THE BRITISH PAIN SOCIETY

A psychological flexibility conceptualisation of the experience of injustice among individuals with chronic pain

British Journal of Pain
2014, Vol 8(2) 62–71
© The British Pain Society 2013
Reprints and permissions:
sagepub.co.uk/
journalsPermissions.nav
DOI: 10.1177/2049463713514736
bjp.sagepub.com

Whitney Scott¹, Lance M McCracken^{2,3} and Zina Trost⁴

Abstract

Accumulating evidence suggests that the experience of injustice in patients with chronic pain is associated with poorer pain-related outcomes. Despite this evidence, a theoretical framework to understand this relationship is presently lacking. This review is the first to propose that the psychological flexibility model underlying Acceptance and Commitment Therapy (ACT) may provide a clinically useful conceptual framework to understand the association between the experience of injustice and chronic pain outcomes. A literature review was conducted to identify research and theory on the injustice experience in chronic pain, chronic pain acceptance, and ACT. Research relating injustice to chronic pain outcomes is summarised, the relevance of psychological flexibility to the injustice experience is discussed, and the subprocesses of psychological flexibility are proposed as potential mediating factors in the relationship between injustice and pain outcomes. Application of the psychological flexibility model to the experience of pain-related injustice may provide new avenues for future research and clinical interventions for patients with pain.

Summary points

- Emerging research links the experience of pain-related injustice to problematic pain outcomes.
- A clinically relevant theoretical framework is currently lacking to guide future research and intervention on pain-related injustice.
- The psychological flexibility model would suggest that the overarching process of psychological inflexibility mediates between the experience of injustice and adverse chronic pain outcomes.
- Insofar as the processes of psychological inflexibility account for the association between injustice experiences and pain outcomes, methods of Acceptance and Commitment Therapy (ACT) may reduce the impact of injustice on pain outcomes.
- Future research is needed to empirically test the proposed associations between the experience of pain-related injustice, psychological flexibility and pain outcomes, and whether ACT interventions mitigate the impact of pain-related injustice on pain outcomes.

Keywords

Chronic pain, injustice, psychological flexibility, acceptance and commitment therapy

¹Department of Psychology, McGill University, Montreal, QC, Canada

²Department of Psychology, King's College London, London, UK

³INPUT Pain Management Unit, Guy's and St Thomas', NHS Foundation Trust, London, UK

⁴Department of Psychology, University of North Texas, Denton, TX, USA

Corresponding author:

Whitney Scott, Department of Psychology, McGill University, 1205 Doctor Penfield Avenue, Montreal, QC, Canada H3A 1B1.
Email: whitney.scott@mail.mcgill.ca

We are socialised to view the world as consistent, predictable and fair.¹ We believe that good ought be rewarded and bad punished – we call this justice.² When the world operates this way, we experience it as right and are at ease. When it does not, we experience it as wrong and sometimes take action to correct the perceived problem.² We sometimes apply this same attitude to problems that arise in our health and functioning,³ which can include chronic pain.

Discourses of justice and injustice are inherent to the chronic pain experience.⁴ Individuals with chronic pain often experience numerous losses, including loss of function, identity and quality of life.⁵ For some individuals these losses may be experienced as unjust. In fact, many individuals with chronic pain ascribe external blame for their circumstances.^{6,7} Sullivan et al.⁸ have operationally defined injustice as an appraisal reflecting the magnitude of pain-related loss, blame and unfairness. McParland et al.⁹ likewise document injustice perceptions among patients with chronic pain and additionally suggest that individuals' socioeconomic status influences the phenomenology of pain-related injustice, which may reflect concerns over equality, the struggle for quality of life, and unfair social disadvantage. Furthermore, pain-related injustice may be experienced on distributive, procedural or interpersonal grounds, respectively, relating to outcomes, mechanisms that determine outcomes or social interactions in the chronic pain context.⁹ Finally, the injustice experience can include a constellation of emotional reactions, including anger, anxiety, depression and disgust.^{8,10,11}

Assessing the injustice experience

A self-report questionnaire of pain-related injustice (Injustice Experiences Questionnaire (IEQ)) was recently validated among individuals with chronic musculoskeletal pain following injury.⁸ Principal component analysis of the IEQ suggests two underlying components, labelled by Sullivan et al. as *severity/irreparability of loss* and *blame/unfairness*. Examples of items loading onto the former component include 'Most people don't understand how severe my condition is' and 'My life will never be the same', while items loading onto the latter component include 'I am suffering because of someone else's negligence' and 'It all seems so unfair'.⁸

Emerging data suggest that the experience of injustice negatively impacts recovery following musculoskeletal injury. Based on data from the IEQ, the experience of injustice is associated with heightened pain intensity, pain behaviour, narcotic use, depressive symptoms, persistent post-traumatic stress symptoms and reduced likelihood of work return following injury,

even when controlling for biomedical and other psychosocial variables, such as catastrophising.^{8,12–15} Conversely, reductions on the IEQ have been associated with improvements in depressive symptoms and physical function.^{8,13}

