psychosocial, and cultural factors. Current clinical methods of assessing pain rely on reports from the patient, the patient's nonverbal expressions, and subjective assessments from caregivers (Horgas, Nichols, Schapson, & Vietes, 2007). The multifaceted etiology of pain makes it difficult to assess objectively:

Poor communication about pain can lead to inaccuracies in the type and extent of pain a person is suffering. When medical professionals garner reports from caregivers, empathic caregivers are more likely to characterize the patient's pain accurately (Carper, 1978; Strayer & Roberts, 1989). As such, understanding the role of autobiographical memory in increasing empathy may have application in all of our daily lives, but be of particular use in training empathic responding in both informal family caregivers and health professionals caring for people in pain. Models of caregiving suggest that empathy is indeed a teachable skill that has tangible benefits (Schulz *et al.*, 2007).

The current research

The following studies investigate the role of autobiographical memory sharing in increasing empathy toward younger and older people in chronic pain. Using methodology previously employed for studying the intimacy function of autobiographical memory (Alea & Bluck, 2007), the current research assesses participants' empathy levels after reading a standard narrative written by a person experiencing chronic pain (pre-test) and then after random assignment to one of two conditions (post-test). Perceived age (25 vs. 85 years old) of the pain narrative's author is varied systematically.

In Study 1, conditions involve sharing either an autobiographical memory of having personally been in pain or in the comparison condition, orally recalling the target person's narrative. The comparison condition was chosen carefully to provide a conservative test of the role of autobiographical memory. That is, the comparison condition involves recalling the person in pain and repeating their pain narrative, thereby focusing the participant on the target person's perspective. Although we predicted autobiographical memory sharing would increase empathy on theoretical grounds, note that it was not obvious that this condition manipulation would work: It is equally plausible that recalling one's own autobiographical pain experience might make one self-focused and in fact distract one from appreciating the other person's pain (e.g., Ryback, 2001). Study 2 also assesses autobiographical memory sharing but uses a new comparison condition to examine whether it is uniquely autobiographical memories that elicit empathy: The participant orally recalls a movie scene of their choice in which a character experienced pain.

Comparison conditions of both Studies 1 and 2 were chosen in light of potential demand characteristics. That is, given the pre-post design, participants might feel that their empathy should increase from pre to post. As such, we designed comparison conditions such that participants interacted meaningfully with the pain narrative: There is no reason that demand should occur more in the autobiographical memory condition than in the comparison conditions. As additional precautions, two forms of the empathy measure were administered in counterbalanced order, the study included a measure of social desirability, and the time between pre-test and post-test was increased through use of a filler task.

The research aims are (i) to test whether participants who perceive the pain narrative as written by an 85-year-old will report higher baseline empathy levels (i.e., at pre-test) than those who believe it was written by a 25-year-old; (ii) to test the prediction that participants who share an autobiographical memory (but not those in comparison conditions) will show an increase in

empathy ratings from pre-test to post-test (regardless of narrator's perceived age). The final aim is exploratory. If increases in empathy do occur, analyses will also examine (iii) what factors might explain such increases. This included testing whether increases in empathy were related to characteristics of the stories that people told in the study, their general tendency to use memory in a functional manner (e.g., to serve social purposes), or participants' current personality.

METHOD

Both studies are 2 (Memory Recall Condition: autobiographical sharing, comparison) \times 2 (Narrator's Age: 25 years, 85 years) \times 2 (Participant Gender) repeated measures designs. Time (pre-test, post-test) is the repeated measure. All others are between subjects variables.

Pain narrative development

To maximize ecological validity, we developed a narrative by combining journal entries of a community resident experiencing chronic pain. In a review of the literature, severity, interference with life, and emotional burden were identified as three major dimensions of chronic pain (VonKorff, Jensen, & Karoly, 2000). The pain narrative was thus enhanced to ensure representation of these dimensions (Jacob & Kerns, 2001). The narrative was gender and age neutral, 932 words long, and describes a morning in the life of a person experiencing chronic pain. The age of the narrator was revealed on a cover page and referenced at the beginning and end of the narrative. Besides the systematically varied age references, the two narratives were identical. This excerpt provides a sense of the pain narrative's content:

About a month ago I think it was. Yes, it was actually right after my 85th [25th] birthday, I had one of these flares. This time, it was mostly in my hips more than anything else... The sun was coming in my window and it looked like it would be a nice day. But I was really stiff. So I lay in bed and took a few minutes to just do some deep breathing and stretching to try to ease the pain a little. After awhile, I carefully got out of bed and got my walker from the hall closet right next to my bedroom doorway. I tried to get started with my day. Try is the operative term. I walked out of my bedroom and then was walking toward the fridge to get some orange juice. I felt a sharp pain right as I reached for the handle. I froze and leaned over the counter wincing with the pain. Words really can't describe how the pain affects me. The pain...and then the feeling that I can't do anything about it. ...This flare that I had last month, just after my 85th [25th] birthday, is one of the worst flares I remember. ...

