MANUAL

The MacArthur Health and Behavior Questionnaire (HBQ 1.0)

Developed by the John D. and Catherine T. MacArthur Foundation Research Network on Psychopathology and Development

Prepared by

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with
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ADDITIONAL INFORMATION

Additional information about the HBQ can be found in the following publications:

Ablow, J.C., Measelle, J.R., Kraemer, H.C., Harrington, R., Luby, J., Smider, N., Dierker, L., Clark, V., Dubicka, B., Heffelfinger, A., Essex, M.J., & Kupfer, D.J. (1999). The MacArthur Three-City Outcome Study: Evaluating multi-informant measures of young children's symptomatology. *Journal of the American Academy of Child and Adolescent Psychiatry, 38,* 1580-1590.

Boyce, W.T., Essex, M.J., Woodward, H.R., Measelle, J.R., Ablow, J.C., Kupfer, D.J., & The MacArthur Assessment Battery Working Group. (2002). The confluence of mental, physical, social, and academic difficulties in middle childhood. I: Exploring the "headwaters" of early life morbidities. *Journal of the American Academy of Child and Adolescent Psychiatry, 41,* 580-587.

Essex, M.J., Boyce, W.T., Goldstein, L.H., Armstrong, J.M., Kraemer, H.C., Kupfer, D.J., & The MacArthur Assessment Battery Working Group. (2002). The confluence of mental, physical, social, and academic difficulties in middle childhood. II: Developing the MacArthur Health and Behavior Questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 41,* 588-603.

Kraemer, H.C., Measelle, J.R., Ablow, J.C., Essex, M.J., Boyce, W.T., & Kupfer, D.J. (2003). A new approach to integrating data from multiple informants in psychiatric assessment and research: Mixing and matching contexts and perspectives. *American Journal of Psychiatry, 160,* 1566-1577.

Lemery-Chalfant, K., Schreiber, J.E., Schmidt, N.L., Van Hulle, C.A., Essex, M.J., & Goldsmith, H.H. (2007). Assessing internalizing, externalizing, and attention problems in young children: Validation of the MacArthur HBQ. *Journal of the American Academy of Child and Adolescent Psychiatry, 46,* 1315-1323.

Luby, J.L., Heffelfinger, A., Measelle, J.R., Ablow, J.C., Essex, M.J., Dierker, L., Harrington, R., Kraemer, H.C., & Kupfer, D.J. (2002). Differential performance of the MacArthur HBQ and DISC-IV in identifying DSM-IV internalizing psychopathology in young children. *Journal of the American Academy of Child and Adolescent Psychiatry, 41,* 458-466.

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TABLE OF CONTENTS

List of Tables iv
List of Figures v
Executive Summary 1
Chapter 1. Introduction 2
MacArthur Assessment Battery for Middle Childhood 2
MacArthur Health and Behavior Questionnaire (HBQ) 3
Multiple Informants: Parents, Teachers, and Children 4
Organization of HBQ Manual 5
Chapter 2. Description and Theoretical Bases of the HBQ 6
HBQ Domains, Scales, and Subscales 6
Inclusion of Aggression Measures in either Mental Health Domain or Social Functioning Domain 9
Theoretical Bases of the HBQ 10
Mental Health Symptoms 10
Physical Health Problems 10
Social and School Functioning 11
Chapter 3. Administration and Scoring of the HBQ 12
Administration 12
Scoring the HBQ Scales and Subscales 12
Missing Data 12
Reversing Items Prior to Computing a Subscale Score 13
Reversing Subscales Prior to Computing a Scale Score 13
Computing Scales where Subscales are Scored on Different Metrics 13
Computing Physical Health Variables 14
Chapter 4. Sample Descriptions 16
Study 1. Wisconsin Study of Families and Work (WSFW) 16
Study 2. Wisconsin Pilot Study Sub-Sample 16
Study 3. Berkeley Pilot Study 18
Study 4. Temple Pilot Study 18
Study 5. Three-City Outcome Study 19
Summary 19

Chapter 5. Psychometric Properties 20
Internal Consistency 20
Test-Retest Reliability and Consistency Over Time 22
Short-Term Reliability 22
Temporal Stability 26
Scale and Subscale Intercorrelations 26
Scale Descriptives 34
Associations with Child Gender, Child Age, and Study Site 34
Associations with Socioeconomic Status and Marital Status 41
Discriminant Validity 41
Cross-Format Agreement 42
Informant Congruence 42
Summary 47
Chapter 6. Limitations and Future Directions 48
References 49
Appendix A. Citations of Papers Using the HBQ 55
Appendix B. HBQ Items by Domain and Scale: Parent Version (HBQ-P 1.0) 61
Appendix C. HBQ Items by Domain and Scale: Teacher Version (HBQ-T 1.0) 70
Appendix D. Sample Percentile Rank Scoring Commands 78

LIST OF TABLES

Table 1a.	HBQ Scales and Subscales Assessed in Each Domain	8
Table 1b.	HBQ Social Functioning Including Overt Hostility and Relational Aggression	9
Table 2.	Physical Health Percentile Rank Scores (Mother Report)	15
Table 3.	Sample Demographics	17
Table 4.	Internal Consistency of HBQ Scales and Subscales by Informant	21
Table 5.	Test-Retest Reliability	23
Table 6.	Consistency and Change Over Time: Kindergarten to First Grade	24
Table 7a.	Intercorrelation of HBQ Scales for FEMALE Children: Mother Report	28
Table 7b.	Intercorrelation of HBQ Scales for MALE Children: Mother Report	29
Table 8a.	Intercorrelation of HBQ Scales for FEMALE Children: Father Report	30
Table 8b.	Intercorrelation of HBQ Scales for MALE Children: Father Report	31
Table 9a.	Intercorrelation of HBQ Scales for FEMALE Children: Teacher Report	32
Table 9b.	Intercorrelation of HBQ Scales for MALE Children: Teacher Report	33
Table 10a.	Descriptive Statistics for All 6- to 8-Year-Old Children by Site: Mother Report	35
Table 10b.	Descriptive Statistics for FEMALE 6- to 8-Year-Old Children by Site: Mother Report	36
Table 10c.	Descriptive Statistics for MALE 6- to 8-Year-Old Children by Site: Mother Report	37
Table 10d.	Descriptive Statistics for 4- to 5-Year-Old Children by Gender: Mother Report	38
Table 11.	Descriptive Statistics for 6- to 8-Year-Old Children by Gender: Father Report	39
Table 12.	Descriptive Statistics for 6- to 8-Year-Old Children by Site and Gender: Teacher Report	40
Table 13.	Discriminant Validity: Group by Site by Child Gender ANOVAs	43
Table 14.	Cross-Format Agreement: Comparison of Mother Report on HBQ-P Interview and Subsequent (3-4 months) Questionnaire	45
Table 15.	Informant Congruence	46

LIST OF FIGURES

Figure 1. Conceptual Model of Interactions Among Child, Context, and Health Factors in Developmental Psychopathology 3

Figure 2. Domains of Health Assessed by the MacArthur Assessment Battery for Middle Childhood, by Informant and Instrument 5

EXECUTIVE SUMMARY

The MacArthur Health and Behavior Questionnaire (HBQ) was designed to collect data from adult reporters about children between the ages of 4 and 8. As part of the MacArthur Assessment Battery for Middle Childhood, the HBQ comprises multiple scales that measure children's symptoms (e.g., Internalizing and Externalizing Symptoms and their subscales), physical health (e.g., Chronic Medical Conditions, Global Physical Health), social functioning (e.g., Peer Acceptance and Rejection, Prosocial Behaviors), and school functioning (e.g., Academic Competence, School Engagement). The HBQ also includes measures of children's health care utilization in the mental, physical, and school domains. Versions of the instrument have been created for both parent (HBQ-P) and teacher (HBQ-T) report. The HBQ does not yield clinical diagnoses. Rather, it provides dimensional scales to enable researchers to assess young children's mental, physical, social, and academic well-being.

An important feature of the HBQ is a multi-informant, multi-domain approach. When used together with the Berkeley Puppet Interview Symptomatology (BPI-S), Social (BPI-Soc) and Academic (BPI-A) modules, parallel reports can be obtained from parents, teachers, and young children. The HBQ and BPI were developed in tandem so as to maximize their conceptual and methodological overlap. (For the companion BPI manual, see Ablow, Measelle, & The MacArthur Working Group on Outcome Assessment, 2003.)

This manual provides a theoretical, psychometric and procedural introduction to the MacArthur Health and Behavior Questionnaire (Boyce et al., 2002; Essex et al., 2002). It describes the samples on which the HBQ-P and HBQ-T were developed and presents descriptive, reliability and validity data as derived from several community samples and a multi-site sample consisting of a community control group and children referred for mental health evaluation and treatment. **Appendix A** contains a current list of publications using the HBQ.

The development of the HBQ is an ongoing process. Since the release of the first publications documenting various aspects of the instrument (Ablow et al., 1999; Boyce et al., 2002; Essex et al., 2002), additional data have been gathered and analyzed, and some refinements have been made in the conceptualization and operationalization of various HBQ scales. In the event of any discrepancies between this manual and reports published to date, this manual should take precedence. Further, the HBQ is currently in use in a variety of research studies, and its predictive validity is being examined in longitudinal work. Subsequent editions of this manual will incorporate additional findings as they become available.

Chapter 1

INTRODUCTION

One of the most significant challenges facing the fields of child psychiatry and clinical psychology is the accurate measurement of symptoms and impairment in children younger than 8 years of age. Precise detection of symptoms and impairment in young children has been impeded by (1) gaps in our understanding of the middle childhood period of development, particularly forms of impairment that, because they are low in frequency or complex in character, are not detected until the emergence of more pronounced difficulties in mental health (Kazdin, 1994); (2) an absence of age appropriate methods with which to obtain young children's reports of their own symptoms and functioning (Measelle, Ablow, Cowan, & Cowan, 1998); and (3) a lack of integration among measures designed to assess multiple informants' perspectives on young children's mental health (Ablow et al., 1999).

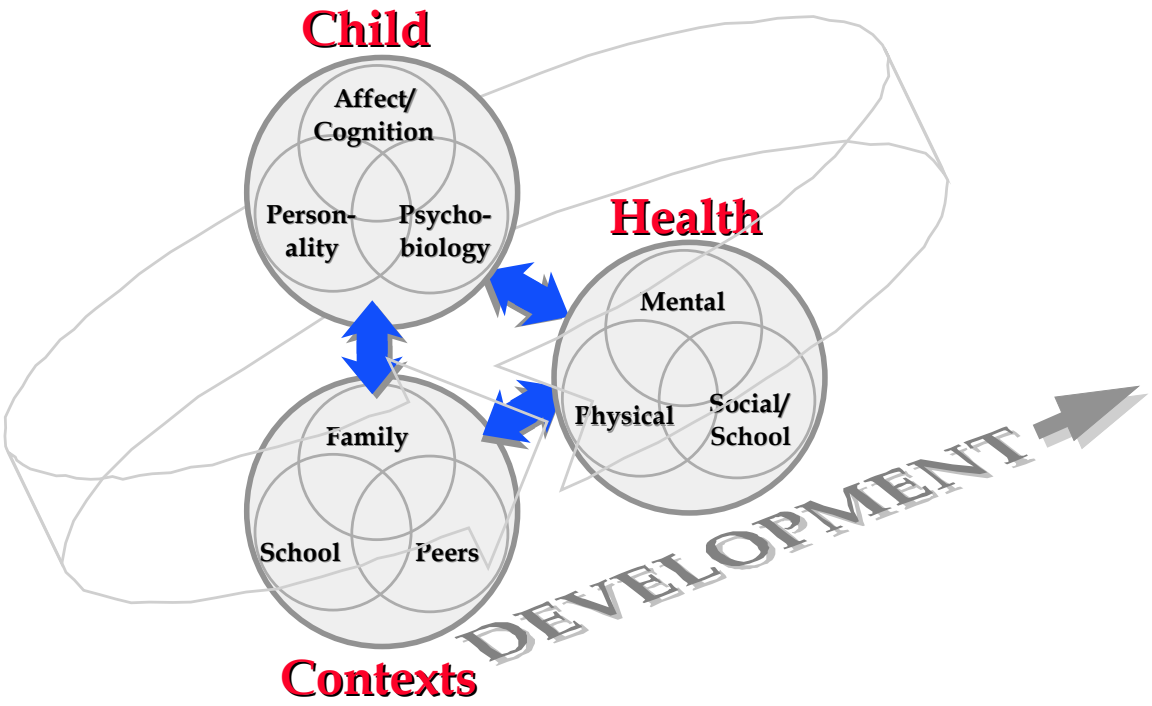
As part of a larger effort to design a battery of measures to assess biological, neuropsychological, personality, and contextual aspects of development that may contribute to adaptation and impairment beginning during the middle childhood years, the MacArthur Foundation Research Network on Psychopathology and Development has supported the advancement of developmentally appropriate assessment methods for children in the 4- to 8-year-old range. The MacArthur Health and Behavior Questionnaire (HBQ) and the Berkeley Puppet Interview Symptomatology (BPI-S), Social (BPI-Soc), and Academic (BPI-A) modules form the health component of the **MacArthur Assessment Battery for Middle Childhood**, described below. The HBQ and the BPI-S, BPI-Soc, and BPI-A were developed in tandem, and together they provide researchers with a set of multi-informant instruments for assessing young children's mental and physical health and functioning. The present manual describes the HBQ. A companion manual (Ablow, Measelle, & The MacArthur Working Group on Outcome Assessment, 2003) describes the BPI.

MacArthur Assessment Battery for Middle Childhood

To generate and examine hypotheses, researchers in the MacArthur Research Network on Psychopathology and Development have assembled an integrated assessment battery, based on a dynamic, multidimensional model of developmental psychopathology and addressing biological, neuropsychological, personality, and contextual aspects of middle childhood development (Boyce et al., 2002). The MacArthur Assessment Battery for Middle Childhood has been developed as a constellation of measures assessing several domains and focusing on early precursors of psychopathology, heightened vulnerability to dysfunctional processes, and protective factors facilitating healthy developmental trajectories. Three mutually interactive and conceptually overlapping domains are contained within each of the three broad conceptual components of child, context, and health (see **Figure 1**). The child domains comprise measures of affective regulation and cognition, personality and temperament, and psychobiological responses to environmental conditions. Contextual domains include family, school, and peer relationships. Health domains include mental health, physical health, and social and school functioning. Although the Battery explicitly makes no claim to encompass exhaustively all risk and protective factors implicated in developmental pathogenesis, a careful, multidisciplinary attempt has been made to assess a representative and promising array of factors involved in brain-behavior-context interactions.

The overarching scientific goals of the MacArthur Assessment Battery project were: first, to identify children at risk by tracing pathways leading to psychopathology; second, to ascertain risk and protective factors associated with disordered outcomes; and third, to generate hypotheses about the etiology and course of psychopathological development. Each of these goals was paralleled by a set of practical objectives enabling scientists to utilize the Battery in empirically credible and clinically meaningful ways. Among such practical objectives were those of assembling a collection of readily exportable measures, ensuring equal applicability in both laboratory and field settings, and providing cost-efficient and logistically feasible measurement strategies. At the core of our aspirations for the MacArthur Assessment Battery for Middle Childhood was the goal of producing reliable and valid measures of constructs that are theoretically important to understanding trajectories across middle childhood development and that are derived with age-appropriate measurement paradigms.

Figure 1. Conceptual Model of Interactions Among Child, Context, and Health Factors in Developmental Psychopathology



MacArthur Health and Behavior Questionnaire (HBQ)

The MacArthur Health and Behavior Questionnaire (HBQ) was designed to assess children's mental health, physical health, and social and school functioning. The novelty of the HBQ lies not in its use of entirely new items representing unique target domains, but in its assembling and reformatting of existing scales into a broader and theoretically oriented configuration of adult-report measures. The HBQ is not intended for diagnostic purposes at this point in time, although initial work to define cut-points or clinical thresholds has begun (see Lemery-Chalfant et al., 2007; Luby et al., 2002).

The HBQ includes a number of distinctive and useful features. First, the HBQ addresses multiple, rather than singular, morbidities. As Roberts and colleagues have observed, "comorbidity is increasingly recognized as a key phenomenological feature of psychiatric disorders among children and adults… yet there are basically no community-based epidemiological data on the prevalence, incidence, and natural history of comorbid disorders in children" (Roberts, Attkisson, & Rosenblatt, 1998). Second, the HBQ provides a measure of functioning and impairment (not just symptoms) since these may be at the core of emerging problems in adaptation and better predictors of subsequent psychopathology than the presence or absence of symptoms alone (Kazdin, 1994). Third, the HBQ may offer a strong index of the *severity* of symptoms, functional impairment, and the need for treatment. Available data suggest that a sizeable proportion of individuals meeting criteria for DSM diagnoses are functioning adequately in their everyday lives, and may thus not be appropriately included in counts or studies of developmental psychopathology. Fourth, HBQ items were specifically selected to address, in a single instrument, the problems of children spanning the 4- to 8-year-old range, a developmental period often divided observationally by the use of multiple measures of the same or similar constructs. This age span of middle childhood is often overlooked and has received considerably less intensive study by researchers interested in the developmental antecedents of psychopathology than the adolescent time period. Finally, the HBQ is an integrated component of the larger MacArthur Assessment Battery for Middle Childhood, the aims of which were outlined above.

Previous research with 4- to 8-year-old children has demonstrated the psychometric properties of the HBQ in various clinic-referred, community, and convenience samples (Ablow et al., 1999; Essex et al., 2002). Specifically, the HBQ has been used in five studies of developmental psychopathology in middle childhood: a case-control study, the MacArthur Three-City Outcome Study (Ablow et al., 1999); a longitudinal study, the Wisconsin Study of Families and Work (WSFW; Essex, Klein, Miech, & Smider, 2001); a nested, cross-sectional pilot study within the larger WSFW (Essex et al., 2002); a cross-sectional pilot study at the University of California, Berkeley (Alkon et al., 2003); and a pilot study at Temple University (see Morris et al., 2002). As detailed in this manual and elsewhere (Ablow et al., 1999; Essex et al., 2002), these studies have established the HBQ as a reliable, multidimensional outcome measure for 4- to 8-year-old children from diverse geographic areas and backgrounds.

Multiple Informants: Parents, Teachers, and Children

The HBQ for parents and teachers and the BPI for children were developed in tandem. With the exception of several scales measuring physical health, global functional impairment, and health care utilization that are asked of adult informants only (see Chapter 2), virtually all HBQ and BPI scales correspond, both at the level of scale definition and item content. When the HBQ and BPI are used together, parallel reports on children's health and functioning can be obtained from parent, teacher, and child.

Figure 2 is an overview of domains within the health-related component of the MacArthur Assessment Battery, the informants utilized, and the specific instruments employed for each domain-by-informant cell of the assessment (Boyce et al., 2002). Health outcome measures comprise evaluations of four health domains — mental, physical, social and school — reported by parent, teacher, and child informants. Of the resulting twelve assessment cells, three are addressed by the BPI; these assessments are presented in detail in the BPI manual (Ablow et al., 2003) that serves as a companion to this HBQ manual and elsewhere (Ablow et al., 1999). The remaining eight cells are covered by the parent or teacher version of the HBQ (HBQ-P and HBQ-T, respectively). The BPI, HBQ-P, and HBQ-T scales were developed together to allow for direct, construct-by-construct comparisons between child and multiple adult informants. This cross-informant, cross-construct format achieves a central aspiration of the health assessment: the elicitation of multiple and varied perspectives on the most important domains of health

and behavior in middle childhood. (For a detailed description of an approach to the challenges of integrating multi-informant data, see Kraemer et al., 2003).

Figure 2. Domains of Health Assessed by the MacArthur Assessment Battery for Middle Childhood, by Informant and Instrument

(shaded cells refer to components addressed in this manual)

Domains of Health

	Mental	**Physical**	**Social/School**	
Child	**BPI-S**		**BPI-Soc**	**BPI-A**
Parent	**HBQ-P**	**HBQ-P**	**HBQ-P**	**HBQ-P**
Teacher	**HBQ-T**	**HBQ-T**	**HBQ-T**	**HBQ-T**

BPI-S, BPI-Soc, and BPI-A = Berkeley Puppet Interview: Symptomatology, Social, and Academic Modules
HBQ-P and HBQ-T = MacArthur Health and Behavior Questionnaire: Parent and Teacher Versions

Organization of HBQ Manual

In this manual, we first describe the domains and scales of the HBQ and the theoretical bases from which they were developed (Chapter 2). We then discuss the administration and scoring of the HBQ (Chapter 3). Next, we present data describing the samples on which the HBQ was developed (Chapter 4), and the psychometric properties of the HBQ (Chapter 5). Finally, we discuss limitations of the HBQ and future directions in its development (Chapter 6).

Chapter 2

DESCRIPTION AND THEORETICAL BASES OF THE HBQ

HBQ Domains, Scales, and Subscales

The HBQ consists of four health domains: 1) the *Mental Health* domain assesses children's symptoms, functional impairment, and mental health care utilization; 2) the *Physical Health* domain assesses children's physical health problems and health care utilization; 3) the *Social Functioning* domain assesses children's social relationships, preferences, and behavior; and 4) the *School Functioning* domain assesses children's academic competence, school engagement, the teacher-child relationship, and educational services utilization. The HBQ domains and corresponding scales and subscales are presented in **Table 1a**. (See Ablow et al., 1999, and Essex et al., 2002, for details of the principal component analyses related to Table 1a.) The organization of domains, scales, and subscales presented in Table 1a is consistent with the BPI (see companion manual), except in places where parents and teachers complete scales which children do not (e.g., physical health, health care utilization).

