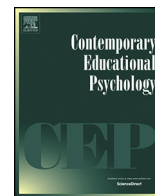




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## Adolescents' help seeking in mathematics classrooms: Relations between achievement and perceived classroom environmental influences over one school year

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### ARTICLE INFO

#### Article history:

Available online 12 January 2015

#### Keywords:

Classroom environment  
 Mathematics achievement  
 Emotional support  
 Achievement goal theory  
 Help seeking

### ABSTRACT

We examined the relation between self reported help-seeking tendencies and standardized mathematics achievement as well as the contribution of shared perceptions of the classroom climate – achievement goal structure and emotional support – to the types of help (instrumental, expedient) middle and high school U.S. students seek and from whom (teacher and peers) over the school year. Hierarchical linear modeling ( $N = 3897$  students grades 7–11 in 306 classrooms) revealed that the more students reported seeking help from their teacher and seeking instrumental help, the greater their over-the-year gains in standardized achievement. In general, shared perceptions of the classroom climate predicted changes in students' reported help seeking from the beginning of the school year (T1) to the end (T2). Students in classrooms collectively perceived to be more mastery-oriented at T1 predicted increases in instrumental help seeking and seeking help from peers at T2. Perceived T1 emotional support predicted increases in seeking help from teachers and peers at T2. By contrast, perceived T1 performance-approach goal structure predicted decreases in reported help seeking from teachers at T2 and positively predicted expedient help seeking at T2. Furthermore: (a) adolescent females reported seeking more instrumental help and seeking more help from peers and teachers, whereas, adolescent males reported seeking more expedient help; and (b) high school students sought more instrumental help than did middle school students. We discuss results with regard to the importance of help seeking to mathematics achievement as well as considering emotional support and classroom achievement goals together when examining students' help-seeking behaviors.

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### 1. Introduction

All students inevitably will encounter tasks that they cannot complete on their own. Help seeking is an important strategy that helps students succeed when tasks become difficult or when students are unable to complete them on their own (e.g., Karabenick & Berger, 2013; Zimmerman, 2008). In the case of mathematics learning, help seeking plays a critical role, such that students who seek more help in classroom settings acquire higher mathematics achievement than those who do not engage in this self-regulated learning strategy (Ryan, Patrick, & Shim, 2005; Ryan & Shim, 2012; Ryan, Shim, Lampkins-uThando, Kiefer, & Thomson, 2009). What characterizes

the complexity of help seeking is that it is a multi-step process in which learners: (a) identify that a problem exists, (b) determine that help is needed for that problem, (c) decide to engage in help seeking, (d) decide why they need help, (e) decide whom to ask for that help, (f) solicit that help, and (g) obtain the requested help (Newman, 2002). Help seeking is unique because of its typical reliance on others (Karabenick, 2011, 2014), such as parents who help with homework. Most significantly in K-12 settings, students look to classroom teachers and peers for help; however students' perceptions of the classroom environment highly shape their help-seeking decisions, such as "Should I ask for help?", deciding whether to ask for the correct answer to avoid work (*expedient* help seeking) or to ask for help to deepen understanding (*instrumental* help seeking; Karabenick & Knapp, 1991; Newman & Goldin, 1990; Ryan & Pintrich, 1997). For example, wanting to know how to complete a task instead of simply asking for the right answer is considered to be more adaptive for future achievement because the student learns skills that can be transferred to future tasks. Help seeking is considered non-adaptive (termed *expedient* or *executive*) when the goal is to reduce effort by, for example, asking for problem solutions from a source

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or asking for help when it is not needed (Butler, 1998; Nelson-Le Gall, 1985; Ryan & Pintrich, 1997).

Since help seeking in classroom settings involves asking others for assistance, from whom students request help is also important. Students who feel threatened are less likely to ask their teacher (a formal, role defined source) for help than those who feel less threatened (Butler, 2006; Knapp & Karabenick, 1988; Newman, 2002). Informal sources of help (e.g., peers) may be seen as less judgmental (Butler, 1998), and soliciting peers for help can strengthen camaraderie among students (Ryan & Shim, 2012). However, asking classmates for help can also invoke social comparisons, which can be considered a cost of seeking help (Newman, 2000), and they possess less expertise than do teachers. Previous research has primarily defined help seeking using the dichotomy adaptive or non-adaptive (e.g., Karabenick, 2004; Ryan & Pintrich, 1997); however, few distinguish help-seeking behaviors by their sources, especially within a single study.