STUDY 1

Participants

Participants ($N=80$; 40 men, 40 women) were undergraduate students (18–25 years old; $M=19.28$; $SD=1.59$) who received course credit as compensation. The breakdown of ethnicities included 57.7% Caucasian, 15.4% Hispanic, 12.8%

African-American, 7.7% Asian/Pacific Islander, and 6.4% 'other'. To ensure participants had previous experience with pain and could thereby share an autobiographical memory, we administered the Personal Pain History (Kerns, Turk, & Rudy, 1985). On 7-point scales, all participants had experienced a moderate amount of pain at least once in their life: severity ($M=4.03$, $SD=1.67$), emotional burden ($M=2.95$, $SD=1.38$), and interference with activities ($M=2.65$, $SD=1.46$).

Measures

All measures used in the study are described. They are presented in the order that they were administered.

Interpersonal Reactivity Index (Davis, 1983)

The IRI is a self-report measure assessing empathy with 28 items by using 5-point Likert-type scales. A subset of 14 cognitive and affectively focused items from the longer scale was used. Items are the same as in the original scale but focused participants to report how they were feeling right at that moment and in reference to the target person (i.e., the narrator in pain). Items generally assess the tendency to adopt another's perspective or viewpoint and to feel warmth and concern toward the target person. Example items include 'I am quite touched by the person's situation' and 'I am trying to understand the person better by imagining how things look from their perspective'. The internal consistency for the brief IRI measure was adequate for both the pre-test (Study 1, Cronbach's $\alpha=.65$; Study 2, Cronbach's $\alpha=.74$) and post-test (Study 1, Cronbach's $\alpha=.76$; Study 2, Cronbach's $\alpha=.96$). Two forms of the IRI were created in which items appeared in different random order.

Pronounce filler task

This task was used as a filler to lengthen the time between administration of the pre-test and post-test measures of empathy. The task required rating the subjective ease of pronunciation of numerous words by using 7-point Likert-type scales (1 = *easy*; 4 = *medium*; 7 = *hard*). The task was chosen because its content is neutral and therefore unlikely to interfere with the subsequent measures.

Memory Quality Questionnaire (Bluck, Levine, & Laulhere, 1999)

The Memory Quality Questionnaire (MQQ) was used to assess participants' ratings of the recalled memory in both conditions by using 7-point Likert-type scales. Participants dated the shared memory and rated it on several dimensions. Exploratory factor analysis for both studies revealed a two-factor solution accounting for 67.25% (Study 1) and 71.62% (Study 2) of the variance. A personal significance factor was composed of three items concerning the significance, memorability, and vividness of the memory. An emotional re-experiencing factor included two items concerning the valence (positive, negative) of the event when it occurred and when it was remembered.

Manipulation checks

The pain manipulation check ensured that participants viewed the target person as actually being in pain. Participants completed a modified version of the West Haven-Yale Multidimensional Pain Inventory (WHYMPI, Part 1; Kerns et al., 1985) in

relation to the narrator's pain. To ensure that participants had processed the age of the target person (i.e., 25 or 85 years old), we asked them to recall the narrator's age in years. In addition, participants rated their perceived level of similarity to the narrator on a 7-point Likert-type scale.

Personality (NEO-FFI; Costa & McCrae, 1992)

The Neuroticism Extraversion Openness-Five Factor Inventory is a 60-item, self-report measure of the 'Big Five' personality traits. Questions assess the extent to which people agree or disagree with statements that describe them (e.g., 'I see myself as someone who is talkative'). Responses are made on 5-point Likert-type scales (1 = *disagree strongly* to 5 = *agree strongly*). Items were averaged to produce subscales indicative of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness.

The Balanced Inventory of Desirable Responding (Paulhus, 1991)

The Balanced Inventory of Desirable Responding (BIDR) has two subscales that measure self-deceptive responding and impression management. Its 40 items are rated on 7-point Likert-type scales (1 = *not true*; 7 = *very true*). Criterion validity of the BIDR has been demonstrated by a correlation of .71 with the Marlowe-Crowne Scale of Social Desirability (Paulhus, 1991).

Thinking About Life Experiences (Bluck, Alea, Habermas, & Rubin, 2005)

The Thinking About Life Experiences (TALE) scale is a 15-item, self-report measure assessing people's general tendency to use autobiographical memory for adaptive functions. Participants rate how frequently they use memory for each of a variety of functions by using 5-point Likert-type scales. The self-continuity subscale focuses on thinking about the past to maintain a sense of self over time. The social-bonding subscale considers how the past is used to initiate or maintain social bonds. The directing behavior subscale centers on using memories to make plans or set goals for current or future behavior. All subscales show good convergent and discriminant validity, and internal consistency. Cronbach's α ranges from .74 to .83 across the subscales (Bluck & Alea, 2011).