Description of the psychological flexibility model

At present, research on the experience of injustice in chronic pain has proceeded without a theoretical model. This review proposes that the psychological flexibility model, the theoretical framework underlying Acceptance and Commitment Therapy (ACT), may provide a clinically useful conceptual model to understand the association between the experience of injustice and chronic pain outcomes. While natural, the psychological flexibility model suggests that attempts to control or avoid unwanted private experiences (e.g. sensations, thoughts, and emotions) often fail, as these experiences can be immune to control and avoidance.¹⁶ Moreover, avoidance strategies may heighten individuals' distress when avoided internal experiences are subsequently re-encountered.¹⁷ Rigid attempts to control or avoid difficult private experiences are assumed to initiate and maintain psychological distress and maladaptive behaviour patterns.¹⁷

In addition to their ineffectiveness, avoidance-based strategies may rob individuals of participation in activities they value most.^{16,17} Essentially, it is difficult to simultaneously struggle for control over private experiences and participate with the outside world. The model suggests that difficult cognitive, emotional and sensory experiences are not necessarily problematic in and of themselves. Instead, it suggests that it is attempts to avoid these experiences and disengagement from meaningful life activities in the service of this avoidance that create suffering. In this sense, the psychological flexibility model underlying ACT is inherently functional, contextual and pragmatic. It does not seek to establish the objective or external 'truth' of individuals' private experiences. Rather, it focuses on behaviour patterns coordinated by these private experiences, and whether such behaviour is useful in enabling the individual to successfully pursue their values and goals.¹⁶

In the conceptual framework of ACT, *psychological (in)flexibility* is the overarching process mediating between unwanted cognitive, emotional and sensory experiences and adverse outcomes, such as disability.¹⁶ Psychological *inflexibility* describes the excessive influence of private experiences on behaviour, and how these experiences can lead to behaviour patterns that are inconsistent with an individual's values and goals.¹⁸ Six interrelated and interacting processes are suggested to underlay psychological inflexibility (Figure 1).¹⁶

Figure 1. Application of the psychological flexibility model to understand the association between pain-related injustice experiences and chronic pain outcomes.

Psychological inflexibility is the overarching process suggested to mediate between pain-related injustice experiences and adverse chronic pain outcomes. Conversely, individuals who approach the injustice experience in a psychologically flexible manner may be less impacted. As shown in the middle of the figure, each subprocess of psychological inflexibility is essentially opposite to one subprocess of psychological flexibility.

Conversely, psychological *flexibility* reflects an ability to face challenging private experiences in an open, aware and values-oriented manner. Psychological flexibility is the therapeutic target of ACT, and each of its subprocesses is essentially the opposite of one of the subprocesses of psychological inflexibility (Figure 1).¹⁶

Strengths and limitations of the psychological flexibility model

The psychological flexibility model has several inherent strengths that make it an attractive model for conceptualising the experience of pain-related injustice. The model is directly linked with a treatment approach (ACT) which may inform intervention to mitigate the impact of pain-related injustice experiences. ACT may be particularly suitable for individuals with chronic and intractable conditions, such as chronic pain, for which symptom remission may be unlikely.¹⁹ Indeed, there is growing support of its efficacy in these patients.²⁰ Additionally, research is accumulating in support of the proposed mechanisms of the psychological flexibility model.²¹

It is important to note that the psychological flexibility model and ACT have drawn several criticisms.

Despite different theoretical underpinnings, some have argued that ACT is not distinct from other treatment approaches (e.g. traditional cognitive behavioural therapies (CBTs)).²² It has also been suggested that ACT outcome research is less developed and methodologically rigorous than that of traditional CBT.²³ Other theoretical models may also be useful for understanding the role of perceived injustice in chronic pain. The strong association between injustice and pain catastrophising⁸ might suggest the usefulness of conceptualising pain-related injustice within coping theory.^{24,25} Theories of meaning-making following victimisation may also be pertinent to conceptualising the injustice experience in chronic pain.^{26,27} Despite these considerations, the psychological flexibility model remains one potentially useful framework to understand the experience of pain-related injustice. The following section will describe its potential utility and application.

Application of the psychological flexibility model to the experience of pain-related injustice

The psychological flexibility model is readily applicable to the experience of injustice in chronic pain. Specifically, both pain and injustice are fundamentally aversive experiences which individuals will naturally wish to avoid (or, possibly 'solve').¹ However, in the context of chronic pain, avoidance of these adverse experiences may be impossible. For instance, complete relief from chronic pain is rarely an option.²⁸ Thus, individuals who construe pain itself as a source of injustice are faced with a problem. Furthermore, unfair circumstances, such as inequitable access to treatment resources,²⁹ do often characterise the pain experience, and it may be difficult to block the mind from evaluating them as unfair. Finally, while financial compensation may offer a legal recourse to restore pain-related justice, this option may not be available or fully address the injustice experience.³⁰ Ironically, repeated unsuccessful attempts to solve the problem of pain-related injustice may contribute to further injustice experiences, greater emotional distress and may lead individuals to disengage from activities that are important to them, thus engendering further suffering.

Recent empirical findings support a negative relationship between perceived injustice and chronic pain acceptance, and it appears that these two constructs uniquely contribute to pain-related outcomes.³¹ While these findings suggest that injustice and acceptance may not comprise opposing ends of the same construct, their inverse relationship provides initial empirical support for the applicability of the psychological

flexibility model to the injustice experience in chronic pain.

