

# Assessing children's homework performance: Development of multi-dimensional, multi-informant rating scales <sup>☆</sup>

Thomas J. Power <sup>a,b,\*</sup>, Stefan C. Dombrowski <sup>c</sup>,  
Marley W. Watkins <sup>d</sup>, Jennifer A. Mautone <sup>a</sup>, John W. Eagle <sup>e</sup>

<sup>a</sup> *The Children's Hospital of Philadelphia, United States*

<sup>b</sup> *University of Pennsylvania, United States*

<sup>c</sup> *Rider University, United States*

<sup>d</sup> *The Pennsylvania State University, United States*

<sup>e</sup> *University of Kansas, United States*

Received 18 August 2006; received in revised form 1 February 2007; accepted 12 February 2007

---

## Abstract

Efforts to develop interventions to improve homework performance have been impeded by limitations in the measurement of homework performance. This study was conducted to develop rating scales for assessing homework performance among students in elementary and middle school. Items on the scales were intended to assess student strengths as well as deficits in homework performance. The sample included 163 students attending two school districts in the Northeast. Parents completed the 36-item Homework Performance Questionnaire — Parent Scale (HPQ-PS). Teachers completed the 22-item teacher scale (HPQ-TS) for each student for whom the HPQ-PS had been completed. A common factor analysis with principal axis extraction and promax rotation was used to analyze the findings. The results of the factor analysis of the HPQ-PS revealed three salient

---

<sup>☆</sup> This study was supported by NIH research grant R01MH068290, awarded to the first author by the National Institute of Mental Health and Department of Education, National Center for Special Education Research. The authors are very grateful to the parents, teachers, and administrators affiliated with the school districts participating in this study.

\* Corresponding author. The Children's Hospital of Philadelphia, CHOP North - 1471, 34th St. & Civic Center Blvd., Philadelphia, PA 19104, United States.

E-mail address: [power@email.chop.edu](mailto:power@email.chop.edu) (T.J. Power).

and meaningful factors: student task orientation/efficiency, student competence, and teacher support. The factor analysis of the HPQ-TS uncovered two salient and substantive factors: student responsibility and student competence. The findings of this study suggest that the HPQ is a promising set of measures for assessing student homework functioning and contextual factors that may influence performance. Directions for future research are presented.

© 2007 Society for the Study of School Psychology. Published by Elsevier Ltd. All rights reserved.

**Keywords:** Homework; Scale development; Parent ratings; Teacher ratings

---

Family involvement in education is important for children to achieve success in school. Family involvement has multiple dimensions, including involvement in home-based educational activities, involvement in school-based events and activities, and collaboration between family members and school professionals (Epstein, 1995; Manz, Fantuzzo, & Power, 2004). Although each dimension of family involvement is supportive of school success, there is evidence that family involvement in educational activities in the home may be the dimension that has the strongest association with academic performance and outcomes (Fantuzzo, McWayne, Perry, & Childs, 2004; Izzo, Weissberg, Kasprow, & Frendrich, 1999).

Homework provides ongoing opportunities for parents to become involved in their children's education. Homework has been defined as educational tasks assigned by teachers to be completed by students during non-instructional periods of the day (Cooper, 1989). This definition acknowledges that homework may be completed in school, in after school programs, and at home, but for most students it is completed in the home setting.

Although the importance of homework has been disputed by some educators, there is a consensus among researchers that homework can have many beneficial effects. First, homework provides students opportunities to practice and master lessons learned in school. Second, homework may engage students in projects that guide them in the application of concepts learned in the classroom (Keith & Keith, 2006). Third, it offers students a context to develop work habits and study skills that will be helpful to them as they mature into adulthood (Cooper, 2001). Finally, homework provides parents and teachers ongoing, natural ways to communicate with each other about a student's education (Olympia, Sheridan, Jenson, & Andrews, 1994). In general, research has demonstrated a positive association between homework and academic performance, when performance is measured by amount of time spent doing homework and amount of work completed and when academic performance is assessed using standardized test scores and classroom grades (Cooper, 2001; Cooper, Lindsay, Nye, & Greathouse, 1998). The extent of the relationship between homework and academic performance is moderated by grade level, with students in the upper grades demonstrating a stronger association than those in the lower grades (Cooper, Robinson, & Pattall, 2006).

Despite its potential advantages, homework can present challenges to many students and their families. Homework that is too difficult or too time consuming can be frustrating and discouraging for students (Keith & Keith, 2006). Also, it can be a source of tension between a parent and child and may exacerbate parent–child conflict (Power, Karustis, & Habboushe, 2001). Further, homework issues can be a source of conflict between parents and teachers and lead to home-school communication problems.

Several intervention strategies have been designed to improve homework performance, including goal setting and contingency contracting (Miller & Kelley, 1994), conjoint behavioral consultation (Weiner, Sheridan, & Jenson, 1998), and self-management approaches (Olympia et al., 1994). These strategies have been demonstrated to be efficacious in single-subject studies. Nonetheless, progress in developing, evaluating, and disseminating homework interventions has been impeded by limitations in the measures available for assessing homework performance.

