

THE DEVELOPMENTAL NICHE AND CHILD BEHAVIOR PROBLEMS IN RURAL
NEPAL: DESCRIPTION AND IMPLICATIONS FOR DEFINITIONS AND MEASUREMENT

by
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ABSTRACT

Background: Child behavior problems represent the most common reason for child mental health referral and a common risk factor for academic failure, delinquency, and adverse mental health outcomes. A challenge to developing accurate and valid measurements and acceptable and effective interventions across contexts is that behavior problems are defined through transactional processes involving expectations of appropriate child behavior that vary widely across settings. This dissertation describes a series of studies that aimed to understand how contextual factors—characterized by the “developmental niche”—influence definitions of and responses to child behavior problems. Implications for measurement are explored in the development and validation of a scale created using local stakeholder participation.

Methods: In rural Nepal, we conducted key informant interviews and focus group discussions focused on identifying influences of children’s physical and social settings, childcare customs and practices, and parental ethnotheories on definitions of and responses to child behavior problems. We then conducted a survey of local stakeholders to assess the importance and relevance of a set of candidate items for a behavior problem scale, drawn from free-lists and a review of existing validated scales. The pool of items was then narrowed based on the results of testing in a small development sample. We evaluated the psychometric properties and construct validity of the resulting scale in a population-based sample in rural Nepal.

Results: Parents were primarily concerned about children’s behaviors that were perceived to adversely affect the child’s academic success, economic or marriage prospects, or the family’s social prestige (*izzat*). The scale developed using local stakeholder participation had good internal consistency, a unidimensional factor structure, and was more strongly correlated with local behavior problem concepts compared with a previously validated scale developed outside Nepal.

Conclusions: This series of studies provides an in-depth evaluation of concepts of child behavior problems in a non-Western cultural context and highlights that what is “at-stake” from child behavior problems may vary greatly between settings. The scale resulting from use of local

stakeholder participation had good psychometric properties and more closely reflected local concepts of behavior problems, compared with an international tool.

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Preface/Acknowledgments

Preface

The research presented in this dissertation is original and previously unpublished. Chapter 2 is currently under review by *Social Psychiatry and Psychiatric Epidemiology* (submitted 7/7/2015).

Parts of the research have been presented or accepted for presentation at academic conferences, including:

Chapter 1:

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My role in each of the studies included: leading the conceptualization and design of the study, leading ethical review applications, training data collectors and interviewers, monitoring data and quality assurance, leading all data analysis, and writing the initial versions of all manuscripts. The co-investigators on each study reviewed and provided feedback that I incorporated into revisions of each manuscript (Chapters 1-3).

Each study was reviewed and approved by ethical review boards at Johns Hopkins University (Schools of Medicine and Public Health) and the Nepal Health Research Council.

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However, her greatest contributions to these projects were not in collecting the data, but in developing plans for effective means to collect it, in making sense of it, and in solving the countless practical problems that came up almost daily. I thank her for her dedication, insights, and many contributions to this project, which have been fueled by her insatiable curiosity that makes her an excellent researcher and collaborator.

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INTRODUCTION

Background

Childhood is increasingly recognized as an important period for prevention of and early intervention for mental disorders (Collins et al., 2011; Kessler et al., 2007). More than half of all mental disorders begin in childhood (Kessler et al., 2005) and most mental disorders involve developmental processes (Collins et al., 2011; Sadock & Sadock, 2011; Sroufe & Rutter, 1984). As one of the most common and impairing child mental disorders (Loeber, Burke, Lahey, Winters, & Zera, 2000), disruptive behavior problems represent an important, but often neglected, target for public health interventions.

There is emerging, but still limited, evidence that child behavior problems are a common source of impairment and disruption in low- and middle-income countries (LMIC). Epidemiologic studies have demonstrated similar prevalence rates of behavior problems in high- and low-income countries (Canino, Polanczyk, Bauermeister, Rohde, & Frick, 2010). Worldwide estimates of disorder burden suggest that conduct disorder is associated with greater total disability (as measured by Disability Adjusted Life-Years) than autism, intellectual disability, or cannabis use disorders (Whiteford, Ferrari, Degenhardt, Feigin, & Vos, 2015). Behavior problems interfere with realization of children's developmental potential, often through paths related to academic failure (Loeber et al., 2000; Tramontina et al., 2001). Behavior problems may also represent a modifiable target for early interventions aimed at preventing later mental disorders, substance abuse, violence, and psychosocial impairment (Petras et al., 2008).

However, there are a number of challenges to identifying and treating child behavior problems in diverse socio-cultural settings. More than most mental disorders, child behavior problems are defined in relation to society-specific norms for appropriate behavior (American Psychiatric Association, 2013). Therefore, a single "universal" definition of behavior problems is unlikely to transfer easily between settings where there are different expectations placed upon

children. However, most existing screening and diagnostic tools for behavior problems—including those that have been applied in LMIC settings—were developed and validated in relatively homogenous, high-income, Western¹ settings (Canino et al., 2010; Crijnen, Achenbach, & Verhulst, 1997; Kessler et al., 2007). In contrast, only a few measurement tools for behavior problems have been developed in low-income, non-Western country contexts (Betancourt et al., 2009; Ng, Kanyanganzi, Munyanah, Mushashi, & Betancourt, 2014).

There is also a dearth of intervention studies on child behavior problems in LMIC settings (Furlong et al., 2012; Klasen & Crombag, 2013; Woolfenden, Williams, & Peat, 2001). The vast majority (>94-96%) of intervention studies for child mental health have taken place in high-income, Western countries (V. Patel, Flisher, Nikapota, & Malhotra, 2007; V. Patel & Sumathipala, 2001; Saxena, Paraje, Sharan, Karam, & Sadana, 2006). There are concerns that treatment models may lack acceptability and/or effectiveness when stakeholders' concerns differ from those targeted by interventions and when intervention methods do not address parents' causal models (Foster & Mash, 1999; Wolf, 1978). These concerns are especially relevant for parenting interventions for child behavior problems since beliefs about appropriate and effective childrearing strategies are often strongly held and vary widely between settings (Forehand & Kotchick, 1996; Lau, 2006).

The studies in this dissertation attempt to provide an in-depth examination of how concerns about children's behavior may differ based on expectations, societal norms, and parents' desires for their children's future. Specifically, we evaluate parents' shared ideas (i.e. "ethnotheories") about behavior problems and use this information to develop and validate an assessment tool that is responsive to local concerns.

¹ "Western" is a problematic term for many reasons, including its implication that that societies can be neatly divided into two homogenous and mutually exclusive categories (i.e. "East" and "West"). Instead, we use the term "Western" for simplicity to refer to North America, (Western) European, and other high-income, predominantly Anglo-influenced and Caucasian-populated countries (e.g. Australia.) While acknowledging the complexities of intracultural variation and dynamic cross-national, cross-regional influences, we also assert that these countries have exerted undue influence on current concepts and agendas in the biomedical and public health spheres, including mental health (e.g. as evidenced by publication disparities noted later in this Introduction.)

Overview of Disruptive Behavior Problems

Definitions. In this dissertation the terms “child behavior problems” and “disruptive behavior problems” are used in a broad sense to refer to observable patterns of child behavior that contravene expectations of “acceptable” child behavior and cause concern, distress, or disruption to others. This broad definition is used to suit the exploratory purposes of the studies presented. We attempt to set aside the assumptions of commonly used clinical and research definitions that have particular historical origins in North American and Western European psychiatry. While often portrayed by their authors and others as “objective” or “agnostic to etiology” (American Psychiatric Association, 2013; Craighead, Miklowitz, & Craighead, 2008), criteria such as those found in the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* carry implicit assumptions about normality (Kirmayer & Crafa, 2014) and the causes and meaning of mental phenomena. For example, the DSM has been critiqued as reflecting an implicit Western ethnopsychology that assumes a gender-, age-, and ethnic-specific “ideal” self (Gaines, 1992). In addition to its implicit cultural biases, there are also ongoing debates about the validity of disorders represented in the DSM and their utility as the basis for intervention (Insel, 2013; McHugh, 2005; Wakefield, 1992).

Therefore, in the studies in this dissertation, we have attempted to set aside, as much as possible, the culturally and historically determined disorder constructs of the DSM. Instead, we attempt to understand how child behavior problems are conceptualized from the points of view of local stakeholders in a low-income, non-Western setting. Thus, our aims are primarily inductive and exploratory rather than deductive and confirmatory. However, it is also important to note that our scope of inquiry, research questions, and analyses have been influenced by the prior experience, education, and beliefs of the author and others involved in the project.

Specifically, the literature cited herein and the research design and analyses were informed at various points by definitions of “Oppositional Defiant Disorder” and “Conduct Disorder” as specified in the DSM (American Psychiatric Association, 2013). In DSM-5 (American Psychiatric Association, 2013), Oppositional Defiant Disorder and Conduct Disorder are categorized under

“Disruptive, Impulse-Control, and Conduct Disorders”, which are identified as “problems in the self-control of emotions and behaviors” and are differentiated from other disorders as “manifested in behaviors that violate the rights of others (e.g., aggression, destruction of property) and/or that bring the individual into significant conflict with societal norms or authority figures.” We note that, while the DSM-5 description of Disruptive, Impulse-Control, and Conduct Disorders refers to “societal norms,” the disorder definitions included in that section fail to elaborate on this concept or how to apply it in research or clinical settings.

DSM-5 defines Oppositional Defiant Disorder as a “pattern of angry/irritable mood, argumentative/defiant behavior, or vindictiveness.” Conduct Disorder is defined in DSM-5 as a “repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated.” Similar to definitions of Oppositional Defiant Disorder and Conduct Disorder, our studies focused mostly on patterns of noncompliance with adult directives, aggression, disruptive behaviors, destroying or stealing property, and violating household or school rules and/or laws.

Epidemiology, Burden, and Consequences of Behavior Problems. Prevalence estimates of behavior problems often vary greatly depending on the subpopulation studied, the diagnostic tools used, and the method of assessment. The largest recent international meta-analysis of prevalence studies of Oppositional Defiant Disorder and Conduct Disorder was conducted in 2010 and identified 25 studies that met inclusion criteria (Canino et al., 2010). Nineteen of the 25 included studies were conducted in North America or Europe, and only two of the studies took place in low- or middle-income countries. This study estimated the worldwide prevalence of Conduct Disorder as 3.2% (SE 0.53) and Oppositional Defiant Disorder at 3.3% (SE 0.45). Prevalence estimates did not vary by continent of study, but Conduct Disorder estimates varied depending on diagnostic criteria used, and Oppositional Defiant Disorder varied by subject age.

Behavior problems are also associated with substantial disability and burden to individuals, their families, and society. The WHO Global Burden of Disease Study 2010 estimated that Conduct

Disorder was responsible for 113.3 Disability-Adjusted Life-Years (DALYs) per 100,000 males and 47.6 DALYs per 100,000 females worldwide (Whiteford et al., 2015). This estimate placed Conduct Disorder as the seventh largest contributor to DALYs among mental disorders—higher than autism and idiopathic intellectual disability (Whiteford et al., 2015). The sizeable burden of behavior problems over the lifespan is suggested by their early age of onset (Kessler et al., 2005), stability over time (with stability of aggression levels rivaling the stability of IQ) (Olweus, 1979; Stattin & Magnusson, 1991), and increased risk of onset of other psychiatric disorders throughout childhood, adolescence, and adulthood (Burke, Hipwell, & Loeber, 2010; Burke, Loeber, Lahey, & Rathouz, 2005; Loeber et al., 2000). Children with behavior problems are at higher risk of developing conduct disorder (Cohen & Flory, 1998), depression (Burke et al., 2010), and substance abuse (Boyle & Offord, 1991).

Child behavior problems (including aggression) are also associated with low school achievement (Olweus, 1983), school dropout (Tramontina et al., 2001), and suicide (Nock et al., 2008). Long-term follow-up studies have demonstrated that childhood behavior problems (including aggression) are associated with later lower educational achievement (Huesmann, Eron, & Yarmel, 1987), increased delinquency (Tremblay et al., 1992), and increased risk of later serious, violent, and chronic criminal offending (Loeber & Farrington, 2000).

Behavior problems in low- and middle-income countries. While there has been a great deal of research on the epidemiology, risk processes, consequences, and effective treatments for behavior problems in high-income countries, there has been relatively little research on child mental disorders in general in LMIC (V. Patel et al., 2007; V. Patel & Sumathipala, 2001; Saxena et al., 2006), where 90% of the world’s children reside. Children in LMIC face greater risk for poor developmental, educational, social, and mental health outcomes due to prevalent conditions of poverty, violence, and limited resources for education. Estimates (modeled from stunting and poverty data) suggest that, in LMIC, “over 200 million children under 5 are not fulfilling their

developmental potential” due to the combined effects of poverty and malnutrition (Grantham-McGregor et al., 2007).

Only a small number of empirical studies have evaluated outcomes associated with behavior problems in LMIC, and all of the studies we identified were limited by their cross-sectional study designs. For example, a case-control study in Brazil identified much higher rates of conduct disorder in children who dropped out from school (31.8%) compared with randomly selected sex-matched control children from the same classroom (2.3%) (Tramontina et al., 2001). More research is needed to understand the epidemiology and consequences of behavior problems in LMIC, where distinct developmental milieu, treatment resources (including at school), legal practices, and employment opportunities may create differential risk and resilience processes and affect the availability and capacity of safety nets. In summary, due to high worldwide prevalence and association with wide-ranging negative academic and social outcomes, behavioral problems are an important, but frequently overlooked problem in LMIC.

Conceptual Frameworks

Like most emotional and behavioral disorders, behavior problems do not appear to share a singular “cause”. Unlike infectious diseases, behavior problems do not emerge as the result of a central pathological entity that can be effectively targeted by treatments across settings. Instead, behavior problems may be seen as the result of individual-level biological predispositions shaped and re-shaped over time through social interactions. These social interactions are themselves influenced by higher-order systems of meaning, resource distribution, and social organization (Bronfenbrenner, 1979, 2005; Worthman, 2010a). Thus, the clinical and epidemiologic patterns that result—as well as the significance of “symptoms”—are likely to vary widely between settings.

Our studies draw on Weisz’ conceptual model that problematic behavior requires both: i) an action by a child (i.e. either by commission or omission), and, ii) an interpretation by an authority (i.e. someone with “power”, usually an adult) that the action is “problematic” (Weisz, McCarty, Eastman,

Chaiyasit, & Suwanlert, 1997). The first component of Weisz' definition of behavior problems is the observable behavior of children. This is often the only component of child behavior problems mentioned in the most commonly used definitions in research and clinical practice (American Psychiatric Association, 2013; World Health Organization, 2010).

While some behavior problems are easily observable (e.g. hitting, kicking, biting), other behaviors referred to in disorder definitions and clinical rating scales require more nuanced interpretations by the observer or evaluator. For example, “deliberately annoys others”—a symptom of Oppositional Defiant Disorder in DSM-5 (American Psychiatric Association, 2013)—requires the evaluator to infer the intent of the child in the course of their actions. Similarly, “actively defies” and “argues” are subjective interpretations of communication events and styles.

Weisz' definition of behavior problems (Weisz et al., 1997) recognizes that behaviors carry symbolic meanings that are embedded within broader social realities. Even within a particular geographic (or “cultural”) setting, the same behavior is likely to be interpreted differently depending on the identity characteristics of the child (e.g., age, gender, class), the identify features of the authority (e.g., age, gender, class, role), and the dyad's own individual and interpersonal histories, among other factors. Moreover, behaviors are interpreted within the micro-context in which the behavior is performed, witnessed, or discovered (e.g., in a quiet classroom vs. on a sports field, daytime vs. nighttime, hidden vs. open, etc.) (Goffman, 1959; Worthman, 2010a). Concepts of how children should and should not act, and how adults (i.e. parents, teachers, and others) should respond to both desirable and undesirable child behaviors may be shared among groups of people. Such shared concepts are often referred to as “ethnotheories” or “parental ethnotheories” and have been applied extensively in anthropological studies of normative child development (Harkness & Super, 1992).

Some child behaviors may be empirically associated with negative outcomes across several populations. However, such conclusions are still often based on epidemiologic studies whose populations are far from “representative” of the diverse population of the world's children (Henrich,

Heine, & Norenzayan, 2010). Conclusions about outcomes should also be qualified by noting that who defines outcomes as “positive” or “negative” may be considered a function of power and privilege (Bourdieu & Thompson, 1991), and the valence of such judgments is also heavily context-dependent. For example, interpersonal aggression may be viewed within some contexts (e.g., by soldiers during war, among youth in violent neighborhoods, among incarcerated males) as acceptable or even desirable, depending on one’s role, social position, and political or other social affiliations.

An Integrative Framework. The multi-level transactional processes that define meaning and shape behaviors can usefully be considered through a social-ecological framework, as proposed by Bronfenbrenner (Bronfenbrenner, 1979, 2005). Bronfenbrenner’s model proposes that an individual’s context—operationalized as interactive concentric “levels” of social organization—affect her/his health and development over time by patterning risk and protective factors, access to resources, and deprivation, among other factors. In the case of child behavior problems, there is evidence of variability in the onset and prevalence of clinical problems related to macro-level (e.g., during national economic downturns (Conger & Elder Jr, 1994)), mezzo-level (e.g., neighborhood socioeconomic deprivation and violence (Loeber et al., 2000)), and micro-level (e.g., exposure to domestic violence, experience of physical abuse, and maternal depression (Loeber et al., 2000)) factors.

Super and Harkness (1986) and Worthman (2010a) have elaborated multi-level transactional models to understand how higher-order factors influence child development. Both models focus attention on proximal influences (i.e. “zone of proximal development”) on children’s development of socially acceptable attitudes and behaviors. Super and Harkness’ “developmental niche” model identifies three key subsystems affecting child development: 1) physical and social settings, 2) childcare customs and practices, and 3) parental psychology (or parental “ethnotheories”) (Super & Harkness, 1986). Their model helps to resolve distinctions between observable (or “objectivist”) and interpretive (or “constructionist”) realities in understanding child behavior problems. That is, their model provides a framework for viewing child behavior patterns as being influenced over time

through interactions within an ecological context and also acknowledges the importance of systems of meaning in defining expectations and parental responses over time.

Worthman (Worthman, 2010a) has more recently advanced a “bioecocultural microniche” model of child development that furthers Super and Harkness’ model by highlighting the important roles of endogenous child factors (portrayed dynamically over time) and their interactions with the developmental niche to produce developmental outcomes over the life course. This model provides a promising framework to situate the biologically oriented findings of psychiatry and neuroscience within the influential mediating cultural-ecological environments in which children live and develop. Despite the promise of Worthman’s model, the studies in this dissertation draw most heavily on Super and Harkness’ developmental niche model as a framework within which to begin exploring the influence of the ecocultural context on concepts of and responses to behavior problems. Future studies might then situate the development of endogenous child factors within a richer understanding of the developmental niche in which behavior problems occur.

Measurement Issues in Behavior Problems

One of the important reasons to be concerned about the context-dependence of definitions of child behavior problems (outlined above) is the implications definitions have on identification, measurement, and outcome assessment in practice and policy-making in diverse contexts. The “Grand Challenges in Global Mental Health” priority-setting report (Collins et al., 2011) identified one of the top priorities for advancing global mental health as: “developing valid and reliable definitions, models, and measurement tools for quantitative assessment at the individual and population level for use across cultures and settings.” While the validity of psychiatric disorder definitions remains a contentious topic in the field of psychiatry (Insel, 2013; McHugh, 2005; Wakefield, 1992), standardized definitions are useful in advancing systematic research on etiology and treatment. Accurate measurements are needed in global child mental health in order to provide helpful estimates of disorder burden for appropriate resource allocation, to identify individuals who

would benefit from targeted prevention or treatment interventions, and to estimate the effectiveness of interventions at the individual and population level (B. A. Kohrt et al., 2011).

A key validity-related challenge in measurement of mental disorders across cultural settings is characterized by Kleinman's (A. Kleinman, 1987; A. M. Kleinman, 1977) concept of "category fallacy." A category fallacy refers to the application of a diagnosis in a new setting, despite lack of coherence (i.e. understandability), salience, and/or association with impairment in the target setting (A. Kleinman, 1987). In the case of behavior problems, a category fallacy may occur when definitions and criteria developed in one setting exhibit distinct (or limited or diffuse) meaning in the target setting. Applying "imported" behavior problem diagnoses to children whose behavior is not cause for concern among parents runs the risks of unnecessarily labeling children, poor engagement in proposed treatment interventions, and ineffective allocation of limited resources.

A common practice in global mental health is translating or adapting previously validated instruments for use in new settings (B. A. Kohrt et al., 2011). However, several technical issues commonly arise in transcultural translation of existing instruments that create barriers to accuracy and validity. Flaherty et al (1988) described five forms of equivalence that are important, but often overlooked, when translating instruments: 1) *content equivalence* (i.e. items relevant to phenomena of interest); 2) *semantic equivalence* (i.e. same meaning of symptoms); 3) *technical equivalence* (i.e. assessment method (e.g., scaling) yields similar data (i.e. magnitude has similar meaning)); 4) *criterion equivalence* (i.e. similar interpretation relative to culturally normative behavior); and 5) *conceptual equivalence* (i.e. same theoretical construct measured in each culture).

Systematic frameworks for transcultural translation have rarely been addressed when translating child mental health instruments (B. A. Kohrt et al., 2011), and we have not found any instances of their rigorous application to instruments measuring child behavior problems in low-income, non-Western populations. We identified two studies that developed "ground-up" measures of behavior problems, both in Sub-Saharan Africa (Betancourt et al., 2009; Ng et al., 2014). The more extensive process used by Ng et al (2014) identified symptoms (i.e. "being independent,"

“roaming around/wandering,” “being undisciplined/impolite,” “doesn’t bathe”) that were considered part of a local behavior problem idiom in Rwanda but have not, to the best of our knowledge, been included in scales developed in Western settings. We have not encountered any thorough transcultural translations of existing instruments or locally developed instruments to measure behavior problems in South Asian settings. These findings underscore the need for scale development procedures for behavior problems that include local participation in generating and selecting relevant items.

Summary

In summary, current psychiatric nosology and research often proceeds with “universal” assumptions about the definitions and causes of child behavior problems. In contrast, models and emerging empirical data from social sciences (especially cultural psychology and anthropology) point to the influence of multiple, interactive layers of social organization in shaping innate child characteristics/predispositions over time (Worthman, 2010a). Moreover, shared parental beliefs and socialization goals for children vary across settings (and between individuals) and are likely to influence parents’ interpretations of and responses to observable behaviors (Harkness & Super, 1992). Together, these observations point to the need to consider children’s social settings and parents’ customs and beliefs when constructing definitions, designing measurement instruments, and developing interventions for child behavior problems. Attention to context is especially important when measurements or interventions are applied in settings that differ substantially from the ones in which they were created.

Overview of Dissertation Studies

The studies in this dissertation represent an initial step toward understanding the influences of settings, caregiver practices, and caregiver beliefs on definitions of and responses to child behavior problems. Chapter 1 provides an in-depth evaluation of contextual influences on behavior problems

through a multi-method qualitative evaluation in rural Nepal, focusing primarily on parental ethnotheories of child behavior problems. Chapter 2 utilizes parents' and teachers' ratings about the importance and relevance of a set of behavior problems as a key step in selecting items for a locally tailored measurement instrument. It also outlines a replicable method for incorporating local participation in the scale development process that could be applied in other settings. Chapter 3 evaluates the construct validity and psychometric properties of the scale developed in Chapter 2.

A common theme throughout the studies is a focus on parents' ideas (or ethnotheories) about child behavior. We selected a focus on parents' ideas given their relevance to problem definitions and to the acceptability and perceived relevance of interventions. While parental ethnotheories are not deterministic of parents' attitudes or actions, they appear to “function as goals as well as interpretations of reality for parents” (Harkness & Super, 1992, p. 374). Therefore, ethnotheories represent critical filters that parents use when considering the extent to which their child's behavior is concerning and the relevance of intervention targets and methods to their concerns.

Why Nepal? As we note in the included studies, Nepal is a suitable setting for studying the influence of context on behavior problems. While there is no existing evidence we are aware of suggesting that child behavior problems are more prevalent in Nepal than in other places, the setting features key ecocultural traits of interest to our research topic. That is, Nepal differs in income level, regional political historical influences, governance, religious practice, recent history of conflict, and linguistic influence (among other factors) from the settings in which dominant definitions and interventions have developed (i.e. predominantly North America and Western Europe.) Nepal is not unique in these differences. Rather, its similarities to a number of other low-income, non-Western settings along these dimensions make Nepal a rich and somewhat representative setting in which to study ecocultural influences on child behavior problems.

Chapter 1: Child Behavior Problems in Rural Nepal: An Analysis of the Developmental Niche

The first study in this dissertation (“Chapter 1”) evaluates how definitions of and responses to child behavior problems are situated within particular physical and social settings, caregiver customs, and parental ethnotheories. Chapter 1 aims to explore implications of ignoring or attending to the symbolic meaning and social-ecological context in which problematic child behaviors occur. Specifically, the study evaluates the following questions:

1. How do definitions of behavior problems and their perceived consequences relate to settings and shared caregiver beliefs about the nature and needs of children?
2. How do physical and social settings and caregiver customs affect the expression of identified behavior problems?
3. What are (shared) parental ethnotheories about effective ways to mitigate behavior problems?

While this study was exploratory in nature and hypothesis-generating (rather than hypothesis-testing), we anticipated that a survey of the developmental niche would help illuminate pathways through which ecocultural contextual factors influence definitions of and responses to behavior problems. We anticipated that behaviors would be considered problematic by parents when they interfered with daily role expectations of children and that teachers’ concerns would be more closely related to disruptions in the classroom setting. We also anticipated that parents would be concerned about potential consequences of child behavior problems that would have some overlap with and some distinction from familiar parental concerns in Western societies. We anticipated that parents’ mitigation strategies would be related to broader belief systems about causation, behavior change, and parent-child relationships in Nepal.

This study is important in that it challenges prevailing views in psychiatry that child mental disorders can be understood apart from the ecocultural context of child development. By evaluating

the relationship between behavior problems and the context in which stakeholders define them, the first study challenges the claim that child behavioral disorder definitions are universally applicable.

We set about addressing the stated research questions using a combination of qualitative research methods. Specifically, we used in-depth interviews with key informants knowledgeable about child behavior and development to gather information about the daily schedules and role expectations of children; parents' goals for their child's development; and concepts about identification, consequences, and effective mitigation strategies for behavior problems. We used information from the interviews to develop contextualized vignettes of children with behavior problems. We then asked focus groups of parents, teachers, and children about the likely causes and consequences of, and effective mitigation strategies to address, the child's problems in the vignettes. We conducted pile-sorting interviews (with behavior problems identified during in-depth interviews) to evaluate concepts about grouping and differentiation of behavior problems. We also recorded field notes of observations of children's behavior in household, school, and public settings. We analyzed translated transcripts of the interviews and focus groups and field notes using pre-determined and emergent codes and evaluated for relationships between themes. We used memos and matrices throughout coding and attempted to triangulate findings between data collected from different sources (i.e. individuals and collection methods).

Chapter 2: Development Process of an Assessment Tool for Disruptive Behavior Problems in Cross-Cultural Settings: the Disruptive Behavior International Scale—Nepal Version (DBIS-N)

The overall goal of Chapter 2 was to identify and prioritize child behavior problems to create a measurement instrument that accounts for local concerns about child behavior. Previous efforts to develop culturally relevant scales in global mental health have often relied exclusively on free-listing methods to generate and select items. However, these methods are often limited by a failure to

obtain a large initial pool of items. Moreover, frequency of appearance in free-listing is a poorly suited tool to evaluate the importance of symptoms.

To address the limitations of free-listing and develop a locally tailored scale, we adapted a commonly used scale development framework (DeVellis, 2011) to incorporate local participation at two key phases: item generation and assessing item relevance and importance. First, we generated an initial pool of items based on free-list interviews in Nepal and a review of existing validated scales measuring child behavior problems. Next, local stakeholders (parents, teachers, and peers) helped to select items by rating each item on dimensions of importance and relevance to their concerns. We dropped additional items based on poor item-test correlation, low frequency, and poor acceptability (by parents) in a development sample of children. We hypothesized that parents' and teachers' importance ratings would be correlated with item difficulty parameters (estimated using a Rasch model) in a separate sample of children in the same community.

