Fear of Pain: assessment and treatment

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Overview

- The threat of pain
- Learning: propositional knowledge
- Reducing the threat of pain
- Conclusions

A simple experiment

Traditional Disease Model

![Stimuli](image1)

Mental representation of stimulus

![Stimuli](image2)

Context

Learning

Stimuli

→ Behaviour

Stimuli

→ Behaviour
**Unconditioned Stimuli (US)**

- Unlearned
- Biologically meaningful
- Potentially harmful
- Stings, attacks, foul odors, bright light, loud noises, facial expressions...
- Painful stimuli

**Cognitive vulnerabilities:**

- Negative affectivity
- Pain catastrophizing (via endogenous opioid system)

**Painful stimuli**

**Cultural factors:**

- Very cold
- Very hot

**Meaning of pain:**

**Catastrophic interpretations of pain**

**Pain Catastrophizing Scale**

When I am in pain...

- I continuously wonder whether the pain will stop
- I think this is terrible and it will never get any better
- I become afraid that the pain will increase
- I wonder whether something serious might happen

Sullivan et al, 1995

**Association of catastrophizing with interleukin-6 responses to acute pain**

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**Unconditioned Response (UR) = protection seeking**

- Painful stimuli
- Selective attention
- Avoidance
- Escape
- Safety seeking
- Facial expression
Selective attention

Avoidance/escape in acute back pain

Task: lifting

Groups:
- TSK Low
- TSK High

Swinkels-Meewisse et al. PAIN, 2005

Safety-seeking behaviors

Task: lifting

Tang et al. BRAT, 2007

Safety-seeking behaviors

Task: lifting

Examples of safety-seeking strategies employed by chronic pain patients during the lifting tasks:

<table>
<thead>
<tr>
<th>Description of the strategy</th>
<th>Reason(s) for the strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lifting and bending the legs cautiously with back legs in front of you</td>
<td>To prevent pain and avoid the risk of falling</td>
</tr>
<tr>
<td>2. Standing with weight on one side</td>
<td>To avoid balancing problems</td>
</tr>
<tr>
<td>3. Holding and pushing my back to the &quot;good&quot; side</td>
<td>To use upper body strength</td>
</tr>
<tr>
<td>4. Constantly crouching, shifting weight between my legs</td>
<td>To maintain balance and reduce strain</td>
</tr>
</tbody>
</table>

Tang et al. BRAT, 2007

Safety-seeking behaviors

Task: lifting

Groups:
- High fearful LBP
- Low fearful LBP
- Healthy

Tang et al. BRAT, 2007

Safety-seeking behaviors

Pain-related fear is associated with avoidance of spinal motion during recovery from low back pain.

James S. Thomas, PhD, and Christopher R. Fronek, PhD
High fear
Low fear
Facial expression

Facial expression
Empathy for Pain Involves the Affective but not Sensory Components of Pain

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<th>US</th>
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Pain-no pain: Red = observer

Paincolour

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Anticipation and adaptation: Pavlovian Learning

CS US
Respondent Learning:
Conditioned stimuli (CS)

- Biologically neutral
- Relevant: functionally related to US

Pavlovian Learning:
Conditioned stimuli (CS) signal value

Propositional knowledge
If CS ... then US

How does propositional knowledge develops?
Pathways to fear

Propositional knowledge
If CS ... then US

Direct experience Observation Verbal instruction

Experiential fear learning

“kinesiophobia”

Experiential fear learning

Predictable

Unpredictable
Fear of pain during CS movements

Eye blink startle reflexes

Eye blink startle reflexes

Pain intensity and unpleasantness

Pathways to learning
Observed fear learning

Helsen et al., JOP (in press)

Pathways to learning

Verbal instruction

The health care provider?