Personal Pain History

This questionnaire was adapted from the WHYMPI (Part 1; Kerns et al., 1985). Seven-point Likert-type scales assess levels of three major aspects of pain: pain severity, interference with life, and emotional burden associated with one self-selected personal pain event in the life of the participant.

Procedure

Study materials were administered to participants individually in a comfortable interview room by a trained young female researcher. After completing informed consents, the participants read a pain narrative, which appeared to have been written by either a younger (i.e., 25 years old) or older adult (i.e., 85 years old). After reading the narrative, participants completed the items from the IRI as a pre-test empathy measure. Two forms of the index (Form A, Form B) were created in which the same items appear, but in different random orders. Use of the two

forms was counterbalanced across pre-test and post-test. In addition to using two forms of the IRI, participants also completed a filler task, rating the ease of pronunciation of words for 10 minutes, to make it less likely that they simply recalled how they responded to pre-test items. Next, participants were randomly assigned to either the autobiographical-memory condition or the other-memory condition. In both conditions, the pain narrative was reinstated through a brief synopsis read to each participant. After either thinking of a personal pain experience to share (autobiographical-memory condition) or after taking time to think about the pain narrative they had read (other-memory condition), participants had seven minutes to provide an oral, open-ended narrative recall. They were encouraged to recall as much as possible and received two standard prompts to ensure completion when it appeared that they had ended their narrative. In the autobiographical-memory condition, participants shared an autobiographical memory of a personal pain experience. In the other-memory condition, they recalled as much about the other person's pain narrative as they could. Participants in both conditions were instructed to frame their recollection as a response to the person who wrote the pain narrative, and were told 'Tell your story as if the person whose pain story you read was sitting here in the room with us'.

The IRI items were completed for a second time at post-test. The Memory Qualities Questionnaire (Bluck et al., 1999) was then administered to assess qualities of the shared memory in both conditions. This was followed by the manipulation checks in which participants estimated the age of the narrator, indicated how much pain they believed the narrator was in (WHYMPI, Part 1; Kerns et al., 1985), and rated their perceived similarity to the narrator. The remaining measures including the NEO-FFI (Costa & McCrae, 1992), BIDR (Paulhus, 1991), TALE (Bluck et al., 2005), and Personal Pain History (Kerns et al., 1985) were given at the end of the session.

Results

The results are reported in three sections. After presentation of control analyses, the second section provides results of major analyses examining the first two study aims. The third section contains exploratory follow-up analyses investigating whether aspects of personality, as well as various qualities and uses of memories, predict post-test empathy ratings.

Manipulation checks and control analyses

Narrator's age. The manipulation check ensures that participants who read narratives purportedly by a younger and older person were indeed aware of the age of the narrator. Thirty-nine participants (97.5%) in the old narrator condition and 39 participants (97.5%) in the younger narrator condition reported the narrator's age within five years of the exact age. The two participants who were inaccurate were removed from the data set.

Narrator's pain. This manipulation check determined that participants indeed perceived the narrator as in pain and did so consistently across conditions. ANOVAs compared narrator pain on the three subscales of the WHYMPI (Part 1; Kerns et al., 1985). Memory Recall Condition (autobiographical memory, other memory) and Narrator's Age (25 years old, 85 years old) were between group variables. There were no main effects

or interactions. Across the sample, participants rated the narrator as experiencing a moderate level of pain: severity ($M=4.77$, $SD=0.77$), emotional burden ($M=3.22$, $SD=1.13$), and interference ($M=4.22$, $SD=0.99$).

Socially desirable responding. Because empathy is a pro-social value, some participants may have reported inflated levels of empathy. To check for this, we correlated the BIDR (Paulhus, 1991) self-deception and impression management subscales with IRI empathy pre-test and post-test scores. Post-test empathy scores were correlated with impression management scores, $r(76)=.22$, $p<.05$. No other correlations were detected. To account for this relation in Study 1 (and for parsimony in Study 2), we ran all analyses with and without impression management as a covariate. Because inclusion of the covariate did not change the pattern of results in either study, all analyses are reported without the covariate.

Major analyses

In keeping with the study aims, the first analysis explores differences in empathy felt for a younger versus older person experiencing chronic pain. The next analysis examines whether sharing an autobiographical memory results in greater empathy than does the comparison condition. Final analyses examine whether personality or other predictors of increased empathy can be determined.

Does empathy depend on the age of the person experiencing pain? An ANOVA was run with Narrator's Age (25 years old, 85 years old) and Participant Gender (male, female) as between group variables, and the pre-test empathy measure (IRI) as the dependent variable. Pre-test IRI scores for the younger and older narrator did not differ. There was a main effect for Participant Gender, $F(1, 74)=13.12$, $p<.05$, $MSE=0.20$, $\eta^2_p=0.15$. Consistent with past research (e.g., Pohl et al., 2005), women provided higher ratings of empathy ($M=3.12$, $SD=0.49$) than men ($M=2.76$, $SD=0.38$). No other main effects or interactions were detected.

