

Students' Needs, Teachers' Support, and Motivation for Doing Homework: A Cross-Sectional Study

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Self-determination theory provided the theoretical framework for a cross-sectional investigation of elementary and junior high school students' autonomous motivation for homework. More specifically, the study focused on the role of teachers' support of students' psychological needs in students' motivation for homework in the two school systems. The study also investigated the contribution of a match between teachers' support and students' expressed level of psychological needs to autonomous motivation for homework. The findings indicated that teacher support partially mediated the difference in autonomous motivation for homework between students in the two school systems. In addition, the findings suggested that whereas students' with different level of expressed needs may perceive different levels of teachers' support, and that teachers' support might be more important for students who express higher level of needs, perceived teachers' support of psychological needs was important for students' adaptive motivation for homework, irrespective of their expressed level of needs.

Keywords: cross-sectional design, homework, motivation, self-determination theory, teachers' support

Homework has been a part and parcel of schooling in most countries for generations (Gordon, 1980). And yet it is interesting that as a topic of research, homework has been rather neglected (Trautwein & Köller, 2003). Only recently have educational

researchers started to pay attention to and acknowledge homework both as an important learning activity and as a bridge between home and school (Murray et al., 2006).

Some research indicates that doing homework is associated with developing self-regulation skills and positive academic attitudes (Bempechat, 2004; Schunk & Zimmerman, 1998). Yet, research results regarding the effect of homework on students' academic outcomes are not consistent. Most studies found only a modest association between time spent on homework and students' learning and performance (Grolnick & Slowiaczek, 1994; Senechal & LeFevre, 2002). Indeed, even this modest association varied by student age: Modest to weak among students in the high grades (e.g., Cooper & Valentine, 2001) and no association among students in elementary school (Cooper, 1989; Cooper, Lindsay, Nye, & Greathouse, 1998).

A plausible explanation for the meek association of time spent on homework and students' achievement is students' motivation towards homework (Trautwein, Ludtke, Schnyder, & Niggli, 2006). Research suggests that the type of motivation students adopt for a task relates to the quality of their engagement (E. M. Ryan & Deci, 2000). Whereas only little research has been done on the subject, there is some indication that many students engage in homework assignments not because of interest or excitement about the task but rather because of a sense of duty, desire to please, and avoidance of punishment (Walker, Hoover-Dempsey, Whetselm, & Green, 2004). This is clearly undesired because such extrinsic motivation has been associated with low persistence, learning, and achievement and with a greater risk for dropping out of school (Vallerand, Fortier, & Guay, 1997), particularly in comparison with intrinsic motivation, which has been associated with a host of positive outcomes such as persistence, creativity, performance, and positive emotions and interest in school (Bouffard, Boileau, & Vezeau, 2001; Coutts, 2004; Flink, Boggiano, Main, Barrett, & Katz, 1992; Hardre & Reeve, 2003; Vallerand, Blais, Brière, & Pelletier, 1989).

Unfortunately, research indicates that students' overall intrinsic academic motivation declines along the years of schooling, particularly in transition between school systems (Anderman, Maehr, & Midgley, 1999; Eccles, Lord, & Buchman, 1996). Stage-environment fit theorists (Eccles & Midgley, 1989) argue that, particularly during adolescence, when students experience heightened needs for autonomy and for social relations with adults outside of the family, students' move from the relatively intimate and supportive elementary school environment to the large junior high environment, which is characterized by less autonomy and support from teachers (Eccles et al., 1993). These researchers suggest that it is this mismatch between environmental characteristics and students' needs that causes the apparent drop in students' adaptive motivation in school (Eccles et al., 1993). Yet, whereas these motivational patterns have been found for school-bound work, researchers have not yet investigated them in the rather unique context of

homework. Moreover, because of the setting within which homework is done (i.e., home), it is not clear whether the educational environment would play a similar role in the hypothesized difference in adaptive motivation between elementary and junior high school students.

The present study uses a cross-sectional design to investigate the following: (a) differences in adaptive motivation for doing homework among elementary and junior high school students, (b) the role of teachers' motivational emphases in this hypothesized motivational difference, and (c) the contribution of a match between teachers' emphases and students' needs to adaptive motivation for doing homework. Self-determination theory (SDT; E. M. Ryan & Deci, 2000)—a humanistic perspective on motivation and adaptive development—provides the theoretical framework for this study.

The Self-Determination Perspective on Students' Motivation to Learn

In the past 3 decades, research findings have been emphasizing the importance of students' motivation for their experience and performance in school (Alonso-Tapia & Pardo, 2006; Eccles, Wigfield, & Schiefele, 1998; Pintrich & Schunk, 2002; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005). Results from studies using experimental, correlational, and qualitative methods have converged on the finding that when students engage in academic tasks out of interest, enjoyment, and the purpose to learn and understand, they engage more meaningfully, regulate their learning, achieve higher grades, retain the material, and manifest higher well-being than when they engage in academic tasks out of more extrinsic reasons such as a desire to please others, to demonstrate ability, to avoid feeling stupid, or to avoid punishment (Ames, 1992; Bouffard et al., 2001; Coutts, 2004; Grolnick, Ryan, & Deci, 1991; Hardre & Reeve, 2003; Midgley, 2002; Vansteenkiste et al., 2004; Vansteenkiste et al., 2005).

