

Factorial and Cultural Validity of a Social and Emotional Behavior Measure in Northern Ghana

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Abstract

In a large sample of children in northern Ghana ($N = 4,723$), we investigated the factorial validity and reliability of the widely used parent-report Strengths and Difficulties Questionnaire (SDQ). Confirmatory factor analysis demonstrated poor fit for the proposed 5-factor model. Using exploratory and confirmatory factor analyses, we found a reliable and empirically sound 3-factor solution. The first factor reflected self-regulatory and prosocial behaviors, a factor we termed “responsibility” to align with skills valued in the Ghanaian context. The second and third factors represented internalizing and externalizing problem behaviors, respectively. Multiple-group confirmatory factor analyses suggested measurement invariance across gender and age. While evidence of convergent and discriminant validity was mixed, associations with child and household characteristics offer new insights into child development in an understudied context. This study contributes to a conversation around the importance of applying socio-cultural understanding to conceptualizing and measuring social and emotional behaviors across diverse contexts.

Keywords: Social and Emotional Behaviors, Psychometric, Ghana, Sub-Saharan Africa, Cross-cultural Psychology

Factorial and Cultural Validity of a Social and Emotional Behavior Measure in Northern Ghana

Social and emotional skills support the academic success and long-term well-being of children across the globe (Durlak et al., 2011; Greenberg et al., 2017). This growing literature has led to the expansion of social and emotional learning (SEL) programs in low- and middle-income countries (LMICs) (Jones & Dolittle, 2017), with multilateral donors prioritizing SEL in school settings (e.g., USAID, 2021), non-government organizations developing SEL programs and frameworks (Easel Lab, 2023), and SEL being integrated into national curricula (Torrente et al., 2015; USAID, 2021). High-quality assessments serve as pivotal tools in understanding children's social-emotional skill development and generating evidence to improve interventions. However, the cultural applicability and validity of Western-developed instruments used in non-Western socio-cultural contexts is a growing concern (Diener et al., 2003; Jukes et al., 2018; Macours et al., 2023). Considering that the development, conceptualization, and expression of social and emotional behaviors are inextricably linked to the broader socio-cultural fabric in which children are socialized and educated (Bronfenbrenner, 1979; Chen, 2000), it becomes evident that applying a measure without due consideration of cultural context may result in the misrepresentation of psychosocial states in non-Western contexts. This study focuses on one such measure, the parent-report Strengths and Difficulties Questionnaire (SDQ), and investigates its applicability in the context of rural Ghana.

The SDQ was initially developed and validated in WEIRD (Western, Educated, Industrialized, Rich, and Democratic) settings (Goodman, 2001; Henrich et al., 2010), which share cultural values and norms (e.g., individualism). Yet it is used internationally to assess children's mental health and social and emotional behaviors with versions available in over 90

languages (Youth in Mind, 2023). Specifically, the SDQ is designed to measure five constructs: emotional problems, conduct problems, hyperactivity/inattention, peer problems, and prosocial behavior. The popularity of the SDQ has been attributed to the fact that it is freely available, short and easy to administer, and flexible in terms of age and informant (Tubbs Dolan, 2018). A search on the Youth in Mind¹ website shows that 143 studies in sub-Saharan Africa (SSA) have used the SDQ (as of October 2024). Hoosen and colleagues' (2018) scoping review of 54 studies across 12 SSA countries demonstrated inconsistent use of the SDQ, including administration outside the recommended age range and selective use of only one or two subscales. Additionally, they concluded that psychometric evidence was lacking; only half of the studies reported internal consistency, a single study examined the factor structure, and one other assessed construct validity (Hoosen et al., 2018). Since Hoosen and colleagues' (2018) scoping review, we have found five additional studies (see Supplementary Materials) that analyzed the validity of the SDQ in SSA, but the present study is the first to test and explore the factor structure in northern Ghana and one of the only studies to rigorously examine the reliability and validity of the instrument in SSA.

The Study Context

Ghana is a lower-middle-income country in West Africa with a highly multiethnic and multilingual population (Ghana Statistical Service, 2021). Social and emotional competencies are taught within the formal education system; indeed, the Ghanaian Ministry of Education embedded social-emotional skills into its national school curricula (NaCCA; National Council for Curriculum and Assessment, 2017). In primary school curricula, for example, non-academic

¹ Youth in Mind is a collective founded by Dr. Goodman, creator of the SDQ, that houses the official SDQ guidance.

subject areas emphasize skills such as problem-solving, creativity, communication, responsibility, and good moral values² (NaCCA, 2017).

