

Letters to the Editor

**Comment on: Unconscious affective processing and empathy: An investigation of subliminal priming on the detection of painful facial expressions [Pain 2009; 1–2: 71–75]**

Dear Editor,

The study published in *Pain* by Makikio Yamada and Jean Decety [19] investigates the unexplored relation of perceived pain to the emergence of empathic concern. According to the authors, the question itself appears problematic. For, how can detected pain at once urge observers to avoid the source of threat and also instigate approach-behaviors in the form of empathy and provision of care? In this letter, we claim that the pathway to empathy for pain is not paradoxical, but is paved by the human capacity to separate perceptions from aversive self-oriented responses and, thereby, to free up those perceptions to acquire symbolic and interactive meaning.

Pain warns of physical threat and danger on the one hand and also signals an opportunity to care for and heal the person in pain on the other [17]. The protective function of pain instigating behavioral escape perhaps is more primitive, because self-focus likely precedes the care of others [2]. Intense self-focus in observers perceiving another person's state is linked to aversive self-oriented emotions (e.g., discomfort and anxiety) that may be negatively associated with regulatory capacities [7]. By contrast, sympathy for others is positively related to the capacity of observers to voluntarily limit their emotional response to a zone that is arousing but not aversive [8]. With respect to pain, higher levels of aversive self-focus have been found in individuals who experience the threat-value of pain in their child [9] or their spouse [15] in a personally distressing way. These individuals would be expected to have a reduced capacity to voluntarily regulate their emotional state and an initial tendency to focus on their own emotional needs [6]. Other-oriented emotional responses such as empathy would likely be inhibited or delayed [1,9]. Since sympathy is positively associated with regulatory capacities, sympathy for pain should promote recognition of the other's state because the observer's regulation of his or her own emotions is the basis for identification with the emotions of others [5]. The ability to manage or 'tame' an emotion-based response to the other in pain therefore permits an observer to attend to the emotional needs of the other and may facilitate sympathy for pain and helping behaviors [7]. Put another way, a response that remains 'catastrophic' tends to undermine interpersonal exchanges and empathy; but a regulated emotion can be used for interacting with others [13].

Observers able to control their response to detected pain in others can voluntarily reflect on their own emotions, and the possible emotions of the other in pain. Adults and older children can say, 'Are you hurt?', and see how the other person responds to this statement. Or perhaps an observer thinks, 'Help him now'. In both situations, the observer is exploring options based on a process of reflective thinking involving the use of symbols rather than an aversive emotional response based on the percep-

tion of pain in the other and a potential threat to oneself [13]. Consulting a symbol enables an observer to know consciously the state he is in; he can now reflect on the emotion rather than let it overwhelm him [13]. We propose that emotion-based reactions and voluntary regulatory capacities are positively linked [6] to the degree in which an emotion is transformed into a symbolic and interactive form [13]. By contrast, if an emotional reaction remains catastrophic, it pushes for an aversive response; there is awareness of the physiologic states but not an understanding of other emotions or reactions. For example, an observer to pain in another person might think, 'My heart is beating fast. I need to get out of here because I am scared' (and then the person runs) [6]. But individuals who can fully symbolize the emotion and reflect on the feeling can describe how it feels to be distressed and can connect it with similar experiences in oneself or even others [13]. This pattern may link accessing long-term memories to process emotional responses at a deeper level [13], and planning effective helping and caring behaviors [7].

