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Beliefs in Pain and Suffering: A Cognitive Neuroscience Approach

RÜDIGER J. SEITZ
Heinrich-Heine-University Düsseldorf
seitz@neurologie.uni-duesseldorf.de
ORCID: 0000-0002-1168-9187

Abstract. In this article recent evidence from cognitive neuroscience is presented showing that believing is a central brain function. It integrates the perception of information from the environment with personal perspective taking ("what does it mean to me?") as the basis for predictive coding of action. Observing that another person becomes injured can make one believe that the pain in the injured person is similar to pain that oneself has experienced previously. This first-person perspective has been called empathy and includes primal beliefs about potentially pain eliciting objects and painful events in the sense of "what does it mean to you?". Furthermore, observing other people to suffer involves the conceptual belief that their condition is aversive and burdensome. Believing in love and peace involves the perspective of "what does it mean to us?". It is argued that contradictory events may cause the sensation of pain and suffering in the afflicted individuals resulting in mutual distrust and eventually disruption of social bonds. In conclusion, beliefs play an important, though long underestimated role in cognitive neuroscience of pain and suffering and more generally for the cultural notions of deities and evil.

Keywords: believing, empathy, love, pain, peace, suffering, trust.

Introduction

Cognitive neuroscience is an interdisciplinary research field aiming at understanding the biological, e.g. neurophysiological, basis of theoretical concepts such as perception, action, memory, reasoning, cognition and emotion. Recently, the term "credition" has been coined to acknowledge the processes of believing as a further entity (Angel 2013). Credition denotes the nature of beliefs and believing at the epistemological, behavioural and neural levels of exploration (Seitz and Paloutzian 2023). At the neural level four sequential processes involved in believing have been identified:

- generation of representations in the brain that integrate information from the environment with an individual's value,
- predictive coding of action as the basis for intuitive and spontaneous behaviour,
- transition of what an individual believes into his/her conscious awareness as prerequisite for verbal communication, and
- inference of beliefs from observed behaviour.

The information from the environment may concern objects and events that constitute the category of primal beliefs or may concern narratives that constitute the category of conceptual beliefs (Seitz and Angel 2020). Importantly, only a small proportion of information enters conscious awareness in the believing individual and can be communicated explicitly as verbal statements or propositions, be accessible for reasoning and, thus, be employed for selecting action routines in a controlled fashion (Seitz et al. 2022). The function of beliefs is to stabilize an individual's behaviour until new information becomes more relevant causing a behavioural modification. It should be pointed out that beliefs are not accessible directly but can only be inferred from a person's behaviour (Seitz and Paloutzian 2023). This cognitive neuroscience account is consistent with the notion of internal coherence of beliefs and the hypothesized role of affect in beliefs, but deviates from the propositional doctrine of beliefs (Griffiths 2014).

An important area of perception is the individual's experience of pain. Because, the bodily sensation of pain is inherent in all mammals including

humans, everybody knows that pain can be induced by an injury, is related to the extent of the physical damage and usually ceases as time goes by. If the injury is severe, it may cause the burden for the affected subject to be incapacitated by the injury and, thus, to be a victim of ongoing physical suffering. Likewise a disease may cause physical pain and, possibly, long-lasting suffering due to secondary impairment of being able to move, talk, and care for oneself. Moreover, it has been known since Antiquity that pain and suffering may also be caused by cruel behaviour of people that does not harm physically but in the victims may result in feelings of being assaulted, inferiority, injustice and even of denial of being a human creature. Although virtually everybody has experienced such situations to a greater or lesser degree in one's own life, people learn to cope with such adverse experience because of its mostly transient character (Cyrulnik 2005). But there are instances of ongoing suffering that eventually may turn into psychic diseases characterized by flash-back experiences as found in post-traumatic distress syndrome (Sartory et al. 2013).

