

# Perceiving Artificial Agents: A Multimethod Investigation into the Shape and Variables of the Uncanny Valley

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## Abstract

The Uncanny Valley Hypothesis (UVH) proposes that artificial agents that are almost—but not fully—humanlike elicit feelings of eeriness and discomfort. Despite extensive research, the causes, shape, and moderators of the uncanny valley effect remain debated. This doctoral dissertation aims to advance the understanding of the uncanny valley phenomenon by addressing three major research goals: (1) clarifying the shape and variables of the uncanny valley effect; (2) identifying cognitive and social moderators influencing emotional reactions toward artificial agents; and (3) examining the interaction between agents’ visual appearance and attributed mind type. The dissertation consists of three empirical studies employing complementary methods: a large-scale natural language analysis of over 220,000 YouTube comments, immersive virtual reality (VR) experiments, and psychophysiological measurements. Results show that general humanlikeness is associated with increasingly negative sentiment, while specific visual subdimensions—particularly facial features—exhibit non-linear relationships with eeriness. Essentialist beliefs about human uniqueness were found to modulate eerie responses, especially for uncanny humanlike agents. Moreover, while appearance primarily influenced eeriness, the congruence between visual appearance and mind attribution affected perceived behavioral realism and likability. These findings demonstrate that the uncanny valley effect emerges from a complex interaction of perceptual, cognitive, and social processes. The dissertation contributes a multidimensional perspective on human–agent interaction and offers theoretical refinements to UVH, with implications for designing more emotionally acceptable and socially coherent artificial agents.