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The embodied simulation account of cognition in Rational Emotive Behaviour Therapy

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ABSTRACT

Rational Emotive Behaviour Therapy (REBT) is built on a unique theory of cognitive vulnerability for emotional disorders that differentiates itself from other forms of cognitive behaviour therapy by several important features. In this article, we describe concepts from the embodied simulation framework on cognition with relevance to REBT and we argue that several distinctive features of REBT may benefit from clarification from an embodied perspective on the cognitive vulnerability to emotional disorders. We present important embodied cognition concepts from the position of grounded cognition and conceptual-act theory of emotions and discuss their implications for the biological foundation of irrational beliefs, the identity position on psychological interactionism, and the centrality of irrational beliefs for disturbed emotions. Finally, we describe the embodied simulation concepts in relation to the cognitive model of emotional disturbance in REBT and conclude by pointing to general implications for the treatment.

Cognitive behaviour therapy (CBT) is an umbrella term used to name evidence-based therapies grouped around the idea that dysfunctional knowledge is the main determinant of psychological disorders (David & Szentagotai, 2006). Most forms of cognitive-oriented therapies from CBT are based on the mainstream social learning theories of cognition (knowledge and thinking) that state that our mental contents consist of information learned from our social environment, and psychological distortions occur due to faulty learning (Ellis, David, & Lynn, 2010; Neenan & Dryden, 2011). For instance, the theory of cognitive therapy (e.g., Beck, 1976) considers that, in genetically vulnerable individuals (Beck & Haigh, 2014), early dysfunctional experiences result in the acquisition of dysfunctional knowledge (negative schemas) that distorts the way we process our environment (cognitive biases or distorted thinking). Thus, distorted (biased) cognitions are processing deficiencies that occur due to dysfunctional knowledge, independently of other types of vulnerabilities for psychological disorders such as biological vulnerabilities, although dysfunctional genotypes have been recently recognized to play a role in early acquisition of dysfunctional knowledge. Furthermore, many theoretical developments in CBT consider that knowledge is generally represented as language-like, amodal (i.e., independent of the experience they reference) propositional symbols in a separate semantic system which interacts with affective and behavioural systems in producing emotions and behaviour (Barsalou, 2008). Yet other developments in CBT such as the retrieval competition account (e.g., Brewin, 2006) explicitly confine themselves from specifying how knowledge is represented. However, a computational and amodal view of thinking is dominant in CBT. It most likely occurred as a natural theoretical development, since CBT developed concomitantly with the cognitive revolution in psychology that powerfully promoted the computational model of knowledge and thinking (David, 2003; Gardner, 1985).

Recently a different idea about the construction of knowledge and thinking has become popular within developmental (Kontra, Goldin-Meadow, & Beilock, 2012), neuropsychological (Damasio, 1994; Edelman, 2004; Oberman & Ramachandran, 2007) and cognitive fields of human research (Barsalou, 1999, 2008; Clark, 2008; Shapiro, 2011): the idea that both thinking and knowledge are built on embodied simulations rather than amodal, language-like symbols. Accordingly, when we think (deliberately or automatically use knowledge to remember, imagine, linguistically describe, understand, perceive, decide and so on), we partially re-

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List of abbreviations

CBT	Cognitive Behaviour Therapy
ABC	the sequence of the cognitive model where A means activating events, B means beliefs, and C means consequences
REBT	Rational Emotive Behaviour Therapy
IBs	Irrational Beliefs
COMT	catechol-*O*-methyltransferase

use from memory, states of our bodies, especially states of our brain, that were active during the actual corresponding experiences we are thinking of (Barsalou, 1999; Gallese & Lakoff, 2005; Gallese, 2014; Vermeulen, Niedenthal, & Luminet, 2007). Thus, we represent the external or internal world in our minds as distributed patterns of sensorimotor and affective neural states captured in memory (i.e., embodied simulators) that were active during the interaction with the world (Barsalou, 1999, 2009; Gallese & Lakoff, 2005). When we think of apples (e.g., decide the propriety of apples is to be red or green fruits, consciously desire or retrieve memories about eating an apple, saying *I like apples* and so on) we partially re-enact states of our body during experiences with apples (simulate) adapted to the situation in which we think (i.e., simulations are situated). When we think of desires, emotions or emotional qualities we partially re-enact states of our bodies that were active during emotional and motivational experiences. We understand that it is awful to be left alone by partial re-enacting states of our bodies during awful experiences. We understand that rejection is unbearable by partial re-enacting states of our bodies during experiences of no tolerance. Thus, several fundamental properties of cognition emerge. Cognition is embodied (body-based), modal (part sensorimotor and affective experience), simulated (re-uses body states for representation) and situated (depends on context) (Wilson, 2002) and differences in cognition (e.g., cognitive distortions) result from differences in our simulated bodies, experiences or in the re-enactment process in a context.