One of the primary theoretical frameworks of motivation that has been applied to educational settings is SDT (Deci & Ryan, 1985, 2000), a macro theory of human motivation concerned with the development and functioning of personality within social contexts. The theory specifies a continuum of motivational orientations for activities, ranging from extrinsic/controlled regulation (engagement out of coercion or for achieving a reward) to intrinsic/autonomous motivation (engagement out of pleasure, interest, and enjoyment). Research results are quite consistent in suggesting that the more autonomous the motivation—or the locus of regulation of action—the higher is the quality of engagement and the well-being of the student (Deci & Ryan, 2000).

SDT emerged from a humanistic perspective on human motivation. According to this theory, there are three basic psychological needs—for autonomy,

relatedness, and competence—that, when satisfied, enhance autonomous motivation and lead to autonomous internalization of behaviors of initial extrinsic origin (E. M. Ryan & Deci, 2000). The satisfaction of the three psychological needs depends on the support provided by the environment. Thus, unlike early need-based theories of motivation, which viewed motivation as an individual-difference characteristic that is mostly determined by personality or developmental processes (e.g., McClelland, 1961), SDT views motivation as dependent on context and has been emphasizing the role of the environment in motivational change (E. M. Ryan & Deci). Hence, the theory assigns a primary role to significant others (e.g., teachers, parents) in providing support for children's psychological needs that contributes to the internalization of their motivation for activities (Assor, Kaplan, & Roth, 2002; Deci & Ryan, 1985; Furrer & Skinner, 2003; Katz, 2003; Reeve & Jang, 2006; Vallerand et al., 1997).

The Role of Teachers in Student Motivation

Many studies indicate that along the years of schooling, students' overall level and quality of motivation decline (Anderman et al., 1999; Anderman & Midgley, 1997; Harter, 1981; Gottfried, Fleming, & Gottfried, 2001). Whereas early explanations suggested that the decline in motivation is related to developmental changes such as puberty (Simmons & Blyth, 1987), more recent studies have mostly focused on the role of the educational environment in these patterns of students' motivation (Eccles & Midgley, 1989; Eccles et al., 1993; Reeve & Jang, 2006; Skinner & Belmont, 1993; Vallerand et al., 1997).

Scholars working within the framework of SDT assume that teachers' behaviors and practices have a substantial effect on students' feelings about and engagement in learning. This perspective suggests that findings of a decline in students' adaptive motivation to schoolwork stem, at least to some degree, from a decline in environmental support of the three psychological needs of autonomy, competence, and relatedness. Indeed, in support of this contention, research finds that in comparison with elementary school teachers, junior high school teachers provide less autonomy and less social support to students (Eccles et al., 1993; Midgley, Anderman, & Hicks, 1995). Thus, according to SDT, such a difference in teachers' support of the psychological needs in elementary and junior high schools would be associated with a parallel difference in students' adaptive motivation across the two school systems.

In the present study, we investigated whether a difference in support for students' needs between elementary and junior high school (Eccles et al., 1993; Midgley, Anderman, & Hicks, 1995) would be related to a difference in students' adaptive motivation for doing homework in the two school systems. More specifically, we hypothesized that students' perceptions of teachers' support of psychological

needs would mediate the negative relation between school level (elementary vs. junior high) and students' autonomous motivation towards homework.

Individual Differences in Students' Expressed Needs

SDT views the three psychological needs as organismic: "innate psychological nutriment that are essential for ongoing psychological growth, integrity, and well-being" (Deci & Ryan, 2000, p. 229). Thus, the theory conceives of the psychological needs as part and parcel of the fundamental psychological make-up of each and every person. Hence, the theory hypothesizes that any change in environmental support for the psychological needs will manifest in change in students' motivation. However, similar to innate differences in the strength of people's physiological needs, there are likely to be innate differences in people's needs for competence, relatedness, and autonomy (Deci & Ryan, p. 232). Moreover, as the level of the need for nourishment may change within the same individual at different periods of life (e.g., during growth spurts vs. between growth spurts), in relation to different types of activities (e.g., more and less taxing on the organism), and even at different times of the day (e.g., right after receiving nourishment vs. long after receiving nourishment), it may be that people would also express different levels of the psychological needs for autonomy, competence, and relatedness in different developmental stages, contexts, and domain. For example, research suggests that children's level and nature of expressed need for autonomy may change along development (e.g., higher in adolescence in comparison with that in childhood; Eccles et al., 1993), and that some of the avenues to autonomy satisfaction may differ from culture to culture (Katz, 2003). Similarly, the level and manifestation of the need for competence may change depending on the domain (e.g., requiring different levels of guidance and structure at different levels of skill or task difficulty). Last, the level and manifestation of the need for relatedness may also be different in different developmental stages and social settings (e.g., with parents, close friends, in a big public crowd; Eccles et al., 1993).

