

## Basic Emotions, Facial Expressions, and Affective Speech Prosody: Harnessing GenAI to Study Young Nezha

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Animated films with voice actors provide us with an interesting alternative means to study one important facet of multimodal communication, namely, emotions conveyed through the interaction between facial expressions and affective speech prosody. The subject of this study is young Nezha in the animated film, *Ne Zha* (2019). Voice actor Lü Yanting (吕艳婷) made tremendous efforts to be authentic in portraying Nezha, a young, impulsive child who, like other children, has not yet learned to dissemble and hide his emotions, neither in his speech nor in his facial expressions. The current study uses Paul Ekman's set of six basic emotions—anger, fear, disgust, happiness, sadness, and surprise (Ekman & Friesen 1971, Ekman 1977)—plus a seventh that he added later, namely, contempt (e.g., Ekman & Cordaro 2011). Proposed as universal, this set of emotions has been widely adopted for studying emotions and facial expressions.

The research here proceeds in two main stages: The first stage consists of an exploration of Ekman's set of basic emotions that are exhibited by Nezha in his interactions with others, and how these emotions are realized with respect to speech and facial expressions. All seven emotions can be found in *Nezha*, with an example from each emotion studied here. The contexts, the words spoken, and various prosodic cues (intonation, amplitude, speech tempo, voice quality, etc.) are studied in conjunction with facial expressions and other nonverbal cues to determine how those emotions are conveyed by Nezha.

The second stage harnesses Gemini 3, the free version of Google's advanced multimodal AI model, which can process text, audio, images, and video, to determine how well it can accurately identify the emotion conveyed by Nezha. Input to Gemini 3 is carried out in four separate trials: (1) the text only (the transcript of the spoken lines), (2) audio (in two separate steps: audio only and audio with the text as part of the prompt), (3) image only (the facial expressions), and (4) video (combined audio and image from the film). Gemini 3 had no difficulty in correctly identifying three of the emotions—Anger, Happiness and Sadness—across all four modes. It found Contempt to be the most difficult, mis-identifying it in three of the modes, thus, correctly identifying it only from the image mode (i.e., facial expression). Gemini 3 selected Disgust as the emotion in the video mode, and outrightly rejected Contempt as a possible answer. It offered a fairly detailed account of its choice: "Based on the visual and auditory data in the third video clip [that is, contempt was the third emotion in the series of prompts and hence the third video clip—mc], the subject is exhibiting Disgust. While some elements overlap with contempt, the physical reaction is more visceral and physiological, fitting the criteria for disgust in the Ekman framework."

A fuller account of this study will be presented at NACCL-38.

## Select References

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- Ne Zha. 2019. (Full Chinese title: Nezha zhi Mo Tong Jiang Shi (哪吒之魔童降世, Nezha, The Demon Boy Descends to Earth).) Screenplay written and directed by Jiaozi. Produced by Yunyun Wei and Wenzhang Liu. Distributed by Beijing Enlight Pictures.