Furthermore, in cognitive neuroscience it is well-known that we can put ourselves into the shoes of other people and experience implicitly their pain and suffering. This capability has been called empathy and can be found also in non-human primates and mammals (Preston and de Waal 2002). Empathy has been ascribed to the so-called mirror neurons in the frontal cortex that have been shown to become activated upon execution and also observation of movements (Bird and Viding 2014). More recently, the mirror neuron system was found in a meta-analysis of 52 studies to be related also to the emotional and cognitive aspects of empathy rather than solely to reflect motor activity (Bekkali et al. 2021). This substantiates the notion that people who empathize with other people share the same feelings as the person they observe (Decety et al. 2015). Specifically, they seem to believe to have the same pain or to suffer similarly as the person they observe. Notably, evidence has been forwarded suggesting that prosocial behaviour towards suffering people is altruistic in the first-person perspective of the helping person but simultaneously may be egoistic from the third-person perspective of the people not involved directly (Miyazono and Inarimori 2021). As described elsewhere (Seitz and

Angel 2020), we can differentiate intuitive primal beliefs about potentially dangerous objects and related painful events from conceptual beliefs that reflect the putative causes, mechanisms and conditions of suffering.

This article provides a cognitive neuroscience account of the relation of beliefs and believing to pain and suffering. Here, psychological processes of pain perception, empathy, prosocial in-group behaviour and their relations to the processes of believing will be described. Furthermore, a perspective on how in-group behaviour can be promoted by supraordinate concepts but be disrupted by discrepancies of underlying primal and conceptual beliefs will be elaborated.

1. Beliefs are the results of brain function

The central notion of this section is that believing is based on neural processes that integrate probabilistic perception of environmental information with individual benefit/cost or effort/reward valuations allowing for predictive coding of purposeful actions and interactions with others (Seitz et al. 2017, 2022). Thereby, beliefs are fundamental for control of human behaviour including decision making. It ought to be emphasized that the external information is mapped via neural pathways into representations in the sensory cortices such that the relations to sensory modality, topographic location, and intensity are maintained (Toga and Mazziotta 2000). In contrast, the subjective valuation of this information calls upon information from the inner state of the individuals that is related to the individual's developmental maturity, aesthetic judgements and momentary affective states (Seitz et al. 2018). Based on this composite information appropriate subsequent action routines are selected by predictive coding. Notably, these actions are formed rapidly in an intuitive and spontaneous fashion by pre-linguistic, pre-attentive processes allowing for fast and intuitive reactions. Intuitive experience of confidence and perceptual uncertainties were found to play leading roles in learning and modulation of beliefs, respectively (Fritsch et al. 2021; Ptasczynski et al. 2022). This comprehensive model of control of behaviour extends the executive model of action control that was proposed earlier by Jeannerod (1995).

Information processing is mediated in parallel cortico-subcortical loops in accordance with the free-energy principle as proposed by Friston et al. (2017). Notably, subjective value of potential rewards is represented explicitly in a medial prefrontal – medial parietal – ventral striatum circuitry in the human brain (Kable and Glimcher 2007). More recently, it was found that circuits of the basolateral amygdala underlying emotional valence processing and anxiety-like behaviour are influenced by norepinephrine input from the locus coeruleus in the lower brainstem (Daviu et al. 2019). Thereby, a putative pathway became apparent that can explain the impact of anxiety on reward encoding. In fact, individual factors such as long-term personality traits or short-term mood states are likely to modulate the individual's benefit/cost or effort/reward valuations.

Beliefs have been categorized according to the external information to that they pertain (Seitz and Angel 2020). Primal beliefs have been described to reflect an individual's experience of the environment with empirical beliefs about objects and relational beliefs about events. In contrast, conceptual beliefs concern culturally important narratives about various thematic subtypes including autobiographical accounts of the self, political and related issues, and matters pertaining to religion or spirituality (Seitz et al. 2023a). Beliefs can be memorized and recalled later without need to pay attention to their contents. Thus, they are "learned by heart" (Seitz et al. 2023b). However, the content of beliefs may be transferred from the level of unattended automatic processing to conscious experience which was shown to rely on the inferior frontal cortex (Weilnhammer et al. 2021). This is the prerequisite for semantic coding of beliefs as propositions. In fact, expressing beliefs as narratives makes it possible to reflect upon them and to convey their contents to other people during conversations or via written texts (Seitz et al. 2022). Because people learn from infancy onwards to rely on narratives, humans are inclined to develop views, hopes, and beliefs about personal and societal affairs that transcend their present circumstances. On this basis humans also tend to make attributions about fictional, e.g. supernatural or proposed agents and deities which can be observed in virtually all faith groups around the world (Griffiths 2014; Plante et al. 2023).