The theory underlying ACT does not assume to know an objective external reality. The validity of private experiences is less important than the behavioural function of those experiences in a given situation, and whether such behaviour enables the individual to pursue valued goals. Following from this functional contextual approach, we have chosen to use the term 'injustice experience', rather than distinguishing between 'perceived injustice' (i.e. an individual's subjective experience of injustice) and 'objective injustice' (i.e. injustice as legally or socially defined). It is recognised that, in the context of chronic pain, individuals' perceptions of injustice may indeed reflect some degree of objective injustice. Thus, while not unique to ACT, empathic validation of the individual's experience of injustice may be a fundamental element of intervention. Ultimately, however, determining the 'truth' of an injustice experience is seen as less important in ACT than understanding the behavioural responses to this experience, and whether these help the individual achieve valued goals.

In applying the psychological flexibility model, it is assumed that the experience of injustice, comprising justice-related thoughts and emotions, does not invariably lead to poor outcomes. The model suggests that injustice experiences may become problematic when individuals engage with these experiences in a psychologically inflexible manner. An injustice experience may become particularly harmful when behaviour aimed at avoiding this experience interferes with engagement in life activities that are valued by the individual. Conversely, individuals who continue to participate in valued life activities despite experiences of injustice (i.e. demonstrate psychological flexibility in the face of injustice) and are able to maintain a perspective that is less overwhelmed by these experiences may be less negatively impacted. In this way, the processes of psychological (in)flexibility are suggested to mediate between experiences of injustice and chronic pain outcomes.

It is important to emphasise that the psychological flexibility model would not suggest that individuals must always tolerate unjust situations. Instead, the approach to the injustice experience is pragmatic. If an unjust situation can be confronted in a way that leads to success (e.g. retribution is received and justice is restored), this may be a viable option. If experience shows that such confrontation consistently fails, or if the cost of confrontation is unacceptably high with respect to one's goals and values, then this becomes problematic. The subprocesses of psychological flexibility are discriminately applied and their usefulness is determined by whether they work for the individual in

a given situation, such that they enable valued goals to be successfully pursued. The following sections examine how the processes comprising psychological (in) flexibility may be applied to understand the association between the injustice experience and adverse pain outcomes.

Experiential avoidance

Experiential avoidance reflects an unwillingness to have unwanted private experiences, such as sensations, thoughts and emotions, as well as attempts to reduce or control these experiences.^{16,17} It is assumed that external environments are more readily amenable to behavioural control strategies than internal experiences.¹⁷ Private experiences may be less effectively controlled because of the associative processes that are the foundation of human language.³² Through these associative processes, efforts to avoid unwanted private experiences may inevitably cue one to re-experience them.³³ Accordingly, avoidance of unwanted private experiences may provide short-term relief initially. However, continued avoidance may prevent engagement in activities that are important to the individual, contributing to greater long-term suffering in the long run.¹⁶ Alternately, acceptance reflects an openness to difficult private experiences and the cessation of efforts to control these experiences so that important life activities may be pursued.¹⁶ Greater self-reported experiential avoidance of pain experience has been found to prospectively predict pain-related distress and disability in individuals with chronic pain.^{34,35} Conversely, results from a meta-analysis of experimental research indicate that interventions that enhance acceptance are associated with improved tolerance of acute pain experience and may show superior effects to other emotion regulation strategies in this respect.³⁶

Applied to the experience of injustice, individuals may develop strategies to avoid unwanted sensations, thoughts and emotions associated with the injustice experience, which ultimately compound long-term suffering. For instance, the experience of pain-related injustice may challenge individuals' just world beliefs and assumptions regarding safety, invulnerability, self-worth and status, contributing to anxiety, depression and anger.^{1,37-39} Attempts to suppress these difficult thoughts and emotions may enable short-term avoidance of these aversive experiences. However, such suppression can make these experiences more salient and contribute to greater pain intensity and pain behaviour, as has been demonstrated in experimental studies on anger suppression among individuals with pain.^{40,41} Additionally, recent research suggests that anger inhibition, a control-based strategy, partially mediates the relationship between pain-related

injustice experiences and depressive symptoms.⁴² Outward expression of emotions such as anger may momentarily allow the aversive experience of injustice to be avoided by increasing feelings of power in the face of challenges to the self and one's world view.^{38,39} However, repeated expression of negative emotion may likewise negatively impact health^{43,44} through such pathways reduced social support^{45,46} and increased physiological reactivity.⁴⁷

As noted above, there is preliminary evidence that high scores on a measure of pain-related injustice are significantly associated with low levels of self-reported pain acceptance.³¹ However, research has not yet investigated whether pain acceptance mediates the relationship between the experience of injustice and chronic pain outcomes. It also remains unclear whether the demonstrated adverse impact of the injustice experience is primarily mediated by unwillingness to experience pain specifically or unwillingness to have other private experiences, such as injustice-related thoughts and feelings.