(The construct validity and psychometric properties of the resulting scale were evaluated in Chapter 3, below).

Chapter 3: Validity and Psychometric Properties of the Disruptive Behavior International Scale—Nepal Version: A Scale Developed Using Local Stakeholder Participation

The main objective of Chapter 3 was to evaluate the psychometric properties and construct validity of the scale (which we called the “Disruptive Behavior International Scale—Nepal version (DBIS-N)”) developed in Chapter 2. A key conceptual objective of Chapter 3 was to compare multiple methods of evaluation for behavior problems, including: locally and externally derived scales, local nomination, local vignettes, and external clinical interviews. Of particular interest were correlations between methods of assessment, correlations with functional impairment, and associations with being identified as “*badmaash*” (a local term for bad behavior.)

We hypothesized that the DBIS-N would be: 1) associated with parents' and teachers' nominations of children as *badmaash*; 2) associated with diagnoses of Oppositional Defiant Disorder

and Conduct Disorder from clinical interviews; 3) strongly correlated with a previously validated behavior problem scale developed outside of Nepal; 4) strongly correlated with functional impairment; 5) inversely correlated with pro-social items from the DBIS-N; and 6) weakly correlated with number of developmental delays. We also hypothesized that there would be stronger associations (or correlations) between similar measures (e.g., among symptom scales) compared with distinct measurement approaches (e.g., clinical interviews). Finally, we hypothesized that the DBIS-N would be more strongly associated (or correlated) with locally derived nominations (e.g. *badmaash*) and vignette-based identification tools than would the externally derived symptom scale (the Eyberg Child Behavior Inventory (Eyberg & Ross, 1978)).

This study addresses important measurement-related issues in cross-cultural psychiatry. Our study provides a direct quantitative comparison of the extent to which “imported” vs. locally developed measurement tools evaluate constructs similar to existing local concepts and associated with functional impairment. Therefore, this study provides a way to evaluate whether using an imported tool to measure behavior problems creates a “category fallacy” or identifies a locally recognized and coherent problem (A. Kleinman, 2008).

To address these questions, we assessed a population-based sample of children (ages 5-15) in Nepal using the DBIS-N. We also assessed the same children using a standard structured clinical interview for Oppositional Defiant Disorder and Conduct Disorder, the Eyberg Child Behavior Inventory (ECBI), and a locally developed functional impairment scale. Finally, we asked parents and teachers whether particular children were considered *badmaash*. We then evaluated the internal consistency, factor structure, test-retest reliability, and inter-rater reliability of the DBIS-N; the correlation between the DBIS-N and other assessment methods and functional impairment; and criterion validity using multiple criteria.

Chapter 1. Child Behavior Problems in Rural Nepal: An Analysis of the Developmental Niche

ABSTRACT

Background/Objective: Dominant causal paradigms for studying child psychopathology, and their associated interventions, emphasize context-independent child-level (“endogenous,” usually “biological”) and operant learning factors. This study evaluates how concepts of child behavior problems are situated within ecocultural contexts and how these concepts can be used to develop culturally responsive interventions.

Method: We used a combination of qualitative methods, including in-depth interviews, vignette-based focus group discussions, pile-sort interviews, and direct observations to evaluate the influence of physical and social settings, childcare customs and practices, and parental ethnotheories (i.e. subsystems of the “developmental niche”) on the development of and responses to child behavior problems. Participants included parents (n= 18), teachers (n=14), and child peers (n= 9) in a rural Nepali community. We integrated the findings from multiple interview modalities using a content analysis approach with coding based on pre-determined research questions and emergent themes identified during the study.

Results: Child behavior problems were defined in light of role expectations and socialization goals and were often associated with particular places and groups of people. Parents had a distinct theory about the nature and consequences of behavior problems. In it, a specific set of behaviors suggested that a child was on a “path” perceived to lead to failure (e.g., in academic, financial and social domains) and loss of prestige to the family. Another set of beliefs and customs, shared among parents and teachers, prioritized verbal reminding (Nepali *samjhaune*) over physical punishment to

mitigate behavior problems. Theories, behavioral expectations, and parent responses varied consistently by child gender, age, and family income, and could be specific to places and situations (e.g., unsupervised time after school, especially during harvest season).

Conclusions: Our results demonstrate the relevance of ecocultural contextual influences on the definitions, development of, and responses to child behavior problems. The developmental niche may be a useful framework for identifying contextually relevant intervention targets and acceptable or existing strategies for interventions. Our study was limited by relying mostly on interview data; future efforts to characterize physical and social settings and childcare customs and practices would benefit from systematic direct observations of children's behavior at home, at school, and in the community.

INTRODUCTION

Background

Perhaps more than for other child mental disorders, definitions of and responses to behavior problems are highly dependent on the context in which they occur. All child behavior takes place within a particular physical and social setting, and elicits responses from caregivers that are shaped by their customs and beliefs (Super & Harkness, 1986). More broadly, social scientists recognize child development as a transactional process situated within social, ecological, and cultural contexts (referred to here as “ecocultural contexts”) (Bronfenbrenner, 1979, 2005; Harkness & Super, 1996; Super & Harkness, 1986; Worthman, 2010a, 2010b). Yet, contemporary scholarship in the field of psychiatry often proceeds with the implicit assumption that psychopathologies in children can be identified, understood, and effectively treated with minimal consideration of the child’s contexts. As a result, psychiatric definitions and treatments often lack coherence (i.e. understandability) or relevance to local concerns and are met with limited engagement when applied in novel ecocultural contexts (A. Kleinman, 2008; A. M. Kleinman, 1977; Lau, 2006).

Weisz et al (Weisz et al., 1997) posit that:

“Child psychopathology is inevitably the study of two phenomena: the behavior of children, and the lens through which adults view child behavior—that is, the attitudes and beliefs that lead adults to regard some forms of child behavior as disturbed or ‘pathological’.” (pg. 569)

Similarly, Kirmayer and Swartz have argued that the *types* of symptoms or behaviors that are problematic in one cultural setting may have different meaning or significance in other settings (Kirmayer & Swartz, 2013). They note that culturally rooted symbolic meanings affect the course and outcome of emotional and behavioral problems by shaping interpersonal responses to affected individuals, including family coping processes and patient-provider interactions (Kirmayer & Swartz, 2013).

Cultural anthropologists have described cultural contexts of parenting and child

development (LeVine & New, 2008; Worthman, 2010a, 2010b), though little anthropological scholarship has focused specifically on the topic of child behavior problems. In contrast, most clinically focused studies of child behavior problems in non-Western settings have not considered the symbolic meaning or local relevance of symptoms. Instead, they have focused primarily on quantifying the frequency or severity of pre-specified sets of behavior problems (c.f. (Canino et al., 2010; Crijnen et al., 1997; Kessler et al., 2007)). These studies primarily draw on causal frameworks related to endogenous child factors or operant conditioning that are supposedly universally related to psychopathology.

Relatively little attention has focused on the ecocultural context of parenting and child development, in which behaviors may be variously defined by local stakeholders as “normal” or problematic. This is an important area for research because most widely used definitions (American Psychiatric Association, 2013; World Health Organization, 2010), clinical assessment tools (Achenbach, Vermont, & Edelbrock, 1983; Goodman, 1997), and clinical interventions (Furlong et al., 2012; Woolfenden et al., 2001) have been developed in Western settings. Systematic reviews indicate that 94-96% of published studies in psychology and psychiatry have taken place in high-income, Western countries (Arnett, 2008; V. Patel & Sumathipala, 2001).

The Developmental Niche as a Framework for Studying Culture and Behavior Problems

In contrast to psychopathological models that view endogenous child-level biological factors as deterministic and “universal”, ecologically-focused developmental psychologists and anthropologists suggest the “child-in-context” as a more appropriate object of study (Super & Harkness, 1986). Ecological theorists posit that biological predispositions are continuously shaped throughout development by macro-social factors acting via their impacts on the proximal conditions of child development (Whiting, 1977; Worthman, 2010a). Similarly, ecological models of child development situate parent’s expectations and childcare practices within a rich theoretical framework

that relates higher-level cultural factors with child-rearing practices (Super & Harkness, 1986; Worthman, 2010a, 2010b).

In this study, we draw upon Super and Harkness' (Harkness & Super, 1996; Super & Harkness, 1986, 2002) concept of the "developmental niche" as a useful framework to study how "culture" structures the environment for child development. Super and Harkness proposed the developmental niche as the composite of three subsystems: 1) the physical and social settings in which the child lives, 2) childcare customs and practices, and 3) parents' psychology (i.e. related to parental ethnotheories). Together, these three subsystems interact to influence child development over time. In Super and Harkness' model, "physical and social settings" refer to characteristics of the physical places where children spend time, the people they spend time with, and the social roles (e.g., work vs. play) children fill throughout the day. "Childcare customs and practices" refer to sequences of behavior that are commonly used and accepted when interacting with children in given situations or stages of development. "Parents' psychology" refers to the beliefs that commonly accompany childcare customs and include "beliefs concerning the nature and needs of children, parental and community goals for childrearing, and caretaker beliefs about effective rearing techniques" (i.e. "ethnotheories") (Super & Harkness, 1986, p. 556). Together, these three "subsystems" mediate the child's experience within her/his culture throughout development and result in the child learning the rules of the culture.

Aims of this Study

Our aim in this study was to provide a description of the "developmental niche" in a community in rural Nepal, specifically focusing on the influences of physical and social settings, caregiver practices, and parental ethnotheories on definitions, development of, and responses to child behavior problems. Parents and teachers shape the everyday environments of children at home and in classrooms throughout the school years, and understanding their perceptions and ideas is critical to developing acceptable and relevant interventions. Therefore, while we provide a description of all

three subsystems of the developmental niche, we concentrated on understanding parents' and teachers' goals for children, expectations of child behavior, and concepts of behavior problems, including mitigation strategies.

Study Setting: Nepal

Nepal differs along socioeconomic, political, and key cultural dimensions (e.g., language, religion) from the contexts in which clinical constructs of child mental disorders have primarily been studied (i.e., the U.S. and Western Europe). By conducting this study in Nepal, we offer a novel perspective on the potential variability in stakeholders' concepts of behavior problems. In addition, Nepal is a suitable place to study child behavior problems and context, as it has been the site of prior research in fields related to culture and child development, including: parents' goals for socialization of affective displays (Cole, Bruschi, & Tamang, 2002; Cole & Tamang, 1998; Cole, Tamang, & Shrestha, 2006) and socioeconomic determinants of child neurodevelopmental outcomes (S. A. Patel et al., 2013). Therefore, our study builds on existing scholarship to develop a more detailed view of child behavioral development in context, while adding a focus on behavior problems and mitigation strategies.

METHODS

Research Setting and Study Site

Nepal, a low-income country in South Asia, continues to emerge from a decade-long civil war and rapid political turnover (Nepal, 2009). While Nepal's economy has continued to grow, and extreme poverty has been substantially reduced in recent years, health and civil services—including mental health and criminal justice—remain sparse outside the capital city of Kathmandu (Nepal, 2009). Child mental health services are especially limited; there is only one trained child psychiatrist in the country (World Health Organization, 2011), and school systems have few resources to support children with learning or behavioral difficulties (UNESCO, 2011).

The current study took place in the Chitwan District of the south-central lowlands (*Terai*) region of Nepal. Prior to the 1950's, Chitwan District was a sparsely populated forested region with high rates of malaria and limited arable land (Shrestha, Velu, & Conway, 1993). In 1954, the Nepali federal government, with assistance from the United States Agency for International Development, initiated the Rapti Valley Land Development Project, a program of deforestation with the stated goals of eradicating malaria and developing land for cultivation and settlement (Shrestha et al., 1993). Chitwan subsequently underwent a period of rapid population growth, largely from internal migration of people from Nepal's hill region who came to Chitwan to seek jobs and land (Shrestha et al., 1993; Yabiku, 2005). The relatively rapid development and migration in the area stands in contrast to many other regions of rural Nepal that are characterized by more extensive family networks.

Chitwan is currently a hub for transportation and education within Nepal and a point of transit with India. School attendance rates in Chitwan have increased substantially in recent decades, though adult literacy rates remain less than 75% (Central Bureau of Statistics, 2011).

Meghauli, one of 40 Village Development Committees (VDCs, the smallest administrative unit in Nepal) in Chitwan District, was selected as the site for this study because it is the setting for a recent primary care/mental health integrated care delivery project (Lund et al., 2012). Most adults in

Meghauli are involved in work in the agricultural sector, engaging in manual labor to cultivate rice and other grains.

Sampling and Participants

The sampling for this study was purposive. Participants were selected based on the goals of identifying participants who: (1) were familiar with childhood and childrearing in the community, and (2) represented a wide range of roles and perspectives with respect to child behavior. Specifically, we sought to include individuals of both sexes, from traditional “high” and “low” caste, and with varying educational and socioeconomic backgrounds. Local liaisons (female community health volunteers working in the formal public healthcare delivery system) assisted the research team in identifying and recruiting participants (including parents, teachers, community leaders, and children) who met the sampling goals. The liaisons were compensated for their time. In addition, interview participants were asked to identify other community members who were knowledgeable about childhood and childrearing, and these persons were approached for participation. Children (ages 7-15) were included as participants in focus group discussions and were also selected on the basis of including a variety of demographic groups.

Data Collection

Data were collected between February and October 2014 using a combination of qualitative research methods. The primary data collection method was in-depth interviews using semi-structured interview guides. This data was supplemented by structured interviews, focus group discussions, field observations, and a focused archival review. Interviews and focus groups were conducted by a Nepali researcher who received initial training and ongoing supervision (via weekly calls or in-person meetings) from a Nepali mental health research supervisor (RA) and a child psychiatrist/public health researcher from the United States (MB). All interviews were audio recorded and transcribed and translated into English by a bilingual researcher. All field notes were handwritten during or

immediately after each interview or field observation session.

In-depth Interviews. We conducted 24 in-depth interviews with parents (N=10; 50% female), teachers (N=6; 50% female), and other community leaders (N=8; 38% female). Many of the participants recruited for their roles as teachers and community leaders were also parents of children in the study age range. In-depth interviews were conducted using a semi-structured interview guide. Interview questions focused on eliciting information about physical and social settings of child development (i.e. daily routines of children, people children spend time with, and social roles children fill throughout the day); childcare customs and practices (i.e. who is responsible for what childcare roles, what are common caregiver responses to child misbehavior); and ethnotheories (i.e. the “nature and needs” of children, parental/community goals for childrearing, and concepts about effective rearing techniques) (Super & Harkness, 1986, p. 556). The interview guide also specifically assessed key beliefs related to child behavior problems, including: causes, associated symptoms, expected course, and effective mitigation strategies.

The interviews took place in private locations—in the participants’ homes or at another convenient location—and typically lasted 30-90 minutes. The initial interviews were audio recorded unless the participant declined recording (n=1), in which case the interviewer took hand-written notes of the interview content. We returned to several of the more informative participants on multiple occasions to ask focused follow-up questions as needed over the course of 9 months and took focused hand-written notes during these meetings. The most informative participant was contacted at least monthly during the study period.

Vignette-based focus group discussions (FGDs). We conducted four vignette-based FGDs with a total of 17 participants. FGDs were conducted by a Nepali researcher (LG). FGDs were held separately with teachers (N=8; 50% female) and children (N=9; 44% female), and the groups were divided by sex of the participants. Discussions began with a brief vignette describing an 11-year-old child exhibiting a variety of behavior-related problems (e.g., arguing, fighting, non-compliance with teachers’ directives) and asked participants to comment on which parts of his

behavior were most concerning to them, potential causes, plausible course and long-term outcomes, and helpful treatments. A follow-up vignette then described improvements in the boy's behavior over time, and participants were asked to speculate on contributing factors to his improvement.

Pile-sorting interviews. Pile-sorting interviews (n=8) were conducted with adult participants (100% female, all mothers of study-age children) using cards with ten behavior problems taken from in-depth interviews and free-listing exercises (taken from a previous study conducted in the same community (Adhikari et al., 2015)). In pile-sorting interviews, participants were first asked to sort the cards into 2-3 piles in any way that made sense to them. Then participants were asked to sort the cards from most to least severe. After each sorting exercise, participants were asked to explain the reasons they sorted the cards as they did. Their answers were recorded using audio recording (n=1) and hand-written notes (n=8).

Field notes and observations. In addition to interviews, the investigators (LG and MB) observed and made handwritten field notes of children's behavior during and immediately after in-home interviews, in public spaces (including community gathering places—e.g., large trees—and along roadsides), and during visits to three area primary and secondary schools (2 public, 1 private). Observations were conducted on four separate visits over a period lasting 9 months. Field notes were typed in English and coded (as below).

Supplementary archival review. We supplemented interview and observation data about the physical and social settings with reviews of maps, census data, and recent historical demographic data. The goal of the archival review was to gather accurate, larger-scale information about the physical geography of and demographic patterns in Meghauli and the surrounding area.

Research Team and Reflexivity

The study was primarily designed and results analyzed by the first author (MB), a Caucasian man from the United States trained as a child and adolescent psychiatrist and public health researcher. The interviews were conducted by the second author (LG), a Nepali female educated as a

nurse and undergoing graduate training in psychology, who also assisted with interpreting and analyzing the data, largely through discussions of interviews and observations in the field.

Interviewees could tell from the interviewer's name that she is from one of the traditional "high" castes, and could usually tell from her appearance (e.g., clothing style) and through direct questioning that she was from an urban area and younger than most of the adults she interviewed. As the most visible "face" of the study, her apparent identity features were likely to have influenced participants' responses through their judgments of what a young, urban, educated, high-caste woman would find acceptable (i.e. social desirability).

Through discussions during the initial stages of data analysis between the first and second authors, it became apparent that different aspects of the interviews seemed salient to each analyst. The first author was most interested in settings, concepts, and child-rearing practices that contrasted to those familiar from his upbringing, his own parenting experience, and his clinical practice in the United States (in both rural and urban inner-city areas.) The second author pointed out differences between what she heard and observed in the study community and her experiences growing up and practicing as a public health nurse in other rural and urban areas in Nepal.

Ethics and Funding

This study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board, Baltimore, Maryland and by the Nepal Health Research Council, Kathmandu, Nepal. All study participants provided oral consent. Compensation in the form of small household items (approximate value: US\$2-3) was provided to participants as determined by consultation with local researchers and the ethical review board in Nepal. Funding for this study was provided by the American Academy of Child and Adolescent Psychiatry and by the Johns Hopkins Center for Mental Health in Pediatric Primary Care. None of the funders played a role in the design, execution, analysis, or writing of this research.

Data Preparation

Audio recordings from interviews and focus group discussions were translated and transcribed into English. Key terms or phrases with ambiguous translations were retained in Nepali in the written transcripts. Transcriptions were spot-checked for quality by an anthropologist fluent in Nepali and English (BK). All transcripts and typed field notes from direct observations were entered into the NVivo software platform (QSR International, 2012), which supported qualitative data analysis.

Data Analysis

An initial codebook was developed using pre-determined codes based on the study objectives and research questions. We developed additional emergent codes by reading the initial transcripts. The emergent codes were developed to address themes connecting and modifying the original research objectives, and questions and were added to the codebook. The codebook (including code labels, definitions, inclusion/exclusion criteria, and examples) was reviewed and updated by members of study team (M.B., L.G., R.A., and B.K.) Codes were then applied to transcripts of the interviews, FGDs, and pile-sorting interviews and to field notes in NVivo using line-by-line coding.

Codes were then developed into themes related to the key study questions of: defining local behavioral problems, reasons for concern about specific behavior problems, models of susceptibility and protection, and mitigation strategies for behavior problems. Through tabulating results, writing memos during coding, and discussions among team members, the authors synthesized the themes into categories related to subsystems of the developmental niche, their interconnections, and cross-cutting themes. Extended quotations are included to illustrate the themes in the participants' own words.

Discussion of Rigor and Robustness

Consistent with emerging concepts of “rigor” in qualitative research, we sought to enhance the robustness of our evaluation through the lens of “goodness” (Denzin & Lincoln, 2000). The concept of goodness is described by Arminio and Hultgren (Arminio & Hultgren, 2002) as “language for judging qualitative research” and is demonstrated by a clear and logical presentation of the interrelationships between the components of the “meaning making process” (pg. 446). In this analysis, we attempted to clearly report the six elements of goodness highlighted by Arminio and Hultgren (2002) and their interconnections: foundation, approach, method, representation of voice, process (“art”) of meaning making, implication for professional practice.

We sought to enhance the *credibility* of our analysis through return visits, checking emerging concepts with key informants (principal, parents, female community health volunteers—all of whom were also interviewed), and peer debriefing with young mental health researchers raised near the study community and an anthropologist/psychiatrist with extensive experience in Nepal. We also made multiple visits to the community preceding, during, and after the formal research period in efforts to prolong our engagement with the study community and seek their input at multiple points in the evolution of our research.

Finally, we incorporated methodologic triangulation into our study design and analysis in order to enhance the *completeness* of our analysis. We used multiple qualitative methods (e.g., in-depth interviews, vignette-based FGDs, pile-sorting interviews, and direct observations) to assess the study questions and “enlarge the landscape of (our) inquiry” (Tobin & Begley, 2004, p. 393). Our goal in utilizing multiple methods of investigation was primarily to evaluate for multiple understandings of our study topic (i.e. completeness), including apparently contradictory viewpoints, exceptions, and nuances. A secondary goal was to corroborate data collected from one source by comparing it with data from other sources (i.e. verification).

RESULTS

Categories of Codes

The codes were organized into five categories representing behavior problems, mitigation of behavior problems, and the three subsystems of the developmental niche (i.e. physical and social settings, childcare customs and practices, and parental ethnotheories) (Super & Harkness, 1986). Statements about behavior problems and mitigation of behavior problems occurred in each of the three subsystems of the developmental niche (see Table 1.1 for sample quotes for each subsystem). In addition, gender differences emerged as a consistent theme found across the five predetermined categories and was included as a sixth category in our analysis. Analysis of the settings, practices, and beliefs related to defining and responding to behavior problems, and differences between genders, provided the framework for the results presented below.

Creating Opportunities, Fulfilling Expectations, and Reminding—The Theory

Our analysis identified key social processes through which components of the developmental niche influenced parents' and other stakeholders' definitions of and responses to child behavior problems. The physical and social settings where children spend their time create opportunities for (and barriers to) the development of behavior problems. Parents identify behaviors as desirable or problematic through the lenses of role expectations and short- and long-term goals for their children. Parents and other caregivers attempt to mitigate behavior problems by controlling their physical and social settings and using a shared strategy of “reminding” children of future goals and consequences. Caregivers (i.e. parents and teachers) approach mitigation differently depending on the gender of the child based on their concepts of the nature of, shared socialization goals for, and differential role expectations of boys vs. girls. These concepts are explained in detail below and illustrated graphically in Figure 1.1.

Physical and Social Settings

Overall, daily routines related to home, school, and community settings provided the settings and opportunities for a number of parents' basic concerns about children's behavior:

They are asked not to mischief (udanda) in the home, not to be involved in the activities that hamper the study, roaming round, not helping in family are taken as bad.

– Male teacher

Household setting and routines. According to daily schedule reviews and community observations, children in Meghauri spent the majority of their time in or near their household each day. The majority of children in Meghauri resided in households with members of their extended paternal family, including grandparents and often aunts, uncles, or cousins. Most adults in the area worked in the agricultural sector, largely consisting of manual labor cultivating rice and other grains. During planting and harvest seasons, field laborers were often required to work from early in the morning (before school starts) until late in the evening. In many cases, all the adults in a household would work in the fields, frequently leaving the children at home without adult supervision for several hours a day. Many fathers of school-age children in the families we encountered lived and worked outside of Nepal for extended periods, often for several years at a time. This pattern was reflected in the most recent census in Nepal (Central Bureau of Statistics, 2011), which found a 0.50 male-to-female sex ratio in Meghauri for the 25-29 year-old age range. Thus, children often lived in households composed of their siblings, mother, their paternal grandparents, and often other paternal relatives (i.e. mother's in-laws).

In their households on weekdays, children woke up at home, washed, ate breakfast, went to school, and returned home in the afternoon. Most parents reported that their children spent the late afternoon and evening near their home, assisting the family with household chores, doing homework, eating, or playing with friends who live nearby. In discussions about girls, household work duties

were especially prominent, as evident in this teacher's response about 14-15 year-old girls' daily routines:

The daughters (girls), now, after they wake up in the morning, now, let us say, they mostly focus in cleanliness. They wake up in the morning, go to toilet. Some of them also cook food and clean the house and yard, go to school and study. This is all. They go back home and clean the house. The daughters help the mother the most. They do their homework. This is all. And they sleep. – Female teacher

On weekends and during other school breaks, children often had fewer demands on their time and were allowed to spend more time playing with their friends. In the context of daily routines at home, parents' primary concerns about their children's behavior were related to not completing their expected household chores or self-care routines. Several parents and teachers attributed this neglect to children playing too much instead of fulfilling their obligations.

School. Children in Meghauli often began attending school at age 4 or 5, and school attendance rates were high in Meghauli, for both boys and girls. The student role was given a great deal of importance by most parents, who often viewed schooling as critical to future success. Most children attended public schools near their homes, though a large minority attended private schools in the area, occasionally at a greater distance from their home. Most schools were organized into same-age classrooms. Children's daily school-related routines included travelling to school, spending time in classes, a lunch break and brief breaks between classes, and returning home from school. Most children travelled to and from school by foot, often accompanied by their siblings and other peers. Several parents raised concerns about their children not coming home directly from school or "roaming" around the community after school. Other parents and teachers were concerned that students would often leave class or sneak away from school before the school day ended, occasionally when saying they were going to the bathroom or during breaks between classes.

Community settings. Children were often observed playing together in public places.

Younger children often played informally near their homes with siblings and neighbors, and appeared to favor groups of children of around the same age (e.g., within 2-4 years of their age). Older children, especially boys, were frequently seen playing sports—cricket, soccer, or volleyball—in grassy fields or on the school grounds after school. Some parents were concerned that their children “played too much” instead of studying or helping with household work. Others were concerned about older children “roaming” around the community without supervision or specific tasks to complete.

In addition to sites for “roaming,” public spaces were mentioned by some as settings that created opportunities for problematic behavior. One respondent described how a boy, unsupervised by his laboring parents, took money left as offerings at a tree in the center of the village:

Here is a boy who is kumal (caste) and the parents work as labor. He is very bethai (translation: child who ruins the work). Immediately after waking up they plan what kind of bad work they could do in the morning, he goes to the peepal tree (a large tree that serves as a place for community gathering) in the chowk (main intersection) and steals the money the devotees offer to the tree. – Female Community Health Volunteer

Other parents, especially those in close proximity, spoke of the nearby rivers, banana fields, orchards, temples, and dense community forest as unsupervised spaces associated with problematic behaviors. They reported that children would go to the river to fish instead of attending school. Other parents noted that children would use drugs (mostly cigarettes, alcohol, and marijuana) hidden behind buildings or inside banana fields or orchards.

They play. There is no work here. They either play football or in the rainy season they go to catch the fish in the ponds and river. The boys go to catch the fish in rainy season. Even the small children of age 8-9 years go to catch fish. Last year a child died by drowning in the river as he went to catch the fish. The river is near

here. Since then we yelled (at them) and now, they do not go to that river, if not then [long sigh]. The boys used to come here... They mix cannabis and other things in the cigarette and take (use) that. Even many of the small children who go to school of 7-8 years, they sit tolaera (drunk) in the orchard... He used to say that he is going to school but instead come here and hide, if not then go round there is a temple there and he used to stay there. – Female Community Health Volunteer

Childcare Customs and Practices

Respondents highlighted several shared customs and practices that parents, teachers, and other caregivers in Meghauli routinely employed with school-aged children. Several of these customs were explained in the context of attaining their childrearing goals (i.e. health, safety, and academic accomplishment) and navigating (adults’) social goals of maintaining the family’s social status (*iz̄z̄at*) and the community’s reputation. Most of the customs involved efforts to encourage appropriate social behavior and discourage behaviors seen as dangerous, endangering *iz̄z̄at*, or threatening the possibility of the child’s “bright future” (defined as academic and career accomplishment, and social acceptance).

