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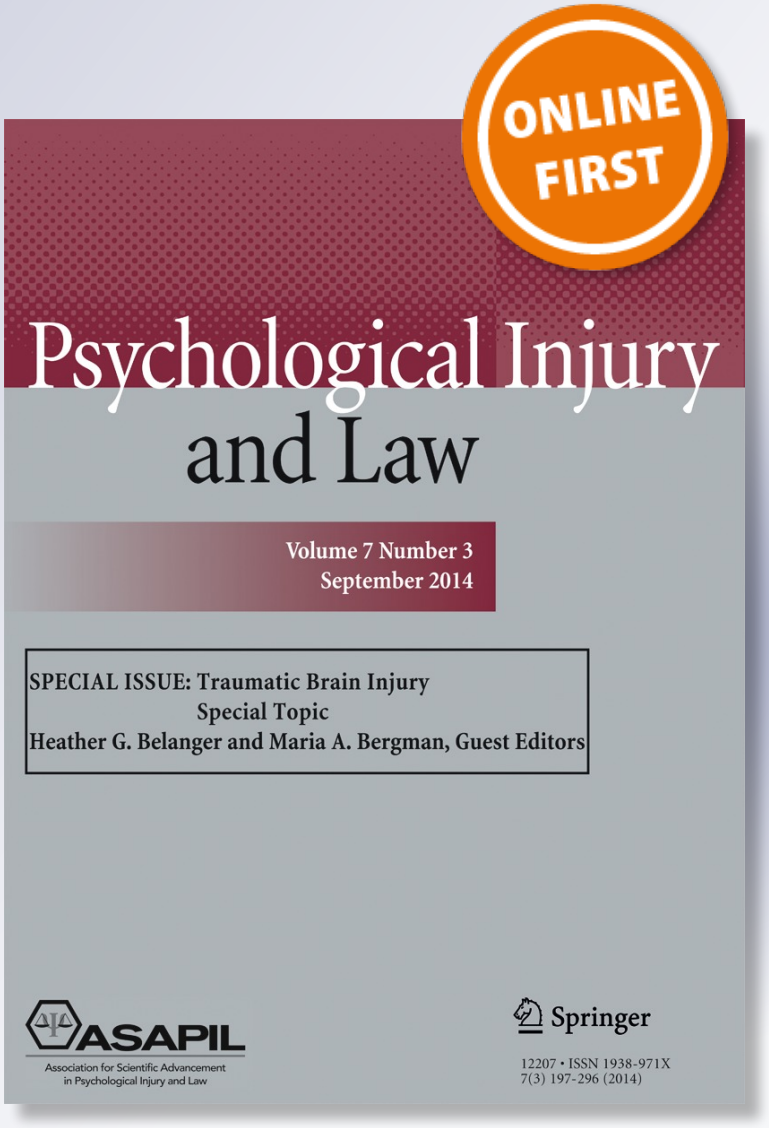

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Abstract Research is accumulating highlighting the negative impact of perceptions of injustice on health and mental outcomes associated with pain. To date, the relation between perceived injustice and adverse pain outcomes has been demonstrated with individuals suffering from a wide range of debilitating pain conditions. This paper summarizes what is currently known about the negative impact of justice-related appraisals on recovery trajectories following injury. The paper also addresses the processes that might underlie the relations between perceived injustice and adverse pain outcomes. Given the research indicating that perceived injustice is a powerful predictor of disability, it follows that interventions that yield reductions in perceived injustice should be associated with reductions in disability. Of concern, however, is that perceptions of injustice do not appear to respond to current treatment approaches used in the management of pain and disability consequent to injury. It is argued that a paradigm shift in approaches to evaluation and treatment might be required in order to yield meaningful reductions in perceived injustice. Such a paradigm shift might entail broadening the targets of assessment and intervention beyond the 'perceptions' of the injured individual to include potential external sources of injustice (e.g., employer, insurer, health care provider) in the treatment plan.

Keywords Perceived injustice · Injury · Compensation · Disability

M. J. L. Sullivan (✉) · E. Yakobov
Department of Psychology, McGill University,
1205 Docteur Penfield, Montreal, QC, Canada H3A 1B1
e-mail: Michael.Sullivan@mcgill.ca

W. Scott
Institute of Psychiatry, Psychology and Neuroscience,
King's College London, London, UK

R. Tait
Department of Neurology and Psychiatry, Saint Louis University
School of Medicine, St. Louis, MO, USA

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The potentially devastating consequences of musculoskeletal injury have been described in numerous reports (Chapman & Gavrin, 1999; Keogh, Nuwayhid, Gordon, & Gucer, 2000). For some individuals, life following injury will be characterized by significant and persistent physical and emotional suffering (Berglund, Bodin, Jensen, Wiklund, & Alfredsson, 2006; Nederhand, Hermens, Ijzerman, Turk, & Zilvold, 2003). In addition, post-injury life might be replete with loss experiences, including the loss of employment, the loss financial security, the loss of independence, and the loss of sense of identity (Harris, Morley, & Barton, 2003; Lyons & Sullivan, 1998). While some of these losses might be temporary, others might be permanent (Evans, Mayer, & Gatchel, 2001; Suissa, 2003; Watson, Booker, Moores, & Main, 2004).

