Personality Disorders: Theory, Research, and Treatment
2016, Vol. 7, No. 3, 240–246

1949-2715/16/$12.00 http://dx.doi.org/10.1037/per0000180

"Do Unto Others"? Distinct Psychopathy Facets Predict Reduced Perception and Tolerance of Pain

Sarah J. Brislin, Jennifer M. Buchman-Schmitt, Thomas E. Joiner, and Christopher J. Patrick
Florida State University

Recent research has sought to understand how individuals high in psychopathic traits perceive pain in others (Decety, Skelly, & Kiehl, 2013; Marsh et al., 2013). Perception of pain in others is presumed to act as a prosocial signal, and underreactivity to others' pain may contribute to engagement in exploitative–aggressive behaviors among individuals high in psychopathic traits (Jackson, Meltzoff, & Decety, 2005). The current study tested for associations between facets of psychopathy as defined by the triarchic model (Patrick, Fowles, & Krueger, 2009) and decreased sensitivity to pain in 105 undergraduates tested in a laboratory pain assessment. A pressure algometer was used to index pain tolerance, and participants also rated their perceptions of and reactivity to the algometer-induced pain during the assessment and again 3 days later. A unique positive relationship was found between pain tolerance and the meanness facet of psychopathy, which also predicted reduced fear of painful algometer stimulation. Other psychopathy facets (boldness, disinhibition) showed negative relations with fear of pain stimulation during testing and at follow-up. Findings from this study extend the nomological network surrounding callousness (meanness) and suggest that increased pain tolerance may be a mechanism contributing to insensitivity to expressions of discomfort in others.

Keywords: psychopathy, triarchic model, personality, pain tolerance

A hallmark of individuals high in psychopathic traits is persistent engagement in aggressive–exploitative behavior without apparent concern for victims. Recent research has implicated deficient understanding of fear, sadness, and pain in other individuals as playing a role in this dysfunctional behavior (de Wied et al., 2010; Marsh et al., 2008). The capacity to vicariously experience, or empathize with, negative emotional reactions of others is thought to inhibit such behaviors in nonpsychopathic individuals (e.g., P. A. Miller & Eisenberg, 1988).

Following from this, some recent research has examined how individuals high in psychopathic traits perceive pain, and evaluated whether they show reduced neural activation indicative of deficient empathic response to pain in others. One study by Fanti, Panayiotou, Kyranides, and Avraamides (2015) reported that participants high on callous–unemotional traits showed decreased potentiation of the noise-elicited startle reflex during viewing of violent films. This finding suggests diminished reactivity of the defensive system, perhaps related to reduced amygdala reactivity, in callous–unemotional individuals when viewing others in pain. In another recent study of incarcerated males, Decety, Skelly, and Kiehl (2013) reported that individuals high in psychopathic tendencies demonstrated decreased activation in the ventromedial prefrontal cortex, lateral orbitofrontal cortex, and periaqueductal gray along with increased activation in the insula when observing depictions of individuals being harmed and in a separate task, facial expressions of pain. Along similar lines, another study of adolescents with conduct disorder accompanied by callous–unemotional traits characteristic of psychopathy reported decreased reactivity in the amygdala, rostral anterior cingulate cortex, and ventral striatum when viewing dynamic stimuli of individuals being hurt (Marsh et al., 2013). The authors of this study noted that these brain differences were attributable in particular to participants high on the affective facet of psychopathy (reflecting callous–unemotional tendencies), as indexed by the Psychopathy Checklist—Youth Version (PCL–YV; Forth, Kosson, & Hare, 2003).

The foregoing findings provide support for the idea that psychopathic individuals have reduced sensitivity to the pain of others at a basic neural level. Further direct support for this hypothesis comes from recent work by J. D. Miller, Rausher, Hyatt, Maples, and Zeichner (2014) reporting evidence of increased tolerance for pain stimulation of differing types in participants scoring high in a self-report measure of psychopathic traits. However, additional work is needed to corroborate these findings and clarify whether increased pain tolerance is characteristic of psychopathy as a whole, or more specifically related to features of psychopathy reflecting callous–unemotional tendencies (cf. Marsh et al., 2013).

This article was published Online First March 7, 2016.
Sarah J. Brislin, Jennifer M. Buchman-Schmitt, Thomas E. Joiner, and Christopher J. Patrick, Department of Psychology, Florida State University.
This work was supported by Grants W911NF-14-1-0027 and W81XWH-10-2-0181 from the U.S. Army, Grants MH072850 and MH089727 from the National Institute of Mental Health, and the National Science Foundation Graduate Research Fellowship under Grant 952090. The views, opinions, and findings contained in this report are those of the authors and shall not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documents.
Correspondence concerning this article should be addressed to Sarah J. Brislin or to Christopher J. Patrick, Department of Psychology, Florida State University, Tallahassee, FL 32306. E-mail: brislin@psy.fsu.edu or cpatrick@psy.fsu.edu

Current Study Aims and Hypotheses

Individual differences in the experience of painful stimuli have the potential to influence one's empathic response and sensitivity to physical and psychological discomfort others, and the abovementioned findings point to a possible role for increased pain tolerance in psychopathy. The current work built upon prior published work by testing for associations of behavioral and report-based measures of pain sensitivity with psychopathic traits, and evaluating the role of specific symptomatic components (facets) of psychopathy in these associations, in order to advance our understanding of the role of reduced personal pain sensitivity in the expression of psychopathic tendencies.

