

Fear of Pain: assessment and treatment

Johan W.S. Vlaeyen, PhD
Pain and Disability Research Program
University of Leuven, Belgium
Maastricht University, Netherlands



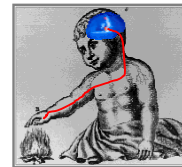
Overview

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

Overview

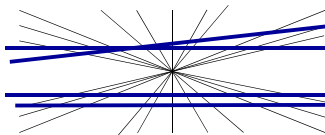
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Traditional Disease Model

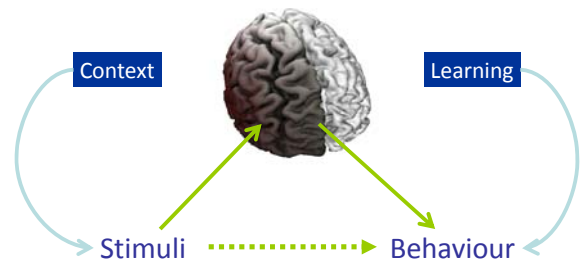


Stimuli → Behaviour

A simple experiment



Mental representation of stimulus



Unconditioned Stimuli (US)

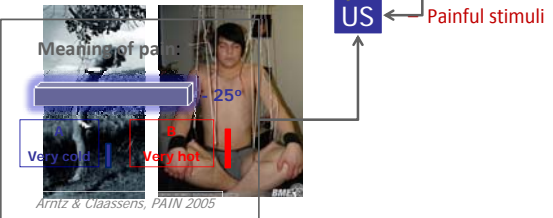
- Unlearned
- Biologically meaningful
- Potentially harmful
- Stings, attacks, foul odors, bright light, loud noises, facial expressions...
- Painful stimuli

US

Unconditioned Stimuli (US)

Cognitive vulnerabilities:

- Negative affectivity
- Pain catastrophizing (via endogenous opioid system)
- In Cultural factors



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

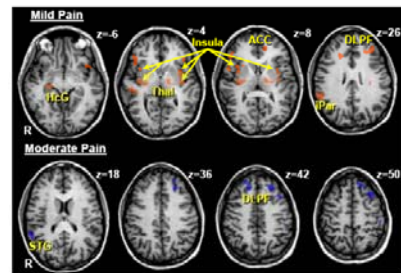
Sullivan et al, 1995

Catastrophic interpretations of pain

Cortical responses to pain in healthy individuals depends on pain catastrophizing

David A. Seminowicz, Karon D. Davis *

Frontal Pain Research Institute, University Health Network, University of Medical Sciences and Department of Neurology, University of Toronto, Canada



Association of catastrophizing with interleukin-6 responses to acute pain

Robert R. Edwards^{a,b,*}, Tarek Kronfli^b, Jennifer A. Haythornthwaite^b, Michael T. Smith^b, Lynanne McGuire^c, Gayle G. Page^d

^a Department of Anesthesiology, Perioperative and Pain Medicine, Harvard Medical School, Pain Management Center, Brigham & Women's Hospital, 850 Boylston Street, Chestnut Hill, MA 02467, USA

^b Department of Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine, 600 North Wolfe St, Baltimore, MD 21287, USA

^c Department of Psychology, University of Maryland at Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250, USA

^d Johns Hopkins University School of Nursing, 525 North Wolfe St, Baltimore, MD 21205, USA

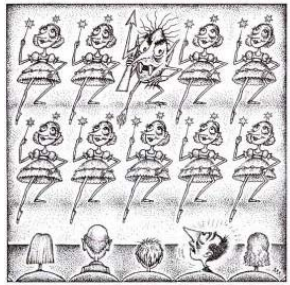
Unconditioned Response (UR) = protection seeking

US - Painful stimuli

UR

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

Selective attention



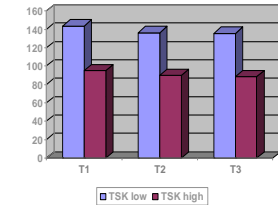
Avoidance/escape in acute back pain

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

Examples of safety-seeking strategies employed by chronic pain patients during the bag-carrying tasks