Clinical anecdotes abound of persistent pain sufferers who feel they have been victimized either as a direct result of their injury, or indirectly by injury-related sequelae (Aceves-Avila, Ferrari, & Ramos-Remus, 2004; Bigos & Battie, 1987; McParland, Eccleston, Osborn, & Hezseltine, 2011; Waugh, Byrne, & Nicholas, 2014). An Internet search quickly reveals numerous attestations that emphasize the injustice of living with pain: "*What did I do to deserve this*?", "*I wish he could see what he has done to my life*", or "*Nothing will ever make up for what I have gone through.*" Such attestations reflect at once elements of the magnitude of loss, the irreparability of loss, and a sense of unfairness (McParland & Whyte, 2008; Sullivan et al., 2008).

Surprisingly, it is only within the last decade that justice-related appraisals have become the focus of systematic enquiry in the domain of injury and pain (Brown, Bostick, Lim, & Gross, 2012; Chibnall & Tait, 2009; McParland & Eccleston, 2013; Scott, Trost, Bernier, & Sullivan, 2013; Sullivan et al.,

2008). While themes of victimization have long been reflected in clinical discourse, attention to the conditions necessary for the development of perceived injustice and/or its consequences has, until recently, remained at the level of speculation (DeGood & Kiernan, 1996; Ferrari & Russell, 2001; Kan, 2013).

This paper will review what is currently known about the role of justice-related appraisals in the experience of, and recovery from, debilitating injury. We will argue that perceived injustice is an important risk factor for problematic recovery at both physical and psychological levels. We will also argue that perceived injustice is distinct from other pain-related psychosocial risk factors, particularly with respect to the multiplicity of sources from which it can arise. Personal, social, and systemic influences converge to render perceived injustice one of the most challenging pain-related psychosocial risk factors to target clinically (McParland, Eccleston, et al., 2011; Sullivan, Scott, & Trost, 2012; Tait, 2004).

The Nature of Justice-Related Appraisals

Perceptions of injustice are inherently subjective. An early paper on the psychology of injustice defined perceived injustice as "a dissatisfied state of mind: a felt discrepancy between what is perceived to be and what is perceived should be" (Adams, 1965). Proceeding from this definition, large individual differences might be expected as perceivers will vary both in terms of their construal of 'what is' and their referent for 'what should be.'

Lerner (1980) proposed that one central referent for 'what should be' was the belief that we live in a world where everyone gets 'what they deserve.' According to Lerner, a belief in a just world promotes the illusion of a stable, orderly, and predictable world. Lerner argued that individuals are driven to maintain their just world beliefs, even in the face of disconfirming evidence, and will invoke the necessary perceptual (e.g., denial) and cognitive (e.g., rationalization) maneuvers required to maintain their beliefs (Lerner, 1980).

At present, little is known about the factors that give rise to perceptions of injustice. It has been suggested that perceptions of injustice are likely to emerge in situations that are characterized by a violation of basic human rights, transgressions of status or rank, or challenges to equity norms and just world beliefs (Fetchenhauer & Huang, 2004; Hafer & Begue, 2005; McParland & Eccleston, 2013; McParland & Knussen, 2010; Mohiyeddini & Schmitt, 1997). Conceptual models of justice-related appraisals have highlighted the potential role of blame, loss, and suffering in the subjective experience of injustice (McParland & Eccleston, 2013; McParland, Hezseltine, Serpell, Eccleston, & Stenner, 2011; Sullivan et al., 2008).

Although the focus of research to date has been on perceptions of injustice subsequent to injury, injuries are not the only conditions under which individuals might experience a sense of injustice. Perceptions of injustice can also arise in the context of health conditions that have an insidious onset such as fibromyalgia, osteoarthritis, multiple sclerosis, arthritis, cancer, and HIV (Cebolla, Luciano, DeMarzo, Navarro-Gil, & Campayo, 2013; Douard, 1991; Yakobov, Scott, Stanish, et al., 2014). Any life situation that interferes with equal access to resources or opportunities, and/or is associated with suffering or loss can give rise to perceptions of injustice.

