



Research article

Criminality labelling influences reactions to others' pain

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ABSTRACT

Disparities in healthcare for underrepresented and stigmatized groups are well documented. Current understanding is that these inequalities arise, at least in part, from psychosocial factors such as stereotypes and in-group/out-group categorization. Pain management, perhaps because of the subjective nature of pain, is one area of research that has spearheaded these efforts. We investigated how observers react to the pain of individuals labelled as criminals. Face models expressing pain of different levels of intensity were portrayed as having committed a crime or not (control group). A sample of $n = 327$ college students were asked to estimate the intensity of the pain expressed by face models as well as their willingness to help them. Trait empathy was also measured. Data was analyzed using regression, mediation and moderation analyses. We show for the first time that observers were less willing to help individuals with a criminal history. Moreover, a moderation effect was observed whereby empathic participants were more willing to help control face models compared to less empathic participants. However, criminality history did not influence participant's pain estimation. We conclude that negative stereotypes associated with criminality can reduce willingness to help individuals in pain even when pain signals are accurately perceived.

1. Introduction

Disparities in health care are well documented for visible minorities (e.g., Black Americans, Mays et al., 2007; Tait and Chibnall, 2014), individuals with stigmatized health conditions (e.g., mental illness, substance users, Nyblade et al., 2019), marginalized groups (e.g., poor, homeless, Carr, 2016), and women (e.g., Hirsh et al., 2014; Hoffmann and Tarzian, 2001). Pain management, perhaps because of the subjective nature of pain, is one area of research that has spearheaded these efforts. Because the experience of pain is covert, it has been argued that reactions to others' pain are particularly prone to the influence of psychosocial factors such as discrimination (DeRuddere et al., 2014; Tait and Chibnall, 2014). Accordingly, there is evidence that pain of minority and stigmatized groups is systematically underestimated and undertreated (e.g., Anderson et al., 2009; Carr, 2016; Dubin et al., 2017; LeResche, 2011; Meghani et al., 2012). Many individuals are imprisoned each year, with cross-sectional rates reaching 106 per 100,000 in Canada and 698 per 100,000 in the United States (Walmsley, 2016). Members of the public prefer to socially distance from persons convicted of a crime due to their perceived dangerousness (Rade et al., 2016). Moreover, persons with a

history of criminality are stigmatized as belonging to a lower-status group and described as evil, cold, unkind, untrustworthy, and incompetent (Berry & Weiner, 2020; Carlsmith and Darley, 2008; Carroll et al., 1987; Côté-Lussier, 2016; Langworthy and Whitehead, 1986; Rade et al., 2016; Roberts, 1992; Tam, Au & Leung, 2008). In the present study, we explore the possibility that stigma associated with having a history of criminality can also lead to inequalities in pain treatment. More specifically, we investigated whether labelling individuals as criminals would reduce estimations of pain intensity and willingness to help others in pain.

Stigma is a psycho-social process that includes the recognition that a labeled individual is different, the construction of negative attitudes (conscious or unconscious) towards labeled persons, and a power differential that allows members of the dominant group to discriminate against labeled individuals (Hipes and Gemoets, 2019; Link and Phelan, 2001). In the context of health care, it is believed that stigma leads to inequalities via multiple interacting stressors (Corrigan and Rao, 2012; Stangl et al., 2019; Stuber et al., 2008). First, interactions between stigmatized groups and members of the dominant group activate stress processes. Second, discrimination can lead to mistreatment and/or denied access to treatment. Third, while individuals who perpetrate

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discriminatory behaviours often do so spontaneously and unconsciously, stigmatized persons are aware of negative stigma and discrimination. As a result, stigmatized individuals may endorse negative stereotypes about themselves (self-stigma) which can negatively impact self-esteem and lead to health-related conditions such as depression and immuno-suppression. Moreover, expectations about discrimination may lead people to avoid seeking help from the health care system.

According to this theoretical framework, criminality labelling alone is enough to lead to discrimination and mistreatment in various settings (Hipes and Gemoets, 2019). Accordingly, individuals with a history of criminality experience social rejection, loss of social status, and discrimination in housing and employment (e.g., Batastini et al., 2014; Berry & Weiner, 2020; Brand & Clairborn, 1976; Frank et al., 2014; Homant and Kennedy, 1982; Moore et al., 2016; Schwartz and Skolnick, 1962; Stuber et al., 2008; Turney et al., 2013; Winnick and Bodkin, 2008). Less is known in the context of healthcare. There is evidence that rates of emergency department use and hospitalization are elevated for those who have experienced imprisonment (Binswanger et al., 2013; Feron et al., 2005; Kouyoumdjian et al., 2018). While this trend may be caused by a higher prevalence of co-morbid conditions, psycho-social processes such as discrimination may also be at play (Chapman et al., 2013; Kouyoumdjian et al., 2018; Redmond et al., 2020). In a recent study, Fahmy et al. (2018) examined this possibility by testing whether criminality labelling triggers discrimination in health care. Mock 'patients' identified themselves as having either been recently released from prison or not (control). Results showed that patients with a history of imprisonment were 41% less likely to be given appointments with primary care providers who were currently accepting new patients in their practices.