Research on children's social and emotional development in Ghana is limited and has focused largely on younger children in urban and peri-urban regions (i.e., Greater Accra region; Wolf et al., 2019; Wolf et al., 2021), which may not be entirely transferrable to northern Ghana as there are ethnic, religious, linguistic, and economic differences. Stark regional inequalities between the southern, urban, and peri-urban regions of Ghana and the northern, rural regions result in heterogeneity in children's access to educational opportunities and their developmental trajectories. For example, only 59.4% of children in the five northern regions from which our sample is drawn (i.e., Upper West, Upper East, North East, Northern, and Savannah) attend primary school, which represents the country's lowest proportions of school attendance (UNICEF, 2020). Further, only 10.6% of 7-14-year-olds in the northern regions have acquired foundational reading skills compared to the 52% of children in the Greater Accra region (UNICEF, 2020). Households in the northern regions experience much higher poverty rates than the Greater Accra region, with 53% and 6.6% of households living below the national poverty line, respectively (Ghana Statistical Service, 2015). Regional inequalities in the acquisition of social and emotional skills remain unstudied.

Factorial and Construct Validity in Cultural Context

Individual vs. collectivist cultural beliefs influence psychological and behavioral development in profound ways (Henrich et al., 2010; Hofstede, 1997). Collective cultures value social competence and shared responsibility, interdependence, and the acquisition of physical, cognitive, social, and emotional skills specific to enabling a child to engage with the family and

² see *Our World and Our People* and *Religious and Moral Education* in the national curriculum subject areas.

community over individualized growth (Nsamenang, 2006; Rogoff, 2003). In African contexts, scholars of child development have termed these processes as “human ontogenesis” (Nsamenang, 2006), which emphasizes socialization processes through children’s co-participation in family and community life (Nsamenang & Lamb, 1994). Ethnographic research from Ghana shows that parents define their role in terms of transmitting collectivistic values such as respect, compliance, and obedience (Twum-Danso Imoh, 2013; Twum-Danso Imoh, 2022). As an example specific to an SDQ construct, prosocial socialization in collectivist societies may promote qualities such as respect, obedience, cooperation, and ascribed gender roles (Jukes et al., 2018) and behaviors that contribute to the household, such as caregiving (Armstrong-Carter et al., 2019). In contrast, WEIRD societies may place more emphasis on other types of behaviors, such as sharing with peers. Therefore, the SDQ items may be interpreted by caregivers through the lens of a child’s contribution to family and community cohesion, and parents may define well-being in terms of a child’s ability to fulfill social roles and obligations.

The SDQ measures social-emotional behaviors as both positively (e.g., prosociality) or negatively valenced (e.g., externalizing problem behaviors), but whether a behavior is viewed by a caregiver as positive, negative, or neither is culturally determined (Henrich et al., 2010). The SDQ has been validated across WEIRD contexts and while many social and emotional behaviors may be universally applicable across cultural contexts, one of the goals of this study is to evaluate construct and factorial validity with the lens of how the larger socio-cultural landscape may differentially shape the presentation of social and emotional behaviors. Furthermore, while evaluating measurement equivalence by age and gender is an important component to inform measurement within any study context (Putnick & Bornstein, 2016), we do not presume that the SDQ will measure strengths and difficulties equivalently (i.e., possess measurement invariance)

for children of all ages and genders in northern Ghana given that parental expectations for children's behavior in northern Ghana may differ by age and gender. In Ghana, gender disparities are pervasive in terms of education and household responsibilities (UNICEF, 2020) and, along with gender, age determines familial expectations for children in terms of contributions to the family and community, both of which could differentially shape the expression of social and emotional behaviors (Fuligni et al., 2009).

Convergent Validity in Context

In addition to understanding the factorial validity and consistency of the parent-report SDQ in Ghana, a key contribution of this study is the investigation, via multiple informants, of convergent and discriminant validity by examining its associations with concurrently assessed social, emotional, cognitive, and academic outcomes. Evidence on the extent to which social and emotional skills are associated with later academic success in Ghana is inconclusive: one study found that early social and emotional skills were not associated with later numeracy and literacy (Wolf & McCoy, 2019) and another study found that “skills beget skills” with children achieving more favorable academic outcomes as their social and emotional skills grew (Wolf et al., 2021). Nevertheless, both studies included young, peri-urban children, which may not generalize to rural areas in northern Ghana or later stages of development. Children in northern Ghana face more poverty-related risks than children living in southern or peri-urban regions—risks that may negatively impact children's social and emotional development (Black et al., 2017; Engle & Black, 2008; Walker et al., 2011).