The Measurement of Perceived Injustice

Research on the role of perceived injustice in health and mental health outcomes consequent to injury was facilitated by the development of the *Injustice Experiences Questionnaire* (IEQ) (Scott, Trost, Milioto, & Sullivan, 2013; Sullivan et al., 2008). On this measure, perceived injustice is conceived as a cognitive appraisal comprising elements of the severity of loss ("*Most people don't understand how severe my condition is*"), the irreparability of loss ("*My life will never be the same*") and blame ("*I am suffering because of someone else's negligence*").

The IEQ consists of 12 items reflecting various justice-related appraisals relevant to the experience of injury. Respondents are asked to indicate the frequency with which they experience each thought on a five-point scale with the endpoints (0) *never* and (4) *all the time*. Research shows that the IEQ has high internal consistency (alpha=.92) and high test–retest reliability (r=.90). Studies on the psychometric properties of the IEQ reveal that the scale comprises two correlated factors that have been labeled severity/irreparability of loss and blame/unfairness (Sullivan et al., 2008; Yakobov, Scott, Tanzer, et al., 2014). The results of a recent study suggest that a cut-score of 19 on the IEQ distinguishes between individuals who recover from musculoskeletal injury and those whose course of recovery will be characterized by persistent pain and disability (Scott, Trost, Milioto, et al., 2013).

The instructional set of the IEQ orients respondents to reflect on how their injury has affected their lives. In this manner, the IEQ is appropriate only for individuals who have sustained a debilitating injury. To broaden the scope of the instrument, the IEQ was modified to make it applicable to individuals suffering from a wide range of debilitating health and mental health conditions. The instructional set of the modified IEQ (referred to as IEQ-chr) orients respondents to reflect on how 'their health condition' has affected their lives. Otherwise, the item content and response format of the IEQ-chr are identical to that of the original IEQ. The results of a recent study using the IEQ-chr with a sample of individuals with osteoarthritis revealed that the IEQ-chr has psychometric properties similar to the original version (Yakobov, Scott,

Tanzer, et al., 2014). (The IEQ and the IEQ-chr are available free of charge and can be obtained from http://sullivan-painresearch.mcgill.ca/).

A measure of perceived injustice was also developed by Franche and colleagues (Franche et al., 2009). These authors developed a scale to assess claimants' perceptions of justice specific to their experience with the injury compensation process. The *Perceived Justice of the Compensation Process Scale* is a 15-item scale where respondents are asked to indicate their level of agreement (1=strongly agree; 5=strongly disagree) with statements reflecting different dimensions of justice relevant to the injury compensation system. The scale was developed in accordance with four theoretically based dimensions of organizational justice, namely, distributive justice, procedural justice, informational justice, and interpersonal justice (Colquitt, 2001).

The distributive justice subscale contains items reflecting rules of equity in the distribution of resources ("*Overall, your compensation benefits have been fair and acceptable*"); the procedural justice subscale contains items reflecting the fairness of procedures used by the injury insurer ("*The way that the insurer has been making decisions has been fair to you*"); the informational justice subscale contains items concerning the adequacy of information provided to the claimant ("*The person from the insurer has provided you with the information you needed*"); and the interpersonal justice subscale addresses the degree to which the claimant feels that interactions with insurer representatives have been characterized by respect and sensitivity ("*The person from the insurer has treated you with dignity and respect*"). The subscales have been shown to have high internal reliability (alphas .86 to .92) (Franche et al., 2009). A copy of the scale can be obtained by communicating with the scale developers (renee-louise.franche@worksafebc.com).

Perceived Injustice and Health Outcomes

Clinical Studies DeGood and Kiernan provided one of the first empirical reports on the negative consequences of perceived injustice in individuals with pain conditions (DeGood & Kiernan, 1996). In this study, individuals with chronic pain who blamed their employer for their injury, compared with those who did not blame an external source, reported significantly more emotional distress, expected less benefit from treatment, and were more likely to indicate that previous treatment had worsened their condition. The authors suggested that the efforts devoted to finding and ascribing blame for one's injury might detract from the investment of cognitive and emotional resources required to benefit fully from treatment.

Research is accumulating highlighting the negative impact of perceptions of injustice on health and mental outcomes associated with pain. To date, the relation between perceived injustice and adverse pain outcomes has been demonstrated in individuals suffering from a wide range of debilitating pain conditions such as work-related low back pain (Sullivan et al., 2008), whiplash injury (Scott, Trost, Milioto, et al., 2013), fibromyalgia (Rodero et al., 2012), osteoarthritis (Yakobov, Scott, Stanish, et al., 2014; Yakobov, Scott, Tanzer, et al., 2014), and rheumatoid arthritis (Ferrari & Russell, 2014).