Cognitive fusion

Cognitive fusion describes the process by which the semantic content of thought becomes synonymous with the actual event to which a thought refers.^{16,48} The content of thought is thus regarded as absolute 'truth' and initiates behaviours as such. Consequently, this process leads to excessive or inappropriate cognitive influence over behaviour.¹⁶ On the other hand, cognitive *defusion* reflects a purposeful awareness of thoughts and detachment from thoughts such that they are not used as reasons for behaviour.¹⁶ Wicksell et al.⁴⁹ found that cognitive fusion with pain-related thoughts (as measured by a self-report questionnaire) was associated with greater pain interference and reduced quality of life in patients with chronic pain. Conversely, experimental interventions to promote cognitive defusion have been shown to reduce the believability of pain-related thoughts and to improve tolerance for experimentally induced pain in healthy individuals.³⁶

The experience of injustice may comprise thoughts of suffering, loss, inequality, unfairness and blame, as well as retribution or revenge.^{8,11,50} Individuals thus fused with such thoughts may engage in a number of unhelpful behaviours that logically follow from their content. Fusion with thoughts of undeserved suffering may initiate behaviours to express the extent of suffering, thus accounting for the association between injustice and heightened pain behaviour.¹² Individuals might likewise engage in behaviours to mitigate their sense of loss and unfairness,¹ such as a persistent pursuit of financial compensation. If pain reduction is a perceived means to restore fairness, individuals fused

with such thoughts may persist in a fruitless struggle to control pain, for example, by seeking numerous medical interventions.⁵¹ Fusion with thoughts of blame and revenge may foster hostility towards those perceived responsible (e.g. medical professionals) or passive behaviours like treatment disengagement.^{11,52} Research suggests that the above-listed behavioural consequences that may proceed from cognitive fusion are associated with prolonged pain, distress and disability among patients with pain.^{35,53,54}

Attachment with the conceptualised self

The conceptualised self consists of characteristics and qualities verbally related to oneself over time and is, in essence, the 'self we believe ourselves to be'.^{16,55} Through associative processes of language, the conceptualised self can become highly elaborate, touching on all aspects of life as verbally described, including one's history, current situation, preferences, abilities and private experiences.⁵⁵ While this is not necessarily pathological, it can create difficulties when behaviour is narrowed towards defending self narratives, at the expense of flexible pursuit of valued courses of action.^{16,55} Conversely, self-as-context refers to an active awareness of the distinction between one's private experiences and the person observing those experiences, and the adoption of an accepting and defused stance towards inner experiences, including self narratives and evaluations.^{16,56} Limited research has investigated attachment with the conceptualised self/self-as-context in chronic pain. However, research with healthy participants suggests that interventions that promote self-as-context reduce individuals' emotional discomfort with negative self-referential thoughts compared to control interventions.^{48,57}

A number of unhelpful behaviour patterns may emerge among individuals attached to injustice-oriented self-conceptualisations, such as 'I am a person who stands up for what is right'^{11,37} or 'I am a victim'.³⁹ Insofar as healthy behaviours undermine these self-conceptualisations, such behaviours may be blocked. Fusion with thought content regarding the irreparability of pain-related loss⁸ may contribute to rigid attachment to self-conceptualisations prior to pain onset.^{58,59} Individuals attached to a particular pre-pain conceptualised 'self' (e.g. 'I used to do X') may approach opportunities for healthy behaviour in an inflexible manner (e.g. 'I can *only* do X'). In an effort to defend the 'truth' of one's suffering, a defensive conceptualised self may emerge as individuals over-identify with the injustice story itself. From this position, anyone who challenges the veracity of the pain-related injustice may be perceived as an enemy. Even a professional who suggests ways to help may be viewed as behaving unjustly if the

solution somehow does not appreciate the legitimacy of the injustice.

Disconnection from the present

Through processes of language, individuals can become excessively focussed on the verbally remembered past or imagined future, rather than engaging with and experiencing the present as it unfolds.^{16,60} Ironically, past and future-oriented attention may increase present distress and further distance behaviour from valued goals in the present.^{16,39} Alternately, being present describes being in contact with internal and external events as they occur, moment by moment.¹⁶ Low scores on a self-report measure of mindfulness, which includes items assessing disconnection from the present, have been associated with greater chronic pain-related distress and disability.⁶¹ Conversely, experimental findings suggest that meditation training to enhance focus on the present moment reduces pain sensitivity and anxiety.⁶²

With respect to the experience of injustice, individuals may ruminate about past losses and unfair treatment.^{38,63,64} Past-oriented thoughts of blame might focus individuals' efforts on finding reasons or causes for the unfair behaviour of others.⁶⁴ Future injustices may also be predicted,³⁹ as people may envision the persistence of ineffectively controlled pain or interpersonal invalidation of pain experience. To protect against predicted injustices, individuals may adopt confrontational or avoidant interaction styles with health professionals, insurers and significant others.⁵² Consequently, individuals who spend significant time analyzing the past or predicting future justice-related events may miss opportunities to take effective action towards their goals in the present.

Failures in values-based action

Values are chosen ways of living that guide behaviour toward what is important for an individual and represent an overarching sense of purpose or direction in life.¹⁶ Values have been defined along a number of life domains, including health, family, relationships, education, employment, recreation, spirituality and citizenship.⁶⁵ Failures in values-based actions occur when behaviour is dominated by experiential avoidance and cognitive fusion, which leads to behaviour that is inconsistent with what individuals define as important.⁵⁶ Conversely, values-based action describes the process by which individuals engage in behaviour that is consistent with their values, rather than behaviour aimed at avoidance of unwanted private experiences. Low scores on self-reported values-based action have been associated with greater chronic pain-related

anxiety, depression and disability.⁶⁶ Basic and clinical research suggest that interventions that enhance values-based action are associated with greater pain tolerance, reduced emotional distress and improvements on various indices of disability.^{67,68}

