A PRELIMINARY MODEL OF INFLUENCES ON ADOLESCENTS' PERCEPTIONS OF USEFULNESS IN SCHOOL MATHEMATICS

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Students commonly question teachers about the *usefulness* of mathematics, and the Common Core State Standards in Mathematics encourages teachers to help students "see mathematics as…useful" (National Governors Association Center for Best Practices, 2010). In fact, perceiving a subject as useful can have numerous positive benefits for students including enhanced interest in a subject and improved course performance (Hulleman et al., 2010; Hulleman & Harackiewicz, 2009). However, adolescents use a range of criteria to evaluate whether something is useful (Dobie, 2019), and little is known about when or why these various criteria are employed. This research explores the question, *What factors influence the decisions adolescents make about what is or is not useful in the context of school mathematics?*

Expectancy-value theory highlights that one's goals and self-schemata influence perceptions of usefulness (Eccles & Wigfield, 2002), yet a black box remains regarding the mechanisms that mediate this relationship. The current research begins to build theory around influences on adolescents' perceptions of usefulness by drawing on data from interviews with 11-14-year-old students in two large cities in the United States. In particular, adolescents responded to card-sorting tasks depicting images of students engaging with varied mathematics content in a range of ways and described whether or not the mathematics seemed useful and why. Those responses were used to identify criteria adolescents used to make judgments about usefulness, and additional questions probed into the factors that influenced the criteria students applied.

Figure 1 illustrates a preliminary model unpacking the relationship between one's goals and self-schemata, and perceptions of usefulness. Emergent influences include whether usefulness was considered at the level of the subject (mathematics), specific topic (e.g., linear equations), or particular task (e.g., worksheet). Additionally, some adolescents attended to the form of engagement (e.g., individual vs. collaborative). Others considered the novelty of what they were learning, the usefulness of a specific practice (e.g., justifying thinking) or strategy (e.g., making graphs to represent data), or how engaging with the mathematics made them feel. These features attended to in turn influenced the specific criteria used to make judgments about usefulness, such as whether the mathematics applies to everyday life or enhances one's understanding of mathematics. Individual cases of students will be shared along with quotes to illustrate each factor in action. Future work will explore how different features influence the criteria applied, as well as the outcomes afforded by different pathways to perceiving mathematics as useful.

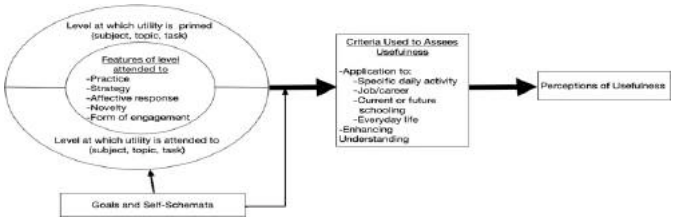

Figure 1: Influences on Adolescents' Perceptions of Usefulness

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