In a cross-sectional study of chronic pain patients consulting a tertiary care pain clinic, perceived injustice was positively correlated with measures of pain severity and disability (Scott, Trost, Bernier, et al., 2013). In a prospective study of individuals with musculoskeletal injuries (i.e., back sprain, whiplash), high scores on perceived injustice predicted work disability at 1 year follow-up, even when controlling for initial pain severity, catastrophizing, depression, and pain-related fears (Sullivan et al., 2008). In a prospective study of individuals with osteoarthritis who were scheduled for total knee arthroplasty, pre-surgical scores on perceived injustice prospectively predicted pain severity 1 year following surgery (Yakobov, Scott, Stanish, et al., 2014). In the latter study, pre-surgical perceived injustice remained a significant predictor of post-surgical pain even when controlling for pre-surgical pain severity, catastrophizing, and pain-related fear.

Naturalistic Studies Several investigators have examined associations between legal involvement and compensable injury (Chibnall & Tait, 2010; Tait, Chibnall, & Richardson, 1990). Research has pointed to a significant association between involvement in a compensation system and negative pain-related outcomes (Hestbaek, Rasmussen, & Leboeuf-Yde, 2009; Rohling, Binder, & Langhinrichsen-Rohling, 1995; Teasell, 2001). While perceptions of injustice might account, at least in part, for the relation between involvement in a compensation system and negative pain-related outcomes, it is important to caution that involvement in compensation could reflect the influence of processes unrelated to perceived injustice. These might include the lure of financial gain, potential coping skill deficits among claimants, and less favorable employment opportunities following claim resolution (Tait, 2004; Teasell, 2001).

Studies of workers' compensation claimants that have examined claimant dissatisfaction are more directly relevant to perceptions of injustice. Dissatisfied workers have voiced recurrent themes that reflect their perceptions of an unjust system. These have included a desire for greater choice of providers, a distrust of the "company doctor," and frustration with the claims handling process (Rudolph, Dervin, Cheadle, Maizlish, & Wickizer, 2002). A study of workers' compensation claimants in Washington State showed that, relative to a satisfied cohort, dissatisfied claimants with chronic pain were 3.5 times more likely to remain on time-loss compensation 6 and 12 months after injury, even after controlling for multiple

mediating variables (Wickizer, Franklin, Fulton-Kehoe, et al., 2004). Similarly, a Missouri study that also controlled for mediating factors showed that dissatisfaction with (provider or employer) treatment was widespread (approximately 65 % of claimants were "not at all" or "only a little" satisfied with treatment). In this study, dissatisfied claimants were significantly more likely to apply for Social Security Disability Insurance benefits following claim closure, almost 2 years after the initial injury (Chibnall, Tait, Andresen, & Hadler, 2006).

The research that is most clearly linked to perceived injustice involves compensation claimants who retained attorneys secondary to dissatisfaction with their treatment. Seeking legal representation following injury, particularly in situations where individuals are already receiving compensation, can be construed as a proxy for perceived injustice (Sullivan, Davidson, Garfinkiel, Siriapaipant, & Scott, 2009). When legal representation is driven by dissatisfaction, long-term negative effects are evident (Chibnall & Tait, 2010). Relative to claimants who do not retain an attorney, those who retain an attorney secondary to dissatisfaction, report significantly higher levels of disability that persist years after claim settlement. It is important to note, however, that while seeking legal representation is significantly higher for dissatisfied claimants (Wickizer, Franklin, Turner, et al., 2004), dissatisfaction is not the only factor that can drive the decision to retain legal services. Indeed, many claimants may retain legal representation in order to cope with adversarial processes that can be endemic to workers' compensation systems (Tait et al., 1990).

Perceived Injustice and Mental Health Outcomes

Several cross-sectional studies have shown that injustice appraisals are associated with more severe depressive symptoms (DeGood & Kiernan, 1996; Scott & Sullivan, 2012; Sullivan et al., 2008). One study showed that perceptions of injustice moderated the relation between pain severity and depression (Scott & Sullivan, 2012). In other words, pain severity was associated with heightened symptoms of depression only in pain patients who had high scores on perceived injustice.

