

Visual experience influences silent gesture productions across semantic categories

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Multimodal language theories embrace a relatively embodied perspective to explain gesture production, and claim that gestures arise from sensorimotor simulations underlying concepts (e.g., Goldin Meadow & Beilock, 2010; Hostetter & Alibali, 2008, 2019). As such, gesture forms are thought to reflect gesturers' specific sensorimotor experience with objects and events (e.g., Cook & Tanenhaus, 2009; Pouw, et al., 2018). Studies examining gestural representations of semantic concepts during speech or when no speech is allowed—i.e., silent gestures (Masson-Carro et al., 2017; Ortega & Özyürek, 2020) have revealed certain regularities in strategies used by sighted people. For example, concepts that trigger motor imagery—such as manipulable objects—result in the use of an acting strategy (the reenactment of an action with an object). When visuospatial information is more pertinent, such as for non-manipulable objects, sighted people tend to use a drawing strategy (tracing the outline of an object). Based on Taub's (2001) model, van Nispen et al. (2017) propose that people select salient features of their mental representations that fit the constraints of the visual-manual depiction in gesture. In general, only motor and visuospatial features of concepts fit these constraints as other salient features of concepts, such as color, do not lend themselves to gestural forms. If visuospatial and motor cues drive gesture, then visual experience may cause differences in gesture strategies. In the present pre-registered study, we asked whether visual experience affects how different semantic concepts are mapped onto gestures. We compared gesture forms produced by 30 congenitally blind and 30 sighted Turkish people for simple concepts that rely on motor (manipulable objects) versus visuospatial (non-manipulable objects and animals) information to different extents. We had 60 concepts in total: 20 concepts per semantic category. We coded the strategies (acting, representing, drawing, and personification) for each gesture by following Ortega and Özyürek (2020). If visual experience matters for how concepts strongly related to visuospatial experience are depicted in gestures, then we expect gestural forms to differ between concepts that rely more on visuospatial than motor information. As expected, blind gesturers were less likely than sighted gesturers to produce a gesture for visuospatial concepts, but this was not the case for motor concepts—see Figure 1. Their gestures were also qualitatively different than sighted people's gestures, relying less on strategies depicting visuospatial features—e.g., drawing and personification. Thus, visual experience shapes how concepts are depicted in gestures.

Index Terms: silent gesture; blindness; manipulable objects; non-manipulable objects; animals

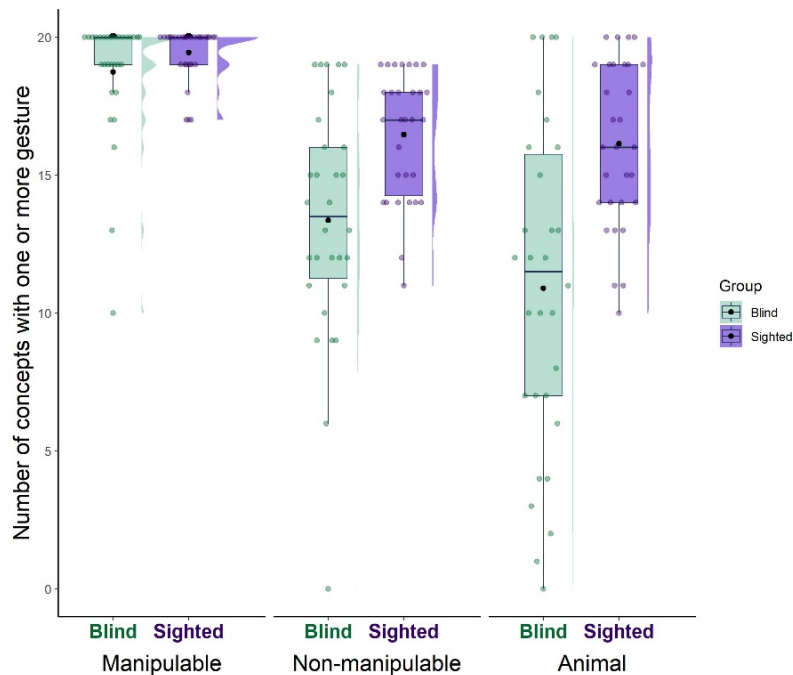


Figure 1. Frequency of gestures for manipulable object (n = 20), non-manipulable object (n = 19), and animal (n = 20) categories. Colored dots represent each participant. Black dots represent the group mean.

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