Individuals who experience chronic pain and injustice will naturally be motivated toward pain relief and the restoration of justice.^{1,69,70} Indeed, some patients may come to define the reduction of pain and injustice as important goals. Again, the approach to values here is pragmatic and, ultimately, defined by what works for the individual. If actions taken in the service of pain relief and the restoration of justice are effective in the long term, such actions may not be problematic. If, however, the individual repeatedly experiences that such behaviours are ineffective in the long term, this may suggest the unworkability of goals stemming from values of pain relief and justice. Moreover, even if effective, pain relieving and justice-restoring behaviours may encroach on individuals' ability to engage in value-oriented activities in other life domains. For instance, expressions of pain and disability may convey the injustice experienced and thus provide opportunity for retribution, but may preclude engagement in functional activities, such as employment.^{12,71} Additionally, efforts to control the emotional consequences of injustice (anger inhibition, as an example⁴²) may interfere with the maintenance of meaningful relationships.^{72,73} In short, the struggle to control or avoid experiences of pain and injustice may cause individuals to engage in narrowed patterns of behaviour that may be inconsistent with broader goals and values that they deem important.

Non-committed action

Non-committed action occurs when an individual fails to persist with a valued course of action in the face of challenging unwanted experiences, which will inevitably arise when individuals pursue valued activities.¹⁶ Committed action, on the other hand, reflects broadly integrated and lasting re-engagement with valued activities in a manner that incorporates these challenges.¹⁸ Research has shown that persisting with valued life activities in the face of psychological barriers is associated with greater life satisfaction and quality of life in patients with chronic illness, including chronic pain.^{74,75}

For individuals with pain, the experience of injustice may interact with the other processes of psychological inflexibility to prevent committed action. For instance, an individual who becomes more active to pursue a goal may encounter increased pain or doubts from others about the validity of his pain condition. Fusion with or unwillingness to experience thoughts such as 'I

don't deserve to experience more pain' or 'others must understand my pain' may subsequently contribute to reduced activity.⁷⁶ Insofar as individuals chose not to persist with valued activities in the face of ongoing experiences of pain-related injustice, enduring engagement with such activities may be blocked.

Assessment and treatment implications

This review suggests that an understanding of the deleterious effects of the injustice experience requires knowledge of both private injustice-relevant experiences and the function of those experiences. Therefore, clinical assessment of both the content and function of injustice experiences may be necessary. To this end, clinicians might utilise the IEQ as a measure of the content of pain-related injustice experiences^{8,15}, in combination with validated measures of the processes of psychological (in)flexibility to inform the conceptualisation of the injustice experience in patients with pain.^{49,51,61,65,66,74,77,78}

Insofar as the processes on psychological (in)flexibility account for the association between injustice experiences and pain outcomes, methods of ACT may be clinically useful.^{60,79,80} Briefly, ACT attempts to increase psychological flexibility with the aim of changing behaviour. ACT is an experiential therapy. It does not provide information alone or attempt to alter the frequency or intensity of sensations, thoughts and feelings. Instead, ACT aims to change how individuals relate to their private experiences and, by doing so, to improve the quality and effectiveness of action.

ACT is sensitive to the therapeutic relationship, maintaining a stance that is respectful, compassionate and, above all, pragmatic.⁷⁹ This is particularly important when health-care providers as a group may be perceived as a source of injustice.⁹ The focus within ACT on values is also suitable for problems that stem from injustice experiences. Treatment can focus on how to achieve the life one wants rather than focusing excessively on fairness, truth or right and wrong. In the context of a healthy therapeutic relationship, the individual is encouraged to see new options other than struggle and defence. They are able to see, for example, that they can either seek to be right, to punish, and to be believed, *or* they can seek the health, family life and work life they want, but not both at once.

Several ACT exercises may enhance psychological flexibility when injustice experiences become problematic. Exercises such as the Chinese finger trap⁷⁹ may facilitate the cessation of ineffective efforts to control injustice-related experiences by showing the

ironic effect of struggling for control. To promote cognitive defusion, individuals may repeat the word 'unfair' for 30 seconds so that it can be experienced as a meaningless sound.⁶⁰ Individuals may mindfully 'track their thoughts in time'⁶⁰ to gain awareness of the mind's tendency to drift to past and future injustice experiences. The 'observer self'⁶⁰ exercise may help individuals experience the self as context, distinct from the justice-related content of the conceptualised self. To clarify values, individuals may imagine what they would like others to say about them at a send-off party.⁷⁹

Conclusion and future directions

There is mounting evidence that the experience of pain-related injustice adversely influences recovery among individuals with chronic pain. Accumulating evidence also supports the role of psychological flexibility in adjustment to chronic pain and the usefulness of ACT for improving patients' quality of life with pain through enhancing psychological flexibility. This review brings together these lines of research and proposes that the psychological flexibility framework underlying ACT may be a clinically useful model to understand the association between the experience of pain-related injustice and adverse pain outcomes.

