

Homework Purposes Reported by Secondary School Students: A Multilevel Analysis

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ABSTRACT. The author examined purposes for doing homework as perceived by 969 eighth-grade students from 52 classes and 831 11th-grade students from 45 classes. Through an exploratory factor analysis, 15 homework purposes were reduced to a 3-factor structure: peer-oriented, adult-oriented, and learning-oriented reasons. A series of 3 multilevel models were run, with each derived factor serving as the dependent variable. All three factors were positively associated with homework interest, teacher feedback, affective attitude toward homework, and family homework help. Adult-oriented and learning-oriented reasons were negatively associated with homework distraction. Boys reported statistically significantly lower scores in adult-oriented and learning-oriented reasons than did girls. Finally, older students were more likely to do homework for peer-oriented and learning-oriented reasons.

Keywords: homework, multilevel analysis, secondary school

Homework views ascribed by adults exert important but more distal influences on student homework behavior than do children's own views (Bryan, Nelson, & Mathur, 1995; Cooper, Lindsay, Nye, & Greathouse, 1998; Leung, 1993; Warton, 2001). However, much contemporary literature on homework purposes reflects an adult point of view (Epstein & Van Voorhis, 2001; Warton), and few studies have investigated purposes of doing homework perceived by children (Warton; Xu, 2005).

Recently, Xu (2005) examined purposes for doing homework as perceived by 920 students in Grades 5–12 and whether their perceptions were related to gender, grade level, and family homework involvement. However, no data were available about whether homework purposes were influenced by other important variables, such as homework interest and teacher feedback. In addition, the study did not examine the hierarchical structure of the data (i.e., students nested within classes).

Consequently, there is a need to model the multilevel structure of the data to examine how students may perceive homework purposes (Xu, 2005) and how their perceptions may be influenced by a broad spectrum of variables

in the homework process. This line of research is important, as “homework is a multifaceted process that involves a complex interplay of factors in two contexts—home and school” (Warton, 2001, p. 155), and as homework purposes perceived by students (e.g., relating to school learning and self-regulation) are associated with their use of homework management strategies, homework completion, and their class grades (Xu). This line of research is particularly important at the secondary school level, as “students grow older their own attitudes about homework play . . . an increasingly important role in how much homework they complete and in their class grades” (Cooper et al., 1998, p. 81).

Related Literature

The present investigation was informed by two lines of related literature: (a) literature that examines purposes for doing homework as perceived by students, and (b) literature that suggests a number of factors that may link to their perceived purposes for doing homework.

Homework Purposes

The first line of literature finds that children often do homework for multiple purposes, some of them maybe of little priority to their parents and teachers. Xu and Corno (1998) examined purposes for doing homework as perceived by third-grade students, their parents, and teachers. The data were collected through (a) open-ended interviews, (b) videotaped observations of homework sessions, and (c) stimulated-recall interviews with parents, following each homework session.

The results revealed that the parents and teachers shared similar views about purposes for doing homework, namely, homework was a way to reinforce school learning (e.g., “to understand better what’s going on in the classroom”) and to develop self-regulatory attributes (e.g., “You have to

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have responsibility to complete daily assignments"). As for the children in the study, a majority of them were aware of the role that homework played in helping them better understand their lessons (e.g., it helps me "learn more" and "do math better"). Yet they seemed unaware of their parents' view that homework could foster the development of desirable attributes. On the other hand, "doing homework became one route to gain approval from significant others" (Xu & Corno, 1998, p. 414). For example, one girl said she wanted her father to be proud of her; it made her feel good when he told her that all of her homework was right. One mother observed that her son was much more willing to do his homework in the third grade because he got along better with this teacher than he had with other teachers in previous grades.

To provide a greater perspective on how homework purposes may evolve over time, Xu and Yuan (2003) interviewed middle school students, teachers, and their parents. One purpose of homework shared by students, parents, and teachers was to review, practice, and reinforce what students learned in class. Another reason, shared mostly by teachers and parents, was the development of personal responsibility and study skills (e.g., "I look on homework as a way to have kids own their own learning, and really learn how to set their own pace, manage their time and energy, and plan what they have to do"). This purpose, to a lesser extent, was also mentioned by some students (e.g., "Homework helps you improve study skills").

Students further noted that they did homework to please significant others or to comply with their expectations. Some students considered it too obvious to even be asked. For example, one student responded, "[Why] do homework? The teacher tells us to do it, and I'm not going to disobey and not do my homework." Likewise, another student commented that "my dad says I have to get good grades, so I do homework even if I don't feel like it."

To determine how secondary school students would classify a set of homework purposes drawn from relevant literature, Xu (2005) conducted an exploratory factor analysis to ascertain the underlying factor structure of these homework purposes, based on the survey data from 920 students in Grades 5–12. The sample was 89.8% Caucasian, 3.2% Latino, 3.0% multiracial, 1.8% Asian American, 1.4% African American, and 0.8% Native American.

The eight homework purposes included in the study ranged from reinforcing school learning, developing a sense of responsibility and good discipline, learning study skills, and learning to work independently, to gaining approval from teachers, parents, and peers. The results from an exploratory factor analysis indicated that the eight homework purposes could be reduced to a two-factor structure that accounted for nearly two thirds of the total variance (65.7%). One factor was labeled as Intrinsic Factor, consisting of five items regarding reinforcement of school learning and the development of self-regulatory attributes (e.g., responsibility, discipline, study skills); the second factor was labeled as Extrinsic Factor, including the three remaining items relating

to gaining approval from teachers, parents, and peers. Alpha reliability coefficients for the scores on these two factors were .84 and .80, respectively.

In addition, the result from a one-way, within-subjects analysis of variance (ANOVA) revealed a statistically significant difference between Intrinsic Factor and Extrinsic Factor. The students were more likely to agree that they did homework for Intrinsic Factor than for Extrinsic Factor.