Providing. Parents spent much of their time in efforts aimed at meeting their children’s basic needs for nutrition, shelter, and other material needs (e.g., supplies for school.) While taking care of these needs often entailed working long hours away from their children, “providing” was seen as parents’ paramount responsibility, especially among poorer families. However, parents expressed tension between the competing roles of providing for their family’s financial needs and tending to their children’s other (non-material) needs. This mother who worked in the fields and whose husband worked overseas noted the difficult choice between working and addressing parents’ concerns about their child’s disobedient behavior:

All the parents are involved in agriculture. They are farmers. They have to go to work from the morning--the parents go to work after cooking and eating. They have to work. We do not get to eat without working. This

is the slum area. (Sigh.) If the children do not obey should we look after the children or go to work to fulfill the hand to mouth? This is also one of the problems here. This is the problem here. – Mother

Supervision and gatekeeping. Parents and other caregivers attempted to protect their children from dangerous places and perceived negative influences by monitoring children and directing where children spend time and with whom children spend time. These practices, which we termed “supervision,” were described as key tasks for the caregivers of school-age children. Supervision tasks included assisting children with schoolwork, ensuring the completion of household tasks, and attempting to guard children against physical and moral dangers. Caregivers accomplished this task by being present in the household, keeping children (especially younger children and girls) close to the household during non-school hours, inquiring about children’s activities, and by directing children’s activities and social interactions.

(Parents) should... care where the children went and care about the children, what are they doing...(by) talking with the children and trying to find out what is going on with the children. – Mother

Peers were seen as a potential negative influence, and parents attempted to prevent their children from “roaming” with a “bad circle” of peers. Parents took a number of approaches to direct their children’s social affiliations, including asking their children to account for their whereabouts, expecting them to come home immediately after school, and forbidding some children from entering their household. This mother described her active efforts to keep drug-using neighbors/classmates away from her son:

The boys of my neighbor who were studying along with our children also use drugs. My son used to say that he does not like to be with his friend as his friend used to talk strange (kasto kasto) when they were studying in class 10. He could not say it (directly) to his friend. I used to tell (his friend) not to come into my home saying

that he does not care about his studies. I used to tell him to go away. His parents also do not care about the child. The friends of my children say that I am chuchiz (translation: harsh or rude). Though they said it for sometime, but my children are good now. – Mother

While parents often were the ones who supervised children, grandparents, aunts, or uncles also participated in supervision. In cases where fathers were living overseas, they often attempted to remain involved in supervision by talking frequently to their children by phone and by issuing directives to the adults in the household. In addition, supervision was often delegated to older siblings when adults were not available. Adults in Meghauli were often occupied with household work and economic activities throughout the day, including during their time with children. When adults' responsibilities required them to be away from the household, children were often left unsupervised or supervised only by a slightly older sibling. This especially occurred among poorer families and those involved with agricultural work during planting and harvest seasons. Minimal supervision was made somewhat more feasible by the general perceived safety of the community and proximity to neighbors who were often relied upon to participate in caregiving for neighbor children. However, when no adults were present in the household in the morning, parents reported that children would sometimes skip school. After school, the absence of adult supervision concerned teachers and parents alike that children would not have adequate guidance to complete their homework.

Sending to School. A critical institutionalized practice in Meghauli is enrolling children in school and ensuring their regular attendance. In Nepal, free basic education was extended from 5 years to 8 years in 2009, and net primary school enrollment in Nepal in 2009 was over 95%.

Parents and other caregivers are involved in schooling their children by sending them off to school daily, assisting them with homework in the evenings, and encouraging their ongoing attendance. Parents occasionally noted tensions between promoting their child's academic work and their need for children to be involved in household work.

If they could then I would wish them to study well. Most of all we want them to study well and be a good person. This is all. But, as we have needs, so they should (also) work... They have to clean the house, sweep it, cook food and again after this. In some of the circumstances even my daughter has to bring the book and study and be in the kitchen. She has to study, do homework and also to cook the food. They also have to do this. – Father

Parental Ethnotheories

The nature of children. Parents, teachers, and other caregivers described several cross-cutting concepts about the “nature” of children, normal behavior, and child development that related to concepts of behavior problems. Several participants described children as being on a good or bad “path” from a young age. The path was frequently described as being continuous into at least young adulthood. As one mother described, “From the behavior of the children’s parents could know in which path their children are heading to.”

There were various concepts about how children came to be on one path vs. the other—some informants spoke of children “catching a path”, others invoked a child’s choice, and still others noted the influence of parents on a child’s path. Others suggested a model similar to habit development.

We should ask (children) not to do bad work (deeds)--if he does bad work then he cannot be a good man in future. If he does good work from a small age then his behavior will be good even in the future. But if he does bad then his mind is deviated in that. – Mother

Despite the apparent continuity of the path metaphor, change was also viewed as possible, especially among younger children. Multiple informants noted that children’s behavior could be

changed more easily (compared with older children) through persuasion or punishment. The difference between younger and older children was frequently attributed to “ignorance” of younger children and “maturation” over time. Specifically, multiple informants noted that the “brain-mind” (Nepali: *dimaag*) developed and matured over time. Some reported that age 15 was as a critical threshold when the *dimaag* (and bad behaviors) became more fixed and less amenable or likely to change. Consequently, many parents described less optimism when confronting behavior problems in older adolescents and used more severe interventions, including involving the police, or reported giving up efforts to change.

We cannot fight with the children in small things—small children have less thinking (sochai nai kam huncha). The one of 8-10 years they cannot think everything so we cannot beat them. Only sometimes we can ask them not to do this and that and make them afraid, but we cannot do it every time that if they do not study or any such things. – Father

Children up to 15 years, their brain-mind (dimaag) is not matured. So these children of 8 to 15 years, we can correct them on these things and—except these other bad things like alcohol and all—we cannot. – Mother

The needs of children. Participants described several conditions that children “needed” to be fulfilled in order to develop and function appropriately, ranging from basic nutrition to parental warmth. Several parents highlighted the importance of children receiving adequate food, highlighting that this need was not taken for granted among poor families in the study community. Similarly, several parents and teachers noted that children had some basic material needs related to school, such as pens, clothing, and notebooks.

In addition to material needs, informants described the household emotional climate and the quality of the parent-child relationship as critical factors in child development. Participants noted that children need a peaceful household environment, free from (or with minimal levels of) parental

marital conflict. Similarly, they noted that children need “caring” from their parents, which they described as warm, child-centered interactions. This need was met when parents spent time with their children talking together, laughing, and sharing stories. Key concepts that participants reported about “caring” were: an interest in the child’s experience or point of view, gentleness (including speaking with a calm tone of voice), and expressing warmth.

(Parents) should care for the children... They should ask the children what they have in mind and ask the children by admonishing them. – Mother

They should not talk about the economic family discussion but joke and be romantic and talk with the family. Sometimes the parents should joke and speak in a happy mood with children. They should be fresh for a while and then sleep. – Father

Finally, several respondents noted that children had a “need” to play. This was demonstrated in parents’ and teachers’ narratives about children’s daily routines, which generally included playtime after school. Play was described as a way to relieve “stress” that developed from the responsibilities of household work, and especially from school-related demands. Of note, play was more often described as a “need” of boys, whereas (especially older) girls were expected to spend more time assisting with food preparation and other household work.

Then after this, he does not have free time: he goes to study, to school and come back, does home work. They do not have time. They will also have pressure. We should also allow them to play--not only to study but also get to watch television as time allows, and also to play. – Father

When children’s needs were not adequately met, they were seen as being more vulnerable to misbehaving. Often, there was a direct connection between the type of need and the resulting

behavior problem. For example, hungry children were described as being more likely to steal food; children who lacked basic school supplies were seen as likely to steal money or other material possessions. In contrast, respondents stated that missing out on play could build up “pressure” and predispose children to misbehaving, including substance use.

Parental and community goals for childrearing. Parents and community members described several goals they had in mind for childrearing, focusing not only on the child, but also on their desired goals for the family and community. Parents’ long-term desires for their children were summarized by the concept of a “bright future” (Nepali: *ujjwala bhavishya*), a term used to describe the constellation of academic, career, and social success. In contrast, parents also referred to the importance of avoiding a “dark future” (Nepali: *amdhyaro bhavishya*) for their child. Parents reported several goals for socializing their child’s behavior and attitudes. Parents desired for their children to be respectful towards elders, obedient, and timely, and to complete their household chores and schoolwork.

The unnecessary things are not doing the work of the school, not studying. They should not do such work (i.e. behavior) and roaming round unnecessarily, not coming home in time, not eating in time and not studying in time is the mischievous act. –Male teacher

(Eight year-old boys) should talk in a good way with teachers, they should be able to study clearly what we write and we should be also able to read what they have written clearly. They should submit the homework in a good way and submit to us. They should do the class work that we give. They should understand in class. This is all I want from the children. – Female teacher

The majority of adults interviewed (17 out of 24) also noted that a key responsibility children should learn is to maintain their personal cleanliness and hygiene. In this context, children’s failure to adequately maintain personal hygiene was commonly cited as an important problem. For example,

one teacher commented:

In home, we wish the children to go home after the school, wash their hands and feet, eat snacks and then start to study. But after they come back home they do not concentrate in hygiene and eat snacks without washing their hands and feet and they go to play running, I do not like this. – Female teacher

In interviews, problems related to personal hygiene were frequently listed in close proximity to other “serious” offenses. For example, when asked about things that children do at home that are considered bad, this teacher responded:

Other things are being involved in addiction like marijuana, smoking, alcohol, not playing in dirt, not paying attention in hygiene are taken as bad. – Male teacher

While hygiene problems were often discussed as common or routine problems of childhood, lack of attention to hygiene was also highlighted in accounts of more “deviant” children, especially those from socially marginalized groups. One female respondent, when asked to elaborate on what she meant when she said children around 8 do “bad works,” she described a group of young boys from an indigenous caste, saying:

Some of them come immediately to the orchard after waking up. They leave the home immediately after they wake up. They come to the orchard without washing face; they immediately come to the orchard (to steal) – Female Community Health Volunteer

Respondents noted that an important goal for childrearing is to help maintain the family’s social prestige or status (Nepali: *izzat*) and the community’s good reputation. When children broke accepted rules of social behavior, their family’s and community’s reputation were at risk. In pile-

sorting interviews parents explained that they sorted some behaviors (especially stealing and using alcohol, marijuana or cigarettes) as “worse” because they had a negative impact on the family’s *izzat*. When asked how he responds when his children misbehave in school, one father highlighted the connection between misbehaving (in a public setting) and “ruining the prestige of the family”:

If the teachers (tell us our child is misbehaving) then we scold them telling them not to do so. 'Be good as the children of others are good by being educated. Do not ruin the prestige (izzat) of the family. Study well—we are working hard for your education. – Father

Similarly, some members of traditionally lower castes noted that a child’s bad behavior could reflect poorly on the whole community (likely referring to their caste community, for which the same term is used in Nepali):

When the people of other community look at them they should think that the boys of this community are good. If the children do not go to school, if they do not obey parents, if they walk around taking marijuana, cigarette and alcohol it is not good. We do not feel good—we wish for our children to improve. We wish for the children of the community to get improved. We feel good when the people say that the children of our community are good. When we go somewhere and if they say that the children of our community are bad then we feel bad from inside the heart. We really feel bad. – Father (from Dalit caste)

Parents’ ideas about effective rearing techniques. Ideas about effective rearing techniques were related to childcare customs and practices and children’s needs. For example, the children’s perceived need for parental warmth was responded to through speaking softly, joking, and demonstrating interest in a child. “Supervision,” noted above as a routine “practice,” was also described as a useful strategy for managing children’s behavior and preventing unwanted behavioral patterns.

Parents, teachers, and other adult respondents noted a general preference for verbal influence over disciplinary actions (especially physical punishment) in their approaches to shaping children's behavior. When asked about appropriate and helpful responses to behavior problems, almost all interview participants (22 out of 24) and members of each FGD noted that parents should begin by "admonishing" (Nepali: *samjhaune*) misbehaving children. The Nepali word "*samjhaune*" implies "reminding," "explaining," or "persuading." *Samjhaune* was described as a way of addressing misbehavior by informing a child of his/her wrongdoing and reminding him/her of the future consequences of continuing the behavior. The examples given frequently demonstrated how elders reminded children of potential negative future outcomes of their behavior in order to persuade them to change their present behavior. The focus of discussions in *samjhaune* is usually future-oriented, and focused on negative consequences of behavior, as this teacher succinctly describes:

First, the school admonishes the children if they have done bad by saying not to do this and that. We should show the future perspective and inform them that their life will be ruined. – Female teacher

For others, admonishing also included reminding a child of his/her responsibility to his/her family to maintain their social standing (*izzat*) and for the financial investment they have made in the child's education:

If the teachers complain (about our child's behavior)...then we scold (the child) saying not to do so: 'be good as the children of others are good by being educated. Do not ruin the prestige of the family. Study well. We are working hard for your education.' – Mother

In addition to warnings about future "ruin," *samjhaune* was also used to describe providing positive messages and setting positive expectations for a child. A teacher explained the importance of focusing on a child's good behavior when admonishing him:

We could admonish him saying that: "Babu [respectful title of address], you have done a good work here so if you do this good then that's better." We should admonish him but not hate him or discard him. – Male teacher

Admonishing was frequently discussed together with, or in contrast to, 'beating'. Several informants described admonishing as being a more effective alternative to beating, noting that beating, especially when done in excess, could lose its effectiveness:

(Parents) scold, beat, and threaten the children asking why they eat the food without washing hands and in other things, so the children stay away more due to this. Instead of this they should be advice saying the positive and negative aspect of the activities so that the children will be motivated to do this. If it is done then the children will improve if not then they will be worse. –Female teacher

While admonishing was commonly discussed as a first-line approach to dealing with behavior problems, respondents also described situations in which beating might be the preferred approach. When asked how parents respond when children misbehave, one respondent's answer demonstrated the ambivalence between physical and verbal mitigation strategies that was seen across a number of informants:

We must scold them. We should also admonish them saying that they should not do in this way. We should say this: 'Why did he do so?' We must scold and admonish. To beat? We should not beat. We cannot beat to the one who are big. If they were small then we could beat them saying that 'Why did they do--?' We should admonish the big ones saying that 'Why he did so? He should not do so.' – Father

While admonishing and "beating" were the most commonly discussed mitigation strategies

by both parents and teachers, a variety of other strategies were also mentioned. Several of these (e.g., “imparting knowledge” and “caring”) were closely related and complementary to the concept of *samjbaune*. Respondents also discussed inducing fear through threats or other physical punishments as more effective alternatives to beating. For example, the researchers witnessed an adult male tying a young boy (approximately age 7) to a tree. When asked about what he was doing, the man told the researchers that the boy had been taking fruit from the tree and throwing it down to other children. The man also related other recent episodes of stealing and said he was tying the boy to the tree to “teach him” not to steal again, since his parents were not available or willing to do so. Some respondents also addressed poverty as a contributing factor to behavior problems, and suggested providing needed food and supplies as a preferred mitigation approach.

Second-order Effects

The settings children frequented, the expectations placed upon them, and the concepts adults held about childrearing were not uniform across all groups of children. Factors related to a child’s sex, caste, age, and socioeconomic status appeared to shape their experience within the developmental environment. In our analysis, one of the most prominent among these “second-order effects” was the child’s gender. Parents expected girls to do more housework and boys to spend more time playing. They had different ideas about girls’ and boys’ interests, inherent inclinations, and typical responses to discipline. For example, this respondent’s narrative illustrates a divergence among expectations for boys and girls involvement in household duties after school:

They come back home and then, if they are hungry they ask the food with parents and eat. After eating, they try to play for sometime. They play. After playing, they do their homework for some time and then help in household work. They do the household work as much they can. The girls are mostly involved in cleaning--especially cleaning the room, keeping the book, washing the clothes, clean the room, wash utensils, help the mother in cutting grass and feeding cattle. They do this. – Male community leader

Another respondent noted similar gendered household work patterns:

The children after getting up in the morning, they are more (involved) in cleanliness: they bathe and get clean, do this and that. The son do not work much but the girls after getting up, they clean the house and yard, help the mother. This is all. They study and do homework.” – Female teacher

A gender-specific expectation placed upon girls was preparing for the role of wife and daughter-in-law. Parents and teachers pointed out that a girl’s “bad behaviors” could lead to problems when she moves to live with her husband’s family after marriage. This mother referenced the double standards that face young wives living with their in-laws (a common theme of discussion in patrilocal cultures in South Asia):

Even for the educated and grown up daughters after their marriage also, we do not want to hear that our daughter is this or that way from her in-laws. They do not talk if the daughter is in injustice but they only say us if they are doing bad. They never say that the mother-in-law is bad may be they will say later on. –

Mother

DISCUSSION

Parents and teachers in our study frequently referenced physical and social settings, childcare customs, and their own concepts of the nature and needs of children when describing why some behaviors were problematic and how they attempted to address children’s behavior problems. A number of, though not all, practices and beliefs related to childrearing were held in common between parents and teachers. When addressing behavior problems, parents and teachers generally reported

favoring verbal reminders (i.e. *samjhaune*) over physical punishments, which were viewed as ineffective, though occasionally necessary. Gender, age, caste, and class appear to affect how children experience the environment. These factors shaped role expectations at home, the types of physical and social settings children were exposed to, and socialization goals related to appropriate behavior.

The findings from our study illustrate some of the limitations of universal definitions and causal models that view behavior problems as the result of endogenous, biologically determined pathological processes that can be understood apart from the settings in which children develop and act. Instead, our findings suggest that behavior problems may be better understood as problems of the “child-in-context.” For example, parents defined behaviors as “problematic” based on shared concepts of role expectations and socialization goals for children that were meaningful in their particular settings (e.g., agrarian economy with particular gender, age, and caste role expectations). Through an ecocultural lens, endogenous child traits become problematic when they predispose to behaviors that interfere with a child’s ability or willingness to meet expectations defined by age-, gender-, and setting-specific roles and socialization goals. Thus, definitions of behavior problems may have limited applicability or coherence when considered outside of a particular ecocultural context.

Parents and teachers in our study reported a shared set of mitigation strategies for behavior problems that corresponded to beliefs about the nature and needs of children and effective ways of eliciting change. The substantial overlap in practices and understandings noted between parents and teachers illustrates continuity of messages and experiences that children experience across settings and between subsystems that serve to reinforce the influence of the developmental niche (Super & Harkness, 1986). However, parents had some concepts about child behavior that were distinct from teachers’, creating space for disagreement and inconsistency of approach.

Implications and Future Directions

Our findings reiterate that parents' goals for their children's social and behavioral development are context-dependent. The problems and goals that concern parents the most in one context may align poorly with the treatment goals targeted by an intervention developed in another context. Instead, tailoring recruitment messages and emphasizing treatment goals that address local concerns may enhance acceptability and engagement in interventions set in ecocultural settings distinct from those where interventions were developed. The developmental niche may provide a useful framework for formative research to address the "social validity" gaps in current intervention implementation strategies.

Our study suggests that already existing local childcare customs and practices and concepts, such as *samjhaune* in rural Nepal, might be a useful source for readily acceptable and potentially effective intervention procedures. In addition to greater acceptability, another potential benefit of building on endogenous practices is strengthening (rather than alienating) local cultural traditions.

Our findings also suggest that interventions may need to move beyond targeting one or two parents if they are to be effective in settings where caregiving and disciplinary roles are distributed among multiple members of the household. In our study, multiple members of the household—including older siblings and often neighbors—were involved in caregiving and discipline for school-aged children. These findings suggest that focusing on the household or neighborhood as unit of treatment may be preferable in situations where caregiving and discipline are more widely distributed than in many Western family systems. Building on our findings, one possible preventive intervention tailored to the rural Nepali agrarian setting might consider offering supervised after-school tutoring sessions during planting and harvest seasons. An approach like this would focus scarce resources on specific risk periods (after school, during harvest and planting seasons) and high-priority parental and community goals for advancing children's education.

Our findings also suggest that causal models and etiologic research on child behavior problems may benefit from greater consideration of the “child-in-context”. The developmental niche could serve as a useful framework for future studies wishing to deepen our understanding of the role of settings, customs, and beliefs in shaping children’s behavior over time. Ecocultural analyses could also be beneficially incorporated into models to enhance understanding of how individual-level innate traits are shaped by ecocultural contextual factors over time (e.g., Worthman’s “bioecocultural microniche” context (Worthman, 2010a)).

Limitations

Our study focused on a specific geographic locale in Nepal. While there is a range of variability in parental beliefs and customs and physical settings within the research setting, our findings about the utility of the developmental niche in understanding ecocultural influences on child behavior problems would be strengthened by additional evaluations in other diverse settings. Our conclusions are based primarily on reported data; the correlation of our interview findings with observed behavioral data (e.g., regarding the use of reported caregiving practices) awaits further study. Systematic collection of behavioral data would likely lead to a more in-depth understanding of how settings and childcare customs and practices relate to the expressions of and responses to child behavior problems.

Our study does not address the lived experience of children identified as having behavior problems or their families. While we included children in two focus groups, the overall contribution of children’s perspectives into our overall findings is rather limited. As children are often the ones most affected by other children’s disruptive behavior (e.g., bullying, teasing, and distraction in classes), more work needs to be done to understand children’s perspectives on behavior problems in low-income settings. While we presume that our findings will be useful for designing and implementing interventions, their actual utility awaits intervention studies that include assessments of acceptability and effectiveness.

CONCLUSIONS

The findings of our study illustrate the transactional nature of behavior problem development that involves context-specific goals, roles, and concerns that are likely to affect adults' interpretations and responses to children's behavior. Our findings also demonstrate how physical and social settings can create opportunities for or barriers to developing behavior problems. The developmental niche offers an analytic framework that is useful for understanding cross-cultural variability in the definitions of, distributions of, and responses to child behavior problems. Greater attention to the ecocultural context of development in studies of child psychopathology may help guide the development of more coherent definitions and more acceptable and effective intervention strategies.

TABLES AND FIGURES

Table 1.1: Example Quotes about Influences of Developmental Niche Subsystems on Definitions, Development of, and Mitigation Strategies for Behavior Problems

Developmental Niche Subsystem	Quote
<i>Physical and Social Settings</i>	<i>Those who go to school do not go to school, their friends come to call them and then they go round the banana field and smoke cigarette. If they get marijuana they take that and also drink alcohol. They take all these and then come back home and eat lunch. They say that they are going to school and they go elsewhere and keep the bag outside and go to smoke and marijuana. They walk outside.</i>
<i>Childcare Customs and Practices</i>	<i>We must scold them (when they do bad). We should also admonish (samjhaune) them saying that they should not act in this way. We should say this: “Why did he do so?” We must scold and admonish. To beat? We should not beat--we cannot beat to the one who are big. If they were small then we could beat them saying “why did they do this?” We should admonish the big ones saying that why he did so, he should not do so.</i>
	<i>As the children not only always do the wrong work, they also do the good work. We could admonish (samjhaune) him saying that “babu, you have done a good work here so if you do this good then that’s better.” We should admonish him but not hate him or discard him.</i>
	<i>At first the school admonishes the children if they have done bad by saying not to do this and that. We should show the future perspective and inform them that their life will be ruined.</i>
<i>Parental Ethnotheories</i>	<i>It is not taken as normal if they do the huge (big) bad activities. But in the case of small bad activities, like if they tease (chalnu) with the friends, if they quarrel with the friends, then we can think that this is normal. We think that this was small thing but not say it to them but think by ourself and take it as normal... “Big things” means, like when boys and girls are in school, the things like teasing the girls, if they use the foul language then it could not be taken as normal. He is said that he has become rude (acting “too big”) as he is using the bad words to the sister and friends so this is not good.</i>

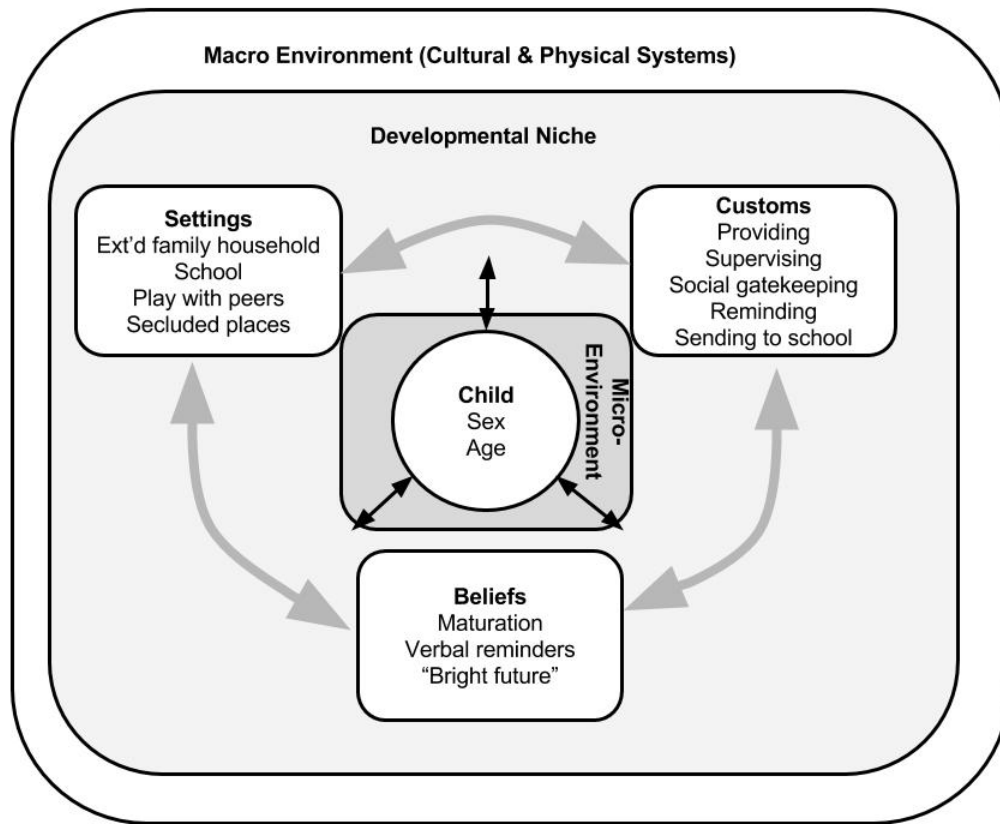


Figure 1.1: Developmental Niche Framework and Key Findings

Source: Based on concepts from Harkness and Super (Super & Harkness, 1986) as illustrated in Worthman (Worthman, 2010a), adapted to include findings from the present study in Nepal.

Note: The figure illustrates the nesting of the child in a micro-environment shaped by the interacting subsystems of the developmental niche (i.e. settings, customs, and beliefs). The developmental niche, in turn, is embedded within the larger macro-environment, characterized by cultural and physical systems. Words in normal (vs. bold) typeface indicate findings from our study in Nepal. Within the “child” circle, “sex” and “age” indicate “second-order effects” that shape the child’s experience within the developmental niche.

Chapter 2. Development process of an assessment tool for disruptive behavior problems in cross-cultural settings: the Disruptive Behavior International Scale—Nepal version (DBIS-N)

ABSTRACT

Background: Because of wide-ranging cross-cultural variability in societal norms for child behavior, systematic processes are needed to develop valid measurement instruments for disruptive behavior disorders (DBDs) in cross-cultural settings.

Methods: We employed a four-step process in Nepal to identify and select items for a culturally valid assessment instrument: 1) *Item generation:* We extracted items from validated scales and local free-list interviews. 2) *Item relevance:* Parents, teachers, and peers rated the perceived relevance and importance of candidate behavior problem items. 3) *Item utility:* Highly rated items were then piloted with children in Nepal. 4) *Psychometric properties:* We evaluated internal consistency of the final scale and compared item difficulty parameters from a Rasch model to stakeholders' ratings of item relevance and importance.

