Uncanny valley and motor empathy

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The uncanny valley phenomenon (Mori, 1970/2012) is the tendency to perceive as eerie human-looking characters with nonhuman features. It has been repeatedly claimed that falling into the uncanny valley can lead to a loss of empathy for a character (Hodgins, Jörg, O'Sullivan, Park, & Mahler, 2010). Empathy is the tendency to orient one's responses to the situation of another instead of one's own (de Vignemont & Singer, 2006). Empathy has been shown to be a combination of dissociable neurocognitive processes broadly grouped as cognitive, emotional, and motor empathy (Blair, 2005). It takes on such forms as perspective taking, sympathy, nonconscious mimicry, and the synchronizing of facial expressions, postures, and movements. To determine whether the uncanny valley suppresses motor empathy, operationalized as movement synchronization, a pilot study was undertaken by 25 participants. The study required participants to perform an action while viewing videos of a human character or its silhouette performing the same action. The frequency of actions performed by participants fell within their individual frequency and that of the character regardless of whether the participants were asked to coordinate or not coordinate their movement with the character. No significant difference in performance was noticed between the human character and its silhouette for all the conditions. Participants were observed to adjust their individual frequency in a similar manner for both the human character and its silhouette. Future studies with systematic variation in the human realism of the character's features (e.g., skin texture or eye size) and its type of movement (biological vs. mechanical) can help ascertain the extent to which the uncanny valley phenomenon suppresses motor empathy.