Influences on Homework Purposes

Whereas the first line of literature examines purposes of doing homework as perceived by students, the second line of literature alludes to a number of variables that may influence their perceived purposes for doing homework. These variables have included student and family characteristics, family homework help, teacher feedback, and homework interest.

Leone and Richards (1989) employed the Experience Sampling Method to investigate students' subjective experiences while doing homework, based on the data from 401 students in Grades 5–9. The students were asked to carry an electronic pager for one week. When signaled, every 2 hr between 7:30 a.m. and 9:30 p.m., students completed brief reports on where they were, with whom they were, what they were doing, and what they were thinking.

Students rated their levels of positive affect, motivation, and attention lower during homework than they did during other after-school activities (e.g., eating, doing chores). Students reported that they were most attentive to homework when completing it with a parent (rather than with a peer or on their own), implying that parental assistance with homework may influence student homework behavior and attitudes.

Recently, Trautwein, Ludtke, Schnyder, and Niggli (2006) linked homework control to homework effort, as reported by 1,501 eighth-grade students from 93 classes in Switzerland. Homework effort was measured using a 5-item scale (Cronbach's $\alpha = .79$), relating to homework completion compliance (e.g., the extent to which students do homework carefully). Homework control (5 items; $\alpha = .79$) assessed the extent to which a teacher monitored homework completion compliance (e.g., the extent to which a teacher checks homework). Data from the study revealed that perceived teacher control was a statistically significant predictor of homework effort at the student level, implying that teacher monitoring may influence student homework attitudes and initiatives.

In addition to the possible linkages between adult monitoring and homework purposes, several studies have alluded to other factors that may influence homework purposes as perceived by secondary school students. In one study reviewed previously (Xu, 2005), each derived factor relating to homework purposes (i.e., Intrinsic Factor and Extrinsic Factor) was further linked to gender, grade level, and family help. A three-way ANOVA with Intrinsic Factor as the dependent variable, and gender, grade level, and family

help as the independent variables, yielded a significant main effect for gender and for family help. Those main effects were qualified by a significant interaction between gender and family help: girls' score on intrinsic purposes was not affected by family help. On the other hand, the effect of homework help was apparent among the boys; those who received help more likely mentioned that they did homework for intrinsic purposes than did boys who did not receive help.

Meanwhile, a three-way ANOVA with Extrinsic Factor as the dependent variable, and gender, grade level, and family help as the independent variables yielded a significant main effect for grade level and for family help. Middle school students were more likely to agree that they did homework for extrinsic purposes than did high school students. In addition, students who received family help were more likely to agree that they did homework for extrinsic purposes than those who did not receive help.

Finally, in their study, Cooper et al. (1998) alluded to a possible linkage between homework purposes and homework interest. The participants were 424 students in Grades 6–12, along with teachers and their parents. They posed five questions to the participants. Two questions focused on homework interest—whether the students in general liked or disliked their homework and thought that it increased or decreased their interest in school. The three other questions focused on homework purposes—whether the students thought it helped them learn, develop study skills, and manage their time. These five items were combined in a homework attitude scale ($\alpha = .77$). The data revealed that, to a large extent, the students did not feel positive about homework, scoring less than halfway down ($M = 6.42$, $SD = 3.15$) on a 14-point scale, and their attitudes were significantly more negative than found either among the parents ($M = 9.30$, $SD = 2.78$) or teachers ($M = 10.15$, $SD = 2.35$) on this composite measure.

Because the 5-item homework attitude scale combined interest items with purpose items, it is not clear whether students' negative attitudes toward homework are due to their responses to the interest items alone, the purpose items alone, or both sets of items (Warton, 2001). On the other hand, the findings that these were reasonable interitem correlations among the five interest and belief items, along with an adequate reliability coefficient for the five-item homework attitude scale, implied that the interest items (i.e., whether homework was liked or disliked and if it increased or decreased interest in school) were positively associated with the purpose items (i.e., whether it helped students learn, develop study skills, and manage their time). Consequently, there is a need to link homework interest and homework purposes, as perceived by secondary school students.

Gaps in Previous Research

Taken together, the first line of literature suggests that students often do homework for a variety of reasons, some of them of little priority to their parents and teachers. Mean-

while, the second line of literature suggests that a number of factors may link to homework purposes (e.g., family help, teacher feedback, homework interest). However, much of what researchers know about homework purposes, as well as the possible linkages between homework purposes and other variables, (a) is inferred from studies that did not focus on homework purposes (Leone & Richards, 1989; Trautwein et al., 2006), (b) is informed by insights from qualitative data (Xu, 1994; Xu & Corno, 1998; Xu & Yuan, 2003), and (c) has failed to incorporate a multilevel perspective (Cooper et al., 1998; Xu, 2005).

In addition, previous research has ignored other important variables that may influence homework purposes. For example, students' views toward and desires to engage in other after-school activities may influence their attitudes toward homework in general and perceived purposes for doing homework in particular (Coutts, 2004; Warton, 2001; Xu & Yuan, 2003).

Meanwhile, secondary school students continue to experience various distractions that often arise during homework time, such as phone calls, television shows, noise from other household appliances, and siblings moving in and out of the room (Benson, 1988; Corno & Xu, 2004; Pool, Koolstra, & van der Voort, 2003a, 2003b; Wober, 1992; Xu & Corno, 2003, 2006). Recent research on learning and memory suggests that distractions affect the way people learn, resulting in the acquisition of knowledge that is less flexibly applied in new situations (Foerde, Knowlton, & Poldrack, 2006; Schmid, 2006), thus implying that homework distraction may influence students' level of learning as well as the purposes and benefits that they attach to doing homework (e.g., the extent to which students view the role of homework in helping them better understand what is going on in class).