Researchers within SDT disagree whether individual differences in expressed level of psychological needs would moderate the role of environmental support on people's motivation. Some theorists argue that despite possible individual differences in level of psychological needs, it is people's perceived environmental support of the psychological needs that constitutes the relevant factor for need satisfaction and for adaptive motivation (Deci & Ryan, 2000). Other theorists, however, suggest that individual differences in level of needs may be relevant for understanding the role of environmental support in motivational processes (Vallerand, 2000). These theorists suggest that individual differences in level of needs may moderate the relation between perceived environmental support of the needs and people's motivation (Richer, Blanchard, & Vallerand, 2002). This raises the possibility that students with different level of needs may have different

sensitivities to environmental need support and would differ with regard to the effect of environmental conditions on their level of perceived teacher need support. In this case, we would expect that, in the same environment, students with lower level of needs would perceive higher needs support than would students with higher level of needs. Alternatively, it is possible that students with different levels of psychological needs would perceive similar level of environmental needs support but would require different levels of support for needs satisfaction. In this case, we would expect that, in the same environment, students with lower level of needs would require lower level of environmental needs support for needs satisfaction than would students with higher level of needs. In the present study, we investigated the following hypotheses: (a) whether individual differences in expressed level of the needs would moderate the relations between students' school level and their perceived environmental support of psychological needs; and (b) whether individual differences in expressed level of needs would moderate the relations between students' perceived environmental support of psychological needs and autonomous motivation for doing homework.

Homework: A Unique Academic Task

A growing body of research supports the relation between teachers' support of the three psychological needs and students' adaptive motivation for school activities (Reeve & Jang, 2006). However, relatively little research exists, to our knowledge, concerning the role of teachers' motivational emphases and practices in children's motivation in the specific task of homework.

As an academic task, homework involves different motivational processes than do school-bound academic activities. First, whereas homework is often perceived to be a major and important task in students' life, it is a task that takes hours from after-school time (Levin et al., 1997). Thus, unlike school-bound academic activities, the homework task competes with activities that students engage in during their leisure time. Moreover, unlike school-bound activities, which are supposedly performed in educational settings, homework is done at home, often with only few environmental cues and supports for focusing on the task. Last, unlike school-bound activities, which are conducted under the supervision of a teacher, homework is done either with no supervision or under the supervision of a parent. Also, because very often students are either not motivated to do homework or are motivated because of extrinsic reasons (Walker et al., 2004), the interaction around homework at home mostly involves conflict between parents and children (Cooper, 2001).

All these characteristics raise the possibility that motivational patterns for homework may be somewhat different from those in motivation to school-bound activities. Specifically, it is not clear whether adaptive motivation for doing homework would indeed be lower among junior high students relative to elementary school students. Moreover, it is not clear what role would teachers' motivational

emphases play in motivation for doing homework. The present study aims to investigate these questions.

The Present Study

The present study used SDT to investigate the role of teachers' motivational emphases in students' adaptive motivation towards homework. More specifically, on the basis of findings from stage-environment fit concerning differences in students' motivation between elementary and junior high school systems (Eccles et al., 1993), we began by investigating whether students' adaptive motivation for doing homework manifests similar patterns to motivation for school-bound activities, and is lower among junior high school students in comparison with elementary school students. We followed by investigating whether the hypothesized difference in adaptive motivation for doing homework between junior high and elementary school students is mediated by a difference in perceived teacher support of students' psychological needs. Last, we investigated whether the mediating role of teachers' support of students' psychological needs between school level and adaptive motivation for doing homework is different at different levels of students' expressed needs, constituting a case of *moderated mediation* (Baron & Kenny, 1986)

The present study was conducted in the context of Bible studies. Bible studies is a mandatory subject domain in the Israeli Jewish education system. Unlike the Israeli Jewish religious school system, in which Bible studies is taught as part of the religious curriculum, held in high esteem, and comprises a significant portion of the weekly schedule; in the secular school system, Bible studies is considered a part of the humanities curriculum, is taught from a literary perspective, and receives a small allocation of up to 5 hours in the weekly schedule. Thus, in the present context, Bible studies can be thought of as equivalent to other humanities subject matters. Homework in Bible studies follows the national curriculum and involves worksheets asking students to translate and explain Biblical Hebrew text in modern Hebrew and conduct literary analysis of Biblical stories (e.g., explain characters and their motives, the moral messages of stories). Assignments in the elementary school curriculum focus more on literal understanding of the stories whereas assignments in junior high school focus more on interpretation. Homework is assigned in almost every lesson and its evaluation comprises a significant element in students' grades in this subject matter. In a pilot study, 92% of the students reported that they complete all or most of the homework assigned in Bible studies. Approximately 40% of the students reported spending up to 15 min on homework per lesson, whereas the other 60% reported spending more time. The majority (92%) indicated that they do not get a choice in their Bible studies homework and many (74%) perceived the homework as a rehearsal of classwork.