The most commonly used measure for assessing homework performance is the Homework Problem Checklist (HPC; Anesko, Schoiock, Ramirez, & Levine, 1987), a 20-item, parent rating scale. This questionnaire was developed to assess the extent to which students display a broad range of homework problems. Factor analytic studies have revealed that this measure assesses two broad factors: inattention/work avoidance and poor productivity/non-adherence with homework rules (Power, Werba, Watkins, Angelucci, & Eiraldi, 2006). This factor structure emerged with students in general education classes as well as those referred to a specialty clinic for children with attention-deficit/hyperactivity disorder (ADHD). Although the HPC has been useful in screening for homework problems and assessing outcomes, it has several limitations. First, it was developed for students in elementary school and may have less applicability for students in middle school. Second, many of the items overlap with symptoms of ADHD, making it difficult to measure ADHD symptoms independent from homework performance. Third, the items assess deficits in functioning and not strengths, which does not support a strength-based model of practice. Fourth, the HPC does not include a teacher version. In fact, it does not appear that a standardized, teacher-report measure of homework functioning has ever been developed, which is a significant limitation given that teachers directly observe many behaviors related to homework (e.g., recording assignments, completing work, and turning in assignments on time).

This study focused on the development of parent and teacher rating scales of homework performance, which are referred to as the Homework Performance Questionnaire — Parent Scale (HPQ-PS) and HPQ — Teacher Scale (HPQ-TS). These scales have been developed for students in grades 1 through 8. A distinguishing feature of the scales is that they were developed in partnership with parents and teachers through the use of focus groups and interviews. The scales exclude items directly related to the core symptoms of ADHD. Further, the items on these measures assess primarily student strengths and not deficits.

The primary purpose of this study was to conduct a preliminary examination of the construct validity of the HPQ-PS and HPQ-TS by exploring the factor structure of each measure. Also, this study explored the associations between factors on the parent-report and teacher-report scales. Further, gender and grade level differences on salient factors were examined.

## Method

### *Participants*

The sample for the present study was derived from general education classes in two school districts serving children in kindergarten through eighth grade located within

30 miles of a large urban center in the Northeast. The sample excluded children in kindergarten. District A has a first-through eighth-grade student population of 816 students, and District B includes 705 first through eighth graders. Approximately 22% of the first through eighth grade students in these school districts were randomly selected for participation in the present study. (See the procedures section for details about recruitment.)

A total of 163 parents (return rate of 47.8%) across both districts participated in the study; 95 parents participated from District A (58.6% return rate) and 68 from District B (38.0%). The majority of the respondents were mothers (67.5%); in some cases parents completed the scale together (17.2%) or fathers (4.3%) and other caregivers (1.8%) completed the ratings. Respondent information was missing for 9.2% ( $n=14$ ) of the cases.

The sample included 84 boys (51.5%) and 79 girls (48.5%) approximately equally distributed across grades 1 through 8. Forty-eight (29.4%) of the participants were in first or second grade, 41 (25.2%) were in third or fourth grade, 39 (23.9%) were in fifth or sixth grade, and 35 (21.5%) were in seventh or eighth grade. Mean number of students per grade was 20.4 (range=15–26). The racial/ethnic composition of the sample was 67.5% Caucasian, 25.8% African American, 2.5% Asian, and 4.3% Hispanic; 11.6% of the sample received free or reduced-fare lunch. (See Table 1 for specific demographic data by district.)

Teachers of students whose parents completed the HPQ-PS were requested to complete the HPQ-TS. Teachers completed the HPQ-TS for 98.2% of the students for whom parent-report scales were completed ( $n=160$ ). HPQ-TS scales were received for 100% ( $n=95$ ) of the students from District A and 95.6% ( $n=65$ ) of the students from District B.

Table 1 presents demographic data for the sample and population from which it was derived for each school district. Chi square analyses indicated that there were no significant differences between the study sample and the school district populations with regard to gender and racial/ethnic group status, with the exception of Hispanic students in District B ( $\chi^2=4.45$ ;  $p<.05$ ). Although 13% of students in school District B were Hispanic, only 4.4% of the participants from this district were Hispanic. Also, the sample from

Table 1

Distribution of students in the school samples and populations according to gender, race/ethnicity, and subsidized lunch status for each school district

	District A	District A population	$\chi^2$	District B	District B population	$\chi^2$	Total sample
Gender							
Male	52 (54.7%)	54%	0.02	32 (47.1%)	51%	0.41	84 (51.5%)
Female	43 (45.3%)	46%	0.02	36 (52.9%)	49%	0.41	79 (48.5%)
Ethnicity							
Caucasian	70 (73.7%)	79%	1.61	40 (58.8%)	51%	1.66	110 (67.5%)
African American	18 (18.9%)	15%	1.13	24 (35.3%)	33%	0.16	42 (25.8%)
Asian	3 (3.2%)	2%	0.70	1 (1.5%)	3%	0.53	4 (2.5%)
Hispanic	4 (4.2%)	4%	0.01	3 (4.4%)	13%	4.45 *	7 (4.3%)
Free and reduced-fare lunch	7 (7.4%)	11.9%	1.83	12 (17.6%)	30%	4.98 *	19 (11.7%)

Note:  $\chi^2$  reflects the difference between the study sample and school population for each school district.

\*  $p<.05$ .

District B underrepresented students receiving free or reduced-fare lunch ( $\chi^2=4.98$ ;  $p<.05$ ). Although 30% of students in District B received free or reduced-fare lunch, only 17.6% of the participants from this district received subsidized lunch.

### *Scale development*

Scale development occurred in three stages. Stage 1 involved an extensive review of the homework literature and a review of the only existing measure of homework performance, the HPC. This review resulted in the identification of several strategies for scale development: (a) homework measures should include items related to work efficiency, given that this variable is highly responsive to interventions targeted to improve homework performance (Kahle & Kelley, 1994); (b) it is important to minimize the overlap in items between measures of ADHD and indices of homework, given that measures of homework performance are often used to assess academic impairments related to ADHD or outcomes of interventions for this disorder (e.g., Hinshaw et al., 1997; Lahey et al., 1994; Power, Soffer, Clarke, & Mautone, 2006); (c) homework measures should assess whether the assignments are appropriate for the child's skill level, and are not overly difficult, which may impede learning and frustrate the child (Gravois & Gickling, 2002), and (d) there is a strong need for a teacher-report measure of homework performance (Power, Soffer et al., 2006; Power, Werba et al., 2006).