Purpose of the Study

The purposes of the present study are twofold. First, in order to determine how secondary school students would perceive and classify a more expanded set of homework purposes drawn from recent literature, an exploratory factor analysis was conducted to ascertain the underlying factor structure of these homework purposes. Second, each derived factor was subjected to multilevel analyses based on a homework model, informed by previous research on homework purposes (discussed previously). In particular, the homework model in the present study was influenced by Cooper's (1989) theoretical model of factors influencing the effectiveness of homework. These factors include exogenous factors, assignment characteristics, initial classroom factors, home–community factors, and classroom follow-up. Consequently, I hypothesized that homework purposes are associated with the following variables at the student level, relating to student and family characteristics (e.g., gender, parent education), the contexts of doing homework at home (e.g., family help, homework distraction, affective attitude toward homework), and assignment characteristics and classroom follow-up (e.g.,

TABLE 1. Rotated Factor Pattern (Structure) Matrix for Homework Purposes

Item	Peer oriented	Adult oriented	Learning oriented
1. Doing homework helps you understand what's going on in class.	-.026 (-.444)	.073 (-.445)	.782 (.750)
2. Doing homework helps you learn how to manage your time.	-.103 (-.470)	-.022 (-.470)	.613 (.688)
3. Doing homework gives you opportunities to practice skills from class lessons.	.096 (-.371)	.058 (-.447)	.855 (.762)
4. Doing homework helps you develop a sense of responsibility.	.019 (-.418)	-.046 (-.498)	.715 (.733)
5. Doing homework helps you learn to work independently.	.011 (-.410)	-.010 (-.468)	.716 (.717)
6. Doing homework helps you develop good discipline.	-.101 (-.440)	-.087 (-.467)	.510 (.625)
7. Doing homework helps you learn study skills.	-.007 (-.437)	-.014 (-.488)	.729 (.742)
8. Doing homework makes your family more aware of your learning at school.	-.097 (-.463)	-.385 (-.629)	.304 (.609)
9. Doing homework brings you teacher approval.	.001 (-.393)	-.616 (-.716)	.156 (.553)
10. Doing homework brings you family approval.	.017 (-.422)	-.987 (-.926)	-.083 (.546)
11. Doing homework brings you approval from classmates.	-.331 (-.548)	-.330 (-.554)	.094 (.499)
12. Doing homework helps you get a good grade.	.035 (-.303)	-.067 (-.390)	.526 (.549)
13. Doing homework helps you prepare for the next lesson.	-.191 (-.545)	-.022 (-.499)	.592 (.717)
14. Doing homework gives you opportunities to work with classmates.	-.833 (-.853)	.018 (-.425)	.049 (.521)
15. Doing homework gives you opportunities to learn from classmates.	-.855 (-.844)	.001 (-.408)	-.018 (.477)

Note. The bolded pattern coefficients represent items considered to load on an appropriate factor.

homework interest, teacher feedback). I further hypothesized that homework purposes are associated with two variables at the class level: grade level, and homework interest (i.e., students' shared assessment of their teachers' homework interest).

Method

Participants and Procedure

Participants were 1,800 students from 97¹ classes in the Southeast United States, including 969 eighth-grade students from 52 classes and 831 11th-grade students from 45 classes. Overall, the survey response rate was 88.9%, and the racial/minority breakdown of the students who responded to this survey was comparable to that of these school districts. Specifically, of the participants in this sample, 46.7% were boys and 53.3% were girls. The sample was 56.0% Caucasian, 37.0% African American, 3.4% multiracial, 1.3% Latino, 1.2% Native American, and 1.1% Asian American. About one third (34.5%) of the participants in this sample received free meals.

Instrument

The homework survey, which took about 40 min to administer, incorporated several variables relating to student and family characteristics. Students were asked to indicate their gender (female = 0, male = 1) and grade level (Grade 8 = 0, Grade 11 = 1). They were also asked to indicate

the frequency of family help on a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*routinely*).

In addition, the survey included two items on parents' education. These two items asked, "What is the highest level of education completed by your father/guardian?" and "What is the highest level of education completed by your mother/guardian?" Possible responses for both items included *less than high school* (scored 6 years), *some high school* (scored 10 years), *high school graduate* (scored 12 years), *some college or two-year college graduate* (scored 14 years), *four-year college graduate* (scored 16 years), *some graduate school* (scored 17 years), and *graduate degree* (scored 19 years). A composite variable for parental education was then constructed by averaging the educational levels for the father and the mother.

Of major interest in the survey were homework purpose statements, built on the initial version of homework purpose statements developed by Xu (2005). The final version of homework purpose statements consisted of 15 items (see Table 1), which retained all eight items used in the previous study (Xu).

Several new items were incorporated to better examine homework as an achievement-related activity (Epstein & Van Voorhis, 2001; Van Voorhis, 2004; Warton, 2001), such as practicing skills from class lessons, preparing for the next lesson, and getting a good grade. Others were included to better reflect the ever-changing reality of doing homework at home, such as opportunities to work with peers presented by the emergence of new technologies (Corno, 2000; Epstein & Van Voorhis, 2001; Foehr, 2006; Lenhart, Madden, & Hitlin, 2005; Lenhart, Simon, & Graziano, 2001; National