These questions were addressed by examining the responses of individuals assessed for psychopathic tendencies in a laboratory pain assessment. Pain response was assessed via a standardized protocol entailing increasing levels of force applied to the hand using a pressure algometer (Pollatos, Füstös, & Critchley, 2012). Reported pain experience and behavioral tolerance for pain were examined in relation to facets of psychopathy as described in the triarchic model (Patrick & Drislane, 2015; Patrick, Fowles, & Krueger, 2009), which conceives of psychopathy as encompassing three distinct facets: *boldness*, involving social dominance, stress immunity, and tolerance for danger and uncertainty; *meanness*, entailing callous disregard for others, lack of close relationships, and exploitative interpersonal style (symptoms most related to the callous–unemotional component of child/adolescent psychopathy; cf. Marsh et al., 2013); and *disinhibition*, entailing poor impulse control, dysfunctional emotion regulation, and low frustration tolerance. The Triarchic Psychopathy Measure (TriPM; Drislane et al., 2014) was used to operationalize these constructs of the model in the current work. In addition, we collected participant ratings of pain and fear in relation to the algometer assessment both on the day of this assessment and on a later follow-up day, and examined associations of these ratings at each time point with boldness, meanness, and disinhibition facets of psychopathy as indexed by the TriPM. The ratings data from the follow-up assessment day were of particular interest, as perception or memory of a painful event may affect willingness to reengage in punished behaviors, regardless of fear and pain experienced in the actual moment.

Our major prediction, based in particular on the findings of Marsh et al. (2013) highlighting the role of callous–unemotionality in reduced sensitivity to the pain of others, was that the meanness facet of psychopathy as indexed by the TriPM would be associated with heightened physical tolerance for pain. We did not have specific hypotheses regarding associations with pain tolerance for the two other triarchic model constructs, boldness and disinhibition, as these constructs have not been operationalized separately in prior relevant studies. However, we hypothesized that both boldness and meanness would show negative associations with reported fear of pain and catastrophization of experienced pain, as these triarchic constructs are theorized to share a common element of genotypic fearlessness (Patrick et al., 2009). Specifically, we predicted that both boldness and meanness would be negatively associated with in-lab ratings of fear of the algometer, experienced pain, and overall distress associated with the pain assessment protocol. We also predicted that boldness and meanness would be negatively associated with the use of coping strategies to deal with the in-lab pain stimuli. The follow-up ratings, collected from participants 3 days after the in-lab test session, were obtained for exploratory–analytic purposes, and as such we did not have specific hypotheses about how they would relate triarchic model constructs.

Method

Participants

One hundred participants were recruited from the general psychology subject pool at Florida State University.[1] The following inclusion criteria were used: (a) at least 18 years of age, (b) able to speak and read English fluently, and (c) nonsmoker. Smokers were excluded from the study due to the potential influence of tobacco use on pain tolerance data (Murray & Hagan, 1973). All participants were asked to abstain from pain suppressants including alcohol and analgesics for a minimum of 8 hr as well as caffeine and sugary foods for a minimum of 1 hr prior to study participation to prevent potential influence on the pain tolerance task (Mercer & Holder, 1997; Murray & Hagan, 1973; Pomerleau, Turk, & Fertig, 1984). The sample was predominantly female (58%) and mostly Caucasian (79%) with 7% identifying as African American, 3% as Asian, 1.0% as American Indian or Alaska Native, 4% as other, and 6% declining to respond. Additionally, 22% identified as being of Hispanic, Latino, or Spanish origin. Participant age ranged from 18 to 35 years, with a mean age of 19.4 years. This study was reviewed and approved by the Florida State University institutional review board. Informed consent was obtained from all participants.

Procedures and Measures

Procedures. Following informed consent, all participants completed a demographic questionnaire and in-lab measures of fear of pain, pain tolerance, pain appraisal, and distress associated with the pain tolerance task. Additionally, participants completed trait measures of fear of pain, psychopathic traits, pain coping strategies, and pain catastrophization. The study concluded with reassessment of fear of pain and pain appraisal by phone approximately 3 days following the initial study visit.

Trait measures.

