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**Linking dragging strategies to levels of geometrical reasoning in a dynamic geometry environment.**

Smith, C. (ed.), Proceedings of the British Society for Research into Learning Mathematics (BSRLM). Vol. 33, No. 2. Proceedings of the day conference, Sheffield Hallam University, UK, June 2, 2013. London: British Society for Research into Learning Mathematics (BSRLM). 26-31 (2013).

Summary: Students working in Dynamic Geometry Environments interact with geometric figures by dragging constituent objects on the computer screen. A number of researchers have described different dragging modalities and linked them to cognitive activity. This paper draws on data from recordings of students working with a dynamic figure based on fixed length perpendicular diagonals. The diagonals can be dragged in the figure thus generating a number of quadrilaterals and triangles. Two new dragging strategies have been observed in use by students within the context of working with the dynamic figure. Refinement dragging is used when students check and review side and angle properties of shapes they have generated. Dragging maintaining symmetry is used when students drag so that one diagonal bisects the other generating what could be termed a ‘dragging family’ of shapes. This paper describes these dragging strategies and relates them to the Van Hiele levels of reasoning. The students’ innate sense of symmetry also emerged as an important aspect of how they conceptualise 2D shapes.

*Classification:* G43 U73 C33

*Keywords:* geometry; dynamic figures; dynamic geometry software; computer as educational medium; quadrilaterals; diagonals; dragging family of shapes; dragging maintaining symmetry; van Hiele model for geometric reasoning; educational research; cognitive psychology

<http://www.bsrlm.org.uk/IPs/ip33-2/BSRLM-IP-33-2-05.pdf>