Stage 2 consisted of a series of focus groups, conducted separately with parents and teachers. The focus groups were conducted in District B, which consisted of families of diverse socioeconomic and ethnic backgrounds. Separate focus groups were held at the elementary and middle school levels. Parents and teachers were asked a series of questions regarding children's homework functioning. Sample questions included: "What are the challenges you face with homework?"; "What homework strengths does your child (do your students) display?"; and "Describe the impact of homework on the parent-teacher relationship." Each focus group lasted between 45 and 60 min. The group facilitator, a PhD-level psychologist, consistently asked participants to comment on responses made by other attendees to check for level of agreement and request elaboration and clarification as a way of establishing the credibility of the data (Lincoln & Gruba, 1985). The discussions held in these groups were audiotaped and transcribed. Members of the research team categorized the responses, using a process known as inductive coding (LeCompte & Schensul, 1999), which consisted of clustering items referring to similar themes. Subsequently, the investigators collaborated to identify a common set of categories.

During Stage 3, initial versions of the parent and teacher scales were developed. Items were generated based upon conclusions derived from the literature review and themes that emerged from the focus groups. These items were further refined through individual interviews with seven parents and seven teachers associated with elementary and middle schools located in both suburban and urban settings. Parents and teachers reviewed the questionnaire, which presented items to be rated on a four-point scale ranging from 0=rarely/never to 3=always/almost always, and provided feedback regarding the clarity and appropriateness of the items and scaling method used. Based on this feedback, items and response categories were modified. The following paragraphs include a more detailed description of Stages 2 and 3 in the development of the HPQ-PS and HPQ-TS.

### *Homework Performance Questionnaire — Parent Scale (HPQ-PS)*

Three focus groups were held with parents, which included a total of 12 parents of children in elementary and middle school. Parent responses addressed three broad themes: (a) child behaviors during homework; (b) family involvement with homework; and (c) teacher approaches to assigning homework. In general, parent responses focused mostly on the teacher's role with homework, including comments about quantity of homework assigned, type of homework assigned (e.g., material not covered in class; homework not at the child's level), and lack of clarity in giving directions for homework assignments.

The revised version of the HPQ-PS<sup>1</sup> consisted of 32 items requesting parents to assess their child's homework behavior during the past 4 weeks. A four-point Likert scale response format was used (0=rarely/never; 1=some of the time; 2=most of the time; 3=always/almost always). Items referring to each of the three thematic categories emerging from the focus groups were included in the scale.

An additional four items (non-Likert) were included to collect background information regarding a child's homework behavior. The intent of these items was to identify information pertinent to a specific child that might assist in the development of interventions to improve homework performance. These items included: (a) the average amount of time a child spends doing homework; (b) whether the child has trouble completing homework in any subjects; (c) whether the child is expected to write homework assignments in a notebook; and (d) what the child does when he or she cannot remember what to do for homework (e.g., call a homework hotline; call a friend). Responses to these additional items were not analyzed in this study.

### *Homework Performance Questionnaire — Teacher Scale (HPQ-TS)*

Two focus groups were held with teachers, including a total of 18 teachers at the elementary and middle school levels. Teacher responses to the focus group questions centered on two major themes: (a) child behaviors during homework; and (b) lack of family involvement with homework (e.g., lack of supervision, failure to make homework a priority).

Based on feedback from individual interviews with teachers, the initial version of the HPQ-TS was revised. Both specific items and response categories were modified. In addition, items pertaining to family involvement were omitted due to concerns expressed by teachers. Teachers cautioned that parental knowledge of teacher ratings of family involvement might adversely affect the quality of the parent–teacher relationship. Further, our research team was concerned that some teachers might feel uncomfortable reporting their actual perceptions on items pertaining to family involvement.

The revised version of the HPQ-TS<sup>1</sup> consisted of 14 items that referred to student homework behaviors observable by teachers. The 14 items were divided into two categories: (a) homework behaviors and (b) homework performance. Ten of the items requested teachers to report the percentage of time that specific homework-related behaviors occurred during the previous four weeks. An additional four items requested teachers to indicate the percentage corresponding with the student's performance or accuracy during the previous 4 weeks. Teacher responses were recorded using a five-point Likert scale: 0=0% to 39%; 1=40% to 69%; 2=70% to 79%; 3=80% to 89%; 4=90% to 100%. Teacher responses used

<sup>1</sup> To obtain a copy of the HPQ-PS or HPQ-TS, please contact the corresponding author.

a five-point scale using percentage values as anchor points, because pilot studies demonstrated their ability to make these relatively fine discriminations.

The HPQ-TS also included eight (non-Likert) items to collect background information regarding a student's homework-related behavior and performance. As with the HPQ-PS, these items were intended to assist in homework intervention development. These items included: (a) the subject areas in which the teacher instructs the child; (b) the maximum amount of time children at this grade level should be spending doing homework; (c) whether the child is expected to write homework assignments in a notebook; (d) how often the teacher checks to see whether the student writes down homework assignments accurately; (e) how often the teacher checks to see whether the student takes home the materials needed for homework; (f) suggestions for families when students have difficulty remembering homework assignments; (g) how often the teacher checks to see that homework has been completed accurately; and (h) the percentage of the child's grade that is affected by the amount or quality of homework completed. Responses to these additional items were not analyzed in this study.

