Children express emotions multimodally before expressing them in speech

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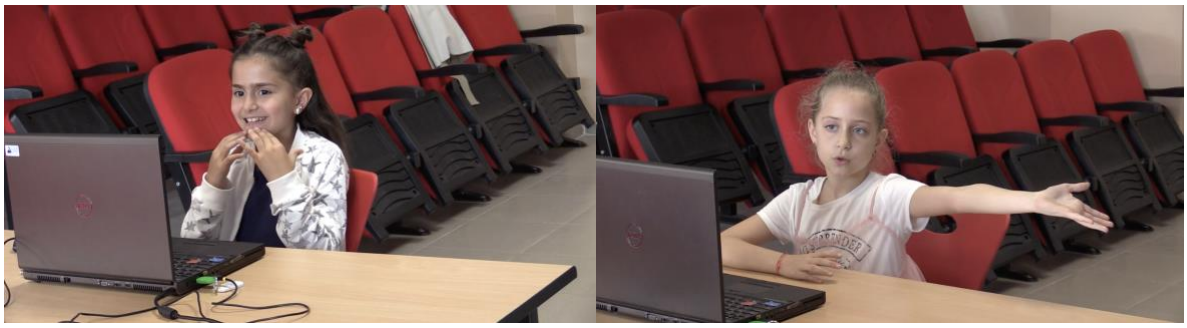
Children can express some concepts in their gestures before they can do so in speech (Goldin-Meadow, 2015; Avcılar et al., 2021). This phenomenon has been shown in several domains that are rich in visuospatial information, such as mathematics (Alibali & DiRusso, 1999), spatial reasoning (Ehrlich et al., 2006), and expression of spatial relation between objects (Karadöller et al., 2024; Ünal et al., 2025). Another domain that can benefit from gestures is emotion communication as emotions are essentially embodied and frequently expressed in multiple channels (i.e., speech, face, and gesture) (Kelly & Ngo Tran, 2023; Aslan et al., 2024). However, less is known about how and to what extent children and adults differ in their expressions of emotions multimodally. In the current study, we explored monolingual Turkish-speaking children's and adults' emotion-expressing strategies through a story recall task.

Children (N = 23, *Mage* = 8.6) and adults (N = 19, *Mage* = 35.6) watched a silent short film named 'Spider Story' (Herman et al., 2004), in which two child actors demonstrated several theatrical emotions such as demand, refusal, annoyance, surprise, mischief, and disgust (Denmark et al., 2018). Later, they were asked to narrate the events in the film, without any specific emphasis on emotions. This process was recorded and coded by using the ELAN annotation software (Lausberg & Sloetjes, 2009). We annotated emotion expressions in speech alone and/or multimodally (head/body/hand gestures and/or facial expressions). We have also coded whether these gestures and facial expressions are used complementarily, supplementarily or redundantly. The redundant use refers to no additional information by the multimodal channels. The supplementary use refers to novel information conveyed through either gestures or facial expressions. The complementary use refers to instances where speech and bodily cues are used together to form a meaningful unit.

Two independent samples t-tests showed that children (M = 13.8, SD = 6.4) recalled significantly more emotions than adults (M = 9.5, SD = 3.8) (p = .014). They also recalled emotions significantly more multimodally (M = 8, SD = 7) compared to adults (M = 4.9, SD = 4) (p = .03). Additionally, gestures were not employed supplementarily to express emotions by adults or children. Furthermore, complementary gestures and facial expressions were exclusively used by children, whereas adults did not employ this pattern.

Summarizing, these results corroborate previous research on children's reliance on gestures, demonstrating that children adopt a multimodal approach when expressing emotions. These results corroborate previous research on children's reliance on gestures, now also extending it to domain of emotions and by incorporating the use of facial expressions as an alternative expression channel in emotion domain.

Figure 1. Examples of emotion expression via (a) face and (b) gesture.



a) Child expressing mischief via facial expression b) Child expressing demand via gesture

Keywords: multimodal language; language acquisition; emotion communication

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