1.1. The present study

The aforementioned findings suggest that criminality labelling alone is sufficient to activate stigma-related processes. However, how this might lead to discrimination in healthcare settings is still understudied. Our goal was to address this gap by examining if criminality labelling would influence reactions to the pain of labelled individuals. Pictures of male models displaying varying degrees of intensity of the facial expression of pain were shown to participants. For half the participants, the models were portrayed as having committed a crime; the other half of participants served as controls. Observers estimated the intensity of the pain expressed by the models and their willingness to help alleviate the models' pain. These two variables are commonly measured in pain research because of their clinical relevance for pain estimation and pain treatment decisions (e.g., De Ruddere et al., 2013; Hampton et al., 2018). How much observers 'liked' the models (valence) was also measured because it has been shown that valence can mediate responses to others' pain (DeRuddere et al., 2013; Hampton et al., 2018).

We derived the following hypotheses from the extant literature:

H1. *Criminality labelling will reduce estimations of pain intensity and willingness to help.*

We predicted that observers would provide lower estimates of the pain experienced by models labelled as criminals compared to controls. This prediction is based on evidence that individuals having a history of criminality are stigmatized using labels that intersect with labels used to describe other groups for which pain is underestimated (e.g., racialized minorities: Mende-Siedlecki et al., 2019; mental illness, Baillargeon et al., 2010; substance use, van Boekel et al., 2013; see also Decety, Echols & Correll, 2010). Moreover, the pain of models portrayed as deceptive, unfair, and immoral is underestimated (Cui et al., 2016; De Ruddere et al., 2013; Hampton et al., 2018; Singer et al., 2006). Given this evidence, we predicted that participants would underestimate the pain expressed by models labelled as criminals as compared to controls.

Willingness to help is a pro-social behaviour that is driven by sympathy and compassion for others (Cikara et al., 2011). Pro-social

behaviours are known to be influenced by psychosocial processes (Cikara et al., 2011; Szanto and Krueger, 2019) such as in-group/out-group categorization, ethnic membership, prejudices, and perceptions of the 'sameness' of the other (Azevedo et al., 2013; Eres and Molenberghs, 2013; Mende-Siedlecki et al., 2019). Moreover, previous research has shown that willingness to help others in pain is influenced negatively by suspicion of dishonesty (De Ruddere et al., 2013; Hampton et al., 2018). Finally, empathic reactions are modulated by interpersonal perceptions of warmth (Aue et al., 2021). Based on this, we predicted that participants would be less willing to help models labelled as criminals than models in the control condition.

H2. *Participants with high empathic concern (EC) will provide higher pain intensity estimations for facial expressions of pain.*

A prevailing model in the pain literature is that perception of others' pain elicits an empathic response whereby observers recognize the presence of pain in others, experience similar sensations and emotions, and are motivated to alleviate the suffering of others via helping behaviours (e.g., Critchley et al., 2004; Decety and Lamm, 2006; Goubert et al., 2005; Morrison et al., 2004; Peyron et al., 2000; Rainville et al., 1997). Given this association between pain and empathy, researchers have raised the possibility that empathy as a *personality variable*, might influence reactions to others pain (Green et al., 2009). Accordingly, it has been shown that observers with higher scores on measures of empathy display stronger responses to others' pain, including higher pain intensity estimations (Goubert et al., 2005; Green et al., 2009; but see Gleichgerrcht and Decety, 2014 for contradictory findings). Hence, trait empathy is emerging as a critical determinant of reactions to others pain. In the present study, we focus on empathic concern (EC), which relates to a person's propensity to display concern for the welfare of others and a tendency to engage in real-life helping behaviors (Davis, 1983; Decety et al., 2015). We predicted that participants high in EC would provide higher pain intensity estimations and be more willing to help others in pain than participants low in EC.

H3. *There will be an interaction between trait empathy and criminality labelling such that the impact of criminality labelling will be reduced for participants high in empathy compared with participants low in empathy.*

Participants high in empathy report less negative reactions to crimes (Haegerich and Bottoms, 2000; Sjöberg, 2015). For example, Sjöberg (2015) found that compared to mock jurors lower in empathy, mock jurors higher in empathy made less stringent sentence recommendations for crimes. We therefore predicted a significant interaction between trait empathy and criminal labelling. Specifically, compared with participants low in empathy, participants high in empathy will be less likely to underestimate the pain of individuals with a criminal history and more willing to help them.

2. Method

2.1. Participants

665 undergraduate students were recruited from a participant pool at the University of Ottawa, Canada. This project was approved by the Office of Research Ethics and Integrity of the University of Ottawa (H-10-19-5082). Because the study was conducted online, three criteria were used to reject data when participants appeared to not be engaged with the task at hand. First, data from 172 participants who did not complete all phases of the study were removed. Second, based on pilot testing, we removed data from 91 participants who took less than 40 min and more than 120 min to complete the study. Third, engagement questions (see Procedure) were included throughout the study. Data from 18 participants were removed due to their failure to correctly answer at least 5/7 seven engagement questions. Four multivariate outliers were identified with Mahalanobis inspection and removed from the dataset ($p < .001$, $df = 8$). Lastly, considering differences in the accuracy of recognizing

faces of ethnicities for which one has not been in extensive contact with (Zhou, Elshiekh & Moulson, 2019), and considering that all our faces models are white, we kept only participants which self-identified as white or who had been living in Canada for more than five years. This led to the removal of 53 participants. The final sample is $n = 327$. No missing data were observed for the variables in this study.

