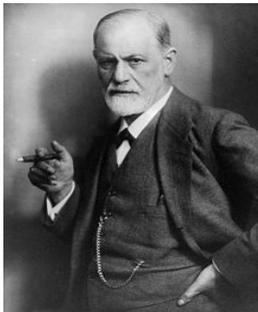


Mind &/v Logic

3. The cognitive unconscious

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To sum up: *exemption from mutual contradiction, primary process ..., timelessness, and replacement of external by psychical reality* – these are the characteristics which we may expect to find in processes belonging to the system *Ucs*.

Freud (1915)

The dynamic unconscious

The cognitive unconscious

- If one sides with a definition of knowledge as the establishment of successful relations with the environment (James, 1904), then empirical data in behavioural and (neuro)cognitive psychology suggests strongly that there is a qualitatively distinct kind of knowledge, acquired, stored, and recalled in a wholly unconscious way.
- The overall focus of research into unconscious knowledge is the “knowledgeable” behaviour of subjects in the absence of metaknowledge concerning their own epistemic states [.]
- [I]ndividuals can behave successfully by relying only on unconscious mental states, such as unconscious beliefs and intentions.

Augusto (2010)

3

The
somatic
marker
hypothesis



António Damásio

Background assumptions

In addition to an operative self and consciousness, the basis for neither of which I will discuss, the mechanisms I envision require four main assumptions:

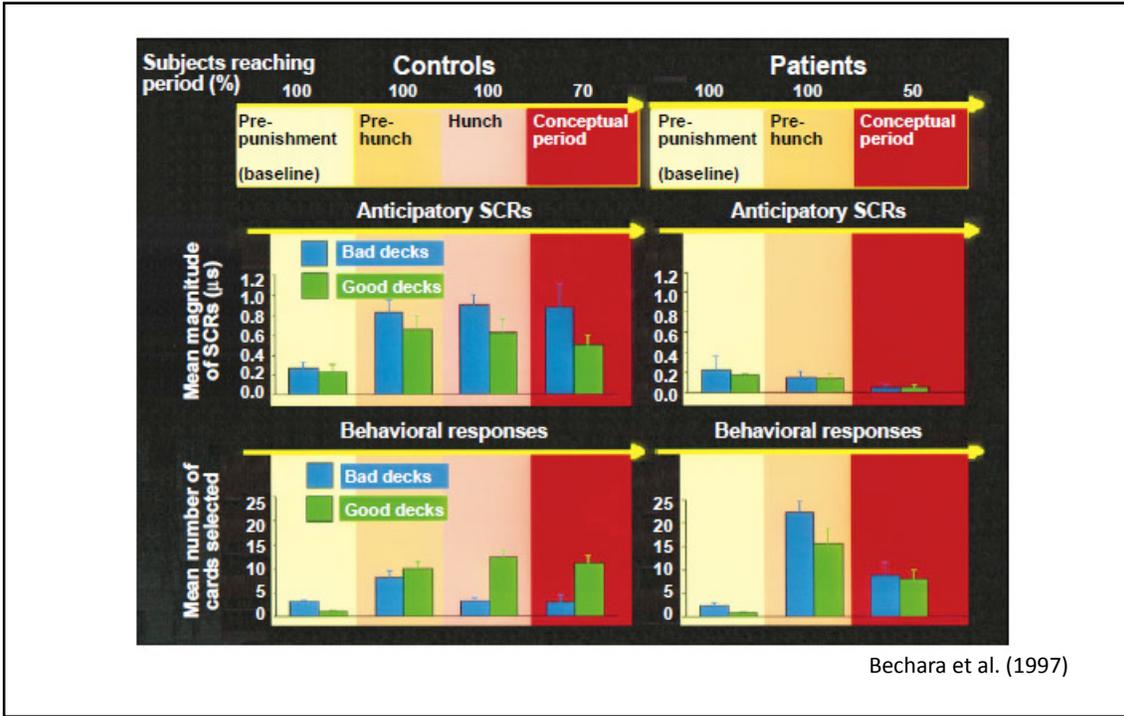
1. that human reasoning and decision making depend on many levels of neurobiological operation, some of which occur in mind (i.e. are conscious, overt cognitive), and some of which do not. Minded (conscious, overt cognitive) operations depend on sensory images which are based on the coordinated activity of early sensory cortices.
2. that all mind operations regardless of the content of images, depend on support processes such as attention and working memory.
3. that reasoning and decision making depend on the availability of knowledge about situations, actors, options for action and outcomes. Such knowledge is stored in 'dispositional' form throughout higher-order cortices and some subcortical nuclei. (By the term dispositional I mean coded, implicit and non-topographically organized; see Damasio 1989*a, b*, 1994; Damasio & Damasio 1994; for details on dispositional knowledge and convergence zone

framework.) Dispositional knowledge can be made explicit in (a) motor responses of varied types and complexity (some combinations of which can constitute emotions), and in (b) images. The result of all motor responses, including those that are not generated consciously (i.e. minded), can be represented in images and become minded.

4. that knowledge can be classified as follows:
 - A. innate and acquired knowledge concerning bioregulatory processes and body states and actions, including those which are made explicit as emotions.
 - B. knowledge about entities, facts (e.g. relations, rules), actions and action-complexes, and stories, which are usually made explicit as images.
 - C. knowledge about the linkages between B items and A items, as reflected in individual experience.
 - D. knowledge resulting from the categorizations of items in A, B and C.

Damásio (1996), p. 1414





Logic
 &
 decision
 making

tions. Our experiment indicates that in normal participants, the activation of covert biases preceded overt reasoning on the available facts. Subsequently, the covert biases may have assisted the reasoning process in cooperative manner, that is, biases would not decide per se, but rather facilitate the efficient processing of knowledge and logic necessary for conscious decisions (7). We suspect that the autonomic responses we detected are evidence for a complex process of nonconscious signaling, which reflects access to records of previous individual experience—specifically, of records shaped by reward, punishment, and the emotional state that attends them. In this light, damage to ventromedial cortices acts by precluding access to a particular kind of record of previous and related individual experience.

Bechara et al. (1997)

P	$\sim P$
1	0
0	1

Negation
(NOT)

P	Q	$P \& Q$	$P \vee Q$	$P \rightarrow Q$	$P \leftrightarrow Q$
1	1	1	1	1	1
1	0	0	1	0	0
0	1	0	1	1	0
0	0	0	0	1	1

Conjunction
(AND)

Disjunction
(OR)

Material
Conditional
(IF, THEN)

Material
Equivalence
(IF AND
ONLY IF)

Figure 1. Truth Tables for Classical Logic.

A logical model of decision making in the SMH?

- $X \rightarrow Y$
- $(P \vee Q) \rightarrow ?$
- $((A \& B) \vee (C \& D)) \rightarrow (A \vee B) ?$
for $v(A) = 1$, $v(B) = 1$, $v(C) = 0$, and $v(D) = 0$

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