The HBQ is an assembly of child health and behavioral items derived from several sources. As noted earlier, the novelty of the HBQ lies not in its use of entirely new items representing unique target domains, but in its assembling and reformatting of existing scales into a broader and theoretically oriented configuration of adult-report measures. In the interests of parsimony and to minimize respondent burden that would have resulted from an overly long questionnaire, some measures were imported in abbreviated form, with only select scales or reduced item sets included in the HBQ. The mental health symptom scales are drawn primarily from the Revised Ontario Child Health Study Scales (OCHS-R; Boyle et al., 1993), which themselves include selected items from the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1981). Additional items tapping overt hostility and relational aggression come from the Child Behavior Scale (CBS; Ladd & Profilet, 1996) and the Preschool Social Behavior Scale (Crick, Casas, & Mosher, 1997). The physical health items are derived primarily from the Medical History Questionnaire from the Rand Health Insurance Study of Children (Eisen, Donald, Ware, & Brook, 1980; Lewis, Pantell, & Kieckhefer, 1989). Social Functioning measures include the Prosocial Behavior Scale in its original form (Weir & Duveen, 1981); peer relation items drawn primarily from the Child Adaptive Behavior Inventory (Cowan, Cowan, Heming, & Miller, 1995) and the CBS (Ladd & Profilet, 1996); the Asocial with Peers subscale of the CBS (Ladd & Profilet, 1996); and items regarding Adult-Led Recreational Activities adapted from Offord, Lipman, and Duku (1998). In the School Domain, teacher-report school-engagement items are derived primarily from the Teacher Rating of School and Social Adjustment (Kochenderfer & Ladd, 1996b). Academic competence was measured in the HBQ-P with items drawn from the work of Eccles and colleagues (Frome & Eccles, 1998; Parsons, Adler, & Kaczala, 1982) and in the HBQ-T with a measure adapted from Pierce, Hamm, and Vandell (1999). The Teacher-Child Relationship Scale is a shortened form of the original Student-Teacher Relationship Scale (Pianta, 1996; Pianta, Steinberg, & Rollins, 1995). Across the four target domains, additional items were written or adapted from existing measures to increase coverage in particular areas (e.g., Social Inhibition, parent-report School Engagement). To facilitate the comparison of HBQ findings with studies that have used — in their original form — measures imported into the HBQ, items from existing scales were added to the HBQ in their original format (i.e., with the original response options) when feasible. Formats and scaling of items therefore sometimes differ across (and, in a few instances detailed in Chapter 3, within) scales.

The current HBQ parent version (HBQ-P 1.0) is approximately 175 items in length (225 including sub-questions), while the teacher version (HBQ-T 1.0) contains approximately 150 items. Each questionnaire is divided into labeled sections to help keep respondents oriented as they progress through

the instrument. The HBQ-P begins with "Your Child's Physical Health" comprising subsections for Global Physical Health, Injuries and Accidents, Neurological Risk, and Chronic Medical Conditions. This section is followed by sections covering Social and School Functioning, including "Your Child's Recreational Activities," "Your Child's Experiences with Peers," and "Your Child's School Experiences." The remaining sections cover Mental Health ("Your Child's Behavior" and "Impact of Child's Behavior on your Child and on your Family") and service use ("Health Care Utilization" and "Medications"). The HBQ-T is similarly organized, beginning with an "Introduction" that asks for general information about the classroom setting (e.g., type of childcare setting or grade in school, typical number of children in the classroom) and a section on "This Child's Health" comprising subsections for General Physical Health, Chronic Problems and Disorders, and Emotional and Behavioral Functioning. The remaining sections are "This Child's Experiences with Peers," "This Child's School Experiences," "Your Relationship with This Child," "This Child's Behavior," and "Impact of Child's Behavior." Each version of the HBQ omits items not relevant to that informant. Specifically, the HBQ-P omits the Teacher-Child Relationship items; the HBQ-T omits items related to Chronic Medical Conditions (with four exceptions), Adult-Led Recreational Activities, Separation Anxiety, Functional Impairment-Family, and some health care utilization items. Lists of items organized by scale are presented for the parent and teacher versions separately in **Appendix B** and **Appendix C**.

Table 1a. HBQ Scales and Subscales Assessed in Each Domain

Domain	*Scale*		*Subscale*
Mental Health	Internalizing Symptoms		Depression Overanxious Separation Anxiety [b]
	Externalizing/ADHD Symptoms [a]	Externalizing Symptoms [a]	Oppositional Defiant Conduct Problems Overt Hostility [c] Relational Aggression [c]
		ADHD Symptoms [a]	Inattention Impulsivity
	Functional Impairment-Child		
	Functional Impairment-Family [b]		
	Mental Health Care Utilization [d]		
Physical Health	Physical Health Problems Index [b]		Global Physical Health Chronic Medical Conditions [b]
	Injuries/Accidents [b]		
	Neurological Risk [bd]		
	Physical Health Care Utilization [d]		
Social Functioning [c]	Peer Relations		Peer Acceptance/Rejection Bullied by Peers (reversed) [e]
	Social Withdrawal		Asocial with Peers Social Inhibition
	Prosocial Behavior		
	Adult-Led Recreational Activities [bd]		
School Functioning	Academic Functioning		School Engagement Academic Competence
	Teacher-Child Relationship [f]		Teacher-Child Closeness [f] Teacher-Child Conflict (reversed) [ef]
	Education Services Utilization [d]		

[a] Depending on the aims of a specific set of analyses and the scale psychometrics in a particular sample, *either* Externalizing Symptoms and ADHD Symptoms may be used as separate scale scores *or* the six subscales these comprise (i.e., Oppositional Defiant, Conduct Problems, Overt Hostility, Relational Aggression, Inattention, and Impulsivity) may be combined into a single summary score for Externalizing/ADHD Symptoms. See Ablow et al. (1999) and Essex et al. (2002) for additional information.
[b] Scale included in HBQ-P but not HBQ-T.
[c] See Table 1b for an alternate treatment of Social Functioning that includes Overt Hostility and Relational Aggression in that domain *instead* of the Mental Health domain.
[d] Scale under development and therefore excluded from subsequent tables.
[e] See Chapter 3 for instructions on the reverse coding of subscales.
[f] Scale included in HBQ-T but not HBQ-P.

Inclusion of Aggression Measures in <u>either</u> Mental Health Domain <u>or</u> Social Functioning Domain

Depending on the aims of a particular research study, the Overt Hostility and Relational Aggression subscales can be included in **<u>either</u>** the Mental Health domain (as shown in Table 1a) **<u>or</u>** the Social Functioning domain (see **Table 1b**). To support the inclusion of these scales in the Social Functioning domain, principal component analyses (PCAs) with varimax rotation were conducted on the seven Social Functioning subscales shown in Table 1b separately for mothers, fathers, and teachers in the Wisconsin Study of Families and Work (see Chapter 4, p. 16). Since patterns were similar for all reporters, including children reporting on these same scales in the Berkeley Puppet Interview, only the results for mothers are described here. (Results of the PCAs with other reporters can be obtained from the authors.) Given our conceptualization of the Social Functioning domain, we specified a three-factor solution. Subscales loaded on the three components with only minimal cross-loading as follows: component 1 (Eigenvalue=2.69) was labeled Social Behavior and comprised Overt Hostility (.83), Relational Aggression (.77), and Prosocial Behavior (-.67); component 2 (Eigenvalue=1.29) was labeled Peer Relations and was made up of Bullied by Peers (.91) and Peer Acceptance/Rejection (-.88); and component 3 (Eigenvalue=.98) was labeled Social Withdrawal and comprised Social Inhibition (.85) and Asocial with Peers (.69).

If the Social Functioning and Mental Health scales are to be used in the same set of analyses, we recommend that Overt Hostility and Relational Aggression be used *only* in the Mental Health domain; in that case, the Social Functioning scales of Peer Relations, Social Withdrawal, and Prosocial Behavior may be used as shown in Table 1a. Analyses focusing on Social Functioning to the exclusion of Mental Health symptoms can use the subscales and scales shown in Table 1b below. Throughout the remainder of this manual, we will not present data on the Social Behavior scale listed in Table 1b. We do, however, present psychometric data at the subscale level to allow readers to get a preliminary feel for the reliability and validity of this scale.

Table 1b. HBQ Social Functioning Including Overt Hostility and Relational Aggression [a]

Domain	*Scale*	*Subscale*
Social Functioning	Peer Relations	Peer Acceptance/Rejection
		Bullied by Peers (reversed) [b]
	Social Withdrawal	Asocial with Peers
		Social Inhibition
	Social Behavior	Prosocial Behavior (reversed) [b]
		Overt Hostility
		Relational Aggression
	Adult-Led Recreational Activities [c]	

[a] Shaded boxes indicate differences in scale construction between Tables 1a and 1b.

[b] See Chapter 3 for instructions on the reverse coding of subscales.

[c] Scale included in HBQ-P but not HBQ-T; also, scale under development and excluded from subsequent tables.

Theoretical Bases of the HBQ

The health component of the MacArthur Assessment Battery for Middle Childhood, including the HBQ and the BPI-S, BPI-Soc, and BPI-A modules, was developed to improve the availability of multi-informant instrumentation for assessing the health and behaviors of 4- to 8-year-old children. Given documented links between physical and mental health (see Boyce et al., 2002), the adult-report HBQ (unlike existing measures) also focuses on physical ailments and illnesses that may emerge during this period of childhood. Furthermore, because epidemiological research suggests that child impairment rather than symptom severity tends to be the basis for most clinical referrals (Offord et al., 1996), the HBQ and BPI are designed to evaluate young children's adaptation and impairment in addition to their symptoms. By integrating measures of mental and physical health and impairment, and social and school functioning, the health component of the Battery provides researchers with new ways to organize and understand child health during middle childhood. Further, measures of health care and service utilization have been included and recently revised in the HBQ since knowledge of disproportionate under- or over-utilization of the health-care and education-services systems can provide important additional information for understanding children's health and development (e.g., see Leventhal, Brooks-Gunn, McCormick, & McCarton, 2000; Farmer, Stangl, Burns, Costello, & Angold, 1999; Wu et al., 1999).

Mental Health Symptoms

The HBQ measures of mental health symptoms were selected because they (1) pertain to symptoms of known importance in this age range, and (2) comprise sets of items that can be used to map onto the current diagnostic system for childhood disorders (DSM-IV). In addition to measures of the widely-accepted subscales of depression, generalized anxiety, separation anxiety, oppositional defiance, conduct problems, inattention and impulsivity, the HBQ includes measures of overt hostility and relational aggression. These additional scales gauge the extent to which children aggress against peers in overt, physical ways as well as in coercive ways that involve the withdrawal of friendship. Both of these scales fall under the broad heading of externalizing behavior and repeatedly are shown to presage a host of near and long-term problems (Crick, 1995; Crick et al., 1997; Keenan & Shaw, 1997).

Physical Health Problems

The measures of physical health problems were selected primarily because they (1) pertain to problems of known importance in this age range, and (2) comprise sets of items that are consistent with existing evidence of the associations between children's physical and mental health and functioning. Although children's physical health is not often considered together with their mental health, there is evidence of the confluence between these two domains of health (Boyce et al., 2002). Prior research has demonstrated cross-sectional, longitudinal, and bi-directional associations between children's somatic and mental illnesses (e.g., Cohen et al., 1998), and more specific linkages have been found between children's mental illness and chronic headaches (Egger, Angold, & Costello, 1998; Pine, Cohen, & Brook, 1996), asthma (Biederman, Milberger, Faraone, Guite, & Warburton, 1994), and epilepsy (Kim, 1991). Other studies have documented associations between asthma and academic and physical impairments (Fowler, Davenport, & Garg, 1992; Taylor & Newacheck, 1992), between chronic physical illness and internalizing symptomatology (Bennett, 1994; Gartstein, Short, Vannatta, & Noll, 1999), and between behavior problems and non-intentional injuries (Bussing, Menvielle, & Zima, 1996; DiScala, Lescohier, Barthel, & Li, 1998). Thus, the HBQ includes measures of somatic complaints, chronic medical conditions, and items tapping numbers of injuries and associated use of services. Items assessing neurological risk (e.g., preterm birth, neonatal intensive-care unit admission) have also been included in the HBQ given the consequences posed for later development (e.g., see Luciana, Lindeke, Georgieff, Mills, & Nelson, 1999); an HBQ summary measure for neurological risk is currently under development.

Social and School Functioning

In keeping with recent models (Cowan, Cowan, Schulz, & Heming, 1994; Entwisle & Alexander, 1993; Ladd, 1996; Roeser & Eccles, 2000), the HBQ Social and School Functioning domains conceptualize social and school adjustment as the degree to which children demonstrate competence and engagement with the academic and non-academic aspects of school. In identifying the domains to measure, our goal was not to be exhaustive but to develop broad measures of early functioning with demonstrated potency to predict subsequent mental health outcomes.

In the Social Functioning domain, the HBQ measures children's peer relations (peer acceptance; bullied by peers), social withdrawal (asocial with peers; social inhibition), prosocial behaviors, and participation in adult-led recreational activities. (This is in addition to measures of aggression described above and outlined in Table 1b.) The capacity to form peer relationships that are based on acceptance and mutual affinity is a fundamental component of early social ability (Boivin, Poulin & Vitaro, 1994; Ladd, 1996). Peer rejection and victimization by peers have been linked to both internalizing and externalizing problems in children (see Deater-Deckard, 2001), and both bullying of and victimization by peers have been related to difficulties in psychosocial adjustment (Kochenderfer & Ladd, 1996a; Schwartz, 2000). Just as impaired peer relationships may portend lasting interpersonal difficulties and problems in other domains of child functioning (Buhs & Ladd, 2001; Rudolph & Asher, 2000), children's demonstrations of prosocial behaviors and concern for others have been linked to peer acceptance, school achievement, and decreases in mental health problems (Hastings, Zahn-Waxler, Robinson, Usher, & Bridges, 2000; Wentzel & Caldwell, 1997). Children's tendency to withdraw from social interactions is typically considered an internalizing spectrum problem (Achenbach, 1991; Eley, 1997; Harrington, Rutter, & Fombonne, 1996) which has been linked to peer rejection and social loneliness (Boivin, Hymel, & Hodges, 2001; Cassidy & Asher, 1992; Wentzel & Asher, 1995). However, participation in adult-led recreational activities has been shown to be a protective factor for children (Marshall et al., 1997).

In the School Functioning domain, the HBQ measures children's academic functioning (including academic competence and school engagement) and relationship with their teacher (including closeness and conflict). Children's academic functioning represents inner resources of the child that have been linked to school achievement and general adaptation (Wigfield et al., 1997). Academic functioning has also been tied to mental health problems (both internalizing and externalizing) such that problems in one of these domains can reciprocally influence difficulties in the other in ways that may be mutually reinforcing over time (see Roeser & Eccles, 2000). The Academic Competence scale taps children's abilities in areas such as math and reading. It is assessed, in part, as the degree to which parents, teachers, and children (in the BPI) view children as academically skilled relative to other children. Numerous studies suggest that parents and teachers utilize relative comparisons to evaluate their own children's ability levels (Miller, 1995). Likewise, as children develop, they too increase their use of self-other comparisons in forming perceptions of their own competencies (Harter, 1999). The School Engagement measure comprises items that assess both intrinsic motivation and school liking. Children who demonstrate an orientation toward learning and who respond to challenges and obstacles in a mastery-oriented fashion tend to display patterns of motivation that predict positive school outcomes (Eccles et al., 1993; Heyman & Dweck, 1992). Similarly, when children exhibit positive versus negative attitudes toward school, they are more likely to engage in classroom activities that are designed to promote academic and social competence (Ladd, Buhs, & Seid, 2000). Children's relationships with classroom teachers can also influence the success with which they adapt to new environments (Ladd, 1996; Ladd, Birch, & Buhs, 1999). Specific aspects of the teacher-child relationship — in particular, closeness and conflict — have been shown to predict early school adjustment and to moderate other risk processes (e.g., insecure attachment with primary caretaker) among high-risk children (Pianta & Nimetz, 1991). Further, negative teacher-child relationships during the earliest school years have been related to child academic and behavioral outcomes in later elementary and middle school years (Hamre & Pianta, 2001).

Chapter 3

ADMINISTRATION AND SCORING OF THE HBQ

Administration

The MacArthur Health and Behavior Questionnaire (HBQ) can be administered in either questionnaire or interview format and takes approximately 30 to 40 minutes to complete. As currently formatted for distribution, the HBQ is available only as a questionnaire. It is recommended that a single format be selected and used throughout a given study. (See Chapter 5 for an analysis of data addressing cross-format agreement.) The HBQ can be administered as a questionnaire if study participants speak English as their first language and are able to complete forms independently. However, administration as an interview, particularly in face-to-face settings with informants whose first language is not English, may aid in the collection of more complete and accurate data. Currently, the HBQ has not yet been translated into other languages.

Scoring the HBQ Scales and Subscales

Responses on the HBQ are generally scored either dichotomously (e.g., "yes" or "no") or on 3-, 4- or 7-point Likert scales (e.g., "never or not true," "sometimes true," or "often or very true"). A majority of the HBQ scales and subscales listed in Chapter 2 (Table 1a) are scored as means of items (for subscale scoring) or means of subscales (for scale scoring). However, the Chronic Medical Conditions subscale is computed as a sum. Further, as described in the following sections, some recoding and/or transforming of variables is required before some scores can be computed. *Some items must be reverse coded* prior to computing a mean subscale score; *some subscale scores must be reverse coded* before they can be used in the construction of scale scores; *some subscale scores must be recoded to new metrics* before scale scores are computed; and *some variables in the Physical Health domain require more complicated scoring procedures*, involving percentile ranks.

In addition, scoring instructions are not yet available for some sections in which items have been recently revised — specifically, Neurological Risk, Mental Health Care Utilization, Physical Health Care Utilization, Education Services Utilization, and Adult-Led Recreational Activities. (Also, three items that provide an overview of children's emotional and behavioral functioning have been retained for investigator use in the HBQ-T, though they are not currently included in any scale construction.) Neurological Risk and the care and service utilization items are meant to yield summary scores in the different domains of health and functioning, while the recreational activity items are intended to yield a global score comprised of sub-scores based on the number and frequency of activities in each of the three recreational areas (i.e., sports, lessons, and clubs). The development of these scales is ongoing, and planned future versions of this manual will include updates regarding these measures.

Missing Data

Prior to constructing subscale and scale scores, the data should be checked for any missing values (e.g., respondent overlooked or refused to answer an item). In our work with the HBQ (reported in Chapter 5), there was very little missing data across the five studies reported herein. Where missing data were found, we generally set a stringent criterion requiring no more than one item to be missing on a subscale in order for the subscale score to be computed. (The few subscales comprising less than 4 items

were required to have no missing data.) Further, scale scores were not computed if one or more of the component subscale scores was missing.

Depending on how the entry of data is handled, HBQ skip instructions for some items (e.g., "If No, please go to Question 7") may require some recoding of data before scoring to avoid inappropriately missing data. For example, a parent who answers "no" to Question 6, "Has your child ever had an accident or injury requiring medical attention?" is instructed to skip to Question 7, leaving Questions 6a – 6c blank. Therefore, before computing the Injuries/Accidents score (which comprises Questions 6a, 6b, and 6c, but not Question 6; see Appendix B for item list by scale), scores of zero on questions 6a, 6b, and 6c should be assigned to those parents who answered "no" to Question 6. Thus, for parents who report that their child has never had an injury requiring medical attention (Question 6), the number of times that the child had such an injury or accident is zero (Question 6a), and so on. This recoding can be handled in most statistical software with a line or two of programming (e.g., "IF (HBQ6 = 0) HBQ6A = 0").

Reversing Items Prior to Computing a Subscale Score

Some items must be reverse-coded prior to the computation of subscale scores. That is, the direction the item was originally coded (e.g., 1 = low and 4 = high) must be switched to the opposite (e.g., 1=high and 4=low) to match the directionality of the other items on the subscale. For the HBQ-P, 6 items must be reverse scored on Peer Acceptance/Rejection (Items 18, 19, 21, 23, 25, 28), 4 items on School Engagement (Items 32, 33, 35, 37), and 2 items on Academic Competence (Items 41, 42). For the HBQ-T, 6 items must be reverse scored on Peer Acceptance/Rejection (Items 11, 12, 14, 16, 18, 21) and 3 items on School Engagement (Items 24, 25, 31). (See Appendix B and Appendix C for item lists.) Again, this recoding can be easily handled in most statistical software by way of a recode command (e.g., "RECODE HBQ33 (1=4) (2=3) (3=2) (4=1) INTO HBQ33NEW") or a simple arithmetic transformation (e.g., "COMPUTE HBQ33NEW = 5 – HBQ33").

Reversing Subscales Prior to Computing a Scale Score

In addition to item-level reverse coding, some subscale scores must be reversed before scale scores are computed. These include Bullied by Peers, Teacher-Child Conflict, and — depending on the treatment of the Social Functioning domain used (see Tables 1a and 1b) — Prosocial Behavior. This is most easily accomplished with an arithmetic transformation (e.g., "COMPUTE BULLNEW = 5 – BULLIED" to reverse code the Bullied by Peers scale for which items are scored from 1 to 4).

Computing Scales where Subscales are Scored on Different Metrics

As described in Chapter 2, the HBQ is in large part an assembly of items drawn from multiple sources. In order to facilitate comparisons with prior research using these previously separate measures, the original response options typically were kept intact for items imported into the HBQ. For one scale — Academic Functioning — this unavoidably resulted in an HBQ scale that combines subscales which are scored on different metrics. In this case, subscale scores were transformed before the Academic Functioning scale score was computed. (See "Computing Physical Health Variables: Percentile Rank Scores" below for details of how this issue was handled in the Physical Health domain.)

As shown in Table 1a, the Academic Functioning scale is comprised of School Engagement (scored 1 to 4 for parents, 0 to 2 for teachers) and Academic Competence (scored 1 to 7 for parents, 1 to 5 for teachers). Teachers' report of Academic Competence serves as a mock report card with response options comparable to grades (see item list in Appendix C for exact wordings), where 5 is roughly a grade of "A", 4 approximates a grade of "B", etc. This "real world" analog allows the scores to be more easily interpreted. Teacher-Child Closeness and Conflict, the other main subscales in this domain, are also

scored from 1 to 5. For these reasons, the Academic Functioning scale is scored on a 1-to-5 metric, requiring the transformation of School Engagement for both parents and teachers and Academic Competence for parents. Algebraic equations are employed to effect these transformations:

$$Y_{PSE} = \frac{4}{3} X_{PSE} - \frac{1}{3},$$

where X_{PSE} equals *parent-report* School Engagement scored on the original 1-to-4 metric, and Y_{PSE} equals the subscale score of parent-report School Engagement transformed to a 1-to-5 metric;

$$Y_{TSE} = 2X_{TSE} + 1,$$

where X_{TSE} equals *teacher-report* School Engagement scored on the original 0-to-2 metric, and Y_{TSE} equals the subscale score of teacher-report School Engagement transformed to a 1-to-5 metric; and

$$Y_{PAC} = \frac{2}{3} X_{PAC} + \frac{1}{3},$$

where X_{PAC} equals *parent-report* Academic Competence scored on the original 1-to-7 metric, and Y_{PAC} equals the subscale score of parent-report Academic Competence transformed to a 1-to-5 metric.

Computing Physical Health Variables

In the HBQ-P and HBQ-T, the *Global Physical Health* subscale is computed as the mean of its five component items. The *Chronic Medical Conditions* subscale is computed as a sum of its item scores; this subscale is found in the HBQ-P only. (The HBQ-T includes 4 items addressing chronic problems with or disorders of hearing, vision, learning, and speech as reported by teachers; although these items are not used in any current HBQ scales, they have been retained for investigator use.) Prior to the computation of the chronic conditions sum, additional physical health problems reported at Questions 13 and 13a should be reviewed on a case-by-case basis to filter out redundant or trivial problems. A variable should then be created to represent the number of additional chronic physical health problems, and this variable should be included in the total sum of the Chronic Medical Condition items.

