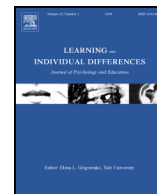




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## Investigating factors that influence students' help seeking in math homework: A multilevel analysis

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### ABSTRACT

The current investigation examined empirical models of help seeking in math homework. Individual- and class-level predictors of help seeking were analyzed in a survey of 796 8th graders from 46 classes. Multilevel results indicated that help seeking was positively associated with mastery orientation and homework interest at the individual and class level. At the individual level, help seeking was positively related to family help availability, homework interest, peer participation, performance orientation, monitoring motivation, value belief, and family help frequency. Our results suggest that mastery orientation exerts a powerful influence on students' help seeking in math homework. Our results further suggest that teachers can play a vital role in promoting help seeking, by placing greater emphasis on mastery goals, by making homework more interesting, by helping students learn to maintain homework motivation, and by encouraging families to make themselves available in the homework process.

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### 1. Introduction

Although help seeking is conceptualized as a critical component of self-regulation (Newman, 2000; Pintrich, 2000; Zimmerman, 2008), although homework is an important instructional activity across countries (Cooper, Robinson, & Patall, 2006; Eilam, 2001; Epstein & Van Voorhis, 2001; İflazoğlu & Hong, 2012; Núñez et al., 2015), it is surprising to note that little attention has been directed to the issue of help seeking in homework.

To fill this notable gap in research on homework, the aim of the current investigation is to propose and examine empirical models of students' help seeking in math homework, with the models informed by research and theorizing on self-regulated learning (e.g., Newman, 1998; Pintrich, 2004; Puustinen, Bernicot, & Erbol, 2011; Zimmerman, 2008). This line of investigation is important, because help seeking can help to avert possible failure, promote academic engagement and achievement, and increase the likelihood of long-term autonomous learning (Karabenick, 2004; Marchand & Skinner, 2007; Newman, 2002). Yet, students do not necessarily seek help when it is needed (Karabenick & Knapp, 1991; Kessels & Steinmayr, 2013; Newman, 2002). Indeed, help seeking tends to decrease during early adolescence (Ryan, Gheen, & Midgley, 1998; Ryan, Shim, Lampkins-uThando, Kiefer, & Thompson, 2009). This becomes more of a concern for homework, as it typically occurs in the middle of competing after-school activities,

thus placing more demands on students' self-regulation (Fries, Dietz, & Schmid, 2008), with help seeking in particular. Consequently, it would be critically important to examine a range of factors that influence help seeking in homework at this developmental stage.

### 2. Theoretical framework

Help seeking is frequently discussed under the umbrella of self-regulated learning (Newman, 1998, 2000; Pintrich, 2004; Puustinen, Bernicot, & Bert-Erboul, 2011; Ryan & Pintrich, 1997; Zimmerman, 2008). According to Pintrich's (2004) classification, self-regulation includes four phases (forethought, monitoring, control, and reflection). For each phase, self-regulation is delineated in four areas (cognition, motivation, behavioral, and context), in which help seeking is considered as one aspect of behavior for self-regulation or "a behavioral control activity" in self-regulation (Puustinen, Kokkonen, Tolvanen, & Pulkkinen, 2004, p. 232). It refers to the procurement of help from others in the environment to cope with difficulty and ambiguity in the learning process (e.g., aid and advice; Pintrich, 2004; Ryan & Pintrich, 1997).

This classification suggests that help seeking may be affected by other three areas of self-regulation, including cognition (e.g., goal orientations), context (e.g., peer interaction), and motivation. One construct expected to be associated with help seeking is goal orientation (Newman, 1990), and research on achievement orientation theory has indicated that children high in mastery orientation use more adaptive help seeking strategies (Aleven, Stahl, Schworm, Fischer, & Wallace, 2003; Karabenick, 2004).

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As students with high self-perceived competence use more adaptive self-regulated strategies including help seeking (Alevén et al., 2003; Newman, 1990; Pintrich & Schunk, 2002), help seeking may be influenced by students' beliefs and expectations regarding their competence to perform a task successfully (expectancy belief). In addition, as students who show more interest in a task and views it valuable are more likely to use more adaptive self-regulation strategies (Pintrich & Zusho, 2002), task interest and value may affect self-regulation (Schunk, 2005), with help seeking in particular (Alevén et al., 2003). Furthermore, given that monitoring motivation can sustain interest is a key hypothesis in volition theory (Corno, 2000; Corno & Mandinach, 2004), monitoring motivation may influence help seeking.

As individual and social differences can influence students' efforts at self-regulation (Pintrich, 2004), help seeking is likely to be further affected by background variables (e.g., parent education and gender; Alevén et al., 2003; Calarco, 2011; Kessels & Steinmayr, 2013) and social influences (e.g., parents, teachers, and peers; Newman, 2000; Puustinen, Lyyra, Metsapelto, & Pulkkinen, 2008; Ryan, Hicks, & Midgley, 1997). For example, middle-class children (compared with working-class children) requested and received more help from teachers (Calarco, 2011). Peers' achievement goals and attitudes may affect students' attitudes toward the value of school work and help seeking (Newman, 2002).