Fear of pain. The Pain Anxiety Symptoms Scale—20 (PASS–20; McCracken, Zayfert, & Gross, 1992) is a 20-item questionnaire which assesses pain-related anxiety in four domains: physiological, cognitive, fear, and escape/avoidance. Participants are asked to rate questions such as "during painful episodes it is difficult for me to think of anything besides the pain" and "I think that if my pain gets too severe, it will never decrease" on a 6-point scale ranging from 0 (*never*) to 5 (*always*). Total scores may range

[1] In the present study, data were missing for the following measures: Pain Anxiety Symptoms Scale—20 (PASS–20; $n = 94$), Fear Visual Analogue Scale (VAS; $n = 95$), Pain VAS ($n = 95$), Distress VAS ($n = 95$), Follow-up Fear VAS ($n = 85$), and Follow-up Pain VAS ($n = 85$). Missing data for the PASS-20, Fear VAS, Pain VAS, and Distress VAS were attributable to discontinued administration of these measures in an effort to decrease participant burden and, in the case of the PASS-20, failure of a participant to fully complete the measure. With regard to the Follow-up Fear and Pain VAS measures, 10 participants were lost at follow-up and 5 participants did not complete these measures due to discontinued administration.

from 0 to 100, with higher scores indicative of greater pain-related anxiety. The PASS-20 has been shown to have adequate concurrent validity with other pain anxiety measures (Abrams, Carleton, & Asmundson, 2007), and its internal consistency and construct validity have been demonstrated to be adequate in both clinical (Roelofs, Goubert, Peters, Vlaeyen, & Crombez, 2004) and nonclinical populations (Abrams et al., 2007). The alpha coefficient for the 20 items of the PASS-20 in this study was .92, indicating excellent internal consistency.

Pain catastrophization. The Pain Catastrophizing Scale (PCS; Sullivan, Bishop, & Pivik, 1995) is a 13-item measure of pain-related rumination, magnification, and helplessness. The PCS is comprised of questions such as "I keep thinking about how badly I want the pain to stop" (rumination; four items, Cronbach's alpha = .90), "I think of other painful experiences" (magnification; three items, Cronbach's alpha = .57), and "there is nothing I can do to reduce the intensity of the pain" (helplessness; six items, Cronbach's alpha = .86), which participants are asked to rate on a 5-point scale from 0 (*not at all*) to 4 (*all the time*). The PCS was originally developed as a measure of previous painful experiences. It has demonstrated adequate construct and predictive validity in clinical populations (Sullivan et al., 1995) and has shown high internal consistency within nonclinical populations (Buenaver, Edwards, Smith, Gramling, & Haythornthwaite, 2008). In the context of the present study, participants were asked to answer questions as they pertained to the pain tolerance task. The PCS was found to have excellent reliability in the current study (Cronbach's alpha = .90).

Psychopathic traits. The TriPM (Patrick, 2010) is a 58-item measure assessing for boldness (19 items), meanness (19 items), and disinhibition (20 items), corresponding to the constructs detailed by Patrick and colleagues (2009). Items of the TriPM are answered using a 4-point Likert scale that ranges from 0 (*mostly false*) to 3 (*mostly true*). The Disinhibition and Meanness subscales are composed of items from the Externalizing Spectrum Inventory (Krueger, Markon, Patrick, Benning, & Kramer, 2007), while the Boldness scale items were developed to index the psychopathy-related construct of fearless dominance (cf. Lilienfeld & Widows, 2005). The subscales of the TriPM demonstrate good convergent and discriminant validity with measures of psychopathy and normal-range personality across various samples (Drislane, Patrick & Arsal, 2014; Sellbom & Phillips, 2013). Within the present study, the alpha coefficients for Boldness, Meanness, and Disinhibition, were .83, .87, and .81, respectively, indicating good internal consistency for each scale.

In-lab task measures.

Fear of pain. The Fear of Pain Visual Analogue Scale (Fear VAS) is a dimensional scale developed by the investigators for the proposed study in which participants are asked to rate their fear of the pain tolerance task along a continuum from 0 (*not at all fearful*) to 10 (*extremely fearful*). This measure was administered both immediately prior to the pain tolerance task and 3 days later (follow-up Fear VAS).

Pain tolerance. A pressure algometer was used to assess pain tolerance. The pressure algometer (Somedic, Solletuna, Sweden Type II brand) assesses the level of pressure an individual is able to withstand on his or her dominant hand (dorsal side, medial placement between knuckles of pointer and middle finger). The pressure algometer has received support as a valid measure of pain tolerance and has demonstrated high interrater reliability (Pollatos et al., 2012). The assessment comprised two trials with 30-s waiting intervals to control for habituation. During each trial the experimenter applied the algometer perpendicularly to the area specified above and progressively increased pressure at an approximate rate of 50 kPa/s to the participant's dominant hand until the participant said "stop," indicating that the level reached was the maximum amount of pain he or she was able to withstand. Within the current study, the pressure algometer was found to be reliable across the two trials (r = .73). An aggregate score was calculated for each participant and used in all subsequent analyses.