Participants reported being in majority female (78.3%) with a mean age of 19.5 years old ($SD = 3.7$). Participant's ethnicity is reported in Table 1. A majority identified as white (63%). 81% of the sample is born in Canada.

2.2. Study design

The study follows a cross-sectional mixed design. All measurements were taken at a single point in time. Participants were randomly separated in two groups (criminality history or control). Subsequently, all participants completed the same measurements.

3. Materials

3.1. Priming conditions

Twelve priming scenarios were created. Half described a criminal history and half described 'socially-correct' behaviours (control condition). Crime scenarios were created based on crimes reported by popular online media. Our goal was to create scenarios that were realistic and that portrayed comparably violent crimes but not sexual offenses because of the unique stigma associated with these (e.g., Ricciardelli and Moir, 2013). Examples are provided in Table 2.

3.2. Face models

Five face models were taken from The Delaware Pain Database (Mende-Siedlecki et al., 2019). For each one model, photographs expressing a neutral facial expression and the highest pain intensity expressed were used to create 7 intermediate levels pain intensity using Morpheus Photo Morpher (v3.17 Standard) software (see Figure 1).

3.3. Interpersonal reactivity index (IRI)

To test H2 and H3, we focused on the Empathic Concern (EC) subscale (question 15 to 21) of the IRI (Davis, 1983) which measures an individual's tendency to show compassion and concern for mistreatment of another person (Decety et al., 2015; Green et al., 2009; Ruben and Hall, 2013). Cliffordson (2001) found evidence of convergent validity for the empathic concern subscale of the IRI by showing that it was identical to the concept of empathy when comparing students' and parents' personality judgments. The IRI shows good psychometric properties (Keaton, 2017; but see also Murphy and Lilienfeld, 2019 for a criticism of the perspective taking sub-scale). Davis (1983) originally reported the internal consistencies coefficients for the IRI subscales to be in the range of

Table 1. Participants' self-identified ethnicity.

Ethnicity	
White (North America, Europe, Other)	62.7%
Asian (East, South, South East, Central, Other)	11.6%
Black (North America, Africa, Caribbean, Other)	6.6%
Mixed Heritage	6.9%
Arab (North Africa, Middle East, Other)	6.9%
Indian (India, Caribbean, Other)	3.4%
Hispanic/Latin American	1.6%
Decline to answer	2.4%

Note. $n = 327$.

Table 2. Examples of priming scenarios.

Condition	Priming scenario
Criminality history	This man has been charged with one count of attempted murder. He stabbed a man on public transit. The man spent several weeks in the hospital and he still suffers daily due to his injuries.
	This man has been convicted of aggravated assault. He shoved his victim to the ground and gave him several kicks to the head and body. As a result of the assault, the victim has suffered a concussion and bruises.
Control	This man enjoys working out at the gym. At work, he values his employees and puts a great deal of importance on customer satisfaction. Last year, he was awarded the "best manager" of the year award.
	This man loves animals. His favorite activity is to take his dog for a walk in the park near his house. He always carries treats in his pockets and walks several dogs in the neighborhood for free.

$\alpha = .75$ to $\alpha = .78$. Test-retest fidelity ranged from $r = .61$ to $.81$ for its subscales. Davis (1983) demonstrated the validity of the IRI's subscales by comparing them to previous cognitive and emotional measures of empathy, interpersonal functioning, self-esteem, emotionality, sensitivity to others, and intelligence (Keaton, 2017). As reviewed by Keaton (2017), the EC subscale positively correlated with the concepts of shyness and anxiety, and negatively correlates to an undesirable communication style (boastfulness and egotism), self-esteem, emotionality, and an unselfish concern for others.

3.4. Procedure

The survey was administered online through Qualtrics. Instructions for configuring devices for the study were provided after written consent was obtained. Demographic questions followed. Pain intensity and unpleasantness intensity ratings were then collected. Next, measurements of valence, willingness to help, and deception followed. The IRI questionnaire was completed at the end of the study.

3.4.1. Phase 1: priming

Participants were divided into two independent groups and randomly assigned to one of the two conditions (criminal history vs. control). Each priming scenario was randomly paired with a face model. Phase 1 was made up of three identical blocks. Before each block, participants were instructed to examine the picture shown and memorize the description of the individual portrayed. For each block, the five model-scenario pairings were shown one after the other for a minimum of 15 s or until participants pressed a key to move to the next pairing. Order of presentation of the pairings was randomized within each block. In Block 2 and Block 3, we verified participants engagement by asking them to choose which of two statements best matched the task instructions.

3.4.2. Phase 2: estimates of pain intensity

In this phase, participants were shown two blocks of trials: one Intensity Block where participants estimated the pain intensity expressed by the models, and one Unpleasantness Block where participants estimated the pain unpleasantness expressed by the models. Order of presentation of these two blocks was counterbalanced. Instructions were provided prior to presentation of each of these two blocks of trials to explain to the participants the distinction between the sensory (i.e., intensity) and affective (i.e., unpleasantness) aspects of pain (Price, 2000). Again, two questions followed the presentation of the task instructions to assess the participants' level of engagement in the study.