Results: We identified 218 items representing 49 distinct symptoms from 11 scales, and 39 distinct behavior problems from free-list interviews ($n=72$), yielding a total of 62 unique items from both sources. We dropped 33 items due to low ratings of relevance and severity by local informants ($n=30$). We dropped 12 additional items based on poor item-test correlation, low frequency, and/or poor acceptability in pilot testing with 60 children. The remaining 16 items for the Disruptive Behavior International Scale—Nepali version (DBIS-N) had good internal consistency ($\alpha=0.86$).

Item difficulty parameters were strongly correlated with stakeholders' ratings of relevance ($\rho=0.65$, $p=0.0001$) and importance ($\rho=0.63$, $p=0.0001$).

Conclusions: Our 4-step systematic approach to scale development in non-Western cultural settings yielded a scale with good internal consistency. Ratings of items' relevance and severity by key stakeholders were strongly correlated with item difficulty parameters observed in a sample of local children. Adding local stakeholder input may be an efficient way to account for behavioral expectations in cross-cultural scale development for disruptive behavior problems.

KEYWORDS: Disruptive Behavior Disorders, Oppositional Defiant Disorder, Conduct Disorder, Scale, Validation, Nepal, Low-income countries

INTRODUCTION

Disruptive behavior disorders (DBDs) are among the most common child mental disorders and are important risk factors for academic failure, psychopathology, substance abuse, delinquency, and incarceration (Loeber et al., 2000). DSM-5 (American Psychiatric Association, 2013) characterizes DBDs as patterns of behavior that “bring the individual into significant conflict with societal norms or authority figures.” However, wide cross-cultural variability in societal norms for child behavior poses a critical challenge to measuring DBDs. In order to maximize the content validity of DBD measurement tools, systematic procedures are needed to account for cross-cultural variation in societal norms for child behavior. This paper evaluates a procedure that utilizes local participants’ insider (‘emic’) knowledge of child behavioral expectations to identify and select items for measuring DBDs in cross-cultural settings.

Advances in development of scales with locally derived content have come from the increasing use of free-listing interviews with beneficiary cultural groups to generate and select salient items (Betancourt et al., 2009; Bolton & Tang, 2002; Ng et al., 2014). Free-listing is a qualitative interview technique used by cultural anthropologists and others to describe semantic networks within cultural domains (Borgatti, 1999) and provides a useful measures of “salience” and “prototypicality” (Thompson & Juan, 2006). Improvements on these methods need to address two limitations of free-listing relevant to scale development: 1) item pools derived exclusively from free-listing are often small and lack completeness, and 2) other techniques are better suited to assessing severity-related relevance.

Standard scale development guidelines suggest developing a large pool of candidate items – 3- to 4-times as large as the anticipated length of the final scale – that represent the construct of interest as completely as possible (DeVellis, 2011). A large initial item pool covers the breadth of the target construct and facilitates dropping less relevant or poorly performing items at later stages. However,

free-list interviews often lead to limited sets of responses (Brewer, 2002). Previous studies using free-listing to generate items for behavior problem-related scales in LMIC have started with pools of 13 or 21 items (Betancourt et al., 2009; Ng et al., 2014). Moreover, the content of free-list interviews may be biased by the prompt provided, which may not capture all relevant elements. Given these limitations, advances are needed that expand the size and completeness of the initial item pools.

In addition, after a large item pool has been developed, DeVellis (2011) recommends that content experts review the items to aid in the selection of those that are most relevant to the target construct. While frequency of mention in free-lists is often taken as a proxy for relevance, DeVellis (pg. 86) recommends using content experts' direct ratings of items' importance and relevance. Somewhat differently than for other mental health constructs, the relevance of behavior problem items can be conceptualized as a function of the degree to which behaviors violate societal norms (American Psychiatric Association, 2013). This ('emic') knowledge of perceived severity is possessed by those who--by their evaluations and responses in everyday life—define and reinforce local behavioral norms. Therefore, comparative rating methods (such as Likert scales) with local stakeholders may be well suited for evaluating the relevance of behavior problems vis-à-vis local behavioral norms.

We propose a novel procedure for scale development for DBDs in cross-cultural settings that addresses the shortcomings of current free-listing-based methods by: 1) generating a large initial item pool integrating items from local free-list interviews and existing validated scales; and, 2) narrowing items for pilot testing using direct ratings of perceived severity by individuals with emic knowledge of local behavioral norms. This procedure has the benefit of capturing items that may be missed in free-listing but that local experts rate as important when introduced from existing scales.

In this paper, we describe the 4-step process used to develop a scale rating disruptive behavior problems among children and youth in Nepal (see Figure 2.1). To demonstrate that the method

addresses the difficulties described above, we hypothesized that it would result in a larger initial item pool than previous scale development efforts for behavior problems that have used free-listing alone. Second, we hypothesized that some items derived from existing scales but not mentioned in local free-list interviews would be rated highly (i.e. in the top quartile) by local stakeholders on criteria of importance and relevance. Third, we hypothesized that stakeholders' ratings of an item's importance and relevance would be correlated with the item's difficulty parameter (estimated from a Rasch model) in a separate sample of children from the local community.

METHODS

Study Context

We developed the Disruptive Behavior International Scale—Nepal version (DBIS-N) within a broader study of child behavior problems in Nepal, a low-income country in South Asia. Nepal has high rates of extreme poverty, child malnutrition, and migration and recent high exposure to conflict during the People's War in Nepal (1996-2006) (UNICEF, 2006). As part of an ongoing project aiming to establish mental health care in Nepal (Jordans, Luitel, Pokharel, & Patel, 2015), our team has conducted formative research in order to understand stakeholders' concerns related to child behavior problems and effectively target an intervention toward locally meaningful and acceptable goals (M. D. Burkey et al., 2015).

Purpose of the Instrument

The primary purpose of the instrument developed in this paper was to identify children with behavior-related problems who might benefit from a treatment intervention. The construct we sought to measure was behavior-related problems in children that were broadly related to disruptive,

aggressive, and/or antisocial behaviors. In order to maintain relevance to existing empirical literature, our guiding construct was based largely on the broad category of Disruptive Behavior Disorders in DSM-5 (American Psychiatric Association, 2013). We also remained open to local concerns and priorities in order to reduce the possibility of reifying a disorder construct devoid of local coherence (i.e. “category fallacy” (A. Kleinman, 1987)).

Ethics Statement

This study was approved by the Johns Hopkins Bloomberg School of Public Health IRB and the Nepal Health Research Council. All participants provided informed consent (and children provided assent) and were compensated for their time.

Step 1: Item generation

To generate a pool of behavior-related problems from which to develop a locally adapted tool, we used both free-list interviews and a review of existing tools. We began by conducting free-list interviews with teachers and parents in the local community in Nepal (total N=72). Each participant was asked: "Please tell us about the problems children between 8-15 years are facing in your community." We coded behavior-related problems and tabulated the frequency of each. Interviews and coding were conducted in Nepali and then translated into English. Problems were included as items in this study if they were mentioned by at least 3 respondents. We excluded problems related to socioeconomic conditions.

Next, we sought to add items from existing instruments that measure DBD-related constructs. We identified instruments by searching MEDLINE and PsycINFO and by hand-searching references and web resources. We included instruments that evaluated DBD-related constructs (including Oppositional Defiant Disorder, Conduct Disorder, aggression, or closely related disruptive behavior

problems) with at least one positive measure of concurrent or criterion validity reported in a peer-reviewed published report that included at least 100 subjects. Instruments were excluded if they evaluated only adults (over 18 years). We then coded and extracted items using NVivo (QSR International, 2012), grouping items by conceptual similarity and tabulating the frequency of each symptom.

Step 2: Item relevance

We then translated each item into Nepali and assessed the comprehensibility, importance, and relevance of each item to potential respondents and key stakeholders. We assessed comprehensibility in two focus groups of parents and teachers using probing questions to identify and resolve potential barriers to understandability. A bilingual Nepali-English speaker blinded to the instrument then back-translated the modified items into English to check for conceptual equivalence.

We then assessed the importance (i.e. perceived severity) and relevance of each item using a structured survey with 10 children (ages 8-15, i.e. “peer perspective”), 10 teachers, and 10 parents (50% female in each category). The framework for assessing item importance was based on our previous ethnographic research in Nepal indicating that a widely shared and highly valued desire among parents is to ensure a “bright future” (Nepali: *ujjwala bhavishya*) and avoid a “dark future” (*amdhyaro bhayishya*) for their children (M. D. Burkey et al., 2015). Each respondent rated importance on a 1-to-4 scale (‘4’ represented behaviors most likely to lead to a dark future). Each respondent also rated the relevance of each item to the local terminology related to bad behavior (*badmaash*) (‘4’ indicated behaviors most indicative of *badmaash*.)

We then selected the items for piloting in the next step based on criteria of comprehensibility, importance, and relevance. We also included a small number of items with lower

importance/relevance ratings for piloting if they were included in a majority of validated scales in order to include items with potential global significance.

Step 3: Item utility

To assess the performance of individual items in situations resembling actual usage, we then pilot tested the narrowed set of items in a “development sample” of children in the local community (DeVellis, 2011). Respondents in the development sample were parents of children aged 5-15, selected using a convenience sample of households in the target community. Response options included: 0—“Never/rarely”, 1—“Occasionally”, and 2—“Often”. During pilot testing interviews, the research assistants also took notes concerning parents’ difficulty understanding questions and barriers to acceptability of asking the questions.

Following pilot testing, we dropped items for the final scale based on the following criteria: 1) lack of acceptability of asking the item (based on solicited feedback from parents); 2) low item-test correlation (Pearson’s correlation coefficient <0.20); and/or 3) extremes of frequency (i.e. item was rated as highest or lowest response choice in $>80\%$ of those sampled.) We also selected a subset of items that would only be asked for older children (10-15 year olds), given considerations about local epidemiologic patterns and acceptability of asking questions about serious offenses of younger children.

Step 4: Psychometric properties and evaluation of procedures

The goal of step 4 was to conduct an initial evaluation of the psychometric properties of the scale and to evaluate the utility of adding items from existing scales to the initial item pool and of using

stakeholder ratings as a method to select items for the scale. We assessed the internal consistency of the resulting scale using Cronbach's alpha.

We evaluated the utility of including items from both free-list interviews and existing scales by tabulating the number of unique items generated from each method, comparing the mean importance and relevance ratings of items from each source using t-tests, and evaluating the source of items rated in the top quartile for relevance and importance.

We conducted a sensitivity analysis to test the utility of stakeholder ratings of item severity and relevance by comparing ratings to item difficulty parameters estimated from a unidimensional Rasch model using the development sample. A Rasch model, a type of Item Response Theory model, is a parsimonious model that estimates the difficulty parameter for each item (De Ayala, 2013). A difficulty parameter is defined as the point along the latent trait continuum (i.e. disruptive behavior problems) where the probability of a correct response is 0.50. Therefore, items with lower item difficulty parameters are "easier," meaning that individuals with lower levels of behavior problems commonly endorse these items. Similar interpretations can be made for higher item difficulty parameters (i.e. "harder" items). Our hypothesis was that item severity and relevance would both be positively correlated to item difficulty. Our hypothesis was based on the assumptions that a gradient exists in which some behavior problems are more likely to be present in children with patterns of more severe behavior problems, and that stakeholders' emic knowledge would be a good predictor of this gradient in the local context. For the sensitivity analysis, unidimensionality was evaluated using exploratory factor analysis. We then compared the stakeholder's ratings of severity and of relevance to item difficulty parameters using Spearman's rank correlation coefficient (Rosner, 2010). Statistical analyses were performed in Stata 12 (Stata Corporation, 1985-2013).

RESULTS

Step 1: Item Generation

Free-list interviews (n=72) with local parents and teachers revealed 39 unique behavior problems of concern to at least 3 respondents. Free-list participants were particularly concerned about local patterns of “bad habits” (e.g., gambling), maintaining hygiene (i.e. washing), sexual mores (e.g., proper dress, watching pornography, premature interest in dating), and leisure activities (e.g., watching TV or using cell phones too much).

We identified 11 published instruments that met inclusion criteria for review (Table 2.1). Of these, ten were developed in the United States or Western Europe and one in East Africa (Ng et al., 2014). The included scales varied in length and measured a variety of DBD-related constructs. We identified 218 items from the scales that related to disruptive behavior problems, representing 49 unique symptoms. The final pool consisted of 62 unique symptoms comprised of 13 items (21%) from free-listing, 23 items (37%) from existing tools, and 26 items (42%) from both sources (i.e. overlapping). Figure 2.2 illustrates the identification and selection of items throughout the study’s three phases.

Step 2: Item relevance

Participants in focus group discussions (n=10) identified problems with items' comprehensibility and suggested improvements. Problems with comprehensibility largely related to difficulty understanding the terms and phrases used to describe behaviors. For example, "watching pornography films" was not understood by several elderly respondents. A local term, "blue films" (spoken in English) (also used in other parts of South Asia) was better understood by local participants, but remained unfamiliar to many. Participants noted problems with the relevance of items like "beating animals," which was associated with common animal herding practices and not viewed as a problematic behavior.

Local stakeholders (child peers, parents, and teachers) rated the 62 candidate items for importance (i.e. association with a "dark future") and relevance (i.e. to the local behavior problem term of *badmaash*) (see Table 2.2). Importance and relevance were strongly correlated (Spearman's rho = 0.87, $p < 0.0001$). The mean importance rating was 2.88, and the mean relevance rating was 2.84. The highest-rated items (combined score) were: *using a dangerous weapon on others, smoking marijuana, stealing from non-family members, and drinking alcohol*. The lowest-rated items were: *roaming around or wandering, watching TV too much, acting "mischievous" (Nepali: chakechake), using mobile phone too much, and not sharing*.

In total, 32 items were selected for pilot testing on the basis of comprehensibility, acceptability, and at least one indicator of importance: importance/relevance ratings (n=27), inclusion in a majority of reviewed scales (n=4), and prominence in qualitative interviews in the local community (n=1) (M. D. Burkey et al., 2015).

Step 3: Item utility

We administered the 32-item version of the tool to the parents of 60 children in the local community. The children in this development sample had a mean age of 10.2 (SD: 3.2, range: 5-15), and 60% were female. Results in the development sample and comments from parents highlighted additional problems with some items related to low frequency, poor item-test correlation, poor comprehensibility in test settings, and poor acceptability. For example, *using a dangerous weapon* and *deliberately setting fires to cause damage* were rated as “Never/Rarely” by 97% of respondents and were dropped. Multiple attempts were made to identify an equivalent translation for *temper tantrums*, but none was widely understood. Multiple parents stated they felt uncomfortable when asked about substance use or sexual behavior in their younger children, especially young girls. After dropping problematic items, sixteen questions remained for the final instrument.

Based on feedback from local parents who were concerned about the deficit-focused questions, we added 4 items to assess pro-social child behaviors (derived from recent qualitative interviews with local stakeholders (M. D. Burkey et al., 2015).) We also modified the response choices to include 4 options (“Never,” “Sometimes,” “Often,” and “Very Often”) in order to enhance precision and increase variability in responses. The final version of the instrument included 16 problem items, 4 pro-social items, and a 4-item supplement for older children and adolescents (Figure 2.3). Items in the adolescent supplement address widespread concerns about substance use/abuse and running away which were statistically infrequent and culturally inappropriate to ask younger children.

Phase 4: Psychometric properties and evaluation of procedures

Cronbach’s alpha based on parent ratings on 16 problem items was 0.86 (development sample, N=60).

Compared with items identified from free-listing alone (n=13), items identified from existing scales alone (n=23) were rated slightly higher for importance (mean: 2.88 vs. 2.62, $t(34)=2.23$, $p=0.03$) but

not relevance (mean: 2.90 vs. 2.77, $t(34)=1.02$, $p=0.31$). Among items rated in the top quartile for importance, 5 came from existing scales alone, 3 were from free-listing alone, and 5 were from both sources. In the top quartile for relevance, 5 items came from existing scales alone, 1 from free-listing alone, and 7 from both sources.

Item difficulty parameters generated by applying a Rasch model to data from the development sample ranged from -2.62 to 2.28. Item difficulty parameters were strongly correlated with stakeholders' ratings of item's importance ("dark future") ($\rho=0.63$, $p=0.002$) and relevance to *badmaash* ($\rho=-0.65$, $p=0.0001$) (see Figure 2.4).

DISCUSSION

While many instruments have been validated for the measurement of disruptive behavior problems, only a few have been developed outside of North America or Europe. This paper describes the application of a systematic procedure to incorporate local stakeholder participation for generating and selecting items for the Disruptive Behavior International Scale—Nepal version (DBIS-N). The utility of combining free-lists and existing tools to generate candidate items is demonstrated by the large number of items in the initial pool and the high ratings of importance and relevance for items from both sources. The validity of stakeholders' ratings as a criterion for item selection is supported by the strong correlations observed between ratings and item difficulty parameters in a sample of local children. Our findings support the use of local participation as an efficient, and potentially widely applicable, component of scale development to address cross-cultural variation in DBDs.

The process we used demonstrates an adaptation of DeVellis' (2011) framework for scale development that may be useful in other global mental health settings. Our study highlights the utility of using local informants as "experts" in disorder constructs that closely relate to local behavioral expectations—in this case, child behavior problems. In our study, parents and teachers from the local

community provided feedback on acceptability as well as the relevance and importance of candidate items assessing child behavior problems. Their feedback helped narrow a large initial item pool into a smaller set of items that could more feasibly and efficiently be assessed in pilot testing in a development sample. The high internal consistency of the final scale suggests that stakeholder participation helped to select items that measure a cohesive underlying construct.

Our evaluation of candidate items found a large degree of overlap between locally identified problem behaviors and items from externally derived scales. However, there was also a subset of symptoms we identified in the local context that were only shared by the single other study we found of an instrument developed in another LMIC (i.e. Rwanda) (Ng et al., 2014). Both our study and the study in Rwanda identified overlapping concerns that local residents identified as behavior problems but that are not commonly included in existing instruments. These include: *roaming around*, *speaking rudely*, *sexually deviant behavior*, *being impolite*, *taking drugs/ alcohol*, *failing to maintain hygiene*, doing other “bad behaviors” not specified in DSM (e.g., gambling), and *being ungrateful*. While several of these items were dropped from the DBIS-N due to concerns about acceptability or lower importance ratings, these findings suggest that there may be sets of concerns that many parents in LMIC settings identify as behavior-related problems that are not represented by “Western” concepts of disruptive behavior disorders (as in the DSM (American Psychiatric Association, 2013)). These findings support the need for “ground up” approaches to scale development for child behavior problems in novel sociocultural contexts.

Given the context-specificity of child behavioral norms, we expected to find a smaller degree of overlap in symptoms between the locally-derived symptoms and the items from international scales. There may be a number of explanations for our observation of substantial overlap. Some child behavioral patterns may be universally concerning (or nearly so) to peers, parents, and/or teachers. This may be especially true among teachers, given the international influences prominent in teachers’

education (e.g., textbooks, urban-based education), and in school classrooms given a similar structure and demands across settings (Pope Edwards, Gandini, & Giovaninni, 1996).

An alternative explanation is that the overlap of symptoms represents a “category fallacy” (A. Kleinman, 1987). Kleinman noted that investigators looking for specific mental health syndromes in new sociocultural contexts may inadvertently ‘reify’ the syndromes they are looking for, but that these syndromes either lack coherence or have different meanings (A. Kleinman, 1987). Given this common methodological and conceptual failure of some cultural psychiatry and global mental health research, we did not attempt to identify a narrowly-defined syndrome (e.g., conduct disorder), and we do not treat *badmaash* as a syndrome. Instead, we used a “ground up” (inductive) approach that prioritized local concerns for child behavior (broadly defined) as a filter to select items derived from both local and international sources. In a separate paper (M. D. Burkey et al., 2015) we describe the qualitative research that identified the problem area of *badmaash* child behavior as well as locally meaningful frameworks used in this paper to assess importance and relevance.

Limitations

Our results concerning the psychometric properties of the scale and its items are from a “development phase” pilot study that was exploratory in nature, and relied on a small convenience sample of children in a single community in Nepal. Conclusions about other reliability properties and construct validity of the DBIS-N await the results of an ongoing study in a larger validation sample in Nepal.

Additional questions remain about the transferability of stakeholder ratings to other sociocultural settings and disorder constructs. We note that incorporating laypersons’ feedback on the importance of items may not be as useful when developing scales targeting a construct that is thought to depend less upon culture-specific behavioral norms (such as schizophrenia) or have more “universal”

characteristics. However, even in these contexts, obtaining feedback from the population targeted by the instrument will help develop items phrased in ways that are comprehensible, acceptable, and relevant to local circumstances (Van Ommeren et al., 1999).

Applications

Applications of the DBIS-N include local epidemiological assessments, screening for interventions, and evaluating intervention outcomes. In addition, this systematically and locally developed tool may aid efforts in global mental health and neuroscience (Stein et al., 2015) to identify cross-cultural biological markers and mechanisms related to DBDs. Prior studies with boys in Nepal and other regions of Asia have demonstrated associations of disruptive behaviors with hypocortisolism in naturalistic assessments (Hruschka, Kohrt, & Worthman, 2005; Brandon A Kohrt et al., 2015).

In addition, we anticipate that the process and results of this study will serve as a template for developing similar locally adapted instruments for DBDs in other contexts. In order to facilitate transferability of this process to other settings, we plan to make an extensible version of our item database (Step 1), structured data collection tools (Step 2), and data analysis coding and decision aids (Step 3) available online (through the Mental Health Innovation Network website (<http://mhinnovation.net/>)).

CONCLUSIONS

Valid instruments that assess parents' and teachers' concerns for child behavior problems are needed to identify children who would benefit from targeted treatment interventions. Instruments in common use were developed in high-income, Western settings; current adaptation procedures are limited by the lack of input from key stakeholders in child development and may fail to address important societal norms for child behavior. To address this gap, we developed the DBIS-N using

procedures that incorporate local participation for item generation and selection. While an item response theory analysis suggests concurrent validity for item prioritization, our process requires further assessment of construct validity in Nepal and replication in other sociocultural settings to better characterize its transferability. Through the systematic development of tools that account for local concerns, we will better be able to target interventions to the children that need them, measure interventions' effectiveness, and meet the needs of a culturally diverse population of children worldwide.

FIGURES AND TABLES

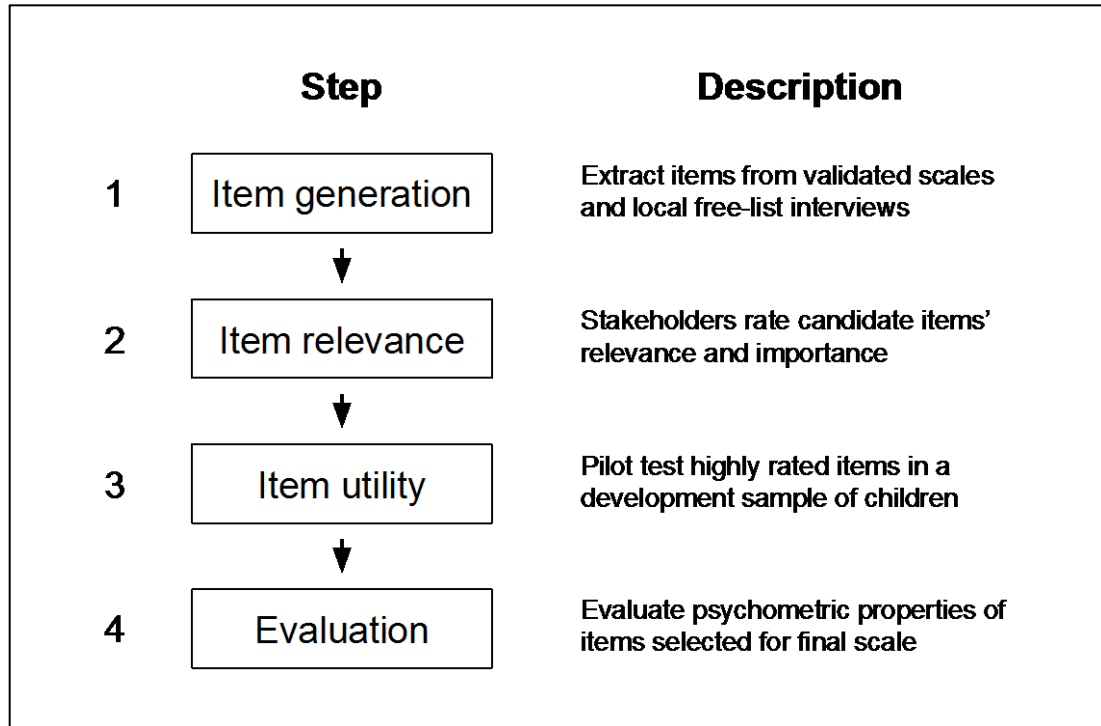


Figure 2.1: Study Flow Diagram Illustrating the Development Phases for the Disruptive Behavior International Scale—Nepal version (DBIS-N)

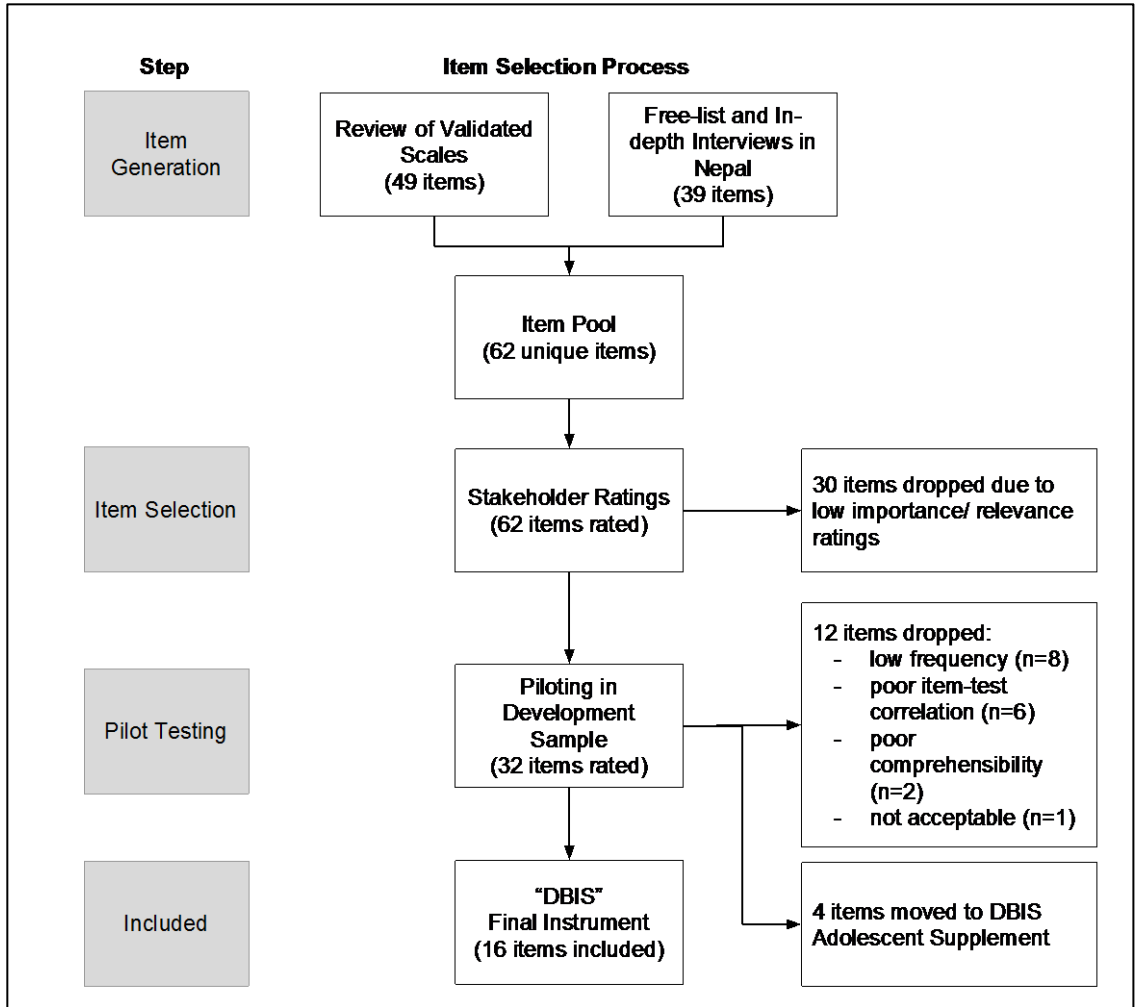


Figure 2.2: Study Flow Diagram Illustrating the Identification and Selection of Items for the Disruptive Behavior International Scale—Nepal version (DBIS-N) problem scale and adolescent supplement.