The *Physical Health Problems Index* comprises the Global Physical Health and Chronic Medical Conditions subscales. Because these subscales are on different metrics and are not normally distributed, these variables are converted to percentile rank scores prior to computing the scale score. Percentile rank scores are computed for each subscale by rank-ordering the score and then dividing the rank-ordered score by the number of Rs with valid data on the subscale; then the Global Physical Health and Chronic Medical Conditions percentile rank scores are averaged to create the Physical Health Problems Index.

Because the items that form the *Injuries/Accidents* scale are scaled on different metrics, and in order to facilitate comparisons between this scale and the Physical Health Problems Index, the *items* that make up the Injuries/Accidents scale are also converted to percentile rank scores. The scale score is then computed by averaging the percentile-ranked items.

Table 2 presents the physical health percentile rank scores from the Wisconsin Pilot Study Sub-Sample. Researchers can use Table 2 to convert raw scores in their own samples to percentile rank scores as shown. Alternatively, if the target population varies greatly from the sample on which these percentile rank scores were based, researchers may choose to calculate their own rank-ordering based on their specific samples. (See Appendix D for sample SPSS commands for computing percentile ranks.)

Table 2. Physical Health Percentile Rank Scores (Mother Report)

DATA SOURCE: Wisconsin Pilot Study Sub-Sample (First Grade, Assessment 2, n = 120)

Global Physical Health

Raw Score	Percentile Rank Score
0	.24
0.2	.56
0.4	.72
0.6	.85
0.8	.93
1.0	.98
1.2	1.0

Chronic Medical Conditions

Raw Score	Percentile Rank Score
0	.19
1	.52
2	.76
3	.88
4	.94
5	.99

Injuries/Accidents

item	Raw Score	Percentile Rank Score
Q. 6a # injuries or accidents requiring medical attention	0	.28
	1	.68
	2	.86
	3	.94
	4	.98
	5	.99
	6	1.0
Q. 6b # times injury or accident kept from normal activites	0	.42
	1	.90
	2	.98
	3	1.0
	4	1.0
	5	1.0
Q. 6c # injuries or accidents in past year	0	.43
	1	.93

NOTE: See Appendix B for exact item wordings.

Chapter 4

SAMPLE DESCRIPTIONS

The HBQ has been used in five studies (comprising six sites) in the United States and England. These studies were conducted in part to pilot test the HBQ at different geographic locations where sample characteristics, symptoms, and functioning were expected to vary in ways that would be informative to the development of the instrument. Each study is described below, and the demographic characteristics of the samples are presented in **Table 3**.

Study 1. Wisconsin Study of Families and Work (WSFW; n = 469)

A total of 570 families were recruited from family practice and obstetric clinics in Milwaukee and Madison, Wisconsin, to participate in an NIMH-funded longitudinal study, the Wisconsin Maternity Leave and Health Project, subsequently renamed the Wisconsin Study of Families and Work. Of the original sample, 560 women had live births and were eligible to continue in the study. To be included in the study, women were required to be over age 18, between weeks 12 and 21 of pregnancy at first contact, and not so disabled as to significantly alter functioning as a parent. Since the original focus of the study was the impact of parental leave and work patterns on women and their families, the sample was restricted to women who were living with (though not necessarily married to) a partner and who currently were working for pay or profit, employed but on leave, or full-time homemakers (see Hyde, Klein, Essex, & Clark, 1995, for additional details).

The original aim of the WSFW was to conduct a longitudinal study of sufficient breadth and depth to investigate the ways in which maternity leave, employment, and an array of psychosocial factors impact the mental health of women, children, and families over time. In the first phase of the project, five waves of data were collected, beginning in pregnancy (Time 1), and again at child's age one (Time 2) and four months (Time 3), one year (Time 4), and two years (Time 5). In the second phase, the project was elaborated to focus comprehensively on children's socio-emotional development during preschool (age 3½ and 4½ years; Times 6 and 7 respectively) and the transition to school (Kindergarten and First Grade; Times 8 and 9 respectively). At the end of Time 9, 480 families remained in the study. There were no significant demographic differences between these 480 families and the original 560 families who were eligible to continue in the study after the baby's birth. Of these 480 families, mothers and teachers from 469 families completed the HBQ in interview format during the spring of First Grade. This sample was predominantly European American, married, and fairly well-educated. The children's mean age at Time 9 was 7.2 years (SD=.29).

Study 2. Wisconsin Pilot Study Sub-Sample (n = 120)

A sub-sample of 120 6- to 7-year-old children (73 girls, 49 boys) and their parents and teachers was recruited from the first of two cohorts in the longitudinal WSFW to participate in an intensive pilot study of the MacArthur Assessment Battery. To be eligible for the intensive pilot study, families were required: 1) to have participated in two prior waves of data collection, at age 4½ and in kindergarten; 2) to live in geographic proximity of the project offices (i.e., no more than a 4-hour drive); and 3) to have a target child enrolled in a local school (i.e., not home-schooled). Children were excluded if they were twins. These criteria were met by 203 of 257 families in the first cohort of the WSFW.

Table 3. Sample Demographics

		Wisconsin Study of Families & Work (n = 469)	Wisconsin Pilot Study Sub-Sample (n = 120)	Berkeley Pilot Study (n = 111)	Temple Pilot Study (n = 71)	Three-City Community Sample (n = 67)	Three-City Clinic Sample (n = 53)
Marital Status	Married	93%	93%	81%	41%	79%	73%
	Separated/Divorced	6%	7%	11%	27%	6%	6%
	Never Married	0%	0%	7%	30%	6%	15%
	Widowed	1%	0%	1%	1%	9%	6%
Mother's Education	Some High School	2%	2%	0%	10%	0%	2%
	HS Diploma or GED	16%	11%	5%	18%	12%	17%
	Some College or 2-Year Degree	25%	28%	23%	37%	25%	34%
	4-Year College Degree	36%	30%	23%	10%	16%	15%
	Some Beyond College	7%	10%	14%	8%	8%	4%
	Professional/Graduate Degree	13%	20%	36%	16%	39%	28%
Income[a]	Less than $30K	8%	3%	25%	44%	20%	20%
	$30K - $59,999	44%	40%	30%	30%	16%	25%
	Over $60K	48%	57%	45%	25%	64%	55%
Child's Ethnicity	Black/African American	4%	0%	11%	63%	5%	2%
	White	89%	96%	55%	30%	90%	90%
	Latino/a	2%	1%	6%	3%	1%	4%
	Asian/Pacific Islander	1%	0%	11%	0%	3%	4%
	Other	4%	3%	17%	4%	1%	0%
Child's Gender	Female	51%	61%	47%	39%	46%	40%
	Male	49%	39%	53%	61%	54%	60%
Child's Age	Mean Age (years)	7.2	7.2	6.5	7.5	6.0	6.1
	Age Range	6.4 - 8.1	6.0 - 7.9	4.1 - 8.9	6.1 - 9.7	4.3 - 7.9	4.3 - 7.7

[a] The Three-City Sample included a site in England. Income was converted from British pounds to U.S. dollars for this table.

To refine the sub-sample, children of families meeting the inclusion criteria were divided into two preliminary mental health symptom groups (low or high) using HBQ scores obtained one year earlier (at the Kindergarten assessment) from mothers and teachers. Children rated in the upper 20% on the HBQ Internalizing Symptoms and/or Externalizing Symptoms scales by either the mother or the kindergarten teacher were classified as "high" on Internalizing Symptoms, Externalizing Symptoms, or both. Children were otherwise classified as "low" in symptoms. The sampling objective was to identify at least 100 children from the potential pool of 203 families, divided roughly evenly between children high and low in reported symptoms and, among symptomatic children, between Internalizing Symptoms, Externalizing Symptoms, and "Both" profiles. A total of 122 families (87% of those meeting selection criteria) agreed to participate, and 120 completed all components of the study. Letters were also mailed to children's teachers requesting their participation in the study, of which 116 (97%) agreed.

In addition to the parent- and teacher-report telephone interviews completed by all participating WSFW families (as described above) at the First Grade assessment, the families participating in the pilot study underwent two additional assessment sessions: Assessment 1 during the spring of the children's first grade year, and Assessment 2 conducted 3 to 4 months later in the summer immediately following first grade. These assessments included in-person mother interviews, mother-child interaction tasks, puppet interviews with the children, videotaped child-testing procedures (e.g., temperament, psychobiology), and self-administered parent and teacher questionnaires.

The mean ages of mothers, fathers, and children at the time of Assessment 1 were, respectively, 37.4 years (SD = 4.1), 39.9 years (SD = 5.0), and 7.0 years (SD = .24). All of the children were in first grade, except for two children who were repeating kindergarten. With respect to the children's teachers, all but two were female; their mean number of years of teaching experience was 17.4 (SD = 9.6); and 110 (96% of those reporting) were European American and non-Hispanic, with three African Americans, one Native American, and one multi-racial teacher (two teachers refused to answer these questions).

Study 3. Berkeley Pilot Study (n = 111)

In a psychobiology laboratory setting at the University of California at Berkeley, a cross-sectional study was conducted with a convenience sample of 111 4- to 8-year-old children (59 boys, 52 girls) to examine the relations among autonomic reactivity, other psycho-physiologic measures, and physical and mental health indicators (see Alkon et al., 2003). This sample was recruited from university childcare centers, newspaper and radio advertisements, and community organizations. Families were asked to visit the psychobiology laboratory for one visit, during which mothers completed the HBQ in questionnaire format. Eighty-one percent of the children's parents were married, and the mean age of the children was 6.5 years (SD = 1.4).

Study 4. Temple Pilot Study (n = 71)

Seventy-one first- and second-graders (43 boys, 28 girls) and their mothers participated in a study at Temple University (see Morris et al., 2002) in which mothers (or other primary caregiver for those children without a mother in the household) completed the questionnaire version of the HBQ-P. For 42 children, teacher reports of children's classroom behavioral problems were also obtained. Children were recruited primarily from urban public schools and a free local parents' magazine. The mean age of the children was 7.5 years (SD = .77); mothers (and other primary caregivers) ranged in age from 23 to 57 years (mean = 36 years, SD = 7 years). The families came from diverse ethnic and socioeconomic backgrounds, reflecting the community from which the sample was drawn. Approximately 63% of the children were African American; 30% were European American; and the remaining 7% were from other or mixed ethnic/racial groups. At the time of the interview, 31% of the sample was receiving some form of government assistance while approximately 48% of the children resided in two-parent homes. Three

children over the age of 9 were excluded from analyses presented in this manual because they were outside of the 4- to 8-year-old range targeted by the MacArthur Assessment Battery.

Study 5. Three-City Outcome Study (n = 120)

The MacArthur Three-City Outcome Study, a multi-site case-control study designed to test the discriminant validity of the HBQ, was conducted in Palo Alto, California, St. Louis, Missouri, and Manchester, United Kingdom, and comprised a sample of 120 4.5- to 7.5-year-old children (69 boys, 51 girls) and their primary caregivers and teachers. The mean age of the children was 6.0 years (SD = .96). The design and findings of the study are presented in greater detail elsewhere (Ablow et al., 1999; Essex et al., 2002). Of the total sample, 67 children were recruited from community populations in the three geographic areas, and 53 were clinical referrals to mental health facilities which were selected to maximize demographic diversity in socioeconomic status, ethnicity and culture. Eligibility criteria were: 1) age between 4.5 and 7.5 years, 2) presence of a primary caretaker with whom the child had lived for at least 6 prior months, and 3) enrollment in a school or childcare setting at which the child had spent at least 40 hours. Children in the clinic-referred sample had been referred for mental health evaluation or treatment at mental health clinics, hospitals, or private practices prior to enrollment in the study but had not yet received one month of treatment. Community sample children were recruited through school districts, preschools, and the patient registries of primary care practices. Site and group (clinic-referred vs. community) differences in demographic characteristics have been reported elsewhere (Ablow et al., 1999).

Summary

Table 3 displays demographic characteristics for the five study samples, including the Three-Cities sample split between its community and clinic sub-samples. Overall, parents in the study samples were predominantly married, educated, middle to upper-middle class in socioeconomic status, and European American. The Temple University sample had the lowest predominance of families in which the parents were married, and the most diverse range of income and ethnicity. Compared to the WSFW sample (and Wisconsin Pilot Study Sub-Sample), families from the MacArthur Three-City Outcome Study had a higher proportion of mothers with professional or graduate degrees, higher average household income levels, and a more diverse profile of ethnic representation. Males were over-represented in both the community and clinical samples from the MacArthur Three-City Outcome Study, and in the Berkeley and Temple Pilot Study samples.

Chapter 5

PSYCHOMETRIC PROPERTIES*

This chapter presents data on the psychometric properties of the HBQ. It describes the characteristics of the HBQ scales and subscales including their internal consistency, reliability, and consistency over both short- and long-term periods of time, and the intercorrelations among the scales. Data are also presented on scale descriptives, including associations with child gender and age, study site, family socioeconomic status, and parental marital status. Data on the scales' discriminant validity are presented. Finally, data examining cross-format and cross-informant agreement are presented.

Internal Consistency

Cronbach α coefficients are presented in **Table 4**, reported separately for mothers, fathers, and teachers. Estimates of the internal consistency of the HBQ ***subscales*** tend to be high for all three informants, with most coefficients exceeding .70 and many exceeding .80, levels that can be considered acceptable given the breadth of symptoms or behaviors covered by each subscale. Since HBQ ***composite scales*** are computed as the mean of their component subscales, scale α coefficients were calculated using subscale scores rather than individual items. Scale α coefficients were highest in the Mental Health domain, with all values but one in the range of .74 to .87. With the exception of Peer Relations, scale α values were substantially lower in the Social Functioning and School Functioning domains. These lower α coefficients indicate a higher level of distinctness between component subscales for Social Withdrawal, Academic Functioning, and Teacher-Child Relationship. (As noted in Table 4, scale α coefficients would have exceeded .75 in all cases had scale scores been calculated as the mean of all component *items* rather than subscales.) A similar pattern of results was found for the parallel child-report BPI scales (see Ablow et al., 2003).

The internal consistency of HBQ scales imported from existing measures are generally comparable to reports in the literature. In the mental health domain, αs are similar in value to the Revised Ontario Child Health Study Scales (OCRS-R; Boyle et al., 1993) from which several HBQ scales were drawn. For example, mother-, father-, and teacher-report αs in the WSFW compared with parents and teachers in the OCHS-R as follows: Overanxious, WSFW = .76, .70 and .76, OCHS-R = .68 and .75; Conduct Problems, WSFW = .74, .74, and .72, OCHS-R = .68 and .68; ADHD Symptoms, WSFW = .90., 90, and .94 for item-level data, OCHS-R = .90 and .95 (see Boyle et al., 1993).

The items for Relational Aggression are drawn from the Preschool Social Behavior Scale (PSBS; Crick, Casas, & Mosher, 1997). The teacher-report α reported by Crick and colleagues (.96) is somewhat higher than that shown in Table 4 (.88); the HBQ parent-report α values are acceptable but lower still (.78 and .76). This is likely due in part to the Relational Aggression items in the HBQ being mixed into a

* As outlined above (see Chapter 2), the HBQ was consciously designed as an assemblage of existing, established scales (and where necessary, new items) that together could tap four key domains of child outcomes (i.e., mental and physical health, social and school functioning). In this chapter, the section on Internal Consistency provides an overview of how scales imported from existing instruments fared as components of the HBQ in comparison to the original measures. Due to limitations of space, an exhaustive examination of psychometric similarities and differences of imported scales when administered in the HBQ pilot studies versus the studies in which these measures were developed is beyond the scope of this manual. Therefore, subsequent sections generally refrain from making explicit such comparisons, though psychometric data on the scales as administered in the HBQ have been reported here with the intention of providing sufficient detail for interested readers to make these comparisons themselves.

Table 4. Internal Consistency of HBQ Scales and Subscales by Informant

DATA SOURCE: Wisconsin Study of Families and Work (First Grade)

	HBQ-P			HBQ-T	
	# of items (or subscales)[a]	Mother α (n = 469)	Father α (n = 396)	# of items (or subscales)[a]	Teacher α (n = 428)
Mental Health					
Internalizing Symptoms	(3)	.79	.74	(2)	.68
Depression	7	.65	.69	6	.77
Overanxious	12	.76	.70	8	.76
Separation Anxiety	10	.77	.75	0	----
Externalizing Symptoms	(4)	.82	.81	(4)	.85
Oppositional Defiant	9	.82	.78	9	.85
Conduct Problems	12	.74	.74	11	.72
Overt Hostility	4	.65	.61	4	.77
Relational Aggression	6	.78	.76	6	.88
ADHD Symptoms	(2)	.84	.85	(2)	.87
Inattention	6	.84	.82	6	.90
Impulsivity	9	.83	.83	9	.91
Externalizing/ADHD Symptoms	(6)	.85	.84	(6)	.85
Functional Impairment-Child	8	.68	.59	7	.69
Functional Impairment-Family	8	.79	.69	0	----
Physical Health					
Physical Health Problems Index	(2)	.69[b]	NA	0	----
Chronic Medical Conditions[c]					
Global Physical Health	5	.67[b]	NA	5	.77
Injuries/Accidents	3	.71[b]	NA	0	----
Social Functioning					
Peer Relations	(2)	.83	.78	(2)	.76
Peer Acceptance/Rejection	8	.89	.86	8	.91
Bullied by Peers	3	.78	.73	3	.72
Social Withdrawal	(2)	.44	.53	(2)	.57
Asocial with Peers	6	.81	.80	6	.87
Social Inhibition	3	.78	.72	3	.74
Prosocial Behavior	20	.85	.85	20	.91
School Functioning					
Academic Functioning	(2)	.43	.52	(2)	.31
School Engagement	8	.90	.85	8	.76
Academic Competence	8	.91	.89	5	.94
Teacher-Child Relationship	0	----	----	(2)	.35
Teacher-Child Closeness	0	----	----	5	.79
Teacher-Child Conflict	0	----	----	5	.81

[a] Since scale scores are computed as the mean of component subscales, scale alpha coefficients are computing using *subscale* scores rather than individual items. If scale scores are computed as *item* means instead of subscale means, scale alpha coefficients range from .76 to .95.

[b] Scale not asked in the full WSFW; data shown are from the Wisconsin Pilot Study Sub-Sample (Assessment 2, n = 120).

[c] Given the wide range of conditions intentionally included in the Chronic Medical Conditions scale (see Appendix B), calculation of internal consistency is inappropriate for this scale and therefore is not reported here.

KEY: '----' = scale not asked in that version of HBQ (P or T); NA = scale in HBQ but not asked of informant in reported study.

much longer and broader set of child behavior and symptom items than in the PSBS. The PSBS is a 23-item teacher-report instrument measuring relational aggression, overt aggression, prosocial behavior, and depressed affect. In contrast, the child behavior section of the HBQ-P is 86 items long (69 for teachers) and comprises — in addition to Relational Aggression — Depression, Overanxious, Separation Anxiety (parents only), Oppositional Defiant, Conduct Problems, Overt Hostility, Inattention, Impulsivity, Asocial with Peers, and Social Inhibition. Also, while the PSBS uses a 5-point Likert scale, the Relational Aggression items in the HBQ are rated on a 3-point Likert scale to be consistent with the other HBQ child behavior and symptom items; this shift in metric also may have contributed to differences in the psychometric properties of this scale as administered in the PSBS versus the HBQ.

In the Social Functioning Domain, the Asocial with Peers subscale is taken from the Child Behavior Scale (CBS; Ladd & Profilet, 1996). The α levels reported in Table 4 (.81, .80, and .87 for mothers, fathers and teachers) are consistent with the teacher-report findings reported by Ladd & Profilet (1996; mean α = .88). Alpha coefficients for Prosocial Behavior (.85, .85, and .91 for mothers, fathers and teachers) approximate those reported by that scale's original authors (mean teacher-report α = .93; Weir & Duveen, 1981).

In the School Functioning domain, the Teacher-Child Relationship was assessed in the HBQ with select items from the Student-Teacher Relationship Scale (STRS; Pianta, Steinberg, & Rollins, 1995). Given the difference in number of items in this area between the STRS and HBQ, it is not surprising that while the α values reported in Table 4 remain adequate (.79 and .81 for Closeness and Conflict respectively, each 5 items), they are somewhat lower than those reported by Pianta and colleagues (1995; α = .86 for their 8-item closeness scale, .93 for their 12-item conflict scale).

Test-Retest Reliability and Consistency Over Time

The test-retest reliability estimates of selected HBQ scales and subscales are presented in **Table 5**. The reliability coefficients (Spearman ρ) are based on the correlation between scale means that were collected 7 to 10 days apart. Evidence of the HBQ's consistency over a longer period of time, i.e., one year, is presented in **Table 6**, including mean scores of the HBQ scales and subscales collected at each time point, paired *t* tests assessing the statistical significance of differences in the sample-level means, and rank-order correlations reflecting the consistency of individual scores over the one-year period.

Short-Term Reliability

The short-term reliability of HBQ mental health, physical health, and social functioning scales and subscales was established for mother and teacher reports, based on a sub-sample of 63 children (37 community; 26 clinic-referred) participating in the MacArthur Three-City Outcome Study. Father reports were not obtained in the Three-City study. Further, because many of the children were not yet in school, test-retest reliability of the School Functioning domain was not assessed. As shown in **Table 5**, both mother and teacher reports of children's health and social functioning demonstrated moderately high to high reliability in both the community and clinic samples. All but two subscales demonstrated reliabilities above .60, and the majority were above .80. In the Mental Health domain, the one scale that demonstrated only moderate reliability was mothers' assessments of children's Functional Impairment-Child among the community sample (Spearman ρ = .59; 95% Confidence Interval = .33 - .77). The test-retest reliability coefficients in this domain are comparable to those found in the Ontario Child Health Study for the Internalizing Symptoms and the Externalizing Symptoms scales (range = .65 - .93; Boyle et al., 1993). In the Physical Health domain, the reliability coefficients for mothers' and teachers' assessments were uniformly high. And in the Social Functioning domain, the one scale that demonstrated only moderate reliability was maternal report of children's tendencies to be Asocial with Peers in the clinic sample (Spearman ρ = .51; 95% Confidence Interval = .15 - .75).