For each block, the models displaying varying levels of pain intensity were shown according to a method of constant stimuli. The 9 stimuli displaying varying levels of pain for each of the 5 models were randomly presented, 3 times each, for a total of 135 trials. For the Intensity Block, participants were asked to rate the level of pain intensity expressed by the



Note. Pain intensity levels are labelled as 1 to 9 from left to right.

Figure 1. Models depicting nine levels of intensity of the facial expression of pain.

models using a scale ranging from “no pain” (0) to “most intense pain imaginable” (10). For the Unpleasantness Block, participants were asked to rate the level of unpleasantness expressed by the models using a scale from “not at all unpleasant” (0) to “most unpleasant pain imaginable” (10). Each face model was shown until the participant made a choice. A 5-minute forced break was introduced between the two blocks.

3.4.3. Phase 3: valence, willingness to help, deception, EC

This phase was divided in three blocks where participants answered valence, willingness to help, and suspicion of deception questions. In the first ‘valence’ block, participants were shown each model (neutral expression) in random order and were asked to rate “How do you feel towards this individual” with “totally negative” (0) and “totally positive” (10) as anchors. In the second ‘willingness to help’ block, participants were shown each model (pain intensity level 6) in random order and asked to rate “How willing would you be to help this individual if you had the opportunity to do so” with “totally unwilling” (0) and “totally willing” (10) as anchors. For the third ‘deception’ block, participants were shown each model (pain intensity level 6) in random order. Participants were informed that some individuals may have faked their pain and were asked to “Indicate the extent to which you believe the person was faking their facial expression of pain” with “not at all” (0) and “totally” (10) as anchors. To verify participants’ engagement, one multiple choice question (e.g., “What will you be asked to do in the next part of the study?”) was introduced after task instructions before each block, for total of three questions.

Finally, participants completed all questions of the IRI. At the end of the survey, participants were debriefed and the true purpose of the study was revealed. Participants were given the right to withdraw the data they provided.

3.5. Plan of statistical analyses

We collapsed the nine levels of intensity ratings into two variables, namely Low intensity expressed (average of levels 1, 2, 3; see Figure 1) and High intensity expressed (average of levels 7, 8, 9; see Figure 1) to produce two separate dependent variables and avoid multicollinearity effects. For simplicity, results for the unpleasantness ratings are not included because they mirrored the intensity ratings (Descriptive statistics of the unpleasantness ratings can be found in Supplementary materials Table S1).

The statistical analyses included three general linear models. Model 1 is a multivariate multiple regression with Criminality Labelling (criminal history vs. control) and EC simultaneously predicting five outcome variables, namely intensity ratings for low intensity expressed, intensity ratings for high intensity expressed, valence ratings, willingness to help ratings, and deception ratings¹. This model included Gender as a covariate.

Model 2 is a moderation model testing the hypothesis that Criminality Labelling have a different effect for individuals high or low on EC. The same outcome variables as in Model 1 were included in Model 2. All variables were standardized prior to this analysis. Lastly, Model 3 is a

¹ As described in the Results section, this variable was not included in any of the models reported herein because of its poor internal reliability.

mediation model testing the hypothesis that Criminality Labelling and EC both influence valence ratings (see De Ruddere et al., 2013), which in turn influence the remaining outcome variables.

All models were fully saturated (i.e., no degrees of freedom, therefore no indices of fit) and were tested in Mplus 7. The dataset contained no missing data. Models 1 and 2 were estimated with Maximum Likelihood-Robust (MLR) estimator, which correct for acceptable degrees of skewness. Model 3 was estimated with bias-corrected bootstrap with 5,000 resampling, a method robust to skewed distributions (Efron and Tibshirani, 1993; MacKinnon et al., 2004). Raw data can be found at https://osf.io/5jfn9/?view_only=6e32afdb4c54417da8494e45102b147b.

4. Results

4.1. Preliminary analyses

Descriptive statistics, reliability coefficients, and correlations are presented in Table 3. All variables presented good reliability coefficients except deception ratings (Cronbach’s $\alpha = .19$). As a result, we decided to exclude it from further analyses.² Data for the low intensity pain ratings were relatively skewed (see Table 3). However, the models were estimated with MLR and bootstrapping procedures which are robust to skewed distributions.

4.1.1. Model 1—regression results

See Table 4. Gender significantly predicted ratings of high intensity expressions (standardized regression coefficient $\beta = .12, p = .02$). However, Gender was not a significant covariate when the other independent variables were included in the model (Step 2). Criminality Labelling did not significantly predict ratings of low nor high intensity expressions ($\beta = .002, p = .96$, and $\beta = .06, p = .26$, respectively). This is shown in Figure 2. But criminality Labelling significantly predicted valence ($\beta = .51, p < .001$) and willingness to help ($\beta = .35, p < .001$) ratings. Next, Empathic Concern (EC) negatively predicted pain intensity ratings for low intensity expressions ($\beta = -.20, p = .002$), and positively predicted pain intensity ratings for high intensity expressions ($\beta = .16, p = .003$; see Figure 3). EC positively predicted willingness to help ($\beta = .18, p = .002$) but did not significantly predict valence ($\beta = .003, p = .95$).