Does autobiographical memory sharing elicit empathy? We predicted changes in empathy from pre-test to post-test in the autobiographical-memory condition but not in the other-memory condition. A 2 (Memory Recall Condition: autobiographical memory, other memory) \times 2 (Narrator's Age: 25 years old, 85 years old) \times 2 (Participant Gender) repeated measures ANOVA was performed. Memory Recall Condition, Narrator's Age, and Participant Gender were between-subjects factors, Time (pre-test empathy, post-test empathy) was the within-subjects factor, and IRI empathy scores were the dependent variable. Including Narrator's Age as a factor in these analyses allows examination of whether changes in empathy within memory recall conditions occur differentially by perceived age of the pain narrator. There was a trend toward significance for the interaction of Memory Recall Condition \times Time, $F(1, 69)=3.10$, $p=.08$, $MSE=0.11$, $\eta^2_p=0.04$. This trend suggests that those in the autobiographical memory condition show increased empathy whereas those in the comparison condition do not (Figure 1). There were no other significant effects.

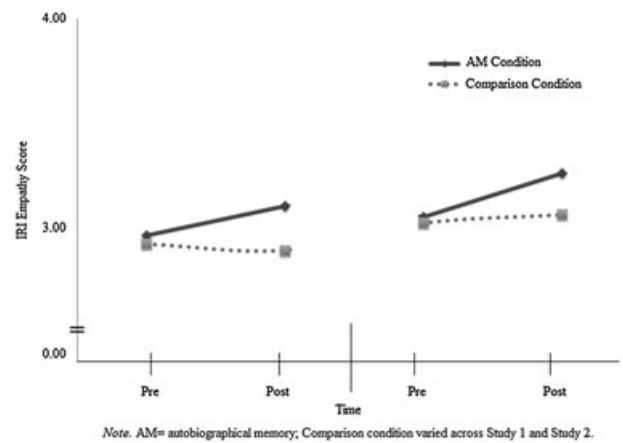


Figure 1. Changes in IRI empathy scores from pre-test to post-test by condition (Studies 1 and 2)

Relation of empathy to memory characteristics, uses, and personality. Exploratory analyses were conducted for the autobiographical memory-sharing condition to examine whether characteristics of the shared memory, overall self-reported functional use of memory, or personality traits were predictors of this increase. Note that the personal significance subscale (MQQ), self-continuity subscale (TALE), and both extraversion (NEO-FFI) and agreeableness (NEO-FFI) are all correlated with IRI scores at both the pre-test and post-test (r ranges from .34 to .57; all $p<.05$). Scores on the directive subscale (TALE; $r=.35$; $p<.05$) are correlated with IRI scores only at the post-test. The question of interest, however, was whether any variables were good predictors of post-test empathy after controlling for pre-test scores (i.e., thereby assessing change in empathy) and accounting for variability in impression management (from the BIDR).

Three hierarchical regressions were performed with IRI post-test empathy as the criterion. Each used IRI pre-test scores on the first step to control for baseline differences in empathy. The first examined memory qualities as predictors: IRI pre-test empathy and BIDR impression management were entered on the first step, followed by MQQ personal significance and emotional re-experiencing subscales. IRI pre-test empathy ($\beta=.75$) was the only significant predictor of IRI post-test scores, adjusted $R^2=.61$, $F(2, 37)=29.101$, $p<.05$, $\eta^2_p=0.10$. Memory quality variables did not play a role in empathy increases in autobiographical memory sharing.

Next, IRI pre-test empathy and BIDR impression management were again entered on the first step but this time followed by memory functions: TALE self-continuity, social bonding, and directing behavior subscales. Again, IRI pre-test empathy ($\beta=.75$) was the only significant predictor of IRI post-test scores, adjusted $R^2=.60$, $F(2, 37)=29.10$, $p<.05$, $\eta^2_p=0.10$. Self-reported memory function variables did not play a role in empathy increases at the post-test.

A final regression examined personality traits: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The first step included the IRI pre-test empathy and BIDR impression management, and the second step included all personality subscales. IRI pre-test empathy ($\beta=.25$) was the only significant predictor of IRI post-test empathy scores, adjusted $R^2=.59$, $F(2, 37)=29.05$, $p<.05$,

$\beta^2 = 0.13$. There was a trend toward significance for agreeableness ($\beta = .27$) as a predictor of post-test empathy ($p = .08$).