Participants in the study came from two elementary schools and one junior high school in Israel. Most Israeli students attend relatively small (200–300 students) neighborhood elementary schools, with 2–3 classes in each grade level. Between

sixth grade and seventh grade, most Israeli students make a transition to a large 6-year comprehensive (2,000–3,000 students) high school, in which Grades 7 and 8 are considered junior high. Whereas junior high school students are commonly housed in separate buildings from the high school students, the academic and social character of the junior high is similar to those of the high school. For example, in the junior high school, there is a large number of classes in each grade level, the teachers interact with hundred of students, and the instruction and evaluation practices are more standardized than they are in the elementary school. These characteristics were those mentioned by stage-environment fit theorists as contributing to the sense of mismatch in environmental support and adolescents' developmental needs, which could lead to a decline in adaptive motivation (Eccles et al., 1993). We therefore hypothesized that Israeli junior high school students' would perceive their teachers as providing less support for the psychological needs than would the Israeli elementary school students.

Our specific hypotheses were the following:

Hypothesis 1: Junior high school students will report lower autonomous motivation towards homework than will elementary school students.

Hypothesis 2: Junior high school students will perceive their teachers as providing less support of their psychological needs than will elementary school students.

Hypothesis 3: Students' perceptions of teachers' support of psychological needs will mediate the relationship between school level and autonomous motivation towards homework.

Hypothesis 4: Students' expressed level of needs will moderate the role of perceived teachers' support of students' needs in the relation between school-level and autonomous motivation for doing homework in two possible ways. One, students' expressed level of needs will moderate the relations between school level and students' perceived teachers' support of needs. School level will be related more strongly and negatively to students' perceived teachers' support of needs at higher levels of expressed needs. Two, students' expressed level of needs will moderate the relations between students' perceived teachers' support of needs and students' autonomous motivation. Teachers' support of students' needs will be related more strongly and positively to autonomous motivation at higher levels of expressed needs.

METHOD

Participants

Participants were 71 fourth-grade students (27 boys, 44 girls) from two elementary schools and 108 eighth-grade students (44 boys, 64 girls) from one junior high school all located in a secular middle-class community in southern Israel. The students were retrieved from three fourth-grade classes that are taught by two

different Bible studies teachers and four eighth-grade classes that are taught by two different Bible studies teachers.

Participants responded to surveys asking about their motivation for doing homework, their perceptions of their teacher's behavior as supporting their psychological needs in the context of homework, and their needs in the context of homework.

Procedure

Permission to administer surveys to students was granted by the Israeli Ministry of Education, the school administration, and students' parents. Surveys were administered during school time in students' classrooms. No teachers were present during administration. Research assistants explained to students that the purpose of the survey was to understand more about their attitude towards homework. Students' were guaranteed the confidentiality of their responses and were asked not to write their names on the survey. Students practiced responding on a sample item and were encouraged to ask questions about any item that they found to be unclear.

Measures

Surveys were administered in students' mother tongue—Hebrew. Surveys were phrased to focus on homework in the domain of Bible studies. Responses on all items were on a 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*very very much*). Because in several measures the items were newly constructed, we conducted exploratory factor analyses. We conducted all exploratory factor analyses with maximum likelihood extraction and with an oblique rotation because the factors were expected to correlate with each other. We used a combination of eigenvalue greater than 1 and a visual scree test to determine the number of factors in each analysis.

Students' adaptive motivation for doing homework. Students' adaptive motivation for doing homework was assessed with 16 items constructed based on the approach that R. M. Ryan and Connell (1989) developed (Grolnick & Ryan, 1989; Grolnick et al., 1991). Items were phrased to focus on homework. Participants indicated the extent to which they are engaged in homework out of controlled reasons (external or introjected forces or pressures, e.g., "I do my homework because I want to get a better grade," "I do my homework because I'll feel ashamed if the teacher will find out I didn't do it") or autonomous reasons (identified or intrinsic reasons that reflect endorsing the value of the task or enjoyment it; e.g., "I do homework to improve my understanding in this subject," "I do my homework because it is fun").

The results indicated that the items loaded on two distinct factors that accounted for 52% of the variance. Items loaded on their expected factors with no cross-loading more than .30 on the other factor. The first factor accounted for 38% of the variance and included 10 items assessing students' engagement in homework out of intrinsic/autonomous reasons ($\alpha = .93$) with loadings ranging from .65–.80. The second factor accounted for 14% of the variance and included 6 items assessing students' engagement in homework out of extrinsic/controlled reasons ($\alpha = .81$) with loadings ranging from .43 to .85. The two factors were weakly and positively correlated, $r = .21, p < .01$.

Because in this specific study, we focused on students' adaptive motivation, we used the autonomous motivation variable as the dependent variable (see Williams, McGregor, Zeldman, Freedman, & Deci, 2004). However, because of the positive correlation between the two factors, analyses included the controlled motivation variable as a covariate.

