

A normal psychology of chronic pain

Christopher Eccleston explains how psychology is working to help people disabled by pain

Pain functions primarily as an alarm, working to interrupt all other concerns, goals, desires and motivations, and impose a new priority of escaping pain or its causes. For most people in most situations pain is only temporary. Sometimes, however, pain proves to be long-lasting and untreatable – which we call ‘chronic’.

Chronic pain is for many a wholly destructive experience, characterised by equally chronic distress and disability. Adopting a ‘normal psychology of pain’ enables a focus on the actions that people take to change their lives. Cognitive behavioural therapies have been developed that offer significant promise to both adults and young people in chronic pain, and the pipeline for new developments in CBT, including e-health innovation, is rich.

question

How does a normal psychology of chronic pain differ from an traditional abnormal psychology approach?

resources

Eccleston C. (2010). Psychology of chronic pain and evidence based psychological interventions. In C.F. Stannard, E. Kalso & J. Ballantyne (Eds.) *Evidence based chronic pain management* (pp.59–67). Oxford: BMJ Books.

Pain and suffering are fundamental to human being. Indeed, we are born into pain, will likely die in pain, and we have lives punctuated by painful experience. On the brighter side, we are adept at learning how to live with pain: we have developed extensive knowledge and tools for analgesia and anaesthesia, have created social structures that offer respite, succour and practical help, and have even developed methods for personal growth in our reflection on pain and suffering.

The 21st-century world we live in can be characterised as an ‘analgesic culture’, one in which we work to avoid pain and distress. When the avoidance of pain fails our first thoughts are that any pain should be short-lived, diagnostically relevant, treatable, and a cause for empathy, sympathy or social assistance (Morris, 1991). For the large part this analgesic culture is successful. When it fails, it fails because pain falls outside of these expectations, normally when it lasts too long, does not respond to treatment, and begins to impair social function. This pain we refer to as chronic: pain that has lasted for three months or longer (Merskey & Bogduk, 1994). In what follows I focus on this ‘chronic’ experience of pain and suffering. Acute pain is not uninteresting, but raises different challenges for psychology.

In this article I aim to do three things. First, I introduce the idea of a ‘normal psychology of pain’, seeking to persuade that pain and

how we behave in pain can best be explained by normal social and contextual features of our psychological environment. Second, extending this idea, I explore the interruptive function of pain and its effect on attentional systems. Finally, I review the evidence for psychological treatments of chronic pain, focusing on areas for treatment development.

A normal psychology of pain

Pain is a normal feature of human experience: only a small number of people are unfortunate enough to be born insensitive to pain, and live complicated and often foreshortened lives (Nagasako et al., 2003). For most, pain is a common everyday occurrence. For example, in one interesting playground observation study, children were observed communicating pain on average every 20 minutes (Fearon et al., 1996). In a large and extensive European study, 19 per cent reported pain lasting six months or longer, and 34 per cent of these reported their chronic pain to be severe (Breivik et al., 2006). Pain is to be expected, indeed it is inevitable.

Pain is defined as ‘...an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage’ (Merskey & Bogduk, 1994). This



We are willing to endure needle pain because we judge inoculation to be important

references

- Breivik, H., Collett, B., Ventafridda, V. et al. (2006). Survey of chronic pain in Europe. *European Journal of Pain*, 10, 187–333.
- Cano, A., Barterian, J.A. & Heller, J.B. (2008). Empathic and non-empathic interaction in chronic pain couples. *Clinical Journal of Pain*, 24, 678–684.
- Crombez, G., Beirens, K., Van Damme, S. et al. (2009). The unbearable lightness of somatisation. *Pain*, 145, 31–35.
- Dick, B., Eccleston, C. & Crombez, G. (2002). Attentional functioning in fibromyalgia, rheumatoid arthritis and musculoskeletal pain patients. *Arthritis Care and Research*, 47, 639–644.
- Eccleston, C. & Crombez, G. (1999). Pain demands attention: A cognitive-affective model of the interruptive function of pain. *Psychological Bulletin*, 125, 356–366.
- Eccleston, C. & Crombez G. (2007). Worry and chronic pain. *Pain*, 132, 233–236.
- Eccleston, C., Malleon, P.M., Clinch, J. et al. (2003). Chronic pain in adolescents. *Archives of Disease in Childhood*, 88, 881–885.
- Eccleston, C., Moore, R.A., Derry, S. et al. (2010). Improving the quality and reporting of systematic reviews. *European Journal of Pain*, 14, 667–669.
- Eccleston, C., Palermo, T.M., Williams, A.C. de C. et al. (2009). Psychological therapies for the management of chronic and recurrent pain in children and adolescents. *Cochrane Database of Systematic Reviews*, Issue 2. Art. No. CD007407. doi: 10.1002/14651858.CD007407.pub2.
- Eccleston, C., Williams, A.C. de C. & Morley, S. (2009). Psychological

definition recognises a number of useful psychological characteristics of pain:

- I It acknowledges that pain is fundamentally an emotional event. Pain is coevally sensory and emotional. The emotional experience of either fear or depression should be considered core to the experience.
- I Pain is typically associated with tissue damage but not ordinarily. A common finding in the pain literature is the report of severe pain in response to little observable tissue damage, or little pain in response to extensive tissue damage. The reasons for this are partly biological and partly psychological, but important for the definition is the recognition that variation in pain behaviour is to be expected, and that observable physical signs are very poor predictors of pain complaint.
- I There is a recognition that pain is typically described in terms of damage, often associated with external violent force (e.g. burning, splitting, grinding) (Melzack & Torgerson, 1971). This external attribution for pain is part of the analgesic culture that ascribes pain exteroceptively, leading one to avoid or escape an external force.

Not recognised in this definition, however, are two other important functions of pain. First, Craig and colleagues have argued persuasively that pain should be understood not only as a private mental event, but as a communicative event (e.g. Goubert et al., 2005). Expression or suppression of pain are common features of a social alarm system, functioning to alarm others of danger or the threat of danger. Simply put, understanding why pain behaviours occur requires not only an understanding of the person, but of the social function of that behaviour. Second, Geert Crombez and I have argued repeatedly for a focus on the interruptive function of pain. Pain operates largely to interrupt current concerns, impose a new behavioural priority of escape or avoidance, initiate motor behaviour, and provide updated

information about environmental threat (Eccleston & Crombez, 1999).

Abnormal psychology and psychiatry have been spectacularly unsuccessful at helping us understand how people behave when in pain. The idea of there being a 'pain personality' is accepted now as popular myth, because no evidence has been found for any stable personality traits that put one at risk of chronic pain, or for any underlying pre-morbid psychological vulnerability. Still culturally dominant, however, is the idea of 'psychogenic pain' or of chronic pain as principally a variant of a psychosomatic disorder. We recently demonstrated that the science in this area is poor and misleading and can be harmful (Crombez et al., 2009). A normal psychology of pain is better suited to the exploration of all of the functional characteristics of pain complaint.

In summary, pain is not only inevitable, but is fundamentally threatening. It promotes avoidance and urges escape by interrupting other behavioural priorities, focuses attention to self, signals danger to others and increases vigilance for cues to pain. These functions, we have argued, are far from abnormal and can parsimoniously be understood as features of a normal attention and motivational system operating in the context of chronic alarm.

Attention and pain

Viewing pain as an interruptive signal, functioning to alarm an organism of possible danger, requires that we account for how pain achieves interruption and what the consequences of that interruption are. We now know that the selection of pain over other competing stimuli in our environment is determined by 'bottom up' features of pain, principally its novelty, duration and character (e.g. throbbing or lancinating), and 'top-down' characteristics such as expectations, and how fearful one is about pain. Important for how quickly one can attend back to other important aspects of life once

interrupted by pain

is the speed and effectiveness of our evaluation of pain as unthreatening (Legrain et al., 2009). Pain is an important warning system, but like all warning systems it can deliver false alarms, or the source of the alarm emerges as less important than other demands. A good example of our control over pain is when a superordinate goal is at play: we are willing to endure needle pain because we judge inoculation to be important, some can run 26.2 miles through pain because they have decided completing a marathon is important, or we can hold a baby despite aching arms because to drop her would be catastrophic.

Consider chronic pain from this normal psychological understanding of attention. Experiencing chronic pain is to experience chronic interruption and chronic alarm. Imagine what life would be like if every 90 seconds one was interrupted by an unpleasant and threatening signal of danger that has priority into your awareness pushing aside any other thoughts, goals, plans or emotions. People who are chronically alarmed report this not only to be distressing, but also depressing as one struggles ineffectually to control the interruption and return to other valued life activities (Linton et al., 2011). In such a context of persistent interruption one would expect neuropsychological problems to emerge, and indeed patients report memory loss and attentional dysfunction (Dick et al., 2002). I have found it helpful to think of patients with chronic pain as people who are forced into an unwanted and unwelcome egocentrism, dragged into the present with a focus on one's body, alarmed to danger, with no options, techniques or methods at their disposal to achieve escape.