In healthy development, emotions such as fear and anger tend to be transformed from fixed catastrophic reactions into interactive patterns and symbols in the second half of year one and the second year of life and thereafter [11–13]. The catastrophic responses of infants to tissue pathology become shaped by parents and caregivers into differentiated and socially responsive patterns of behavior [14]. The infant who looks to a parent or caregiver when in pain is learning to show distress, to negotiate [16], and to get his or her needs met [4,10]. As this happens, emotional responses are no longer locked into patterns of intense self-focus; preschoolers able to bring a parent to provide help when others are in pain can modulate their aversive response through interactions with others [3,4,10]. The development of normal language allows children to use words and sentences to symbolize pain. This may facilitate other-oriented interactions and reflective thinking through sharing emotions and ideas. For example, a toddler may represent painful distress in role-playing scenarios to direct or manipulate the attention of parents and siblings [4]. Just as a baby or infant exists in the social circumstance of a baby/caregiver relationship [18], an emotional response that has become an interactive symbol exists in the circumstance of its interactive pattern [11]. Without the modulating influence of an interaction, the child's response to a person in pain may grow more intense and she or he may be left using the aversive self-oriented feelings. The child's expression of emotion is, therefore, not part of a fine-tuned regulated symbolic system: it may be simply a self-oriented emotional response. We argue that the separation of a perception from its aversive response may explain how perceived pain shapes its threat values and instigates empathic behavior.

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doi:10.1016/j.pain.2009.08.005

## Empathy, sympathy and the perception of pain

Pain serves evolved protective functions not only by warning the suffering person, but also by impelling expressive behaviors that attract the attention of others [2].

The idea, put forward by van Rysewyk, that empathy necessitates the capacity to separate perceptions from aversive self-oriented responses makes a lot of sense. In most definitions of empathy, there is at least a modicum of self-other awareness to distinguish oneself from others, as well as the capacity to regulate one's own emotional arousal [1,3,4,8]. Unfortunately, many recent neuroimaging experiments ignore, or at best overlook the complexity of the empathy construct and equate somato-sensory resonance with empathy and sympathy. There is a problem with equating empathy with vicarious emotion because the latter does not convey insight into another's internal state and does not account for any other-oriented motivational state that characterizes empathic concern.

The evolutionary more recent cognitive aspects of empathy and sympathy are closely related to processes involved in theory of mind, self-regulation, and language. These cognitive abilities that are unique to our species are layered on top of phylogenetically older social capacities and emotions. I have argued elsewhere that the capacity for two people to resonate with each other emotionally, prior to any cognitive understanding, is the basis for developing shared emotional meanings, but is not enough for mature empathic understanding and sympathetic concern [3,5]. Such an understanding requires forming an explicit representation of the feelings of another person, which necessitates additional computational mechanisms beyond the emotion sharing level, as well as self-regulation to modulate negative arousal in the observer [4,6].

I concur with van Rysewyk that the regulation of internal emotional states and processes is particularly relevant to the modulation of vicarious emotion and the experience of empathy and sympathy. Support for this notion comes from work in developmental psychology, which indicates that sympathy is strongly related to effortful control, with children high in effortful control showing greater empathic concern [11]. A number of studies conducted on children found that individual differences in the tendency to experience sympathy versus personal distress vary as a function of dispositional differences in individuals' abilities to regulate their emotions [7]. Well-regulated children who have control over their ability to focus and shift attention are hypothesized to be relatively prone to sympathy regardless of their emotional reactivity. This is because they can modulate their negative vicarious emotion to maintain an optimal level of emotional arousal. In contrast, children who are unable to regulate their emotions, especially if they are dispositionally prone to intense negative emotions, are found to be low in dispositional sympathy and prone to personal distress [7]. Cognitive neuroscience documents that the understanding of emotions and feelings of others, and the regulation of our own feelings are associated with activation of brain regions in the medial, lateral and orbitofrontal cortices [6,9,10]. These regions are connected with, but do not overlap with those involved in emotion sharing and somato-sensory resonance.

The study conducted with Makiko Yamada shows that the early (and unconscious) processing of pain perception of others cannot be seen as the unifying source of all empathic feelings [12]. Future research is warranted to determine how interpersonal, dispositional, and motivational factors influence the primitive aspect of resonance. This is crucial to understanding the conditions in which empathy and caring will be expressed.

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