Teachers' support of students' needs. We assessed students' perceptions of their teachers' behaviors as supporting their psychological needs with items adopted from various scales for the assessment of teachers' support of autonomy, competence, and relatedness (Alfi, Assor, & Katz, 2004; Assor et al., 2002; Grolnick, Deci, & Ryan 1997; Reddy, Rhodes, & Mulhall, 2003; Reeve & Jang, 2006; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Skinner & Belmont, 1993). The items assessing perceived teacher support of autonomy included items that tapped teachers' behaviors such as showing understanding for students' perspective, providing a relevant rationale for the task, offering choice, and allowing criticism (e.g., "The teacher provides us choice of tasks in homework," "The teacher explains what homework is good for"). The items assessing perceived teacher support of competence tapped teachers' behaviors such as setting optimally challenging tasks, helping students to plan their work and providing informative and noncomparative feedback (e.g. "The teacher matches the difficulty level of the task to each of us," "The teacher makes sure that we all understand the task"). The items assessing perceived teacher support of relatedness tapped teachers' behaviors such as encouraging peer acceptance and empathy in the classroom and minimizing social comparisons and competition among students (e.g. "The teacher gives us the feeling that she respects us even if we do not succeed in homework," "The teacher takes personal interest in students").

Because these items were adopted and modified from several instruments, we conducted exploratory factor analyses with oblique rotation. All of the items loaded on a single factor, explaining 53% of the variance, with no apparent patterns relating to the three different needs. Loadings ranged between .48 and .81. The reliability of the scale was high ($\alpha = .93$). These data indicated that students do not distinguish between teachers' behavior that supports different needs but rather treat support for psychological needs globally. These findings are consistent with

the literature that suggests that students' perceptions of their teacher are affected by a general impression they have of the specific teacher (Patrick, Anderman, Ryan, Edelin, & Midgley, 2001; Urdan, Kneisel, & Mason, 1999). Therefore, we constructed one variable to assess teachers' global support for students' psychological needs.

Student's expressed level of needs. We assessed students' expressed level of needs with items assessing students' needs for autonomy, relatedness, and competence in the context of homework. The items were constructed on the basis of scales assessing support of the three needs (Grolnick et al., 1997; Reddy et al., 2003; Reeve & Jang, 2006; Skinner & Belmont, 1993). Thus, the items assessing students' need for autonomy in the context of homework included items that assessed students' expressed need for a relevant rationale for the task and for having choice among tasks (e.g., "I need choice of tasks in homework," "I need to know what homework is good for"). The items assessing students' need for competence in the context of homework included items that assessed students' need for optimally challenging tasks, help in planning their work, and receiving informative and noncomparative feedback (e.g., "It is important to me that the homework task will be challenging"). The items assessing students' need for relatedness in the context of homework included items that assessed students' need for acceptance, empathy, and personal relations (e.g., "I need to feel respected even if I do not succeed in homework," "It is important to me to feel that the atmosphere around homework is pleasant").

Similar to items assessing teachers' support of psychological needs, we conducted an exploratory factor analysis with oblique rotation. Again, similar to the findings with items assessing teachers' support of psychological needs, all of the items assessing students' expressed level of needs loaded on one factor that accounted for 43% of the variance. Loadings ranged from .49 to .76. The 14 items were found to be highly correlated, and the scale comprised by these items was reliable ($\alpha = .91$).

RESULTS

Table 1 presents the descriptive statistics of the variables in the study and the correlations among the variables.

All variables manifested acceptable psychometric characteristics. School level was negatively correlated with perceived teachers' support of students' needs ($r_{pb} = -.58, p < .001$), autonomous motivation ($r_{pb} = -.56, p < .001$), and level of expressed needs ($r_{pb} = -.7, p < .01$). Older students reported lower levels of perceived teachers' support of students' needs, autonomous motivation, and

TABLE 1
Descriptive Statistics and the Correlations Among the Variables

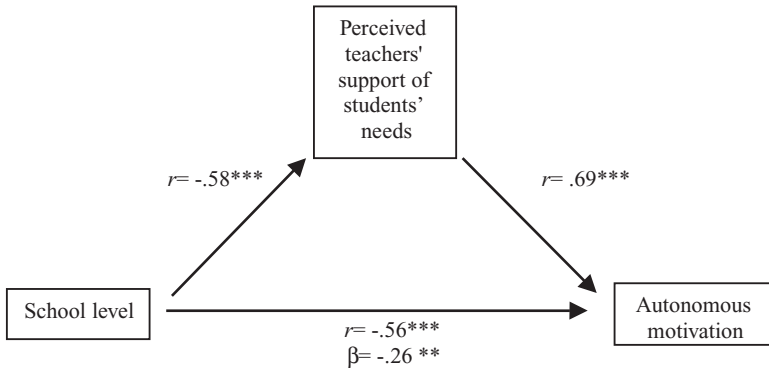
	<i>Expressed level of needs</i>	<i>Controlled motivation</i>	<i>Autonomous motivation</i>	<i>Perceived teachers' support of students' needs</i>
	<i>M=3.60</i>	<i>M=2.60</i>	<i>M=3.01</i>	<i>M=2.84</i>
	<i>SD=.84</i>	<i>SD=.91</i>	<i>SD=.98</i>	<i>SD=.98</i>
	<i>Skewness=-.47</i>	<i>Skewness=.43</i>	<i>Skewness=.15</i>	<i>Skewness=-.82</i>
School level	-.27***	-.05	-.56***	-.58***
4th grade = 1				
8th grade = 2				
Expressed level of needs	—	.25**	.58***	.48**
Controlled motivation	—	—	.21**	.17*
Autonomous motivation	—	—	—	.69***