Perceived injustice has been shown to impede recovery from post-traumatic stress symptoms arising as a consequence of injury (Sullivan, Thibault, et al., 2009). In one study, individuals who scored in the clinical range on a measure of post-traumatic stress symptoms and who scored high on a measure of perceived injustice were less likely to show recovery from their post-traumatic stress symptoms than individuals with low scores on perceived injustice (Sullivan, Thibault, et al., 2009). High scores on perceived injustice have also been shown to interfere with recovery from depressive symptoms in individuals with co-morbid pain and depression (Scott, Trost, Milioto, & Sullivan, 2014).

There is research to suggest that attorney involvement is also associated with poorer mental health outcomes following occupational injury (Chibnall et al., 2006). Similarly, the longitudinal study cited in the previous section (Chibnall & Tait, 2010) found that Workers' Compensation claimants who retained attorneys, secondary to dissatisfaction with care, demonstrated long-term decrements in mental health and higher levels of pain catastrophizing, compared with claimants who did not retain an attorney.

It is possible that perceptions of injustice may underlie, at least in part, the clinical presentation of some individuals who are considered to be suffering from 'compensation neurosis.' The term compensation neurosis has a long history dating back to the late 1800s (Weighill, 1983). In its current usage, the term refers to a psychiatric condition that is expressed in the context of compensation systems and is characterized by the exaggeration of symptoms, assumed to be driven by internal motives and the anticipation of secondary (i.e., financial) gain (Hall & Hall, 2012). Justice-related concepts such as entitlement, blame, and retribution are central to both the presumed causes and the phenomenology of compensation neurosis (Hall & Hall, 2012; Weighill, 1983). At present, the relation between perceived injustice and diagnoses of compensation neurosis has not been empirically examined, and as such, any apparent overlap between these constructs must be viewed with appropriate caution.

Lack of Treatment Response

There are important clinical implications arising from research pointing to the negative impact of perceived injustice on pain outcomes (Sullivan et al., 2012; Tait, 2004). Until recently, perceptions of injustice were not thought to be important determinants of recovery and rehabilitation outcomes. As a result, the management of perceived injustice in the treatment of individuals with persistent musculoskeletal pain has not been systematically addressed. Cognitive–behavioral interventions delivered within multidisciplinary programs are currently considered to be the treatment of choice for chronic pain conditions. However, in the subject index of cognitive–behavioral treatment manuals for pain management, the word 'injustice' does not appear (Kerns, Sellinger, & Goodin, 2011; Turk, Meichenbaum, & Genest, 1983).

One study showed that, compared with other pain-related psychosocial risk factors (e.g., pain catastrophizing, fear of pain), perceived injustice was more resistant to change through the course of a multidisciplinary pain treatment program (Sullivan et al., 2008). In this study, participants were enrolled in a standardized 7-week multidisciplinary rehabilitation program aimed at fostering functional recovery from whiplash injury. The intervention team consisted of a physiotherapist, occupational therapist, and psychologist.

Intervention techniques included exercise, education, and instruction in self-management skills and coping. While scores on pain catastrophizing and fear of pain decreased by 15–25 % over the course of the 7-week treatment program, scores on perceived injustice decreased by only 5 % (Sullivan et al., 2008). Findings such as these suggest that the treatment techniques currently being used within multidisciplinary pain rehabilitation programs do not yield clinically meaningful reductions in perceptions of injustice.

Processes Linking Perceived Injustice to Adverse Pain Outcomes

Prompted by the mounting evidence showing a relation between perceived injustice and adverse pain and recovery outcomes, there have been calls for increased attention to perceptions of injustice as a target of intervention (Scott et al., 2014; Sullivan et al., 2012). However, effective treatment or management of perceived injustice will require more knowledge about the processes by which perceptions of injustice affect the experience of pain and suffering, as well as how such processes influence recovery trajectories. Research is beginning to shed some light on the processes through which perceptions of injustice might occasion adverse health and mental outcomes associated with debilitating pain conditions. These processes span cognitive, emotional, behavioral, and social domains.

Cognitive Processes There are a number of cognitive processes through which perceptions of injustice might contribute to adverse pain outcomes. For example, several studies have reported high correlations between perceived injustice and pain catastrophizing (Scott & Sullivan, 2012; Sullivan et al., 2008). Pain catastrophizing has been broadly defined as an exaggerated negative mental set that comprises elements of rumination, magnification, and helplessness (Sullivan et al., 2001). Hence, justice-related appraisals might lead individuals to ruminate or focus excessively on their suffering or losses, ultimately increasing their physical and emotional distress. Attributional processes have also been discussed in relation to perceptions of injustice (Darley & Pittman, 2003). To the degree that individuals with high levels of perceived injustice make external attributions (i.e., blame others) for their negative circumstances, they may be less likely to take responsibility for mitigating their losses. External attributions might promote a more passive orientation to rehabilitation, which is likely to compromise recovery potential.