### *Procedures*

For grades 1 through 4, four children (two boys and two girls) were chosen from class lists using a systematic sampling approach (e.g., selection of the second and tenth boy and the fifth and eighth girl, as listed alphabetically) for each general education class. For grades 5 through 8, two children (one boy and one girl) were chosen using a similar sampling procedure from each math class and two children were selected from each language arts class. The selections were checked to insure that the same child was not selected from each class. District B had a relatively high percentage of parents who did not speak English fluently. Because an English language version of the HPQ-PS was used in this preliminary study, a representative from each of the schools in District B (i.e., teacher of English Language Learning class or building principal) was consulted to identify children whose parents did not speak English. These children were excluded from the sample.

Parents of the 341 selected students (162 from District A and 179 from District B) were mailed a packet of information including a letter signed by the principal introducing the study, a consent form, a copy of the HPQ-PS, and a self-addressed, stamped envelope. Parents were asked to read the consent form and indicate whether they chose to have their child participate in the study. Parents who consented to participate in the study were requested to complete the HPQ-PS. Parents were requested to return the consent form and HPQ-PS by mail, regardless of whether consent was granted. Approximately 6 weeks after the initial letter was sent, another packet was mailed to parents who did not respond after the first request. A third request was made approximately 5 weeks after the second request. The return rates after each of the three mailings were 25.2%, 36.7%, and 47.8%. Shortly thereafter, teachers were requested to complete the HPQ-TS for each child whose parent(s) completed the measure.

### *Data analyses*

Common factor analysis was selected over principal components analysis because the goal of the study was to identify the latent structure of the HPQ scales (Wegener & Fabrigar, 2000). Additionally, common factor analysis may produce more accurate estimates of

population parameters than does principal components analysis (Widaman, 1993). Given its relative tolerance of multivariate nonnormality and its superior recovery of weak factors, principal axis extraction was used (Briggs & MacCallum, 2003). Communalities were initially estimated by squared multiple correlations and were iterated twice to produce final communality estimates (Gorsuch, 2003). Following the advice of Velicer, Eaton, and Fava (2000), minimum average partials (MAP; Velicer, 1976) and parallel analysis (Horn, 1965), supplemented by a visual scree test (Cattell, 1966), were used to determine the number of factors to retain for rotation. It was assumed that factors would be moderately correlated. Thus, a Promax rotation with a  $k$  value of 4 was selected (Tataryn, Wood, & Gorsuch, 1999). Pattern coefficients  $\geq .32$  were predetermined to be salient. If an item demonstrated pattern coefficients  $\geq .32$  on more than one factor, the highest psychologically meaningful pattern coefficient was deemed salient. A priori criteria for determining factor adequacy included a minimum of five salient loadings, internal consistency reliability  $\geq .70$ , and theoretical meaningfulness.

## Results

On the HPQ-PS, no cases had to be eliminated because of missing data. As expected for the content and number of response options, six of the parent items were severely skewed and two items were severely kurtotic (Fabrigar, Wegener, MacCallum, & Strahan, 1999). On the HPQ-TS, one case had to be eliminated because of missing data. Eight of the teacher items were severely skewed and one item was severely kurtotic (Fabrigar et al., 1999).

### *Factor analysis of the HPQ-PS*

Results from Bartlett's Test of Sphericity (Bartlett, 1954) indicated that the correlation matrix was not random ( $\chi^2 = 1936.27$ ;  $df = 465$ ;  $p < .001$ ). The Kaiser–Meyer–Olkin (Kaiser, 1974) statistic was .825, well above the minimum standard for conducting a factor analysis suggested by Kline (1994). Measures of sampling adequacy for each variable were also within reasonable limits. Thus, the correlation matrix was appropriate for factor analysis.

Parallel analysis suggested that six factors be retained, but the MAP criterion recommended four factors. The visual scree demonstrated two 'bends,' one at six factors and another at four factors. Given that it is better to over-factor than under-factor (Wood, Tataryn, & Gorsuch, 1996), six- to four-factor solutions were examined for both substantive and statistical suitability. Both the six- and five-factor solutions were problematic in that one or more factors had an insufficient number of salient items. In contrast, the four-factor solution contained sufficient salient items in each factor and accounted for 39% of the total variance. Factor intercorrelations ranged from .21 to .46.

Nine items loaded saliently on factor I (see Table 2) with an internal consistency of .799. However, coefficient alpha increased to .823 when item 5 was deleted, suggesting that only eight items should be retained. These eight salient items seemed to refer to a student task orientation/efficiency dimension. Eight items with an alpha coefficient of .805 loaded saliently on factor II. These items appeared to tap a student competence dimension. Eight salient items with an internal consistency reliability of .767 loaded on factor III. Factor III seemed to assess a teacher support dimension. Factor IV, which seemed to assess parent