Pain appraisal. The Pain Appraisal VAS (Pain VAS) is a dimensional scale developed for the proposed study in which participants are asked to rate the overall pain level evoked by the pressure algometer task. The scale was anchored from 0 (*not at all painful*) to 10 (*extremely painful*). Visual analog scales are common practice in the measurement of pain (Alden, Dale, & DeGood, 2001; Arendt-Nielsen et al., 2012; Vancleef & Peters, 2011). This measure was administered both immediately following the pain tolerance task and again 3 days later (Follow-up Pain VAS).

Distress rating. The Pressure Algometer Distress VAS (Distress VAS) required participants to rate how distressing they found the pressure algometer task on a dimensional scale ranging from 0 (*not at all distressing*) to 10 (*extremely distressing*).

Pain coping strategies. The Daily Coping Inventory—Adapted Version (DCI; Affleck, Urrows, Tennen, & Higgins, 1992) is a 7-item questionnaire used to assess the use of common pain-coping strategies such as relaxation ("Did something to help me relax") or distraction from the pain ("Diverted attention from the pain by thinking about other things or engaging in some activity"). Participants were instructed to answer "yes" or "no" to each item to indicate whether or not they engaged in coping strategies as described during the pain tolerance task. For purposes of the current study, only the first five items of the DCI were used, as Questions 6 ("sought spiritual support") and 7 ("sought emotional support from loved ones, friends, or professionals") were not relevant to the task at hand. The DCI has demonstrated adequate construct validity and good internal consistency (Keefe, Rumble, Scipio, Giordano, & Perri, 2004). The measure was developed to assess pain-coping strategies in individuals suffering with chronic pain; however, research suggests that these coping mechanisms are pertinent to pain, in general, and not specific to chronic pain (Kohl, Rief, & Glombiewski, 2013). In the current study, the DCI was found to have acceptable internal consistency (Cronbach's alpha = .65).

Data Analytic Approach

Correlational analyses were performed to evaluate associations between triarchic model constructs and all self-report and behavioral measures. As boldness, meanness, and disinhibition were moderately intercorrelated in this sample (Boldness and Meanness r = .24; Boldness and Disinhibition r = .04; Meanness and Disinhibition r = .46), multiple regression analyses were performed to determine the unique contribution of each triarchic model construct. In each regression analysis, all three Tri-PM scales were included simultaneously as predictors of the variables of interest. All statistical effects were evaluated using the alpha levels of $p < .05$ and $p < .005$.

Results

Relations Between TriPM Scales and Self-Report Trait Measures

Self-report measures of trait levels of pain-related anxiety and catastrophizing behaviors regarding pain were administered and relations with TriPM scales are presented in Table 1. Consistent with hypotheses, Boldness was negatively associated with pain-related anxiety as indexed by scores on the PASS-20 as a whole and its subscales in both correlational and regression analyses. Similarly, Meanness demonstrated negative associations with PASS-20 total and subscale scores in correlation and regression analyses. Disinhibition emerged as a positive predictor of scores on the Fear subscale of the PASS-20 in a regression model, whereas Boldness and Meanness demonstrated significant negative associations with this subscale. Boldness was the only TriPM scale to show significant associations (in a negative direction) with overall scores on the PCS and its Rumination subscale, both in correlational analyses and when all three TriPM scales were entered into regression models.

Relations Between TriPM Scales, Pain Tolerance, and Ratings of Fear, Distress, and Intensity of Pain

Table 2 presents associations for triarchic model constructs as indexed by the TriPM with behavioral and self-report data recorded during the testing session. Analyses revealed that at the bivariate level, higher levels of meanness were significantly associated with higher pain tolerance, measured via the pressure algometer. Meanness emerged as the sole predictor when the three TriPM scales were entered together into a regression model predicting pain tolerance.[2]

During the testing session, participants were asked to indicate how fearful they were of the algometer task using a VAS before completing the algometer trials. Both Boldness and Meanness were negatively associated to a significant degree with Fear VAS rating at the zero-order (bivariate) level and when all three TriPM scales were entered into a regression model predicting Fear VAS rating. Following the algometer procedure, participants completed two separate ratings via VAS to indicate how painful they found the pressure algometer task and how distressing they found the experience. There was no association between physical tolerance of pain and ratings of pain experienced during the pressure algometer assessment ($r = -.06$). TriPM scale scores were not significantly associated with Pain VAS ratings or Distress VAS ratings in either correlation or regression analyses. Participants also completed the DCI following the algometer administration to determine if there were individual differences in coping skills used to withstand the pain; however, DCI scores were not significantly associated with any of the TriPM scales.

Relations Between TriPM Scales and Follow-Up Self-Report Ratings

Three days after the in-lab testing session, participants again rated their fear of the algometer and how painful they found the pressure stimulation using the VAS measure. Associations between TriPM scale scores and VAS ratings collected at follow-up (see Table 2) were consistent with those for initial ratings collected in the lab assessment, with follow-up VAS ratings of Fear correlating to a significant negative degree with both Boldness and Meanness. However, neither scale emerged as uniquely predictive when all three scales were entered into a regression model. Also, in contrast with findings from the initial lab assessment, Disinhibition showed negative associations with follow-up VAS ratings of Pain in both correlation and regression analyses.