TABLE 2. Multi-Item Scales

Scale	Item	α	CI
Learning-oriented reasons ^a	Doing homework helps you learn how to manage your time.	.90	.89, .90
	Doing homework helps you develop a sense of responsibility.		
	Doing homework helps you learn to work independently.		
	Doing homework helps you develop good discipline.		
	Doing homework helps you learn study skills.		
	Doing homework helps you understand what's going on in class.		
	Doing homework gives you opportunities to practice skills from class lessons.		
	Doing homework helps you prepare for the next lesson.		
Adult-oriented reasons ^a	Doing homework makes your family more aware of your learning at school.	.79	.77, .81
	Doing homework brings you family approval.		
	Doing homework brings you teacher approval.		
Peer-oriented reasons ^a	Doing homework brings you approval from classmates.	.79	.77, .80
	Doing homework gives you opportunities to work with classmates.		
	Doing homework gives you opportunities to learn from classmates.		
Homework distraction ^b	Daydreaming during a homework session	.87	.86, .88
	Starting conversations unrelated to what I'm doing (e.g., phone calls)		
	Playing around with other things while doing my homework		
	Stopping homework repeatedly to find something to eat or drink		
	Stopping homework to watch my favorite TV show		
	Stopping homework to surf the Internet		
	Stopping homework to play games (e.g., online games and videogames)		
	Stopping homework to send or receive e-mails		
	Stopping homework to send or receive text messages		
	Stopping homework to send or receive "instant messaging"		
	Stopping homework to send or receive "instant messaging"		
Homework interest	Overall, do you think the homework you get is _____? ^c	.83	.81, .84
	How do you feel about homework in general? ^d		
	How does your homework affect your interest in school?		
Affective attitude toward homework	My motivation or desire to do homework is _____ ^e other after-school activities.	.86	.85, .87
	My attention while doing homework is _____ ^f other after-school activities.		
	My mood while doing homework is _____ ^g other after-school activities.		
Teacher feedback ⁱ	Compared with other activities I do after school, homework is my _____. ^h	.79	.77, .80
	How much of your assigned homework is discussed in class?		
	How much of your assigned homework is collected by teachers?		
	How much of your assigned homework is checked by teachers?		
	How much of your assigned homework is graded by teachers?		
	How much of your assigned homework is counted in your overall grade?		

Note. CI = 95% confidence interval.

^aResponses were 1 (*strongly disagree*), 2 (*disagree*), 3 (*agree*), and 4 (*strongly agree*).

^bResponses were 1 (*never*), 2 (*rarely*), 3 (*sometimes*), 4 (*often*), and 5 (*routinely*).

^cResponses were 1 (*very boring*), 2 (*boring*), 3 (*neither boring nor interesting*), 4 (*interesting*), and 5 (*very interesting*).

^dResponses were 1 (*don't like it at all*), 2 (*don't like it some*), 3 (*neither like it nor dislike it*), 4 (*like it some*), and 5 (*like it very much*).

^eResponses were 1 (*decreases it a lot*), 2 (*decreases it some*), 3 (*does not make a difference*), 4 (*increases it some*), and 5 (*increases a lot*).

^fResponses were 1 (*much lower than*), 2 (*lower than*), 3 (*about the same as*), 4 (*higher than*), and 5 (*much higher than*).

^gResponses were 1 (*much worse than*), 2 (*worse than*), 3 (*about the same as*), 4 (*better than*), and 5 (*much better than*).

^hResponses were 1 (*least favorite activity*), 2 (*less favorite activity*), 3 (*about the same as other activities*), 4 (*more favorite activity*), and 5 (*most favorite activity*).

ⁱResponses were 1 (*none*), 2 (*some*), 3 (*about half*), 4 (*most*), and 5 (*all*).

School Boards Association, 2007). Indeed, according to one recent survey of 1,277 9–17-year-old students, more than 50% of the respondents reported that they talked specifically about schoolwork through social networking tools (e.g., chatting online, text messaging, blogging, visiting online communities such as Facebook and MySpace; National School Boards Association). A 4-point Likert-type scale for-

mat accompanied each item on which students selected a response ranging from 1 (*strongly disagree*) to 4 (*strongly agree*).

In addition, several multi-item scales were used for the present study (see Table 2). These scales included affective attitude toward homework, homework interest, homework distraction, and teacher feedback.

Affective attitude toward homework. Informed by related literature (Leone & Richards, 1989; Xu, 2004, 2006, 2007), four items were used to assess homework favorability or relative attractiveness of homework as compared with other after-school activities, relating to students' motivation, attention, and mood. Internal consistency (Cronbach's α) was .86.

Homework interest. Three items were used to assess the level of homework interest as perceived by students ($\alpha = .83$), informed by literature on interest and intrinsic motivation in general (Deci, Vallerand, Pelletier, & Ryan, 1991; Katz, Assor, Kanat-Maymon, & Bereby-Meyer, 2006; Wigfield & Eccles, 2000), and with homework interest in particular (Cooper et al., 1998; Xu, 2006, 2007). These items measured the extent to which students consider homework interesting and to what extent they like or dislike homework assignments.

Homework distraction. Ten items were used to assess various homework distractions encountered by students while doing homework ($\alpha = .87$). Homework distractions ranged from conventional distractions (e.g., daydreaming, watching television, initiating unrelated conversations; Xu, 2006; Xu & Corno, 2003, 2006) to newer homework distractions (e.g., stopping homework to play online games or to read and answer e-mail and other instant messages; Foehr, 2006; Wallis, 2006; Warton, 2001; Xu, 2008b, 2008c; Xu & Corno, 2003).

Teacher feedback. Five items were used to assess the extent to which teachers provide ongoing homework feedback ($\alpha = .79$), informed by some related literature (Murphy et al., 1987; Trautwein, Koller, Schmitz, & Baumert, 2002; Trautwein et al., 2006; Walberg, Paschal, & Weinstein, 1985). These items measured how much of the assigned homework was monitored by teachers (e.g., discussed, collected, checked).