Emotional Processes Experimental research suggests that injustice appraisals are likely to trigger anger and emotional distress responses (Darley & Pittman, 2003; Mikula, Scherer, & Athenstaedt, 1998; Trost et al., 2013). Similarly, clinical research indicates that anger, especially directed at physicians, and depression are common among patients with chronic pain (Fishbain, Bruns, Disorbio, & Lewis, 2008; Von Korff et al., 2005).

A recent investigation conducted with patients with chronic musculoskeletal pain demonstrated that state anger mediated the relation between the blame subscale of the IEQ and pain severity (Scott, Trost, Bernier, et al., 2013). Expressions of anger have also been shown to exacerbate the intensity of pain by inhibiting endogenous opioid analgesia (Bruehl, Chung, & Burns, 2006, 2007). In addition, acute induction of anger has been shown to increase muscle tension and systolic blood pressure, possibly augmenting sensitivity to pain (J. W. Burns et al., 2008). Anger arising from perceptions of injustice may thus be one vehicle through which perceived injustice impedes recovery from injury.

A relation between perceived injustice and depression has also been reported in several investigations (Scott & Sullivan, 2012; Scott et al., 2014; Sullivan et al., 2008). It has been suggested that perceived injustice might act as a cognitive vulnerability for the development or maintenance of depressive symptoms (Scott et al., 2014). Different elements of perceived injustice overlap with factors that have been discussed as determinants of depression. For example, several items on the IEQ severity/irreparability of loss subscale reflect the inherently interpersonal nature of perceived injustice. For instance, the statement, "Most people don't understand how severe my condition is" simultaneously reflects the perceived severity of losses and the perceived failure of others to acknowledge those losses. Such invalidation or "secondary victimization" may cast doubt on the individual's value within society and contribute to negative self-evaluations that maintain depressive symptoms (Dickerson, Gruenewald, & Kemeny, 2004; Gilbert, 2000). Invalidating experiences may also lead individuals to withdraw from their social environment (Åsbring & Närvänen, 2002; Kool & Geenen, 2012). The cumulative negative impact of the appraisal of loss, invalidation, and social isolation might contribute to the development or maintenance of depressive symptoms.

Behavioral Processes A recent experimental study showed that exposure to a justice violation prior to the laboratory induction of pain led to increases in the display of pain behaviors (e.g., grimacing, holding, rubbing) (Trost et al., 2013). Another study showed that, among individuals with whiplash injuries, higher levels of perceived injustice were associated with more pronounced displays of pain behavior during the performance of a simulated occupational lifting task (Sullivan, Davidson, et al., 2009).

To obtain public recognition or validation of one's suffering, it must first be perceived by observers. It is possible that, for individuals high in perceived injustice, the display of pain behavior might reflect the need to demonstrate the magnitude

of injury-related losses or suffering. Expressions of pain behavior might also serve as a strategy for soliciting validation of injury-related losses or suffering (Sullivan, Davidson, et al., 2009).

The display of pain behavior might also have unintended adverse effects. Research has shown that pain behavior is a significant and independent predictor of prolonged work absence following musculoskeletal injury (Prkachin, Schultz, & Hughes, 2007). The expression of pain behavior might contribute to disability directly by compromising task performance efficiency. The expression of pain behavior might also contribute to disability indirectly by influencing others' judgments of an individual's ability to perform certain tasks. For example, the observation of heightened levels of pain behavior in an injured patient might lead physicians to infer high levels of pain and, in turn, consider recommending an extended period of sick leave. The observation of heightened levels of pain behavior might also lead an employer to consider that the employee is unable to meet his or her occupational responsibilities. As such, pain behavior might not only be disruptive to activity engagement, but the social response to pain behavior might also contribute to prolonged disability (Martel, Wideman, & Sullivan, 2012).

Social Processes There is increasing recognition that the effective treatment of pain and disability typically involves a social contract between the client and the clinician, in which each agrees to a set of responsibilities (Frantsve & Kerns, 2007; Schiavenato & Craig, 2010). Clearly, clients who perceive their clinicians to be unjust or untrustworthy are at risk of blaming their clinicians for negative developments in the course of their care. In turn, this can interfere with effective communication and problem-solving, both factors often deemed critical to treatment success (Cooper-Patrick et al., 1999; Kalauokalani, Franks, Oliver, Meyers, & Kravitz, 2007). Unfortunately, this dynamic also can be self-perpetuating in that treatment frustrations can serve to reinforce pre-existing perceptions of unjust care.