Description of the strategy	Rationale for the strategy
1 "Lifting and loading the bag cautiously with back kept straight"	"To prevent pain and sudden jolt. Lifting could have put me out of circulation and my back would have seized up."
2 "Standing with weight on one side"	"I can't stand still with both feet on the floor otherwise pain would have increased and I'd be in agony."
3 "Holding and pushing my back to the 'good' side"	"So that no weight will be on my 'bad' side. This is to avoid something drastic from happening... I'll panic, I'll die."
4 "Constantly rocking. Shifting weight between my legs"	"To keep muscles in back moving otherwise tension will build up in my neck leading to severe headache."

Tang et al, BRAT, 2007

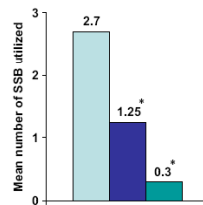
Safety-seeking behaviors

Task: lifting



Groups:

High fearful LBP
Low fearful LBP
Healthy

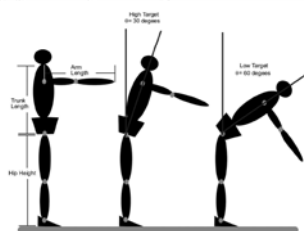


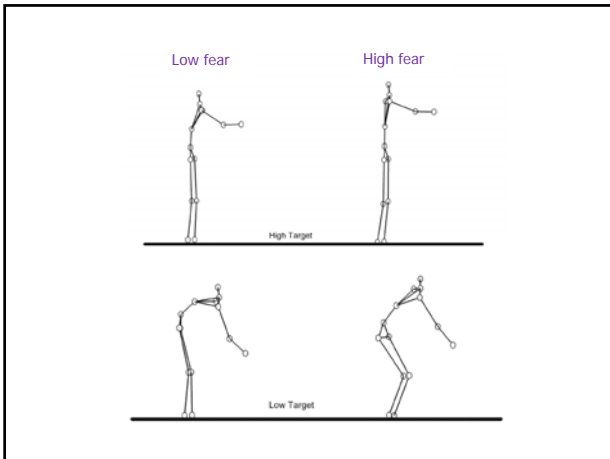
Tang et al, BRAT, 2007

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. France, PhD†





Facial expression

Facial expression

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

Tania Singer,^{1*} Ben Seymour,¹ John O'Doherty,¹ Holger Kaube,² Raymond J. Dolan,¹ Chris D. Frith¹

Pain-no pain: Red = observer

Singer et al, Science 2004

Unconditioned Response (UR)
= protection seeking

US

↓

UR

→

– Painful stimuli

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

Overview

- The threat of pain
- **Anticipation and learning**
- Reducing then threat of pain
- Conclusions

Anticipation and adaptation:
Pavlovian Learning

Respondent Learning: Conditioned stimuli (CS)

- Biologically neutral **CS** **US** - Painful stimuli
- **Relevant:** functionally related to US

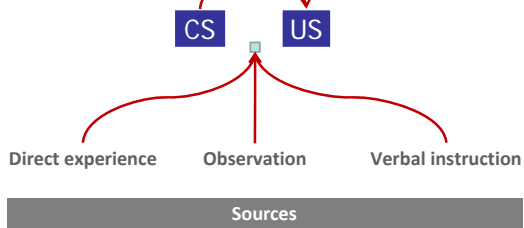
Pavlovian Learning: Conditioned stimuli (CS) signal value