Statistical Analyses

First, exploratory factor analysis using the maximum likelihood method was performed on the scores of the 15 homework purpose items. Specifically, direct oblimin rotation was used in the present study, as factor structure based on oblique rotation yields interfactor relations that are more realistic than one based on orthogonal rotation (Byrne, 2005; Preacher & MacCallum, 2003). In addition, given that an optimally derived structure reveals that factors to be truly orthogonal, an obliquely rotated factor solution still reflects these independent factor relations (Floyd & Widaman, 1995). A combination of criteria was used to determine the appropriate number of factors to retain (e.g., eigenvalue, scree plots, conceptual meaningfulness of the rotated factors).

Next, for each derived factor, multilevel analyses were computed with the hierarchical linear modeling 6 (HLM) computer program (Raudenbush, Bryk, Cheong, Congdon, & Toit, 2004) to take into account the nonindependence of observations by addressing the variability associated with each level of nesting (Raudenbush & Bryk, 2002; Schreiber & Griffin, 2004; Snijders & Bosker, 1999). To enhance the interpretability of the resulting regression coefficients, all continuous variables were standardized ($M = 1$, $SD = 1$) before performing the multilevel analyses. As a result, the regression weights for all variables (except the dummy-coded variables, including gender and grade level) were approximately comparable with the standardized weights that result from multiple-regression procedures (Trautwein et al., 2006).

Each model² (i.e., for each derived factor) incorporated seven student-level variables, including gender, parent education, homework interest, family homework help, homework distraction, affective attitude toward homework, and teacher feedback. In addition, the variable of homework interest was aggregated at the class level to form an index of students' shared assessment of their teachers' homework interest level (which was not restandardized). This variable, along with grade level, were introduced as two class-level variables.

All models reported are random-intercept models. The random part of the intercept was freely estimated to reflect between-classroom differences in homework purposes. As there were no a priori hypotheses concerning between-classroom differences in the predictive power of the predictor variables, the random parts of the slopes were not estimated. Restricted maximum likelihood estimation was used in all models, and all predictor variables were introduced as uncentered variables.

There were a few missing values, ranging from 0.00% to 6.72% ($M = 2.05\%$, $SD = 1.28\%$). These missing values were imputed using the expectation-maximization algorithm (EM) in SPSS (version 13.0).

Results

Descriptive Statistics

The mean educational level for the parents was 13.60 years ($SD = 2.72$ years). The frequency of family help was *never* (38.2%), *rarely* (11.3%), *sometimes* (27.4%), *often* (16.5%), and *routinely* (6.6%). In addition, the mean score for homework distraction was 2.61 ($SD = 0.87$), falling between *rarely* (scored 2) and *sometimes* (scored 3) on the 10 items that related to various homework distractions. The mean score for affective attitude toward homework was 2.14 ($SD = 0.84$), indicating that students' affect while doing homework was *lower or worse than* (scored 2) that experienced with other after-school activities.

Meanwhile, the mean score for homework interest was 2.37 ($SD = 0.95$), indicating that students were inclined

TABLE 3. Pearson Intercorrelations of Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Grade level (class)	—											
2. Gender	-.01	—										
3. Parent education	-.11**	.05	—									
4. Family help	-.30**	-.03	.14**	—								
5. Homework distraction	.11**	-.02	.01	-.08**	—							
6. Homework interest	.01	-.19**	.04	.17**	-.34**	—						
7. Homework interest (class)	.02	-.03	.00	.08**	-.18**	.37**	—					
8. Affective attitude toward homework	-.06**	-.14**	.04	.22**	-.39**	.71**	.34**	—				
9. Teacher feedback	-.14**	-.04	.05*	.20**	-.17**	.28**	.17**	.25**	—			
10. Peer-oriented reasons	.05*	-.12**	.01	.20**	-.12**	.42**	.19**	.36**	.19**	—		
11. Adult-oriented reasons	-.03	-.12**	.04	.21**	-.24**	.45**	.19**	.39**	.30**	.56**	—	
12. Learning-oriented reasons	.07**	-.19**	.02	.16**	-.29**	.56**	.23**	.48**	.31**	.59**	.66**	—

Note. The number of respondents varied from 1,789 to 1,800.

* $p < .05$.

** $p < .01$.

to think homework as boring (scored 2). The mean score for teacher feedback was 3.5 ($SD = 0.84$), indicating that teachers provided feedback for between half (scored 3) and most (scored 4) of their assigned homework.

An Exploratory Factor Analysis of Homework Purposes

The Kaiser-Meyer-Olkin measure of sampling adequacy index for the students in this sample was high (.933), indicating that the sample was appropriate for factor analysis. The result of Bartlett's test of sphericity was significant, $\chi^2 = 13287.835$, $df = 105$, $p < .001$.

An exploratory factor analysis yielded a three-factor solution that accounted for 62.17% of the variance in the homework purpose scores (see Table 1). With the exception of Item 11, all of the remaining items loaded substantially on the three factors that could be labeled appropriately as (a) learning-oriented (about academic progress or self-regulation), (b) peer-oriented, or (c) adult-oriented reasons. The factor pattern and structure coefficients are presented in Table 1. In other words, taking into account conceptual meaningfulness, it seemed more reasonable and appropriate to incorporate Item 11 ("Doing homework brings you approval from classmates") into peer-oriented reasons (not adult-oriented reasons).

Based on the results of the factor analysis, the 15 homework purpose items were reduced to three scales for use in subsequent analyses. The nine items in Table 1 related to learning-oriented reasons were combined into a single scale (i.e., Items 1–7 and 12–13), along with the three items related to peer-oriented reasons (i.e., Items 11 and 14–15) and the three items related to adult-oriented reasons (i.e., Items 8–10). Alpha reliability coefficients (and 95% confidence intervals³) for scores on these three scales were .90 (.89,

.90), .79 (.77, .80), and .79 (.77, .81), respectively. These reliability estimates were in the adequate to excellent range (Henson, 2001; Nunnally & Bernstein, 1994).