Future research in this area is needed to empirically test whether the process of psychological flexibility mediates between experiences of injustice and chronic pain outcomes. Additional research is needed to refine the measurement of the processes comprising psychological flexibility, which are currently in the initial stages of development within the field of pain. Future research may also benefit from the use of momentary ecological assessment methods to investigate the dynamic associations among the injustice experience and the interrelated processes of psychological flexibility. Basic research will be needed to experimentally test the relationships between injustice experiences, processes of psychological flexibility and pain outcomes. This research will benefit from recent methods used to experimentally induce pain-related injustice^{81,82} in conjunction with experimental ACT interventions that are well described in the literature.³⁶ Future research is also needed to investigate the effectiveness of ACT to mitigate the association between the injustice experience and adverse chronic pain outcomes in patients with pain and, if effective, whether this can be attributed to the proposed processes.

Acknowledgements

The authors thank Dr Michael Sullivan for his comments on an earlier version of this manuscript.

Conflict of interest

The authors declare that there is no conflict of interest.

Funding

This research was supported by funds from le Fonds de la Recherche en Santé du Québec and l'Institut de Recherche Robert-Sauvé en Santé et en Sécurité du Travail.

References

- Lerner MJ. Justice motive – some hypotheses as to its origins and forms. *J Pers* 1977; 45: 3–52.
- Lerner MJ and Miller DT. Just world research and the attribution process: looking back and ahead. *Psychol Bull* 1978; 85: 1030–1051.
- Gruman JC and Sloan RP. Disease as justice: perceptions of the victims of physical illness. *Basic Appl Soc Psych* 1983; 4: 39–46.
- McParland J, Hezsetine L, Serpell M, et al. An investigation of constructions of justice and injustice in chronic pain: a Q-methodology approach. *J Health Psychol* 2011; 16: 873–883.
- Lyons R and Sullivan MJL. Curbing loss in illness and disability. In: Harvey J (ed.) *Perspectives on personal and interpersonal loss*. New York: Taylor & Francis, 1998, pp. 579–605.
- McParland JL and Whyte A. A thematic analysis of attributions to others for the origins and ongoing nature of pain in community pain sufferers. *Psychol Health Med* 2008; 13: 610–620.
- DeGood DE and Kiernan B. Perception of fault in patients with chronic pain. *Pain* 1996; 64: 153–159.
- Sullivan MJL, Adams H, Horan S, et al. The role of perceived injustice in the experience of chronic pain and disability: scale development and validation. *J Occup Rehabil* 2008; 18: 249–261.
- McParland JL, Eccleston C, Osborn M, et al. It's not fair: an Interpretative Phenomenological Analysis of discourses of justice and fairness in chronic pain. *Health* 2010; 15: 459–474.
- Mikula G, Scherer KR and Athenstaedt U. The role of injustice in the elicitation of differential emotional reactions. *Pers Soc Psychol Bull* 1998; 24: 769–783.
- Miller DT. Disrespect and the experience of injustice. *Annu Rev Psychol* 2001; 52: 527–553.
- Sullivan MJL, Davidson N, Garfinkel B, et al. Perceived injustice is associated with heightened pain behaviour and disability in individuals with whiplash injuries. *Psychol Inj Law* 2009; 2: 238–247.
- Sullivan MJL, Thibault P, Simmonds MJ, et al. Pain, perceived injustice and the persistence of post-traumatic stress symptoms during the course of rehabilitation for whiplash injuries. *Pain* 2009; 145: 325–331.
- Scott W and Sullivan MJL. Perceived injustice moderates the relationship between pain and depressive symptoms among individuals with persistent musculoskeletal pain. *Pain Res Manag* 2012; 17: 335–340.
- Scott W, Trost Z, Milioto M, et al. Further validation of a measure of injury-related injustice perceptions to identify risk for occupational disability: a prospective study of individuals with whiplash injury. *J Occup Rehabil* 2013; 23: 557–565.
- Hayes SC, Luoma JB, Bond FW, et al. Acceptance and commitment therapy: model, processes and outcomes. *Behav Res Ther* 2006; 44: 1–25.
- Hayes SC, Wilson KG, Gifford EV, et al. Experiential avoidance and behavioral disorders: a functional dimensional approach to diagnosis and treatment. *J Consult Clin Psychol* 1996; 64: 1152–1168.
- Hayes SC and Strosahl K. *A practical guide to acceptance and commitment therapy*. New York: Springer, 2005.
- Dahl J, Luciano C and Wilson KG. *Acceptance and commitment therapy for chronic pain*. Oakland, CA: New Harbinger Publications, 2005.
- Veehof MM, Oskam M-J, Schreurs KM, et al. Acceptance-based interventions for the treatment of chronic pain: a systematic review and meta-analysis. *Pain* 2011; 152: 533–542.
- Hayes SC, Masuda A, Bissett R, et al. DBT, FAP, and ACT: how empirically oriented are the new behavior therapy technologies? *Behav Ther* 2005; 35: 35–54.
- Hofmann SG and Asmundson GJ. Acceptance and mindfulness-based therapy: new wave or old hat? *Clin Psychol Rev* 2008; 28: 1–16.
- Öst L-G. Efficacy of the third wave of behavioral therapies: a systematic review and meta-analysis. *Behav Res Ther* 2008; 46: 296–321.
- Severeijns R, Vlaeyen JW and van den Hout MA. Do we need a communal coping model of pain catastrophizing? An alternative explanation. *Pain* 2004; 111: 226–229.
- Lazarus RS and Folkman S. Transactional theory and research on emotions and coping. *Eur J Pers* 1987; 1: 141–169.
- Janoff-Bulman R. The aftermath of victimization: rebuilding shattered assumptions. In: Figley CR (ed.) *Trauma and its wake*, vol. 1. Bristol, PA: Brunner/Mazel, 1985, pp. 15–35.
- Janoff-Bulman R. Posttraumatic growth: three explanatory models. *Psychol Inq* 2004; 15: 30–34.
- McCracken LM. Learning to live with the pain: acceptance of pain predicts adjustment in persons with chronic pain. *Pain* 1998; 74: 21–27.
- Green CR, Anderson KO, Baker TA, et al. The unequal burden of pain: confronting racial and ethnic disparities in pain. *Pain Med* 2003; 4: 277–294.
- Okimoto TG. Outcomes as affirmation of membership value: material compensation as an administrative response to procedural injustice. *J Exp Soc Psychol* 2008; 44: 1270–1282.
- Rodero B, Luciano JV, Montero-Marín J, et al. Perceived injustice in fibromyalgia: psychometric characteristics of the Injustice Experience Questionnaire and relationship with pain catastrophising and pain acceptance. *J Psychosom Res* 2012; 73: 86–91.
- Barnes-Holmes Y, Hayes SC, Barnes-Holmes D, et al. Relational frame theory: a post-Skinnerian account of human language and cognition. *Adv Child Dev Behav* 2002; 28: 101–138.
- Hayes SC. Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behav Ther* 2004; 35: 639–665.