Faced with inescapable pain, depression, anxiety and the relatively punishing responses from those fatigued by their own failure to help (Cano et al., 2008), one might expect chronic pain patients to surrender; that is, to stop

therapies for the management of chronic pain (excluding headache) in adults. *Cochrane Database of Systematic Reviews*. Issue 2. Art. No. CD003968. doi: 10.1002/14651858.CD003968.pub2.

Fearon, I., McGrath, P.J. & Achat, H. (1996). 'Boo-boos': The study of everyday pain among young children. *Pain*, 68, 55–62.

Goubert, L., Craig, K., Vervoort, T. et al.

(2005). Facing others in pain: The effects of empathy. *Pain*, 118, 285–288.

Keogh, E., Rosser, B. & Eccleston, C. (2010). e-health and chronic pain management: Current status and developments. *Pain*, 151, 18–21.

Leeuw, M., Goossens, M.E.J.B., van Breukelen, G.J.P. et al. (2008). Exposure in vivo versus operant graded activity in chronic low back

pain patients. *Pain*, 138, 192–207.

Legrain, V., Van Damme, S., Eccleston, C. et al. (2009). A neuro-cognitive model of attention to pain: Behavioural and neuroimaging evidence. *Pain*, 144, 230–232.

Linton, S.J., Nicholas, M.K., MacDonald, S. et al. (2011). The role of depression and catastrophizing in musculoskeletal pain. *European Journal of Pain*, 15, 416–422.

McCracken, L.M. (2005). *Contextual cognitive behaviour therapy for chronic pain*. Seattle: IASP Press.

Melzack, R. & Torgerson, W.S. (1971). On the language of pain. *Anesthesiology*, 34, 50–59.

Merskey, H. & Bogduk, N. (Eds.) (1994). *Classification of chronic pain* (2nd edn). IASP Task Force on Taxonomy. Seattle: IASP Press.

Morris, D.B. (1991). *The culture of pain*.

presenting to healthcare professionals who have communicated their impotence, to stop complaining about pain to people who have heard the same complaint repeatedly over a many years, and simply to accept a life in pain. Typically, however, people do not surrender, and instead persist in a variety of analgesic behaviours, including treatment seeking. This paradox is one that frequently challenges health professionals, who, when faced with seemingly healthy (i.e. undiseased) people who are severely disabled by an unobservable private sensation, struggle to find ways to help them adjust to a new life in pain. A normal psychology of pain can help explain this seemingly paradoxical behaviour.

We have not evolved to ignore warning signals. To do nothing in the face of pain interruption is not only counter-cultural but it is also counter-biological. Pain is an affective and motoric event, it urges escape at a pre-conscious level and motivates problem solving (Wiech & Tracey, 2009). In my experience, the average chronic pain patient is far from passive; people are actively engaged in ruminating about possible causes and consequences of pain, and possible actions. Extending advances from the worry literature, we recently discussed chronic pain as an active process of searching for solutions (Eccleston & Crombez, 2007). This model of misdirected problem solving presents people as active in their pursuit of pain management. Figure 1 represents the psychological processes involved in making sense of pain.

People typically construct pain as

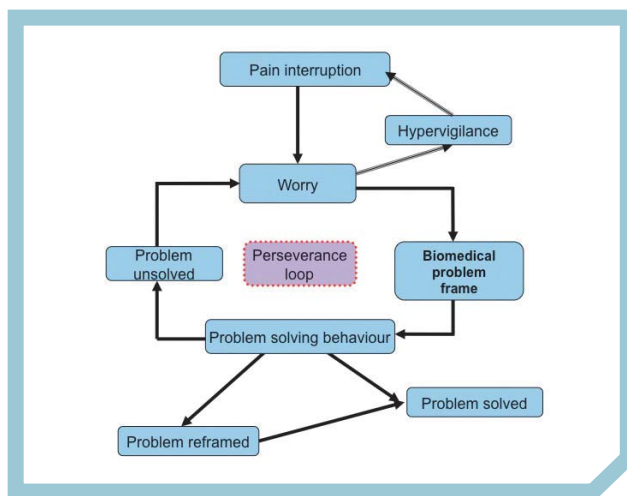


Figure 1: A misdirected problem-solving model of chronic pain

diagnostic and attribute the cause of pain to potential damage. Such attributions promote problem-solving behaviours such as seeking treatment. Some people develop a heightened awareness of cues for pain and become hypervigilant for signals of possible pain (Van Damme et al., 2006). This is a specific feature in which cues for possible pain become generalised. Others persist in seeking a solution to the problem of pain, in which the pain must be removed. Some persevere in seeking solutions for pain regardless of the negative outcomes.