Discussion

Findings from the current study serve to elucidate the association between psychopathic traits and pain perception. In particular, this study is the first to investigate pain tolerance in relation to distinct facets of psychopathy as described by the triarchic model, and also the first to examine associations between triarchic model constructs and measures of pain perception and experience.

Associations between TriPM scales and trait-level measures of anxiousness and catastrophizing of painful experiences were largely consistent with hypotheses. The unique negative associations for PASS-20 total and subscale scores with the Boldness and Meanness scales are consistent with the notion that these constructs share a component of dispositional fearlessness (Patrick et al., 2009; Patrick & Drislane, 2015; see also Frick & White, 2008). In contrast, Disinhibition as indexed by the TriPM was largely unrelated to anxiousness regarding pain. Notably, Disinhibition did demonstrate a significant positive association with the PASS-20 Fear scale, which indexes fearful appraisal of pain; however, this result emerged only in the regression analysis for this scale, indicating a suppressor effect, which needs to be interpreted with caution. Nonetheless, this finding suggests that when controlling for levels of Boldness and Meanness, individuals higher in Disinhibition have a greater fear reaction when experiencing pain. Despite this association, Disinhibition was unrelated to the propensity to catastrophize experiencing painful stimuli and was unrelated to all PCS subscales. Boldness was the only TriPM scale that demonstrated any unique associations with the tendency to overemotionalize pain experience—showing a significant, negative relationship with overall pain catastrophization as indexed by the PCS total score, and with the "rumination" facet of catastrophization in particular. Again, these findings are consistent with previous work demonstrating robust negative associations of boldness with self-report measures of anxiety, distress, and neuroticism (Patrick & Drislane, 2015; see also Benning et al., 2005).

Meanness was uniquely positively associated with tolerance of the in-lab administered pain stimuli, such that individuals who scored higher in meanness were able to withstand more pain. While other studies have found that individuals with higher levels of psychopathic traits exhibit differing neural activation when viewing others in pain, the current study is the first to examine how distinct facets of psychopathy as described by the triarchic model relate to the ability to withstand pain. Our finding of increased pain tolerance in relation to meanness

[2] Consistent with prior work (Chesterton, Barlas, Foster, Baxter, & Wright, 2003), gender was significantly associated with pain tolerance ($r = .43$), with males showing higher tolerance than females; however, gender did not moderate the association between Meanness scores and pain tolerance (two-way interaction not significant; $p = .71$).

Table 1
Triarchic Scale Measures: Relations With Self-Report Measures of Anxiousness and Catastrophizing Regarding Pain

Measure	TriPM Scale			
	Boldness r (β)	Meanness r (β)	Disinhibition r (β)	Multiple R (R^2)
PASS–20[a]	−.43** (−.37**)	−.31** (−.32**)	.04 (.18)	.52** (.27)
Cognitive	−.48** (−.43**)	−.26* (−.26*)	.07 (.18)	.54** (.29)
Escape/Avoid	−.42** (−.36**)	−.29** (−.30*)	.04 (.17)	.50** (.25)
Fear	−.29** (−.24*)	−.21* (−.27*)	.12 (.24*)	.39** (.16)
Physiological	−.28* (−.22*)	−.32** (−.30**)	−.09 (.04)	.39** (.15)
PCS[b]	−.30* (−.29**)	−.10 (−.04)	.00 (.03)	.30 (.09)
Rumination	−.36** (−.34**)	−.15 (−.09)	−.01 (.04)	.36** (.13)
Magnification	−.18 (−.19)	−.02 (.05)	−.04 (−.05)	.19 (.04)
Helplessness	−.20 (−.19)	−.06 (−.04)	.03 (.06)	.20 (.04)

Note. TriPM = Triarchic Psychopathy Measure; r = Pearson correlation coefficient; β = standardized beta coefficient from regression model incorporating scores on the three TriPM scales as predictors; PASS–20 = Pain Anxiety Symptoms Scale—20 Item Version; PCS = Pain Catastrophizing Scale.
[a] $n = 94$. [b] $n = 100$.
* $p < .05$. ** $p < .005$.

coincides with the work of Marsh et al. (2013), who found that decreased brain reactivity when viewing others in pain was most associated with the affective facet of psychopathy as indexed by the PCL-YV—the component most closely associated with meanness as conceptualized by the triarchic model (Patrick et al., 2009). No corresponding association was evident between Meanness scores and rated painfulness of the algometer experience. This finding can be interpreted in relation to the instruction participants were given, namely, to accept increments in algometer pressure up to the point of maximal capacity to withstand pain. The implication is that participants high in meanness "opted out" at greater levels of objective pressure stimulation.