Table 2

Four-factor structure of the Homework Performance Questionnaire — Parent Scale

Item	Factor pattern coefficients			
	I	II	III	IV
5 — Child records homework assignment	.350	-.191	.005	.160
6 — Child brings home necessary materials	.230	.161	.041	<b>.351</b>
7 — Child denies having homework	<b>.383</b>	-.003	-.141	.422
8 — Teacher and parent have similar expectations	.019	.229	<b>.407</b>	-.064
9 — We always find time to complete homework	-.198	.202	.117	<b>.372</b>
10 — Child understands how to do homework	-.040	<b>.697*</b>	-.065	.150
11 — Child is ready to begin homework on time	<b>.537</b>	-.049	.173	.183
12 — Child gets frustrated with parents during homework	<b>.401</b>	.268	.040	-.068
13 — Teachers assign too much homework	.000	.085	<b>.514</b>	-.302
14 — Teachers understand challenges families face	.174	-.085	<b>.671*</b>	.007
15 — Family routine helps child complete homework	.015	-.102	<b>.446</b>	.216
16 — Child must be reminded to begin homework	<b>.813*</b>	-.027	-.065	-.106
17 — Child does homework in quiet area without distractions	.173	.010	.308	.070
18 — Homework assignments are easy for child	-.050	<b>.722*</b>	.112	-.043
19 — Child wastes time during homework	<b>.672*</b>	.046	.186	-.090
20 — Teachers seem willing to help	-.022	.023	<b>.649*</b>	.127
21 — Parents able to help if homework is confusing	-.271	.208	<b>.361</b>	.269
22 — Child needs close supervision to complete homework	<b>.683*</b>	.200	-.096	-.172
23 — Child is able to complete homework	-.015	<b>.471</b>	-.012	.418
24 — Takes child longer than classmates to complete homework	.138	<b>.374</b>	.127	-.147
25 — Child is cooperative when given advice/direction	<b>.376</b>	-.003	.210	.111
26 — Child able to work steadily on homework	<b>.445</b>	.199	.068	.135
27 — Parents able to provide enough supervision during homework	-.164	-.007	.149	<b>.667*</b>
28 — Child able to complete math homework	.063	<b>.756*</b>	-.205	.009
29 — Work assigned is too difficult	-.061	<b>.549</b>	.291	-.162
30 — Parents able to remain patient with child during homework	.204	<b>.337</b>	-.103	.192
31 — Teachers communicate with parents effectively about homework	.037	-.130	<b>.679*</b>	.009
32 — Child able to complete reading/language arts homework	.058	<b>.588</b>	-.074	-.090
33 — Child brings completed homework back to class	.197	.080	-.090	<b>.652*</b>
34 — Parents sign and return forms and tests	.100	-.268	-.031	<b>.730*</b>
35 — Teachers check homework after it is completed	.054	-.094	<b>.381</b>	.275
$\alpha$	.823	.805	.767	.716

Note. Salient and substantive pattern coefficients are indicated in bold. \* Three highest structure coefficients for each factor.

involvement, was saliently loaded by five items with a coefficient alpha of .716. Unfortunately, responses to the items on this factor were so severely skewed that there was very little variability in the distribution of responses. In other words, almost all of the parents rated the items in a way that demonstrated high levels of parent involvement. The findings indicated that this factor was problematic and needed to be significantly modified or deleted.

#### Factor analysis of the HPQ-TS

Results from Bartlett's Test of Sphericity (Bartlett, 1954) indicated that the correlation matrix was not random ( $\chi^2=1507.7$ ;  $df=91$ ;  $p<.001$ ). The Kaiser–Meyer–Olkin (Kaiser,

1974) statistic was .876, well above the minimum standard suggested by Kline (1994). Measures of sampling adequacy for each variable were also within reasonable limits. Thus, the correlation matrix was appropriate for factor analysis.

Both MAP and parallel analysis suggested that two factors be retained, but the visual scree test indicated three factors. Consequently, both solutions were iteratively evaluated. The three-factor solution was problematic because the third factor was saliently loaded by only two items. In contrast, the two-factor solution contained a sufficient number of salient items in each factor and accounted for 58.6% of the total variance. The factor intercorrelation was .40.

Eight items loaded saliently on factor I (see Table 3) with an internal consistency of .861. However, coefficient alpha increased to .878 when item 9 was deleted, suggesting that only seven items should be retained. These seven salient items seemed to refer to a student responsibility dimension. Six items loaded saliently on factor II with an internal consistency of .898. Those six salient items appeared to tap a student competence dimension.

#### *Intercorrelations between parent and teacher factors*

Unit-weighted factor scores on the HPQ-PS and HPQ-TS were intercorrelated. Parent factor I (student task engagement) was significantly correlated with teacher factor I (student responsibility;  $r=.28$ ,  $p<.01$ ) but not significantly correlated with teacher factor II (student competence;  $r=.11$ ,  $p=.19$ ). Also, parent factor II (student competence) was significantly correlated with teacher factor I (student responsibility;  $r=.29$ ,  $p<.01$ ) as well as teacher factor II (student competence;  $r=.44$ ,  $p<.01$ ).

Table 3  
Two-factor structure of the Homework Performance Questionnaire — Teacher Scale

Item	Factor pattern coefficients	
	I	II
9 — Student writes down homework assignments independently	.404	.101
10 — Student organizes necessary materials	<b>.570</b>	.404
11 — Student has ability to complete homework independently	−.115	<b>.885*</b>
12 — Student turns in homework on time	<b>.897*</b>	−.165
13 — Student finishes homework (regardless of quality)	<b>.936*</b>	−.185
14 — Quality of homework is acceptable	<b>.598</b>	.253
15 — Student manages time effectively during homework	<b>.808*</b>	.114
16 — Forms and tests are signed and returned	<b>.478</b>	.076
17 — Student is ready for homework upon leaving class	.378	<b>.477</b>
18 — Homework assignments are easy for child	.035	<b>.829*</b>
19 — Percentage of homework completed	<b>.879</b>	−.133
20 — Percent accuracy of completed homework	.333	<b>.512</b>
21 — Percentage of homework child is able to complete independently	−.100	<b>.929*</b>
22 — Percentage of material assigned that child has learned and understood in class	−.026	<b>.783</b>
$\alpha$	.861	.898

Note. Salient and substantive pattern coefficients are indicated in bold. \* Three highest structure coefficients for each factor.