34. McCracken LM and Vowles KE. A prospective analysis of acceptance of pain and values-based action in patients with chronic pain. *Health Psychol* 2008; 27: 215–220.
35. McCracken LM and Eccleston C. A prospective study of acceptance of pain and patient functioning with chronic pain. *Pain* 2005; 118: 164–169.
36. Kohl A, Rief W and Glombiewski JA. How effective are acceptance strategies? A meta-analytic review of experimental results. *J Behav Ther Exp Psychiatry* 2012; 43: 988–1001.
37. Eifert GH and Forsyth JP. The application of acceptance and commitment therapy to problem anger. *Cogn Behav Pract* 2011; 18: 241–250.
38. Blackledge JT. Functional contextual processes in posttraumatic stress. *Int J Psychol Psychol Ther* 2004; 4: 443–467.
39. Janoff Bulman R and Frieze IH. A theoretical perspective for understanding reactions to victimization. *J Soc Issues* 1983; 39: 1–17.
40. Quartana PJ, Yoon KL and Burns JW. Anger suppression, ironic processes and pain. *J Behav Med* 2007; 30: 455–469.
41. Burns JW, Quartana P, Gilliam W, et al. Effects of anger suppression on pain severity and pain behaviors among chronic pain patients: evaluation of an ironic process model. *Health Psychol* 2008; 27: 645–652.
42. Scott W, Trost Z, Bernier E, et al. Anger differentially mediates the relationship between perceived injustice and chronic pain outcomes. *Pain* 2013; 154: 1691–1698.
43. Bruehl S, Chung OY and Burns JW. Anger expression and pain: an overview of findings and possible mechanisms. *J Behav Med* 2006; 29: 593–606.
44. Burns JW, Quartana PJ and Bruehl S. Anger inhibition and pain: conceptualizations, evidence and new directions. *J Behav Med* 2008; 31: 259–279.
45. Hardy JD and Smith TW. Cynical hostility and vulnerability to disease: social support, life stress, and physiological response to conflict. *Health Psychol* 1988; 7: 447–459.
46. Zautra AJ, Burleson MH, Matt KS, et al. Interpersonal stress, depression, and disease-activity in rheumatoid arthritis and osteoarthritis Patients. *Health Psychol* 1994; 13: 139–148.
47. Burns JW and Bruehl S. Anger management style, opioid analgesic use, and chronic pain severity: a test of the opioid-deficit hypothesis. *J Behav Med* 2005; 28: 555–563.
48. Masuda A, Hayes SC, Sackett CF, et al. Cognitive defusion and self-relevant negative thoughts: examining the impact of a ninety year old technique. *Behav Res Ther* 2004; 42: 477–485.
49. Wicksell RK, Renöfält J, Olsson GL, et al. Avoidance and cognitive fusion – central components in pain related disability? Development and preliminary validation of the Psychological Inflexibility in Pain Scale (PIPS). *Eur J Pain* 2008; 12: 491–500.
50. Montada L. Attribution of responsibility for losses and perceived injustice. In: Montada L, Sigrun-Heide F and Lerner MJ (eds) *Life crises and experiences of loss in adulthood*. Hillsdale, NJ: Lawrence Erlbaum and Associates, 1992, pp. 133–161.
51. McCracken LM, Vowles KE and Eccleston C. Acceptance of chronic pain: component analysis and a revised assessment method. *Pain* 2004; 107: 159–166.
52. Trost Z, Vangronsveld K, Linton SJ, et al. Cognitive dimensions of anger in chronic pain. *Pain* 2012; 153: 515–517.
53. Cassidy JD, Carroll LJ, Côté P, et al. Effect of eliminating compensation for pain and suffering on the outcome of insurance claims for whiplash injury. *N Eng J Med* 2000; 342: 1179–1186.
54. Burns JW, Johnson BJ, Devine J, et al. Anger management style and the prediction of treatment outcome among male and female chronic pain patients. *Behav Res Ther* 1998; 36: 1051–1062.
55. Barnes-Holmes D, Hayes SC and Dymond S. Self and self-directed rules. In: Hayes SC, Barnes-Holmes D and Roche B (eds) *Relational frame theory*. New York: Kluwer Academic Publishers, 2002, pp. 119–139.
56. Hayes SC, Levin ME, Plumb-Villardaga J, et al. Acceptance and commitment therapy and contextual behavioral science: examining the progress of a distinctive model of behavioral and cognitive therapy. *Behav Ther* 2013; 44: 180–198.
57. Healy HA, Barnes-Holmes Y, Barnes-Holmes D, et al. An experimental test of cognitive defusion exercise: coping with negative and positive self-statements. *Psychol Rec* 2010; 58: 623–640.
58. Smith DJA and Osborn M. Pain as an assault on the self: an interpretative phenomenological analysis of the psychological impact of chronic benign low back pain. *Psychol Health* 2007; 22: 517–534.
59. Risdon A, Eccleston C, Crombez G, et al. How can we learn to live with pain? A Q-methodological analysis of the diverse understandings of acceptance of chronic pain. *Soc Sci Med* 2003; 56: 375–386.
60. Hayes SC and Smith S. *Get out of your mind & into your life: the new acceptance & commitment therapy*. Oakland, CA: New Harbinger Publications, 2005.
61. McCracken LM, Gauntlett-Gilbert J and Vowles KE. The role of mindfulness in a contextual cognitive-behavioral analysis of chronic pain-related suffering and disability. *Pain* 2007; 131: 63–69.
62. Zeidan F, Gordon NS, Merchant J, et al. The effects of brief mindfulness meditation training on experimentally induced pain. *J Pain* 2010; 11: 199–209.
63. Sukhodolsky DG, Golub A and Cromwell EN. Development and validation of the anger rumination scale. *Pers Indiv Differ* 2001; 31: 689–700.
64. Rusting CL and Nolen-Hoeksema S. Regulating responses to anger: effects of rumination and distraction on angry mood. *J Pers Soc Psychol* 1998; 74: 790–803.
65. Wilson KG, Sandoz EK, Kitchens J, et al. The Valued Living Questionnaire: defining and measuring valued action within a behavioral framework. *Psychol Rec* 2011; 60: 249–272.
66. McCracken LM and Yang SY. The role of values in a contextual cognitive-behavioral approach to chronic pain. *Pain* 2006; 123: 137–145.
67. Páez-Blarrina M, Luciano C, Gutiérrez-Martínez O, et al. The role of values with personal examples in altering the functions of pain: comparison between acceptance-