Notably, both TriPM Boldness and Meanness were negatively associated with reported fear of the algometer stimulus, consistent with their correlations as discussed above with trait-like measures of fear of pain. Participants high in both Boldness and Meanness reported less fear of the pressure algometer, demonstrating similar "approach" responses; however, in the moment, it was only individuals high in Meanness who were able to withstand greater levels of pain stimulation. Considered together, these findings accord with the idea that the exploitative–aggressive behavior exhibited by high-mean individuals reflects (at least in part) dysfunction in basic pain-perception systems, whereas the fearlessness that is characteristic of high-bold individuals reflects reduced sensitivity of the acute-threat system (Davis, Walker, & Lee, 1997), or perhaps enhanced ability to down-regulate negative activation in the face of threat (Charney, 2004; Gross & John, 2003). As such, current results are in line with a growing body of evidence for differing biobehavioral mechanisms contributing to distinguishable symptomatic facets of psychopathy (Patrick & Drislane, 2015; Skeem, Polaschek, Patrick, & Lilienfeld, 2011).

Disinhibition, on the other hand, was uniquely and negatively associated with ratings of how painful the pressure algometer was 3 days following the experience. This association suggests that while individuals high in Disinhibition were not able to withstand more pain, they remembered the experience as being less painful than they reported in the testing session. This finding may have implications for our understanding of the role of disinhibition in the persistence versus "disintegration" of memory for punishing experiences.

Table 2
Triarchic Scale Measures: Relationships With Algometer-Related Fear, Pain, and Distress Ratings, and Reported Use of Pain-Coping Strategies

Measure	TriPM Scale			
	Boldness r (β)	Meanness r (β)	Disinhibition r (β)	Multiple R (R^2)
Pain Tolerance[a]	.20 (.12)	.30** (.33**)	.04 (−.12)	.35* (.12)
Fear VAS[b]	−.35** (−.30**)	−.27** (−.25*)	−.02 (.09)	.41** (.17)
Fear VAS follow-up[c]	−.27* (−.21)	−.29* (−.22)	−.13 (−.03)	.35* (.12)
Pain VAS[b]	−.18 (−.19)	−.09 (.02)	−.17 (−.18)	.25 (.06)
Pain VAS follow-up[c]	−.05 (−.06)	.01 (.14)	−.23* (−.28*)	.26 (.07)
Distress VAS[b]	−.18 (−.16)	−.15 (−.13)	−.05 (.01)	.22 (.05)
DCI[a]	−.04 (−.01)	−.10 (−.17)	.08 (.15)	.17 (.03)

Note. TriPM = Triarchic Psychopathy Measure; r = Pearson correlation coefficient; β = standardized beta coefficient from regression model incorporating scores on the three TriPM scales as predictors; VAS = Visual Analogue Scale; DCI = Daily Coping Inventory.
[a] $n = 100$. [b] $n = 95$. [c] $n = 85$.
* $p < .05$. ** $p < .005$.

The current study sought to test for relations between personal pain perception and distinct facets of psychopathy described in the triarchic model. While the findings from this study are novel and have implications for future research, our results must be considered in light of certain limitations. The sample size for the study was only moderate, and the finding of reduced pain tolerance novel, so replication is clearly warranted to establish its robustness. Pressure pain is distinct from pain associated with other tactile stimuli (e.g., heat or coldness, electric current), and further work is needed to evaluate associations for pain stimuli of other types. Participants were recruited from an undergraduate community not likely to represent the full range of psychopathic traits, and thus further work is needed to extend the current work to samples that includes individuals with more extreme callous–unemotional tendencies (e.g., clinic-referred youth; adult correctional or forensic samples).

Notwithstanding these limitations, findings from the current study serve to extend knowledge of the nomological networks surrounding the constructs of the triarchic model and suggest heightened pain tolerance as a possible mechanism for deficient sensitivity to others' distress in psychopathy. Given the unique relationship found for the callous–unemotional (meanness) facet of psychopathy, it will be interesting in future work to evaluate whether pain tolerance might covary with other variables known to be related to the callousness facet of psychopathy—in particular, decreased ability to recognize (Marsh & Blair, 2008), and react neutrally to (Jones, Laurens, Herba, Barker, & Viding, 2009; Marsh et al., 2008), fearful face stimuli. In addition to further advancing our understanding of the nature and bases of callous–unemotional tendencies in psychopathy, work of this kind can contribute to novel neurobehavioral methods for indexing such tendencies (Kozak & Cuthbert, 2016; Patrick & Drislane, 2015), as a complement to traditional report- or rating-based measures.