Propositional knowledge
If CS ... then US

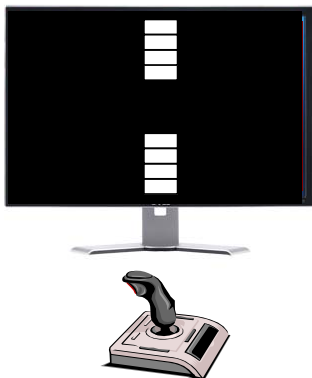


How does propositional knowledge develops? Pathways to fear

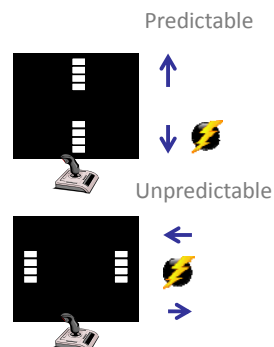
Propositional knowledge
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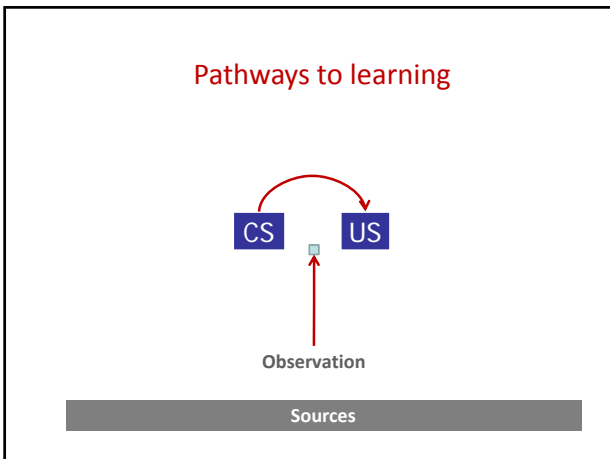
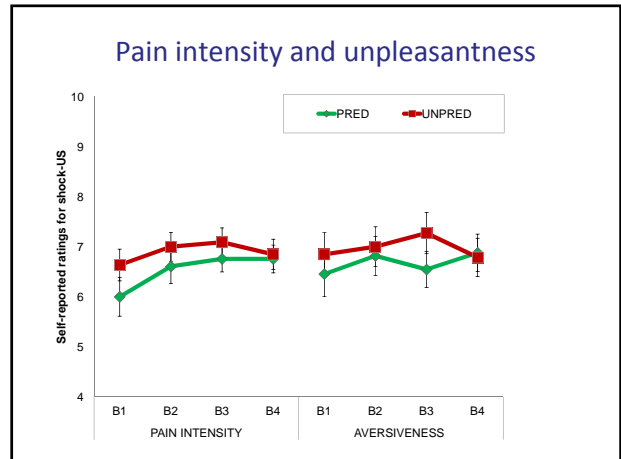
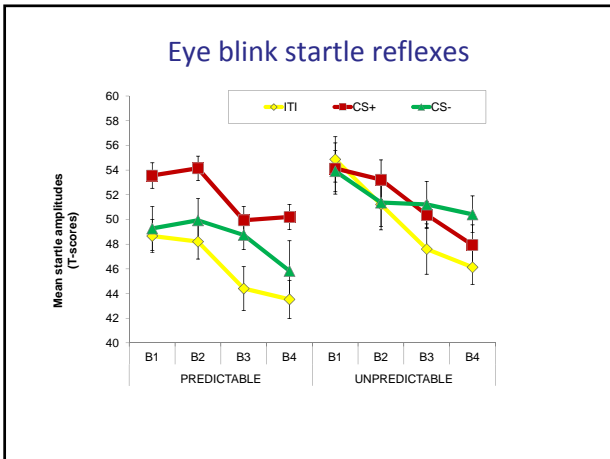
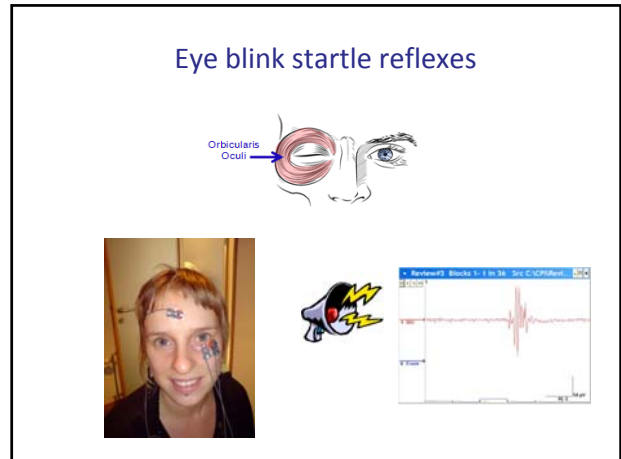
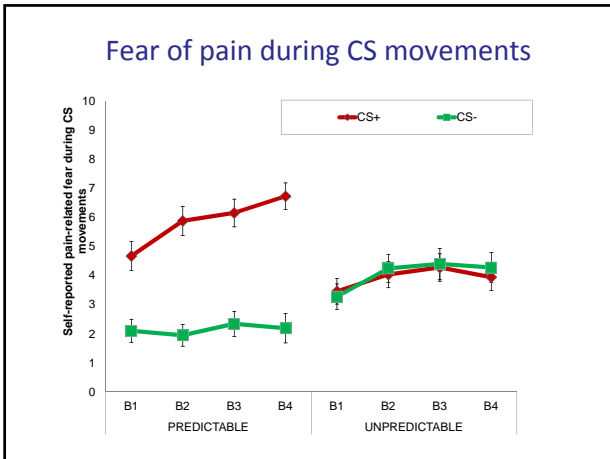