- based and cognitive-control-based protocols. *Behav Res Ther* 2008; 46: 84–97.
68. Vowles KE and McCracken LM. Acceptance and values-based action in chronic pain: a study of treatment effectiveness and process. *J Consult Clin Psychol* 2008; 76: 397–407.
 69. Exline JJ, Worthington EL Jr, Hill P, et al. Forgiveness and justice: a research agenda for social and personality psychology. *Pers Soc Psychol Rev* 2003; 7: 337–348.
 70. Melzack R and Casey KL. Sensory, motivational and central control determinants of pain: a new conceptual model. In: Kenshalo DR (ed.) *The skin senses*. Springfield, IL: Thomas, 1968, pp. 423–443.
 71. Martel MO, Wideman TH and Sullivan MJL. Patients who display protective pain behaviors are viewed as less likable, less dependable, and less likely to return to work. *Pain* 2012; 153: 843–849.
 72. Dahlen ER and Martin RC. The experience, expression, and control of anger in perceived social support. *Pers Indiv Differ* 2005; 39: 391–401.
 73. Butler EA, Egloff B, Wilhelm FH, et al. The social consequences of expressive suppression. *Emotion* 2003; 3: 48–67.
 74. Lundgren T, Dahl JA and Hayes SC. Evaluation of mediators of change in the treatment of epilepsy with acceptance and commitment therapy. *J Behav Med* 2008; 31: 225–235.
 75. McCracken LM. Committed action: an application of the psychological flexibility model to activity patterns in chronic pain. *J Pain* 2013; 14: 828–835.
 76. McCracken LM. Social context and acceptance of chronic pain: the role of solicitous and punishing responses. *Pain* 2005; 113: 155–159.
 77. Baum C, Kuyken W, Bohus M, et al. The psychometric properties of the Kentucky Inventory of Mindfulness Skills in clinical populations. *Assessment* 2010; 17: 220–229.
 78. Bond FW, Hayes SC, Baer RA, et al. Preliminary psychometric properties of the Acceptance and Action Questionnaire – II: a revised measure of psychological inflexibility and experiential avoidance. *Behav Ther* 2011; 42: 676–688.
 79. McCracken LM. *Contextual cognitive-behavioral therapy for chronic pain*. Seattle, WA: IASP Press, 2005.
 80. Eifert GH, McKay M and Forsyth JP. *ACT on life not on anger*. Oakland, CA: New Harbinger Publications, 2006.
 81. Gray K and Wegner DM. The sting of intentional pain. *Psychol Sci* 2008; 19: 1260–1262.
 82. Trost Z, Scott W, Lange JM, et al. An experimental investigation of injustice and pain experience among individuals with high and low just world beliefs. *Eur J Pain*. Epub ahead of print 5 August 2013. DOI: 10.1002/j.1532-2149.2013.00375.x.