A one-way, within-subjects ANOVA revealed a statistically significant difference among these three factors, with a large effect size, $F(2, 1798) = 624.76$, $p < .001$, $\eta^2 = .410$. An adjusted Bonferroni post hoc comparison detected specific differences among these factors. The mean score for learning-oriented reasons ($M = 2.82$, $SD = 0.61$) was statistically significantly higher than adult-oriented reasons ($M = 2.70$, $SD = 0.73$), which was, in turn, statistically significantly higher than was peer-oriented reasons ($M = 2.31$, $SD = 0.73$).

Multilevel Analyses

Intercorrelations of the variables included in the present study are reported in Table 3.

A series of three multilevel models was run, with each of the derived factor as the dependent variable (i.e., peer-, adult-, and learning-oriented reasons). Each model incorporated seven student-level variables (i.e., gender, parent education, homework interest, family homework help, homework distraction, affective attitude toward homework, and teacher feedback) as well as two class-level variables (i.e., grade level and homework interest).

Peer-oriented reasons. In the first model, peer-oriented reasons was the dependent variable. The results from fully unconditional model revealed that the within-class variance and the between-classes variance were .977 and .024, respectively, indicating that 2.4% of the variance in peer-oriented reasons was at the class level.⁴

TABLE 4. Predicting Homework Purposes: Results From Hierarchical Linear Modeling

Predictor	Model 1: Peer-oriented reasons		Model 2: Adult-oriented reasons		Model 3: Learning-oriented reasons	
	B	SE B	B	SE B	B	SE B
Student-level intercept	-.07	.03	.01	.04	-.03	.03
Class-level variables						
Homework interest	.08	.06	.00	.06	-.04	.05
Grade level (8 = 0, 11 = 1)	.20**	.04	.08	.05	.26**	.04
Student-level variables						
Gender (girl = 0, boy = 1)	-.06	.04	-.10*	.04	-.19**	.04
Parent education	-.02	.02	.01	.02	.01	.02
Family homework help	.15**	.02	.12**	.02	.07**	.02
Homework distraction	.03	.03	-.08**	.02	-.10**	.03
Homework interest	.30**	.04	.27**	.03	.37**	.03
Affective attitude	.10**	.03	.10**	.03	.12**	.03
Teacher feedback	.07**	.02	.17**	.02	.17**	.02

Note. $N = 1,789$ from 97 classes. Interaction terms of gender and family help were examined; however, no significant interaction was found. Subsequently, based on the principle of parsimony, the interaction terms were not included in the present study. Model deviance for Models 1, 2, and 3 was 4,694.42, 4,597.12, and 4,274.72, respectively. Model deviance change from fully unconditional model for Models 1, 2, and 3 was 409.68, 496.59, and 808.82, respectively. R^2 for individual level of Models 1, 2, and 3 was .192, .238, and .355, respectively. R^2 for class level of Models 1, 2, and 3 was .991, .537, and .739, respectively. R^2 total for Models 1, 2, and 3 was .211, .250, and .375, respectively.

* $p < .05$.

** $p < .01$.

As using multilevel modeling to control for cluster effects is justified even when ICCs are as low as .02 (Kreft & de Leeuw, 1998; Von Secker, 2002), seven student-level variables and two class-level variables were included in Model 1. The results revealed that four student-level variables were found to have a statistically significant effect on peer-oriented reasons (see Table 4). Peer-oriented reasons was positively associated with homework interest ($B = .30, p < .01$), family help ($B = .15, p < .01$), affective attitude toward homework ($B = .10, p < .01$), and teacher feedback ($B = .07, p < .01$).

At the class level, grade level was found to have a positive effect on peer-oriented reasons ($B = .20, p < .01$). Eleventh-grade students, as compared with eighth-grade students, were more likely to do homework for peer-oriented reasons. Taken as a whole, this model (Model 1) explained 19.2% of the variance in peer-oriented reasons at the student level, 99.1% of the variance in peer-oriented reasons at the class level, and 21.1% of the total variance in peer-oriented reasons.

Adult-oriented reasons. In the next model, adult-oriented reasons was substituted as the dependent variable. The results from fully unconditional model revealed that the within-class variance and the between-classes variance were .960 and .040, respectively, indicating that 4.0% of the variance in adult-oriented reasons was at the class level.

Seven student-level variables and two class-level variables were then incorporated in the model, with six student-level variables showing to have a statistically significant effect.

Adult-oriented reasons was positively associated with homework interest ($B = .27, p < .01$), teacher feedback ($B = .17, p < .01$), family help ($B = .12, p < .01$), and affective attitude toward homework ($B = .10, p < .01$). On the other hand, adult-oriented reasons was negatively associated with homework distraction ($B = -.08, p < .01$). Boys reported statistically significantly lower scores in adult-oriented reasons than did girls ($B = -.10, p < .05$). Taken together, this model (Model 2) explained 23.8% of the variance in adult-oriented reasons at the student level, 53.7% of the variance in adult-oriented reasons at the class level, and 25.0% of the total variance in adult-oriented reasons.

Learning-oriented reasons. In the final model, learning-oriented reasons was substituted as the dependent variable. The results from fully unconditional model revealed that the within-class variance and the between-classes variance were .949 and .051, respectively, indicating that 5.1% of the variance in learning-oriented reasons was at the class level.

Next, seven student-level variables and two class-level variables were included in the model. Six student-level variables were found to have statistically significant effects on learning-oriented reasons. Learning-oriented reasons was positively related to homework interest ($B = .37, p < .01$), teacher feedback ($B = .17, p < .01$), affective attitude toward homework ($B = .12, p < .01$), and family help ($B = .07, p < .01$). Meanwhile, learning-oriented reasons was negatively associated with homework distraction ($B = -.10, p$

< .01). Boys reported statistically significant lower scores in learning-oriented reasons than did girls ($B = -.19, p < .01$).