4.1.2. Model 2—moderation results

See Table 4. EC only significantly moderated the relationship towards willingness to help. More specifically, as shown in Figure 4, participants high on EC were more willing to help models in the control condition than in the criminality labelling condition. In contrast, low EC participants were equally willing to help models whether they were in the control or the criminal labelling condition. The moderation effect explained an additional 2.2% of the variance in ratings of willingness to help.

² Informal feedback from participants who participated in an in-person pilot version of this study (pre COVID-19 pandemic) suggests that some participants did not understand the question, which may explain the low inter-model correlations for this measure.

Table 3. Descriptive statistics and internal consistency.

Measure	Mean	SD	Skew	α	1	2	3	4	5	6	7
1. Gender	1.80	.42	-1.14	n/a	—						
2. Priming condition	n/a	n/a	n/a	n/a	.05	—					
3. Empathic Concern	3.03	0.66	-0.69	.79	.34**	.03	—				
4. Low intensity (lvl 1–3)	1.25	1.27	1.88	.97	.03	.00	-.15**	—			
5. High intensity (lvl 7–10)	6.78	1.40	-0.49	.98	.12*	.10	.18**	.27**	—		
6. Valence	4.22	1.96	-0.08	.84	-.02	.51**	.00	-.03	.09	—	
7. Willingness to help	6.03	2.17	-0.52	.90	.04	.35**	.17**	.09	.33**	.45**	—
8. Deception	4.83	1.30	0.01	.19	-.05	-.04	-.02	.01	-.02	.02	-.11*

Note. SD = Standard Deviation, α = Cronbach's alpha. $n = 327$. * $p < .05$. ** $p < .01$. Gender: 1 = Male, 2 = Female. Condition: 1 = criminal history, 2 = control.

Table 4. Results of regression model 1 and moderation model 2.

	Low intensity	High intensity	Valence	Willingness to help
Step 1—Model 1				
Gender	.03	.12*	-.02	.04
Step 2—Model 1				
Gender	.10	.06	-.05	-.04
Criminality Labelling	.002	.09	.51***	.35***
Empathic Concern	-.20**	.16**	.003	.18**
R ²	3.6%	4.6%*	26.3%***	15.3%***
Step 3—Model 2				
Gender	.26	.17	-.08	-.05
Criminality Labelling	-.28	-.25	.11	-.33
Empathic Concern	.38	-.06	-.26	-.26
Criminality Labelling × EC	.19	.22	.26 [†]	.44**
R ²	3.9%	5.2%*	27.0%***	17.5%***

Note. $n = 327$. EC = Empathic Concern. * $p < .05$, ** $p < .01$, *** $p < .001$, [†] $p = .051$.

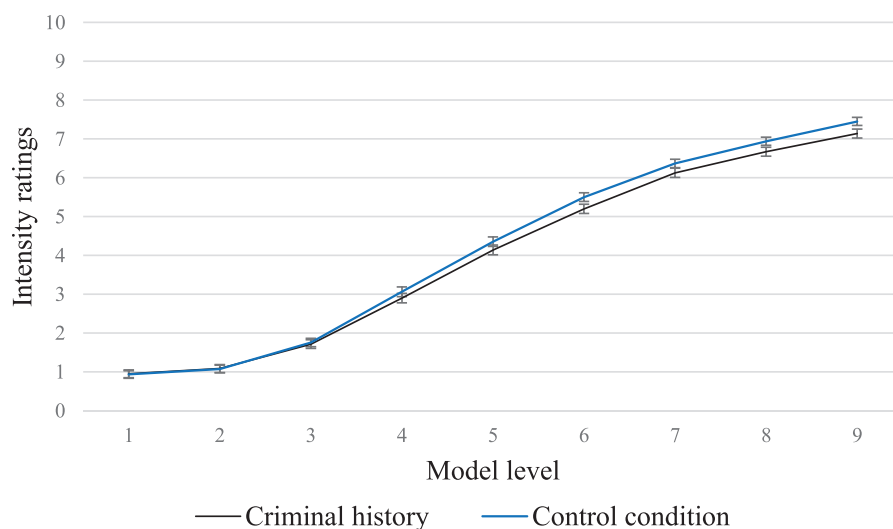
4.1.3. Model 3—mediation results

See Table 5. Criminality Labelling negatively influenced ratings of valence, which in turn, negatively influenced ratings of willingness to help. The direct effect for this mediation (i.e., the link between Criminality Labelling and Willingness to help while accounting for the mediator) remained significant, thus suggesting a partial mediation. The variance of willingness to help explained by the model went from 15.3% in Model 1 to 25.5% in this mediation model.

We observed significant total effects (link without accounting for the mediator) between EC and ratings of Low and High intensity expressions, as well as towards willingness to help. These findings echo those observed in Model 1. None of the indirect effect for those links reached statistical significance, suggesting no mediating role of valence on those relationships.