References

Abrams, M. P., Carleton, R. N., & Asmundson, G. J. (2007). An exploration of the psychometric properties of the PASS-20 with a nonclinical sample. *Journal of Pain, 8,* 879–886. http://dx.doi.org/10.1016/j.jpain.2007.06.004

Affleck, G., Urrows, S., Tennen, H., & Higgins, P. (1992). Daily coping with pain from rheumatoid arthritis: Patterns and correlates. *Pain, 51,* 221–229. http://dx.doi.org/10.1016/0304-3959(92)90263-B

Alden, A. L., Dale, J. A., & DeGood, D. E. (2001). Interactive effects of the affect quality and directional focus of mental imagery on pain analgesia. *Applied Psychophysiology and Biofeedback, 26,* 117–126. http://dx.doi.org/10.1023/A:1011387122804

Arendt-Nielsen, L., Andresen, T., Malver, L. P., Oksche, A., Mansikka, H., & Drewes, A. M. (2012). A double-blind, placebo-controlled study on the effect of buprenorphine and fentanyl on descending pain modulation: A human experimental study. *Clinical Journal of Pain, 28,* 623–627.

Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits: A step toward community epidemiological investigations. *Assessment, 12,* 3–18. http://dx.doi.org/10.1177/1073191104271223

Buenaver, L. F., Edwards, R. R., Smith, M. T., Gramling, S. E., & Haythornthwaite, J. A. (2008). Catastrophizing and pain-coping in young adults: Associations with depressive symptoms and headache pain. *Journal of Pain, 9,* 311–319. http://dx.doi.org/10.1016/j.jpain.2007.11.005

Charney, D. S. (2004). Psychobiological mechanisms of resilience and vulnerability: Implications for successful adaptation to extreme stress. *American Journal of Psychiatry, 161,* 195–216. http://dx.doi.org/10.1176/appi.ajp.161.2.195

Chesterton, L. S., Barlas, P., Foster, N. E., Baxter, G. D., & Wright, C. C. (2003). Gender differences in pressure pain threshold in healthy humans. *Pain, 101,* 259–266. http://dx.doi.org/10.1016/S0304-3959(02)00330-5

Davis, M., Walker, D. L., & Lee, Y. (1997). Amygdala and bed nucleus of the stria terminalis: Differential roles in fear and anxiety measured with the acoustic startle reflex. *Philosophical Transactions of the Royal Society of London, Series B*: *Biological Sciences*, *352,* 1675–1687. http://dx.doi.org/10.1098/rstb.1997.0149

Decety, J., Skelly, L. R., & Kiehl, K. A. (2013). Brain response to empathy-eliciting scenarios involving pain in incarcerated individuals with psychopathy. *Journal of the American Medical Association Psychiatry, 70,* 638–645. http://dx.doi.org/10.1001/jamapsychiatry.2013.27

de Wied, M., Gispen-de Wied, C., & van Boxtel, A. (2010). Empathy dysfunction in children and adolescents with disruptive behavior disorders. *European Journal of Pharmacology, 626,* 97–103. http://dx.doi.org/10.1016/j.ejphar.2009.10.016

Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the triarchic psychopathy measure. *Psychological Assessment, 26,* 350–362. http://dx.doi.org/10.1037/a0035152

Fanti, K. A., Panayiotou, G., Kyranides, M. N., & Avraamides, M. N. (2015). Startle modulation during violent films: Association with callous–unemotional traits and aggressive behavior. *Motivation and Emotion*. Advance online publication. http://dx.doi.org/10.1007/s11031-015-9517-7

Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). *The Hare PCL: Youth version*. Toronto, Ontario, Canada: Multi-Health Systems.

Frick, P. J., & White, S. F. (2008). Research review: The importance of callous–unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of Child Psychology and Psychiatry, 49,* 359–375. http://dx.doi.org/10.1111/j.1469-7610.2007.01862.x

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85,* 348–362. http://dx.doi.org/10.1037/0022-3514.85.2.348

Jackson, P. L., Meltzoff, A. N., & Decety, J. (2005). How do we perceive the pain of others? A window into the neural processes involved in empathy. *NeuroImage, 24,* 771–779. http://dx.doi.org/10.1016/j.neuroimage.2004.09.006

Jones, A. P., Laurens, K. R., Herba, C. M., Barker, G. J., & Viding, E. (2009). Amygdala hypoactivity to fearful faces in boys with conduct problems and callous-unemotional traits. *American Journal of Psychiatry, 166,* 95–102. http://dx.doi.org/10.1176/appi.ajp.2008.07071050

Keefe, F. J., Rumble, M. E., Scipio, C. D., Giordano, L. A., & Perri, L. M. (2004). Psychological aspects of persistent pain: Current state of the science. *Journal of Pain, 5,* 195–211. http://dx.doi.org/10.1016/j.jpain.2004.02.576

Kohl, A., Rief, W., & Glombiewski, J. A. (2013). Acceptance, cognitive restructuring, and distraction as coping strategies for acute pain. *Journal of Pain, 14,* 305–315. http://dx.doi.org/10.1016/j.jpain.2012.12.005

Kozak, M. J., & Cuthbert, B. N. (2016). The NIMH Research Domain Criteria Initiative: Background, issues, and pragmatics. *Psychophysiology, 53,* 286–297. http://dx.doi.org/10.1111/psyp.12518

Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. D. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology, 116,* 645–666. http://dx.doi.org/10.1037/0021-843X.116.4.645

Lilienfeld, S. O., & Widows, M. R. (2005). *Psychopathic Personality Inventory—Revised (PPI–R) professional manual*. Odessa, FL: Psychological Assessment Resources.

