

The Dance of Thumbs: Kinematic signature of Digital Intentions

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In daily life, humans produce complex and subtle hand and finger movements, such as playing instruments or typing on keyboards and touchscreens. Typing on smartphones is common in two main domains: (i) content consumption (e.g., browsing, reading news), and (ii) content generation (e.g., writing messages, posting on social media). Recent findings show that merely observing smartphone typing can reveal whether a user is consuming or generating content, suggesting that distinct kinematic cues characterize the two behaviors. Leveraging advanced 3D motion analysis techniques, this study investigates the temporal, spatial, and velocity characteristics of thumb movements during smartphone typing, aiming to reveal the underlying structure of digital intentions. Fourteen naïve participants were recorded while typing seven sentences on: (i) Google (content consumption), and (ii) WhatsApp (content generation). Anatomical landmarks were defined to develop a new 3-D model: the Dance of Thumbs (DoT). Movements of both thumbs were captured using six infrared cameras and a 3-D motion analysis system. Results indicate that: (i) significant kinematic differences exist between typing for content consumption and generation, and (ii) motor efficiency is higher in digital natives (born after 1980; Prensky, 2001). These findings offer new insights into sensorimotor representations of digital actions and intentions, expanding our understanding of embodied cognition in the touchscreen era. Moreover, this work contributes to the emerging framework of digital competence, a concept with potential applications in addressing digital exclusion.

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No

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