Note. $N=179$; * $p < .05$, ** $p < .01$, *** $p < .001$; Correlation coefficients with School level are point-biserial correlation coefficients.

psychological needs than did younger students. However, school level was not correlated with controlled motivation ($r_{pb} = -.05, ns$). As expected, teachers' support of students' needs was strongly and positively correlated with autonomous motivation ($r = .69, p < .001$), but also weakly and positively correlated with controlled motivation ($r = .17, p < .05$). Expressed level of needs was positively correlated with controlled motivation ($r = .25, p < .01$), with autonomous motivation ($r = .58, p < .001$), and with perceived teachers' support of students' needs ($r = .48, p < .01$). Most of the correlations between the variables are consistent with the literature and with theoretical predictions. However, the positive albeit low correlation between autonomous and controlled motivation was surprising and inconsistent with previous studies. Therefore, to make sure that analyses address the outcome variable of autonomous motivation, all analyses include controlled motivation as a covariate.

We conducted an analysis of covariance with school level as an independent variable, autonomous motivation as a dependent variable, and controlled motivation as a covariate to test the first hypothesis—that junior high school students would report lower autonomous motivation towards homework than would elementary school students. The analysis suggested that the difference in reports of autonomous motivation towards homework between participants in eighth grade and in fourth grade was statistically significant, $F(1, 176) = 81.03, p < .001, \eta^2 = .32$. Eighth-grade students ($M = 2.56, SD = 0.78$) reported less autonomous motivation than did fourth-grade students ($M = 3.70, SD = 0.87$).

We conducted an analysis of variance with school level as an independent variable and perceived teacher needs support as a dependent variable to test the second hypothesis—that junior high school students would perceive their teachers



Note. $N=179$; $*p<.05$; $**p<.01$; $***p<.001$; Correlation coefficients with School Level are Point-Biserial correlation coefficients. Sobell test is significant ($-7.35, p<.001$).

FIGURE 1 Mediation model: perceived teachers' support of students' needs mediating between school level and autonomous motivation.

as providing less support of their needs than would elementary school students. The analysis indicated a statistically significant difference in students' reports of teachers' support of students' needs in the two grade levels, $F(1, 177) = 91.5, p < .001. \eta^2 = .34$. Participants in the eighth grade ($M = 2.40, SD = 0.70$) reported less perceived teacher support of students' needs than did participants in the fourth grade ($M = 3.55, SD = 0.93$).

To test the mediation hypothesis, we followed recommendations by Baron and Kenny (1986). We ran regression analyses in which school level was the independent variable, autonomous motivation was the dependent variable, controlled motivation was a covariate, and the hypothesized mediator—perceived teachers' support of students' needs—was entered as an independent variable in the second step. The results are presented in Figure 1.

The analysis indicated that when perceived teachers' support of students' needs was entered into the equation, the decrease in the direct path between school level and students' autonomous motivation for homework was statistically significant (Sobell test = $-7.35, p < .001$). The magnitude of the indirect path between school level and students' autonomous motivation for doing homework, through perceived teacher support of students' needs ($\beta = -.38$), was a bit higher than but not statistically different from the remaining direct path. These findings suggest that perceived teachers' support of students' needs is a partial mediator between school level and students' autonomous motivation for doing homework.

To test the two hypotheses concerning the moderating role of students' expressed level of needs in the mediation of teachers' support of students' needs between school level and students' autonomous motivation, we used a modified *moderated causal step procedure* (Baron & Kenny, 1986; Muller, Judd & Yzerbyt, 2005). The common procedure in testing a moderated mediation involves introducing interaction terms in a series of stepwise regressions that test a *moderated total effect model*: The potential moderating role of the moderator in each of the paths in the mediation model, including the indirect and the direct paths. Most studies follow a procedure described by Muller et al. that involves three regression analyses with interaction terms that, in the present study, would correspond to the following analyses: (a) the moderation of students' expressed level of needs on the overall simple relations between school level and autonomous motivation for doing homework, (b) the moderation of students' expressed level of needs on the relations between school level and teachers' support of students' needs, and (c) the moderation of students' expressed level of needs on the relation between teachers' support of students' needs and autonomous motivation as well as on the residual relation between school level and autonomous motivation after controlling for teachers' support of students' needs. Our hypotheses do not concern the moderation of students' expressed level of need on the total effect of school level on autonomous motivation. Rather, the hypotheses directly concern two distinct processes: (a) the moderated effect of students' expressed level of needs on the relations between school level and teachers' support of students' needs and (b) the moderated effect of students' expressed level of needs on the relations between teachers' support of students' needs and autonomous motivation. Therefore, we only conducted the corresponding two regression analyses: (a) a regression predicting perceived teachers' support of students' needs with school level, students' expressed level of needs, and their interaction as predictors; and (b) a regression predicting autonomous motivation for doing homework with perceived teachers' support of students' needs, students' expressed level of needs, and their interaction as predictors. Following Aiken and West (1991), to reduce multicollinearity, the variables of perceived teachers' need support and students' expressed level of needs were centered before forming the interaction terms.