Notes: Some items were dropped due to more than one reason.

Disruptive Behavior International Scale—Nepali Version

Instructions: Read each question to the child's primary caregiver. After reading the question, ask whether the child has done this "rarely, sometimes, often, or very often" over the past 6 months. Circle the best response (only one per question. Questions 21-24 are for children age 10-15 only.

Question	Response (Circle one)			
Before each question read: "In the past 6 months..."	Never: child never does this Sometimes: only once or twice per month Often: at least once per week Very Often: almost every day			
Pro-social Subscale				
1. How often did your child get along well with other children?	Never	Sometimes	Often	Very Often
2. How often did your child treat elders respectfully?	Never	Sometimes	Often	Very Often
3. How often did your child complete his/her schoolwork willingly?	Never	Sometimes	Often	Very Often
4. How often did your child help with household work?	Never	Sometimes	Often	Very Often
Problem Subscale				
5. How often was your child boldly disobedient?	Never	Sometimes	Often	Very Often
6. How often did your child get angry even on small things?	Never	Sometimes	Often	Very Often
7. How often did your child skip school?	Never	Sometimes	Often	Very Often
8. How often did your child curse or use foul words?	Never	Sometimes	Often	Very Often
9. How often did your child lie?	Never	Sometimes	Often	Very Often
10. How often did your child fail to follow instructions from elders?	Never	Sometimes	Often	Very Often
11. How often did your child fight with other children?	Never	Sometimes	Often	Very Often
12. How often did your child seek revenge?	Never	Sometimes	Often	Very Often
13. How often did your child spend time with children who do bad things? ("walks in bad circle")	Never	Sometimes	Often	Very Often
14. How often did your child do things to deliberately annoy others?	Never	Sometimes	Often	Very Often
15. How often did your child argue with elders?	Never	Sometimes	Often	Very Often
16. How often did your child damage or destroy others' property on purpose?	Never	Sometimes	Often	Very Often
17. How often did your child blame others for his/her own mistakes?	Never	Sometimes	Often	Very Often
18. How often did your child talk back to adults?	Never	Sometimes	Often	Very Often
19. How often did your child fail to pay attention to hygiene and cleanliness?	Never	Sometimes	Often	Very Often
20. How often did your child take valuable items from people outside the family?	Never	Sometimes	Often	Very Often
Questions for Older Children (ages 10-15)				
21. How often did your child run away from home overnight?	Never	Sometimes	Often	Very Often
22. How often did your child smoke marijuana?	Never	Sometimes	Often	Very Often
23. How often did your child use cigarettes or tobacco?	Never	Sometimes	Often	Very Often
24. How often did your child drink alcohol?	Never	Sometimes	Often	Very Often

Scoring: To score the subscales, add the scores for each item within the subscale, where "Never"=0, "Sometimes"=1, "Often"=2, and "Very often"=3

Figure 2.3: Final Version of the Disruptive Behavior International Scale—Nepal version (DBIS-N)

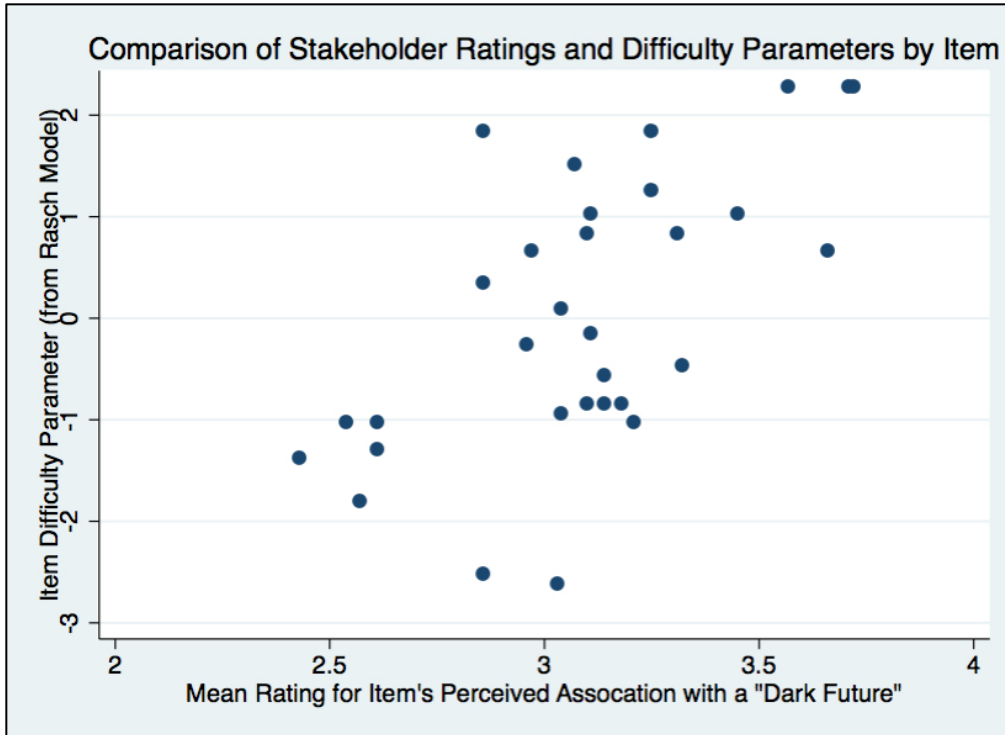


Figure 2.4: Comparison of Stakeholder Ratings of Importance and Difficulty Parameters by Item

Notes: Importance ratings were determined using stakeholders’ ratings of the extent to which an item was perceived to be associated with a “dark future.” Item difficulty parameters were estimated using a Rasch Model with results from the development sample of children (n=60) in the local community. Each dot in the figure represents one item.

Table 2.1: Scales Reviewed for Item Identification

Scale name (Reference)	Type of instrument	Version reviewed	Construct measured (or subscales reviewed)	No. items (behavior-related)
Child Behavior Checklist (CBCL) (Achenbach et al., 1983)	Broad-based screening	Ages 4-16	Subscales: “Rule-breaking behavior,” “Aggressive behavior”	118 (34)
Conduct Disorder Rating Scale (Waschbusch & Elgar, 2007)	Disorder-specific screening	Parent version	Conduct disorder	15 (15)
Conners Parent Rating Scale--Revised (Conners, 1997)	Broad-based screening	Parent version (long version)	Subscales: “Oppositional”	80 (13)
Disruptive Behavior Rating Scale (Erford, 1993)	Disorder-specific screening	Teacher version	Factors: “Oppositional,” “Antisocial” Rational scales: “Oppositional,” “Conduct”	50 (24)
Eyberg Child Behavior Inventory (Eyberg & Ross, 1978)	Broad-based screening	N/A	Child behavior problems	36 (36)
New York Teacher Rating Scale (Miller et al., 1995)	Disorder-specific screening	Teacher version	“Defiance,” “physical aggression,” “delinquent aggression,” “conduct problems”	34 (27)
Pediatric Symptom Checklist (Jellinek et al., 1988)	Broad-based screening	Youth report (Y- PSC)	Behavioral problems	35 (7)
Youth Conduct Scale—Rwanda	Disorder-specific	Long version	Conduct problems (“uburara”)	16 (16)

(Ng et al., 2014)	screening			
Strengths and Difficulties Questionnaire (Goodman, 1997)	Broad-based screening	Age 4-17 (English (USA))	Subscales: "Conduct problems," "Prosocial (sub)scale"	25 (10)
SNAP-IV (Swanson, 1995)	Broad-based screening	Teacher and Parent Rating Scale	Subscales: "Oppositional Defiant Disorder," "Conduct Disorder"	90 (13)
Vanderbilt ADHD Parent Diagnostic Scale (Wolraich, 2003)	Disorder-specific screening	Parent	Subscales: "Oppositional Defiant Disorder," "Conduct Disorder"	47 (23)

Table 2.2: Ratings of Perceived Relevance and Importance for 32 Behavior Problem Items Selected for Pilot Testing

Item	Relevance ¹	Importance ²
	Mean (SD)	Mean (SD)
1. Has used a dangerous weapon on others	3.83 (0.38)	3.71 (0.66)
2. Smokes marijuana	3.72 (0.45)	3.66 (0.61)
3. Takes things (steals) from people outside the family	3.59 (0.63)	3.72 (0.59)
4. Drinks alcohol	3.76 (0.44)	3.45 (0.69)
5. Deliberately sets fires to cause damage	3.48 (0.69)	3.57 (0.74)
6. Uses cigarettes or tobacco	3.55 (0.57)	3.31 (0.66)
7. Carries a weapon	3.52 (0.63)	3.25 (0.80)
8. Involved in physical relationship or watches porn movies	3.43 (0.74)	3.25 (1.04)
9. Does dangerous things often	3.31 (0.66)	3.32 (0.77)
10. Fights often	3.28 (0.70)	3.21 (0.79)
11. Blames others for own mistakes	3.24 (0.83)	3.18 (0.86)
12. Lies often	3.17 (0.71)	3.14 (0.74)
13. Seeks revenge	3.17 (0.85)	3.11 (0.96)
14. Gambles	3.21 (0.86)	3.07 (0.94)
15. Argues with elders	3.07 (0.92)	3.14 (0.97)
16. Wears improper or indecent clothing	3.24 (0.83)	2.86 (0.85)
17. Takes things (steals) from family members without asking	3.00 (1.00)	3.10 (0.98)
18. Boldly disobedient	3.07 (0.84)	3.03 (0.78)
19. Damages or destroys others' property on purpose	2.97 (0.91)	3.11 (0.88)
20. Spends time with children who do bad things (Walks in bad circle)	3.00 (0.76)	3.04 (0.96)
21. Talks back to adults	3.00 (0.89)	3.04 (0.92)
22. Runs away from home	3.07 (0.84)	2.97 (0.94)
23. Does not follow rules (family rules)	3.17 (0.97)	2.86 (0.79)

24. Curses or uses foul words	2.86 (0.95)	3.10 (0.82)
25. Skips school	2.79 (1.05)	3.11 (0.83)
26. Seeks attention from others too often	3.03 (0.78)	2.86 (0.80)
27. Threatens others	2.86 (0.79)	2.96 (0.88)
28. Doesn't pay attention to hygiene and cleanliness	2.79 (0.90)	2.61 (0.99)
29. Does things to deliberately annoy others	2.79 (0.86)	2.54 (0.96)
30. Harasses (teases or bullies) other children	2.59 (0.68)	2.61 (0.96)
31. Has frequent temper tantrums (or anger outbursts)	2.62 (1.05)	2.43 (1.03)
32. Gets angry even on small things	2.38 (1.01)	2.57 (0.74)

¹ **Relevance** was rated on a 1 to 4 scale: '1' Item not associated with *badmaash*;

'4' Item highly associated with *badmaash*.

² **Importance** was rated on a 1 to 4 scale: '1' Item unlikely to lead to a "dark future"; '4' Item highly likely to lead to a dark future.

Chapter 3. Validity and psychometric properties of the Disruptive Behavior International Scale (Nepal Version)—a scale developed using local stakeholder participation

ABSTRACT

Background: Obtaining accurate and valid measurements of disruptive behavior disorders (DBDs) remains a challenge in cross-cultural settings, due to widespread variability in societal norms for child behavior. In prior work, we demonstrated a method for constructing a locally valid tool for assessing DBDs, the Disruptive Behavior International Scale—Nepal version (DBIS-N). This study assesses the construct validity and psychometric properties of the DBIS-N and compares its performance to “emic” nominations and an international scale translated into Nepali.

Methods: We assessed a population-based sample of children ages 5-15 in rural Nepal for behavior problems using the DBIS-N (parent and teacher report), nomination using local behavior problem terms, a locally developed vignette-based assessment, a structured clinical interview, and the Eyberg Child Behavior Inventory (ECBI). Functional impairment was assessed using a locally developed inventory of child role expectations (the Child Functional Impairment scale (CFI)). We evaluated the correlations between each measurement method, convergent and discriminant validity of the DBIS-N, and psychometric properties of the DBIS-N.

Results: We evaluated 268 children (42.0% female; mean age 10.1 [SD 2.8]) with the DBIS-N and other instruments. The DBIS-N had good internal consistency (Cronbach’s α : 0.82), a unidimensional factor structure that accounted for 83.8% of the overall variance, and excellent test-retest reliability (ICC 0.93, $r = .93$). The DBIS-N was strongly correlated with the ECBI ($r = 0.84$) and

functional impairment ($r=0.63$). Children identified as having behavior problems using vignette-based screening had higher mean scores on the DBIS-N (11.1 vs. 4.8, $t(266)=-10.2$, $p<0.0001$).

Discussion: The DBIS-N, an instrument developed using items from internationally validated measures and local ethnographic research, demonstrated good internal and external reliability and strong correlations with multiple locally and externally derived behavior problem assessments, and greater convergence with local behavior problem concepts compared with the ECBI.

INTRODUCTION

Need for Valid Measurement Instruments in Global Mental Health

The World Health Organization estimates that mental, neurological, and substance use disorders contribute nearly 30% of the global burden of disease as measured by years lived with disability (YLDs) (Whiteford et al., 2015). Studies of the age-of-onset distributions of mental disorders demonstrate that mental disorders set in early (Kessler et al., 2005), often go untreated for more than a decade (Wang et al., 2007), and are associated with serious impairment (Murray et al., 2013), suggesting childhood as a critical period for intervention. However, a major factor limiting the advancement of child mental health in low-resource settings is the lack of valid measurement tools that take into account cross-cultural variability in disorder presentations (Collins et al., 2011; B. A. Kohrt et al., 2011). This study compares multiple locally and externally derived methods for assessing disruptive behavior problems in a non-Western cultural setting. This study also provides an in-depth evaluation of the construct validity and psychometric properties of a scale (the Disruptive Behavior International Scale—Nepal version [DBIS-N]) developed using input from local stakeholders in the Nepal to account for societal norms for child behavior (see Chapters 1 and 2 in this dissertation).

Valid tools are needed in order to determine disorder prevalence, allocate limited resources, and appropriately target evidence-based treatment interventions (B. A. Kohrt et al., 2011). Careful contextual adaptation is essential for mental health assessment tools given the variety of local idioms employed to describe symptoms and the between-culture variability in normative affective and behavioral expectations (B. A. Kohrt et al., 2011). An additional concern in using disorder definitions and tools derived in other cultural contexts is that of a “category fallacy”—that is, the risk of identifying clusters of symptoms that may have a substantially different meaning and/or association with impairment in the target context (A. M. Kleinman, 1977). Cultural considerations may be even more important in the case of disruptive behavior disorders (DBDs), the definition of which depends on violation of society-specific norms for child behavior (American Psychiatric Association, 2013).

Epidemiology and Measurement Issues for Disruptive Behavior Problems

As the most common child mental disorders and important risk factors for academic failure, delinquency, and affective disorders (Loeber et al., 2000), DBDs represent an important, but neglected, public health problem in LMIC. Meta-analyses have demonstrated consistent rates of Oppositional Defiant Disorder and Conduct Disorder in international samples (Canino et al., 2010), though few studies have been conducted in LMIC. Existing epidemiologic and treatment studies of DBDs have predominantly relied on diagnostic tools developed in the United States or Western Europe with minimal adaptation (usually limited to translation and back-translation) to the local context (Kessler et al., 2007). Whereas studies of depression and post-traumatic stress disorder in children in LMIC have made use of transcultural translation methods to ensure the comprehensibility, relevance, or completeness of the constructs tested (B. A. Kohrt et al., 2011), such cross-cultural validation processes have not yet been implemented in the study of DBDs. Consequently, the paucity of studies of DBDs in LMICs is compounded by uncertainty about the validity of their findings, and there is a shortage of useful clinical tools for identifying children in need of treatment for behavior problems.

Validation and cultural adaptation of assessment tools may be especially important for DBDs (as well as more broadly defined child behavior problems) given the wide variability in role and behavioral expectations for children between settings. DBDs are some of the few disorders for which DSM-5 makes special note of the importance of culture and context in determining variance in normative levels of symptoms (American Psychiatric Association, 2013). In addition to varying normative levels of symptoms, the specific behaviors of concern (i.e. those that “bring the individual in conflict with societal norms or authority figures” (American Psychiatric Association, 2013)) vary widely between societies. The current study aims to address the need for valid, contextually adapted assessment tools for global child mental health by creating a flexible framework for cross-cultural scale development. We assess the feasibility of this approach by conducting a preliminary analysis in the specific case of DBDs in a culturally diverse Nepali community.

Study Context and Objective

Specifically, in this study we assess the validity and psychometric properties of a new assessment tool for DBDs—the Disruptive Behavior International Scale—Nepal version (“DBIS-N”)—that was developed using a combination of common items drawn from a database of existing validated structured assessment tools for DBDs and locally identified symptoms identified through qualitative research in the local community (Adhikari et al., 2015)(and Chapter 1 in this dissertation). After translating the items, local stakeholders in Nepal prioritized the items by perceived importance until a final set of questions was developed. The current paper reports the results of a validation study using the adapted tool in a representative population-based sample in the community where the DBIS-N was developed.

The specific objectives of the current study were to assess the construct validity and psychometric properties of the DBIS-N in the context where it was developed. Our hypotheses are that the DBIS-N will demonstrate: 1) good reliability and psychometric properties (i.e. internal consistency, unidimensional factor structure, and good test/re-test and inter-rater reliability), and 2)

good construct validity as measured by convergent validity with functional impairment, clinical diagnoses using international definitions of Oppositional Defiant Disorder and Conduct Disorder, and locally used terms for behavior problem syndromes, and discriminant validity (compared with ADHD symptom score and screening for neurodevelopmental disabilities). While we anticipate considerable overlap between the DBIS-N and scores and diagnoses from international tools, we expect that the DBIS-N might identify some children missed by the international scales and that the international measures might label as “disordered” some children that the DBIS-N and local nominations consider to be “normal.”

We also sought to contribute to conceptual discussions about “category fallacies” in global child mental health. Category fallacy is concerned with the local coherence and impact of constructs derived in an external cultural context (A. M. Kleinman, 1977). To evaluate for the possibility of a category fallacy, we conducted quantitative comparisons of locally- vs. externally- developed measures of child behavior problems and functional impairment. Specifically, we compared nominations using locally derived vignettes of behavior problems, local idioms for behavior problems, the DBIS-N, and a locally developed functional impairment scale with scales and structured clinical interviews of related constructs derived in Western cultural contexts.

METHODS

Brief Overview of Study Design

The current study assessed the construct validity and psychometric properties of a brief structured instrument—the DBIS-N—that was previously developed for use in rural Nepal (see Chapter 2 in this dissertation). In this study, we assessed psychometric properties including: test-retest reliability, inter-rater reliability, internal consistency, and factor structure in a population-based sample of children in Nepal. We also evaluated construct validity by comparing scores on the DBIS-

N with: 1) functional impairment, 2) diagnosis of Oppositional Defiant Disorder or Conduct Disorder in a clinician-administered interview using the K-SADS-PL, 3) Eyberg Child Behavior Inventory (ECBI) problem intensity score (Eyberg & Ross, 1978), and 4) teachers' and parents' assessments of whether children have locally described behavior-related problems using idioms identified in previous qualitative research in the study community (M. D. Burkey et al., 2015). We also assessed correlations between local syndrome nomination, DBIS-N score, and diagnoses of Oppositional Defiant Disorder or Conduct Disorder on the K-SADS-PL.

Ethics Approval

The study was approved by the Johns Hopkins School of Medicine Institutional Review Board and by the Nepal Health Research Council. Written consent was provided by all adult study participants (i.e. children's primary caregivers and teachers) and parents of child participants; child participants (under age 18) provided verbal assent.

Study Setting and Population

The study was conducted in one of the Village Development Committees (VDCs; i.e. a small administrative area similar to a municipality) in Chitwan District in south-central Nepal. Chitwan District is in the *Terai* (lowland) region near Nepal's border with India. The study community is situated 20-25 km (requiring a 1-1.5 hour trip by bus) from the nearest city, Bharatpur (population 199,867 (Central Bureau of Statistics, 2011)). Most residents of the study VDC work in the agricultural sector, often earning their living through a combination of farming their own small plot of land and working as a field laborer for larger landowners. Healthcare in Chitwan District is operated primarily through Nepal's Ministry of Health and Population; there are no trained mental health professionals working in the rural areas outside of Bharatpur in Chitwan District.

Participants

Participants for this study included children, parents (or primary caregivers), and teachers residing in the study VDC. The study included children (both males and females) between the ages of 5 and 15 years. This age range was chosen due to considerations relating to school attendance, developmental stage, and family role definitions in the rural Nepali context. In Nepal, school attendance begins around age 5. Youth age 16-17 years have often completed secondary school (which finishes after grade 10), may be married, or may have left the community for further education or employment (UNICEF, 2006). If multiple primary caregivers (e.g., mother and father) were available for a child, the mother was the preferred respondent, based on parenting roles in Nepal in which mothers are most involved in child-rearing, and fathers are frequently involved in work away from the family for extended periods of time (months to several years). Teachers were identified by participating families as the primary teachers for the index child and were recruited through community liaisons. Subjects identified through sampling procedures (below) were included if they spoke Nepali, met age inclusion criteria (between 5-15 years old for index children; no age criteria for caregivers or teachers), and provided consent (adults) and assent (children).

Sampling Procedures

This study utilized a two-stage sampling plan with stratified sampling as a way to achieve probability-based population sampling in the defined geographic area while obtaining a sample enriched for children with a high likelihood of DBDs (see Figure 3.1). First, households were randomly selected for screening using a register of households in the study VDC that was previously obtained through a community enumeration survey of Chitwan District. From the register, households were selected sequentially through a randomly sorted list of household IDs (generated using random number generation in the R statistical package.) Household sampling continued until the desired sample size (n=268) was enrolled. In the case that an adult was not available in the household to participate in screening, the researchers made one additional attempt to return to the house. If an adult was not present at the second attempt, if the parent did not provide consent, or if

the household did not include a child who met inclusion criteria, the household was skipped, and the next household (located on the right side of the previous house) was approached for participation until a child was recruited.

At selected qualifying households in which the parent provided consent, a research assistant then conducted screening of children residing within the household. The purposes of screening at each household were: 1) to enrich the sample with a greater number of children likely to have behavior problems (for purposes of statistical efficiency in the case of a potentially rare criterion), 2) to avoid within-household clustering (i.e. by selecting multiple children from the same household), and 3) to maintain random sampling (i.e. to minimize selection bias) within pre-defined strata.

First, the researcher listed each child between the ages of 5 and 15 who lived in the household. Second, the researcher read gender-specific vignettes (see Annex 1) of children with mild-moderate behavior problems (based on previous qualitative studies in Nepal (Adhikari et al., 2015; M. D. Burkey et al., 2015)) and, for each child, asked the head of the household whether the description: 1) “does not apply,” 2) “the child has significant features of this description,” 3) “the description applies well,” or 4) “the child exemplifies the description, is a prototypical case.” (Gender-specific vignettes were used based on our previous qualitative study that demonstrated community perceptions that girls had fewer behavior problems and sensitivity to labeling girls as having bad behavior (M. D. Burkey et al., 2015).) Children who met the description at least moderately well (#2-4 above) were considered “screen positive”; children who did not fit the description (#1) were considered “screen negative.” Third, one child was then selected from the household based on a “lottery” (i.e. drawing slips of paper from a bag) in which screen negative children were given one “chance” and screen positive children were given four “chances.”

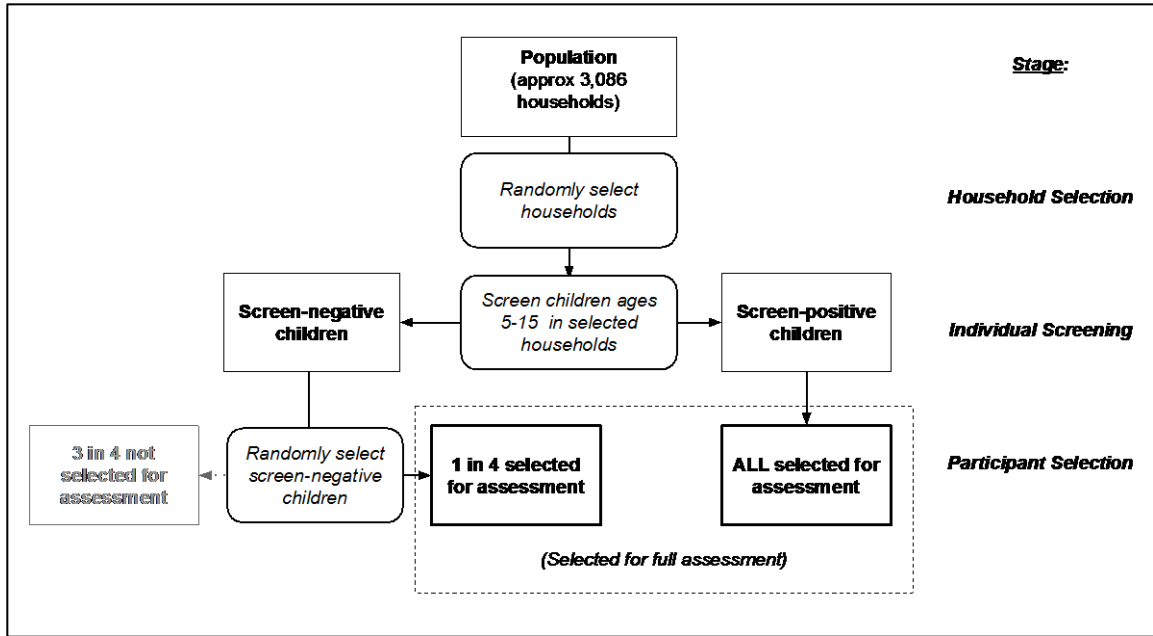


Figure 3.1: Sampling Flow Chart Illustrating the Identification, Screening, and Selection Process for Study Recruitment

Study Procedures: Data collection

For each consenting child, a trained research assistant completed a brief demographic survey and the following assessments: the DBIS, the Child Functional Impairment Scale (Tol, Komproe, Jordans, Susanty, & De Jong, 2011), the ADHD Rating Scale-IV (DuPaul, Power, Anastopoulos, & Reid, 1998), the Ten Questions Plus (Stanger & Lewis, 1993), the Eyberg Child Behavior Inventory (Eyberg & Ross, 1978), and the parents' assessments of whether the child was thought to fit one of the local ("emic") disorder categories related to child behavior problems (all instruments are described in detail below).

A psychosocial counselor then made a separate visit within 1-7 days to complete a semi-structured diagnostic clinical interview (see additional details below). Each index child's main school teacher was also contacted and asked to complete the DBIS-N and asked whether he/she thought the child fits one of the local ("emic") disorder categories for behavior problems.

Instruments

Disruptive Behavior International Scale—Nepal version (DBIS-N). The DBIS-N was developed using a modified version of the scale development procedures outlined by DeVellis (2011). (Complete study procedures for developing the DBIS-N are described in detail elsewhere (see Chapter 2 in this dissertation.) Candidate items were initially generated through (1) a review of existing structured scales for conduct problems and (2) a local qualitative study including free-listing, in-depth interviews, and focus group discussions with parents, teachers, community leaders and peer informants (Adhikari, 2015). The candidate items were then assessed by local stakeholders (including parents, teachers, and children) to evaluate their relevance in the local community, perceived importance along dimensions identified as relevant to key outcomes of childhood in the local context, and correspondence with the local behavior problem term of "*badmaasib*" (approximate translation: "naughty"). Items were included in the final scale if they met the following conditions: 1) Assessed by local stakeholders as relevant, comprehensible, and appropriate (assessed through focus

group discussions and individual interviews); 2) Perceived by local stakeholders as important predictors of a “dark future” and corresponding to *badmaash* (assessed by structured ratings); 3) Items not meeting the above conditions were also included if they were among the most common symptoms appearing on previously validated instruments.