In a related fashion, perceived injustice might contribute to poor recovery outcomes by compromising the development of a strong working alliance between the client and the clinician (Burns, Johnson, Mahoney, Devine, & Pawl, 1996; Dahlen & Martin, 2005; Fox, Spector, & Miles, 2001). The working alliance describes warmth, trust, and a shared sense of the presenting problem, solution, and the therapeutic goals between a client and clinician (Corbière, Bisson, Lauzon, & Ricard, 2006; Horvath & Greenberg, 1989). A large body of evidence has identified the working alliance as one of the strongest predictors of outcomes in the rehabilitation of patients with persistent physical and mental health problems (Ahn & Wampold, 2001; Bennett, Fuertes, Keitel, & Phillips, 2011; Flückiger, Del Re, Wampold, Symonds, & Horvath, 2012; Miciak, Gross, & Joyce, 2012). Feelings of distrust and expressions of anger might present significant challenges to the development of a strong working alliance between the client and the clinician.

Dimensions of Justice Relevant to the Context of Injury

Justice-related appraisals have been linked to core beliefs that emerge early in childhood (Darley & Pittman, 2003). For example, research shows that children as young as 6 months of age are sensitive to violations of distributive justice (Hamlin, Wynn, Bloom, & Mahajan, 2011). Appraisals based on beliefs associated with principles of compensatory and retributive justice appear most relevant to the context of losses and suffering consequent to injury (Darley, 2001). Compensatory justice is concerned with needs of the injured individual and is based on the belief that actions should be taken to restore the injured individual to his or her pre-injury state. The policies of many injury insurers are related to principles of compensatory justice. Retributive justice is directed toward the perpetrator or source of injustice and is based on the belief that punishment must be inflicted on perpetrators in a manner commensurate with the severity of their wrongful actions (Carlsmith & Darley, 2008).

Compensatory justice proceeds without significant complication in cases that concern loss or damage to material property. The process of awarding compensation increases in its ambiguity and complexity as the domain of loss moves from material property into pain, suffering, and disability. Lay individuals typically proceed under the assumption that compensation will be proportional to the losses sustained (Darley, 2001). 'Perceived entitlement' can be construed as the product of the injured individual's evaluation of the monetary value of his or her losses and suffering. Problems arise when there is a discrepancy between the injured individual's perceived entitlement and the insurer's award of compensation. A sense of injustice is likely when the compensation award falls short of the injured individual's perceived entitlement. The process of managing this discrepancy can lead to further complication if it takes the form of conflict between the injured individual and the insurer, or the initiation of legal action to contest the award decision made by the insurer (Moeller, Crocker, & Bushman, 2009; Tait, 2004). To the degree that their payment is proportional to the size of the settlement awarded to an injured individual, some legal representatives might encourage injured individuals to fight for significant compensation, even if doing so inflates perceptions of injustice. Intentionally or unintentionally, legal representatives might contribute to the psychosocial risk factors that ultimately impede the injured individual's recovery potential.

Retribution motives might arise if the injured individual believes that he or she is suffering as a result of another's negligent, reckless, or intentional behavior (Carlsmith &

Darley, 2008; Lagnado & Channon, 2008). A driver at fault for a motor vehicle accident or an employer's disregard of safety concerns could be the basis for inferring recklessness or negligence. In systems of jurisprudence, *retribution* is usually reserved for *criminal* acts; however, research suggests that retribution motives might be entertained by lay individuals in any situation where blame is attributed for the experience of significant loss or suffering (Carlsmith & Darley, 2008; Levmore & Sharkey, 2012).

When injured individuals believe their injuries occurred as a result of negligence, recklessness, or intentional harm, they will show a propensity to direct anger at the targets of their blame attributions. Research suggests that these targets might include health care providers, employers, insurance representatives, and family members (Fishbain et al., 2008; Okifuji, Turk, & Curran, 1999). Health care providers might be seen as deserving of blame for failing to appropriately or effectively treat the injured individual's condition; insurance representatives might be seen as deserving of blame for disrespectful or adversarial interactions with the injured individual; family members might be seen as deserving of blame for failing to recognize or validate the magnitude of the injured individual's suffering. These same individuals might become the focus of the injured individual's retribution motives.

The goal of retribution is to inflict harm on the individual identified as the perpetrator of the adverse event or action (Carlsmith & Darley, 2008). Although retribution has been discussed within legal systems as serving a deterrent function, research with lay participants suggests that retribution is more likely to serve a 'just deserts' function; in other words, the lay person appears to proceed from the justice rule of 'an eye for an eye' (Darley & Pittman, 2003). There are indications that retribution might be intrinsically rewarding, as shown by increased activation in brain reward centres (e.g., striatum) following punishment of an offender (Knutson, 2004). Thus, the potential rewards associated with retribution might lead to the persistence of retribution-related actions, even if significant costs (e.g., increased pain and disability) are incurred.