A problem-solving model of chronic pain helps guide different approaches to psychological treatment. For those who present anxiously – hypervigilant for signals of possible pain, with heightened fear of possible consequences of pain – a behavioural therapeutic treatment focusing on fear exposure is best (Vlaeyen & Linton, 2000). Where the focus of treatment is on reducing the rigidity of belief in pain as requiring biomedical intervention, and in changing the problem frame from one of needing a cure, to one of managing a chronic problem, then a variety of methods from cognitive behavioural therapy are indicated (Turk &

Gatchel, 2002). However, where the focus of treatment is on a more thoroughgoing accommodation of a life changed to one in which pain is a feature, but not a central one, then acceptance and commitment therapy is emerging as the treatment of choice (McCracken, 2005).

Evidence-based psychological treatments

Psychological treatments for chronic pain have a strong tradition of empirical investigation. For the Cochrane Library (www.thecochranelibrary.com) we recently systematically reviewed all randomised controlled trials for psychological interventions for chronic pain in adults (Eccleston, Williams et al., 2009) and children (Eccleston, Palermo et al., 2009). We are now updating both reviews. There are now 60 randomised controlled trials of cognitive behavioural and behavioural interventions for adult chronic pain and 20 for child chronic pain.

For adult chronic pain there are some empirical studies of exposure interventions for those with high fear of pain and damage (e.g. Leeuw et al., 2008), and an emerging focus on acceptance and commitment therapy (McCracken, 2005). However, the evidence base is dominated by studies of cognitive behavioural or behavioural treatments for chronic pain. These vary from multifactorial, multidisciplinary residential treatment programmes running for four weeks (e.g. Williams et al., 1996) to short, targeted coping interventions lasting for a total of six hours (e.g. Turner et al., 2006). In general, the goals of treatment are to reframe the problem of pain toward one of self-management, improve engagement in valued activities, reduce affective distress, and reduce the complaint of pain. Many treatments have additional specific targets depending on the particular population or treatment. In general, the news is good and treatments are promising, although there is some cause for concern.

In the last 10 years the quality of

Berkeley, CA: University of California Press.
 Nagasako, E.M., Oaklander, A.L. & Dworkin, R.H. (2003). Congenital insensitivity to pain: An update. *Pain*, 101, 213–219.
 Palermo, T.M. & Eccleston, C. (2009). Parents of children and adolescents with chronic pain. *Pain*, 146, 15–17.
 Palermo, T.M., Wilson, A.C., Peters, M. et al. (2009). Randomized controlled

trial of an internet-delivered family cognitive-behavioral therapy intervention for children and adolescents with chronic pain. *Pain*, 146, 205–213.
 Turk, D.C. & Gatchel, R.J. (Eds.) (2002). *Psychological approaches to pain management* (2nd edn). New York: Guilford Press.
 Turner, J.A., Mancl, L. & Aaron, L.A. (2006). Short- and long-term efficacy

of brief cognitive-behavioral therapy for patients with chronic temporomandibular disorder pain: A randomized controlled trial. *Pain*, 121, 181–194.
 Van Damme, S., Crombez, G., Eccleston, C. et al. (2006). Hypervigilance to learned pain signals: A componential analysis. *Journal of Pain*, 7, 346–357.
 Vlaeyen, J.W.S. & Linton, S.J. (2000). Fear-avoidance and its

consequences in chronic musculoskeletal pain: A state of the art. *Pain*, 85, 317–832.
 Wiech, K. & Tracey, I. (2009). The influence of negative emotions on pain. *NeuroImage*, 47, 987–994.
 Williams, A.C. de C., Richardson, P.H., Nicholas, M.K. et al. (1996). Inpatient versus outpatient pain management: Results of a randomised controlled trial. *Pain*, 66, 13–22.

design of randomised controlled trials has improved. There is now a better understanding of how to undertake well-controlled studies free from bias. Unfortunately, however, as more studies are conducted and added, the overall effectiveness of psychological interventions is reducing. It is not exactly clear how to understand this, but there are at least three related explanations. First, in recent years there has been social pressure to develop shorter treatments that can be delivered by a range of healthcare professionals. The database is now overrepresented by studies of relatively weak treatments delivered by staff with minimal training, producing weak effects. Second, many of the studies that dominated early systematic reviews were those of pure behavioural interventions, such as biofeedback and relaxation training, delivered intensively following theoretically informed manuals. These are now rarely reported. Third, the recent studies are better designed, with larger populations, and have increased power. The next generation of studies will benefit from a clear rationale as to the aims of treatment, and from being delivered effectively and at an appropriate dose. In addition, sorely needed in this field is some control over what is labelled a psychological intervention and better discrimination over what enters meta-analyses (Eccleston et al., 2010).