At the class level, grade level was found to have a positive effect on learning-oriented reasons. Eleventh-grade students, as compared with eighth-grade students, were more likely to do homework for learning-oriented reasons ($B = .26, p < .01$). Overall, the final model (Model 3) explained 35.5% of the variance in learning-oriented reasons at the student level, 73.9% of the variance in learning-oriented reasons at the class level, and 37.5% of the total variance in learning-oriented reasons.

Discussion

The first goal of the present study was to examine how secondary school students would classify an expanded set of homework purpose statements from literature. The results showed that the 15 homework purpose statements could be divided into a three-factor structure that accounted for a high percentage of the total variance in this sample: peer-, adult-, and learning-oriented reasons.

The findings of the three-factor structure from the present study were in line with the finding of the two-factor structure in a previous study (Xu, 2005), in the sense that the students in both samples viewed that one broad category of homework purposes was learning-oriented (i.e., academic progress and self-regulation). In addition, the students in both samples were more likely to agree that they did homework for learning-oriented reasons than for other reasons. The samples from the present and previous studies varied in a number of dimensions (e.g., grade level, cultural background), further suggesting that these findings might be generalized across different settings.

Meanwhile, unlike the finding of the two-factor structure in the previous study (Xu, 2005), the present study took one step forward, by differentiating peer-oriented reasons from adult-oriented reasons. The results from the present study further revealed that, compared with peer-oriented reasons, the students were more likely to agree that they did homework for adult-oriented reasons.

The second goal of the present study was to determine whether each derived factor (i.e., peer-, adult-, and learning-oriented reasons) was influenced by a broad spectrum of variables in the homework model, based on Cooper's (1989) theoretical model of factors influencing the effectiveness of homework. The results from the multilevel analyses revealed that all three factors were positively associated with four variables—homework interest, teacher feedback, affective attitude toward homework, and family help. The results further revealed that in all three models, the regression coefficient for homework interest was about twice as large as the next largest predictor in each model (recalling that all continuous variables were standardized before the multilevel analyses, and their regression coefficients were approximately comparable with the standardized weights resulting from multiple-regression procedures). This finding

suggests that homework interest plays a predominant role in the way students view about homework purposes, whether peer-oriented, adult-oriented, or learning-oriented.

In addition, the results from multilevel analyses revealed that whereas gender was not related to peer-oriented reasons, girls reported statistically significantly higher scores in adult- and learning-oriented reasons than did boys. The finding that girls had significantly higher scores in learning-oriented reasons is in line with the finding in a previous study (Xu, 2005) that girls as a group were more likely to report that they did homework to reinforce school learning and to develop good study habits. On the other hand, whereas the finding from the previous study (Xu) indicated that gender was unrelated to doing homework for peer and adult approval in general, the present study took one step forward, by further differentiating peer-oriented reasons from adult-oriented reasons (i.e., suggesting that gender was related to adult-oriented reasons but not peer-oriented reasons).

How can researchers explain the findings that homework distraction had a negative effect on adult- and learning-oriented reasons but not on peer-oriented reasons? As distraction negatively affects the way people learn (Foerde et al., 2006; Schmid, 2006), it makes sense that students consider homework distraction interfering with learning-oriented reasons. It also makes sense that students consider homework distraction interfering with adult-oriented reasons, as adults (a) often view homework as an achievement-related activity, particularly at the secondary school level (Coutts, 2001; Epstein & Van Voorhis, 2001; Van Voorhis, 2004; Warton, 2001); and (b) are often concerned about the negative impact of various distractions on homework completion (Hoover-Dempsey et al., 2001; Xu & Corno, 1998).

On the other hand, there are frequent distractions in cooperative learning activities with peers (Corno, 2004; Zimmerman, Bonner, & Kovach, 1996) and over the Internet (Lenhart, Rainie, & Lewis, 2001). Thus, students are less likely to view homework distractions as interfering with peer-oriented reasons if they consider that these distractions are inherent in the process of studying with peers.

Finally, grade level was positively associated with peer- and learning-oriented reasons but not adult-oriented reasons. Eleventh-grade students, as compared with eighth-grade students, were more likely to do homework for peer- and learning-oriented reasons. One possible explanation is that older teens, compared with younger teens, are given more opportunities to work with their peers on homework assignments. In addition, older teens tend to have more autonomy and access to a wide array of media in their homes and bedrooms (Roberts, Foehr, & Rideout, 2005). As a result, older teens are more likely to communicate with peers about homework assignments and thus are more likely to attach homework to peer-oriented reasons. In addition, as homework is found to be more strongly associated with achievement for high school than for middle school students (Cooper & Valentine, 2001), high school students are more

likely to be socialized into viewing homework as a vehicle for academic progress (i.e., learning-oriented reasons).

Limitations

Although students in the present study came from diverse cultural backgrounds, the racial compositions of this sample (e.g., 56.0% White, 37.0% African American, 1.3% Latino) were somewhat different from those of the national average (e.g., 56.5% White, 17.1% African American, 19.6% Latino; National Center for Education Statistics, 2006). On the other hand, the percentage of the students who received free meals (34.5%) was close to the national average (32.3%; National Center for Education Statistics).

The findings from the present study were based on self-reported homework purposes and therefore may be subject to social desirability bias (Fowler, 1995). Several steps were taken to minimize this potential bias. First, students answered the survey in a self-administered form instead of giving the answers to an interviewer. Second, students were encouraged to answer the questions based on what their own opinions. Before taking the survey, they were told,

Many students often have different opinions about homework. Some students feel homework is boring; some even refuse to do homework. Others try hard to concentrate and complete homework on time. In this survey, we want to find out your attitudes toward homework and how you do homework at home.