5. Discussion

The pain of minority and stigmatized groups is systematically underestimated and undertreated, which can lead to poorer health outcomes and distrust in the healthcare system (e.g., Anderson et al., 2009; Carr, 2016; De Ruddere et al., 2013; Dubin et al., 2017; LeResche, 2011;



Note. $n = 327$. Errors bars represent +/-1 SE.

Figure 2. Effect of criminality labelling on the intensity rating.

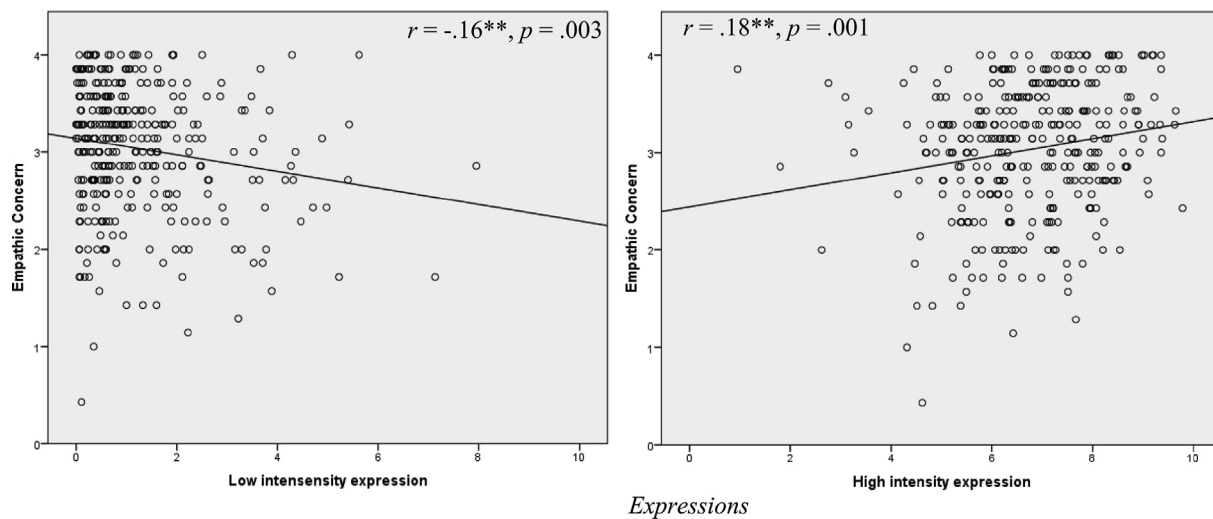
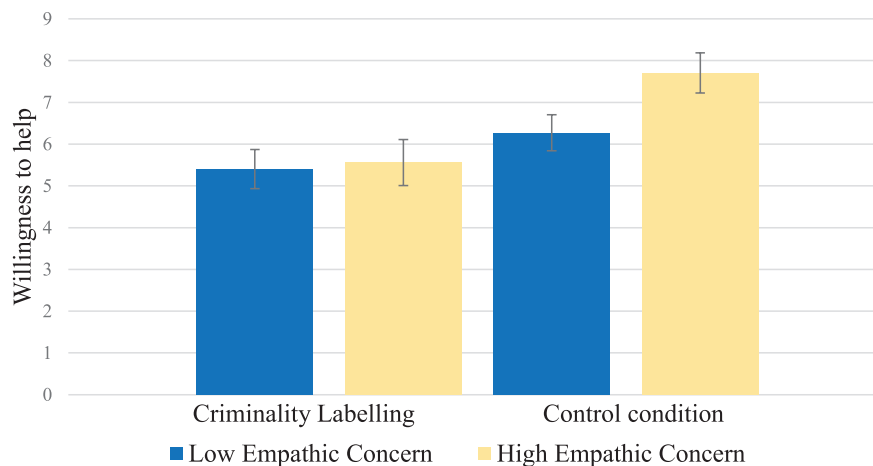


Figure 3. Correlation between empathic concern and intensity estimations for low and high intensity.



Note. $n = 327$. Error bars represent ± 1 SE.

Figure 4. Interaction between empathic concern and criminality labelling control condition.

Meghani et al., 2012). These inequalities have been attributed to stereotypes about pain tolerance (Mende-Siedlecki et al., 2019), reduced sensitivity to pain signals emitted by individuals belonging to an out-group (Azevedo et al., 2013), suspiciousness about the genuineness of the pain displayed (Kappesser & de C. Williams, 2008; Poole and Craig, 1992), and observers' empathy (Azevedo et al., 2013). We examined whether criminality labelling also influences reactions to others' pain. We discuss results related to the three hypotheses tested, followed by a presentation of implications for clinical practice and limitations.

As predicted by H1, criminality labelling reduced willingness to help. Consistent with past research (DeRudder et al., 2013; Hampton et al., 2018), the influence of criminality labelling on willingness to help was mediated by reduced valence ratings³ for models labelled as criminals. Given that the models were identical in both conditions, our study provides convincing evidence that criminality labelling *in and of itself* can lead to discrimination in willingness to help others in pain. Our findings mirror reports of discrimination in a broad range of social settings (Berry & Weiner, 2020; Frank et al., 2014; Moore et al., 2016; Turney et al.,

2013; Winnick and Bodkin, 2008), which likely result from stereotypes and stigma associated with having a criminal history (e.g., Berry & Weiner, 2020).