The initial form of the DBIS-N was piloted in a group of 60 children. Based on these data, items were dropped by applying the following criteria: difficulty with comprehensibility, poor item-test correlation, or extremely common or uncommon (DeVellis, 2011). A 20-item instrument, including 4 items assessing pro-social behaviors and 16 behavior problem items, resulted from the above procedures. Items were rated on a 0-3 scale based on frequency of occurrence (0=“Never” to 3=“Very Often”), and higher overall scores represented a greater number and/or frequency of behavior problems. The highest possible score for the DBIS-N problem subscale was 48.

Kiddie SADS Present and Lifetime (K-SADS-PL). The K-SADS-PL is a semi-structured diagnostic clinical interview that yields categorical psychiatric diagnoses according to criteria outlined in the *Diagnostic and Statistical Manual-III* and *-IV* (Kaufman, Birmaher, Brent, Rao, & Ryan, 1996). For this study, the Behavior Disorders Supplement (including subsections for Oppositional Defiant Disorder and Conduct Disorder) was administered. The questions were translated into Nepali, and minor adaptations were made to fit local conditions (e.g. “Crips” and “Bloods” were replaced with the names of local gangs). One item (forced sex) was removed from the Conduct Disorder section based on feedback from local community members that it was inappropriate to ask about explicit sexual behaviors in children. Each DSM symptom of Oppositional Defiant Disorder and Conduct Disorder is evaluated by the interviewer and rated on a 1-3 scale with 1 representing “not present,” 2 “subthreshold” level, and 3 “threshold” level. The interview also assesses duration and impairment related to the symptoms endorsed.

Clinical interviews were conducted by a psychosocial counselor with the child and (at least) one of the child’s primary caregivers. Psychosocial counselors are the main mental health providers

in Nepal and have completed a 6-month standardized training course (B. A. Kohrt et al., 2011). For this study, the two participating psychosocial counselors also received additional training in interview techniques and use of the K-SADS-PL by the first author. Both counselors conducted practice interviews independently on subjects until their agreement reached 87.8% ($\kappa=0.74$).

Child Functional Impairment Scale. Functional impairment was assessed using the Child Functional Impairment Scale (CFIS), a tool that has previously been used in Nepal to assess a child's ability to complete 11 routine daily functions expected of children in the study age range (Tol et al., 2011). Adult respondents report the extent to which a child's ability to complete each expected daily function has been affected by problems related to his or her behavior. For example, items assess how much difficulty the child had completing her or his household chores, homework, and hygiene routines. Each item is rated on a 0-3 scale, with 0 representing no difficulty and 3 representing difficulty completing the task "most of the time." Therefore, the range of potential scores on the CFIS is 0-33, with 33 representing the highest level of functional impairment across tasks.

Eyberg Child Behavior Inventory. The Eyberg Child Behavior Inventory (ECBI), is a previously-validated 36-item parent-report questionnaire that assesses child behavior problems using a 7-point scale to assess the frequency and a "yes/no" response to assess the current presence of specific problems (Eyberg & Ross, 1978). The ECBI is scored according to "intensity" and "problem" domains, with "intensity" representing the summed numerical scores (range: 36-252, where higher numbers indicate greater "intensity" of behavior problems) and "problem" representing the total number of items that are reported as being a "problem" for the informant (range: 0-36, where higher numbers indicate a greater number of "problem" items) (Eyberg & Ross, 1978). Informants for the ECBI were the primary caregivers of the index children. The investigators translated and back-translated the items, and the author of the ECBI approved the final version.

ADHD Rating Scale-IV. The ADHD Rating Scale-IV is an 18-item checklist assessing DSM-IV symptoms of ADHD (DuPaul et al., 1998). Respondents rate the frequency of each item using a 0-3 scale. Total scores range from 0 to 54, with higher numbers indicating greater symptom

severity. The ADHD-Rating Scale has previously been validated in international samples (M. Burkey et al., 2015; McGoey, DuPaul, Haley, & Shelton, 2007; Zhang, Faries, Vowles, & Michelson, 2005). Informants for the ADHD-Rating Scale-IV were the primary caregivers of the index children. The investigators translated the items into Nepali, and a separate translator back-translated the items to English for review by the study authors.

Ten Questions Plus. The Ten Questions Plus is an 11-item screening tool for the presence of common neurodevelopmental disabilities, including delayed motor development, cognitive impairment, sensory deficits, and epilepsy (Belmont, 1986). Possible scores on the Ten Questions Plus range from 0-11, with higher scores indicating a greater number of neurodevelopmental problems. The Ten Questions Plus has previously been translated into Nepali and used in a neighboring region in the country (Wu et al., 2010). Informants for the Ten Questions Plus were the primary caregivers of the index children.

Emic Nomination Form for Nepali Behavioral Syndromes. The emic nomination form for Nepali behavioral terms was developed for this study based on previous qualitative studies of behavior problems in the study area (M. D. Burkey et al., 2015). The form includes four common Nepali descriptors of children with behavior problems, including: *badmaash* (literal translation: “naughty”); *chakchake* (mischievous), *chuchho* (rude), and *bigreco* (literal translation: “broken”; refers to broken behavior, e.g., socially undesirable behavior). Respondents (primary caregivers and teachers) were asked to rate the extent to which the index child fits the description of each term using a 1-4 scale, with higher scores indicating a better “fit” with the label.

Statistical Analysis

Reliability. Cronbach’s alpha was used to assess internal consistency of items on the DBIS-N. Test-re-test reliability was evaluated by administering the DBIS-N to the same parent by the same RA on two separate occasions within 3-6 days. Inter-rater reliability was assessed by evaluating the consistency of ratings: 1) taken by two RAs interviewing the same parent, and 2) of a teacher and a

parent evaluating the same child. For test-retest reliability and inter-rater reliability, intra-class correlation (ICC) and Pearson's correlation coefficient were calculated.

Construct validity. We evaluated the factor structure of the DBIS-N using exploratory factor analysis. Dimensionality of the scale was evaluated using visual inspection of the scree plot, eigenvalues, and parallel analysis using the *paran* package in Stata. We also calculated the percent of variability explained by the first factor.

Convergent validity was evaluated by calculating Spearman's rank sum correlation (ρ) between the total problem score on the DBIS-N and: 1) the number of symptoms of Oppositional Defiant Disorder and Conduct Disorder (evaluated separately) on the K-SADS-PL, 2) the total score on the Child Functional Impairment Scale, and 3) the problem intensity score on the ECBI. We also planned to assess the association between diagnosis of disruptive behavior disorder on the DBIS-N (defined by cutoff determined from ROC analysis [see below]) and: 1) the diagnosis of Oppositional Defiant Disorder or Conduct Disorder using the K-SADS-PL, and 2) parent and teacher nomination of emic behavior problem terms.

We assessed correlations between the total score on the DBIS-N and other constructs, including ADHD (total score on the ADHD-RS-IV) and neurodevelopmental delays (total score on the Ten Questions Plus).

Criterion validity. We assessed criterion validity using 2 conditions. Our primary criterion was diagnosis of Oppositional Defiant Disorder or Conduct Disorder using the K-SADS-PL. Our secondary criterion was agreement between the parent and teacher nominations of *badmaash*. That is, we considered children to have locally meaningful behavior problems if both the teacher and parent agreed that they were "definitely" *badmaash*. We calculated the area under the curve (AUC) for each criterion using receiver operating characteristic analysis (*roctab* package in Stata). We used the Youden Index (which maximizes the difference between the false negative and false positive rates) to determine the optimal cutoff point for the DBIS-N.

Comparison of assessment methods. We evaluated the correlations between each behavior problem assessment method, including the DBIS-N (parent and teacher reports), nomination using local behavior problem terms, locally developed vignette-based assessment, symptoms of Oppositional Defiant Disorder and Conduct Disorder on the K-SADS-PL, and ECBI score. We were specifically interested in which measurements had the strongest correlations with: 1) functional impairment on the CFIS and 2) parent nomination of “*badmaash*.” We tested for differences between correlations using Fisher r-to-z transformations.

Statistical analysis. Statistical tests for the validity study were performed using Stata 12.0 (Stata Corporation, 1985-2013). We used Pearson’s correlation coefficient to evaluate linear relationships between interval variables. We used Spearman correlations to evaluate correlations between variables in which at least one variable was ordinal.

RESULTS

Sample Characteristics

We screened 421 children from 268 households in the study community. Of these, 268 children (42.0% female; mean age 10.1 [SD 2.8]) were selected for the study and were evaluated with the DBIS-N and other instruments between January and June 2015. Among the children identified for the study, 37.3% were identified by parents and 21.1% by teachers as “probably” or “definitely” *badmaash*. Additional sample characteristics are presented in Table 3.1. The analyses below refer to the whole sample (i.e. those identified as *badmaash* as well as those not identified as *badmaash*), except where noted.

Overview of DBIS-N Score Distributions and Comparison of Parent and Teacher Reports

The mean problem score on the parent report DBIS-N was 6.4 (SD 5.3, range: 0-29) and on the teacher report DBIS-N was 4.2 (SD 5.3, range: 0-41). Parent scores were significantly higher than

teacher scores ($t(267)=5.31, p<0.001$). DBIS-N scores were skewed, with 53.0% of children scoring 5 or less on the parent report and 73.5% scoring 5 or less on the teacher report. There was no difference between mean scores of girls and boys on the parent ($t(265)=0.49, p=0.63$) report; however, there was a significant difference between girls (lower) and boys (higher) on the teacher reports ($t(265)=4.75, p<0.0001$). Total problem scores decreased with increasing age on the parent report ($\beta=-0.30, p=0.007$) but did not change significantly with age on teacher report ($\beta=0.06, p=0.59$). Additional analyses below are based on parents' reports, except where noted.

Clinical Interviews (K-SADS-PL)

Only 1 child (0.4%) met DSM-IV-TR diagnostic criteria on the K-SADS-PL for Oppositional Defiant Disorder, and 2 (0.8%) met criteria for Conduct Disorder. Given the very low prevalence of children meeting full criteria for Oppositional Defiant Disorder or Conduct Disorder, we also evaluated subthreshold symptoms of both disorders on the K-SADS-PL. Two hundred five (76.5%) children had at least one symptom of Oppositional Defiant Disorder at the "subthreshold" level. The mean number of Oppositional Defiant Disorder symptoms endorsed at the subthreshold level was 2.9 (SD 2.6), and subthreshold symptoms were a good predictor of Oppositional Defiant Disorder -related impairment as ascertained using the K-SADS-PL (OR for impairment with each additional subthreshold symptom=1.63 (95% CI: 1.37-1.93, $p<0.001$)). Eighty-four (31.3%) children had at least one symptom of Conduct Disorder at the "subthreshold" level. The mean number of Conduct Disorder symptoms endorsed at the subthreshold level was 0.77 (SD 1.4), and subthreshold symptoms were a good predictor of Conduct Disorder-related impairment as ascertained by the K-SADS-PL (OR for impairment with each additional subthreshold symptom=2.28 (95% CI: 1.55-3.35, $p<0.001$)).

Comparison of Assessment Methods

Compared with the ECBI, the DBIS-N was more strongly correlated with nomination on the locally derived vignette ($\rho=0.61$ vs. 0.53 for the DBIS-N and ECBI, respectively) and nominations of local behavior problem terms: *badmaash* ($\rho=0.57$ vs. 0.50), *chuchbo* ($\rho=0.44$ vs. 0.42), *chakchake* (0.48 vs. 0.44), and *bigreco* ($\rho=0.50$ vs. 0.44). The DBIS-N was less strongly correlated with functional impairment (as measured by the CFI) compared with the ECBI ($r=0.63$ vs. 0.68). However, none of these differences in correlations reached statistical significance (all p 's > 0.15).

DBIS-N problem scores were strongly associated with parent and teacher nominations on all 4 local behavior problem terms (all $p < 0.001$). Correlations between parent reported DBIS-N problem scores and other measures addressing convergent and discriminant validity are given in Table 3.3.

Reliability

The DBIS-N had good internal consistency (Cronbach's alpha: 0.82). The test-retest ICC was 0.93 and $r = 0.93$ (i.e. very strong). ICC of the inter-rater reliability (different RAs interviewing same parent) was 0.62 and $r = 0.68$ (i.e. strong). ICC of the inter-rater reliability (parent and teacher rating same child) was 0.14 and $r = 0.13$ (i.e. weak). (See Table 3.3 for a summary of reliability and factor structure of the DBIS-N).

Factor Structure of the DBIS-N

Exploratory factor analysis revealed a unidimensional factor structure for the DBIS-N in both the parent and teacher reports (eigenvalues for parent report: factor 1= 4.02 , factor 2= 0.6). The first factor accounted for 83.8% of the variance in the parent report and 82.1% in the teacher report (see Table 3.3).

Criterion Validity

Given the small number of diagnoses of Oppositional Defiant Disorder (n=1) and Conduct Disorder (n=2) on the K-SADS-PL interviews, we also evaluated AUC using alternate criteria, including: nomination (by parent, teacher, and both combined) using local behavior problem terms and ECBI cut-off scores (using both previously reported cut-offs (i.e. 127 (Eyberg & Ross, 1978)) and 2 standard deviations above the sample mean). Among the criteria evaluated, AUC ranged from 0.64 to 0.99, and classification accuracy ranged from 58.2% to 97.0% (see Table 3.4).

DISCUSSION

Our evaluation of the DBIS-N support its reliability, construct validity, and trend toward improved convergence with local behavior problem constructs compared with a translated international tool, the ECBI. The DBIS-N, a scale developed using local stakeholder participation, demonstrated good internal reliability, a unidimensional factor structure, good discriminant validity, and good convergent validity with parental nomination of behavior problems and functional impairment. Due to the limited number of cases of Oppositional Defiant Disorder and Conduct Disorder identified through clinical interviews, we were unable to assess the criterion validity of the DBIS-N as planned. However, alternate criteria suggested good classification accuracy compared with both local nominations and an externally derived validated scale for behavior problems (i.e. the ECBI). Our findings support the construct validity and potential usefulness of a scale developed using local stakeholder ratings to account for local behavioral expectations related to DBDs.

Similar to previous scale development efforts for behavior problems in low-income country settings (Ng et al, 2014), there was poor convergence with clinical symptom assessments of Oppositional Defiant Disorder and Conduct Disorder. The correlation between scores on the DBIS-N and symptoms of Oppositional Defiant Disorder and Conduct Disorder on the K-SADS-PL were only moderate and weak, respectively. These differences suggest the importance of evaluating alternative construct definitions of behavior problems (other than those used in structured clinical

interviews developed in Western contexts) and/or considering alternative methods of case ascertainment in low-income country contexts.

Our study is one of few validation studies of a scale for child behavior problems performed in a low-income country setting that utilized representative population-based sampling. Compared with commonly used practices (e.g. comparing an “extreme” clinical group likely to have the condition of interest based on attendance in a clinic or nomination by community members), a representative sample allowed us to assess how the instrument functions in actual screening settings in which pre-test probability is unknown. Our two-stage sampling involving initial screening and probability-based selection had the benefits of both an enriched sample (therefore increasing statistical power) and a representative sample. Therefore, our estimates of classification accuracy are more likely to represent the actual functioning of the instrument in actual practice situations evaluating children with a wide range of problem severity.

Unexpected Findings and Study Limitations

An unexpected finding in our study was the very poor correlation between teacher and parent reports on the DBIS-N. While poor agreement between parents and teachers on child mental health measurement instruments is a common occurrence, our correlations were lower than other studies (Stanger & Lewis, 1993) and much lower than suggested by the other reliability measurements in our study. One possible explanation is that teachers and parents have different thresholds for considering behaviors to be problematic. This explanation is supported by the significantly lower mean scores on teacher compared with parent reports. However, this does not explain the poor correlation between overall scores. Another possible explanation is that teachers may interpret behaviors through different lenses. For example, while there was no significant difference in total scores by gender for parent reports, in teacher reports boys scored significantly higher (i.e. more problems) than girls.

Finally, the scores may have differed substantially due to measurement errors. We experienced difficulties in correctly identifying children to the teachers who were rating them. We noted several instances in which the teacher who a parent indicated as their child's teacher did not recognize the name of the child. While we attempted to remedy this problem by returning to the family to confirm the teacher's name, school, and grade, some of the children may have been misidentified. This scenario would lead to information bias that would most likely result in attenuation of the true correlation between parent and teacher ratings. To account for this potential inaccuracy, we relied mostly on results of the parent reports in the analyses for this paper.

Our study was also limited by the small number of cases identified using the K-SADS-PL clinical interview, thus precluding a traditional analysis of criterion validity. (However, we have noted the potential limitations of DSM-based interviews and diagnostic categories in the Introduction.) The low rate of qualifying symptoms identified may reflect a low rate of child behavior problems in the study population, social desirability bias by the respondent (which may vary by ascertainment method), or a different calibration for distinguishing between sub-threshold and "threshold" symptoms by the clinical interviewers in the study. Compared to samples of children of similar ages in the U.S. (Robinson, Eyberg, & Ross, 1980) and Norway (Reedtz et al., 2008), the Nepali children in this study also scored substantially lower on the problem intensity scale of the ECBI. These cross-national comparisons support the possibility of different rates of problem behavior, social desirability bias, different parental thresholds (Weisz et al., 1988), or a combination of contributors. However, the higher rate of problem endorsement by parents (compared to teachers) in our study appears make social desirability bias a less likely explanation for the low prevalence of clinical diagnoses in this enriched sample.

Alternatively, the low rate of diagnoses may reflect limitations of the K-SADS-PL with culture-specific behaviors that fail to capture children with behavior problems in contexts that differ from those similar to the one in which the instrument was developed. This represents a challenge for validation when the clinical interview is also biased toward culture-specific behaviors. To address this

limitation, we used any symptom endorsement on the K-SADS-PL (i.e. including at the “subthreshold” level), which resulted in weak to moderate correlations with the DBIS-N, functional impairment, and other assessments of behavior problems. These findings may suggest that problems in using the K-SADS-PL were related not only to the threshold applied, but also to the range of behaviors surveyed.

Conclusions

This study supports the reliability and construct validity of a behavior problem measurement tool developed using local stakeholder ratings to account for behavioral norms in non-Western cultural settings. To our knowledge, this is the first measure of child behavior problems developed based on empirical observations and validated in a population-based sample in South Asia. Our findings suggest that the DBIS-N measured a meaningful construct that was associated with local concepts of behavior problems and with impairment in local role expectations of children. Our results lend support to the DBIS-N as a promising brief instrument for the assessment of locally prioritized behavior problems in Nepal. Moreover, the use of systematic procedures with local stakeholder participation may also represent a more widely applicable process for developing locally adapted scales in other non-Western cultural settings.

TABLES AND FIGURES

Table 3.1: Study Sample Characteristics and Differences between Children Screened Negative vs. Positive for Behavior Problems

Characteristic	Screen negative¹ (N=137) N (%)	Screen positive¹ (N=131) N (%)	Overall Sample (N=268) N (%)
Sex (% female)	53 (39.0)	59 (45.0)	112 (42.0)
Mean Age (SD)	10.5 (2.9)*	9.7 (2.7)*	10.2 (2.8)
<i>Parent's marital status</i>			
Married	132 (96.4)	126 (96.2)	258 (96.3)
Divorced	0 (0)	1 (0.8)	1 (0.4)
Widowed	3 (2.2)	2 (1.53)	5 (1.9)
Separated	1 (0.7)	0 (0)	1 (0.4)
Re-married	1 (0.7)	2 (1.5)	3 (1.1)
<i>Family type</i>			
Nuclear family	81 (59.1)	74 (57.4)	155 (58.3)
Extended family	56 (40.9)	55 (42.6)	111 (41.7)
<i>Caste/ethnicity</i>			
Bahun/Chhetri	44 (32.4)	46 (35.1)	90 (33.6)
Dalit (Nepali, BK)	8 (5.9)	5 (3.8)	14 (5.2)
Tharu	37 (27.2)	31 (23.7)	68 (25.4)
Kumal	24 (17.7)	34 (26.0)	58 (21.6)
Others (Newar, Magar)	23 (16.9)	15 (11.5)	38 (14.2)
<i>Religion</i>			
Hindu	121 (88.3)	123 (93.4)	244 (91.0)
Buddhist	13 (9.5)	6 (4.6)	19 (7.1)
Christian	3 (2.2)	2 (1.5)	5 (1.9)
Parent working overseas	44 (32.1)*	61 (46.6)*	105 (39.2)

¹ Screening status based on initial screening using vignettes

* Significant (unadjusted) difference between screen-negative and screen-positive at $p < 0.05$ level (by t-test for continuous variables, chi-squared test for categorical variables)

Table 3.2: Correlations between Parent Report Measures: Convergent & Discriminant Validity

Measure	1	2*	3*	4	5	6	7	8	9
<i>Locally-derived behavior problem measures (convergent validity)</i>									
1 Parent report DBIS-N	--								
2 Vignette-based nomination*	0.59	--							
3 Behavior problem term nomination* (<i>badmaasb</i>)	0.57	0.55	--						
<i>Externally-derived behavior problem measures (convergent validity)</i>									
4 ECBI	0.84	0.53	0.53	--					
5 ODD symptoms on K-SADS-PL**	0.58	0.39	0.41	0.59	--				
6 CD symptoms on K-SADS-PL**	0.44	0.31	0.36	0.45	0.60	--			
7 ADHD Rating Scale-IV (total score)	0.75	0.46	0.40	0.82	0.45	0.39	--		
<i>Functional impairment (convergent validity)</i>									
8 Functional impairment (CFI)	0.63	0.36	0.30	0.68	0.35	0.32	0.76	--	
<i>Different constructs (discriminant validity)</i>									
9 Ten Questions Plus (total score)	-0.27	-0.01	-0.09	-0.34	-0.26	-0.19	-0.41	-0.38	--
10 DBIS-N Pro-social subscale score*	-0.59	-0.49	-0.44	-0.62	-0.39	-0.31	-0.65	-0.57	0.30

*Correlation calculated using Spearman's rank-sum correlation coefficient for ordinal variables

**Calculated using number of 'subthreshold'- and 'threshold'-level symptoms endorsed

Abbreviations: DBIS-N: Disruptive Behavior International Scale—Nepal version; ECBI: Eyberg Child Behavior Inventory; K-SADS-PL: Kiddie-SADS-Present and Lifetime version; CFI: Child Functional Impairment scale; ODD: Oppositional Defiant Disorder; CD: Conduct Disorder; ADHD: Attention Deficit/Hyperactivity Disorder

Table 3.3: Internal Reliability and Factor Structure of the DBIS-N Scale, Sub-scales, and Short Form

	DBIS-N problem sub- scale	DBIS-N pro- social sub- scale	Full DBIS-N Scale*	DBIS-N Short form
Number of items	16	4	20	10
<i>Parent reports</i>				
Cronbach's alpha	0.82	0.76	0.86	0.84
% variance explained by 1 st factor	83.8%	>100%	72.1%	>100%
Factor loadings (1 st factor)	0.07-0.70	0.61-0.76	0.07-0.71	0.41-0.69
<i>Teacher reports</i>				
Cronbach's alpha	0.89	0.66	0.87	0.86
% variance explained by 1 st factor	82.1%	>100%	73.0%	99.5%
Factor loadings (1 st factor)	0.42-0.78	0.41-0.70	0.21-0.78	0.47-0.78

Full DBIS-N Scale includes 4 pro-social items in the DBIS-N pro-social subscale (scoring was inverted for pro-social items)

Table 3.4: Area Under the Curve (AUC) Results for Multiple Criteria

	Number of cases (% total)	CFI score of cases mean (SD)	AUC	Cutoff score*	Classification accuracy
ECBI Problem Score Cutoff	4 (1.5)	19.0 (2.9)	0.99 (0.99 to 1.00)	17	97.0%
>2SD on ECBI	8 (3.0)	16.0 (7.0)	0.99 (0.98 to 1.00)	17	97.0%
K-SADS-PL ODD or CD diagnosis	3 (1.1)	12.3 (7.9)	0.90 (0.73 to 1.00)	17	94.8%
Parent nomination (<i>badmaash</i>)	70 (26.1)	7.5 (6.3)	0.83 (0.77 to 0.88)	7	74.3%
Teacher nomination (<i>badmaash</i>)	30 (11.5)	6.4 (6.3)	0.64 (0.53 to 0.75)	6	58.2%
Teacher & Parent agree child is <i>badmaash</i>	13 (5.0)	8.6 (6.6)	0.83 (0.73 to 0.93)	10	80.1%

*Cutoff scores calculated using the Youden Index in Stata

Abbreviations: CFI: Child Functional Impairment scale; ECBI: Eyberg Child Behavior Inventory; K-SADS-PL: Kiddie-SADS-Present and Lifetime version; ODD: Oppositional Defiant Disorder; CD: Conduct Disorder

CONCLUSIONS

Summary of Findings

The studies described in this dissertation provide an initial step toward understanding the influence of the physical, social, and symbolic context of child development on locally meaningful definitions of behavior problems. Investigations of local settings, practices, and systems of meaning helped to make sense of the significance of behavior problems to caregivers, illuminated context-specific risk and resilience processes, and identified local mitigation strategies that have potential for applications in interventions. The findings of Chapters 2 and 3 also suggest the feasibility and utility of using structured methods with local participation to develop measurement tools that address stakeholders' concerns about child behavior problems. Specifically, scale development methods that account for local stakeholders' concerns about child behavior may lead to assessment tools that measure coherent local constructs associated with impaired functioning.

Chapter 1. The study in Chapter 1 used in-depth interviews, key informant interviews, pile-sorting interviews and field observations to identify parents', teachers' and peers' concepts about expected child roles and behaviors and deviations from these expectations. The respondents identified a consistent set of daily role expectations that varied somewhat according to the child's age, sex, and family's economic position. Respondents then identified patterns of child behavior that were concerning to them. Their concerns about child behavior problems were related to anticipated consequences to the child's immediate safety (e.g., fears of reprisal); the child's future prospects for academic and economic success, marriage, and personal reputation (characterized by participants as a "bright" vs. "dark" future); and the family's social prestige (*iʒʒat*). Behavioral patterns that threatened any of these consequences were considered to be problematic and requiring intervention from parents or other older family members, teachers, or older neighbors. The types of behaviors that were expected to bring consequences, the severity of those consequences, and fitting responses were substantially different for boys compared with girls.

Patterns of child behavior problems appeared to be influenced by opportunities and barriers created by the physical and social settings and caregiver customs related to childrearing. The findings from this study suggest that the developmental niche may be a useful framework for understanding how ecocultural contextual factors influence differential definitions, expressions of, and responses to child behavior problems across settings.

Chapter 2. Chapter 2 built on the findings from Chapter 1 with the goal of developing a contextually adapted scale to measure child behavior problems. We found that combining items from local interviews and a review of existing validated tools led to a larger initial item pool than other studies using free-list interviews alone (Betancourt et al., 2009; Ng et al., 2014). Moreover, parents, teachers, and peers rated a number of items that were identified from externally derived scales as more “important” and “relevant” than items identified through interviews with local participants. This finding highlights an important limitation of free-list-only methods for symptom identification: free-lists are not exhaustive of local concerns and often identify only “prototypical” items within a category (Thompson & Juan, 2006).

The resulting pilot scale demonstrated good internal consistency in a small development sample in the local community. Testing in the development sample also assisted in identifying items that were difficult to understand and/or unacceptable to ask in the local cultural context. Thus, we conclude that combining locally and externally derived items may lead to more thorough coverage of the construct of interest, and that obtaining ratings from local stakeholders is an efficient and effective way to systematically evaluate the importance and relevance of candidate items. This study appears to represent an advance over existing free-list based methods by providing a template for selecting important and relevant scale items from both locally and internationally derived items using local participation.

DeVellis (2011) suggests that thorough coverage of the construct of interest and selection of items by knowledgeable experts are important steps in developing valid scales. Our protocol was successful in creating a larger initial pool of items compared with studies in LMIC that used free-lists

only (Betancourt et al., 2009; Ng et al., 2014). In our study, we consulted local caregivers as “experts” for item prioritization given the relevance of their concerns to the construct of interest. Local key informants have previously been used in scale development for global mental health, though their participation was typically not systematic or used as a major criterion for item selection (Bass, Ryder, Lammers, Mukaba, & Bolton, 2008; Betancourt et al., 2009; Ng et al., 2014). The findings of our study supported the use of local informants for item selection: parents’ ratings of item importance and severity were strongly correlated with the observed “severity” of items, as estimated using item difficulty parameters derived from an Item Response Theory-based analysis.

