Framing Mental Disorders

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This contribution aims to highlight the benefits of frame theory for classifying psychiatric disorders. Frames, conceived as recursive attribute-value structures (Barsalou, 1992), can be used both to represent our knowledge of psychiatric disorders and the way these disorders impair the normal functioning of the human cognitive system. Here I mainly focus on the first goal and only sketch an agenda to reach the second one.

Given the complexity of both the cognitive system and psychiatric syndromes, I shall here exemplify my approach by focusing on a key symptom of many sever psychiatric disorders such as schizophrenia and other psychotic disorders, namely monothematic delusions. Examples of delusions include patients reporting that someone else controls their actions (delusion of control), that a close relative has been replaced by an impostor (Capgras delusion) or even that they are dead (Cotard delusion). According to the DSM-IV (ASA, 2000), a delusion is "*a false belief based on incorrect inference about external reality that is firmly sustained despite what almost everyone else believes and despite what constitute incontrovertible and obvious proof or evidence to the contrary*". A critical analysis reveals that this definition is highly unsatisfactory from a theoretical point of view. The specificity of delusions lies rather in their abnormal asymmetrical inferential profile: delusions are beliefs that might have implications for the behavior and for the other beliefs of the subject but that are immune to revision in light of counter evidence.

Etiological accounts of delusions involve several levels of analysis. At the psychological level, delusions are only poorly explained. Psychodynamic accounts suggest that delusions occur in order to prevent self-deception. At the cognitive level, monothematic delusions occur, according to the two-factor account (Coltheart, Langdon and McKay, 2011), due to the conjunction of two factors. First, the delusional subject undergoes an abnormal experience due to a first factor (A-factor). A corresponding belief is formed either in order to express or to explain the specific content of this strange experience. The second factor (B-factor) consists in the inability of the subject to reject the pathological belief in light of counter-evidence. The two-factor account of delusions is supported by empirical evidence at the neurological level, since the B-factor seems to be highly correlated to right prefrontal abnormalities whereas the neural correlate of the A-factor might vary and depends on the content of the delusion in question. Figure 1 summarizes these elements in a multi-level frame representation of the concept 'Capgras delusion'.

The proposed functional definition of delusions focuses on the B-factor. However, paying attention also to the A-factor provides us with a natural way of individuating functional sub-types of delusions according to their causal antecedents. From a psychological point of view, pathological delusions might be described as mental properties that are immune to revision and that have a specific content, with the former element being the functional counterpart of the B-factor and the latter of the A-factor. For instance the Capgras delusions and the Cotard delusion are both underlain by the same B-factor, which prevents the rejection of the delusional beliefs by the subject, but they differ with regards to the A-factor. Whereas Capgras patients appears to have a au-

tonomus hyporeactivity to familiar faces, Cotard patients are characterized by a general lack of autonomous response (Langdon, McKay and Coltheart, 2008). Thus, both delusions are characterized, from a functional point of view, by their immunity to revision, while they differ, relatively to their content at the psychological level and to their etiology at the cognitive and the neurological levels. These further specifications distinguishing both delusions explain why they qualify respectively as Capgras and Cotard delusions. Against this background, it is possible to build functional sub-types of delusions as conjunctions of the functional role characterizing delusional beliefs and a further specification describing their etiology.

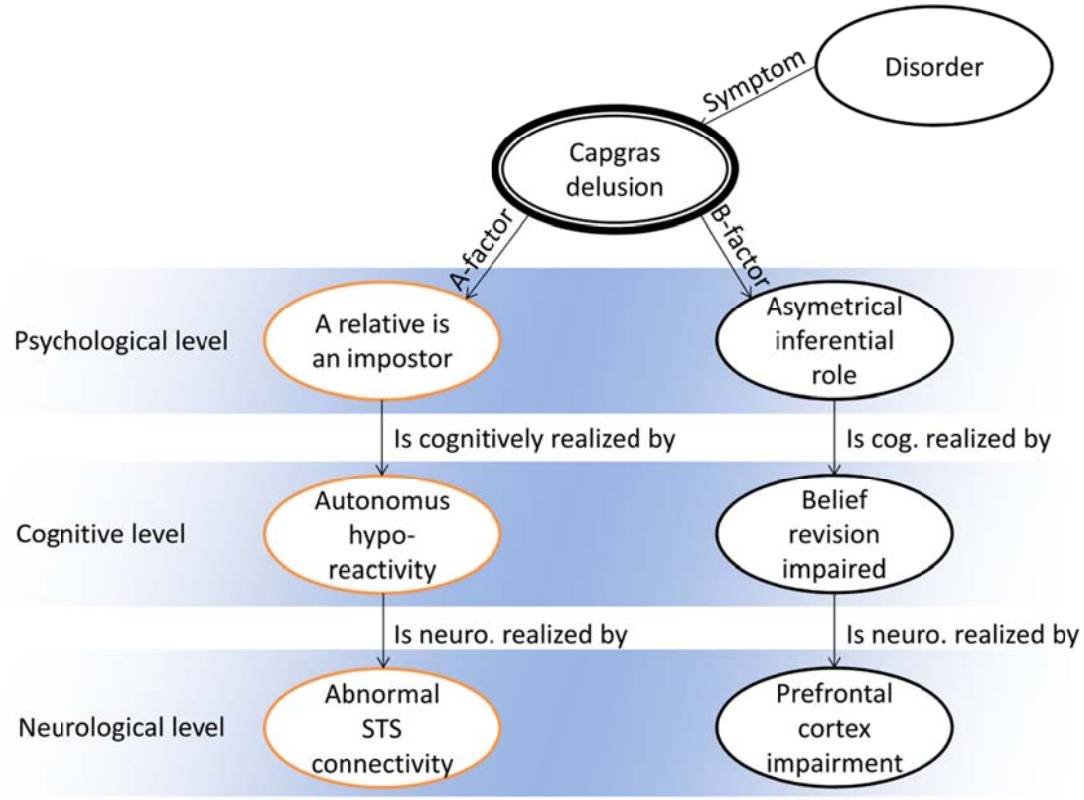

Figure 1. A multi-level frame representation of the Capgras delusion.