Contradictory to H1, criminality labelling did not influence pain intensity estimates. Hampton et al. (2018) reported a similar pattern of results where information regarding misuse of the healthcare system reduced willingness to help ratings but not pain intensity estimates. This pattern of finding likely reflects a 'failure of empathy' for individuals labelled as criminals. Cikara et al. (2011) have reviewed evidence suggesting that categorizing individuals as members of an out-group can disrupt helping behaviours without affecting perceptions of pain and suffering. We speculate that similar psychosocial processes were at play here with observers being aware of the pain expressed by models labelled as criminals but being less willing to help them. In Mende-Siedlecki et al. (2019), the underestimation of pain intensity for African Americans models was more pronounced when low-level pain signals were shown to participants. Hence, another possible explanation for our results is that estimations were not skewed because the pain expressed by the models was unambiguous in most trials (Chibnall et al., 2000; Tait and Chibnall, 2014). Additional research is needed to clarify the conditions under which psychosocial factors like discrimination influence reactions to others pain.

³ Finding a significant effect of criminality labelling on valence ratings shows that our criminality labelling manipulation was effective and believable.

Table 5. Results of the mediation model (model 3). Valence mediating the effect of Criminality Labelling and Empathic Concern onto Intensity ratings and Willingness to help.

	Low Intensity	High Intensity	Willingness to help
Total effect of Criminality Labelling	$\beta = 0.01 [-0.10, 0.11]$	$\beta = 0.09 [-0.01, 0.20]$	$\beta = 0.35 [0.26, 0.44]**$
Indirect effect of Valence	$\beta = -0.02 [-0.08, 0.04]$	$\beta = 0.02 [-0.04, 0.09]$	$\beta = 0.19 [0.12, 0.26]**$
Direct effect of Criminality Labelling	$\beta = 0.03 [-0.10, 0.15]$	$\beta = 0.07 [-0.05, 0.19]$	$\beta = 0.16 [0.05, 0.26]**$
Total effect of EC	$\beta = -0.16 [-0.28, -0.05]**$	$\beta = 0.18 [0.07, 0.29]**$	$\beta = 0.17 [0.06, 0.27]**$
Indirect effect of Valence	$\beta = 0.001 [-0.01, 0.01]$	$\beta = -0.001 [-0.01, 0.01]$	$\beta = -0.01 [-0.04, 0.03]$
Direct effect of EC	$\beta = -0.16 [-0.28, -0.05]**$	$\beta = 0.18 [0.08, 0.29]**$	$\beta = 0.17 [0.07, 0.27]**$

Note. EC = Empathic Concern * $p < .05$. ** $p < .01$. $n = 327$. 95% confidence intervals shown in brackets were estimated with bias-corrected bootstrap and 5,000 re-sampling.

Because the interaction between EC and criminality labelling was significant for willingness to help ratings, we discuss findings for willingness to help in the following section (H3). Findings for high pain expressed are consistent with H2. When models expressed high pain intensities (levels 7, 8, 9), participants high on EC provided *higher* pain ratings than participants low in EC. However, a more subtle pattern of results emerges when looking at the influence of EC on estimations of facial expressions showing low levels of pain intensity. For the low pain intensity expressed condition, observers high in EC provided *lower* pain estimations than observers low in EC. A possible interpretation for these results is that EC drives pain estimation *accuracy*. Green et al. (2009) found that individuals high in empathy tended to provide higher pain intensity ratings. Green et al. (2009) also found that observers high in empathy were more accurate in their pain estimations for one index of pain estimation accuracy. There is also evidence that individuals high in empathy are more accurate at recognizing facial expressions of emotions (Gery et al., 2009; Martin et al., 1996; but see Besel and Yuille, 2010). To explore the possibility that observers high in EC provided more accurate pain estimations, we ran exploratory analyses on an index of accuracy computed as a deviation from the level of pain expressed by the models (as per the morphing procedure) and the pain intensity estimates provided by participants. Small but significant negative correlations between EC and deviations were found (see Supplementary materials, Table S2). Hence, our results support the notion that individuals high in trait empathy provide more accurate estimates of the pain experienced by others. We now turn to H3 for a more in-depth discussion of the impact of EC on willingness to help.

As predicted, observers high in empathy were more sensitive to the labelling manipulation than observer low in empathy. But contrary to H3, the influence of trait empathy did not manifest in the criminality labelling condition but in the control condition. As can be seen in Figure 4, willingness to help was highest for high EC participants in the control condition; all other conditions produced comparable ratings. In the control condition, models were portrayed as behaving in ways that can be qualified as warm and generous (see examples Table 2). In contrast, persons with a criminal history are viewed as cold and unkind (reviewed in Rade et al., 2016; see also Berry & Weiner, 2020; Côté-Lussier, 2016). Warmth, or how 'likeable' a person is, is a fundamental stereotype dimension that influences a wide range of interpersonal and intergroup behaviours, including empathic responses (Aue et al., 2021; Cuddy, Fiske & Glick, 2008). Furthermore, empathic responses are elevated for social targets with whom participants identify (Preis and Kroener-Herwig, 2012) and in-group individuals (Vanman, 2016). Hence, we speculate that observers high in EC were more willing to help models in the control condition because (i) those models were seen as more likeable and (ii) more similar to themselves.