Third, students were assured that their responses would be confidential. They were told, "Do not write your name on this survey. The answers you give will be kept private. No one will know what you write."

Although it is difficult to determine the exact effects of self-reported data on the findings, some available evidence suggests that social desirability bias is unlikely to be a major concern. For example, it appeared that the students did not try to make themselves look better by claiming that they considered homework interesting and that they viewed it as one of their favorite after-school activities, as (a) they viewed both of these areas quite negatively and (b) these responses were further in line with relevant findings from previous studies (Chen & Stevenson, 1989; Cooper et al., 1998; Xu & Corno, 1998; Xu & Yuan, 2003).

Another possible limitation related to the issue of causation, a concern facing nearly all nonexperimental research. Although much care was taken to control for possible confounding variables, other predictor variables might have had an effect on homework reasons had they been included. Unfortunately, there is no ultimate solution to address the issue of causality in nonexperimental research in general (Winship & Sobel, 2004) and with homework research in particular, as homework is influenced by more factors than most other instructional activities (Cooper, 2001).

Research Implications

Further research is needed to further validate the homework purpose statements used in the present study with populations of students with varying characteristics. There is a need, for example, to examine how students across different ability levels (e.g., gifted students or students with learning disabilities) would classify and perceive purposes for doing homework.

The present study is the first to link homework purposes to a broad spectrum of variables at the student and class levels, as "research has largely overlooked the influence of children's developmental level on the stated purposes of homework" (Warton, 2001, p. 156), further research is needed over a greater grade span in other settings. It would be important to continue this line of research with populations of students in upper elementary and early middle school levels, particularly as findings from present study suggest that grade level is related to certain types of homework purposes (i.e., peer- and learning-oriented reasons).

In addition to cross-sectional survey studies, it would be important to conduct nonexperimental, longitudinal studies that follow cohorts of students to examine how they perceive and classify homework purposes over time, and how their perceptions may be influenced by a broad spectrum of variables, from exogenous factors to homework assignment characteristics and to classroom follow-up. Similarly, qualitative data based on multiple perspectives from students, parents, and teachers over time would be informative in deepening researchers' understanding in this area. Finally, although there are multiple barriers to random assignments in applied settings in general (Shadish, Cook, & Campbell, 2002) and with homework intervention in particular (Cooper, Robinson, & Patall, 2006), experimental studies are needed to better address the issue of causation, thereby complementing cross-sectional, longitudinal, and qualitative studies.

Practical Implications

Results from the present study suggest that parents can exert positive influences on homework purposes as perceived by children. They further suggest that the kind of direction parents give to children matters more than if parents have a higher education. This is good news for families from diverse educational and socioeconomic backgrounds. Families of all kinds can play a role in helping their children develop positive attitudes toward homework during the secondary school years.

Whereas Epstein and Van Voorhis (2001) focused on the role of teachers to design homework to promote specific academic outcomes across grades, results the present study suggest that teachers can exert positive influences on homework purposes as perceived by students. Particularly, teachers can have positive influences on homework purposes, by

designing more interesting assignments and then later by providing more frequent feedback.

The finding that affective attitude toward homework was positively associated with homework purposes suggests that there is a need for teachers and parents to work together to enhance the homework favorable rating in the context of other after-school activities. It would be beneficial for teachers and parents to play a more constructive role in helping adolescents prioritize and structure their other after-school activities, not to prevent them from participating in these activities but rather to help them plan and schedule their preferred activities on a regular basis (Xu & Yuan, 2003). If adolescents are aware that they have input and opportunity for other appealing activities during the week, they may view homework tasks in a less negative and more favorable light (Xu, 2008a).

Finally, as homework distraction was found to have a negative effect on learning- and adult-oriented reasons, there is a need to examine homework distraction on students' homework behaviors as well as on their attitudes toward homework. Such an examination is particularly important, as (a) new electronic media increasingly presents new and ubiquitous temptations while doing homework (e.g., online chatting, text messaging, blogging; Cook, 2000; Foehr, 2006; Wallis, 2006; Warton, 2001; Xu, 2007, 2008b, 2008c, in press) and (b) these high-tech distractions are more invisible and difficult for parents to monitor, whether adolescents do homework by themselves at home or with peers using social networking tools (Cook; Dahl, 2006; Xu & Corno, 2003).

NOTES

1. Following the suggestion of Felson and Reed (1986) that class-average scores based on less than 10 students typically lack validity, all classes in the present study containing less than 10 students were excluded from the analyses.

2. Level 1 (i.e., student level) took the following form: $Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Gender})_{ij} + \beta_{2j}(\text{Homework Distraction})_{ij} + \beta_{3j}(\text{Homework Interest})_{ij} + \beta_{4j}(\text{Affective Attitude})_{ij} + \beta_{5j}(\text{Teacher Feedback})_{ij} + \beta_{6j}(\text{Parent Education})_{ij} + \beta_{7j}(\text{Homework help})_{ij} + r_{ij}$. Meanwhile, Level 2 (i.e., class level) was in the following form: $\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Homework Interest}) + \gamma_{02}(\text{Grade Level}) + \mu_{0j}$; $\beta_{1j} = \gamma_{10}$; $\beta_{2j} = \gamma_{20}$; $\beta_{3j} = \gamma_{30}$; $\beta_{4j} = \gamma_{40}$; $\beta_{5j} = \gamma_{50}$; $\beta_{6j} = \gamma_{60}$; $\beta_{7j} = \gamma_{70}$

3. The 95% percent confidence intervals for coefficient alphas were calculated using a method employing the central F distribution (see Fan & Thompson, 2001).

4. The intraclass correlation (ICC) is the proportion of total variance in the outcome that lies systematically between classes.

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