Study 1 discussion

Participants did not report differences in empathy toward a younger versus older person perceived as experiencing the same level of chronic pain. Instead, they appear to have viewed the narrator simply as a person who is suffering, instead of responding to that suffering in relation to the narrator's age. On the basis of the functional approach to autobiographical memory (e.g., Bluck & Alea, 2002; Pillemer, 1992), it was predicted that sharing one's own autobiographical memory of having been in pain would increase the level of empathy felt toward the target person. A small effect was found supporting this hypothesis, with a trend toward significance. Study 2 sought to replicate this finding.

STUDY 2

The comparison condition in Study 1, recalling and narrating the target person's written narrative pain story, provided a strong test of the hypothesis (i.e., presumably greater processing of the pain narrative through not only reading it but recalling it and sharing it aloud could also increase empathy for the target). The purpose of Study 2 was to replicate the trend from Study 1 and also to provide a rigorous test of the hypothesis that autobiographical memory sharing *uniquely* contributes to increases in empathy. Study 2 examined whether autobiographical memories of having personally been in pain are necessary to increase empathy or whether any recollection involving pain features would be sufficient. The comparison condition in Study 2 involved recalling a scene from a movie that participants viewed in their own life in which a character experienced pain. There are three differences in the comparison conditions across the studies. In Study 1, participants in the comparison condition recall the story of the target person for whom they provide empathy ratings. In Study 2, the comparison condition (recalling a movie scene) is unrelated to the target person. Second, in Study 1, a rich (i.e., imagery, detail) autobiographical memory narrative is compared simply with a written narrative text. In Study 2, a rich autobiographical narrative is compared with a movie scene, which is also relatively rich: that is, has a narrative, visual, auditory, and contextual representation. Finally, in Study 1, the comparison condition is to recall a story chosen by the experimenter and heard only minutes earlier, whereas in Study 2, the comparison condition is more similar to the autobiographical memory condition in that it is a self-chosen movie scene and a long-term memory. What remains the same about the comparison conditions across both studies is that recall is about another person. Aims and predictions are the same as in Study 1.

Participants

Participants ($N = 91$; 52 men, 39 women) were undergraduate students (18–27 years old; $M = 19.57$, $SD = 1.53$) who received course credit for participation. The breakdown of ethnicity included 56% Caucasian, 20.9% African-American, 8.8% Hispanic, 7.7% Asian/Pacific Islander, and 6.6% 'other'. As in Study 1, the Personal Pain History showed that participants

had experienced a moderate amount of pain at least once in their life: severity ($M = 4.33$, $SD = 0.96$), emotional burden ($M = 3.12$, $SD = 1.36$), and interference ($M = 3.12$, $SD = 1.36$).

Measures

Study 2 employed the same measures as Study 1, administered in the same order.

Procedure

As in Study 1, following the administration of the IRI empathy pre-test, the filler task was presented for 10 minutes, and the narrative was briefly reinstated. Participants were then randomly assigned to either the autobiographical-memory or movie-memory condition. The autobiographical-memory condition was the same as in Study 1. In the movie-memory condition, participants were asked to remember a movie that they had seen sometime in their life in which a character experienced pain similar to that described in the narrative. They were then asked to recall and narrate that scene from the movie. Sharing of memory narratives proceeded with the same instructions as per Study 1. After thinking of an autobiographical pain experience to share (autobiographical-memory condition) or taking time to think about a movie scene to share (movie-memory condition), participants had seven minutes to orally recall their memory and received the standard prompts once it appeared they had completed their narrative.

Results

The first section presents control analyses. The second describes results of the major analyses examining study aims. The third section reports exploratory analyses investigating whether qualities or functions of memories, or aspects of personality, are predictive of post-test empathy.

Manipulation checks and control analyses

Narrator's age. Forty-six participants (100%) in the young narrator condition and 45 participants (100%) in the old narrator condition correctly stated the narrator's age within five years of the exact age. The age manipulation was effective.

Narrator's pain. ANOVAs were conducted to compare ratings of the narrator's pain experience (WHYMPI, Part 1; Kerns et al., 1985). Memory Recall Condition (autobiographical memory, movie memory) and Narrator's Age (25 years old, 85 years old) were between group variables. The pain manipulation was effective. Note that regardless of the condition they were in, participants perceived the narrator to be in moderate to intense pain on each subscale: severity ($M = 5.89$, $SD = 0.68$), emotional burden ($M = 3.72$, $SD = 0.95$), and interference ($M = 5.35$, $SD = 0.88$). There were no other main effects or interactions.

Socially desirable responding. Neither impression management nor self-deception subscales (BIDR; Paulhus, 1991) were related to IRI empathy pre-test or post-test scores.

Major analyses

Major analyses were conducted in relation to the study aims. Analyses address potential differences in empathy felt for a younger and older person in pain, and whether autobiographical memory sharing results in greater empathy from pre-test to post-test than does the comparison condition. Finally, analyses examine whether personality or other predictors of increased empathy can be determined.