The goal of the present research is to better understand the association between help seeking and standardized mathematics achievement and to consider a multidimensional view of classroom climate in understanding the determinants of help seeking. Previous research supports the link between more general self-regulated learning strategies and mathematics achievement (e.g., Pintrich & de Groot, 1990). However, understanding the more specific strategies that are associated with mathematics achievement and how classrooms support or hinder strategy use is still not well understood. We first seek to replicate the handful of studies supporting the positive association between help seeking and mathematics achievement, and extend this research by examining specifically how various types of help seeking (peer help seeking, teacher help seeking, expedient, instrumental) are each related to over-the-year changes in standardized mathematics achievement. Second, we also seek to understand the associations between various dimensions of classroom climate and different types of adaptive and non-adaptive help seeking. To better approximate the association between classroom climate and help seeking, we include prior measures of help seeking to test if perceptions of the classroom climate contribute to changes in students' reported help seeking. We posit that there are distinct relations in how different classroom climate dimensions are linked to the types of help students seek as well as whom from. In understanding this association, we include a broader, more comprehensive view of defining classroom climate than has typically been taken by including both measures of achievement goal structure and emotional support.

## 2. Help seeking and achievement

There is considerable evidence supporting the relation between self-reported and observed measures of help seeking and learning processes and outcomes, such as task persistence (Wolters, 2004), use of cognitive, metacognitive, and resource management learning strategies (Aleven, McLaren, Roll, & Koedinger, 2006; Karabenick & Knapp, 1991; Wolters, 2004), and the quality of solutions (Mercier & Frederiksen, 2007). Help seeking is considered an important skill supporting students' learning of new, difficult concepts, and there is also evidence demonstrating that help seeking is related to classroom performance as reflected in student grades in mathematics (Ryan et al., 2005; Ryan, Shim, Lampkins-uThando, Kiefer, & Thompson, 2009; Ryan & Shim, 2012). Help seeking allows learners to learn relevant information that further supports future learning. As is the case with mathematics where skills build on each other, engaging in help seeking may be an especially important self-regulated learning skill.

Although there is theoretical and empirical support for the connection between help seeking and academic achievement, very little is known about the relation between help seeking and standardized

test scores – a measure of mathematics achievement that is not confounded by teacher bias or students' classroom behavior. One exception, a study by Ryan et al. (2005), found differences in mathematics achievement between different types of help seekers as rated by their teachers. Accounting for previous math achievement, students characterized by teachers as having avoidant and expedient help-seeking tendencies had lower standardized test scores than did students with instrumental help-seeking tendencies in the fifth grade. A strength of the study was the use of help seeking measures from teachers as reporters; however, two questions remain: (1) whether general help seeking tendencies that did not occur with the teacher were associated with these gains, and (2) if student' own ratings of their help seeking are related to these gains academic achievement as teachers might confound help seeking and other self regulated learning strategies in their judgments of students.

## 3. Environmental influences on help seeking

### 3.1. Classroom goal structure

Student perceptions of their classroom environments have profound effects on their learning (see Urdan, 2010). Through teachers' use of instructional practices and policies within their classrooms, it is thought that teachers create classroom environments that directly and indirectly send messages to students about the goals of learning and achievement (Ames, 1992; Kaplan, Middleton, Urdan, & Midgley, 2002; Urdan, 1997). Within the literature concerning student perceptions, the preponderance of research has focused on the achievement goal structures students perceive (Ames & Archer, 1988; Midgley, 2002). These classroom goal structures have been found to be linked to students' interest in the material, persistence, affect, use of learning strategies, and academic performance (for review, see Urdan, 2010). Classrooms with mastery goal structures focus on individual improvement and understanding the content or task. Mastery-oriented classroom practices include assessment practices and feedback that emphasize students' personal self-improvement and skill development rather than comparing classmates' relative performance. Classrooms with performance goal structures prioritize ability and performance, focusing students on doing better than others (performance-approach) or avoiding looking incompetent or less able than others (performance-avoidance).

Available evidence indicates that classrooms that emphasize performance-avoidance goals are consistently linked with maladaptive student outcomes (e.g., Meece, Anderman, & Anderman, 2006). In contrast, there have been conflicting findings for performance-approach goal structure, which has been linked with students' reported use of cognitive and metacognitive strategies (Wolters, 2004), higher achievement (Linnenbrink, 2005), but also higher procrastination and lower persistence (Wolters, 2004). The present study focused on performance-approach goal structure for two reasons: (1) recent reviews and calls for studies to further examine its relation to student outcomes (e.g., Hulleman & Senko, 2010; Linnenbrink, 2005), and (2) the dearth of empirical evidence available supporting the existence of performance-avoidance goal structures in classrooms (e.g., Lau & Nie, 2008). More specifically, we focused on the normative aspect of performance-approach goal structure, which consists of the degree to which classrooms emphasize external standards (e.g., grades or percent correct) in judging whether students performed better than others (Hulleman, Schragar, Bodmann, & Harackiewicz, 2010).

Evidence indicates that students' reported help-seeking behaviors are affected by the classroom goal structure. Mastery goal structure is linked to lower avoidant and lower expedient help-seeking tendencies for late elementary and middle school students (Linnenbrink, 2005; Ryan, Gheen, & Midgley, 1998; Shim, Kiefer, & Wang, 2013; Turner et al., 2002) and higher peer help seeking for

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