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Experts' and Novices' Use of Gesture in Explaining Geologic Maps

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Abstract: People gesture during spatial tasks (Alibali et al., 2001; Kita & Özyürek, 2003; Morsella & Krauss, 2004), and how they gesture reveals information about ongoing cognitive processes (Alibali & Kita, 2008; Church & Goldin-Meadow, 1986; Schwartz & Black, 1996). One task that requires many spatial processes is reading geologic maps. Geologic maps give information about the spatial relationships of geological structures at the surface that in turn can inform an expert about the underlying 3D structures. However, they are complex, contain both spatial and domain specific symbolic information, and are hard for students to understand. The current study compares how expert geologists and students use gesture in explaining these maps. We report gestures used to convey spatial information about the penetrative relations and those used to convey information about the sequences of events. Hand shape, orientation, placement, and movement of the gesture convey information that is not available in speech.