Does empathy depend on the age of the person experiencing pain? An ANOVA with IRI pre-test empathy as the dependent variable and Narrator's Age (25 years old, 85 years old) and Participant Gender (male, female) as the between groups variables was conducted. There was a main effect for Narrator's Age. Participants reported higher empathy for older narrators ($M=3.14$, $SD=0.42$) than for young narrators ($M=2.93$, $SD=0.50$), $F(1, 87)=5.17$, $p < .05$, $MSE=1.02$, $\eta^2_p=0.06$. As in Study 1, a main effect for Participant Gender also emerged; women reported greater empathy ($M=3.19$, $SD=0.40$) than men ($M=2.91$, $SD=0.49$), $F(1, 87)=8.96$, $p < .05$, $MSE=1.77$, $\eta^2_p=0.09$.

Does autobiographical memory sharing elicit empathy? A 2 (Memory Recall Condition: autobiographical memory, movie memory) \times 2 (Narrator's Age: 25 years old, 85 years old) \times 2 (Participant Gender) repeated measures ANOVA was performed with Time (pre-test empathy, post-test empathy) as a within-subjects factor. As predicted, there was a significant Memory Recall Condition \times Time interaction, $F(1, 81)=5.70$, $p < .05$, $MSE=0.34$, $\eta^2_p=0.07$. Follow-up tests show that participants' empathy scores increased in the autobiographical-memory condition from pre-test ($M=3.05$, $SD=0.47$) to post-test ($M=3.30$, $SD=0.50$), $t(41)=5.81$, $p < .05$, but not in the movie-memory condition. See Figure 1. No other significant effects emerged.

Relation of empathy to memory characteristics, functions, and personality. As in Study 1, exploratory analyses were conducted to examine whether memory characteristics, memory functions, or particular personality factors predict the obtained increases in empathy in the autobiographical-memory condition. Note that only the scores on the NEO-FFI agreeableness subscale are significantly correlated with both the pre-test ($r=.42$; $p=0.001$) and post-test ($r=.58$; $p < .001$) empathy scores. The self-continuity subscale of the TALE ($r=.30$; $p < .05$) was correlated with IRI scores at pre-test. The question of interest, however, was whether any variables were predictors of post-test empathy after controlling for pre-test scores (i.e., related to increases in empathy at the post-test).

Three hierarchical regressions were performed with IRI post-test empathy as the criterion. Each used IRI pre-test scores on the first step to control for baseline differences in empathy. In the first regression, examining memory qualities as predictors, the IRI pre-test empathy score and BIDR impression management were entered on the first step, followed by the MQQ personal significance and emotional re-experiencing subscales. Pre-test empathy ($\beta = .80$) was the only significant predictor of post-test empathy, adjusted $R^2 = .65$, $F(2, 42)=41.95$, $p < .001$, $\eta^2_p=0.16$. In the second regression, IRI pre-test

empathy and BIDR impression management were again entered on the first step, this time followed by the three TALE memory functions subscales. Pre-test empathy ($\beta = .80$) was again the only significant predictor of post-test empathy, adjusted $R^2 = .65$, $F(2, 42)=41.95$, $p < .001$, $\eta^2_p=0.16$.

A third regression was conducted to determine the predictive value of personality traits. The first step included the IRI pre-test empathy and BIDR impression management, and the second included all NEO-FFI personality subscales. Pre-test empathy scores predicted post-test empathy scores, adjusted $R^2 = .65$, $F(2, 42)=41.95$, $p < .001$, $\eta^2_p=0.16$. In addition, replicating the marginal finding in Study 1, agreeableness ($\beta = .39$) significantly predicted post-test empathy scores, adjusted $R^2 = .72$, $F(7, 37)=17.26$, $p < .05$, $\eta^2_p=0.10$.

Study 2 discussion

Study 2 results suggest that individuals may feel somewhat more empathy for older persons. Individuals may base their greater empathy on the perceived 'double jeopardy' of older persons being both old and in pain. Note, however, that the current study confounds age similarity between the participant and target with pain status. That is, future work might use a fully crossed design with younger and older participants who provide empathy ratings for older and younger targets who either are or are not in pain. Such a design is necessary to replicate the current results (found only in Study 2) and to reveal factors that consistently lead to individuals feeling greater empathy for older persons.

Study 2 clearly replicates the Study 1 trend concerning autobiographical memory sharing serving an empathy function. As predicted, empathy levels increased after sharing an autobiographical memory of being in pain, but not in the comparison condition. As such, autobiographical memory sharing was shown to produce increased empathy when compared with recalling the narrator's experience (Study 1) or recalling a movie scene in which a character was experiencing pain (Study 2). Examination of potential predictors of this increase showed (also a trend in Study 1) that one personality trait, agreeableness, was related to increases in empathy after autobiographical memory sharing.