Table 5. Test-Retest Reliability

DATA SOURCE: MacArthur Three-City Outcome Study [a]

	Community		Clinic	
	Spearman ρ	95% CI	Spearman ρ	95% CI
MOTHER REPORT	**(n = 37)**		**(n = 26)**	
Mental Health				
Internalizing Symptoms	.78***	.61-.88	.88***	.75-.95
Externalizing Symptoms	.76***	.58-.87	.88***	.75-.95
ADHD Symptoms	.76***	.58-.87	.71***	.44-.86
Externalizing/ADHD Symptoms	.75***	.56-.86	.82***	.63-.92
Functional Impairment-Child	.59***	.33-.77	.71***	.44-.86
Functional Impairment-Family	.77***	.59-.88	.73***	.48-.87
Physical Health				
Physical Health Problems Index	.93***	.86-.96	.92***	.84-.97
Global Physical Health	.84***	.71-.92	.88***	.75-.95
Chronic Medical Conditions	.94***	.89-.97	.87***	.72-.94
Injuries/Accidents	.77***	.59-.88	.64***	.33-.82
Social Functioning				
Social Withdrawal	.70***	.48-.83	.70***	.43-.86
Asocial with Peers	.77***	.59-.88	.51**	.15-.75
Social Inhibition	.68***	.46-.82	.85***	.69-.93
Prosocial Behavior	.83***	.69-.91	.75***	.51-.88
TEACHER REPORT	**(n = 34)**		**(n = 25)**	
Mental Health				
Internalizing Symptoms	.71***	.49-.85	.88***	.74-.95
Externalizing Symptoms	.87***	.75-.93	.94***	.87-.97
ADHD Symptoms	.94***	.88-.97	.95***	.89-.98
Externalizing/ADHD Symptoms	.92***	.84-.96	.98***	.95-.99
Functional Impairment-Child	.87***	.75-.93	.92***	.82-.96
Physical Health				
Global Physical Health	.85***	.72-.92	.85***	.68-.93
Social Functioning				
Social Withdrawal	.78***	.60-.88	.90***	.78-.96
Asocial with Peers	.64***	.38-.80	.92***	.82-.96
Social Inhibition	.79***	.62-.89	.82***	.63-.92
Prosocial Behavior	.71***	.49-.85	.87***	.72-.94

[a] Only those scales administered in the Three-City Outcome Study are listed here.

KEY: ** $p < .01$; *** $p < .001$; CI = Confidence Interval

Table 6. Consistency and Change Over Time: Kindergarten to First Grade

DATA SOURCE: Wisconsin Study of Family and Work [a]

	Kindergarten Mean (SD)	**First Grade** Mean (SD)	**Paired *t***	**Kindergarten-First Grade** Spearman ρ	**95% CI**
MOTHER REPORT (n=463)					
Mental Health					
Internalizing Symptoms [−]	.30 (.22)	.31 (.22)	-.57	.71***	.66-.75
Depression [−]	.19 (.23)	.19 (.23)	-.20	.57***	.51-.63
Overanxious [−]	.40 (.28)	.42 (.27)	-1.52	.64***	.58-.69
Separation Anxiety [−]	.32 (.28)	.31 (.29)	.33	.60***	.54-.66
Externalizing Symptoms [−]	.40 (.27)	.35 (.25)	5.36***	.72***	.67-.76
Oppositional Defiant [−]	.56 (.35)	.52 (.35)	2.76**	.72***	.67-.76
Conduct Problems [−]	.18 (.20)	.15 (.18)	3.94***	.62***	.56-.67
Overt Hostility [−]	.45 (.37)	.37 (.32)	5.41***	.54***	.47-.60
ADHD Symptoms [−]	.60 (.36)	.61 (.38)	-1.20	.79***	.75-.82
Inattention [−]	.55 (.40)	.58 (.43)	-1.65	.72***	.68-.77
Impulsivity [−]	.64 (.37)	.64 (.38)	-.24	.75***	.71-.79
Externalizing/ADHD Symptoms [−]	.48 (.28)	.45 (.27)	2.81**	.79***	.75-.82
Functional Impairment-Child [−]	.21 (.20)	.23 (.23)	-1.55	.51***	.44-.57
Functional Impairment-Family [−]	.19 (.28)	.20 (.28)	-.51	.62***	.56-.67
Social Functioning					
Social Withdrawal					
Social Inhibition [−]	.83 (.52)	.78 (.51)	2.35*	.64***	.59-.70
Prosocial Behavior [+]	1.39 (.28)	1.41 (.28)	-2.66**	.73***	.68-.77
School Functioning					
Academic Functioning [b +]	4.31 (.41)	4.27 (.52)	1.90	.57***	.49-.64
School Engagement [+]	3.71 (.39)	3.60 (.50)	5.25***	.52***	.45-.58
Academic Competence [+]	5.49 (.90)	5.58 (.98)	-2.10*	.68***	.62-.74
FATHER REPORT (n=381)					
Mental Health					
Internalizing Symptoms [−]	.31 (.19)	.31 (.21)	-.26	.69***	.63-.74
Depression [−]	.18 (.22)	.19 (.23)	-.79	.58***	.51-.65
Overanxious [−]	.41 (.24)	.42 (.24)	-.77	.61***	.54-.67
Separation Anxiety [−]	.35 (.25)	.34 (.28)	.77	.57***	.50-.64
Externalizing Symptoms [−]	.37 (.24)	.33 (.23)	4.03***	.77***	.73-.81
Oppositional Defiant [−]	.54 (.32)	.51 (.32)	2.16*	.70***	.65-.75
Conduct Problems [−]	.16 (.20)	.14 (.18)	2.56*	.60***	.53-.66
Overt Hostility [−]	.40 (.31)	.35 (.30)	3.99***	.64***	.57-.69
ADHD Symptoms [−]	.67 (.37)	.66 (.37)	.77	.78***	.74-.82
Inattention [−]	.65 (.42)	.66 (.42)	-.81	.72***	.67-.77
Impulsivity [−]	.70 (.37)	.67 (.37)	2.29*	.73***	.68-.77
Externalizing/ADHD Symptoms [−]	.49 (.26)	.46 (.26)	2.95**	.81***	.77-.84
Functional Impairment-Child [−]	.18 (.18)	.19 (.19)	-.64	.49***	.41-.56
Functional Impairment-Family [−]	.15 (.20)	.16 (.21)	-.10	.56***	.49-.63
Social Functioning					
Social Withdrawal					
Social Inhibition [−]	.85 (.49)	.81 (.49)	1.68	.65***	.58-.70
Prosocial Behavior [+]	1.32 (.28)	1.35 (.29)	-2.35*	.70***	.64-.75
School Functioning					
Academic Functioning [b +]	4.24 (.45)	4.21 (.49)	.86	.55***	.46-.63
School Engagement [+]	3.68 (.40)	3.55 (.44)	5.99***	.54***	.46-.61
Academic Competence [+]	5.34 (.91)	5.50 (.95)	-3.17**	.53***	.44-.61

(Table continues on next page)

Table 6 (continued).

	Kindergarten Mean (SD)	**First Grade** Mean (SD)	**Paired *t***	**Kindergarten-First Grade** Spearman ρ	**95% CI**
TEACHER REPORT (n=414)					
Mental Health					
Internalizing Symptoms [−]	.25 (.25)	.32 (.27)	-4.42***	.23***	.14-.32
Depression [−]	.16 (.26)	.21 (.30)	-2.86**	.26***	.17-.35
Overanxious [−]	.34 (.31)	.44 (.32)	-4.71***	.16**	.06-.25
Externalizing Symptoms [−]	.15 (.24)	.16 (.22)	-.97	.41***	.33-.49
Oppositional Defiant [−]	.20 (.31)	.22 (.30)	-1.20	.34***	.25-.42
Conduct Problems [−]	.05 (.13)	.06 (.12)	-1.17	.35***	.26-.43
Overt Hostility [−]	.19 (.34)	.20 (.32)	-.52	.38***	.30-.46
ADHD Symptoms [−]	.36 (.40)	.44 (.45)	-3.83***	.48***	.41-.56
Inattention [−]	.33 (.43)	.44 (.50)	-4.60***	.42***	.34-.50
Impulsivity [−]	.40 (.42)	.45 (.45)	-2.22*	.47***	.39-.54
Externalizing/ADHD Symptoms [−]	.23 (.28)	.27 (.28)	-2.97**	.50***	.43-.57
Functional Impairment-Child [−]	.17 (.22)	.20 (.26)	-2.51*	.24***	.15-.33
Social Functioning					
Social Withdrawal					
Social Inhibition [−]	.46 (.45)	.51 (.48)	-1.88	.38***	.29-.46
Prosocial Behavior [+]	1.43 (.41)	1.48 (.37)	-2.16*	.32***	.23-.41
School Functioning					
Academic Functioning [b +]	4.32 (.49)	4.28 (.50)	1.60	.59***	.51-.66
School Engagement [+]	1.89 (.18)	1.87 (.21)	2.52*	.22***	.13-.31
Academic Competence [+]	3.84 (.83)	3.88 (.84)	-1.06	.67***	.60-.73
Teacher-Child Relationship [+]	4.51 (.53)	4.43 (.49)	2.64**	.20***	.11-.29
Teacher-Child Closeness [+]	4.39 (.65)	4.26 (.66)	3.18**	.11*	.01-.20
Teacher-Child Conflict [−]	1.38 (.66)	1.40 (.59)	-.74	.32***	.23-.40

[a] Only those scales asked during both Kindergarten and First Grade are reported here.

[b] See Chapter 3 for details on how scale scores were computed when metrics varied across subscales and/or respondents.

[−] Higher Scores indicate more negative outcomes.

[+] Higher Scores indicate more positive outcomes.

KEY: * $p < .05$; ** $p < .01$; *** $p < .001$; SD = Standard Deviation; CI = Confidence Interval

Temporal Stability

Data from the Wisconsin Study of Families and Work was used to establish the temporal stability (i.e., consistency or change) of the HBQ mental health, social functioning, and school functioning scales and subscales over the developmentally important one-year period from the spring of kindergarten to the spring of first grade. **Table 6** presents the results of these analyses for mother, father, and teacher reports on only those HBQ scales and subscales assessed at both time points. Parents' assessments of their children's mental health symptoms and social and school functioning demonstrated moderately high stability over the one year period, with all rank-order coefficients exceeding .50 except one (father report of children's Functional Impairment-Child, Spearman $\rho = .49$, 95% Confidence Interval = .41 - .56). Teachers' assessments demonstrated considerably less stability over time. Although all rank-order coefficients were significant, only three exceeded .50 (i.e., Externalizing/ADHD Symptoms, Academic Functioning and its component subscale Academic Competence). The relatively lower stability of the teacher reports probably reflects the change in teacher reporters from kindergarten to first grade, since all but a handful ($n = 6$) of children had a different teacher for each of the grades. In examining the differences in mean scores from kindergarten to first grade, several notable differences emerged over this transition period. For mother and father reports, there were declines in Externalizing Symptoms and School Engagement as well as an increase in Academic Competence. Teachers reported sample-level increases in Internalizing and ADHD Symptoms as well as lower levels of Teacher-Child Closeness; these differences may be the result of sequential reporting by kindergarten and first-grade teachers with different levels of behavioral expectations for students.

Scale and Subscale Intercorrelations

The development of the HBQ was motivated by the goal of generating a set of scales that consisted of, to the extent possible, non-overlapping items. As the development process progressed, items were rewritten or dropped when high degrees of association (i.e., correlations of .70 or greater) were found with specific items from other scales. Similarly, when factor analytic procedures suggested that scales were redundant, their items were typically merged to create a new scale. For example, we had originally conceived of a multi-dimensional approach to the measurement of academic motivation, one that consisted of separate measures of school liking and school avoidance. However, our early analyses consistently suggested that we could not reliably maintain these items as separate, and therefore, they were combined to create the School Engagement subscale. In contrast, if a scale's a priori set of items demonstrated too little cohesion, or if factor analytic results consistently split the items onto different factors, the items were separated and two or more new scales were created. In sum, our goal was to create a set of first-order scales for which observed associations could be attributed to construct overlap rather than item redundancy. If items within a subscale seemed sufficiently unrelated, they were separated into two subscales. (See Ablow et al., 1999, and Essex et al., 2002, for additional details.)

Data from the Wisconsin Study of Families and Work first-grade assessment were used to obtain estimates of the intercorrelations among the HBQ scales and subscales within and across health domains. The resulting intercorrelations are presented separately for boys and girls as reported by mothers (**Tables 7a and 7b**), fathers (**Tables 8a and 8b**), and teachers (**Tables 9a and 9b**). Overall, the intercorrelation coefficients are typically small to moderate in size (mother-report mean absolute value $\rho = .31$, $SD = .19$, range = .00 - .93; father-report mean absolute value $\rho = .37$, $SD = .18$, range = .03 - .94; teacher-report mean absolute value $\rho = .36$, $SD = .20$, range = .00 - .95). Correlations are strongest *within* domains (mean absolute value $\rho = .48$, .47, and .47 for mothers, fathers, and teachers respectively) rather than across domains (mean absolute value $\rho = .23$, .29, and .31 for the same reporters). Similarly, correlations were strongest *among* subscale sets rather than *across* them. For example, the four Externalizing Symptoms subscales (Oppositional Defiant, Conduct Problems, Overt Hostility, Relational Aggression) tended to correlate more highly among themselves (mean $\rho = .56$, .55, .61 for mothers, fathers, and

teachers respectively) than with the three Internalizing Symptoms subscales (Depression, Overanxious, Separation Anxiety; mean ρ = .29, .27, and .20 for the three reporters).

Nevertheless, significant associations of small to moderate size were also typically found *across* domains as well. For example, correlations between Internalizing Symptoms and Physical Health Problem Index, Peer Relations, and Academic Functioning ranged in absolute value from .28 to .46 for mothers, .31 to .44 for fathers, and .34 to .52 for teachers. Inter-domain correlations tended to be highest in ways that would be expected given predicted theoretical connections and demonstrated empirical links between scales. The correlation between Internalizing Symptoms and Social Withdrawal, for example, was .47 on average across reporters. Similarly, teachers reported that students with more impaired Peer Relations tended to have more difficult relations with their teachers as well (ρ = .53 for girls, .54 for boys). The scale that tended to have the lowest correlations across domains appeared to be mothers' reports of Injuries/Accidents (mean ρ = .09 for girls as well as boys).

Generally, the magnitude and patterns of correlations tended to be similar for boys and girls, though differences did emerge. A notable pattern of differences was found for physical health. Correlations between physical health scales and measures in other domains tended to be stronger for *boys* than girls per *mother report* (e.g., physical health X mental health mean absolute value ρ = .21 for girls, .13 for boys). The pattern is reversed for teachers, with physical health cross-domain correlations tending to be stronger for *girls* than boys per *teacher report* (e.g., physical health X mental health mean absolute value ρ = .16 for girls, .21 for boys.)

While there were variations by reporter and gender that warrant further exploration, the overall patterns were generally similar across mothers, fathers, and teachers, and for girls and boys. Overall, the level of association between variables at the *scale* level both underscores the non-redundancy of the various scales while also suggesting the underlying connections between the domains of child health and functioning. These results point to significant convergences among health problems in middle childhood stemming from mental, physical, social and academic difficulties.

Table 7a. Intercorrelation (Spearman ρ) of HBQ Scales for FEMALE Children: Mother Report

DATA SOURCE: Wisconsin Study of Families and Work (First Grade, n = 239)

	Mental Health															Physical Health				Social Functioning							Sch. Func.		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Mental Health																													
1. Internalizing Symptoms [−]	1.0	.74	.86	.81	.43	.42	.38	.39	.23	.49	.47	.42	.51	.41	.44	.37	.36	.28	.16	-.41	-.37	.38	.50	.37	.44	-.25	-.30	-.36	-.19
2. Depression [−]		1.0	.52	.39	.48	.48	.41	.41	.31	.42	.40	.36	.51	.46	.40	.31	.35	.21	.08	-.39	-.43	.31	.46	.46	.34	-.37	-.29	-.33	-.15
3. Overanxious [−]			1.0	.56	.37	.39	.32	.32	.19	.44	.40	.41	.45	.37	.40	.36	.36	.29	.22	-.35	-.30	.33	.43	.32	.40	-.17	-.22	-.27	-.19
4. Separation Anxiety [−]				1.0	.23	.22	.24	.22	.10	.35	.37	.26	.32	.27	.30	.18	.20	.13	.09	-.25	-.20	.26	.35	.18	.35	-.12	-.26	-.29	-.14
5. Externalizing Symptoms [−]					1.0	.86	.72	.85	.80	.57	.52	.54	.91	.60	.43	.20	.15	.20	.11	-.40	-.39	.37	.16	.26	.06	-.46	-.26	-.29	-.18
6. Oppositional Defiant [−]						1.0	.61	.65	.54	.53	.47	.53	.82	.56	.44	.30	.24	.31	.19	-.35	-.32	.32	.12	.24	.02	-.44	-.15	-.25	-.07
7. Conduct Problems [−]							1.0	.61	.45	.46	.43	.42	.69	.41	.32	.22	.13	.25	.15	-.35	-.30	.34	.11	.16	.06	-.37	-.26	-.29	-.17
8. Overt Hostility [−]								1.0	.55	.52	.46	.50	.79	.51	.31	.24	.12	.28	.20	-.36	-.35	.33	.13	.24	.03	-.41	-.25	-.24	-.20
9. Relational Aggression [−]									1.0	.37	.34	.34	.69	.45	.31	.00	.06	-.08	-.11	-.32	-.32	.29	.07	.12	.01	-.33	-.25	-.24	-.19
10. ADHD Symptoms [−]										1.0	.93	.89	.84	.42	.38	.27	.17	.29	.00	-.29	-.26	.28	.10	.11	.06	-.34	-.25	-.30	-.21
11. Inattention [−]											1.0	.68	.78	.42	.37	.26	.19	.27	-.03	-.29	-.26	.28	.11	.14	.05	-.36	-.28	-.31	-.24
12. Impulsivity [−]												1.0	.77	.36	.33	.23	.12	.26	.03	-.22	-.20	.22	.06	.05	.05	-.26	-.16	-.22	-.13
13. Externalizing/ADHD Symptoms [−]													1.0	.59	.46	.22	.14	.24	.06	-.40	-.36	.37	.13	.21	.05	-.45	-.29	-.33	-.22
14. Functional Impairment-Child [−]														1.0	.45	.34	.32	.29	-.08	-.37	-.34	.34	.20	.29	.11	-.37	-.29	-.31	-.15
15. Functional Impairment-Family [−]															1.0	.44	.39	.43	.13	-.30	-.29	.25	.23	.14	.20	-.29	-.29	-.35	-.14
Physical Health																													
16. Physical Health Problems Index [a −]																1.0	.86	.90	.01	-.43	-.33	.43	.26	.21	.24	-.23	-.26	-.34	-.16
17. Global Physical Health [a −]																	1.0	.58	.00	-.44	-.34	.44	.33	.29	.28	-.25	-.28	-.36	-.15
18. Chronic Medical Conditions [a −]																		1.0	.05	-.35	-.28	.35	.16	.11	.16	-.17	-.20	-.31	-.11
19. Injuries/Accidents [a −]																			1.0	.01	.06	.02	.08	.11	.06	-.05	-.03	-.07	.02
Social Functioning																													
20. Peer Relations [+]																				1.0	.86	-.92	-.27	-.33	-.18	.26	.31	.37	.22
21. Peer Acceptance/Rejection [+]																					1.0	-.61	-.32	-.38	-.22	.35	.28	.32	.17
22. Bullied by Peers [−]																						1.0	.18	.24	.10	-.18	-.24	-.31	-.20
23. Social Withdrawal [−]																							1.0	.64	.90	-.17	-.19	-.24	-.08
24. Asocial with Peers [−]																								1.0	.29	-.18	-.09	-.23	.04
25. Social Inhibition [−]																									1.0	-.12	-.15	-.17	-.06
26. Prosocial Behavior [+]																										1.0	.25	.34	.14
School Functioning																													
27. Academic Functioning [+]																											1.0	.73	.83
28. School Engagement [+]																												1.0	.29
29. Academic Competence [+]																													1.0

[a] Scale not asked in the full WSFW; data shown for Wisconsin Pilot Study Sub-Sample (n = 73), mental & physical health data from Assessment 2, social & school from Assessment 1
KEY: ρ > .13, $p < .05$; ρ >.17, $p < .01$, ρ > .23, $p < .001$, except #16-20, where ρ > .23, $p < .05$; ρ >.30, $p < .01$; ρ > .40, $p < .001$.
[−] Higher Scores indicate more negative outcomes. [+] Higher Scores indicate more positive outcomes.