Pain Attitudes and Beliefs Scale for HC providers

(Houben et al., EJP, 2005)

Sample item Biomedical orientation:
“People would not have much back pain if there weren’t something wrong with the back”

Sample item Behavioral orientation:
“Even if the pain has worsened, the intensity of the next treatment can be increased”

Instructional fear learning

From: Vlaeyen et al. (2000)

Observational fear learning

Acquisition
Anticipation Immersion

CS+ CS-

CS CS-

US

Helsen et al., JOP (in press)
Instructional fear learning
Role of health care provider

Health care providers’ orientations towards common low back pain predict perceived harmfulness of physical activities and recommendations regarding return to normal activity

Roland M.A. Houben 1,2,3, Raymond W.J.G. Oostendorp 2, Johan W.S. Vlaeyen 1, Peer M.J.C. Wolf 1, Maaike Prins 1, Suzanne G.M. Stoepelen 1,2,3,4

BIO BEHAV

10 20 30 40
0 0

Harmfulness of daily activities
Recommendation against work resumption

Back Pain patient vignette

Instructional fear learning
Role of health care provider

Do health care providers’ attitudes towards back pain predict their treatment recommendations? Differential predictive validity of implicit and explicit attitude measures

S.M.A. Houben1,2, A. Gijzen3, J. Demoures4, D.J. de Jong5, P.M.C. Vlaeyen6

How does the self-reported clinical management of patients with low back pain relate to the attitudes and beliefs of health care practitioners? A survey of UK general practitioners and physiotherapists

Annette Bishop 1, Nadine E. Foster, Elaine Thomas, Elaine M. Hay

Primary Care Musculoskeletal Research Group, Primary Care Science, Keele University, Staffordshire, ST5 5BG, UK

Fear Avoidance Model

Low back pain

CTB
Disability management

Start

End

Early change Catastrophizing

Late change Pain-related fear

Late change Pain severity

OR = 1.07*

OR = 1.09*

OR = 1.03*

Return to work

Wideman et al., PAIN 2009

Low back pain

Workers developing pain disability

T1

T2

48

24

20

58

Pain-related fear

Pain severity

Social Disability

Gheldof et al., EJP 2010
Back/Neck pain

Health care workers developing pain disability

Pain-related fear → Sickness Absence Days → Back Pain severity

Jensen et al., JOEM 2010

Low back pain

Jensen et al., JOEM 2010

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Exposure

- Setting functional goals
- Educate about paradox of safety seeking behaviors
- Hierarchy
- Modeling
- Challenge expectancies with behavioral experiments

Vlaeyen et al., CJP 2002

Exposure

a. Setting functional goals
b. Educate about paradox of safety seeking behaviors
c. Hierarchy
d. Modeling
e. Challenge expectancies with behavioral experiments

Vlaeyen et al., CJP 2002

Fear Hierarchy

http://www.psychology.unimaas.nl/phoda-sev/
Exposure

- Setting functional goals
- Educate about paradox of safety seeking behaviors
- Hierarchy
- Modelling
- Challenge expectancies with behavioral experiments

Vlaeyen et al., CJP 2002

Some conclusions

- Pain-related fear is a normal response to unusual threatening information.
- Fear can be and maintained through conditioning to relevant stimuli, which need to be assessed.
- Pain-related fear is associated with increased disability, through escape/avoidance behaviors and selective attention.
- Health care providers concerns do matter!
- Asymmetry between fast acquisition and slow extinction
- Fear-reduction techniques may help customizing CBT for chronic pain

Teamwork:

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- Madelon Peters
- Marielle Goossens
- Martien Schrooten
- Linda Vansteke
- Petra Karsdorp
- Jeroen de Jong
- Hanne Kindermans
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- Pim Peeters
- Ken Ceulemans

Leuven (B):
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- Kim Hohens
- Stéphanie Volders
- Erik Ceunen
- Nele Vandebroek

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- Liesbet Soubert, Belgium
- Stephen Morley, UK
- Amanda Williams, UK
- Katrina Wiech, UK
- Mick Sullivan, Canada
- Gordon Asmundson, Can
- Steven Linton, Sweden

Thank you