Table 2 presents the results testing for the moderation of students' expressed level of needs on the relation between school level and perceived teachers' support of needs. The results in Table 2 indicate that students' level of needs, which in and of itself is a positive predictor of perceived teachers' support of students' needs, is also a moderator in the relations between school level and perceived teachers' support of needs. Figure 2 presents a plot of the interaction.

An interpretation of the statistically significant interaction suggests that students in junior high school were less likely than students in elementary school to perceive teachers' support of needs; however, the magnitude of the difference was higher among students who expressed higher levels of needs than among students who

TABLE 2
 Regression Results of the Moderating Role of Students' Expressed Level of Needs on the Relations Between School Level and Perceived Teachers' Support of Students' Needs

	<i>Dependent variable: Perceived teachers' support of students' needs</i>		
	<i>Step 1</i>	<i>Step 2</i>	<i>Step 3</i>
School level	-.58 ^c	-.51 ^c	-.48 ^c
Level of needs		.28 ^c	.35 ^c
School level × level of needs			-.19 ^a
<i>R</i> ²	.34	.41	.45
ΔR^2		.07	.04

Note. *N* = 179; ^a*p* < .017, ^b*p* < .01, ^c*p* < .001; Values in the Table are Beta weights.

expressed lower level of needs. Accounting for this moderation added 4% to the explained variance in perceived teachers' support of needs.

Table 3 presents the results testing for the moderation of students' expressed level of needs on the relation between perceived teachers' support of needs and students' autonomous motivation for doing homework. The results in Table 3 indicate that students' expressed level of needs, which is in itself a positive predictor of

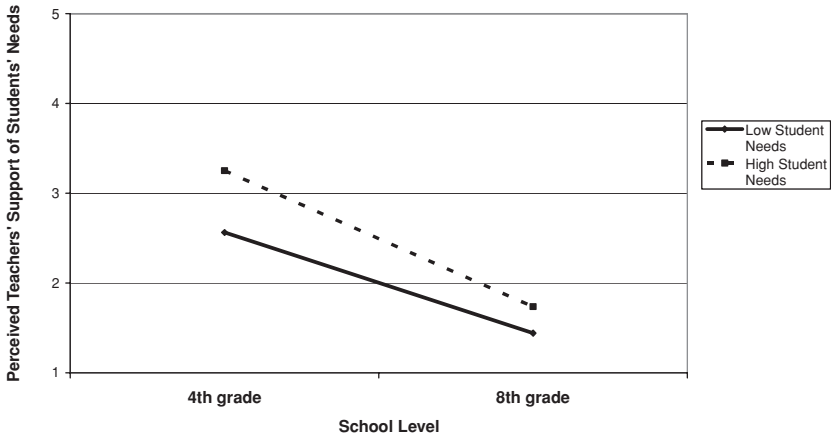


FIGURE 2 Interaction between school level and students' level of needs in predicting perceived teachers' support of students' needs.

TABLE 3
 Regression Results of the Moderating Role of Students' Expressed Level of Needs on the Relations Between Perceived Teachers' Support of Students' Needs and Autonomous Motivation for Doing Homework

	<i>Dependent variable: autonomous motivation for homework</i>			
	<i>Step 1</i>	<i>Step 2</i>	<i>Step 3</i>	<i>Step 4</i>
Controlled motivation	.21 ^b	.10	.04	.05
Perceived teachers' support of students' needs		.65 ^c	.51 ^c	.48 ^c
Level of needs			.36 ^c	.39 ^c
Perceived teachers' support of students' needs × Level of needs				.13 ^a
<i>R</i> ²	.05	.46	.56	.57
ΔR^2		.41	.10	.01

Note. *N* = 179; ^a*p* < .017, ^b*p* < .01, ^c*p* < .001; Values in the Table are Beta weights.

autonomous motivation, was a moderator of the relation between teachers' support of needs and autonomous motivation. Figure 3 presents a plot of the interaction.

Teachers' support of needs was positively associated with autonomous motivation, but the magnitude of the relation was higher among students who expressed higher level of needs than among students who expressed lower level of needs.