Table 7b. Intercorrelation (Spearman ρ) of HBQ Scales for MALE Children: Mother Report

DATA SOURCE: Wisconsin Study of Families and Work (First Grade, n = 230)

	Mental Health															Physical Health				Social Functioning							Sch. Func.		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Mental Health																													
1. Internalizing Symptoms [−]	1.0	.74	.90	.80	.45	.49	.29	.34	.25	.46	.43	.42	.50	.47	.43	.36	.45	.19	.12	-.46	-.41	.42	.33	.28	.29	-.21	-.28	-.34	-.17
2. Depression [−]		1.0	.56	.39	.40	.42	.30	.35	.16	.32	.36	.23	.40	.42	.33	.26	.28	.17	.02	-.44	-.40	.40	.29	.32	.19	-.21	-.21	-.32	-.08
3. Overanxious [−]			1.0	.61	.38	.43	.21	.27	.20	.41	.37	.39	.44	.39	.36	.16	.29	.00	.01	-.41	-.35	.38	.34	.30	.29	-.16	-.26	-.28	-.16
4. Separation Anxiety [−]				1.0	.34	.37	.18	.23	.25	.37	.31	.38	.39	.37	.39	.32	.36	.20	.24	-.30	-.25	.27	.23	.11	.24	-.13	-.22	-.24	-.12
5. Externalizing Symptoms [−]					1.0	.89	.78	.85	.69	.63	.55	.63	.91	.59	.52	.18	.24	.08	.16	-.40	-.35	.37	.17	.25	.09	-.50	-.34	-.28	-.24
6. Oppositional Defiant [−]						1.0	.62	.68	.47	.62	.54	.61	.84	.59	.50	.22	.26	.12	.11	-.42	-.35	.42	.24	.31	.15	-.51	-.34	-.32	-.20
7. Conduct Problems [−]							1.0	.65	.44	.50	.44	.50	.72	.43	.43	-.02	.07	-.08	.17	-.26	-.26	.21	.06	.13	.02	-.42	-.23	-.14	-.19
8. Overt Hostility [−]								1.0	.43	.56	.49	.55	.79	.44	.43	.12	.15	.07	.12	-.31	-.29	.28	.12	.18	.06	-.35	-.31	-.23	-.22
9. Relational Aggression [−]									1.0	.34	.28	.36	.57	.43	.34	.17	.31	-.04	.20	-.24	-.21	.21	.06	.13	.00	-.35	-.18	-.18	-.10
10. ADHD Symptoms [−]										1.0	.93	.92	.88	.54	.52	.05	.07	.02	.05	-.33	-.32	.30	.11	.18	.05	-.45	-.39	-.32	-.32
11. Inattention [−]											1.0	.72	.79	.48	.48	.07	.13	.02	.01	-.31	-.32	.26	.11	.17	.06	-.42	-.36	-.32	-.33
12. Impulsivity [−]												1.0	.84	.51	.50	.06	.07	.03	.02	-.30	-.28	.30	.08	.13	.02	-.42	-.38	-.26	-.30
13. Externalizing/ADHD Symptoms [−]													1.0	.62	.58	.10	.20	-.02	.12	-.40	-.37	.38	.16	.24	.09	-.51	-.39	-.31	-.31
14. Functional Impairment-Child [−]														1.0	.65	.08	.11	.03	-.01	-.37	-.37	.32	.15	.24	.04	-.42	-.28	-.35	-.10
15. Functional Impairment-Family [−]															1.0	.07	.02	.12	.10	-.31	-.30	.28	.04	.11	.01	-.36	-.26	-.28	-.20
Physical Health																													
16. Physical Health Problems Index [a −]																1.0	.84	.83	.25	-.33	-.24	.33	.29	.20	.31	-.35	-.26	-.27	-.01
17. Global Physical Health [a −]																	1.0	.41	.24	-.38	-.31	.36	.26	.29	.24	-.41	-.26	-.33	.05
18. Chronic Medical Conditions [a −]																		1.0	.22	-.17	-.09	.19	.21	.03	.27	-.18	-.16	-.08	-.09
19. Injuries/Accidents [a −]																			1.0	-.08	-.09	.06	.00	-.02	.03	-.21	-.06	.08	-.08
Social Functioning																													
20. Peer Relations [+]																				1.0	.89	-.94	-.30	-.37	-.18	.34	.27	.31	.09
21. Peer Acceptance/Rejection [+]																					1.0	-.70	-.30	-.39	-.15	.39	.34	.37	.15
22. Bullied by Peers [−]																						1.0	.24	.30	.14	-.25	-.21	-.24	-.05
23. Social Withdrawal [−]																							1.0	.70	.90	-.29	-.07	-.21	.08
24. Asocial with Peers [−]																								1.0	.34	-.26	-.15	-.29	.06
25. Social Inhibition [−]																									1.0	-.24	-.01	-.09	.01
26. Prosocial Behavior [+]																										1.0	.41	.38	.23
School Functioning																													
27. Academic Functioning [+]																											1.0	.72	.80
28. School Engagement [+]																												1.0	.23
29. Academic Competence [+]																													1.0

[a] Scale not asked in the full WSFW; data shown for Wisconsin Pilot Study Sub-Sample (n = 47), mental & physical health data from Assessment 2, social & school from Assessment 1
KEY: ρ > .13, $p < .05$; ρ >.17, $p < .01$, ρ > .23, $p < .001$, except #16-20, where ρ > .29, $p < .05$; ρ >.38, $p < .01$.
[−] Higher Scores indicate more negative outcomes. [+] Higher Scores indicate more positive outcomes

Table 8a. Intercorrelation (Spearman ρ) of HBQ Scales for FEMALE Children: Father Report

DATA SOURCE: Wisconsin Study of Families and Work (First Grade, n = 201)

	Mental Health															Social Functioning							School Func.		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Mental Health																									
1. Internalizing Symptoms [−]	1.0	.73	.84	.78	.32	.40	.23	.19	.25	.41	.37	.40	.41	.43	.45	-.31	-.28	.30	.44	.36	.39	-.15	-.32	-.32	-.17
2. Depression [−]		1.0	.51	.31	.41	.49	.26	.30	.28	.38	.35	.36	.44	.50	.45	-.29	-.28	.30	.44	.36	.39	-.15	-.34	-.32	-.17
3. Overanxious [−]			1.0	.49	.23	.32	.16	.10	.12	.33	.32	.30	.30	.37	.41	-.20	-.16	.21	.33	.25	.30	-.05	-.19	-.25	-.07
4. Separation Anxiety [−]				1.0	.19	.21	.17	.10	.20	.31	.24	.33	.28	.20	.24	-.23	-.22	.24	.28	.14	.30	-.04	-.26	-.17	-.20
5. Externalizing Symptoms [−]					1.0	.86	.72	.86	.78	.58	.48	.61	.90	.60	.49	-.38	-.35	.31	.24	.41	.07	-.47	-.33	-.34	-.19
6. Oppositional Defiant [−]						1.0	.59	.64	.52	.57	.48	.60	.82	.59	.49	-.31	-.27	.25	.27	.40	.11	-.44	-.31	-.35	-.14
7. Conduct Problems [−]							1.0	.62	.48	.47	.42	.44	.67	.48	.39	-.24	-.20	.21	.14	.26	.03	-.42	-.31	-.34	-.19
8. Overt Hostility [−]								1.0	.57	.48	.40	.50	.77	.50	.38	-.37	-.35	.28	.20	.39	.03	-.40	-.28	-.25	-.22
9. Relational Aggression [−]									1.0	.41	.31	.44	.68	.43	.39	-.31	-.31	.28	.20	.30	.07	-.29	-.22	-.21	-.16
10. ADHD Symptoms [−]										1.0	.94	.91	.86	.51	.51	-.34	-.26	.32	.19	.26	.09	-.46	-.41	-.38	-.27
11. Inattention [−]											1.0	.71	.77	.47	.50	-.32	-.24	.29	.18	.23	.11	-.38	-.42	-.34	-.31
12. Impulsivity [−]												1.0	.84	.47	.43	-.34	-.28	.33	.18	.25	.07	-.48	-.34	-.38	-.18
13. Externalizing/ADHD Symptoms [−]													1.0	.63	.57	-.41	-.36	.36	.25	.39	.09	-.52	-.41	-.41	-.26
14. Functional Impairment-Child [−]														1.0	.58	-.33	-.30	.27	.36	.47	.20	-.35	-.38	-.37	-.20
15. Functional Impairment-Family [−]															1.0	-.27	-.24	.26	.30	.40	.18	-.34	-.38	-.41	-.23
Social Functioning																									
16. Peer Relations [+]																1.0	.89	-.91	-.39	-.39	-.28	.32	.41	.36	.30
17. Peer Acceptance/Rejection [+]																	1.0	-.65	-.41	-.43	-.28	.34	.41	.36	.30
18. Bullied by Peers [−]																		1.0	.30	.29	.23	-.22	-.36	-.31	-.27
19. Social Withdrawal [−]																			1.0	.76	.90	-.19	-.22	-.20	-.12
20. Asocial with Peers [−]																				1.0	.44	-.25	-.13	-.24	-.03
21. Social Inhibition [−]																					1.0	-.08	-.21	-.12	-.14
22. Prosocial Behavior [+]																						1.0	.37	.42	.20
School Functioning																									
23. Academic Functioning [+]																							1.0	.77	.79
24. School Engagement [+]																								1.0	.28
25. Academic Competence [+]																									1.0

KEY: ρ > .14, $p < .05$; ρ >.19, $p < .01$; ρ >.25, $p < .001$.

[−] Higher Scores indicate more negative outcomes. [+] Higher Scores indicate more positive outcomes.

Table 8b. Intercorrelation (Spearman ρ) of HBQ Scales for MALE Children: Father Report

DATA SOURCE: Wisconsin Study of Families and Work (First Grade, n = 186)

	Mental Health															Social Functioning							School Func.		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Mental Health																									
1. Internalizing Symptoms [−]	1.0	.73	.87	.81	.45	.42	.37	.34	.32	.40	.35	.41	.47	.41	.44	-.44	-.33	.42	.37	.44	.25	-.19	-.37	-.40	-.25
2. Depression [−]		1.0	.54	.36	.46	.47	.36	.33	.30	.37	.37	.32	.46	.41	.42	-.43	-.33	.40	.37	.55	.18	-.25	-.26	-.37	-.12
3. Overanxious [−]			1.0	.57	.36	.32	.33	.28	.27	.34	.30	.36	.38	.36	.41	-.42	-.29	.41	.34	.37	.26	-.12	-.31	-.32	-.24
4. Separation Anxiety [−]				1.0	.31	.28	.25	.26	.22	.29	.23	.32	.33	.25	.30	-.25	-.20	.24	.24	.23	.20	-.10	-.29	-.32	-.20
5. Externalizing Symptoms [−]					1.0	.85	.78	.87	.67	.59	.54	.57	.89	.59	.51	-.27	-.29	.24	.34	.39	.22	-.42	-.29	-.39	-.15
6. Oppositional Defiant [−]						1.0	.59	.60	.42	.60	.53	.59	.82	.52	.52	-.24	-.24	.23	.31	.36	.20	-.47	-.30	-.36	-.16
7. Conduct Problems [−]							1.0	.62	.42	.54	.52	.49	.74	.49	.40	-.24	-.25	.23	.22	.25	.16	-.35	-.28	-.31	-.16
8. Overt Hostility [−]								1.0	.49	.46	.41	.46	.74	.47	.40	-.19	-.19	.19	.24	.27	.15	-.28	-.18	-.30	-.08
9. Relational Aggression [−]									1.0	.29	.29	.26	.54	.40	.27	-.26	-.26	.22	.31	.36	.20	-.24	-.22	-.28	-.15
10. ADHD Symptoms [−]										1.0	.94	.92	.88	.52	.56	-.35	-.38	.31	.20	.21	.13	-.50	-.44	-.44	-.33
11. Inattention [−]											1.0	.75	.82	.49	.51	-.31	-.35	.27	.19	.21	.12	-.46	-.47	-.42	-.39
12. Impulsivity [−]												1.0	.84	.52	.56	-.36	-.37	.31	.18	.18	.12	-.48	-.37	-.42	-.23
13. Externalizing/ADHD Symptoms [−]													1.0	.62	.60	-.34	-.37	.31	.29	.33	.18	-.52	-.41	-.46	-.26
14. Functional Impairment-Child [−]														1.0	.63	-.33	-.36	.29	.33	.40	.19	-.39	-.33	-.46	-.19
15. Functional Impairment-Family [−]															1.0	-.29	-.33	.23	.25	.31	.15	-.41	-.33	-.44	-.22
Social Functioning																									
16. Peer Relations [+]																1.0	.84	-.92	-.34	-.49	-.17	.30	.36	.43	.24
17. Peer Acceptance/Rejection [+]																	1.0	-.57	-.37	-.39	-.25	.43	.35	.41	.23
18. Bullied by Peers [−]																		1.0	.24	.44	.07	-.20	-.32	-.37	-.23
19. Social Withdrawal [−]																			1.0	.68	.90	-.27	-.07	-.17	.05
20. Asocial with Peers [−]																				1.0	.32	-.23	-.06	-.30	.14
21. Social Inhibition [−]																					1.0	-.22	-.05	-.05	-.04
22. Prosocial Behavior [+]																						1.0	.43	.43	.19
School Functioning																									
23. Academic Functioning [+]																							1.0	.80	.82
24. School Engagement [+]																								1.0	.36
25. Academic Competence [+]																									1.0

KEY: ρ > .14, $p < .05$; ρ >.19, $p < .01$; ρ >.26 $p < .001$.

[−] Higher Scores indicate more negative outcomes. [+] Higher Scores indicate more positive outcomes.

Table 9a. Intercorrelation (Spearman ρ) of HBQ Scales for FEMALE Children: Teacher Report

DATA SOURCE: Wisconsin Study of Families and Work (First Grade, n = 225)

	Mental Health													P.H.	Social Functioning							School Functioning					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Mental Health																											
1. Internalizing Symptoms [−]	1.0	.79	.86	.28	.33	.14	.17	.22	.24	.33	.14	.28	.53	.34	-.46	-.41	.39	.56	.50	.48	-.26	-.47	-.46	-.35	-.35	-.27	.24
2. Depression [−]		1.0	.42	.27	.32	.18	.20	.18	.26	.32	.15	.28	.55	.24	-.48	-.47	.36	.54	.55	.44	-.43	-.45	-.53	-.32	-.45	-.39	.27
3. Overanxious [−]			1.0	.20	.25	.06	.12	.18	.17	.23	.10	.19	.36	.34	-.32	-.26	.32	.38	.30	.36	-.04	-.33	-.25	-.28	-.17	-.07	.19
4. Externalizing Symptoms [−]				1.0	.89	.58	.73	.90	.57	.46	.59	.87	.56	.08	-.41	-.41	.33	.02	.17	-.09	-.56	-.31	-.37	-.23	-.39	-.18	.51
5. Oppositional Defiant [−]					1.0	.48	.63	.73	.52	.41	.54	.78	.58	.07	-.43	-.42	.35	.12	.29	-.02	-.51	-.29	-.37	-.20	-.40	-.19	.53
6. Conduct Problems [−]						1.0	.55	.46	.46	.38	.50	.57	.44	.03	-.37	-.36	.28	-.03	.15	-.18	-.38	-.23	-.26	-.19	-.26	-.11	.33
7. Overt Hostility [−]							1.0	.58	.56	.47	.59	.72	.52	.12	-.35	-.36	.30	-.03	.09	-.11	-.44	-.26	-.22	-.25	-.36	-.19	.43
8. Relational Aggression [−]								1.0	.46	.37	.49	.76	.48	.04	-.33	-.34	.24	.01	.13	-.06	-.49	-.28	-.30	-.21	-.29	-.10	.41
9. ADHD Symptoms [−]									1.0	.89	.91	.88	.46	.15	-.42	-.39	.38	-.02	.07	-.08	-.53	-.40	-.32	-.40	-.35	-.13	.47
10. Inattention [−]										1.0	.65	.76	.40	.16	-.39	-.35	.37	.05	.09	.00	-.47	-.49	-.37	-.48	-.30	-.13	.35
11. Impulsivity [−]											1.0	.83	.47	.10	-.36	-.35	.32	-.09	.04	-.15	-.48	-.29	-.23	-.28	-.33	-.09	.52
12. Externalizing/ADHD Symptoms [−]												1.0	.57	.12	-.44	-.43	.37	-.00	.13	-.10	-.61	-.39	-.39	-.34	-.40	-.16	.53
13. Functional Impairment-Child [−]													1.0	.26	-.58	-.59	.41	.34	.45	.19	-.51	-.42	-.42	-.32	-.47	-.34	.42
Physical Health																											
14. Global Physical Health [−]														1.0	-.16	-.08	.14	.15	.05	.17	-.17	-.22	-.12	-.22	-.07	.01	.10
Social Functioning																											
15. Peer Relations [+]															1.0	.92	-.79	-.34	-.36	-.24	.47	.36	.40	.32	.53	.43	-.41
16. Peer Acceptance/Rejection [+]																1.0	-.55	-.34	-.42	-.20	.50	.31	.41	.25	.52	.43	-.40
17. Bullied by Peers [−]																	1.0	.21	.19	.17	-.26	-.31	-.26	-.32	-.33	-.25	.32
18. Social Withdrawal [−]																		1.0	.77	.89	-.32	-.26	-.40	-.16	-.36	-.41	.11
19. Asocial with Peers [−]																			1.0	.45	-.34	-.17	-.40	-.07	-.39	-.37	.22
20. Social Inhibition [−]																				1.0	-.22	-.29	-.28	-.22	-.26	-.34	.03
21. Prosocial Behavior [+]																					1.0	.40	.48	.31	.56	.45	-.44
School Functioning																											
22. Academic Functioning [+]																						1.0	.52	.95	.35	.33	-.22
23. School Engagement [+]																							1.0	.27	.45	.36	-.33
24. Academic Competence [+]																								1.0	.25	.24	-.16
25. Teacher-Child Relationship [+]																									1.0	.84	-.71
26. Teacher-Child Closeness [+]																										1.0	-.29
27. Teacher-Child Conflict [−]																											1.0

KEY: ρ > .13, $p < .05$; ρ >.18, $p < .01$, ρ > .23, $p < .001$.
[−] Higher Scores indicate more negative outcomes. [+] Higher Scores indicate more positive outcomes.

Table 9b. Intercorrelation (Spearman ρ) of HBQ Scales for MALE Children: Teacher Report

DATA SOURCE: Wisconsin Study of Families and Work (First Grade, n = 202)

	Mental Health													P.H.	Social Functioning							School Functioning					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Mental Health																											
1. Internalizing Symptoms [−]	1.0	.80	.91	.29	.29	.26	.24	.21	.36	.41	.26	.36	.52	.47	-.52	-.51	.46	.59	.49	.48	-.17	-.44	-.45	-.34	-.42	-.27	.43
2. Depression [−]		1.0	.51	.24	.23	.28	.27	.15	.31	.37	.20	.30	.54	.46	-.51	-.50	.44	.56	.50	.42	-.26	-.46	-.51	-.32	-.46	-.33	.39
3. Overanxious [−]			1.0	.27	.26	.20	.19	.20	.32	.34	.25	.32	.41	.38	-.42	-.39	.37	.48	.38	.40	-.08	-.31	-.32	-.27	-.29	-.15	.36
4. Externalizing Symptoms [−]				1.0	.90	.75	.87	.80	.67	.58	.69	.88	.65	.17	-.45	-.46	.36	.06	.20	-.09	-.55	-.25	-.24	-.20	-.51	-.17	.63
5. Oppositional Defiant [−]					1.0	.69	.73	.64	.62	.52	.66	.81	.61	.16	-.45	-.44	.40	.00	.14	-.12	-.55	-.26	-.24	-.21	-.50	-.12	.67
6. Conduct Problems [−]						1.0	.72	.56	.52	.47	.55	.70	.60	.10	-.38	-.38	.32	.03	.15	-.08	-.48	-.20	-.25	-.17	-.45	-.12	.59
7. Overt Hostility [−]							1.0	.58	.64	.57	.66	.82	.63	.11	-.44	-.45	.32	.00	.19	-.16	-.57	-.24	-.23	-.17	-.47	-.15	.57
8. Relational Aggression [−]								1.0	.43	.37	.45	.65	.48	.08	-.30	-.29	.26	.03	.13	-.07	-.37	-.11	-.13	-.10	-.39	-.14	.46
9. ADHD Symptoms [−]									1.0	.94	.94	.93	.61	.13	-.41	-.44	.29	.06	.20	-.09	-.48	-.44	-.26	-.39	-.41	-.06	.63
10. Inattention [−]										1.0	.79	.85	.61	.12	-.45	-.48	.32	.14	.26	-.02	-.46	-.55	-.33	-.48	-.42	-.12	.58
11. Impulsivity [−]											1.0	.91	.54	.13	-.32	-.34	.23	-.02	.12	-.15	-.47	-.28	-.15	-.26	-.34	.02	.61
12. Externalizing/ADHD Symptoms [−]												1.0	.69	.16	-.48	-.49	.36	.05	.21	-.11	-.57	-.37	-.27	-.32	-.50	-.13	.69
13. Functional Impairment-Child [−]													1.0	.20	-.57	-.59	.43	.29	.42	.07	-.51	-.44	-.45	-.33	-.56	-.25	.64
Physical Health																											
14. Global Physical Health [−]														1.0	-.23	-.23	.22	.32	.29	.20	.01	-.20	-.21	-.16	-.20	-.18	.20
Social Functioning																											
15. Peer Relations [+]															1.0	.95	-.84	-.36	-.45	-.18	.45	.42	.40	.31	.54	.31	-.52
16. Peer Acceptance/Rejection [+]																1.0	-.67	-.37	-.46	-.18	.46	.45	.40	.34	.53	.30	-.50
17. Bullied by Peers [−]																	1.0	.27	.35	.13	-.29	-.32	-.34	-.22	-.42	-.23	.44
18. Social Withdrawal [−]																		1.0	.76	.86	-.06	-.21	-.36	-.08	-.28	-.39	.07
19. Asocial with Peers [−]																			1.0	.37	-.19	-.17	-.35	-.03	-.34	-.34	.18
20. Social Inhibition [−]																				1.0	.07	-.14	-.21	-.09	-.15	-.29	-.04
21. Prosocial Behavior [+]																					1.0	.27	.34	.14	.56	.40	-.42
School Functioning																											
22. Academic Functioning [+]																						1.0	.51	.92	.42	.28	-.42
23. School Engagement [+]																							1.0	.19	.54	.47	-.36
24. Academic Competence [+]																								1.0	.25	.10	-.36
25. Teacher-Child Relationship [+]																									1.0	.78	-.71
26. Teacher-Child Closeness [+]																										1.0	-.20
27. Teacher-Child Conflict [−]																											1.0

KEY: ρ > .13, $p < .05$; ρ > .19, $p < .01$; ρ >.25, $p < .001$.
[−] Higher Scores indicate more negative outcomes. [+] Higher Scores indicate more positive outcomes.

Scale Descriptives

Associations with Child Gender, Child Age, and Study Site

In this section, descriptive statistics for HBQ scales and subscales are presented separately for each adult reporter, with consideration given to possible mean level differences that are attributable to child gender, age, and/or study site effects. These data are summarized in **Tables 10a - 10d, 11, and 12.**

Mother Report. Table 10a presents means and standard deviations for the HBQ scales based on mother reports on 6- to 8-year-old children from 3 samples: WSFW, Berkeley Pilot Study, and Temple Pilot Study. (Comparable data for the Three-City study are presented in the section, "Discriminant Validity," below.) These data were analyzed for effects of child gender and (where data were available from all three sites) study site using Two-Way Analysis of Variance (ANOVA). Since the majority of the scale means differed by one or both of these factors, the means are also presented by site *separately* for girls and boys in **Tables 10b and 10c**. In general, mothers of girls reported higher levels of Separation Anxiety, Prosocial Behavior, and Social Inhibition, whereas mothers of boys reported higher levels of Externalizing Symptoms, ADHD Symptoms, and Functional Impairment. Further, compared with the mothers in the WSFW sample, mothers in the Berkeley and Temple samples tended to report higher levels of Internalizing, Externalizing, and ADHD Symptoms; higher levels of Functional Impairment; and in the domain of Social Functioning, lower levels of Prosocial Behavior and Social Inhibition. Two gender-by-site interactions also were significant (Overanxious and Depression), with boys in the Berkeley and Temple samples scoring higher on the Depression and Overanxious scales than girls; in the WSFW sample, girls scored slightly higher on these scales than boys. To consider child age differences, **Table 10d** presents the HBQ means separated by gender of the 4- to 5-year-old children from the Berkeley site (mother report). In comparing the Berkeley 4- to 5-year-old group to the Berkeley 6- to 8-year-old group, several age differences were found. Older children had higher scores on Overanxious ($F_{1,\ 104} = 7.48$, $p < .01$) and Functional Impairment ($F_{1,\ 105} = 5.53$, $p < .05$), whereas younger children had higher scores on Social Inhibition ($F_{1,\ 107} = 4.20$, $p < .05$). Some small gender effects were found, though given the limited sample size, none were statistically significant.

Father Report. Table 11 presents father-report data by child gender for the WSFW. As with the WSFW mothers, fathers of girls reported high levels of Separation Anxiety, Prosocial Behavior, and Social Inhibition, whereas fathers of boys reported higher levels of Externalizing Symptoms and ADHD Symptoms. Fathers also reported higher levels of Relational Aggression and School Engagement for girls.