This classification of delusions might be represented in a generalized frame by substituting a list of possible values to the specific values of the left-sided attributes in figure 1, as show in figure 2. Whenever the central node receive a unique value specifying which particular sub-type of delusion (for instance delusion of control) is described by the frame, the left-sided nodes shall adopt unique values as well (for instance 'my arm was moved', 'impaired sensory-motor monitoring', and 'right angular girus impairment'), and vice-versa. Such dependencies between attributes values might be represented as attributes constraints in the frame. They would describe relations such as "if the value of the attribute 'A-factor' is 'autonomic hypo-reactivity', then the value of the 'symptom' attribute is 'Capgras delusion' and vice-versa". Thus, such a generalized frame allows for representing different sub-types of delusions in a coherent way. I shall defend this approach against various other ways of representing psychiatric disorders by means of frames.

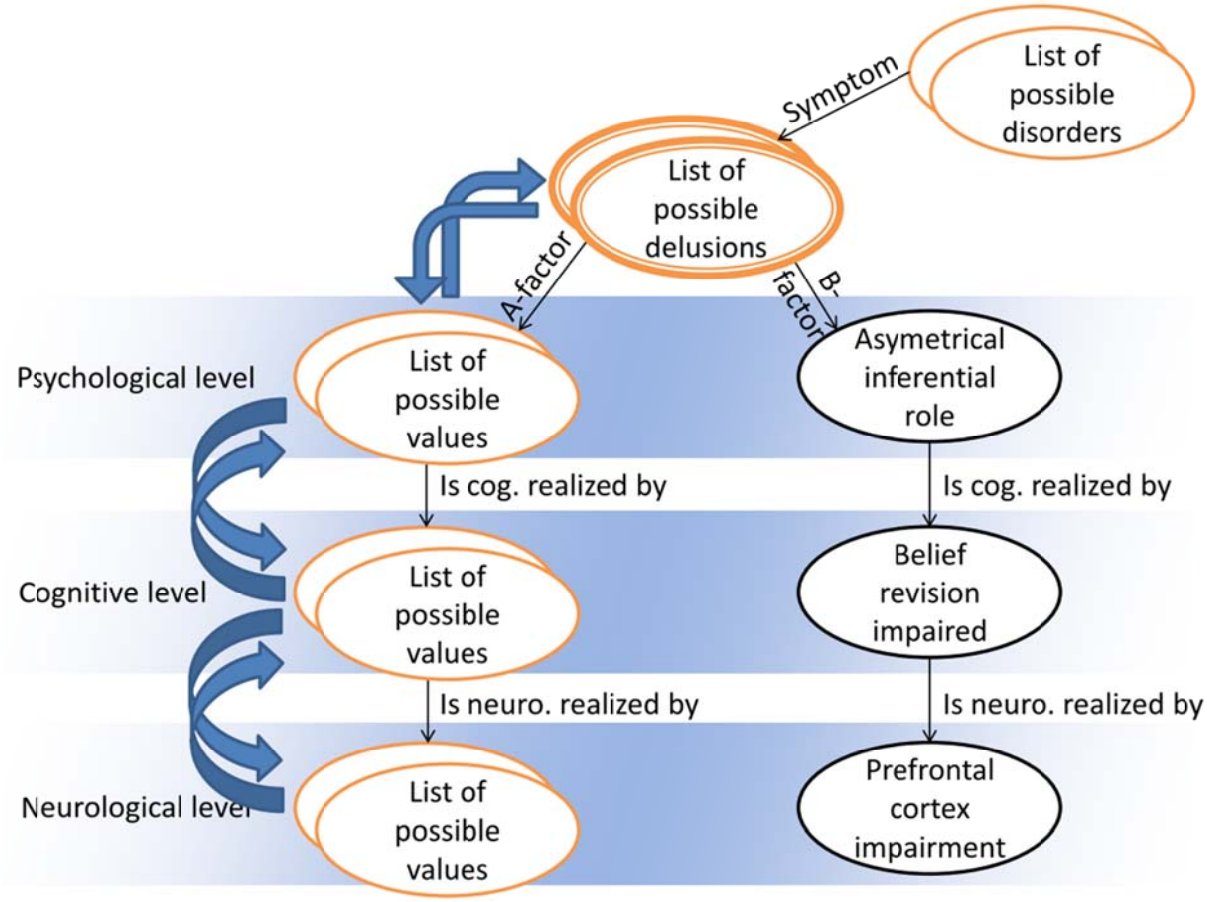

Figure 2. A multi-level frame representing delusions sub-types.

Finally, this application of frames might be extended in order to represent the way mental disorders affect individuals. This should be done by merging a) the frames describing a patient at several levels and b) the multi-level frame describing a given psychiatric disorder. Attribute constraints may then be used in order to grasp the way the pathology affects the values of attributes normal individuals possess.

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