Chapter 3. In Chapter 3, we evaluated the psychometric properties and construct validity of the scale developed in Chapter 2, using a population-based sample in the local community. The scale—the Disruptive Behavior International Scale—Nepal version (DBIS-N)—showed good internal consistency and good test-retest reliability. It had a unidimensional factor structure, suggesting that it measured a unified construct. Scores on the DBIS-N were strongly correlated with scores on the Eyberg Child Behavior Inventory (ECBI), a widely used, previously validated behavior problem scale (Eyberg & Ross, 1978). Compared with the ECBI, DBIS-N scores were more strongly correlated with nominations and vignette-based assessments of local behavior problems. The study was limited by very low prevalence of Oppositional Defiant Disorder or Conduct Disorder symptoms or diagnoses in clinical interviews, which were the planned outcomes for criterion validity. This finding may underscore the challenges of applying DSM-based assessments of behavior problems in LMIC settings. To the best of our knowledge, this is the largest validation study of a locally developed instrument for child behavior problems to be conducted in South Asia to date.

Our study is also one of few validation studies in global mental health to use a representative population-based sample. An advantage of population-based sampling in validation studies is that it provides a more accurate prediction of the scale’s discriminatory functioning in actual practice settings (especially screening applications). In contrast, typical methods restrict recruitment to high- and low-risk samples (e.g. subjects nominated by local informants as having vs. not having the

disorder of interest) (Goodman, 1997) and may therefore provide limited information about children with intermediate levels of symptoms.

Future Research Directions

Our findings also suggest a number of additional research questions about the nature of, risk and protective processes for, course of, and effective prevention and treatment strategies for behavior problems in this and other LMIC settings. Future research could advance understanding about the influence of the developmental niche on child behavior problems by incorporating observed behavioral data. Structured observational data would help to quantify where children spend time; who they spend time with; and what parents, teachers, and other caregivers do to realize their socialization goals for their children. Of specific interest would be in-depth case studies that include direct observations of how caregivers respond to children when they exhibit behavior problems. An observational study could also evaluate the extent to which *samjhaune* is practiced and further delineate its applications. Case studies could also evaluate whether caregivers use different mitigation strategies to deal with children with more severe behavior problems (e.g., those labeled as *badmaash*). Future research in other LMIC settings could also test the generalizability of the developmental niche as a useful model to illuminate beliefs and practices related to behavior problems in other settings.

The developmental niche may also be a useful framework to evaluate gender differences in the frequency and presentation of behavior problems. Gender differences are frequently reported in epidemiologic studies and are often explained in studies as being the result of biologically determined processes, with little mention of the social context of gender in development (Loeber et al., 2000). Our findings suggest that school-age boys and girls in rural Nepal have different developmental experiences (e.g., role expectations, settings frequented, disciplinary experiences) that may affect their development of behavior problems. Gender has previously been described as a key “second-order effect” in the developmental niche, the meaning and consequences of which are influenced by the context (Super & Harkness, 2002). Our findings, if extended to younger children in Nepal and

replicated in other settings, suggest potential mechanisms of differential socialization of child behavior by gender that could help to explain the previously observed epidemiologic differences.

Our qualitative study has also suggested risk and protective processes relevant to LMIC settings that could be evaluated in future research. For example, there has been little research about the relationship between poverty and child behavior problems outside of high-income, Western settings. Our findings suggest that poverty may be a risk factor in the rural Nepali setting, and also suggests potential pathways for this effect (e.g., decreased parental availability for supervision). Given widespread poverty combined with between-family variability in wealth, studies in LMIC have the opportunity to compare the effects of relative vs. absolute poverty as risk factors for behavior problems. Longitudinal population-based cohort studies in LMIC are needed to test and quantify the magnitude of risk and protective factors for child behavior problems (and other mental disorders).

Chapters 2 and 3 demonstrated a replicable process for incorporating local behavioral concerns into the development of measurement scales for child behavior problems. Key questions for future research relate to the utility of the procedures we outlined when applied in other socio-cultural contexts and to other mental disorders. The procedures outlined in Chapter 2 provide a potential framework for cross-cultural comparisons of the priority ascribed to a set of behavior problems. With an expanded comparative database, one could test the extent to which parents' concerns about child behavior are shared vs. setting-specific.

Our validation study (Chapter 3) also found very low rates of Oppositional Defiant Disorder and Conduct Disorder diagnoses using a commonly used structured clinical diagnostic interview (KSADS-PL (Kaufman et al., 1996)) administered by psychosocial counselors. Another LMIC-based study (in Rwanda) also found poor correlation between a local behavior problem syndrome and the Conduct Disorder diagnosis using a DSM-based structured clinical interview (Ng et al., 2014). Studies are needed that evaluate possible reasons for differences between locally developed structured instruments and clinical interview-ascertained diagnoses of behavior problems in LMIC.

Final Conclusions

In one of the most comprehensive series of studies of child behavior problems in a low-income, non-Western setting to date, we found evidence suggesting that local stakeholders had shared ideas about the causes, consequences, and ways to effectively mitigate child behavior problems. Many of these concepts varied from those commonly presented in the existing psychiatric literature that has primarily developed out of clinical experience and research in high-income, Western settings. We found that parents, teachers, and peers were concerned about children's behavioral patterns for reasons that were embedded in local systems of symbolic meaning, social relationships, role expectations, and caregiver customs. Incorporating parents' feedback about the importance and relevance of specific behavior problems in the scale development process resulted in a scale that corresponded with local idioms for behavior problems and impairment in locally defined role expectations. Future measurement development efforts might also benefit from greater involvement of local participants in efforts to enhance validity and accuracy.

In summary, greater attention to the ecocultural context of child development, including parental beliefs, may lead to more valid definitions, measurements that are more relevant to local stakeholders, and more acceptable and effective interventions for child behavior problems. With increasing global attention to child mental health, there is an urgent need to consider the “child-in-context” when defining problems, establishing priorities, and selecting targets and treatments for implementation.

References

- Achenbach, Thomas M, Vermont, Vt.). Department of Psychiatry University of, & Edelbrock, Craig S. (1983). *Manual for the child behavior checklist and revised child behavior profile*: Department of Psychiatry of the University of Vermont.
- Adhikari, Ramesh P, Upadhaya, Nawaraj, Gurung, Dristy, Luitel, Nagendra P, Burkey, Matthew D, Kohrt, Brandon A, & Jordans, Mark JD. (2015). Perceived behavioral problems of school aged children in rural Nepal: a qualitative study. *Child and Adolescent Psychiatry and Mental Health*, 9(25), 1-9. doi: 10.1186/s13034-015-0061-8
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders, DSM-5*. Arlington, VA.
- Arminio, Jan L, & Hultgren, Francine H. (2002). Breaking Out from the Shadow: The Question of Criteria in Qualitative Research. *Journal of College Student Development*, 43(4), 446-460.
- Arnett, Jeffrey J. (2008). The neglected 95%: why American psychology needs to become less American. *American Psychologist*, 63(7), 602.
- Bass, Judith K, Ryder, Robert W, Lammers, Marie-Christine, Mukaba, Thibaut N, & Bolton, Paul A. (2008). Post-partum depression in Kinshasa, Democratic Republic of Congo: Validation of a concept using a mixed-methods cross-cultural approach. *Tropical Medicine and International Health*, 13(12), 1534-1542.
- Belmont, L. (1986). *Screening for severe mental retardation in developing countries: the international pilot study of severe childhood disability*. Paper presented at the Science and service in mental retardation: proceedings of the Seventh Congress of the International Association for the Scientific Study of Mental Deficiency. London: Methuen Ltd.
- Betancourt, Theresa S, Bass, Judith, Borisova, Ivelina, Neugebauer, Richard, Spielman, Liesbeth, Onyango, Grace, & Bolton, Paul. (2009). Assessing local instrument reliability and validity: a

- field-based example from northern Uganda. *Social Psychiatry and Psychiatric Epidemiology*, 44(8), 685-692.
- Bolton, Paul, & Tang, Alice M. (2002). An alternative approach to cross-cultural function assessment. *Social Psychiatry and Psychiatric Epidemiology*, 37(11), 537-543.
- Borgatti, Stephen P. (1999). Elicitation techniques for cultural domain analysis. In J. J. Schensul & M. D. LeCompte (Eds.), *Enhanced ethnographic methods: audiovisual techniques, focused group interviews, and elicitation techniques* (Vol. 3, pp. 1-26). Walnut Creek, CA: Altamira Press.
- Bourdieu, Pierre, & Thompson, John B. (1991). *Language and symbolic power*. Harvard University Press.
- Boyle, Michael H, & Offord, David R. (1991). Psychiatric disorder and substance use in adolescence. *The Canadian Journal of Psychiatry/La Revue canadienne de psychiatrie*.
- Brewer, Devon D. (2002). Supplementary interviewing techniques to maximize output in free listing tasks. *Field methods*, 14(1), 108-118.
- Bronfenbrenner, Urie. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, Urie. (2005). *Making human beings human: Bioecological perspectives on human development*. Sage.
- Burke, Jeffrey D, Hipwell, Alison E, & Loeber, Rolf. (2010). Dimensions of oppositional defiant disorder as predictors of depression and conduct disorder in preadolescent girls. *Journal of the American Academy of Child and Adolescent Psychiatry*, 49(5), 484-492.
- Burke, Jeffrey D, Loeber, Rolf, Lahey, Benjamin B, & Rathouz, Paul J. (2005). Developmental transitions among affective and behavioral disorders in adolescent boys. *Journal of Child Psychology and Psychiatry*, 46(11), 1200-1210.
- Burkey, Matthew D, Ghimire, L, Adhikari, R, Luitel, Nagendra P, Jordans, Mark J, Wissow, Lawrence S, & Kohrt, Brandon A. (2015). *Roles of Cultural Context in Definitions of and Responses to Conduct Problems in Children: A Case Study from Nepal*. Paper presented at the Society for the Study of Psychiatry and Culture, Providence, RI.

- Burkey, MD, Murray, SM, Bangirana, P, Familiar, I, Opoka, RO, Nakasujja, N, . . . Bass, JK. (2015). Executive function and attention-deficit/hyperactivity disorder in Ugandan children with perinatal HIV exposure. *Global Mental Health*, 2, e4.
- Canino, Glorisa, Polanczyk, Guilherme, Bauermeister, Jose J, Rohde, Luis A, & Frick, Paul J. (2010). Does the prevalence of CD and ODD vary across cultures? *Social Psychiatry and Psychiatric Epidemiology*, 45(7), 695-704.
- Central Bureau of Statistics. (2011). *National Population and Housing Census 2011*. Kathmandu, Nepal: Government of Nepal.
- Cohen, P, & Flory, M. (1998). Issues in the disruptive behavior disorders: attention deficit disorder without hyperactivity and the differential validity of oppositional defiant and conduct disorders. *DSM-IV Sourcebook*, 4, 455-463.
- Cole, Pamela M, Bruschi, Carole J, & Tamang, Babu L. (2002). Cultural differences in children's emotional reactions to difficult situations. *Child Development*, 73(3), 983-996.
- Cole, Pamela M, & Tamang, Babu Lal. (1998). Nepali children's ideas about emotional displays in hypothetical challenges. *Developmental Psychology*, 34(4), 640-646.
- Cole, Pamela M, Tamang, Babu Lal, & Shrestha, Srijana. (2006). Cultural variations in the socialization of young children's anger and shame. *Child Development*, 77(5), 1237-1251.
- Collins, P. Y., Patel, V., Joestl, S. S., March, D., Insel, T. R., Daar, A. S., . . . Stein, D. J. (2011). Grand challenges in global mental health. *Nature*, 475(7354), 27-30. doi: 10.1038/475027a
- Conger, Rand D, & Elder Jr, Glen H. (1994). Families in troubled times: The Iowa youth and families project. *Families in troubled times: Adapting to change in rural America*, 3-19.
- Conners, C Keith. (1997). *Conners' Parent Rating Scale--Revised (Long version)*. North Tonawanda, NY: Multi-Health Systems
- Craighead, W Edward, Miklowitz, David J, & Craighead, Linda W. (2008). *Psychopathology: History, diagnosis, and empirical foundations*: John Wiley & Sons.

- Crijnen, A. A., Achenbach, T. M., & Verhulst, F. C. (1997). Comparisons of problems reported by parents of children in 12 cultures: total problems, externalizing, and internalizing. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36(9), 1269-1277. doi: 10.1097/00004583-199709000-00020
- De Ayala, Rafael Jaime. (2013). *Theory and practice of item response theory*: Guilford Publications.
- DeVellis, Robert F. (2011). *Scale development: Theory and applications* (Vol. 26). Los Angeles: Sage Publications.
- DuPaul, George J, Power, Thomas J, Anastopoulos, Arthur D, & Reid, Robert. (1998). *ADHD Rating Scale—IV: Checklists, norms, and clinical interpretation*. New York: Guilford Press.
- Erford, BT. (1993). Manual for the disruptive behavior rating scale. *East Aurora, NY: Slosson*.
- Eyberg, Sheila M, & Ross, Arthur W. (1978). Assessment of child behavior problems: The validation of a new inventory. *Journal of Clinical Child and Adolescent Psychology*, 7(2), 113-116.
- Flaherty, Joseph A, Gaviria, F Moises, Pathak, Dev, Mitchell, Timothy, Wintrob, Ronald, Richman, Judith A, & Birz, Susan. (1988). Developing instruments for cross-cultural psychiatric research. *The Journal of nervous and mental disease*, 176(5), 260-263.
- Forehand, Rex, & Kotchick, Beth A. (1996). Cultural diversity: A wake-up call for parent training. *Behavior Therapy*, 27(2), 187-206.
- Foster, Sharon L, & Mash, Eric J. (1999). Assessing social validity in clinical treatment research: Issues and procedures. *Journal of Consulting and Clinical Psychology*, 67(3), 308.
- Furlong, Mairead, McGilloway, Sinead, Bywater, Tracey, Hutchings, Judy, Smith, Susan M, & Donnelly, Michael. (2012). *Behavioural and cognitive-behavioural group-based parenting programmes for early-onset conduct problems in children aged 3 to 12 years*: Wiley Online Library.
- Gaines, Atwood D. (1992). From DSM-I to III-R; Voices of self, mastery and the other: A cultural constructivist reading of US Psychiatric classification. *Social Science and Medicine*, 35(1), 3-24.
- Goffman, Erving. (1959). The presentation of self in everyday life. *Garden City, NY*.

- Goodman, Robert. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry*, 38(5), 581-586.
- Grantham-McGregor, Sally, Cheung, Yin Bun, Cueto, Santiago, Glewwe, Paul, Richter, Linda, & Strupp, Barbara. (2007). Developmental potential in the first 5 years for children in developing countries. *The Lancet*, 369(9555), 60-70.
- Harkness, Sara, & Super, Charles M. (1992). Parental ethnotheories in action. *Parental belief systems: The psychological consequences for children*, 2, 373-392.
- Harkness, Sara, & Super, Charles M. (1996). *Parents cultural belief systems: Their origins, expressions, and consequences*. New York: Guilford Press.
- Henrich, Joseph, Heine, Steven J, & Norenzayan, Ara. (2010). The weirdest people in the world. *Behavioral and Brain Sciences*, 33(2-3), 61-83.
- Hruschka, D. J., Kohrt, B. A., & Worthman, C. M. (2005). Estimating between- and within-individual variation in cortisol levels using multilevel models. *Psychoneuroendocrinology*, 30(7), 698-714. doi: 10.1016/j.psyneuen.2005.03.002
- Huesmann, L Rowell, Eron, Leonard D, & Yarmel, Patty W. (1987). Intellectual functioning and aggression. *Journal of Personality and Social Psychology*, 52(1), 232.
- Insel, Thomas R. (2013). Directors blog: transforming diagnosis. Retrieved January 3, 2014, from <http://www.nimh.nih.gov/about/director/2013/transforming-diagnosis.shtml>
- Jellinek, Michael S, Murphy, J Michael, Robinson, John, Feins, Anita, Lamb, Sharon, & Fenton, Terrence. (1988). Pediatric Symptom Checklist: screening school-age children for psychosocial dysfunction. *The Journal of pediatrics*, 112(2), 201-209.
- Jordans, M. J., Luitel, N. P., Pokharel, P., & Patel, V. (2015). Development and pilot testing of a mental health care plan in Nepal. *British Journal of Psychiatry*, (in press).
- Kaufman, J, Birmaher, B, Brent, D, Rao, U, & Ryan, N. (1996). Kiddie-Sads-present and Lifetime version (K-SADS-PL). *Pittsburgh, University of Pittsburgh, School of Medicine*.

- Kessler, Ronald C, Angermeyer, Matthias, Anthony, James C, de Graaf, Ron, Demyttenaere, Koen, Gasquet, Isabelle, . . . Haro, Josep Maria. (2007). Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry, 6*(3), 168.
- Kessler, Ronald C, Berglund, Patricia, Demler, Olga, Jin, Robert, Merikangas, Kathleen R, & Walters, Ellen E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 593.
- Kirmayer, Laurence J, & Crafa, Daina. (2014). What kind of science for psychiatry? *Name: Frontiers in Human Neuroscience, 8*, 435.
- Kirmayer, Laurence J, & Swartz, Leslie. (2013). Culture and Global Mental Health. In V. Patel, M. Prince, A. Cohen & H. Minas (Eds.), *Global Mental Health: Principles and Practice*. Oxford University Press.
- Klasen, Henrikje, & Crombag, Anne-Claire. (2013). What works where? A systematic review of child and adolescent mental health interventions for low and middle income countries. *Social Psychiatry and Psychiatric Epidemiology, 48*(4), 595-611.
- Kleinman, Arthur. (1987). Anthropology and psychiatry. The role of culture in cross-cultural research on illness. *The British Journal of Psychiatry, 151*(4), 447-454.
- Kleinman, Arthur. (2008). *Rethinking psychiatry*: Simon and Schuster.
- Kleinman, Arthur M. (1977). Depression, somatization and the “new cross-cultural psychiatry”. *Social Science and Medicine, 11*(1), 3-9.
- Kohrt, B. A., Jordans, M. J. D., Tol, W. A., Luitel, N. P., Maharjan, S. M., & Upadhaya, N. (2011). Validation of cross-cultural child mental health and psychosocial research instruments: adapting the Depression Self-Rating Scale and Child PTSD Symptom Scale in Nepal. *BMC Psychiatry, 11*(1), 1-17.
- Kohrt, Brandon A, Hruschka, Daniel J, Kohrt, Holbrook E, Carrion, Victor G, Waldman, Irwin D, & Worthman, Carol M. (2015). Child abuse, disruptive behavior disorders, depression, and

- salivary cortisol levels among institutionalized and community-residing boys in Mongolia. *Asia-Pacific Psychiatry*, 7(1), 7-19.
- Lau, Anna S. (2006). Making the Case for Selective and Directed Cultural Adaptations of Evidence-Based Treatments: Examples From Parent Training. *Clinical Psychology: Science and Practice*, 13(4), 295-310.
- LeVine, Robert Alan, & New, Rebecca Staples. (2008). *Anthropology and child development: A cross-cultural reader*. Blackwell Pub.
- Loeber, Rolf, Burke, Jeffrey D, Lahey, Benjamin B, Winters, Alaina, & Zera, Marcie. (2000). Oppositional defiant and conduct disorder: a review of the past 10 years, part I. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39(12), 1468-1484.
- Loeber, Rolf, & Farrington, David P. (2000). Young children who commit crime: Epidemiology, developmental origins, risk factors, early interventions, and policy implications. *Development and Psychopathology*, 12(04), 737-762.
- Lund, Crick, Tomlinson, Mark, De Silva, Mary, Fekadu, Abebaw, Shidhaye, Rahul, Jordans, Mark, . . . Prince, Martin. (2012). PRIME: a programme to reduce the treatment gap for mental disorders in five low-and middle-income countries. *PLoS Medicine*, 9(12), e1001359.
- McGoey, K. E., DuPaul, G. J., Haley, E., & Shelton, T. L. (2007). Parent and teacher ratings of attention-deficit/hyperactivity disorder in preschool: the ADHD Rating Scale-IV Preschool Version. *Journal of Psychopathology and Behavioral Assessment*, 29(4), 269-276.
- McHugh, Paul R. (2005). Striving for coherence. *JAMA: The Journal of the American Medical Association*, 293(20), 2526-2528.
- Miller, Laurie S, Klein, Rachel G, Piacentini, John, Abikoff, Howard, Shah, Manoj R, Samoilov, Anna, & Guardino, Mary. (1995). The New York teacher rating scale for disruptive and antisocial behavior. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34(3), 359-370.

- Murray, Christopher JL, Vos, Theo, Lozano, Rafael, Naghavi, Mohsen, Flaxman, Abraham D, Michaud, Catherine, . . . Abdalla, Safa. (2013). Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, 380(9859), 2197-2223.
- Nepal, UNDP. (2009). Nepal Human Development Report 2009: Kathmandu: United Nations Development Programme.
- Ng, Lauren C, Kanyanganzi, Frederick, Munyanah, Morris, Mushashi, Christine, & Betancourt, Theresa S. (2014). Developing and Validating the Youth Conduct Problems Scale-Rwanda: A Mixed Methods Approach. *PloS One*, 9(6), e100549.
- Nock, M. K., Borges, G., Bromet, E. J., Alonso, J., Angermeyer, M., Beautrais, A., . . . Williams, D. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *British Journal of Psychiatry*, 192(2), 98-105. doi: 10.1192/bjp.bp.107.040113
- Olweus, Dan. (1979). Stability of aggressive reaction patterns in males: a review. *Psychological Bulletin*, 86(4), 852.
- Olweus, Dan. (1983). Low school achievement and aggressive behavior in adolescent boys. *Human development. An interactional perspective*, 353-365.
- Patel, Shivani A, Murray-Kolb, Laura E, LeClerq, Steven C, Khatri, Subarna K, Tielsch, James M, Katz, Joanne, & Christian, Parul. (2013). Household Wealth and Neurocognitive Development Disparities among School-aged Children in Nepal. *Paediatric and Perinatal Epidemiology*, 27(6), 575-586.
- Patel, Vikram, Flisher, Alan J, Nikapota, Anula, & Malhotra, Savita. (2007). Promoting child and adolescent mental health in low and middle income countries. *Journal of Child Psychology and Psychiatry*, 49(3), 313-334.
- Patel, Vikram, & Sumathipala, Athula. (2001). International representation in psychiatric literature Survey of six leading journals. *The British Journal of Psychiatry*, 178(5), 406-409.

- Petras, Hanno, Kellam, Sheppard G, Brown, C Hendricks, Muthén, Bengt O, Ialongo, Nicholas S, & Poduska, Jeanne M. (2008). Developmental epidemiological courses leading to antisocial personality disorder and violent and criminal behavior: Effects by young adulthood of a universal preventive intervention in first-and second-grade classrooms. *Drug and Alcohol Dependence, 95*, S45-S59.
- Pope Edwards, Carolyn, Gandini, Lella, & Giovaninni, Donatella. (1996). The contrasting developmental timetables of parents and pre-school teachers in two cultural communities. In S. Harkness & C. M. Super (Eds.), *Parents cultural belief systems: Their origins, expressions, and consequences* (pp. 270-288). New York: Guilford Press.
- QSR International. (2012). NVivo (Version 10): QSR International Pty Ltd.
- Reedtz, Charlotte, Bertelsen, Bård, Lurie, JIM, Handegård, Bjørn Helge, Clifford, Graham, & MØRCH, WILLY-TORE. (2008). Eyberg Child Behavior Inventory (ECBI): Norwegian norms to identify conduct problems in children. *Scandinavian Journal of Psychology, 49*(1), 31-38.
- Robinson, Elizabeth A, Eyberg, Sheila M, & Ross, A William. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child and Adolescent Psychology, 9*(1), 22-28.
- Rosner, Bernard. (2010). *Fundamentals of biostatistics*. Boston, MA: Cengage Learning.
- Sadock, Benjamin J, & Sadock, Virginia A. (2011). *Kaplan and Sadock's synopsis of psychiatry: Behavioral sciences/ clinical psychiatry*: Lippincott Williams & Wilkins.
- Saxena, Shekhar, Paraje, Guillermo, Sharan, Pratap, Karam, Ghassan, & Sadana, Ritu. (2006). The 10/90 divide in mental health research: trends over a 10-year period. *The British Journal of Psychiatry, 188*(1), 81-82.
- Shrestha, Nanda R, Velu, Raja P, & Conway, Dennis. (1993). Frontier migration and upward mobility: the case of Nepal. *Economic Development and Cultural Change, 41*(4), 787-816.
- Sroufe, L Alan, & Rutter, Michael. (1984). The domain of developmental psychopathology. *Child Development, 17*-29.

- Stanger, Catherine, & Lewis, Michael. (1993). Agreement among parents, teachers, and children on internalizing and externalizing behavior problems. *Journal of Clinical Child Psychology*, 22(1), 107-116.
- Stata Corporation. (1985-2013). *Stata Statistical Software Release 12.0: Programming*. College Station, Texas: Stata Corporation.
- Stattin, Hekan, & Magnusson, David. (1991). Stability and change in criminal behaviour up to age 30. *British Journal of Criminology*, 31(4), 327-346.
- Stein, Dan J, He, Yanling, Phillips, Anthony, Sahakian, Barbara J, Williams, John, & Patel, Vikram. (2015). Global mental health and neuroscience: potential synergies. *The Lancet Psychiatry*, 2(2), 178-185.
- Super, Charles M, & Harkness, Sara. (1986). The developmental niche: A conceptualization at the interface of child and culture. *International journal of behavioral development*, 9(4), 545-569.
- Super, Charles M, & Harkness, Sara. (2002). Culture structures the environment for development. *Human Development*, 45(4), 270-274.
- Swanson, JM. (1995). SNAP-IV Scale. *Irvine, CA: University of California Child Development Center*.
- Thompson, Eric C, & Juan, Zhang. (2006). Comparative cultural salience: measures using free-list data. *Field methods*, 18(4), 398-412.
- Tobin, Gerard A, & Begley, Cecily M. (2004). Methodological rigour within a qualitative framework. *Journal of advanced nursing*, 48(4), 388-396.
- Tol, Wietse A, Komproe, Ivan H, Jordans, Mark JD, Susanty, Dessy, & De Jong, Joop TVM. (2011). Developing a function impairment measure for children affected by political violence: a mixed methods approach in Indonesia. *International Journal for Quality in Health Care*, 23(4), 375-383.
- Tramontina, Silzá, Martins, Silvia, Michalowski, Mariana B, Ketzner, Carla R, Eizirik, Mariana, Biederman, Joseph, & Rohde, Luis A. (2001). School dropout and conduct disorder in Brazilian elementary school students. *Canadian Journal of Psychiatry*, 46(10), 941-947.

- Tremblay, Richard E, Masse, Benoit, Perron, D, LeBlanc, Marc, Schwartzman, Alex E, & Ledingham, Jane E. (1992). Early disruptive behavior, poor school achievement, delinquent behavior, and delinquent personality: longitudinal analyses. *Journal of Consulting and Clinical Psychology, 60*(1), 64.
- UNESCO. (2011). World Data on Education (Vol. VII).
- UNICEF. (2006). *Situation of children and women in Nepal*. UNICEF.
- Van Ommeren, Mark, Sharma, Bhogendra, Thapa, Suraj, Makaju, Ramesh, Prasain, Dinesh, Bhattarai, Rabindra, & de Jong, Joop. (1999). Preparing instruments for transcultural research: use of the translation monitoring form with Nepali-speaking Bhutanese refugees. *Transcultural Psychiatry, 36*(3), 285-301.
- Wakefield, Jerome C. (1992). Disorder as harmful dysfunction: a conceptual critique of DSM-III-R's definition of mental disorder. *Psychological Review, 99*(2), 232.
- Wang, Philip S, Angermeyer, Matthias, Borges, Guilherme, Bruffaerts, Ronny, Chiu, Wai Tat, de Girolamo, Giovanni, . . . Huang, Yueqin. (2007). Delay and failure in treatment seeking after first onset of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry, 6*(3), 177.
- Waschbusch, Daniel A, & Elgar, Frank J. (2007). Development and validation of the conduct disorder rating scale. *Assessment, 14*(1), 65-74.
- Weisz, John R, McCarty, Carolyn A, Eastman, Karen L, Chaiyasit, Wanchai, & Suwanlert, Somsong. (1997). Developmental psychopathology and culture: Ten lessons from Thailand. In S. S. Luthar (Ed.), *Developmental psychopathology: Perspectives on adjustment, risk, and disorder* (pp. 568-592). Cambridge, UK: Cambridge University Press.
- Weisz, John R, Suwanlert, Somsong, Chaiyasit, Wanchai, Weiss, Bahr, Walter, Bernadette R, & Anderson, Wannu Wibulswasdi. (1988). Thai and American perspectives on over-and undercontrolled child behavior problems: Exploring the threshold model among parents, teachers, and psychologists. *Journal of Consulting and Clinical Psychology, 56*(4), 601.