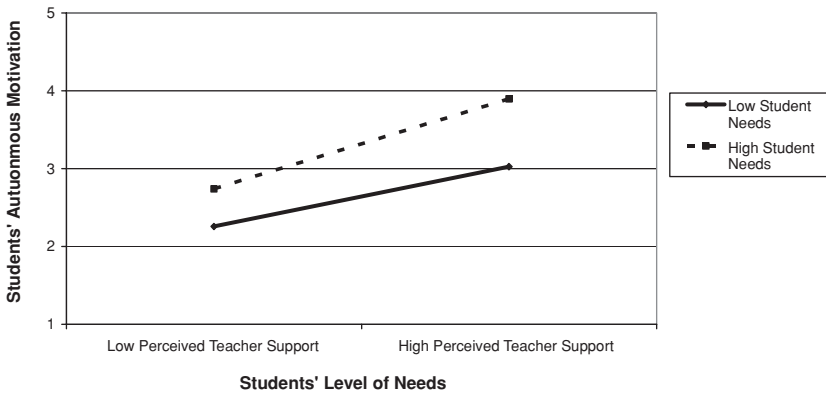


FIGURE 3 Interaction of level of students' needs and teachers' support of students' needs in predicting student autonomous motivation for homework.

Still, the contribution of the moderation to the explained variance in autonomous motivation was marginal—only 1%.

DISCUSSION

The findings of the present study support the hypothesis that junior high school students report lower autonomous motivation for homework than do elementary school students. These findings are consistent with research that has found similar differences in motivation to learn among students across the transition from elementary to junior high school (Anderman et al., 1999; Eccles et al., 1996). More important is that the findings also indicate that junior high school students perceived their teachers as less supportive of their psychological needs than did elementary school students. Again, these findings are consistent with research that has indicated a difference in both students' perceptions of teachers' support (Eccles et al., 1993; Reeve & Jang, 2006; Vallerand et al., 1997) and of teachers' reports of supportive attitudes and practices (Midgley et al., 1995) between elementary and junior high schools. We found the difference in perceived teacher support to be a partial mediator in the relations between school system and students' autonomous motivation for homework. Homework assignments are administered by teachers but are performed at home without direct teachers' supervision and support. Yet, the findings suggest that teachers' support of autonomy, competence, and relatedness extends beyond the realms of the school's walls. SDT emphasizes the important role of environmental support of students' psychological needs for adaptive motivation and development (Deci & Ryan, 2000). The present findings indicate that such support may cast its effect beyond the specific situation within which it is experienced and carry over into other albeit related settings.

It is interesting that the findings also provided some indication that the detrimental effect of the junior high school environment on students' perceived teachers' support of students' needs was somewhat more severe for students who expressed higher level of psychological needs. Students who reported experiencing higher level of psychological needs in junior high were also more likely to perceive their teachers as providing less needs support. The current findings suggest that experiencing higher levels of psychological needs may be related to experiencing environments as less supportive. Since perceptions of lower teacher support of needs are associated with maladaptive motivational and emotional processes (Reeve & Jang, 2006), this issue requires attention. Individual differences in expressed level of needs may be the result of personality dispositions, characteristics of students' home environment, orientations towards academic learning, more or less interest in or familiarity with the material, characteristics of the interpersonal relations between students and a specific teacher and, very likely, the interaction

between these personal, contextual, and situational processes (Vallerand, 2000). The role of these various factors in expressed level of needs, and most particularly the role of situations and contexts, is an important topic for future research.

The findings also suggested that the role of teachers' support of psychological needs in students' autonomous motivation for homework was moderated by students' level of expressed needs. However, the moderation of this relation was quite weak, and the overall findings seem to suggest that perceived teachers' support is important to all students. These findings support the claim that it is the level of perceived environmental support rather than the individual difference in level of needs, in and of itself, that should be the focus of educators and parents as they aim to facilitate students' autonomous motivation for homework (Deci & Ryan, 2000). Nevertheless, the role of individual differences in experienced and expressed level of needs is an understudied topic in SDT. Clearly, the findings of the current study require replication and further investigation.

The present study used a cross-sectional design. Future research should use longitudinal designs to assess the role of teachers' support of psychological needs in the change of students' quality of motivation to homework. In addition, the present findings may reflect unique characteristics of the specific subject matter studied—homework in Bible studies. Future research should replicate the findings in other subject domains. Last, the present investigation relied on students' self-reports. Whereas the effect of teachers' behavior on students' motivation is mediated by students' perceptions of these behaviors (Berliner, 1989), future research may strengthen the findings by including additional sources such as observations and teachers' reports.

In conclusion, the findings highlight the important role of teachers' support of students' psychological needs in the quality of students' motivation to homework. Whereas the findings suggest that students' individual differences may moderate the role of environmental conditions on students' perceived teachers' support, the findings do indicate that perceived teachers' support is important to all students. Yet, teachers' support of psychological needs explained only some of the difference in adaptive motivation to homework of junior high and elementary school students. It is very likely that characteristics of the home environment, such as parents' support, are also related to differences in the quality of students' motivation to homework at different ages. Future research is needed to investigate the role of parents' support and of the home environment more generally. Such research could be fruitful in providing insights and recommendations about improving home-school collaborations that would facilitate quality engagement in homework. At present, the findings of our study highlight the potential change that teachers' behavior that supports students' needs can have in students' motivation for homework. Because homework is often a sore issue in teacher-student interactions, including this insight as part of teacher training may alleviate some distress on both teachers and students.

AUTHOR NOTES

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