Teacher Report. As shown in **Table 12**, the teacher-report data show patterns similar to those of mothers and fathers, with teachers reporting more Prosocial Behavior for girls and higher Externalizing Symptoms and ADHD Symptoms for boys. Teachers also reported higher Academic Competence, less Teacher-Child Conflict, and greater Teacher-Child Closeness for girls than boys. Temple Pilot Study teachers (like the mothers in this sample) tended to report higher symptom levels than did teachers in the WSFW. Two gender-by-site interactions (for Conduct Problems and Functional Impairment) were also found.

Table 10a. Descriptive Statistics for All 6- to 8-Year-Old Children by Site: Mother Report

	Wisc. Study of Families & Work (n = 469) Mean (SD)	**Berkeley Pilot Study** (n = 64) Mean (SD)	**Temple Pilot Study** (n = 68) Mean (SD)	**Significant Main & Interaction Effects**
Mental Health				
Internalizing Symptoms	.31 (.22)	.42 (.25)	.38 (.22)	S**
Depression	.19 (.23)	.32 (.27)	.26 (.27)	S*, GxS*
Overanxious	.42 (.27)	.53 (.31)	.48 (.26)	S**, GxS*
Separation Anxiety	.31 (.29)	.41 (.31)	.41 (.29)	G*, S**
Externalizing Symptoms [a]	.35 (.25)	.46 (.29)	.39 (.31)	G**, S*
Oppositional Defiant	.52 (.35)	.68 (.38)	.50 (.41)	G**, S**
Conduct Problems	.15 (.19)	.25 (.27)	.26 (.25)	G**, S**
Overt Hostility	.37 (.32)	.45 (.34)	.42 (.39)	G**
Relational Aggression	.25 (.30)	NA	NA	
ADHD Symptoms	.61 (.38)	.72 (.35)	.75 (.42)	G**, S*
Inattention	.58 (.43)	.70 (.40)	.74 (.49)	G**, S*
Impulsivity	.64 (.38)	.73 (.37)	.76 (.41)	G**
Externalizing/ADHD Symptoms [a]	.45 (.27)	.56 (.28)	.53 (.33)	G**, S*
Functional Impairment-Child	.23 (.24)	.34 (.33)	.30 (.35)	G**, S**
Functional Impairment-Family	.20 (.28)	.29 (.40)	.28 (.39)	G**, S*
Physical Health				
Physical Health Problems Index [c]	.49 (.23) [b]	NA	NA	
Global Physical Health	.25 (.31) [b]	NA	NA	
Chronic Medical Conditions	1.11 (1.21) [b]	NA	NA	
Injuries/Accidents [c]	.51 (.17) [b]	NA	NA	
Social Functioning				
Peer Relations	3.56 (.45)	NA	NA	
Peer Acceptance/Rejection	3.62 (.44)	NA	NA	
Bullied by Peers	1.50 (.54)	NA	NA	
Social Withdrawal	.52 (.35)	NA	NA	G*
Asocial with Peers	.27 (.33)	NA	NA	
Social Inhibition	.78 (.51)	.61 (.51)	.73 (.47)	G**, S*
Prosocial Behavior	1.41 (.28)	1.26 (.31)	1.29 (.34)	G**, S**
School Functioning				
Academic Functioning [c]	4.27 (.51)	NA	NA	
School Engagement	3.60 (.50)	NA	NA	G**
Academic Competence	5.58 (.97)	NA	NA	

[a] The Berkeley and Temple Pilot Studies did not ask the Relational Aggression subscale; therefore, for comparative purposes Externalizing Symptoms and Externalizing/ADHD Symptoms as reported here exclude Relational Aggression for all samples.

[b] Not asked in full WSFW; data shown are from the Wisconsin Pilot Study Sub-Sample (First Grade, Assessment 2, n = 120).

[c] See Chapter 3 for details on how scale scores were computed when metrics varied across items, subscales, and/or respondents.

KEY: NA = scale is in HBQ but not asked of informant in reported study; G = Gender; S = Site; GxS = Gender by Site interactions; SD = Standard Deviation; * $p < .05$; ** $p < .01$

Table 10b. Descriptive Statistics for FEMALE 6- to 8-Year-Old Children by Site: Mother Report

	Wisc. Study of Families & Work (n = 239) Mean (SD)	**Berkeley Pilot Study** (n = 29) Mean (SD)	**Temple Pilot Study** (n = 28) Mean (SD)
Mental Health			
Internalizing Symptoms	.33 (.21)	.38 (.20)	.34 (.19)
Depression	.20 (.21)	.29 (.23)	.16 (.16)
Overanxious	.43 (.26)	.46 (.23)	.41 (.25)
Separation Anxiety	.34 (.30)	.38 (.28)	.44 (.29)
Externalizing Symptoms [a]	.31 (.22)	.43 (.27)	.31 (.29)
Oppositional Defiant	.48 (.32)	.64 (.36)	.40 (.36)
Conduct Problems	.12 (.15)	.18 (.19)	.20 (.26)
Overt Hostility	.32 (.29)	.46 (.40)	.34 (.38)
Relational Aggression	.27 (.32)	NA	NA
ADHD Symptoms	.54 (.34)	.61 (.32)	.59 (.38)
Inattention	.50 (.39)	.59 (.37)	.55 (.42)
Impulsivity	.57 (.34)	.63 (.34)	.62 (.38)
Externalizing/ADHD Symptoms [a]	.40 (.24)	.50 (.24)	.41 (.30)
Functional Impairment-Child	.21 (.20)	.29 (.23)	.21 (.33)
Functional Impairment-Family	.17 (.21)	.24 (.24)	.25 (.43)
Physical Health			
Physical Health Problems Index [c]	.47 (.24) [b]	NA	NA
Global Physical Health	.23 (.30) [b]	NA	NA
Chronic Medical Conditions	1.04 (1.18) [b]	NA	NA
Injuries/Accidents [c]	.49 (.16) [b]	NA	NA
Social Functioning			
Peer Relations	3.57 (.42)	NA	NA
Peer Acceptance/Rejection	3.62 (.40)	NA	NA
Bullied by Peers	1.48 (.51)	NA	NA
Social Withdrawal	.56 (.34)	NA	NA
Asocial with Peers	.26 (.31)	NA	NA
Social Inhibition	.85 (.52)	.61 (.47)	.69 (.47)
Prosocial Behavior	1.48 (.26)	1.33 (.28)	1.43 (.38)
School Functioning			
Academic Functioning [c]	4.31 (.47)	NA	NA
School Engagement	3.66 (.41)	NA	NA
Academic Competence	5.63 (.91)	NA	NA

[a] The Berkeley and Temple Pilot Studies did not ask the Relational Aggression subscale; therefore, for comparative purposes Externalizing Symptoms and Externalizing/ADHD Symptoms as reported here exclude Relational Aggression for all samples.

[b] Scales not asked in the full WSFW; data shown are from the Wisconsin Pilot Study Sub-Sample (First Grade, Assessment 2, n = 73).

[c] See Chapter 3 for details on how scale scores were computed when metrics varied across items, subscales, and/or respondents.

KEY: NA = scale is in HBQ but not asked of informant in reported study; SD = Standard Deviation

Table 10c. Descriptive Statistics for MALE 6- to 8-Year-Old Children by Site: Mother Report

	Wisc. Study of Families & Work (n = 230) Mean (SD)	**Berkeley Pilot Study** (n = 35) Mean (SD)	**Temple Pilot Study** (n = 40) Mean (SD)
Mental Health			
Internalizing Symptoms	.29 (.23)	.45 (.29)	.39 (.22)
Depression	.18 (.25)	.34 (.30)	.28 (.28)
Overanxious	.40 (.27)	.59 (.35)	.52 (.27)
Separation Anxiety	.28 (.28)	.44 (.34)	.36 (.26)
Externalizing Symptoms [a]	.39 (.28)	.48 (.31)	.43 (.32)
Oppositional Defiant	.57 (.37)	.72 (.40)	.54 (.43)
Conduct Problems	.18 (.21)	.31 (.32)	.28 (.23)
Overt Hostility	.42 (.35)	.44 (.30)	.47 (.39)
Relational Aggression	.23 (.27)	NA	NA
ADHD Symptoms	.69 (.40)	.81 (.36)	.84 (.42)
Inattention	.66 (.46)	.80 (.41)	.84 (.50)
Impulsivity	.72 (.41)	.82 (.37)	.84 (.41)
Externalizing/ADHD Symptoms [a]	*.51 (.30)*	*.62 (.30)*	*.60 (.33)*
Functional Impairment-Child	.25 (.26)	.38 (.39)	.36 (.36)
Functional Impairment-Family	.24 (.34)	.34 (.50)	.29 (.35)
Physical Health			
Physical Health Problems Index [c]	.52 (.23) [b]	NA	NA
Global Physical Health	.28 (.31) [b]	NA	NA
Chronic Medical Conditions	1.21 (1.27) [b]	NA	NA
Injuries/Accidents [c]	.54 (.18) [b]	NA	NA
Social Functioning			
Peer Relations	3.55 (.49)	NA	NA
Peer Acceptance/Rejection	3.61 (.47)	NA	NA
Bullied by Peers	1.51 (.57)	NA	NA
Social Withdrawal	.49 (.35)	NA	NA
Asocial with Peers	.27 (.34)	NA	NA
Social Inhibition	.70 (.50)	.61 (.55)	.70 (.43)
Prosocial Behavior	1.34 (.30)	1.21 (.33)	1.22 (.28)
School Functioning			
Academic Functioning [c]	4.22 (.55)	NA	NA
School Engagement	3.53 (.57)	NA	NA
Academic Competence	5.53 (1.03)	NA	NA

[a] The Berkeley and Temple Pilot Studies did not ask the Relational Aggression subscale; therefore, for comparative purposes Externalizing Symptoms and Externalizing/ADHD Symptoms as reported here exclude Relational Aggression for all samples.

[b] Scales not asked in the full WSFW; data shown are from the Wisconsin Pilot Study Sub-Sample (First Grade, Assessment 2, n = 47).

[c] See Chapter 3 for details on how scale scores were computed when metrics varied across items, subscales, and/or respondents.

KEY: NA = scale is in HBQ but not asked of informant in reported study; SD = Standard Deviation

Table 10d. Descriptive Statistics for 4- to 5-Year-Old Children by Gender: Mother Report

DATA SOURCE: Berkeley Pilot Study (n = 47)

	Female (n = 23) Mean (SD)	**Male** (n = 24) Mean (SD)	**Effect Size** [a]
Mental Health			
Internalizing Symptoms	.36 (.17)	.32 (.19)	.30
Depression	.25 (.23)	.20 (.23)	.30
Overanxious	.38 (.22)	.39 (.20)	.20
Separation Anxiety	.47 (.25)	.39 (.27)	.40
Externalizing Symptoms [b]	.42 (.25)	.45 (.28)	.10
Oppositional Defiant	.59 (.30)	.61 (.31)	.10
Conduct Problems	.20 (.22)	.30 (.27)	.40
Overt Hostility	.47 (.35)	.43 (.34)	.10
Relational Aggression	NA	NA	NA
ADHD Symptoms	.68 (.31)	.66 (.36)	.10
Inattention	.60 (.37)	.57 (.40)	.30
Impulsivity	.73 (.34)	.72 (.39)	.10
Externalizing/ADHD Symptoms [b]	.52 (.25)	.52 (.28)	.00
Functional Impairment-Child	.16 (.19)	.23 (.31)	.10
Functional Impairment-Family	.23 (.23)	.22 (.26)	.10
Social Functioning			
Social Withdrawal			
Social Inhibition	.84 (.52)	.79 (.55)	.10
Prosocial Behavior	1.15 (.33)	1.15 (.36)	.00

[a] Cohen δ (standardized mean difference): .20-.49 = small effect size; .50-.79 = moderate effect size; .80 or greater = large effect size. None of the effects reported were statistically significant.

[b] The Berkeley Pilot Study did not ask the Relational Aggression subscale; therefore, Externalizing Symptoms and Externalizing/ADHD Symptoms as reported here exclude Relational Aggression. Other scales not asked are excluded from this table.

[c] See Chapter 3 for details on how scale scores were computed when metrics varied across subscales and/or respondents.

KEY: NA = scale is in HBQ but not asked of informant in reported study; SD = Standard Deviation

Table 11. Descriptive Statistics for 6- to 8-Year-Old Children by Gender: Father Report

DATA SOURCE: Wisconsin Study of Families and Work (First Grade, n = 386) [a]

	Female (n = 201) Mean (SD)	**Male** (n = 186) Mean (SD)	**Significant Main Effects**
Mental Health			
Internalizing Symptoms	.33 (.20)	.29 (.21)	
Depression	.20 (.24)	.19 (.23)	
Overanxious	.44 (.24)	.40 (.24)	
Separation Anxiety	.37 (.29)	.30 (.28)	G*
Externalizing Symptoms [b]	.30 (.22)	.36 (.23)	G**
Oppositional Defiant	.48 (.31)	.54 (.32)	
Conduct Problems	.11 (.16)	.18 (.20)	G**
Overt Aggression	.31 (.30)	.37 (.29)	G*
Relational Aggression	.25 (.32)	.17 (.21)	G**
ADHD Symptoms	.60 (.35)	.73 (.39)	G**
Inattention	.59 (.40)	.73 (.44)	G**
Impulsivity	.60 (.35)	.73 (.38)	G**
Externalizing/ADHD Symptoms [b]	.42 (.24)	.51 (.26)	G**
Functional Impairment-Child	.18 (.18)	.20 (.20)	
Functional Impairment-Family	.14 (.20)	.17 (.22)	
Social Functioning			
Peer Relations	3.55 (.38)	3.55 (.42)	
Peer Acceptance/Rejection	3.57 (.39)	3.60 (.41)	
Bullied by Peers	1.48 (.46)	1.51 (.51)	
Social Withdrawal	.59 (.34)	.52 (.35)	G*
Asocial with Peers	.31 (.32)	.29 (.34)	
Social Inhibition	.88 (.48)	.74 (.49)	G**
Prosocial Behavior	1.41 (.25)	1.28 (.30)	G**
School Functioning			
Academic Functioning [c]	4.28 (.43)	4.14 (.55)	G*
School Engagement	3.61 (.36)	3.48 (.52)	G**
Academic Competence	5.59 (.89)	5.41 (.99)	

[a] Only those scales administered to fathers in the WSFW are listed here.

[b] Externalizing Symptoms and Externalizing/ADHD Symptoms reported here exclude Relational Aggression so as to be comparable with data reported in prior tables.

[c] See Chapter 3 for details on how scale scores were computed when metrics varied across subscales and/or respondents.

KEY: G = Gender; * $p < .05$; ** $p < .01$

Table 12. Descriptive Statistics for 6- to 8-Year-Old Children by Site and Gender: Teacher Report

	Wisconsin Study of Families & Work		Temple Pilot Study		Significant Main & Interaction Effects
	Female (n = 225) Mean (SD)	**Male** (n = 202) Mean (SD)	**Female** (n = 21) Mean (SD)	**Male** (n = 27) Mean (SD)	
Mental Health					
Internalizing Symptoms	.33 (.26)	.32 (.28)	.49 (.25)	.41 (.30)	S**
Depression	.22 (.30)	.21 (.29)	.42 (.32)	.41 (.40)	S**
Overanxious	.44 (.31)	.43 (.34)	.55 (.28)	.41 (.31)	
Externalizing Symptoms [a]	.13 (.19)	.20 (.26)	.27 (.34)	.42 (.48)	G**, S**
Oppositional Defiant	.19 (.28)	.25 (.33)	.41 (.47)	.51 (.60)	G*, S**
Conduct Problems	.04 (.10)	.08 (.15)	.13 (.23)	.26 (.34)	G**, S**, GxS*
Overt Hostility	.15 (.27)	.27 (.37)	.35 (.43)	.61 (.68)	G**, S**
Relational Aggression	.28 (.38)	.23 (.34)	NA	NA	
ADHD Symptoms	.32 (.35)	.59 (.51)	.54 (.47)	.72 (.57)	G**, S**
Inattention	.32 (.41)	.58 (.56)	.53 (.49)	.78 (.59)	G**, S**
Impulsivity	.32 (.36)	.59 (.51)	.55 (.48)	.68 (.64)	G**, S*
Externalizing/ADHD Symptoms [a]	.20 (.23)	.36 (.32)	.48 (.42)	.66 (.52)	G**, S**
Functional Impairment-Child	.19 (.26)	.22 (.26)	.26 (.20)	.47 (.26)	S**, GxS*
Physical Health					
Global Physical Health	.26 (.40)	.18 (.30)	NA	NA	
Social Functioning					
Peer Relations	3.70 (.40)	3.67 (.43)	NA	NA	
Peer Acceptance/Rejection	3.62 (.50)	3.58 (.53)	NA	NA	
Bullied by Peers	1.22 (.40)	1.27 (.43)	NA	NA	
Social Withdrawal	.43 (.38)	.38 (.34)	NA	NA	
Asocial with Peers	.31 (.41)	.29 (.36)	NA	NA	
Social Inhibition	.55 (.48)	.47 (.47)	.60 (.49)	.50 (.53)	
Prosocial Behavior	1.55 (.34)	1.40 (.39)	1.25 (.47)	.97 (.53)	G**, S**
School Functioning					
Academic Functioning [b]	4.33 (.48)	4.19 (.53)	NA	NA	G** (WSFW)
School Engagement	1.87 (.19)	1.85 (.23)	NA	NA	
Academic Competence	3.91 (.79)	3.69 (.88)	3.23 (.76)	3.14 (.72)	G*, S**
Teacher-Child Relationship	4.50 (.47)	4.34 (.51)	NA	NA	G** (WSFW)
Teacher-Child Closeness	4.34 (.63)	4.16 (.68)	NA	NA	G** (WSFW)
Teacher-Child Conflict	1.34 (.54)	1.49 (.67)	NA	NA	G* (WSFW)

[a] The Temple Pilot Study did not ask the Relational Aggression subscale; therefore, Externalizing and Externalizing/ADHD Symptoms as reported here exclude Relational Aggression for both samples.

[b] See Chapter 3 for details on how scale scores were computed when metrics varied across subscales and/or respondents.

KEY: NA = scale is in HBQ but not asked of informant in reported study; G = Gender; S = Site; GxS = Gender by Site Interactions; * $p < .05$; ** $p < .01$

Associations with Socioeconomic Status and Marital Status

In order to examine possible associations between the HBQ scales and family socioeconomic status (SES), Spearman rank-order correlations were computed between WSFW mother, father, and teacher reports on the HBQ scales and continuous measures of family income, mother education, and father education. Similar analyses were run using data from the Temple Pilot Study, examining the association of mother and teacher reports on the HBQ scales and family income and mother education. (Father education was not included in the Temple analyses due to the large amount of missing data.) In both studies, most associations were weak and the majority were not statistically significant (results not shown). For example, absolute values of the correlation coefficients between the SES variables and Internalizing Symptoms, Externalizing Symptoms, and ADHD Symptoms were less than .15 for all three reporters in the WSFW and for teachers in the Temple Pilot Study, and less than .20 for mothers in the Temple Pilot Study (with the exception of Temple mother-report Internalizing Symptoms and family income, Spearman $\rho = -.27$, $p < .05$). In both samples, one of the strongest associations was between mother report of Global Physical Health and family income (Spearman $\rho = -.23$ and $-.32$, $p < .05$, in the Wisconsin and Temple samples respectively, where a higher score on Global Physical Health indicates poorer outcomes). Given the limitations of these analyses — such as the absence of some SES variables (e.g., occupational prestige) and the small size of the Temple Pilot Study sample — the relationship between the HBQ scales and SES warrants further examination in future studies.

The possible association between HBQ scores and parental marital status was examined in both the WSFW and the Temple Pilot Study. In both cases, comparisons were made between married families (WSFW n = 418, Temple n = 29) and separated/divorced families (WSFW n = 30, Temple n = 17). In some cases, children's parents had separated or divorced from one another and subsequently remarried or entered a new partnered relationship; however, in these analyses the separated/divorced families included only parents who were not living with a significant other at the time of assessment. Effect sizes of marital status on HBQ scales were generally small to moderate for both samples, e.g., for WSFW mother-report, WSFW teacher-report, and Temple mother-report Internalizing Symptoms, Cohen $\delta = .8$, .4, and .5 respectively; Externalizing Symptoms, Cohen $\delta = .4$, .3, and .6; ADHD Symptoms, Cohen $\delta = .4$, .1, and .3; and Prosocial Behavior, Cohen $\delta = .2$, .1, and .5. In the Temple Pilot Study, the number of families headed by a caregiver who was never married and was not currently living with a partner (n = 30) made possible an additional comparison with married families; however, effect sizes here were consistently negligible or small, with most Cohen δ between .0 and .4 (results not shown; details available from the authors).

Discriminant Validity

As a first step in evaluating the validity of the HBQ, we investigated how well adult reports could discriminate between children at varying levels of risk for problems in adjustment. The Three-City Study allowed us to test the HBQ's capacity to discriminate between a group of children referred for mental health evaluation or treatment (high risk) and an unselected group of children from the community (low risk). These analyses were based on the premise that if the HBQ could not first discriminate between referred and non-referred cases, the HBQ's clinical utility would be even less effective in diagnostically complex samples.

The results of these analyses are presented in **Table 13**. To test the discriminant validity of each HBQ scale and subscale, we conducted 3-way analyses of variance with group (community vs. clinic-referred), child gender, study site (Manchester, Palo Alto, and St. Louis), and their interactions as factors. Table 13 also presents effect sizes that reflect the magnitude of differentiation between community and clinic-referred group means on each scale and subscale. Although there were several gender and study site effects present in these data, the most striking feature of Table 13 is the consistency and magnitude of differentiation demonstrated by nearly all HBQ scales and subscales, with the exception of mother- and

teacher-report Social Inhibition and the mother-report physical health scales (where only Chronic Medical Conditions discriminated between the groups). Using Cohen's (l988) distinction between small (.20 through .49), moderate (.40 through .79), and large (≥ .80) effect sizes, the average effect size was large (mean δ = .97). Children in the clinic-referred group were viewed by mothers and teachers as experiencing significantly higher levels of mental health symptoms and impairments in social functioning than community children. Clinic-referred children were scored by their mothers significantly higher than community sample children on Internalizing Symptoms, Externalizing Symptoms, ADHD Symptoms, and Functional Impairment-Child and -Family. According to mothers, children in the clinic-referred group also showed more impaired Social Functioning, including less Prosocial Behavior and higher levels of Asocial with Peers. The patterns of group differences were nearly identical for teachers.

