

Editorial

Changing Beliefs: A Need to Restore Coherence

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What are Beliefs?

Beliefs can be seen as axioms helping us to decide how to interact with the world [1]. One could argue that one of their functions is to eliminate the need to actively and consciously evaluate other possibilities about a given situation: by believing that stealing is bad, I can avoid having to decide whether I will pay or steal my groceries. Beliefs can thus act as a cognitive economical tool, they are practical hypotheses about the world which we do not need to doubt. They support the interaction with the environment. Even more importantly perhaps, they are also a mean to maintain coherence and continuity in our predictive knowledge of the world and of ourselves. Indeed, to interact with the world, we heavily rely on a large set of predictive beliefs such as “when I decide to take the pen, my arm will move to the pen, I will feel and see my arm moving to the pen”. Notably, the loss of this particular belief, usually referred to as agency, is known to induce serious crises in psychotic patients. In that sense beliefs assist our expectations about the feedback we receive from our interactions with the world.

We will focus on 3 functional attributes of different beliefs. First, their capacity to filter information and simplify decision making. For instance, the belief that “society’s rules are good and must be followed” (belief A) easily provides clear contrast between two main categories of actions: those that are supported by society and those that are not. In contrast, holding the belief that “society’s rules can sometimes be wrong” (belief B) leads to more finely grained opinion of what is right or wrong, thus leading to more complex decision making. Secondly comes their cognitive cost. Indeed, in our example above, belief B is more costly in daily decision making in terms of resources than is belief A regarding time, cognitive efforts, necessary knowledge. Thirdly, beliefs can also be considered in their adaptability. This represents how much a belief is adapted only to a specific environment or if it allows to easily rely on new information and thus to adapt to changes in the subject or the environment. Continuing with our first example, for an individual living in a society that becomes heavily corrupted, holding belief B will permit an easier adaptation than belief A.

Losing Coherence: Consequences of a Maladaptive Belief

As mentioned above, a very important attribute of beliefs is to maintain coherence between our predictions and the feedback we

receive from our decisions. However, the environment, or ourselves, can change and in turn modify the feedback we get from specific actions. When this happens, the coherence and predictive capacities of our beliefs can be threatened. A common example is the loss of a family member which can force us to re-evaluate the belief that our parents will always be part of the world we live in. If we continue to act upon obsolete predictions, such as “if I feel sad, I can call my parents to comfort me”, we will no longer receive the expected feedback. Interestingly, other cases like phantom limbs pains show that such mechanisms exist at a physiological level as well. Such pains have been shown to appear in the absence of adequate (or relevant or coherent) feedback from an amputated missing limb, subsequent to the intention of action, supposedly due to a loss of coherence between the prediction and the (lack of) feedback received [2]. A subjective loss of control emerging from these systematically wrong predictions then develops as an intractable pain. In accord with this interpretation, experiments [3] have shown that phantom limbs pains can be lowered, at least temporarily, when the subject is given access to a visual feedback simulating her or his phantom limb movements. This suggests that reestablishing coherence, even from only one of the usual feedback source, can provide relief.

Crises: A Struggle to Repair Coherence

Certain life events can lead to dramatic changes with which it can be difficult or impossible to cope while relying on beliefs that are no longer adapted for the new situation. The loss of a limb, in an accident for instance, will most probably lead to the loss of coherence of many old beliefs of different levels. Moreover, the subject will not only experience incoherence in proprioceptive predictions, but also in predictions about social interactions (reaction of others to his or her new image) or in all the predictions that were systematically confirmed before the accident. More generally, depending on the circumstances, a conviction such as “Since I am a good person, nothing bad will happen to me” could also lose its predictive value. Such massive loss of coherence is very likely to lead to a deep crisis. The perseverance in now obsolete belief, will bring systematic errors in predictions. The subsequent incapacity to adequate decisions, whether realistic or symbolic, may lead to grave discomfort or even pain. At this point, if nothing changes, the beliefs can be considered as pathological considering their harmful consequences on the person.

Crises as such are crucial because they force the individual to adapt to these dramatic changes. Coherence must be re-established through the adoption of new beliefs, more adequate in this new configuration. First psychotic episodes are a powerful example of crisis in which the person will most likely develop very unconventional beliefs while struggling to maintain coherence through the internal changes he or she is experiencing. While the beliefs found in the patients will most likely be considered as delirious from a healthy person’s perspective, it could be argued that they are extreme because they aim at restoring coherence in response to extreme changes. For instance a patient could be lead to believe that a supernatural force moves her or his arm

in order to keep coherence with the severe perturbation of agency [4].

Emergence and Adoption of a New Belief

When trying to establish a new coherence during a crisis, we will have to adapt or change certain beliefs now rendered obsolete by the internal or external changes. It is clearly unlikely that we will actively and consciously ponder which other belief will best suit our new situation. Hence this begs the question of how beliefs are selected. Without pretending to cover all the possible ways in which a belief can emerge, we will overview two specific concepts that may intervene in this selection process.

First, even if the selection process happens unconsciously, the belief must simply be available to one's explicit knowledge. Either through external supports (other people, books or even internet) or based on prior knowledge. While certain new beliefs may be discovered and adopted during the crisis, it is also probable that other beliefs were acquired by sheer exposition (without being adopted until the crisis). Indeed, recent experimental studies [5,6] showed that beliefs can be altered on the short term by simply having subjects read texts promoting or refuting a certain belief (free will in this particular case). It is thus not absurd to think that long-term exposition (e.g. from our cultural environment) to certain beliefs can impregnate memory. Such "latent beliefs" could then emerge at the time of a crisis as a potential solution even though they were not part of the person's worldview before the crisis (consciously at least).

Secondly, we also want to consider the interaction between individual resources and the idea that different beliefs differ in cost/benefits ratio. The notion of resources refers here to the time requirement, the cognitive abilities, the social support and the

knowledge at disposal. Indeed, going through a crisis is very costly in terms of those personal resources and often leads to exhaustion and severe fatigue. This lack of resources could have a profound impact on which new belief emerges to reestablish coherence. A person in a very fragile state, lacking cognitive resources, will be more likely to prioritize beliefs allowing strong reduction of information processing. Consequently, someone suffering from a lack of resources would be less likely to turn to a complex and costly belief that would allow for more nuance and adaptability to changes. In short, we adopt the beliefs that we can afford at the time of the crisis. In that sense, access to psychotherapy and social support will play a tremendous role by giving access to extended resources and hopefully in turn help the person going through the crisis to lean toward more adaptive beliefs on the long term.

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