GENERAL DISCUSSION

The research examined whether autobiographical memory can serve the social function of eliciting empathy. The studies specifically focused on empathy for persons in chronic pain because of its prevalence in society (Frischenschlager & Pucher, 2002). Diagnosing pain is a complex process that relies largely on communication between the individual, and their care provider or family member. Empathic communication is related to greater accuracy in pain reporting (Strayer & Roberts, 1989). As such, the role of autobiographical memory in experiencing empathy has applied, clinical relevance.

The first aim of the research was to determine whether participants would feel greater empathy for the older target person because of perceptions of both pain and age as 'misfortunes'. Participants showed similar levels of empathy toward the young and old target person in Study 1 and in

Study 2 reported greater empathy toward the older person. The second aim, based on the functional approach to autobiographical memory (e.g., Alea & Bluck, 2003; Baddeley, 1988; Bluck, 2003; Pillemer, 1992) focused on the prediction that autobiographical memory sharing would uniquely increase empathy. The obtained finding that autobiographical remembering increases empathy suggests that training programs (Schulz *et al.*, 2007) in empathic responding would benefit from inclusion of how to use autobiographical memory functionally. Exploratory analyses (Aim 3) identified agreeableness as a predictor of increases in empathy after autobiographical memory sharing. Each of these findings is discussed in further detail.

Does a person's age affect the amount of empathy others have for them?

Past research suggests that people sometimes view pain as a normative aspect of aging (Gagliese & Melzack, 1997). Even medical professionals and formal care providers may mistakenly ascribe chronic pain symptoms to old age rather than to identifiable underlying physical causes (e.g., Lasser, Siegel, Dukoff, & Sunderland, 1998). This research explored whether such biases might lead participants' to feel greater empathy for an older adult experiencing pain than for a younger person in the same situation. Participants in Study 1 showed similar levels of empathy for the younger and older narrator, but those in Study 2, as expected, reported more empathy for the older person. Note that one could generate a possible alternative hypothesis beyond the one that we suggested here. That is, greater empathy could be felt for younger persons in pain because of chronic pain being a non-normative life condition (Baltes, 1997) for young adults (Reese, King, & Schmitz, 2009). Neither study, however, found that individuals feel more empathy for younger persons in pain.

Findings across the two studies do not show a clear effect of greater empathy for older persons. This does not seem to be because of design differences across the studies as the procedures for assessing pre-test empathy in relation to age were exactly the same. We suggest that the effect is somewhat fragile and will depend on the extent to which individual participants focus on age status versus pain status during the study. It appears that although participants did register the age of the narrator (as assessed in a manipulation check), the target's pain status may have been a more or equally salient feature. Two things make this plausible. Across studies, our young participants did not report feeling more similar to the young narrator (i.e., see themselves as similar because of age) than to the 85-year-old narrator. In fact, they did not feel particularly similar to either narrator (possibly because the narrator was in pain and they were not). Indeed, across studies, participants perceived the target (regardless of target age) to be in moderate pain in terms of severity, emotional burden, and interference with daily activities. Thus, the richness and detail of the pain narrative may have focused participants on pain status, deflecting some attention from target age. One direction for future research is to systematically vary the quality of the narrative (e.g., high, medium, low vividness-imagery conditions), to examine whether age of the target (e.g., young, old) plays a

more consistent role when the narrative poorly captures the individuals' chronic pain situation (e.g., low quality narrative).

When age of the person in pain does play a role, perceptions of aging as a difficult time in which loss occurs (Butler, 1969; Freund & Baltes, 2007; Palmore, 2000) may favor empathic responses to older over young persons. Perceptions of late life as a time of loss may precondition participants to feel more empathy for older adults simply because of their being old. Participants would then feel even greater empathy for those who face the 'double jeopardy' of being both old and in pain. This is one explanation for the effect seen in Study 2: higher reports of empathy for the older person in pain. Together, the findings suggest that participants may focus more on pain status (as expressed in the target's detailed narrative) than age when feeling empathy, but that when age is considered, older people in pain receive greater empathy.

Does autobiographical memory sharing elicit empathy?

The functional approach (e.g., Pillemer, 1992) suggests that autobiographical memories serve several social functions (e.g., Alea & Bluck, 2003; Webster, 1995). For example, Bluck and Alea (2009) demonstrated that sharing autobiographical memories about one's romantic partner results in greater feelings of intimacy toward that person. The current studies empirically support the claim that autobiographical memory sharing can serve the function of eliciting empathy. Autobiographical memory is a key psychological process in empathy (along with observation, knowledge, and reasoning; Ickes, 1997). Theory suggests that we use our own past experience to construct models that allow us to understand the inner world of others (Robinson & Swanson, 1990). Similarly, Lockhart (1989) argued that the major function of autobiographical memory is to provide flexibility in the construction and updating of knowledge (see also Levine, Lench, & Safer, 2009) that allows individuals to comprehend their past and test hypotheses about how the world (including the social world) operates. Although one cannot objectively know how an experience such as chronic pain affects another person, autobiographical memories may serve as a touchstone in understanding the nature of another's experience. Autobiographical memories are efficient in that they integrate cognitive and affective components of an experience into a remembered episode that can be brought to mind or shared with others in response to everyday situations (e.g., encountering a person in chronic pain).