Typically beliefs are expressed explicitly as verbal statements in a first-person perspective and may include immediate and distant goals to attain, ideas about benefits or costs, or ideas how to achieve a certain state in the future (Seitz et al. 2022, 2023a). They are maintained over extended periods of time, but nevertheless may change based upon new personal insights or scientific findings. In fact, assertions of future gains and rewards providing incentives to follow social norms and rules are likely to fade when evidence suggests that they no longer apply. This may be fostered when people intend to deceive other people and provide statements that deviate from what they really believe. Thus, to infer what a person believes cannot be grounded on what a person says. Rather, people's behaviour is a reliable source for inferring from an external, third-person perspective what a person believes (Seitz et al. 2017, 2018).

2. Pain as a subjective sensation

Pain is a bodily sensation of high emotional impact that is exclusively internal to an individual. It signifies that the integrity of an individual's body is endangered or threatened. The experience of pain has been described in detail concerning the neuroanatomical pathways involved and the overarching neurophysiological system (Wiech et al. 2008). Pain can be defined as an event with a beginning and an end as conceptualized by Zacks and Tversky (2001). The beginning is the point in time when the individual was injured, the end has come when the pain begins to lose intensity or vanishes altogether. Pain may be caused by a physical object such as a sharp knife or heat like fire that damages the outer surface of a body. The intensity and character of the pain reflect the extent of the physical damage or the severity of the injury. Furthermore, pain induces a virtually instantaneous rapid withdrawal of the affected limb and often also makes the subject flee from the noxious situation. Thus, the potentially pain inducing objects and situations are valuated in an anthropocentric manner with respect to "what does it mean to me?" (Seitz et al. 2009). Furthermore, the person will remember the experience of pain including the physical object that caused the pain as well as the location,

character and intensity of the pain (Tiemann et al. 2018). This memory may be so vivid that, for example, people who lost a limb may develop a phantom pain disorder by which they continue to experience the pain caused by the initial injury of the affected limb (Flor et al. 2006). Likewise, they may develop a posttraumatic distress disorder in which they experience the traumatic event including the perceived pain whenever they are exposed to the objects or circumstances that induced the trauma (Sartory et al. 2013). Moreover, pain may be induced also by internal abnormalities of the body such as disruption of the bowel movements, obstruction of arterial blood supply, and inflammation. Nevertheless, pain may be experienced with different intensity among different individuals probably related by the complex neural circuitry within the human brain related to pain perception (Wu and Han 2019).

The explicit memory recall of previously experienced pain opens means to communicate the location, extent and severity of pain to other people. Also, it thereby becomes possible to estimate pain in other people. For example, in medical history taking the reported location of pain, its sudden onset or slowly increasing intensity, its low or high intensity and its sharp, burning or dull character allow to classify the pain for diagnostic purposes. Thus, the subjective experience of pain can be coded in narrative terms in a first-person perspective and be communicated as a pain concept.

3. Suffering as a conceptual belief

Suffering denotes the verbal description of a physical and/or psychic condition that has raised pain in a group of people. Thus, suffering represents a conceptual belief inferred by a non-involved observer concerning an objectively adverse state present in other people. Such adverse states may include pain resulting from physical violence and torture as well as from psychic threat of injury or even death that may be so grave that a bystanding observer may get empathically touched. Accordingly, the term suffering differs from one's own subjective pain sensation by its typically neutral third-person perspective.

4. Empathy as a believing process

When people observe other people to be injured and to have pain, they may be attracted by such conditions. In fact, it is not unusual that people are curious to see the circumstances that may provide a clue for what has happened as well as the actual conditions of the affected individuals. Thus, they perceive the persons in pain as objects as if the actual victims were bare of any bodily or affective sensations (Fiske et al. 2007). However, as soon as people put themselves into the position to estimate what they themselves would experience in such a situation, they take on a first-person perspective and would ask "what does it mean to you?". Thus, they experience the pain they are observing in the other persons as if they were injured themselves. In essence, the other is taken as an individual similarly to oneself. Moreover, humans have an innate and highly developed capability of inferring implicitly the meaning of facial expressions, gestures and whole body movements observed in other people (Meltzoff and Decety 2003; Conty et al. 2012; Lindenberg et al. 2012). These processes have been ascribed to empathy and theory of mind. Theory of mind implies the understanding the other person's point of view and intentions (Gallagher et al. 2000; Frith & Frith 2003). Empathy implies the intuitive understanding of the other's emotion (Ruby & Decety 2001; Shamay-Tsoory et al. 2009; Singer et al. 2004). Notably, empathy has a phylogenetic precursor as it can be observed in non-human primates and other mammals (Preston and de Waal 2002). Empathy has been shown to be fundamental for in-group cohesion, social cooperation and prosocial behaviour on a universal scale (Fiske et al. 2007). Consequently, people in close relationships with each others are likely to be connected by similar beliefs and values, which allows them to maintain common meaning systems (Anderson & Przybylinski 2018). Such commonalities seem to involve predictions about the other person's most likely behaviour, via the so-called mirror neuron system (Bird and Viding 2014). Importantly, there is empirical evidence from functional magnetic resonance imaging and electroencephalographic recordings that the first-person personal perspective about the conditions observed in other people is critically related to involvement of the so-