Experiential fear learning



Experiential fear learning





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The Journal of Pain, Vol. 12, No. 1, 2011, pp 1-10
Available online at www.sciencedirect.com

Observational Learning and Pain-Related Fear: An Experimental Study With Colored Cold Pressor Tasks

Kim Helsen,^{*1} Liesbet Goubert,¹ Madelon L. Peters,¹ and Johan W. S. Vlaeyen^{*1,2}

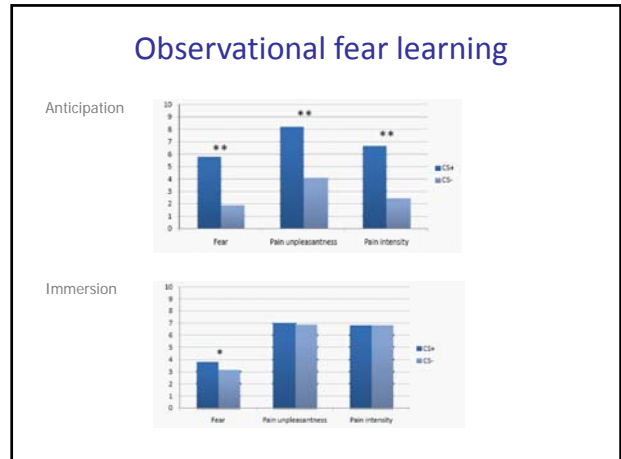
^{*}Research Group on Health Psychology, University of Leuven, Leuven, Belgium.
¹Department of Experimental Clinical and Health Psychology, Ghent University, Ghent, Belgium.
²Department of Clinical Psychological Science, Maastricht University, Maastricht, Netherlands.

Observational fear learning

Acquisition Anticipation Immersion

CS US

Helsen et al. JOP (in press)



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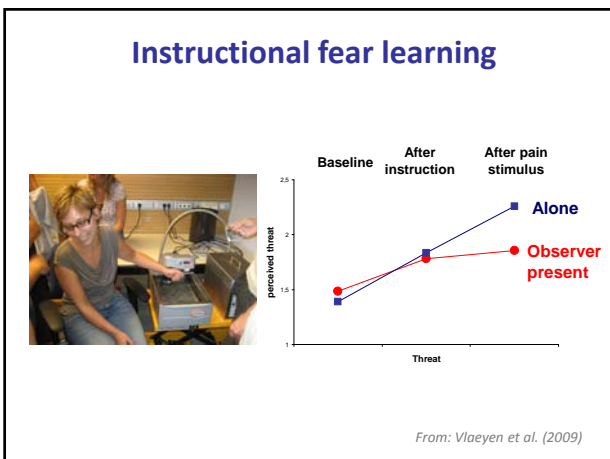
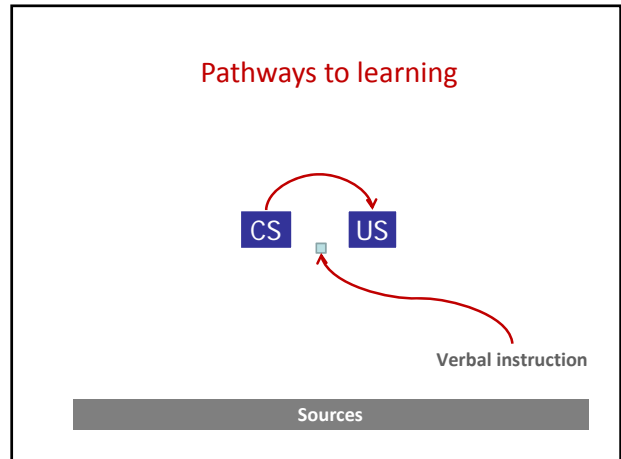
The Journal of Pain, Vol 12, No 2 (February), 2011; pp 167-174
Available online at www.sciencedirect.com