### Child gender and grade level differences

Unit-weighted factor scores were created by summing the responses to the salient and substantive items in each factor and dividing by the number of items in the factor. On each scale, higher scores indicated greater levels of adaptive functioning. Grade levels were divided into two groups, Grades 1 through 5 and Grades 6 through 8, which generally correspond with elementary versus middle school. The sample sizes for the gender by grade grouping cells ranged from 25 to 54. The variances were generally similar across the gender by grade grouping cells, with the exception of the variances between grade groups for the teacher-rated student responsibility factor, suggesting that grade effects on this factor be interpreted with caution. Separate two-way (gender by grade grouping) MANOVAs were conducted for the parent and teacher factors.

Means and standard deviations by gender and grade grouping for each of the HPQ factors are reported in Table 4. For the HPQ-PS, MANOVA results showed a significant main effect for gender (Wilks' Lambda of .941,  $F[3,157]=3.278$ ,  $p=.023$ , partial eta $^2=.059$ ) and for grade grouping (Wilks' Lambda of .822,  $F[3,157]=11.327$ ,  $p<.001$ , partial eta $^2=.178$ ), but a non-significant interaction effect (partial eta $^2=.012$ ). Follow-up univariate analyses demonstrated that boys received higher ratings than girls on the task engagement/efficiency factor with a small effect size ( $F[1,157]=6.426$ ,  $p=.012$ , partial eta $^2=.039$ ). A significant gender effect was not identified on the other factors. There was a significant grade grouping effect on the teacher support factor only ( $F[1,157]=28.453$ ,  $p<.001$ , partial eta $^2=.152$ ); students in elementary school were rated higher than those in middle school, with a large effect size.

For the HPQ-TS, MANOVA results showed a significant effect for grade grouping (Wilks' Lambda of .874,  $F[2,154]=11.062$ ,  $p<.001$ , partial eta $^2=.126$ ), but a non-significant main effect for gender (partial eta $^2=.023$ ) and a non-significant interaction term (partial eta $^2=.007$ ). Univariate follow-up analyses demonstrated significant results related to grade grouping, but only on the student responsibility factor; teachers rated elementary students higher than middle school students, with a moderate effect size, on this factor ( $F[1,155]=21.797$ ,  $p<.001$ , partial eta $^2=.123$ ).

Table 4

Means and standard deviations by gender and grade level for each HPQ-PS and HPQ-TS factor

HPQ factor	Grades 1–5		Grades 6–8	
	Boys	Girls	Boys	Girls
HPQ-PS factor I	2.30 (0.52)	2.45 (0.40)	2.22 (0.65)	2.49 (0.40)
HPQ-PS factor II	2.47 (0.44)	2.37 (0.42)	2.37 (0.46)	2.47 (0.32)
HPQ-PS factor III	2.56 (0.42)	2.55 (0.40)	2.14 (0.46)	2.22 (0.41)
HPQ-TS factor I	3.70 (0.42)	3.81 (0.35)	3.16 (0.93)	3.42 (0.80)
HPQ-TS factor II	3.56 (0.61)	3.63 (0.58)	3.44 (0.57)	3.45 (0.67)

Notes: Standard deviations are indicated in parentheses. HPQ-PS factor I refers to student task orientation/efficiency. HPQ-PS Factor II refers to student competence. HPQ-PS Factor III refers to teacher support. HPQ-TS Factor I refers to student responsibility. HPQ-TS Factor II refers to student competence.

## Discussion

The findings of this study suggest that the HPQ parent and teacher scales are promising measures of homework performance. In particular, the findings support the presence of three substantive factors for the HPQ-PS: student task engagement/efficiency, student competence, and teacher support. Also, the findings provide evidence for two substantive factors for the HPQ-TS: student responsibility and student competence. Each of the three factors of the HPQ-PS consisted of eight items, and the internal consistency reliability indices for these factors were in the moderate to high range. The HPQ-TS factors consisted of at least six items and the internal consistency reliability indices for these factors were high.

Both the HPQ-PS and HPQ-TS assessed a factor related to student competence, referring to a student's ability to complete assignments accurately and independently. The moderate-level correlation between informants on this factor is similar in magnitude to the correlations between parents and teachers on other constructs (e.g. inattention, hyperactivity, conduct problems) using rating scales such as the Achenbach System of Empirically Based Assessment (Achenbach & Rescorla, 2001), Behavior Assessment System for Children, Second Edition (Reynolds & Kamphaus, 2004), and the ADHD Rating Scale — IV (DuPaul, Power, Anastopoulos, & Reid, 1998). The moderate-level correlation between parents and teachers suggests that the student competence factor of the HPQ-PS is similar to its counterpart on the HPQ-TS and that each informant provides relatively unique information about a student's competence related to homework functioning. The student competence factor could be interpreted as referring to the degree of match between the difficulty level of homework assignments and the student's ability to complete assignments, or the degree of instructional match. This factor may be useful in assessing the extent to which assignments are at a difficulty level appropriate for the student.

Although the HPQ-PS student task engagement/efficiency factor and the HPQ-TS student responsibility factor were significantly correlated with each other, they appear to assess somewhat different dimensions of homework functioning. The parent-reported task engagement/efficiency factor provides information about student behaviors while preparing for homework and actually completing the work. In contrast, the teacher-reported student responsibility factor reflects primarily student productivity and compliance with homework rules (i.e., behaviors that the teacher can directly observe or at least be in a position to apprehend).

A unique aspect of the HPQ-PS is that it provides information about the extent to which parents view teachers as supportive to families in coping with the challenges of homework. The teacher support factor refers to contextual issues that may have an affect on homework performance and the quality of the family–school relationship. It is noteworthy that parental ratings of elementary school children were substantially higher (large effect size) than their ratings of middle school children, suggesting that parents view teachers as more supportive and helpful with homework challenges at the elementary level than at the middle school level.