Since the mental health scales on the HBQ were drawn largely from the revised Ontario Child Health Study Scales (OCHS-R; Boyle et al., 1993), research demonstrating discriminant validity from the Ontario Child Health Study is of note. In this study, parents from community (n = 1,751) and clinic (n = 1,017) samples completed a mental health checklist. Scales measuring Externalizing Symptoms discriminated between children using and not using outpatient mental health services. For the Internalizing Symptoms subscales, Depression, but not Overanxious or Separation Anxiety, differentiated between children from the clinic and community samples of the Ontario Child Health Study. (See Boyle et al., 1993 for more information.)

Cross-Format Agreement

To explore associations between questionnaire and interview data, analyses were conducted with a sample of respondents that completed both formats. Mothers in the Wisconsin Pilot Study Sub-Sample were administered the HBQ twice, first as an interview (Assessment 1) during the spring of their children's year in first grade, and second as a questionnaire (Assessment 2) during the summer 3 to 4 months later. As shown in **Table 14**, correlation coefficients between the two assessments were high in the Mental Health domain, including Externalizing (Spearman ρ =.74), Internalizing (.73), ADHD (.82), and Functional Impairment as it impacts the child (.70) and the family (.77). Coefficients were also high in the Social Functioning domain for Asocial with Peers (.61), Social Inhibition (.74), and Prosocial Behavior (.68). These correlations likely would have been even higher had the span of time between assessments been much shorter and had both assessments been conducted during either the school year or the summer (rather than one assessment being conducted during each of these times, as was the case here). Nevertheless, calculations of the effect sizes for differences in Assessment 1 and 2 means show that all except four are trivial, and these four are small in size.

Informant Congruence

Another analytic issue of interest from the perspectives of both psychometric performance and observable consistencies in child behavior and symptoms is the question of cross-informant agreement. The degree to which pairs of informants agreed or disagreed on the HBQ scales was examined using data from the Wisconsin Study of Families and Work. **Table 15** shows Spearman rank-order correlations among dyads of mother, father, and teacher reports. Nearly all of the coefficients were small to moderate in magnitude, ranging from approximately .30 to .50. The strongest agreement was between mothers and fathers. Also apparent across pairs of informants were the generally higher correlations on Externalizing Symptoms and ADHD Symptoms, relative to those for Internalizing Symptoms and Functional Impairments. Finally, the strongest parent-teacher agreements were on estimations of Academic Competence, which has a relatively high potential for objectivity and quantitative evaluation and for which the communication of teacher assessments directly to parents is common via report cards and other means.

Table 13. Discriminant Validity: Group by Site by Child Gender ANOVAs

DATA SOURCE: MacArthur Three-City Outcome Study (n = 120)

	Manchester				Palo Alto				St. Louis						
	Female		Male		Female		Male		Female		Male			Significant Main &	Group Effect
	CM	CL	CM	CL	CM	CL	CM	CL	CM	CL	CM	CL	(SD) [a]	Interaction Effects	Size [b]
MOTHER REPORT															
Mental Health															
Internalizing Symptoms	.40	.66	.23	.69	.37	.65	.29	.48	.26	.45	.36	.44	(.24)	G**	.90
Depression	.17	.46	.14	.58	.26	.71	.20	.43	.13	.41	.33	.33	(.28)	G**	.93
Overanxious	.58	.83	.33	.76	.43	.65	.35	.48	.33	.56	.37	.63	(.30)	G**	.87
Separation Anxiety	.46	.68	.23	.72	.40	.52	.33	.54	.31	.38	.31	.48	(.35)	G*	.60
Externalizing Symptoms	.22	.98	.41	1.12	.35	.77	.27	.63	.29	.50	.50	.67	(.30)	G**, S*, GxS**	1.20
Oppositional Defiant	.47	1.21	.55	1.36	.53	1.08	.44	.89	.47	.84	.78	1.01	(.36)	G**, GxS*	1.44
Conduct Problems	.03	.84	.20	.89	.13	.55	.15	.45	.13	.31	.28	.61	(.30)	G**, GxS**	1.50
Overt Hostility	.21	1.31	.44	1.25	.31	1.00	.41	.81	.23	.55	.47	.86	(.41)	G**, GxS*	1.51
Relational Aggression	.17	.71	.52	.98	.43	.53	.15	.42	.30	.36	.37	.41	(.39)	G*, SxN*	.62
ADHD Symptoms	.74	1.29	.83	1.58	.61	1.02	.45	1.18	.47	.87	.58	1.29	(.36)	G**, S**, N*	1.40
Inattention	.70	1.33	.72	1.46	.56	.94	.45	1.24	.37	.85	.46	1.23	(.41)	G**	1.54
Impulsivity	.79	1.25	.94	1.69	.67	1.09	.45	1.12	.56	.90	.69	1.43	(.39)	G**, S**, GxN* SxN*	1.44
Externalizing/ADHD Symptoms	.47	1.09	.55	1.28	.44	.86	.33	.81	.35	.63	.52	.88	(.28)	G***, S**, GxS*	1.75
Functional Impairment-Child	.06	.69	.15	.65	.15	.58	.19	.64	.15	.51	.23	.45	(.28)	G**	1.60
Functional Impairment-Family	.11	1.00	.19	1.18	.25	1.06	.13	.83	.10	.57	.50	.56	(.47)	G**, GxS**	1.45
Physical Health															
Physical Health Prob. Index	.65	.69	.46	.53	.47	.59	.48	.60	.51	.48	.62	.61	(.22)	SxN*	.23
Global Physical Health	.64	.60	.25	.40	.25	.30	.28	.33	.42	.20	.50	.54	(.47)	n.s.	.02
Chronic Med. Conditions	1.27	1.50	.83	2.50	.68	1.67	.69	1.75	1.18	.91	1.29	1.50	(1.28)	G**	.61
Injuries/Accidents	.50	.45	.53	.46	.55	.65	.55	.49	.53	.47	.57	.50	(.17)	n.s.	-.18
Social Functioning															
Social Withdrawal	.38	.54	.32	.50	.38	.54	.38	.56	.45	.29	.48	.45	(.26)	GxS*	.38
Asocial with Peers	.24	.63	.21	.54	.28	.58	.30	.67	.42	.27	.46	.52	(.36)	G**, GxS*	.60
Social Inhibition	.73	.42	.67	.44	.67	.50	.63	.58	.64	.36	.58	.57	(.49)	n.s.	.40
Prosocial Behavior	1.43	.66	1.05	.76	1.39	.92	1.26	.93	1.45	1.19	1.17	.95	(.32)	G**, S*, N*	1.00

(Table continues on next page)

Table 13 (continued).

	Manchester				Palo Alto				St. Louis						
	Female		Male		Female		Male		Female		Male			Significant Main & Interaction Effects	Group Effect Size [b]
	CM	CL	CM	CL	CM	CL	CM	CL	CM	CL	CM	CL	(SD) [a]		
TEACHER REPORT															
Mental Health															
Internalizing Symptoms	.39	.24	.21	.56	.15	.70	.33	.69	.25	.47	.30	.67	(.28)	G**	1.00
Depression	.13	.22	.06	.58	.07	.67	.25	.65	.14	.36	.23	.46	(.28)	G**	1.25
Overanxious	.58	.17	.32	.50	.22	.79	.42	.56	.36	.41	.33	.67	(.35)	G**	.50
Externalizing Symptoms	.18	.68	.39	.82	.14	.53	.14	.72	.23	.37	.19	.36	(.36)	G**	1.00
Oppositional Defiant	.22	.67	.49	.90	.12	.69	.16	.82	.21	.54	.25	.61	(.42)	G**	1.21
Conduct Problems	.02	.50	.26	.66	.04	.27	.03	.50	.10	.15	.09	.27	(.28)	G**, N*	1.11
Overt Hostility	.08	.75	.36	1.03	.06	.50	.25	.96	.21	.38	.31	.64	(.45)	G**, N**	1.09
Relational Aggression	.42	.79	.44	.70	.36	.67	.10	.61	.39	.40	.08	.06	(.44)	G*, S**	.52
ADHD Symptoms	.33	.96	.64	1.20	.21	.56	.32	1.19	.39	.57	.36	1.17	(.41)	G*, N*, GxN*	1.30
Inattention	.47	.92	.57	1.20	.22	.50	.25	1.25	.39	.56	.31	1.26	(.46)	G**, N**, GxN*	1.24
Impulsivity	.19	1.0	.70	1.20	.20	.61	.39	1.12	.39	.58	.42	1.25	(.46)	G**, N**	1.24
Externalizing/ADHD Symptoms	.23	.77	.47	.95	.17	.54	.20	.88	.28	.43	.25	.63	(.33)	G***, N*	1.30
Functional Impairment-Child	.21	.43	.22	.61	.05	.48	.17	.79	.16	.25	.20	.54	(.35)	G*, N*	1.00
Social Functioning															
Social Withdrawal	.51	.26	.22	.38	.21	.52	.32	.58	.29	.48	.32	.60	(.32)	G*	.49
Asocial with Peers	.31	.38	.26	.59	.15	.64	.30	.87	.26	.58	.33	.98	(.42)	G**, N*	.90
Social Inhibition	.67	.08	.30	.26	.41	.50	.46	.44	.48	.58	.46	.42	(.48)	n.s.	.20
Prosocial Behavior	1.54	.87	1.02	.59	1.58	1.05	1.43	.80	1.26	1.25	1.19	.54	(.42)	G**, N**	1.10

Means are not broken down by gender, but tabled means have been adjusted by group, site, and gender.

[a] Estimate of pooled within-group standard deviation.

[b] Cohen δ (standardized mean difference): .20-.49 = small effect size; .50-.79 = moderate effect size; .80 or greater = large effect size.

KEY: CM = Community sample; CL = Clinic-referred sample; G = Group; S = Site; N = Gender, GxS = Group by Site interaction; GxN = Group by Gender interaction; SxN = Site by Gender interaction; n.s. = no significant effects; * $p < .05$; ** $p < .01$

Table 14. Cross-Format Agreement: Comparison of Mother Report on HBQ-P Interview and Subsequent (3-4 months) Questionnaire

DATA SOURCE: Wisconsin Pilot Study Sub-Sample (First Grade, n = 120) [a]

	Assessment 1 (Interview) Mean (SD)	**Assessment 2 (Questionnaire)** Mean (SD)	**Spearman ρ**	**Effect Size** [b]
Mental Health				
Internalizing Symptoms	.33 (.23)	.35 (.21)	.75	.09
Depression	.20 (.24)	.22 (.23)	.57	.09
Overanxious	.44 (.28)	.48 (.28)	.69	.14
Separation Anxiety	.34 (.29)	.36 (.29)	.67	.07
Externalizing Symptoms	.33 (.22)	.35 (.24)	.73	.09
Oppositional Defiant	.53 (.33)	.55 (.33)	.72	.06
Conduct Problems	.15 (.17)	.17 (.19)	.70	.11
Overt Aggression	.39 (.30)	.41 (.31)	.57	.07
Relational Aggression	.25 (.26)	.29 (.32)	.63	.14
ADHD Symptoms	.61 (.39)	.67 (.37)	.83	.16
Inattention	.58 (.44)	.66 (.41)	.79	.29
Impulsivity	.64 (.38)	.69 (.37)	.77	.13
Externalizing/ADHD Symptoms	.42 (.25)	.46 (.25)	.79	.16
Functional Impairment-Child	.28 (.29)	.19 (.24)	.60	-.34
Functional Impairment-Family	.21 (.31)	.16 (.25)	.68	-.18
Social Functioning				
Social Withdrawal	.56 (.37)	.63 (.38)	.71	.17
Asocial with Peers	.31 (.37)	.39 (.37)	.58	.22
Social Inhibition	.82 (.51)	.87 (.52)	.76	.10
Prosocial Behavior	1.42 (.28)	1.29 (.33)	.66	.43

[a] Only those scales administered at both assessments are included in this table.

[b] Cohen δ (standardized mean difference): .20-.49 = small effect size; .50-79 = moderate effect size; .80 or greater = large effect size

KEY: SD = Standard Deviation

Table 15. Informant Congruence

DATA SOURCE: Wisconsin Study of Families and Work (First Grade) [a]

	Cross-Informant Correlations					
	Mother-Father		**Mother-Teacher**		**Father-Teacher**	
	Spearman ρ	95% CI	Spearman ρ	95% CI	Spearman ρ	95% CI
Mental Health						
Internalizing Symptoms	.36**	.27-.44	.22**	.13-.31	.13*	.03-.23
Depression	.26**	.16-.35	.18**	.09-.27	.13*	.03-.23
Overanxious	.37**	.28-.45	.20**	.11-.29	.08	-.02-.18
Separation Anxiety	.38**	.29-.46	----	----	----	----
Externalizing Symptoms	.37**	.28-.45	.39**	.30-.47	.34**	.24-.43
Oppositional Defiant	.40**	.31-.48	.33**	.24-.41	.31**	.21-.40
Conduct Problems	.38**	.29-.46	.37**	.28-.45	.26**	.16-.35
Overt Hostility	.29**	.20-.38	.28**	.19-.37	.23**	.13-.33
Relational Aggression	.22**	.12-.31	.24**	.15-.33	.24**	.14-.34
ADHD Symptoms	.50**	.42-.57	.43**	.35-.50	.40**	.31-.48
Inattention	.50**	.42-.57	.38**	.30-.46	.38**	.29-.47
Impulsivity	.42**	.33-.50	.42**	.34-.50	.37**	.28-.46
Externalizing/ADHD Symptoms	.44**	.36-.52	.44**	.36-.51	.42**	.33-.50
Functional Impairment-Child	.33**	.24-.42	.31**	.22-.39	.28**	.18-.37
Functional Impairment-Family	.30**	.21-.39	----	----	----	----
Social Functioning						
Peer Relations	.38**	.29-.46	.32**	.23-.40	.19**	.09-.29
Peer Acceptance/Rejection	.37**	.28-.45	.33**	.24-.41	.24**	.14-.34
Bullied by Peers	.29**	.20-.38	.22**	.13-.31	.14**	.04-.24
Social Withdrawal	.44**	.36-.52	.25**	.16-.34	.32**	.22-.41
Asocial with Peers	.34**	.25-.43	.19**	.10-.28	.25**	.15-.35
Social Inhibition	.46**	.38-.54	.25**	.16-.34	.32**	.22-.41
Prosocial Behavior	.46**	.38-.54	.37**	.28-.45	.23**	.13-.33
School Functioning						
Academic Functioning	.57**	.48-.65	.59**	.51-.66	.51**	.41-.59
School Engagement	.39**	.30-.47	.29**	.20-.38	.22**	.12-.32
Academic Competence	.71**	.62-.78	.72**	.64-.78	.62**	.51-.71

[a] For mother-father comparisons, n = 385; mother-teacher, n = 421; and father-teacher, n = 351. Physical Health items not asked in the full WSFW; in the Wisconsin Pilot Study Sub-Sample, informant congruence for Global Physical Health ranged from .09 to .40, with the highest congruence between mothers and fathers.

KEY: '----' = parent-teacher comparisons not possible because scale not asked in HBQ-T; * $p < .05$; ** $p < .01$; CI = Confidence Interval

Summary

The data presented in this chapter demonstrate that the HBQ scales are psychometrically sound, possessing strong internal consistency, predictive validity, cross-format agreement, and short-term test-retest reliability, as well as very good stability over a one-year period. The descriptive statistics reported, while not drawn from nationally representative samples, provide a reference point for researchers by indicating the level and variation of HBQ scales in a variety of samples and considering the role that additional factors (particularly child gender) may play in understanding data obtained with the HBQ. The cross-informant correlations between mothers and fathers, mothers and teachers, and fathers and teachers are similar in magnitude to cross-informant correlations reported by other researchers (Achenbach, McConaughy, & Howell, 1987; Hinshaw, Han, Erhart, & Huber, 1992; Offord et al., 1996; Offord, Boyle, & Racine, 1989), reinforcing the finding that different informants may offer unique perspectives on an individual child and that each view is useful in aggregating an accurate picture of the child (Ladd & Kochenderfer-Ladd, 2002; Offord et al., 1996; see Kraemer et al. [2003] for a theoretically grounded approach for integrating multi-informant data developed by members of the MacArthur Assessment Battery Working Group). Finally, the cross-domain correlations identify substantial convergences among health problems in middle childhood stemming from mental, physical, social and academic difficulties, suggesting that traditional distinctions among ‘mental’ and ‘physical’ health, and among ‘symptoms’ and ‘impairments,’ may obscure, rather than illuminate, the underlying reality of difficulties in children’s lives (Essex et al., 2002).

Chapter 6

LIMITATIONS AND FUTURE DIRECTIONS

Several limitations of the HBQ and the supporting data presented in this manual should be considered. First, the HBQ was not designed to provide clinical diagnoses. Although the items comprising the mental health scales and subscales parallel symptoms that underlie standardized childhood diagnoses, the HBQ was not designed to reflect extant nosologic conventions (i.e., duration of symptoms, current versus past functioning, etc.). Rather, the HBQ yields dimensional scores that offer profiles of children's emotional and behavioral well-being in multiple domains. With time and the accumulation of norming samples, information about clinical thresholds or cut-points will likely become available. (For a discussion of preliminary HBQ clinical cutoff scores and differential performance of the HBQ and DISC-IV, see Lemery-Chalfant et al., 2007, and Luby et al., 2002.) Second, the generalizability of the psychometric data presented herein awaits replication in more culturally, socioeconomically, and clinically diverse samples. Third, the prognostic potency of the HBQ has not yet been ascertained. With the exception of the Wisconsin Study of Families and Work (WSFW) sample, the other samples were cross-sectional in nature. However, because the HBQ has been conceptualized as a tool that can be used to assess young children's current functioning with an eye to identifying children at risk for future maladaptive functioning, demonstrations of predictive validity are essential. At this writing, several papers are being written using the WSFW sample to examine the prediction of critical mental, social, and academic outcomes in third grade using first-grade HBQ (and BPI) scores; and 5th grade data are currently being collected in the WSFW. Finally, as a questionnaire/interview measure, the HBQ is limited by the frailties inherent in this type of assessment (e.g., lack of direct, standardized observation of the child).

Data collection using the HBQ, along with the accompanying BPI, continues in the laboratories of this group and other researchers. Numerous substantive questions are now being addressed with these multi-informant instruments, and the development of additional scoring procedures (e.g., for health care utilization) is underway. Future work on the development of the HBQ is needed in three main areas. First, normative data need to be collected on large, diverse, representative samples of children ages 4 to 8 years old. The samples presented in this manual were community or case-control samples and not designed to be normative. Secondly, more longitudinal work needs to be completed to give us an understanding of the predictive validity of the instrument. As noted above, follow-up HBQ data have been collected in the Wisconsin Study of Families and Work when the children were in 3rd grade, and 5th-grade data collection is currently underway. Analyses of these data will provide some information on the stability of the health and behavior outcomes from 1st to 3rd and 5th grades. Thirdly, more research is needed on the convergent and discriminant validity of the HBQ. By comparing HBQ data to other instruments in the field (e.g., Child Behavior Checklist [CBCL], Edelbrock & Achenbach, 1984; Minnesota Child Development Inventory, Ireton & Thwing, 1974), the validity of the HBQ will be strengthened.

Finally, the use of multi-informant assessment strategies is the gold standard in the fields of child psychiatry, clinical psychology, and developmental psychopathology. However, little exists theoretically to guide the integration or simultaneous usage of information provided by children, parents, teachers, and other informed adults. Using the HBQ and the parallel Berkeley Puppet Interview modules, this group has recently reported on a theoretically- and empirically-anchored approach for combining data from multiple informants (Kraemer et al., 2003). Because this work has led to the creation of new, multi-informant composite scores of children's well being in different functional areas, information about this work will be incorporated into subsequent revisions of this manual.

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Appendix A

CITATIONS OF PAPERS USING THE HBQ

(updated May, 2014)

Ablow, J.C., Measelle, J.R., Kraemer, H.C., Harrington, R., Luby, J. Smider, N. Dierker, L., Clark, V., Dubicka, B., Heffelfinger, A., Essex, M.J., & Kupfer, D.J. (1999). The MacArthur Three-City Outcome Study: Evaluating multi-informant measures of young children's symptomatology. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*, 1580-1590.

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Appendix B

HBQ ITEMS BY DOMAIN AND SCALE: PARENT VERSION (HBQ-P 1.0)

***NOTE*: HBQ items are listed here for informational purposes *only*; complete questionnaire formatting and full instructions to respondents have been omitted here. Researchers interested in using the HBQ or in requesting a copy of the instrument should see page *i* of this manual for contact information.**

1. MENTAL HEALTH SCALES

A. Internalizing Symptoms

B. Externalizing Symptoms

C. ADHD Symptoms

D. Externalizing/ADHD Symptoms

E. Functional Impairment-Child

F. Functional Impairment-Family

G. Mental Health Care Utilization

A. Internalizing Symptoms (mean of 3 subscales: Depression, Overanxious, and Separation Anxiety)

Response options: 0 = Never or not true; 1 = Sometimes or somewhat true; 2 = Often or very true

i. Depression (mean of 7 items)

81. Sleeps more than most children during the day and/or night.

120 Feels worthless or inferior.

124. Unhappy, sad, or depressed.

126. Underactive, slow-moving, or lacks energy.

137. Cries a lot.

140. Seems lonely.

146. Doesn't smile or laugh much.

ii. Overanxious (mean of 12 items)

68. Worries about things in the future.

73. Has trouble sleeping.

75. Worries about past behavior.

86. Worries about doing better at things.

91. Poor appetite, not hungry.

95. Physical problems without known medical cause:

95a. Aches and pains.

95b. Headaches.

95c. Nausea, feels sick.

95d. Stomach aches or cramps.

102. Self-conscious or easily embarrassed.

109. Needs to be told over and over that things are OK.

115. Nervous, high strung, or tense.

iii. Separation Anxiety (mean of 10 items)

71. Worries that something bad will happen to people he/she is close to.

79. Worries about being separated from loved ones.

88. Avoids school to stay home.

98. Scared to go to sleep without parents being near.

104. Avoids being alone.

111. Has nightmares about being abandoned.

118. Complains of feeling sick before separating from those he/she is close to.

122. Overly upset when leaving someone he/she is close to.

129. Overly upset while away from someone he/she is close to.

133. Is afraid of being away from home.

B. Externalizing Symptoms (mean of 4 subscales: Oppositional Defiant, Conduct Problems, Overt Hostility, and Relational Aggression)

Response options: 0 = Never or not true; 1 = Sometimes or somewhat true; 2 = Often or very true

i. Oppositional Defiant (mean of 9 items)

69. Has temper tantrums or hot temper.

77. Argues a lot with adults.

78. Argues a lot with peers.

87. Defiant, talks back to adults.

103. Blames others for his/her own mistakes.

110. Is easily annoyed by others.

116. Angry and resentful.

123. Gets back at people.

130. Swears or uses obscene language.

ii. Conduct Problems (mean of 12 items)

72. Steals; takes things that don't belong to him/her.

80. Lies or cheats.

89. Vandalizes.

94. Sets fires.

99. Cruel to animals.

105. Physically attacks people.
112. Threatens people.
119. Destroys his/her own things.
125. Destroys things belonging to his/her family or other children.
132. Disobedient at school.
138. Cruel, bullies, or mean to others.
145. Uses a weapon when fighting.

iii. Overt Hostility (mean of 4 items)

85. Taunts and teases other children.
97. Does things that annoy others.
135. Kicks, bites, or hits other children.
143. Gets in many fights.

iv. Relational Aggression (mean of 6 items)

70. When mad at peer, keeps that peer from being in the play group.
83. Tries to get others to dislike a peer.
96. Tells others not to play with or be a peer's friend.
108. Tells a peer that he/she won't play with that peer or be that peer's friend unless that peer does what he/she asks.
127. Verbally threatens to keep a peer out of the play group if the peer doesn't do what he/she wants.
139. Tells a peer that they won't be invited to his/her birthday party unless that peer does what he/she wants.