Marsh, A. A., & Blair, R. J. R. (2008). Deficits in facial affect recognition among antisocial populations: A meta-analysis. *Neuroscience and Biobehavioral Reviews, 32,* 454–465. http://dx.doi.org/10.1016/j.neubiorev.2007.08.003

Marsh, A. A., Finger, E. C., Fowler, K. A., Adalio, C. J., Jurkowitz, I. T., Schechter, J. C., . . . Blair, R. J. R. (2013). Empathic responsiveness in amygdala and anterior cingulate cortex in youths with psychopathic traits. *Journal of Child Psychology and Psychiatry, 54,* 900–910.

Marsh, A. A., Finger, E. C., Mitchell, D. G., Reid, M. E., Sims, C., Kosson, D. S., . . . Blair, R. J. R. (2008). Reduced amygdala response to fearful expressions in children and adolescents with callous-unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry, 165,* 712–720. http://dx.doi.org/10.1176/appi.ajp.2007.07071145

McCracken, L. M., Zayfert, C., & Gross, R. T. (1992). The Pain Anxiety Symptoms Scale: Development and validation of a scale to measure fear of pain. *Pain, 50,* 67–73. http://dx.doi.org/10.1016/0304-3959(92)90113-P

Mercer, M. E., & Holder, M. D. (1997). Antinociceptive effects of palatable sweet ingesta on human responsivity to pressure pain. *Physiology & Behavior, 61,* 311–318. http://dx.doi.org/10.1016/S0031-9384(96)00400-3

Miller, J. D., Rausher, S., Hyatt, C. S., Maples, J., & Zeichner, A. (2014). Examining the relations among pain tolerance, psychopathic traits, and violent and nonviolent antisocial behavior. *Journal of Abnormal Psychology, 123,* 205–213. http://dx.doi.org/10.1037/a0035072

Miller, P. A., & Eisenberg, N. (1988). The relation of empathy to aggressive and externalizing/antisocial behavior. *Psychological Bulletin, 103,* 324–344. http://dx.doi.org/10.1037/0033-2909.103.3.324

Murray, F. S., & Hagan, B. C. (1973). Pain threshold and tolerance of hands and feet. *Journal of Comparative and Physiological Psychology, 84,* 639–643. http://dx.doi.org/10.1037/h0034836

Patrick, C. J. (2010). *Operationalizing the Triarchic conceptualization of psychopathy: Preliminary description of brief scales for assessment of boldness, meanness, and disinhibition* (Unpublished test manual). Tallahassee, FL: Florida State University. Available from https://www.phenxtoolkit.org/index.php?pageLink=browse.protocoldetails&id=121601

Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of Personality, 83,* 627–643. http://dx.doi.org/10.1111/jopy.12119

Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology, 21,* 913–938. http://dx.doi.org/10.1017/S0954579409000492

Pollatos, O., Füstös, J., & Critchley, H. D. (2012). On the generalised embodiment of pain: How interoceptive sensitivity modulates cutaneous pain perception. *Pain, 153,* 1680–1686. http://dx.doi.org/10.1016/j.pain.2012.04.030

Pomerleau, O. F., Turk, D. C., & Fertig, J. B. (1984). The effects of cigarette smoking on pain and anxiety. *Addictive Behaviors, 9,* 265–271. http://dx.doi.org/10.1016/0306-4603(84)90018-2

Roelofs, J., Goubert, L., Peters, M. L., Vlaeyen, J. W., & Crombez, G. (2004). The Tampa Scale for Kinesiophobia: Further examination of psychometric properties in patients with chronic low back pain and fibromyalgia. *European Journal of Pain, 8,* 495–502. http://dx.doi.org/10.1016/j.ejpain.2003.11.016

Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and nonincarcerated samples. *Journal of Abnormal Psychology, 122,* 208–214. http://dx.doi.org/10.1037/a0029306

Skeem, J. L., Polaschek, D. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. *Psychological Science in the Public Interest, 12,* 95–162. http://dx.doi.org/10.1177/1529100611426706

Sullivan, M. J., Bishop, S. R., & Pivik, J. (1995). The pain catastrophizing scale: Development and validation. *Psychological Assessment, 7,* 524–532. http://dx.doi.org/10.1037/1040-3590.7.4.524

Vancleef, L. M., & Peters, M. L. (2011). The influence of perceived control and self-efficacy on the sensory evaluation of experimentally induced pain. *Journal of Behavior Therapy and Experimental Psychiatry, 42,* 511–517. http://dx.doi.org/10.1016/j.jbtep.2011.05.006