For children in chronic pain most empirical treatments have been developed for headache, which is the most common childhood pain complaint. These treatments are remarkably effective in reducing the frequency and severity of headache, and represent one of the great good news stories of psychotherapy. Brief behavioural interventions, principally relaxation training, habit management and targeting cues for intermittent pain episodes, are very effective and inexpensive interventions. Such therapies have been delivered in school settings with excellent results. Despite this effectiveness these treatments are rarely offered or practised, due in part to a general ignorance of their effectiveness and availability. Great advances can be made in the treatment of childhood pain by improved effort at knowledge transfer.

Evidence is lacking, however, for the effectiveness of psychological interventions for the non-pain child outcomes, including distress and disability. Also rare are randomised controlled trials of interventions for chronic conditions other than headache. There have been developments in programmatic,

Bath Centre for Pain Research

In Bath (www.bath.ac.uk/health/pain) our aim is to lead science and practice in six related areas:

Evidence: We are actively engaged in evidence synthesis and review not only for psychological interventions but for all pain management technologies. If patients are offered or sold it, we are interested in whether it works. Much of this work is done by those volunteering to write systematic reviews for the Cochrane Library, through our review group (<http://papas.cochrane.org>).

Attention and motivation: Dr Ed Keogh, a senior lecturer in psychology and Deputy Director of the Centre for Pain Research, runs the pain laboratory and our studies on the effects of pain on cognition. We are particularly interested in how pain interrupts, and how to mitigate its effects.

Treatment development: Dr Lance McCracken, senior fellow in the centre and chief psychologist of the Royal National Hospital for Rheumatic Diseases NHS Trust in Bath, leads this programme. He has developed novel treatments for chronic pain focusing on a contextual approach and is currently running randomised controlled trials to examine their effectiveness.

Social and contextual factors: Dr Mike Osborn, a senior fellow in the centre and chief psychologist of the Royal United Hospital NHS Trust in Bath, leads this programme. He is particularly interested in the social construction of disability, and is working on the role of social emotions in acceptance of chronic pain. Ed Keogh also has a strong interest and expertise in sex differences and pain which forms part of this programme.

e-health innovation: We are all exploring the potential benefits of new technologies in radically altering the effectiveness of treatments and changing the nature of communication about pain. Working principally with Dr Nigel Harris, the Director of the Bath Institute for Medical Engineering (www.bath.ac.uk/bime), we are developing a number of remote sensing interventions to promote mobility in people with painful long-term conditions.

Child and family: Finally, I lead our programme of work in developing a better understanding of how young people come to develop chronic pain, the consequences of their struggle to adapt to pain, and the effect that pain has on parents and other family members. We are currently working on methods of including parents as active participants in treatment.

multifaceted and multidisciplinary psychological interventions (eg. Eccleston et al., 2003), but these have not been subjected to controlled trials.

But this is a young field that is growing quickly. Exciting developments are being generated in computer-assisted therapies. For example, Tonya Palermo has created an effective online coping skills training programme for young people with headache, which promises greater access for a large number of currently untreated sufferers (Palermo et al., 2009). Further, a recent focus on families suggests that treatments to help parents of chronic pain patients is a promising area for research investment (Palermo & Eccleston, 2009).

Overall, the evidence base for psychological interventions is promising. The next generation of studies will need to respond to three main developments in the field. First, we will see tailored treatments for specific conditions. For example, there is a growing population of new chronic pain sufferers with pain from iatrogenic causes such as treatment for cancer, and new populations of people presenting with complex comorbid conditions such as pain and obesity, pain and chronic heart failure, and pain and dementia. Second, there are advances in psychotherapy such as

exposure therapy, attentional retraining, and acceptance and commitment therapy that have yet to be tested in controlled trials. Third, there are developments in electronics, computing and robotics that offer the promise of increasing access to effective treatments by remote delivery. Telemedicine for pain is at a very early but exciting stage (Keogh et al., 2010).

Conclusion

Chronic pain can devastate the lives of both adults and children. People with pain often persevere in misdirected attempts to solve the problem of pain, unwittingly working deeper into distress and disability. Applying a normal psychology of pain can help us understand the origins of disability and guide the development of better treatments.



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