called pre-supplementary motor area (pre-SMA; Seitz et al. 2009; Potthoff and Seitz 2015). Furthermore, structural and functional neuroanatomical studies have revealed that the pre-SMA can afford such a multimodal integration owing to its widespread connectivity with frontal and parietal cortical areas as well as subcortical structures (Ruan et al. 2018).

Via the mirror neuron system empathy also allows to get insight into other people's feelings of pain caused by noxious events. For example, pictures showing a person cutting his fingers while attempting to cut a fruit are suited to induce an immediate and strong feeling of pain in the observer. This was accompanied by activation of brain areas that accommodate the human pain and mirror neuron system (Jackson et al. 2005). Consequently, empathy can make people believe intuitively to experience pain in themselves similarly to what they actually observe happening in other people. Such a belief probably evokes prior memories of personally experienced pain in similar situations. Note that this is a primal belief that has been informed by prior experience but does not involve a narrative-based concept (Seitz et al. 2023a).

5. Pain and suffering resulting from disturbances of love and peace

There is a long theological and philosophical tradition of elaborating the notions of love and peace. To review this complex history in detail will exceed the limits of this article. However, most people will agree that love and peace may be understood as supraordinate concepts or ideal states with the anthropocentric implication of "what does it mean to us?". While love concerns the social interaction of individual subjects, peace concerns the social life in tribes and societies. Since ever love and peace have been communicated as verbal statements, e.g. narratives. For example, in the Christian tradition love between humans was defined as (Colossian 3:14–15): *And more than all, have love; the only way in which you may be completely joined together.* Furthermore, peace concerning people and, thus, social life was described as (Philippians 4, 7) *And the peace of God, which is deeper than all knowledge, will keep your hearts and minds.* Ac-

cordingly, one may hypothesize that love and peace may be considered as supraordinate, trinitary-like concepts that are characterized by a coherence of primal and conceptual beliefs (Seitz and Angel 2020). Specifically, the physical appearance of the persons in love can be expected to correspond to or at least do not contradict their aesthetic judgements. This will lead to their desire (Ancient Greek: Eros). Also, the way the persons interact with each other will correspond to what they would predict intuitively. This will involve reciprocity (Ancient Greek: Philia). Moreover, the individuals can be expected to agree about their conceptual beliefs of living in trustworthy cooperation. Broadly speaking this pertains to charity (Ancient Greek: agape). Similarly, concerning peace, there is mutual respect concerning the people's living circumstances including the items of their property. The people's personal interactions can be expected to be guided by mutual respect and social cooperation. Above that, the people will concur with the norms that regulate their social behaviour, roles and relations.

Furthermore, it can be hypothesized that for people who believe that love and peace are ideal states or supraordinate concepts any possible disturbances or disruptions of these conditions are likely to cause severe pain and suffering as summarized in Table 1. For example, social behaviour that appears counterintuitive to the person who loves another person for his or her beauty is likely to result in jealousy (discrepancy of empirical and relational beliefs). Further, when the social behaviour of one partner deviates from the promised mutual love, disappointment will occur that can be explained by a discrepancy of relational and conceptual beliefs. With respect to peace offensive behaviour ignoring the boundaries of another group is likely to result in hostility (discrepancy of empirical and relational beliefs). Furthermore, ignorance of social norms and regulations will insult the people involved (discrepancy of relational and conceptual beliefs). It becomes clear from these examples that behaviour that contradicts predictions based on love or peace is the key factor for mutual distrust among the people involved. Note, that also deceptive statements of the involved people that contradict predictions of love and peace can be disruptive.