Focus Article

Learning About Pain From Others: An Observational Learning Account

Liesbet Goubert,* Johan W. S. Vlaeyen,^{1,4} Geert Crombez,* and Kenneth D. Craig⁵

*Department of Experimental-Clinical and Health Psychology, Ghent University, Ghent, Belgium.
¹Department of Psychology, Catholic University of Leuven, Belgium.
²Department of Clinical Psychological Science, Maastricht University, The Netherlands.
³Department of Psychology, University of British Columbia, Vancouver, Canada.



The health care provider?

Pain Attitudes and Beliefs Scale for HC providers

(Ostelo et al., 2003)

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"

(Houben et al., EJP, 2005)

Instructional fear learning Role of health care provider



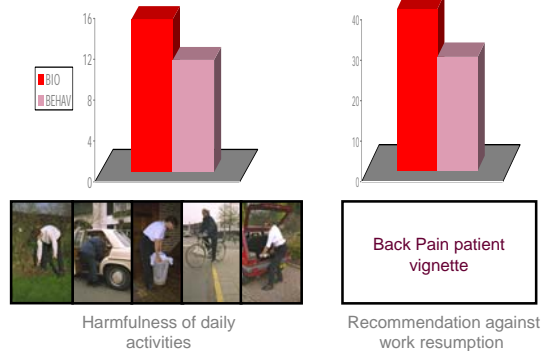
Available online at www.sciencedirect.com
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European Journal of Pain 9 (2005) 173-183



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

Ruud M.A. Houben ^{a,*}, Raymond W.J.G. Ostelo ^b, Johan W.S. Vlaeyen ^a, Pieter M.J.C. Wolters ^c, Madelon Peters ^a, Suzanne G.M. Stomp-van den Berg ^d

Health care providers attitudes



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

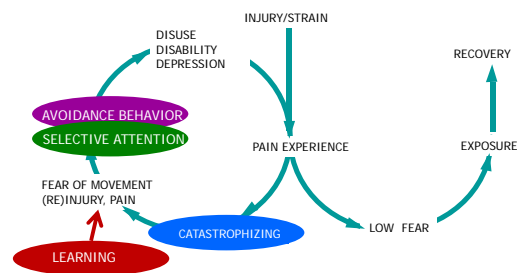
R.M.A. Houben ^{a,*}, A. Gijsen ^b, J. Peterson ^a, P.J. de Jong ^c, J.W.S. Vlaeyen ^a

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

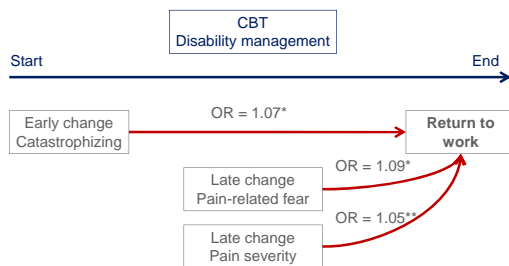
Annette Bishop ^{*}, Nadine E. Foster, Elaine Thomas, Elaine M. Hay
Primary Care Musculoskeletal Research Centre, Primary Care Sciences, Keele University, Staffordshire ST5 5BG, UK