The HPQ-PS teacher support factor provides potentially valuable information about contextual factors that may influence homework performance. This factor refers to the extent to which parents think that teachers understand the challenges parents face in coping

with homework and are able to communicate with parents effectively regarding homework. Although the teacher support factor appears to have educational utility, the inclusion of these items in some cases could have adverse effects in that teacher knowledge of parental ratings on these items could strain the parent–teacher relationship.

### *Limitations*

The school districts included in the study sample represented a diverse range of students both with regard to ethnic/racial grouping and socioeconomic status. However, the sample underrepresented the population of Latino children attending one of the school districts targeted for this study. In this preliminary study an English language version of the HPQ-PS was used, which excluded children whose parents spoke limited English. As such, the findings of this study may not reflect adequately the views of many Latino families from these schools. Also, the sample underrepresented students of lower socioeconomic status, as indexed by eligibility for free and reduced-fare lunch, which is common in studies conducted through schools (National Center for Educational Statistics, 2004). Specialized strategies including incentive systems have been recommended to improve rates of recruitment, particularly in schools situated in underresourced urban and rural settings (Blom-Hoffman, Leff, Franko, & Power, submitted for publication).

Although the sample was relatively diverse, it includes children from only two districts located in the Northeast section of the country. In future research, it will be important to include schools throughout the country that are representative of the diverse ethnic, racial, and socioeconomic groupings that comprise the United States.

The sample size of this study is relatively small and the external validity of the rating scales has not yet been established. Because additional research is needed to determine the validity of the measures and to establish normative parameters, the scales are not yet recommended for clinical use.

### *Directions for research*

The version of the HPQ-TS used in this study did not include items referring to teacher perceptions of the extent to which parents are supportive of teachers in their efforts to guide students through the homework process. In future versions of this measure, it may be useful to include items referring to parent support, which would serve as a counterpart to factor III on the HPQ-PS referring to teacher support. However, because the practice of requesting teachers to rate level of parent support could have adverse effects on the family–school relationship if parents were to learn about the findings, it is recommended that items pertaining to a parent support factor be administered only when teacher ratings can be kept confidential, such as in the context of a research study.

The validity of the HPQ needs to be further established by correlating its factors with various criterion measures. For example, factor scores for the HPQ-PS could be correlated with factor scores for the parent-rated HPC, graded samples of children's homework, and parent ratings of the quality of the parent–teacher relationship, as assessed by a measure such as the Parent–Teacher Involvement Questionnaire (Kohl, Lengua, McMahon, & Conduct Problems Prevention Research Group, 2000). Factor scores on the HPQ-TS could

be correlated with teacher records of homework completion, graded samples of children's homework, and an analysis of the completeness and accuracy of students' homework assignment books.

For purposes of normative comparison, it is important that the HPQ be standardized with a sample representing the diverse geographic regions, ethnic and racial groups, and socioeconomic groupings in the United States. Further, it would be useful to establish cut-points for universal screening by conducting predictive power analyses to determine the threshold at which children are at risk for having homework problems.

### Conclusions

This article describes the development of parent and teacher ratings scales to assess children's homework performance. A unique feature of the rating scales is that they were developed with a focus on the assessment of strengths with regard to homework performance. Also, the scales were developed to assess contextual factors that have an effect on students' homework performance. The findings of this study indicate that the HPQ-PS assesses three factors: student task engagement/efficiency, student competence, and teacher support; and that the HPQ-TS assesses two factors: student responsibility and student competence. The student competence factors of the HPQ-PS and HPQ-TS would appear to be useful in assessing the extent to which homework assignments are at an appropriate instructional level for students. Also, the teacher support factor of the HPQ-PS may provide helpful information about the extent to which teachers are responsive to parents in addressing homework concerns. Additional research on the HPQ is needed to determine whether it is possible to reliably, validly, and ethically assess family contextual factors that influence homework performance. Also, research is needed to establish the validity of the HPQ in relation to a wide range of criterion measures, identify benchmarks for normative comparison, and identify cut-points for universal screening.

### References

Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont, Department of Psychiatry.

Anesko, K. M., Schoiock, G., Ramirez, R., & Levine, F. M. (1987). The Homework Problem Checklist: Assessing children's homework difficulties. *Behavioral Assessment*, 9, 179–185.

Bartlett, M. S. (1954). A further note on the multiplying factors for various  $\chi^2$  approximations in factor analysis. *Journal of the Royal Statistical Society*, 16, 296–298.

Blom-Hoffman, J., Leff, S. S., Franko, D., & Power, T. J. (submitted for publication). Increasing student participation in school-based health promotion program evaluations: A multicomponent strategy. Manuscript under review.

Briggs, N. E., & MacCallum, R. C. (2003). Recovery of weak common factors by maximum likelihood and ordinary least squares estimation. *Multivariate Behavioral Research*, 38, 25–56.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245–276.

Cooper, H. (1989). *Homework*. White Plains, NY: Longman.

Cooper, H. (2001). *The battle over homework: Common ground for administrators, teachers, and parents* (2nd ed.). Thousand Oaks, CA: Corwin Press.

Cooper, H., Lindsay, J. J., Nye, B., & Greathouse, S. (1998). Relationships among attitudes about homework, amount of homework assigned and completed, and student achievement. *Journal of Educational Psychology*, 90, 70–83.

Cooper, H., Robinson, J. C., & Patall, E. A. (2006). Does homework improve academic achievement? A synthesis of research. *Review of Educational Research*, 76, 1–62.

DuPaul, G. J., Power, T. J., Anastopoulos, A. D., & Reid, R. (1998). *The ADHD Rating Scale — IV: Checklists, norms, and clinical interpretation*. New York: Guilford Press.