Table 1. Pain and Suffering Resulting from Discrepancies of Belief Predicted Behaviour

Ideal State	**Love**		**Peace**	
Discrepancy of belief-related predictions	empirical/ relational beliefs	relational/ conceptual beliefs	empirical/ relational beliefs	relational/ conceptual beliefs
Resulting State	jealousy	disappointment	hostility	insult

Importantly, the considerations proposed here have an immediate impact on the notion of pain and suffering (Table 1). In fact, these examples show that discrepancies of the different belief categories affect the psychic conditions of the persons involved. Specifically they may experience the pain and suffering of jealousy and disappointment when their personal relations are challenged. In consequence, such conditions go ahead with distrust towards the counterpart which causes pain and suffering. Similarly, when peace has been broken, people may not only experience pain and suffering due to the threat of potential violence and loss of personal safety and property, but rather hostility is likely to evolve among the people involved. Also, they may be insulted by the other people's behaviour. Ultimately, they may even experience physical pain due to personal injury and even assaults. These scenarios seem to accord with a recent hypothesis by Dalege and van der Does (2022) that discrepancies of the different belief categories will lead to a change of behaviour.

6. Discussion

Pain is an aversive sensation with a first-person perspective typically caused by a physical injury of an individual's body (Wiech et al. 2008). Moreover, the feeling of pain may be re-experienced when an individual observes that another person is injured in a similar manner. This phenomenon reflects the fact that humans tend to trust their perceptions (Brashier et al. 2020). It has been called empathy reflecting the belief that the injured person suffers pain in a similar manner as the observing per-

son has experienced it previously (Bird and Viding 2014). This intuition involves that the empathizing individual considers the injured person as a subject like himself and, thus, is aware what the injury means for the affected individual. From a meta-analytic perspective this intuition can be categorized as a relational belief (Seitz and Angel 2020). Believing that somebody else suffers pain can evoke prosocial behaviour towards the victim that is supposed to imitate mother-child interactions and parental care (Decety et al. 2015). Similarly, it was hypothesized in this article that experiencing disruptions of love or peace cause severe pain in the involved persons, because the hitherto held supraordinate concepts of love and peace ("what does it mean to us?") may be replaced by jealousy, personal disappointment and ultimately by the loss of social norms. Consequently, people will suffer starting to believe that they fare better when they distrust the other person(s). Likewise, the imbalance of perceived effort in dealing with daily activities over perceived reward in terms of societal recognition has been described to be related to the feeling of being left behind as well as an inclination to populism (Steiner et al. 2023). Conversely, it should be pointed out that conceptual beliefs may help people to cope with pain, e.g. during torture, and with suffering, e.g. due to injury or illness.

Such experiential processes have to be taken separate from active inference concerning the putative reasons and intentions of other people's behaviour (Seitz 2023). Moreover, it was outlined that beliefs about the potential causes and consequences of physical and imagined trauma are linked intimately with the third-person perspective of pain and suffering. In contrast to the former psychological processes that result in primal beliefs about a person's experience, the latter result in conceptual beliefs that typically concern social life affairs such as autobiographic, political or religious beliefs, respectively (Seitz et al. 2023a). Such concepts play important roles for in-group and across group behaviour, and transcendent notions or belief systems about God and evil held in societies (Griffiths 2014; Angel 2024).

An essential aspect of the cognitive neuroscience approach is that humans are not neutral concerning information in their environment but

valuate it in an anthropocentric manner with respect to their own personal perspective and imagined self-involvement (Seitz et al. 2009). Accordingly, humans are inclined to believe in personal emotionally loaded meanings of concepts of hope as well as love and peace. This concurs with the notion that faith is not something extraordinary but something that belongs to the normal way of seeing the world (Oviedo 2022). In addition, when being brought up humans are taught narratives about autobiographic data that lead to social identity and belonging to a social group. The smallest in-group is the family with their accepted rules and norms and behavioural routines of mutual trust. Social identity with one group's members fosters in-group favouritism and out-group prejudice (Fiske et al. 2007). Therefore, for cooperation among different groups it is mandatory to accept that the members of the other group are similar and equivalent to oneself and to engage in reconciliatory behaviours, because this has been found to promote social cooperation and peaceful coexistence (Paloutzian et al. 2021). Ultimately, this will afford survival of individuals and their off-springs, even if rivalry pre-existed among the different groups.