The prediction that sharing autobiographical memories would lead to increases in reported empathy was largely supported, using two different comparison groups. In Study 1, the comparison condition involved recalling a recently presented pain narrative. As such, it contained a narrative memory component (as does autobiographical memory sharing; Pillemer, 1998), but involved recalling the pain narrative one had just heard and repeating it back as if talking to the person in pain. This process might also be expected to elicit empathy and was thereby a rather stringent comparison group to employ. It requires the participant to rehearse the pain narrative and to recall it as if talking to the person experiencing pain and letting them know that they are heard. This type of process is relatively common in clinical therapeutic contexts (i.e., 'mirroring,'

Bernieri, Davis, Rosenthal, & Knee, 1994; Raingruber, 2001) but was not effective in eliciting empathy. Instead, sharing one's own personal memory of having been in pain showed a small effect of post-test increases in empathy. To build on Study 1, a new comparison condition was added in Study 2. The issue was to examine whether the recalled memory needed to be autobiographical to elicit empathy or whether recalling a movie memory with many features in common with an autobiographical memory (i.e., an emotional and imagery rich, long-remembered, naturally experienced event), but that was not actually autobiographical, would suffice for eliciting empathy. Again, only participants in the autobiographical memory-sharing condition showed increases in empathy. These results suggest that autobiographical memory sharing is unique in providing a reference point for understanding other's worlds, and in this case, allowing one to feel empathy for them. That is, to elicit empathy, memories must be autobiographical so as to serve as a personal touchstone for understanding another's experience (Ickes, 1997).

Given that autobiographical memory sharing led to increased empathy, the final aim of the study was to explore whether this effect was related to certain types of persons or certain types of memories. Self-reported qualities and generalized use of autobiographical memories were unrelated to increases in empathy, and most personality traits were also not predictive. This suggests that the effect holds regardless of the following: the type of memory shared (e.g., its level of personal significance), the frequency with which participants report using autobiographical memory in daily life, and most personality traits. As such, this appears to be a fairly general effect. Note, however, that even when controlling for impression management, NEO-FFI agreeableness scores predicted increases in empathy levels. Participants who score high on agreeableness are likely to show greater increases in empathy after autobiographical memory sharing, and this may be due to their overall valuing of pro-social and altruistic tendencies. For example, agreeable individuals endorse items such as 'I generally try to be thoughtful and considerate' (Costa & McCrae, 1992). Persons high in agreeableness may already be predisposed toward exhibiting empathy (i.e., a form of pro-social behavior) in daily life and thereby benefit more from autobiographical memory sharing than those lower in agreeableness (i.e., less disposed toward pro-social emotions) who might require a more intensive manipulation to elicit increases in empathy.

Limitations and future directions

The current studies are the first to empirically demonstrate the role of autobiographical memory sharing in increasing empathy. Sample characteristics and boundary conditions of obtained effects should be addressed in future studies.

Many studies investigating social-cognitive effects have used undergraduate samples, and this is a good population to begin demonstrating effects. Because of possible applications of findings linking memory sharing to increased empathy, however, in our continuing research, we are investigating whether the effects obtained here extend to healthcare professionals in whom empathic responding may result in differences in provision of care (Schulz et al., 2007). Medical professionals or

caregivers may show different empathic responses and different patterns of response toward younger and older people (Hirsh, Alquda, Stuts, & Robinson, 2008) than seen in the current data.

This research begins to delineate the boundary conditions for autobiographical memory sharing eliciting empathy. Findings showed that autobiographical memory sharing was more effective in eliciting empathy than recalling the target person's pain story, or recalling a character in pain from a movie. Note that participants did not uniformly recall chronic pain situations in either the movie memory or the autobiographical memory condition. They did, however, recall situations that matched in intensity, duration, or impact on daily activities, to that in the target narrative. Future research might investigate the extent to which a shared autobiographical memory must match the situation of the person experiencing pain in order for empathy to be elicited.

Conclusion

The findings provide a positive picture of how humans use their past to serve social functions such as understanding the plight of older and younger persons in distress. Some researchers have argued that the social-bonding function of autobiographical memory is its most primary (Neisser, 1986; Nelson, 1993). Whether that claim is true, these findings show that autobiographical memory can increase pro-social behaviors (Alea & Bluck, 2007) and offer a direction for training programs focused on encouraging empathic communication and responding.

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