Fear Avoidance Model

Vlaeyen et al, 1995; Crombez et al, 1999, Vlaeyen and Linton, 2000



Low back pain

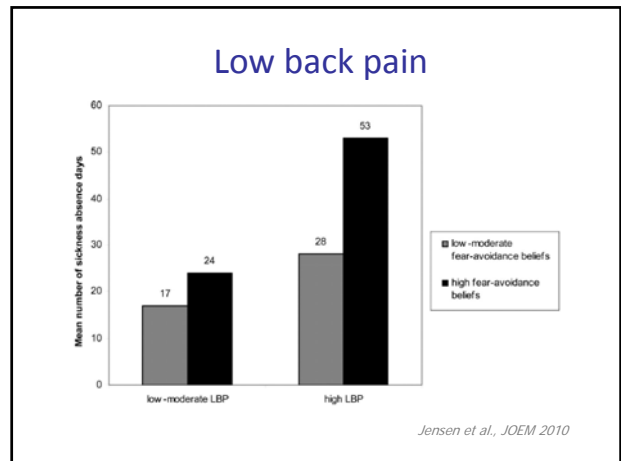
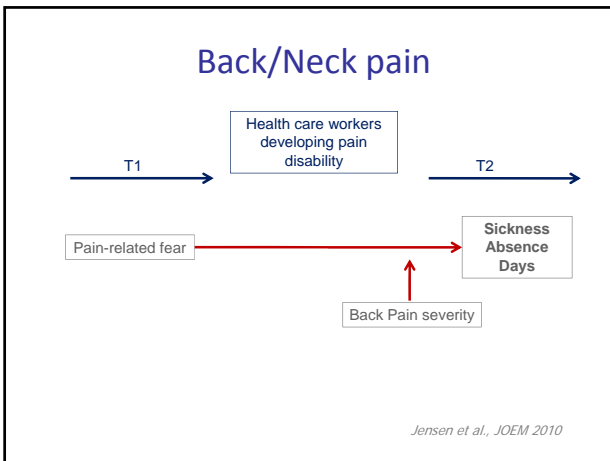


Wideman et al., PAIN 2009

Low back pain



Gheldof et al., EJP 2010



Overview

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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

Exposure

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

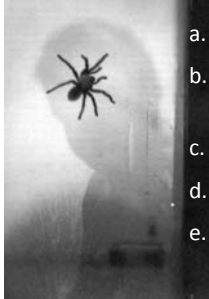
Vlaeyen et al., CJP 2002

Fear Hierarchy

Leeuw et al., J Pain 2007;8(11):840-849.

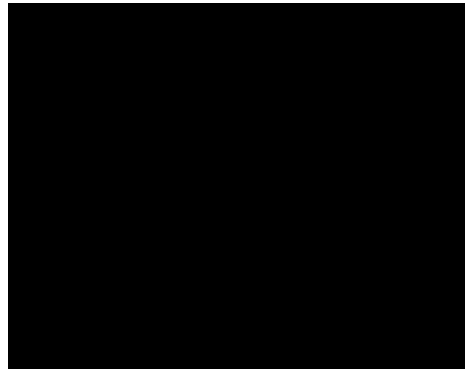
<http://www.psychology.unimaas.nl/phoda-sev/>

Exposure



- a. Setting functional goals
- b. Educate about paradox of safety seeking behaviors
- c. Hierarchy
- d. **Modelling**
- e. **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:

Maastricht (NL):

Madelon Peters
 Marielle Goossens
 Martien Schrooten
 Linda Vancleef
 Petra Karsdorp
 Jeroen de Jong
 Hanne Kindermans
 Saskia Ranson
 Pim Peeters
 Ken Ceulemans

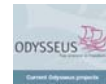
International:

Geert Crombez, *Belgium*
 Liesbet Goubert, *Belgium*
 Stephen Morley, *UK*
 Amanda Williams, *UK*
 Katja Wiech, *UK*
 Mick Sullivan, *Canada*
 Gordon Asmundson, *Can*
 Steven Linton, *Sweden*



Leuven (B):

Ilse van Diest
 Omer van den Bergh
 Steven de Peuter
 Ann Meulders
 Kim Helsen
 Stéphanie Volders
 Erik Ceunen
 Nele Vandebroek



Thank you