The injured individual who adopts retribution goals has limited channels through which to inflict harm on the perceived source (s) of injustice. The injured individual consequently may resort to indirect ways of 'getting back at' perceived perpetrators. For example, retribution might take the form of expressions of criticism or irritation directed toward family members or health care providers. Retribution aimed at health care providers might involve non-compliance with prescribed treatment or attempts to sabotage treatment altogether. Retribution aimed at an employer or insurance representative might take the form of prolonged or exaggerated disability behavior. The injured individual might come to believe that disability is the most effective ammunition he or she can bring to bear in his or her battle against the perceived source of injustice. Without disability, the injured individual is powerless in the battle against the perpetrator.

Implications for Intervention

At the most basic level, perceived injustice and the emergence of retribution motives may reduce the salience and importance of rehabilitation and recovery. Perceptions of injustice might lead the injured individual to focus on 'proving' the magnitude of his or her losses or suffering. The emergence of retribution motives might lead the injured individual to focus on ways of inflicting harm on the source of the injustice. In either case, recovery goals are likely to be given lower priority, and, consequently, will be less likely to be achieved.

It is important to consider that perceptions of injustice are not merely mental constructions of the injured individual but might emerge from a reality that is characterized by justice violations. Reckless drivers and unsafe work environments do exist, as do unfair, disrespectful, or adversarial insurer practices. Injured individuals might face legitimate and continuing inequities in access to services and resources in medical, insurer, and employment systems. If we accept that perceptions of injustice can emerge as a mental construction of the individual, and as a reaction to objective injustices characterizing the environments within which injuries occur, are adjudicated and treated, then it becomes less surprising that interventions that focus only on the injured individual often have limited impact.

Optimal management of perceived injustice might require interventions addressing both the injured individual's injustice appraisals as well as actual systems-based justice violations. The challenge, however, is that the driver at fault, the employer, or the insurance carrier are typically not invited to participate in treatment programs aimed at reducing injured individual's perceptions of injustice. This challenge might need to be tackled if a significant advance in the management of perceived injustice is to be realized. A paradigm shift in approaches to evaluation and treatment might be required where an important assessment objective would be to identify the various sources of injustice contributing to the injured individual's injustice appraisals, and all relevant actors (i.e., employer, insurer, health care provider) might need to be included in the 'treatment plan.'

There is emerging evidence to support the advantages of including multiple actors or stakeholders in rehabilitation interventions. For example, research suggests that interventions that involve workplace accommodations, reduce employer–employee conflict, and increase co-worker support contribute to successful return to work following debilitating

injury (Franche, Baril, Shaw, Nicholas, & Loisel, 2005). In a similar fashion, employers might be invited to participate in discussions aimed at fostering validation of the injured worker's sense of injustice as well as promoting cooperative problem-solving that might resolve issues fuelling the injured worker's sense of injustice. Insurance representatives can be made aware of policies or interaction styles that are contributing to perceived injustice in their claimants. Coupled with knowledge about the negative impact of perceived injustice on claim costs, insurers might choose to alter some of their practices or policies in a manner designed to prevent the development of perceived injustice in their claimants.

Summary

Although the correlational nature of clinical and naturalistic studies precludes strong statements about the direction of causality, the results of prospective studies suggest that perceptions of injustice are not simply 'understandable' reactions to experiencing a debilitating injury. Rather, the results of research conducted to date suggest that injustice appraisals, consequent to injury, somehow impede successful recovery from injury. Indeed, it is likely that injustice appraisals might trigger a cascade of social, psychological, and physiological changes that can compromise an individual's recovery potential (Sullivan et al., 2012; Trost, Vangronsveld, Linton, Quartana, & Sullivan, 2012).

Disability is an unfortunate outcome of injury that disadvantages the injured individual by reducing quality of life, the employer by reducing the efficiency of the workforce, and the insurer by contributing to claim costs. These and other costs associated with poor adjustment to chronic pain constitute a major burden to society. Given the research indicating that perceived injustice is a powerful predictor of disability, it follows that interventions that yield reductions in perceived injustice might be associated with reductions in disability. Thus, reducing perceived injustice holds promise of benefitting all stakeholders in the disability process. Important gains may be realized if stakeholders are made aware of their role in the emergence of injustice appraisals, and if they are included as clients in treatment interventions aimed at preventing or reducing prolonged disability following injury.

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