On the cultural level there are long held conceptual beliefs about the origin of the world, of humans and the presence and future that typically are treated under the umbrella term religion (Angel 2020). Today such beliefs have been proposed to have a biological basis similarly to secular beliefs. Accordingly, they have been linked to cerebral operations that take place in the individual human mind/brain as follows (Ernandes 2018):

- inductive capacity to abstract general rules from single observations,
- necessity of finding cause-effect relations among observed phenomena,
- inferring the presence of some living agents causing observed phenomena,
- capacity to project one's own thoughts and emotions onto others,
- accepting dominant and subordinate roles, including reward and punishment, in a hierarchical manner.

In addition, conceptual beliefs about religion may include the notion of deities and the so-called transcendent unseen (Plante et al. 2023). They

have been found not to be specific but to show similarities to beliefs about meaning, hope and overarching values (Oviedo and Szocik 2020). It is intriguing that similarly to concepts about religions and religiousness, also concepts about political issues and public affairs may include the notion of hope for a desirable future. For example, it is well known that Marxism and Leninism used to proclaim a future with a classless human society free of suppression and discrimination, rendering private property obsolete. Countries that even today follow such ideologies, however, can be seen to do so only by restraining political discussions and suppressing opposing worldviews. Such actions can be seen to result in general distrust as well as pain and suffering in the opposing individuals.

It ought to be emphasized that people who read verbal statements or engage in communication with other people can reflect on the conveyed content. Moreover, people may be touched emotionally by what they read or hear and feel positive about it, remain neutral, or may find it annoying or offensive. Likewise, by-standers may evaluate someone's stated belief and behaviour and conclude that the person acted in a proper way or failed to comply with the purported ethical convictions. According to recent empirical observations, people's spontaneous behaviour is biased by prior beliefs (Oeberst and Imhoff 2023). Nevertheless, humans can modulate their behaviour if they are aware of their options and, thus, are not necessarily slaves of their emotions and suffering. The capability to reflect on narratives and other people's verbal statements and behaviour pertains to the notion of free will which is a topic in its own right beyond the limits of this article. Notably, other people's behaviour may deviate substantially from one's own view. For example, some people appear to behave altruistically in the third-person perspective of a neural observer, while from the first-person perspective of the acting subjects they feel to be guided by a future reward in which they believe. In the end, how people think and talk about their past reflects their actual feelings and emotions (Cyrulnik 2005).

Finally, when people in Western societies communicate with other people about what they believe, they tend to express themselves in a neutral manner and use nouns such as knowledge, mind, culture, economy,

God, etc. This is analogous to how they use nouns for objects such as tree, table, and book. Thus, people would talk, for example, about belief, perception or valuation rather than the verb forms such as believing, perceiving or valuating that denote the neuropsychic processes. Nevertheless, humans have a high proficiency of expressing themselves spontaneously in an intuitively differentiated fashion. However, when they engage themselves in reasoning consciously about what they are going to say, they are faced with the need to define the nouns they use, because only this can guarantee that different persons understand each other. Note, that even the labelling of perceived information as for instance of emotional face expressions has been found to be dependent on the cultural context (Gendron et al. 2014). Another impediment is that in such communications the probability of errors typically increases over time the longer the time interval is between encoding and retrieval of the narrated information from memory (Seitz et al. 2023b). These factors may explain why the interpersonal exchange of conceptual beliefs is usually more difficult than the highly routinized verbal exchange about objects or events. Importantly, when people say: "I know" or "I know that …", this does not relate to abstract knowledge, but rather reflects a person's momentary subjective feeling of certainty of the matter in question. For comparison, the ten Christian Commandments are not conceptual beliefs but rather ecologically useful demands. Thus, talking about conceptual beliefs involves post-hoc attributions to inferred states that may be categorized according to the content to which they refer (Seitz et al. 2023a). Likewise, the colloquial saying "There is good reason to believe that …" is a metacognitive statement signifying conceptual concurrence of the acting and observing individuals.

Conclusion

In this article it has been outlined that the fundamental capacity of humans to believe affords intuitive adaptive behaviour in the complex, continuously changing world. Primal and conceptual beliefs may be encouraging when they predict future rewards or aversive when they convey

pain or suffering. The evolution of conceptual beliefs about suffering is intimately intertwined with implicit and explicit communication as well as with normative concepts.

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