- Whiteford, Harvey A, Ferrari, Alize J, Degenhardt, Louisa, Feigin, Valery, & Vos, Theo. (2015). The global burden of mental, neurological and substance use disorders: an analysis from the global burden of disease study 2010. *PLoS One*, *10*(2), e0116820.
- Whiting, John WM. (1977). A model for psychocultural research. *Culture and infancy: Variations in the human experience*, 29-48.
- Wolf, Montrose M. (1978). Social Validity: The Case for Subjective Measurement or How Applied Behavior Analysis is Finding its Heart. *Journal of Applied Behavior Analysis*, *11*(2), 203-214.
- Wolraich, ML. (2003). Vanderbilt ADHD Teacher Rating Scale (VADTRS) and the Vanderbilt ADHD Parent Rating Scale (VADPRS). *Oklahoma City, OK: University of Oklahoma Health Sciences Center*.
- Woolfenden, SR, Williams, K, & Peat, J. (2001). Family and parenting interventions in children and adolescents with conduct disorder and delinquency aged 10-17. *Cochrane Database of Systematic Reviews*, *2*.
- World Health Organization. (2010). International Classification of Disease (ICD-10) (10 ed.). Geneva.
- World Health Organization. (2011). Mental Health Atlas 2011. Geneva: World Health Organization Geneva.
- Worthman, Carol M. (2010a). The ecology of human development: Evolving models for cultural psychology. *Journal of Cross-Cultural Psychology*, *41*(4), 546-562.
- Worthman, Carol M. (2010b). *Formative experiences: The interaction of caregiving, culture, and developmental psychobiology*. Cambridge University Press.
- Wu, L, Katz, J, Mullany, LC, Haytmanek, E, Khattry, SK, Darmstadt, GL, . . . Tielsch, JM. (2010). Association between nutritional status and positive childhood disability screening using the ten questions plus tool in Sarlahi, Nepal. *Journal of health, population, and nutrition*, *28*(6), 585.
- Yabiku, Scott T. (2005). The effect of non-family experiences on age of marriage in a setting of rapid social change. *Population Studies*, *59*(3), 339-354.

Zhang, S., Faries, D. E., Vowles, M., & Michelson, D. (2005). ADHD Rating Scale IV: psychometric properties from a multinational study as a clinician-administered instrument. *International Journal of Methods in Psychiatric Research*, 14(4), 186-201.

Curriculum Vitae

Matthew D. Burkey, MD, MPH
The Johns Hopkins University School of Medicine
Curriculum Vitae

DEMOGRAPHIC AND PERSONAL INFORMATION

Current Appointments

Assistant (faculty), Child & Adolescent Psychiatry
The Johns Hopkins University School of Medicine, Baltimore, Maryland

Personal Data

The Johns Hopkins University School of Medicine
550 N. Broadway, Room 907, Baltimore, Maryland 21205
Phone: 410-955-8021 Fax: 410-955-8691 e-mail: mburkey1@jhmi.edu

Education and Training

Undergraduate			
1998-2002	B.A.	Biology/Spanish	Bethel College, N. Newton, KS
Doctoral/Graduate			
2005-2006	M.P.H.	Epidemiology & Biostatistics	Johns Hopkins School of Public Health
2006	Certificate	Humanitarian Assistance	Johns Hopkins School of Public Health
2002-2007	M.D.	Medicine	Johns Hopkins School of Medicine
2012-ongoing	Ph.D.	Clinical Investigation	Johns Hopkins School of Public Health
Postdoctoral			
2007-2008	Intern	Psychiatry & Family Medicine	University of Pittsburgh Medical Center
2009-2011	Resident	General Psychiatry	Johns Hopkins Hospital
2011-2014	Fellow	Child & Adolescent Psychiatry	Johns Hopkins Hospital

Professional Experience

2012-2013 Post-doctoral research fellow, Child & Adolescent Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD

2014-present Assistant (faculty), Child & Adolescent Psychiatry, Johns Hopkins University School of Medicine, Baltimore, MD

RESEARCH ACTIVITIES

Peer-reviewed Original Science Publications

1. Gebo KA, **Burkey MD**, Lucas GM, Moore RD, Wilson LE. Incidence of, Risk Factors for, Clinical Presentation, and 1-year Outcomes of Infective Endocarditis in an Urban HIV Cohort. *JAIDS: Journal of Acquired Immune Deficiency Syndromes*. 2006; 43: 426-432.
2. **Burkey MD**, Wilson LE, Lucas GM, Francis G, Moore RD, Gebo KA. Incidence of and Risk Factors for MRSA Bacteremia in an HIV-infected Population. *HIV Medicine*. 2008; 9(10): 858-862.
3. **Burkey MD**, Kim YR, Breakey WR. The Role of Social Ties in Recovery in a Population of Homeless Substance Abusers. *Addictive Disorders and Their Treatment*. 2011; 10(1): 14-20.
4. **Burkey MD**, Howell CJ, Riddle MA, Coffey BJ. Antipsychotic-induced Psychotic-like Syndrome in an Adolescent. *Journal of Child and Adolescent Psychopharmacology*. 2012; 22: 92-95. doi:10.1089/cap.2012.2214.
5. **Burkey MD**, Weiser SD, Fehmie D, Alamo-Talisuna S, Sunday P, Nannyunja J, Reynold SJ, Chang LW. Socioeconomic determinants of mortality in HIV: evidence from a clinical cohort in Uganda. *JAIDS: Journal of Acquired Immune Deficiency Syndromes*. 2014; 66(1):41-7. doi: 10.1097/QAI.0000000000000094
6. **Burkey MD**, Kaye DA, Frosch E. Training in integrated mental health-primary care models: a national survey of child psychiatry program directors. *Academic Psychiatry*. 2014; 38: 485-488. doi: 10.1007/s40596-014-0137-4
7. **Burkey MD***, Feirman S*, Wang H, Choudhury SR, Grover S, Johnston FM. The Association Between Smokeless Tobacco Use and Pancreatic Adenocarcinoma: A Systematic Review. *Cancer Epidemiology*. 2014; 38(6):647-653. doi: 10.1016/j.canep.2014.08.010
8. **Burkey MD**, Murray SM, Bangirana P, Familiar I, Opoka RO, Nakasujja N, Boivin M, Bass J. Executive function and attention-deficit/hyperactivity disorder in Ugandan children with perinatal HIV exposure. *Global Mental Health*. 2015; 2(e4):1-13. doi:10.1017/gmh.2015.2
9. **Burkey MD**, Hosein M, Purgato M, Adi A, Morton I, Kohrt BA, Tol WA. Psychosocial interventions for disruptive behavior problems in children living in low- and middle-income countries: study protocol of a systematic review. *BMJ Open*. 2015;5:e007377. doi:10.1136/bmjopen-2014-007377
10. Kohrt B*, **Burkey MD***, Koirala S, Jordans M. Alternative approaches for studying humanitarian interventions: Propensity score matching to evaluate education impact on depression, PTSD, and function impairment among child soldiers in Nepal. *Global Mental Health*. (2015), 2, e0, page 1 of 11. doi:10.1017/gmh.2015.13
11. Adhikari RP, Upadhaya N, Gurung D, Luitel NP, **Burkey MD**, Kohrt BA, Jordans MJD. Perceived behavior problems among school age children in rural Nepal: A qualitative study. *Child and Adolescent Psychiatry and Mental Health*. 2015; 9:25. doi: 10.1186/s13034-015-0061-8
12. Flynn A, Fothergill KE, Wilcox HC, Coleclough E, Horwitz R, Ruble A, **Burkey MD**, Wissow L. Systematic review of intervention studies of child traumatic stress in primary care settings. *Academic Pediatrics*. 2015; 15(5): 480-492. doi: http://dx.doi.org/10.1016/j.acap.2015.06.012

*Indicates joint first-authorship

Manuscripts Under Review

1. **Burkey MD**, Ghimire L, Adhikari RP, Kohrt BA, Jordans MJD, Haroz E, Wissow L.
Development process of an assessment tool for disruptive behavior problems in cross-cultural settings: the Disruptive Behavior International Scale—Nepal version (DBIS-N). *Social Psychiatry and Psychiatric Epidemiology*. (Submitted 7/6/2015)

Extramural Funding

Current Grants

8/1/14-11/1/15 Developing an Adaptable Assessment Tool for Disruptive Behavior Disorders in Nepal
American Academy of Child and Adolescent Psychiatry (AACAP) Pilot Research Award for Child Psychiatry Residents and Junior Faculty
\$15,000
PI: Matthew Burkey, MD
Effort: %NA

Previous Grants

6/1/03-9/1/03 Role of Social Ties in Recovery among Homeless Substance Abusers
David E. Rogers Research Fellowship, New York Academy of Medicine
PI: William Breakey, MD, Department of Psychiatry, Johns Hopkins School of Medicine
\$2,500
Role: Developed research idea, wrote IRB application, and identified and wrote grant application; Dr. Breakey was formally identified as the faculty PI for the IRB application
Effort: %NA

6/1/03-9/1/03 Role of Social Ties in Recovery among Homeless Substance Abusers
Depression and Related Affective Disorders Association (DRADA)
PI: William Breakey, MD, Department of Psychiatry, Johns Hopkins School of Medicine
\$1,500
Role: Developed research idea, wrote IRB application, and identified and wrote grant application; Dr. Breakey was formally identified as the faculty PI for the IRB application
Effort: %NA

6/1/03-9/1/03 The Incidence of and Risk Factors for Infective Endocarditis in an Urban HIV Cohort
Infectious Disease Society of America Summer Scholarship for Medical Students
\$1,500

PI: Kelly Gebo, MD, Division of Infectious Disease, Johns Hopkins School of Medicine
Role: Generated research idea; designed survey instrument; collected clinical, demographic, and laboratory data; analyzed data; and wrote (published) manuscript
Effort: %N/A

Intramural Funding

Current Grants

10/1/13-6/30/15 Johns Hopkins Clinical Research Scholars Postdoctoral Fellow KL2 Award
Johns Hopkins Institute for Clinical and Translational Research
Direct Cost: \$172,025 (over 2 years)
Role: Full tuition, research, and salary support for PhD at Johns Hopkins Bloomberg School of Public Health
Effort: 80%

11/11/14-11/1/15 Family and Community Resiliency Factors in Baltimore Youth
Johns Hopkins Kanner Memorial Medical Student Research Funds
Direct Cost: \$2137
Role: PI, Mentor to medical student investigator
Effort: N/A

Previous Grants

6/1/03-9/1/03 The Incidence of and Risk Factors for Infective Endocarditis in an Urban HIV Cohort
Johns Hopkins School of Medicine Dean's Fund Research Grant
PI: Kelly Gebo, MD, Division of Infectious Disease, Johns Hopkins School of Medicine
Total Direct Cost: \$1,500
Role: Generated research idea; designed survey instrument; collected clinical, demographic, and laboratory data; analyzed data; and wrote (published) manuscript
Effort: %NA

12/1/06-5/1/07 Effects of Food Insecurity on Mortality in a Ugandan HIV Cohort
Framework Program for Global Health Research Fellowship,
Johns Hopkins University & National Institutes of Health Fogarty International Center
Total Direct Cost: \$3,000
PI: Larry William Chang
Role: Generated research idea; wrote IRB application; designed survey instrument; and collected data; Dr. Quinn was formally identified as the faculty PI for the IRB application
Effort: %NA

- 7/1/12-6/30/13 Johns Hopkins International Medicine Clinical Research Scholar Award
Johns Hopkins International
Total Direct Cost: \$120,000
Role: Full tuition plus salary support for PhD at Johns Hopkins Bloomberg School of Public Health
Effort: 80%
- 1/15/13-1/15/14 Disruptive Child Behavioral Disorders in Nepal
Seed Grant, Center for Mental Health in Pediatric Primary Care
Total Direct Cost: \$7000
PI: Matthew Burkey, MD, MPH and Brandon Kohrt, MD, PhD (Co-PIs)
Role: Primarily responsible for generating research idea, research protocol, leading data collection and analysis.
Effort: %NA
- 10/19/13-10/30/13 Child Psychiatry Research Elective in Nepal
Global Health Travel Grant for Housestaff
Johns Hopkins Center for Global Health
Total Direct Cost: \$3,500
PI: Matthew Burkey, MD, MPH
Role: Developed application to conduct initial fieldwork for dissertation research project.
Effort: %NA

EDUCATIONAL ACTIVITIES

Educational Publications

1. Bass JK, Bornemann TH, **Burkey MD**, Chen L, Copeland JRM, Eaton WW, Ganju V, Hock RS, Kidwai R, Kolappa K, Lee PT, Minas H, Or F, Patel V, Raviola GJ, Saraceno B, Wallace NE. A United Nations General Assembly Special Session for Mental, Neurological and Substance Use Disorders: The Time Has Come. *PLoS Med.* 2012; 9(1): e1001159.
2. Hock RS, Or F, Kolappa K, **Burkey MD**, Surkan PJ, Eaton WW. A new resolution for global mental health. *The Lancet.* 2012; 379: 1367-1368.
3. **Burkey MD** and Perry-Parrish C. Attention Deficit Hyperactivity Disorder. *The Johns Hopkins Phipps Psychiatry Guide.* Johns Hopkins POC-IT (Johns Hopkins Point of Care Information Technology), Baltimore, MD. October 2014.
4. Perry-Parrish C and **Burkey MD**. Oppositional Defiant Disorder. *The Johns Hopkins Phipps Psychiatry Guide.* Johns Hopkins POC-IT (Johns Hopkins Point of Care Information Technology), Baltimore, MD. October 2014.

Teaching

Classroom instruction

- 5/12-9/15 Diagnosis, Symptom & Illness Management II- Pediatrics at Johns Hopkins School of Nursing: Invited lecture on Adolescent Mental Health Problems in Primary Care. (5/3/12, 1/31/13, 11/20/13, 4/3/14, 4/30/15, 9/9/15)

- 4/13-4/14 Intersection of Mental and Physical Health at Johns Hopkins Bloomberg School of Public Health (330.639): Invited lecture on comorbidity of mental and physical health problems in children and adolescents. (4/6/13, 4/14/14, 5/6/15)
- 9/14-10/15 Psychopathology for Public Health (330.617): Invited lecture on disruptive behavior disorders in children and adolescents. (9/25/14, 10/8/15)

Clinical instruction

- 4/11, 4/14 Brain, Mind, and Behavior course at Johns Hopkins School of Medicine: Provided instruction to first-year medical students in psychiatric interviewing. (4/1/11-4/15/11, 4/18/14)
- 9/12-6/13 Psychiatric Formulation in Primary Care: Taught weekly seminar series in the formulation of psychiatric problems in primary care patients to senior pediatrics residents at Johns Hopkins Hospital.

Workshops/seminars

- 4/25/06 Co-Organizer, "Evaluating Torture Survivors in Emergency Room Settings", JB Grant Society of the Johns Hopkins School of Public Health, Baltimore, MD
- 10/07 Invited Presenter, "Mental Health Screening in Low-Income Countries," Northeast Regional Society of Teachers of Family Medicine, Pittsburgh, PA

Educational Program Building / Leadership

- 2012-2013 Johns Hopkins Child & Adolescent Psychiatry Fellowship Residency Redesign Committee, Member
- 2014-2015 Mental Health Curriculum Working Group, HEAL Initiative (U.S.-Nepal), Member

CLINICAL ACTIVITIES

Certification

Medical Licensure, State of Maryland, (2010-present)

Diplomate, American Board of Psychiatry and Neurology (2012-present)

Certification in Child and Adolescent Psychiatry, American Board of Psychiatry and Neurology (2014-present)

Service Responsibilities

Attending Physician in the Child Mobile Treatment Unit, Johns Hopkins Bayview Hospital, 1 day per week, 9/2014 to present

SYSTEM INNOVATION AND QUALITY IMPROVEMENT ACTIVITIES

System Innovation and Quality Improvement efforts outside of JHM:

- 2009-2011 Co-Director, Mental Health Initiative, Tiyatien Health, Liberia

In this role, I provided oversight and direction for the first community-based mental health program in Liberia and collaborated on the creation and implementation of the first computerized mental health medical record system in Liberia. The records system is now used to identify high-risk patients for targeted home visits by community health workers. The program was recognized by the Ashoka Foundation and Robert Wood Johnson Foundation's *Changemaker's* Grand Prize for global mental health innovation.

Effort: 5-15 hours/week

Notes: This was a volunteer position I held during residency training.

- 9/14-present Clinical Advisor, HeartMind International, Jumla, Nepal
In this volunteer role I am assisting in the development of a mental health promotion and treatment program in a remote region of Nepal. My responsibilities include: advising on the development of a monitoring and evaluation program and developing and reviewing clinical treatment protocols.
Effort: 1-5 hours/month

Production of guidelines and/or protocols:

- 9/09-8/10 Developed depression treatment protocol, Tiyatien Health (Liberia), Co-leader, Mental Health advisor, Effort: %NA, Adopted and used to evaluate over 450 patients in 1.5 years at Martha Tubman Memorial Hospital outpatient clinic.
- 12/10-3/11 Adapted World Health Organization's mhGAP Intervention Guide Depression Module for use in a rural community-based treatment program in Liberia, Team Leader, Effort: %NA, Adopted and currently in-use at 16 Ministry of Health clinics.
- 5/11-8/11 Revised Patient Health Questionnaire-9 (PHQ-9) for use in Liberia (translation to Liberian English and validation of questionnaire), Team Leader, Effort: %NA, Adopted for use in the Liberian Health Professional Handbook through the Ministry of Health as the primary reference for all health workers throughout the country.

System Innovation and Quality Improvement Extramural Funding:

- 12/10-3/11 Adaptation of WHO mhGAP depression treatment protocol in rural Liberia MPH Travel Award, The Johns Hopkins Bloomberg School of Public Health
Role: Mentor to Jacob Taylor, M.D. Candidate, M.P.H. Candidate, Johns Hopkins University
Effort: %NA

ORGANIZATIONAL ACTIVITIES

Institutional Administrative Appointments

2010 Administrative Resident, Department of Psychiatry and Behavioral Science, Johns Hopkins Hospital

Editorial Activities

Journal Peer Review

2011 HIV Medicine (Ad hoc reviewer)
2011-present PLoS ONE (Ad hoc reviewer)
2014-present Academic Psychiatry (Ad hoc reviewer)
2014-present Journal of Child and Adolescent Psychopharmacology (Ad hoc reviewer)
2015-present The Pediatric Infectious Disease Journal (Ad hoc reviewer)
2015-present European Journal of Psycho-traumatology (Ad hoc reviewer)

Advisory Committees, Review Groups

2004-2005 Public Health and Safety Committee Member, Mayor's Immigrant Service Working Group, Baltimore, Maryland
2010-present International Advisory Group Member, Movement for Global Mental Health
2014-present Clinical Advisor, HeartMind International (U.S.-Nepal)

Professional Societies

2011-present American Academy of Child & Adolescent Psychiatry, Member
2009-2011 American Psychiatric Association, Member

AWARDS AND HONORS

2002 Summa Cum Laude, Bethel College
2002 Ernest and Ruth DeSanctis Scholarship for Humanities in Medicine, Johns Hopkins School of Medicine
2004 Harold Lamport Biomedical Research Award, Johns Hopkins School of Medicine
2005 Young Investigator Award, Conference on Retroviruses and Opportunistic Infections
2005 Watt-Hansell Endowment, Full-tuition Scholarship, Johns Hopkins Bloomberg School of Public Health
2005 J. Howard Beard Fellowship in Public Health, Johns Hopkins Bloomberg School of Public Health
2006 Award for Excellence in Medical Student Research, Johns Hopkins School of Medicine
2007 David E. Rogers Award for Professionalism, Ethics, & Community Service, Johns Hopkins University
2009 Ashoka Changemakers Award "Rethinking Mental Health: Improving Community Wellbeing" competition (Role: Co-Director), Ashoka Foundation and Robert Wood Johnson Foundation
2012 Child Intervention, Prevention, and Services (CHIPS) Fellow

- 2012 Johns Hopkins International Medicine Clinical Research Scholar Award (full Ph.D. funding)
- 2013 Global Health Travel Grant for Housestaff, Johns Hopkins Center for Global Health
- 2013 Johns Hopkins Clinical Research Scholar Award (full Ph.D. funding)
- 2013 NIH Loan Repayment Program Scholar (2013-2015)
- 2014 American Academy of Child and Adolescent Psychiatry Annual Meeting Junior Scholar Award

Invited Talks, Panels

- 4/06 Peer-selected Oral Presentation, “High Rates of HIV Transmission in Refugee Settings: A Durkheimian Analysis of Macro-social Processes”, International Conference on Women and Infectious Diseases: 2nd Annual Meeting, Atlanta, GA: Centers for Disease Control and Prevention
- 8/10 Invited Speaker, “Treating Depression in Liberia,” The Johns Hopkins Mood Disorders Research Center Meeting, Baltimore, MD
- 12/10 Invited Speaker, “Adapting a Depression Screening Instrument in Rural Liberia”, Behavior Health International Group, The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
- 11/12 Invited Speaker, “Psychiatric Case Formulation in Adolescent Primary Care”, Adolescent Medicine Grand Rounds, The Johns Hopkins Hospital, Baltimore, MD
- 2/14 Invited Speaker, “Ecological Considerations in the Prevention and Treatment of Adolescent Conduct Disorder”, Adolescent Medicine Grand Rounds, The Johns Hopkins Hospital, Baltimore, MD (2/21/14)
- 9/14 Invited Speaker, “Developing a Research Project During Training: Child Behavior Problems in Nepal”, Global Mental Health Monthly Seminar, Department of Psychiatry, George Washington University, Washington, DC (9/8/14)
- 4/15 Peer-selected Oral Presentation, “Development of an Assessment Tool for Disruptive Behavior Problems in Nepal: The Disruptive Behavior International Scale (DBIS)”, Translational Science 2015 Annual Meeting, Washington, DC (4/17/2015)
- 4/15 Peer-selected Oral Presentation, “Roles of Cultural Context in Definitions of and Responses to Conduct Problems in Children: A Case Study from Nepal”, Society for the Study of Psychiatry and Culture: 2015 Annual Meeting, Providence, RI (4/24/15)
- 4/16 Panelist, “Psychosocial interventions for disruptive behavior problems in children living in low- and middle-income countries: a systematic review”, Society for Research on Adolescents: 2016 Biennial Meeting, Baltimore, MD, March 31 to April 2, 2016

OTHER PROFESSIONAL ACCOMPLISHMENTS

Published Abstracts

1. Wilson LE, Moore RD, **Burkey MD**, Gebo KA. The Incidence of and Risk Factors for Infective Endocarditis in an Urban HIV Cohort. Abstracts of the 11th Annual Conference on Retroviruses and Opportunistic Infections, San Francisco, CA, February 2004.
2. **Burkey MD**, Wilson LE, Moore RD, Gebo KA. Long-term Outcomes of Infective Endocarditis in an Urban HIV Cohort. 27th Annual Meeting of the Society of General Internal Medicine, Chicago, IL, May 2004.
3. **Burkey MD**, Lucas G, Moore R, Wilson L, Francis J, Gebo K. The Incidence of and Risk Factors for MRSA Bacteremia in an Urban HIV Cohort in the HAART Era. 13th Conference on Retroviruses and Opportunistic Infections, Denver, CO, February 2006.

4. Taylor J, **Burkey MD**. “Variation by month and day of the week in Internet searches for suicide in the United States”. In: American Psychiatric Association, 165th Annual Meeting, Philadelphia, PA, May 2012.
5. Kelly P, **Burkey MD**. “Lower Rates of Publication about Delirium in Pediatrics versus Child and Adolescent Psychiatry Journals from 2001-2011”. In: American Psychiatric Association, 165th Annual Meeting, Philadelphia, PA, May 2012.
6. **Burkey MD**, Taylor J. “Geographic variability in Internet searches for suicide and suicide rates in the United States in 2007”. In: American Psychiatric Association, 165th Annual Meeting, Philadelphia, PA, May 2012.
7. **Burkey MD**, McIvor Murray S, Opoka R, Boivin M, Bass J. Construct Validity of the ADHD Rating Scale-IV in HIV-Exposed Ugandan Children. Translational Science 2014, Washington, DC, April 9-11, 2014.
8. **Burkey MD**, McIvor Murray S, Andersen A, Horwitz R. Public Perceptions of Mental Illness and Violence: Data from 7 Trillion Internet Queries, 2004-2014. American Academy of Child and Adolescent Psychiatry 61st Annual Meeting, San Diego, CA, October, 2014.
9. **Burkey MD**, McIvor Murray S, Opoka R, Boivin M, Bass J. Gender and ADHD in Ugandan Children: Comparison of Symptoms, Factor Structure, Prevalence, and Executive Functioning. American Academy of Child and Adolescent Psychiatry 61st Annual Meeting, San Diego, CA, October, 2014.
10. Ghimire L, **Burkey MD**, Adhikari R, Kohrt B, Jordans M, Basnet A, Wissow L. Peers' Perspectives on Child Behavior Problems: A Qualitative Study in Rural Nepal. American Academy of Child and Adolescent Psychiatry 62nd Annual Meeting, San Antonio, TX, October, 2015.
11. **Burkey MD**, Ghimire L, Adhikari R, Kohrt BA, Jordans MJD, Haroz E, Wissow L. Comparing Methods of Assessment for Prioritizing Child Behavior Problems in a Cross-Cultural Setting. American Academy of Child and Adolescent Psychiatry 62nd Annual Meeting, San Antonio, TX, October, 2015.
12. Langer J, **Burkey MD**, Ghimire L, Adhikari R, Kohrt BA, Jordans MJD, Wissow L. A Mixed Method Study of Reported Gender Differences in Child Behavior Problems in Rural Nepal. American Academy of Child and Adolescent Psychiatry 62nd Annual Meeting, San Antonio, TX, October, 2015.
13. **Burkey MD**, Ghimire L, Adhikari R, Kohrt BA, Jordans MJD, Wissow L. Validation of an Instrument Developed Using Local Stakeholder Participation: The Disruptive Behavior International Scale—Nepal version (DBIS-N). American Academy of Child and Adolescent Psychiatry 62nd Annual Meeting, San Antonio, TX, October, 2015.
14. **Burkey MD**, Murray-Kolb LE, Khatry SK, LeClerq SC, Christian P. Household Wealth and Behavior Problems Among Children in Rural Nepal. American Academy of Child and Adolescent Psychiatry 62nd Annual Meeting, San Antonio, TX, October, 2015.

Submitted Presentations

- 6/05 “Homeless Substance Abusers: The Role of Social Ties in Recovery,” Poster presentation at the National Healthcare for the Homeless Conference, Washington, D.C.
- 6/05 “Primary Care Delivery among Homeless Persons: An Inpatient Model,” Poster presentation at the National Healthcare for the Homeless Conference, Washington, D.C.
- 10/11 “Rationale and Strategy for a UN General Assembly Special Session on Mental Health”, Global Mental Health Summit, Cape Town, South Africa (co-author)

5/14 “Construct Validity of the ADHD Rating Scale-IV in HIV-Exposed Ugandan Children”,
Johns Hopkins Department of Psychiatry Annual Research Potpourri, Baltimore, MD