J. Behav. Ther. & Exp. Psychiat. xxx (2013) 1e3

Contents lists available at ScienceDirect

Journal of Behavior Therapy and Experimental Psychiatry

journal homepage: www.elsevier.com/locate/jbtep

Contextualisation in the revised dual representation theory of PTSD: A response to Pearson and colleagues[q]

Chris R. Brewin*, Neil Burgess[1]

University College London, UK

a r t i c l e i n f o

Article history:
Received 15 January 2013
Received in revised form
7 May 2013
Accepted 30 July 2013

Keywords:
PTSD
Memory
Context
Intrusion

a b s t r a c t

Three recent studies (Pearson, 2012; Pearson, Ross, & Webster, 2012) purported to test the revised dual representation theory of posttraumatic stress disorder (Brewin, Gregory, Lipton, & Burgess, 2010) by manipulating the amount of additional information accompanying traumatic stimulus materials and assessing the effect on subsequent intrusive memories. Here we point out that these studies involve a misunderstanding of the meaning of "contextual" within the theory, such that the manipulation would

of representation includes sensory details and affective/emotional state experienced during the traumatic event (sensory-bound representation or S-rep for short). The other includes a subset of the sensory input, recoded into an abstract structural description, along with the spatial and personal context of the person experiencing the event (contextual representation or C-rep for short). Thus, S-reps and C-reps are not primarily distinguished by the type of input (e.g. sensory versus verbal) but represent different aspects of the input that are derived from it by different types of processing. In healthy memory the S-rep and C-rep are tightly associated, such that an S-rep is generally retrieved via the associated C-rep. Access to C-reps is under voluntary control but may also occur involuntarily. According to the DRT, direct involuntary activation and re-experiencing of S-reps occurs when the S-rep is very strongly encoded, due to the extreme affective salience of the traumatic event, and the C-rep is either encoded weakly or without the usual tight association to the S-rep. This might be due to stress-induced down-regulation of the hippocampal memory system (Jacobs & Nadel, 1985), and/or due to a dissociative response to the traumatic event.

Within the DRT, one aspect of therapy or normal recovery can be considered to be (re)association of the S-rep with its corresponding C-rep, so that the sensory and affective/emotional representation of the traumatic event can be seen in its appropriate context. This has

* Corresponding author. Clinical, Educational & Health Psychology, University College London, Gower Street, London WC1E 6BT, UK.
E-mail address: c.brewin@ucl.ac.uk (C.R. Brewin).

[1] Neil Burgess is supported by a Wellcome Trust Principal Research Fellowship.

0005-7916/$ e see front matter
http://dx.doi.org/10.1016/j.jbtep.2013.07.011

bene cial consequences, such as allowing the difference between that context (the associated C-rep) and current personal context to be appreciated and used to control the retrieval of the S-rep, allowing integration with other autobiographical knowledge, and facilitating deliberate recall and communication of the details of the traumatic event. The proposed imbalance between S-reps and C-reps in PTSD is also consistent with the observation that, while intrusive sensory and affective representations of a traumatic event are frequent in PTSD, consciously controlled "context-dependent" or "episodic" memories for the traumatic events are often impaired (Brewin, 2013). The DRT also corresponds to animal studies of fear conditioning, in which acquisition of the association between a sensory stimulus and an aversive event leads to subsequent involuntary fearful responses to the stimulus, such as fear-potentiated startle. These changes depend on associative links be-

existing cognitive characteristics associated with enhanced hippocampal functioning such as above average allocentric spatial processing will confer protection against the development of PTSD. Neuroimaging investigations could compare the structural and functional neural correlates of flashbacks in PTSD patients to the brain structures proposed to support S-reps and C-reps (see, for example, Kroes, Whalley, Rugg, & Brewin, 2011; Whalley et al., 2013). On the treatment side, DRT suggests that PTSD will be helped by interventions that either enhance ventral stream processing of trauma memories, for example by encouraging the visualisation of trauma scenes from alternative perspectives, or interfere with dorsal stream processing, for example using transcranial direct-current stimulation.

In conclusion, we welcome the attempts of Pearson and colleagues to test the DRT in novel ways, but we hope that future experiments avoid further confusion associated with the multiple potential uses of the word "context". To facilitate this, we have outlined some of the ways in which the DRT has been tested, how it might be tested further in future, and how this knowledge might be exploited for the benefit of patients.

References

Bisby, J. A., King, J. A., Brewin, C. R., Burgess, N., & Curran, H. V. (2010). Acute effects of alcohol on intrusive memory development and viewpoint dependence in spatial memory support a dual representation model. Biological Psychiatry, 68, 280–286.

Brewin, C. R. (2013). Episodic memory, perceptual memory, and their interaction: Foundations for a theory of posttraumatic stress disorder. Psychological Bulletin. Online First Publication, doi:10.1037/a0033722.

Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. Psychological Review, 103, 670–686.

Brewin, C. R., Gregory, J. D., Lipton, M., & Burgess, N. (2010). Intrusive images in psychological disorders: characteristics, neural mechanisms, and treatment implications. Psychological Review, 117, 210–232.

Byrne, P., Becker, S., & Burgess, N. (2007). Remembering the past and imagining the future: a neural model of spatial memory and imagery. Psychological Review, 114, 340–375.

Glazer, D. A., Mason, O., King, J. A., & Brewin, C. R. (2013). Contextual memory, psychosis-proneness, and the experience of intrusive imagery. Cognition and Emotion, 27, 150–157.

Holland, A. C., & Kensinger, E. A. (2010). Emotion and autobiographical memory. Physics of Life Reviews, 7, 88–131.

Holmes, E. A., & Bourne, C. (2008). Inducing and modulating intrusive emotional memories: a review of the trauma film paradigm. Acta Psychologica, 127, 553–566.

Jacobs, W. J., & Nadel, L. (1985). Stress-induced recovery of fears and phobias. Psychological Review, 92, 512–531.

King, J. A., Burgess, N., Hartley, T., Vargha-Khadem, F., & O'Keefe, J. (2002). Human hippocampus and viewpoint dependence in spatial memory. Hippocampus, 12, 811–820.

King, J. A., Trinkler, I., Hartley, T., Vargha-Khadem, F., & Burgess, N. (2004). The hippocampal role in spatial memory and the familiarity-recollection distinction: a case study. Neuropsychology, 18, 405–417.

Krans, J., Näring, G., Holmes, E. A., & Becker, E. S. (2010). "I see what you're saying": intrusive images from listening to a traumatic verbal report. Journal of Anxiety Disorders, 24, 134–140.