In summary, this line of literature suggests that help seeking is likely to be affected by multiple variables, including background variables (e.g., parent education), social influences (e.g., parent, teacher, and peer), goal orientation (e.g., mastery and performance), expectancy belief, task value and interest, and monitoring motivation. Therefore, there is a need to include these variables in empirical models of students' help seeking in homework.

### 3. Studies pertaining to help seeking in homework

Some recent studies have tapped into students' help seeking in homework. Two studies examined help seeking exchanges on a French online forum providing students with free math homework help, one study including middle school students (Puustinen et al., 2011) and the other including high school students (Puustinen, Bernicot, Volckaert-Legrier, & Baker, 2015). Taken together, these studies suggest that, by middle school level, students are capable of being self-regulated learners and help seekers with unknown teachers in an online learning environment.

Other studies have alluded to several factors that may influence students' help seeking in homework. Crystal, Kakinuma, DeBell, Azuma, and Miyashita (2008), for example, found that females sought more homework support from peers and family. In addition, more 6th graders than 8th graders, and more 8th graders than 10th graders sought family homework help.

In another related study, Martinez (2011) found that 6 of the 22 Latino high school students doing daily homework on a regular basis; the others appeared to experience difficulties completing their assignments. Their inability to complete homework was confounded by the fact that few of them could turn to their parents for homework help. Data further implied that parent education and parent availability may influence help seeking in homework. Some participants did not seek help from their parents because their parents were not physically available during homework sessions (e.g., working long hours and night shifts). Other commented that their parents were not cognitively available (e.g., not with familiar with the material or having difficulty with the English language) because their parents did not graduate from high school.

None of the above studies, however, were specifically designed to examine a range of theoretically grounded variables that influence students' help seeking in homework. On the other hand, it is interesting to note that these studies imply that students' help seeking in homework may be affected by variables such as gender, parent education, and

parent availability, in line with theoretical expectations discussed in the previous section.

### 4. The present investigation

As helping seeking in homework is noticeably and surprisingly lacking from much contemporary homework research, our current study seeks to address this important gap, by examining empirical models of help seeking in math homework. In particular, our models were informed by and built upon the theoretical framework on self-regulation (as discussed above), including the following variables regarding background variables (e.g., parent education), social influences (e.g., parent, teacher, and peer), goal orientation (e.g., mastery and performance), expectancy belief, task value and interest, and monitoring motivation.

Specifically, Model 1 includes thirteen individual-level variables – background variables (parent education and gender), social influences (family help frequency, family help availability, teacher feedback, and peer participation), goal orientation (mastery, performance, and avoidance), value belief, expectancy belief, homework interest, and monitoring motivation. Consistent with the self-regulation literature regarding the importance of social influences on help seeking (Newman, 2000; Puustinen, Lyyra, & Metsapelto, 2008), it is hypothesized that help seeking in homework is positively related to family help frequency, family help availability, teacher feedback, and peer participation. Consistent with the self-regulation literature (e.g. Alevén et al., 2003, Newman, 1990, Pintrich & Zusho, 2002, Schunk, 2005), it is further hypothesized that help seeking is positively related to expectancy belief, value belief, homework interest, and monitoring motivation. In addition, consistent with the self-regulation literature (Alevén et al., 2003; Kessels & Steinmayr, 2013), it is hypothesized that females and those children with higher parent education are more likely to seek homework help. Finally, it is hypothesized that help seeking is positively associated with mastery and performance goal orientations, consistent with relevant findings regarding help seeking (Karabenick, 2004; Pintrich, 2004).

Model 2 further include five class-level variables regarding goal orientation (mastery, performance, and avoidance), teacher feedback, and homework interest. The justification for including goal orientations at the class level is that classroom achievement goal structure can influence help seeking (Alevén et al., 2003; Bong, 2008; Karabenick, 2004). The justification for including teacher feedback and homework interest as both an individual-level and a class-level variable is that students' shared assessment of teachers' feedback and homework interest in a given class may influence help seeking in addition to their influence at the individual level.

The present study focuses on 8th graders, as help seeking becomes increasingly complex at the middle school level (e.g., peer involvement and expectations of benefits; Newman, 2002), and as help seeking tends to decrease during early adolescence (Ryan et al., 1998; Ryan et al., 2009). Meanwhile, they are at the cusp of the transition to high school and have accumulated a rich history of academic performance (Usher, 2009), with homework in particular (i.e., doing homework and seeking homework help). This observation is further substantiated by the finding from several studies that indicated that 8th graders are capable of seeking homework help in online environment (Puustinen et al., 2011) and face-to-face environment (Crystal et al., 2008).

As recent research has examined domain-specific aspects of homework (e.g., effort, emotion, motivation, and self-regulation; Goetz et al., 2012; Trautwein, Ludtke, Schnyder, & Niggli, 2006; Hong, Peng, & Rowell, 2009), there is a need to focus on help seeking in one important domain (i.e., math) in this study. Such a focus is particularly important, as (a) math is a major achievement domain with typically high demands for homework (e.g., students spend about 20% to 40% of their homework time on math; Kitsantas, Cheema, & Ware, 2011; Pezdek, Berry, & Renno, 2002), and as (b) doing math homework is

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