Our findings suggest that individuals high in empathy are not immune to the influence of criminality labelling. A question that remains is whether this influence is limited to pain perception because of its subjective nature (Tait and Chibnall, 2014) or extends to other facets of health care. Given the high level of stress experienced by healthcare practitioners in a multitude of situations, we predict that our finding that

trait empathy does not immunize against discrimination and stigma is likely to extend beyond the realm of pain management. The fact that disparities in health care are well documented for visible minorities and stigmatized groups is also consistent with this prediction (e.g., Black Americans, Mays et al., 2007; Carr, 2016; Hirsh et al., 2014; Hoffmann and Tarzian, 2001; Nyblade et al., 2019; Tait and Chibnall, 2014).

6. Implications

What emerges from our study is that negative stereotypes associated with criminality can reduce willingness to help individuals in pain even when pain signals are accurately perceived. In the broader context of health care, our findings support the notion that elevated health care usage among ex-offenders reflects, at least in part, the influence of psychosocial factors (Kouyoumdjian et al., 2018; Redmond et al., 2020). More importantly, our study uncovers one plausible route for this association: failing to help others in pain could engender a negative cycle for this stigmatized population whereby inequalities in pain management can lead to poorer health outcomes and distrust in the health care system. Whereas some jurisdictions protect the privacy of individuals with a criminal history, health care providers can sometimes guess this information from medical records. In more extreme cases, the status of prisoners is made evident by the handcuff they wear while receiving care in hospitals situated near detention centers (Tuite et al., 2006). Hence, our results highlight the importance of introducing safeguards to ensure the privacy of persons convicted of a crime in health care settings to avoid activating stereotypes and ensuing discrimination (see e.g., Ruddell and Winfree, 2006; but see Winnick and Bodkin, 2008).

Our finding that criminality labelling did not influence pain intensity estimates implies that providing interventions that focus on decoding of pain signals may not be effective to counteract disparities in pain management. Instead, interventions that target cognitive biases (Berry & Weiner, 2020; Cikara, Bureau & Saxe, 2011; Hofmeister and Soprych, 2017; Seviliano and Fiske, 2016), such as individuation of out-group members and imagining positive interactions with out-group members (Miles and Crisp, 2014), might be more effective to reduce pain underestimations.

7. Limitations

One might question whether our findings, which were collected in the laboratory with undergraduate students, would generalize to a real health care setting. For example, whether our findings on willingness to help would translate into actual care behaviours remains to be determined. Several lines of evidence suggest that laboratory studies using rating scales have good ecological validity. For instance, laboratory results showing underestimation and reduced reactions to the pain of Black Americans are consistent with the experiences of Black patients (Hoffman et al., 2016; Mende-Siedlecki et al., 2019; Trawalter and Hoffman, 2015). Furthermore, several studies have shown that health care providers, even those who are experienced in pain management, are not immune to social psychological factors like stereotypes (see e.g. review by Tait and Chibnall, 2014). Nonetheless, it would be interesting to see if our results are

replicated when health care practitioners are provided with mock files about patients in criminal labelling vs. control conditions and asked to write a prescription to alleviate the patients' pain.

There is evidence that those who have personal familiarity with offenders have less punitive attitudes towards individuals with a history of criminality (Hirschfield and Piquero, 2010; Johnson et al., 2007), likely because personal contact enhances individuation and reduces out-group processes. Hence, it is possible that our participants may have been more negatively influenced by criminality labelling as compared to healthcare providers working in facilities near detention centers. Unfortunately, we have no information on how often our participants have been exposed to individuals having a history of criminality. Future research is therefore needed to clarify the role of exposure to individuals with a criminal history on reactions to pain.

8. Conclusion

There is abundant evidence of disparities in healthcare for under-represented and stigmatized groups (e.g., Carr, 2016; Nyblade et al., 2019; Tait & Chinball, 2014). Current understanding is that these inequalities arise, at least in part, from psychosocial factors such as prevailing stereotypes and in-group/out-group categorization. Here, we show for the first time that observers are less willing to help individuals labelled as criminals who are experiencing pain. Similarly, individuals with a history of imprisonment are less likely than controls to be offered an appointment at the offices of family physicians (Fahmy et al., 2018) and are more likely to report personal experiences of inequalities in health care (Frank et al., 2014). Future research is needed to uncover other areas where negative attitudes negatively impacts pro-social behaviours. It will also be important to develop interventions that can effectively reduce biases for healthcare professionals who are in regular contact with stigmatized populations.

Declarations

Author contribution statement

Isabelle Boutet: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Jean-Christophe Goulet-Pelletier: Analyzed and interpreted the data; Wrote the paper.

Safae Maslouhi: Performed the experiments; Wrote the paper.

Daniel Fiset; Caroline Blais: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

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Data availability statement

Data associated with this study has been deposited at https://osf.io/5jfn9/?view_only=6e32afdb4c54417da8494e45102b147b

Declaration of interest's statement

The authors declare no conflict of interest.

Additional information

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