Although increasingly popular, the idea is different than the amodal perspective of cognition which is the common sense approach of cognition in fundamental research and has largely penetrated the theories of cognition in CBT. The amodal perspective posits that we think and represent knowledge by using language-like symbols and not re-enactments of states occurring during corresponding experiences. Accordingly, our experiences and corresponding modal representations are transduced in our cognitive systems in a new format, in language-like symbols that reference them (Barsalou, 1999). Additionally, those symbols are stored and activated from a semantic memory system, independent of modal brain systems (e.g., Fodor, 1975) with a different format than experience-related states (e.g., perceptual symbols, Barsalou, 1999). As a consequence, the differences that occur in knowledge and thinking arise due to differences in processing (representation and manipulation of representations) of language-like symbols related to semantic memory and independent of our modal body.

However, CBT comprises many forms and theories of dysfunctional cognition among which significant differences exist (Kuehlwein & Rosen, 1993). Among the various types of CBT, Rational Emotive Behaviour Therapy (REBT), the oldest form of CBT, has many distinctive features that shape its original cognitive theory of disturbed emotions framework (e.g., Dryden, 2009). In this paper we argue that several distinctive features of REBT bring its theory of cognition and emotion closer to an embodied simulation approach rather than to an amodal perspective which is often encountered in other forms of CBT. Namely, the REBT theory, distinctively from other cognitive theories of vulnerability to emotional disorders, posits (but is not confined to) that (1) irrational beliefs (IBs), as dysfunctional appraisals considered core vulnerabilities for psychological disorders, are directly influenced by our biology and our genes, (2) irrational beliefs, as forms of "hot" cognition, are compulsory for other types of dysfunctional cognition to result in emotional disturbances, (3) human disturbance occurs when we rigidly transform our desires in needs and musts (i.e., demandingness) (4) thoughts, feelings and behaviours are overlapping processes not independent systems (the identity position on the psychological interactionism), and (5) the difference between disturbed and healthy negative emotions is a qualitative difference (e.g., David, 2014; Dryden, 2009; Ellis, 1962).

In this article, we describe basic properties of cognition based on an embodied simulation account of cognition with relevance for several distinctive features of REBT (Barrett, 2006; Barsalou, 1999; Damasio, 1994; Rosch, Thompson, & Varela, 1991). Although there is a wide variety of views about embodiment (Wilson, 2002), some of them even in contradiction with the concept of cognition (e.g., Chemero, 2009), we chose to select only those with special relevance to the abovementioned distinctive features of REBT theory.

Thus, we first present the embodied simulation property of cognition, focusing on central neural mechanisms, and consider the implications for the biological foundation of IBs in REBT. Secondly, we examine the modal simulation property of cognition in which we emphasize the specificity and differences in the re-enactment of sensorimotor and affective experiences in meaning construction. We herein point to the implications for the affirmation that IBs are core cognitive vulnerabilities involved in emotional disturbances (i.e., IBs are necessary as hot cognition for emotional responses). Thirdly, we describe the situated conceptualization as basic process by which cognition builds our conscious experiences and discuss the implications for the identity position of psychological interactionism (thinking-feeling-action identity) in REBT. Next, we outline both the developmental and cross-sectional components of IBs in the cognitive (i.e., ABC) model of REBT. Finally, we conclude by pointing to illustrative implications for REBT treatment. We do not offer here a comprehensive model of embodied vulnerability in REBT since we do not extensively discuss the embodied theories or review evidence for or against embodied concepts nor do we exhaust the implications of embodied cognition for REBT theory and treatment.

Yet given that there are many divergent theories of embodied cognition (Wilson, 2002), it is important to specify what the embodied simulation position presented here is not. It is not an anti-representational theory of cognition (e.g., Chemero, 2009). Instead, we adopt the grounded cognition perspective which proposes modal symbols such as perceptual and interoceptive symbols (i.e., Barsalou, 1999) to implement IBs. It is not focused on peripheral body. Instead we focus on neural embodied simulations as central components of IBs. It is not a focus on body movement and integrative body-mind healings. Further, we do not suggest that all forms of linguistic and cognitive processing are embodied in modal simulations, other types of representations (e.g., statistical representations, Andrews, Frank, & Vigliocco, 2014) or simulation grounding (e.g., environment, Barsalou, 2008) being important for cognition besides our body. However, we do suggest that emotional embodied simulations are essentially required for representing emotional meanings in the context of meaning-directed generation of emotional experiences (e.g., hot cognition including dysfunctional appraisals such as irrational beliefs), and that this is what enables cognition to manifest itself as vulnerability to emotional disorders.