C. ADHD Symptoms (mean of 2 subscales: Inattention and Impulsivity)

Response options: 0 = Never or not true; 1 = Sometimes or somewhat true; 2 = Often or very true

i. Inattention (mean of 6 items)

84. Distractible, has trouble sticking to any activity.
107. Has difficulty following directions or instructions.
114. Can’t concentrate, can’t pay attention for long.
121. Jumps from one activity to another.
147. Does not seem to listen.
148. Loses things.

ii. Impulsivity (mean of 9 items)

67. Fidgets.
74. Can’t stay seated when required to do so.
82. Impulsive or acts without thinking.
93. Has difficulty awaiting turn in games or groups.
101. Interrupts, blurts out answers to questions too soon.
128. Has difficulty playing quietly.

134. Talks excessively.

142. Interrupts or butts in on others.

149. Does dangerous things without thinking.

D. Externalizing/ADHD Symptoms (mean of 6 subscales listed in 1.B and 1.C above)

E. Functional Impairment-Child (mean of 8 items)

Response options: 0 = None; 1 = A little; 2 = A lot

150. How much trouble has your child had getting along with his/her teacher(s) as a result of the behaviors or behavior problems you identified in the previous section?

151. How much trouble has your child had getting along with you or your spouse/partner as a result…

152. How much has your child been irritable or fighting with friends as a result…

153. How much has your child withdrawn or isolated himself or herself as a result…

154. How much has your child been doing less with other kids as a result…

155. How much has your child missed school as a result…

156. How much have your child's grades gone down as a result…

157. How much has your child's life become less enjoyable as a result…

F. Functional Impairment-Family (mean of 8 items)

Response options: 0 = Never; 1 = Sometimes; 2 = Often; 3 = Very often

158. How frequently has your child's behavior made it difficult for you or prevented you from taking him or her out in public or to go shopping or visiting?

159. How frequently has your child's behavior made you decide not to leave him/her with a babysitter?

160. How frequently has your child's behavior prevented you from having friends, relatives, or neighbors visit your home?

161. How frequently has your child's behavior caused you to be anxious or worried about his/her chance for doing well in the future?

162. How frequently have you quarreled with your spouse/partner about your child's behavior?

163. How frequently has your child's behavior prevented his/her brothers or sisters from having friends, relatives, or neighbors to your home?

164. How frequently have friends, relatives, or neighbors expressed concern to you about your child's behavior?

165. <u>During the past year</u>, how frequently have you had to change or forego your vacations or other family outings because your child's behavior was difficult to manage?

G. Mental Health Care Utilization

Under development.

2. PHYSICAL HEALTH SCALES

A. Physical Health Problem Index

B. Injuries/Accidents

C. Neurological Risk

D. Physical Health Care Utilization

A. Physical Health Problem Index (mean of 2 subscales: Global Physical Health [recoded] and Chronic Conditions [recoded]; see scoring section of HBQ manual for more detailed instructions)

i. Global Physical Health (mean of 5 items)

1. In general, would you say your child's physical health is excellent [0], good [1], fair [2], or poor [3]?
2. In general, how much do you worry about your child's health?

   Response options: 0 = None at all; 1 = A little; 2 = Somewhat; 3 = A great deal
3. In general, how much difficulty, pain or distress does your child's health cause him or her?

   Response options: 0 = None at all; 1 = A little; 2 = Some; 3 = A great deal
4. To what extent does health limit your child in any way, keeping him or her from activities he or she wants to do?

   Response options: 0 = None at all; 1 = A little; 2 = Some; 3 = A great deal
5. How often in an average month does your child stay home or come home from school or childcare because of illness?

   Response options: 0 = Rarely or never (less than 1 day/month); 1 = A little of the time (1-2 days/month); 2 = Sometimes (3-5 days/month); 3 = Often (6 or more days/month)

ii. Chronic Medical Conditions (sum of 22 items; see scoring section of HBQ manual for more detailed instructions)

12. Below is a list of chronic medical conditions. For each of the medical conditions, please make a check to mark whether or not your child has ever had the condition. Please mark an answer for each item even if your child has never had the condition. Has your child ever had . . .

    Response options: 0 = No; 1 = Yes

    12a. Arthritis

    12b. Asthma

    12c. Other chronic or recurrent lung disease

    12d. Birth defects, such as spina bifida or cleft lip

    12e. Blood diseases, such as sickle cell anemia or hemophilia

    12f. Bowel diseases, such as inflammatory bowel disease or chronic constipation

    12g. Congenital heart disease

    12h. Cystic fibrosis

    12i. Diabetes

    12j. HIV infection or AIDS

12k. Kidney disease

12l. Leukemia or cancer

12m. Nerve or muscle problems such as muscular dystrophy

12n. Repeated, persistent ear infections

12o. Repeated, persistent urinary infections

12p. Repeated, persistent respiratory infections such as colds, bronchitis, or croup

12q. Bad allergies requiring frequent doctor visits and frequent medications

12r. Hearing problems

12s. Vision problems

12t. Learning disorder

12u. Speech disorder

13. Has your child ever had any other chronic health problems than those listed above?

(If yes:) Please describe the other chronic health problem(s).

B. Injuries/Accidents (mean of 3 recoded items; see scoring section of HBQ manual for more detailed instructions)

6a. How many times has [your child] ever had an injury or accident requiring medical attention?

6b. How many times did serious injury ever keep your child from participating in normal daily activities, either at home, at childcare, or at school?

6c. How many times has he or she had an injury or accident requiring medical attention within the past year?

C. Neurological Risk

Under development.

D. Physical Health Care Utilization

Under development.

3. SOCIAL FUNCTIONING SCALES

A. Peer Relations

B Social Withdrawal

C. Prosocial Behavior

D. Overt Hostility

E. Relational Aggression

F. Adult-Led Recreational Activities

A. Peer Relations (mean of 2 subscales: Peer Acceptance/Rejection and Bullied by Peers [reversed]; see scoring section of HBQ manual for reversed-coding instructions)

Response options: 1 = Not at all like; 2 = Very little like; 3 = Somewhat like; 4 = Very much like

i. Peer Acceptance/Rejection (mean of 8 items)

17. Has lots of friends at school.
18. Is often left out by other children. (reverse scored)
19. Other children refuse to let him/her play with them. (reverse scored)
21. Is not chosen as a playmate. (reverse scored)
23. Actively disliked by other children, who reject him/her from their play. (reverse scored)
24. Is liked by other children who seek him/her out for play.
25. Is avoided by other children. (reverse scored)
28. Is not much liked by other children. (reverse scored)

ii. Bullied by Peers (mean of 3 items)

22. Is picked on by other children.
26. Is teased and ridiculed by other children.
29. Is pushed or shoved around by other children.

B. Social Withdrawal (mean of 2 subscales: Asocial with Peers and Social Inhibition)

Response options: 0 = Never or not true; 1 = Sometimes or somewhat true; 2 = Often or very true

i. Asocial with Peers (6 items)

76. Is a solitary child.
92. Prefers to play alone.
100. Likes to be alone.
117. Avoids peers.
131. Keeps peers at a distance.
144. Withdraws from peer activities.

ii. Social Inhibition (3 items)

106. Shy with other children.
113. Shy with unfamiliar adults.
136. Is afraid of strangers.

C. Prosocial Behavior (mean of 20 items)

Response options: 0 = Rarely applies; 1 = Applies somewhat; 2 = Certainly applies

47. If there is a quarrel or dispute, he/she will try to stop it.
48. Offers to share materials or tools being used in a task.
49. Will invite bystanders to join in a game.
50. Will try to help someone who has been hurt.
51. Apologizes spontaneously after a misdemeanor.
52. Shares candies and extra food.
53. Is considerate of others' feelings.
54. Stops talking quickly when asked to.
55. Spontaneously helps to pick up objects someone has dropped.
56. Takes the opportunity to praise the work of less able children.
57. Shows sympathy to someone who has made a mistake.
58. Offers to help other children who are having difficulty with a task.
59. Helps other children who are feeling sick.
60. Can work easily in a small peer group.
61. Comforts a child who is crying or upset.
62. Is efficient in carrying out regular tasks, such as helping with household chores.
63. Settles down to work quickly.
64. Will clap or smile if someone else does something well.
65. Volunteers to help clean up a mess someone else has made.
66. Tries to be fair in games.

D. Overt Hostility (see 1.B.iii above)[*]

E. Relational Aggression (see 1.B.iv above)[*]

F. Adult-Led Recreational Activities

Under development.

[*] If excluded from the Mental Health Externalizing Symptoms scale, the Overt Hostility and Relational Aggression subscales can be used in the Social Functioning domain and a Social Behavior scale (comprising Prosocial Behavior [reversed], Overt Hostility, and Relational Aggression) may be computed.

4. SCHOOL FUNCTIONING SCALES

A. Academic Functioning

B. Education Services Utilization

A. Academic Functioning (mean of 2 subscales: School Engagement [recoded] and Academic Competence [recoded]; see scoring section of HBQ manual for more detailed instructions)

i. School Engagement (mean of 8 items)

Response options: 1 = Not at all; 2 = A little; 3 = Somewhat; 4 = Quite a bit

To what extent does your child seem…

31. Excited about school
32. Upset about school (reverse scored)
33. Distressed about school (reverse scored)
34. Eager about school
35. Frustrated about school (reverse scored)
36. Happy about school
37. Irritable about school (reverse scored)
38. Interested in school

ii. Academic Competence (mean of 8 items)

39. How good is your child in math?
40. How good is your child in reading?

Response options for Q.39-40(range = 1-7): 1 = Not good at all, 7 = Very good

41. In comparison to other children, how difficult is it for your child to do math? (reverse scored)
42. In comparison to other children, how difficult is it for your child to read? (reverse scored)

Response options for Q.41-42 (range = 1-7): 1 = Not at all difficult, 7 = Very difficult

43. Compared to other children, how much innate ability or talent does your child have in math?
44. Compared to other children, how much innate ability or talent does your child have in reading?

Response options for Q. 43-44 (range = 1-7): 1 = Much less than other children, 7 = Much more than other children

45. In comparison to other children, how would you evaluate your child's performance in math?
46. In comparison to other children, how would you evaluate your child's performance in reading?

Response options for Q. 45-46 (range = 1-7): 1 = Much worse than other children, 7 = Much better than other children

B. Education Services Utilization

Under development.

Appendix C

HBQ ITEMS BY DOMAIN AND SCALE: TEACHER VERSION (HBQ-T 1.0)

***NOTE*: HBQ items are listed here for informational purposes *only*; complete questionnaire formatting and full instructions to respondents have been omitted here. Researchers interested in using the HBQ or in requesting a copy of the instrument should see page *i* of this manual for contact information.**

1. MENTAL HEALTH SCALES

A. Internalizing Symptoms

B. Externalizing Symptoms

C. ADHD Symptoms

D. Externalizing/ADHD Symptoms

E. Functional Impairment-Child

A. Internalizing Symptoms (mean of 2 subscales: Depression and Overanxious)

Response options: 0 = Never/Not true; 1 = Sometimes or somewhat true; 2 = Often or very true

i. Depression (mean of 6 items)

108. Feels worthless or inferior.
111. Unhappy, sad, or depressed.
113. Underactive, slow-moving, or lacks energy.
122. Cries a lot.
125. Seems lonely.
132. Doesn't smile or laugh much.

ii. Overanxious (mean of 8 items)

68. Worries about things in the future.
73. Worries about past behavior.
82. Worries about doing better at things.
87. Complains of stomach aches or headaches.
93. Self-conscious or easily embarrassed.
99. Needs to be told over and over that things are OK.
104. Nervous, highstrung, or tense.
129. Complains about not feeling well.

B. Externalizing Symptoms (mean of 4 subscales: Oppositional Defiant, Conduct Problems, Overt Hostility, and Relational Aggression)

Response options: 0 = Never/Not true; 1 = Sometimes or somewhat true; 2 = Often or very true

i. Oppositional Defiant (mean of 9 items)

69. Has temper tantrums or hot temper.
75. Argues a lot with adults.
76. Argues a lot with peers.
83. Defiant, talks back to adults.
94. Blames others for his/her own mistakes.
100. Is easily annoyed by others.
105. Angry and resentful.
110. Gets back at people.
116. Swears or uses obscene language.

ii. Conduct Problems (mean of 11 items)

71. Steals; takes things that don't belong to him/her.
77. Lies or cheats.
84. Vandalizes.
90. Cruel to animals.
95. Physically attacks people.
101. Threatens people.
107. Destroys his/her own things.
112. Destroys things that belong to his/her family or other children.
118. Disobedient at school.
123. Cruel, bullies, or mean to others.
131. Uses a weapon when fighting.

iii. Overt Hostility (mean of 4 items)

81. Taunts and teases other children.
89. Does things that annoy others.
120. Kicks, bites, or hits other children.
128. Gets in many fights.

iv. Relational Aggression (mean of 6 items)

70. When mad at peer, keeps that peer from being in the play group.
79. Tries to get others to dislike a peer.
88. Tells others not to play with or be a peer's friend.
98. Tells a peer that he/she won't play with peer or be that peer's friend unless peer does what he/she asks.
114. Verbally threatens to keep a peer out of the play group if the peer doesn't do what he/she wants.

124. Tells a peer that they won't be invited to their birthday party unless that peer does what he/she wants.

C. ADHD Symptoms (mean of 2 subscales: Inattention and Impulsivity)

Response options: 0 = Never/Not true; 1 = Sometimes or somewhat true; 2 = Often or very true

i. Inattention (mean of 6 items)

80. Distractible, has trouble sticking to any activity.
97. Has difficulty following directions or instructions.
103. Can't concentrate, can't pay attention for long.
109. Jumps from one activity to another.
133. Does not seem to listen.
134. Loses things.

ii. Impulsivity (mean of 9 items)

67. Fidgets.
72. Can't stay seated when required to do so.
78. Impulsive or acts without thinking.
86. Has difficulty awaiting turn in games or groups.
92. Interrupts, blurts out answers to questions too soon.
115. Has difficulty playing quietly.
119. Talks excessively.
127. Interrupts or butts in on others.
135. Does dangerous things without thinking.

D. Externalizing/ADHD Symptoms (mean of 6 subscales listed in 1.B and 1.C above)

E. Functional Impairment-Child (mean of 7 items)

Response options: 0 = None; 1 = A little; 2 = A lot

136. How much trouble has this child had getting along with teacher(s) as a result of the behaviors or behavior problems that you identified in the previous section?
137. How much has this child been irritable or fighting with friends as a result…
138. How much has this child withdrawn or isolated himself or herself as a result…
139. How much has this child been doing less with other kids as a result…
140. How much has this child missed school as a result…
141. How much have this child's grades gone down as a result…
142. How much has this child's life become less enjoyable as a result…

2. PHYSICAL HEALTH SCALE

A. Global Physical Health (mean of 5 items)

1. In general, would you say this child's physical health is excellent [0], good [1], fair [2], or poor [3]?
2. In general, how much do you worry about this child's health?

   Response options: 0 = None at all; 1 = A little; 2 = Somewhat; 3 = A great deal
3. In general, how much difficulty, pain or distress does this child's health cause him or her?

   Response options: 0 = None at all; 1 = A little; 2 = Some; 3 = A great deal
4. To what extent does health limit this child in any way, keeping him or her from activities he or she wants to do?

   Response options: 0 = None at all; 1 = A little; 2 = Some; 3 = A great deal
5. How often in an average month does this child stay home or go home from school or childcare because of illness?

   Response options: 0 = Rarely or never (less than 1 day/month); 1 = A little of the time (1-2 days/month); 2 = Sometimes (3-5 days/month); 3 = Often (6 or more days/month)

3. SOCIAL FUNCTIONING SCALES

A. Peer Relations

B. Social Withdrawal

C. Prosocial Behavior

D. Overt Hostility

E. Relational Aggression

A. Peer Relations (mean of 2 subscales: Peer Acceptance/Rejection and Bullied by Peers [reversed])

Response options: 1 = Not at all like; 2 = Very little like; 3 = Somewhat like; 4 = Very much like

i. Peer Acceptance/Rejection (mean of 8 items)

10. Has lots of friends at school
11. Is often left out by other children (reverse scored)
12. Other children refuse to let him/her play with them (reverse scored)
14. Is not chosen as a playmate (reverse scored)
16. Actively disliked by other children, who reject him/her from their play (reverse scored)
17. Is liked by other children who seek him/her out for play
18. Is avoided by other children (reverse scored)
21. Is not much liked by other children (reverse scored)

ii. Bullied by Peers (mean of 3 items)

15. Is picked on by other children
19. Is teased and ridiculed by other children
22. Is pushed or shoved around by other children

B. Social Withdrawal (mean of 2 subscales: Asocial with Peers and Social Inhibition)

Response options: 0 = Never or not true; 1 = Sometimes or somewhat true; 2 = Often or very true

i. Asocial with Peers (mean of 6 items)

74. Is a solitary child
85. Prefers to play alone
91. Likes to be alone
106. Avoids peers
117. Keeps peers at a distance
130. Withdraws from peer activities

ii. Social Inhibition (mean of 3 items)

96. Shy with other children
102. Shy with unfamiliar adults
121. Is afraid of strangers

C. Prosocial Behavior (mean of 20 items)

Response options: 0 = Rarely applies; 1 = Applies somewhat; 2 = Certainly applies

47. If there is a quarrel or dispute, s/he will try to stop it.
48. Offers to share materials or tools being used in a task.
49. Will invite bystanders to join in a game.
50. Will try to help someone who has been hurt.
51. Apologizes spontaneously after a misdemeanor.
52. Shares candies or extra food.
53. Is considerate of others' feelings.
54. Stops talking quickly when asked to.
55. Spontaneously helps to pick up objects someone has dropped.
56. Takes the opportunity to praise the work of less able children.
57. Shows sympathy to someone who has made a mistake.
58. Offers to help other children who are having difficulty with a task.
59. Helps other children who are feeling sick.
60. Can work easily in a small peer group.
61. Comforts a child who is crying or upset.
62. Is efficient in carrying out regular tasks, such as helping with classroom chores.
63. Settles down to work quickly.
64. Will clap or smile if someone else does something well.
65. Volunteers to help clean up a mess someone else has made.
66. Tries to be fair in games.

D. Overt Hostility (see 1.B.iii above)[*]

E. Relational Aggression (see 1.B.iv above)[*]

[*] If excluded from the Mental Health Externalizing Symptoms scale, the Overt Hostility and Relational Aggression subscales can be used in the Social Functioning domain and a Social Behavior scale (comprising Prosocial Behavior [reversed], Overt Hostility, and Relational Aggression) may be computed.

4. SCHOOL FUNCTIONING SCALES

A. Academic Functioning

B. Teacher-Child Relationship

C. Education Services Utilization

A. Academic Functioning (mean of 2 subscales: School Engagement [recoded] and Academic Competence; see scoring section of HBQ manual for more detailed instructions)

i. School Engagement (mean of 8 items)

Response options: 0 = Doesn't apply; 1 = Sometimes applies; 2 = Certainly applies

24. Makes up reasons to go home from school. (reverse scored)
25. Dislikes school. (reverse scored)
26. Is interested in classroom activities.
27. Has fun in school.
28. Is cheerful at school.
29. Approaches new activities with enthusiasm.
30. Likes being in school.
31. Seems bored in school. (reverse scored)

ii. Academic Competence (mean of 5 items)

32. Which of these statements best describes how well this child has done in school during the past six months?

    Response options: 1 = Not well at all, poor student; 2 = Not too well, below average student; 3 = Pretty well, average student; 4 = Quite well, good student; 5 = Very well, excellent student

33. How would you evaluate this child's current school performance in reading-related skills?
34. How would you evaluate this child's current school performance in spelling?
35. How would you evaluate this child's current school performance in math-related skills?
36. How would you evaluate this child's current school performance overall?

    Response options for Q.33-36: 1 = Poor/well below grade level; 2 = Needs improvement/below average for grade level; 3 = Satisfactory/at grade level; 4 = Very good/above average for grade level; 5 = Excellent/well above grade level

B. Teacher-Child Relationship (mean of 2 subscales: Closeness and Conflict [reversed])

Response options: 1 = Definitely does not apply; 2 = Not really; 3 = Neutral, not sure; 4 = Applies somewhat; 5 = Definitely applies

i. Teacher-Child Closeness (mean of 5 items)

37. You share an affectionate, warm relationship with this child.
39. If upset, this child will seek comfort from you.
40. This child spontaneously shares information about himself/herself.
42. It is easy to be in tune with what this child is feeling.
46. This child openly shares his/her feelings and experiences with you.

ii. Teacher-Child Conflict (mean of 5 items)

38. You and this child always seem to be struggling with each other.

41. This child easily becomes angry at you.

43. Dealing with this child drains your energy.

44. When this child arrives in a bad mood, you know the two of you are in for a long and difficult day.

45. This child's feelings toward you can be unpredictable and change suddenly.

C. Education Services Utilization

Under development.

Appendix D

SAMPLE PERCENTILE RANK SCORING COMMANDS

Below is an example of syntax used in SPSS to create subscale-level percentile rank variables for Global Physical Health (GPH) and Chronic Medical Conditions (CMC) in order to compute the Physical Health Problems Index (PHPI) scale score. The same principles can be used to create the item-level percentile rank scores for the Injuries/Accidents subscale. Notations are made in *[italics]* to indicate that they are not actual commands:

```
rank variables = GPH CMC (A)  /RANK  /PRINT=YES  /TIES=MEAN.
execute.
```

[The command above creates rank ordered variables that SPSS names by adding an "r" to the beginning of the original variable name. In the following commands, each new score is divided by the number of respondents with valid data for that variable to create the percentile rank variables.]

```
compute prGPH = rGPH / n_gph.
compute prCMC = rCMC / n_cmc.
execute.
```

[These percentile rank scores are then averaged to produce the Physical Health Problems Index as shown below.]

```
compute PHPI = mean.2 (prGPH, prCMC).
execute.
```