Epstein, J. L. (1995). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan*, 76(9), 701–712.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4, 272–299.

Fantuzzo, J., McWayne, C., Perry, M. A., & Childs, S. (2004). Multiple dimensions of family involvement and their relations to behavioral and learning competencies for urban, low-income children. *School Psychology Review*, 33, 467–480.

Gorsuch, R. L. (2003). Factor analysis. In J. A. Schinka & F. Velicer (Eds.), *Handbook of psychology: Volume 2, research methods in psychology* (pp. 143–164). Hoboken, NJ: Wiley.

Gravois, T. A., & Gickling, E. E. (2002). Best practices in curriculum-based assessment. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology IV* (pp. 885–898). Bethesda, MD: National Association of School Psychologists.

Hinshaw, S. P., March, J. S., Abikoff, H., Arnold, L. E., Cantwell, D. P., Conners, C. K., et al. (1997). Comprehensive assessment of childhood attention-deficit hyperactivity disorder in the context of a multisite, multimodal clinical trial. *Journal of Attention Disorders*, 1, 217–234.

Horn, J. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30, 179–185.

Izzo, C. V., Weissberg, R. P., Kasprow, W. J., & Frendrich, M. (1999). A longitudinal assessment of teacher perceptions of parent involvement in children's education and school performance. *American Journal of Community Psychology*, 27, 817–839.

Kahle, A. L., & Kelley, M. L. (1994). Children's homework problems: A comparison of goal setting and parent training. *Behavior Therapy*, 25, 275–290.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39, 31–36.

Keith, T. Z., & Keith, P. B. (2006). Homework. In G. G. Bear & K. M. Minke (Eds.), *Children's Needs III: Development, Prevention, and Intervention* (pp. 615–629). Washington, DC: National Association of School Psychologists.

Kline, P. (1994). *An easy guide to factor analysis*. NY: Routledge.

Kohl, G. O., Lengua, L. J., & McMahon, R. J., & Conduct Problems Prevention Research Group. (2000). Parent involvement in school: Conceptualizing multiple dimensions and their relations with family and demographic risk factors. *Journal of School Psychology*, 38, 501–524.

Lahey, B. B., Applegate, B., McBurnett, K., Biederman, J., Greenhill, L., Hynd, G. W., et al. (1994). DSM-IV field trial for attention-deficit hyperactivity disorder in children and adolescents. *American Journal of Psychiatry*, 151, 1673–1685.

LeCompte, M. D., & Schensul, J. J. (1999). *Ethnographers' toolkit, Book 5: Analyzing and interpreting ethnographic data*. Walnut Creek, CA: Altamira Press.

Lincoln, Y. S., & Gruba, E. G. (1985). *Naturalistic inquiry*. Thousand Oaks, CA: Sage.

Manz, P. H., Fantuzzo, J. F., & Power, T. J. (2004). Multidimensional assessment of family involvement among urban elementary students. *Journal of School Psychology*, 42, 461–475.

Miller, D. L., & Kelley, M. L. (1994). The use of goal setting and contingency contracting for improving children's homework performance. *Journal of Applied Behavior Analysis*, 27, 73–84.

National Center for Educational Statistics. (2004). *The condition of education*. Washington, DC: US Department of Education.

Olympia, D. E., Sheridan, S. M., Jenson, W. R., & Andrews, D. (1994). Using student-managed interventions to increase homework completion and accuracy. *Journal of Applied Behavior Analysis*, 27, 85–99.

Power, T. J., Karustis, J. L., & Habboushe, D. F. (2001). *Homework success for children with ADHD: A family-school intervention program*. New York: Guilford Press.

Power, T. J., Soffer, S. L., Clarke, A. T., & Mautone, J. A. (2006). Multisystemic intervention for children with ADHD. *Report on Emotional & Behavioral Disorders in Youth*, 6, 51–52, 67–69.

Power, T. J., Werba, B. E., Watkins, M. W., Angelucci, J. G., & Eiraldi, R. B. (2006). Patterns of parent-reported homework problems among ADHD-referred and non-referred children. *School Psychology Quarterly*, 21, 13–33.

Reynolds, C. R., & Kamphaus, R. W. (2004). *Behavior assessment system for children* (Second Edition). Circle Pines, MN: American Guidance Service.

Tataryn, D. J., Wood, J. M., & Gorsuch, R. L. (1999). Setting the value of  $k$  in promax: A Monte Carlo study. *Educational and Psychological Measurement, 59*, 384–391.

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika, 41*, 321–327.

Velicer, W. F., Eaton, C. A., & Fava, J. L. (2000). Construct explication through factor or component analysis: A review and evaluation of alternative procedures for determining the number of factors or components. In R. D. Goffin & E. Helmes (Eds.), *Problems and solutions in human assessment: Honoring Douglas N. Jackson at seventy* (pp. 41–71). Boston: Kluwer Academic Publishers.

Wegener, D. T., & Fabrigar, L. R. (2000). Analysis and design for nonexperimental data. In H. T. Reis & C.M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 412–450). NY: Cambridge University Press.

Weiner, R. K., Sheridan, S. M., & Jenson, W. R. (1998). The effects of conjoint behavior consultation and a structured homework program on math completion and accuracy in junior high school students. *School Psychology Quarterly, 13*, 281–309.

Widaman, K. F. (1993). Common factor analysis versus principal component analysis: Differential bias in representing model parameters? *Multivariate Behavioral Research, 28*, 263–311.

Wood, J. M., Tataryn, D. J., & Gorsuch, R. L. (1996). Effects of under- and overextraction on principal axis factor analysis with varimax rotation. *Psychological Methods, 1*, 354–365.