Predictors of children's social and emotional behaviors in Ghana, and in SSA more broadly, remain largely understudied, but emerging research informs our efforts to both validate the SDQ and explore predictors of social and emotional behaviors specific to northern Ghana. At

the child level, one study in peri-urban Ghana showed that boys were more likely to display trajectories of social-emotional skills with lower initial levels and slower growth, whereas children who were over-age at school entry had higher social-emotional skills and more rapid growth of such skills (Wolf et al., 2021). At the household level, caregiver education (Wolf & McCoy, 2019; Wolf et al., 2021), cognitively stimulating home environments (Wolf & McCoy, 2019), parental disciplinary practices (Wolf & Suntheimer, 2020), and poverty and food insecurity (Aurino et al., 2020; Wolf et al., 2021) predicted the development of social and emotional behaviors in directions consistent with WEIRD contexts. Our study contributes to this evidence by examining if SDQ factors are associated with child and household characteristics in the northern regions.

Current Study

The current study evaluates the psychometric properties of the parent-reported SDQ in a large sample of 5-17-year-olds in northern Ghana. We further analyze how child and household characteristics are associated with children's social and emotional behavior. The study seeks to not only examine the psychometric properties of the instrument in this sample but to contribute to a conversation around the importance of applying a socio-cultural understanding to conceptualizing and measuring social and emotional behaviors across diverse contexts. Specifically, we examine the following four research questions (RQs):

1. Is the previously validated 5-factor structure of the parent-reported SDQ applicable to 5-17-year-old children and adolescents in northern Ghana?
2. What is the optimal dimensional structure for the parent-reported SDQ in northern Ghana?
 - a. Are there meaningful factors measuring social and emotional behaviors?

- b. Are these factors different than what one may find in WEIRD contexts?
- 3. Is the factor structure invariant across age and gender? If not, what are the differences?
- 4. Is there evidence of convergent and discriminant validity for the factors as evidenced by associations with concurrently assessed social, emotional, and academic outcomes? Also, are relevant household and child characteristics associated with the factors?

Methods

Participants and Procedures

Data were collected as part of a household-randomized controlled trial to test the impact of a text-message-based intervention for parents in five northern regions of Ghana (Aurino & Wolf, 2024). The sample was drawn from two previously completed studies: the Communications for Development study (C4D, 2012-16; Fink et al., 2019), and the Graduating the Ultra-Poor study (GUP, 2011-13; Banerjee et al., 2015). Households were considered eligible if they included an adult and at least one school-aged child (5-17 years). For households with multiple children, up to two children were randomly selected per household to complete assessments and caregiver surveys reports of children's behavior were completed once per child. The caregiver selected to complete the surveys was based on who was considered the primary adult responsible for the child's education (58.1% female). We use data from the endline survey (September, 2021), which included 2,587 caregivers and 4,745 children.

Data were collected in person in participants' homes or in a common space within the participants' community. Enumerators were all Ghanaian nationals who spoke the local

languages in the study regions, had experience collecting data with children, and participated in a 5-day training on study protocols.

Measures

All data were collected in person in September of 2021 except for household poverty, which was collected three months earlier.

Child Social and Emotional Skills

Strengths and Difficulties Questionnaire. Caregivers completed the parent-report version of the SDQ, which is appropriate for children and adolescents aged 4-17-years. The SDQ is a 25-item scale designed to measure emotional and behavioral disorders and exists in several versions to capture a wide range of ages and informants (caregiver, teacher, and child-reported) (Youth in Mind, 2023). All versions use a three-point Likert scale: (0) ‘not true’, (1) ‘somewhat true’, and (2) ‘certainly true’. The measure includes five items per five subscales: Prosocial, Conduct Problems, Inattention-Hyperactivity, Emotional Symptoms, and Peer Problems; these can be aggregated into three larger constructs: prosocial (using the prosocial subscale), externalizing problems (combining conduct problems and inattention-hyperactivity subscales) and internalizing problems (combining emotional symptoms and peer problem subscales). We reverse-coded the positively valenced items to ease interpretation (i.e., higher scores always indicate more problems). As such, the positively valenced “prosocial” subscale can be interpreted as the “social problems” subscale in our analyses.

Conflict Resolution. Children were directly assessed using the conflict resolution subscale from the International Social and Emotional Learning Assessment (ISELA), which was developed for use in low-income contexts and has been tested in Kenya, Tanzania, and Uganda as well as rigorously validated in Iraq (D’Sa & Krupar, 2021). Data collectors read two

hypothetical scenarios to children and asked how they would respond. One scenario is neutral and the other more confrontational. For example, children aged 5-9 are asked, “If you are playing with a toy you like and another child wants to play with the same toy, but there is only one toy...What would you do?”. Next, they were asked “You are playing with a toy you like and another child wants to play with the same toy, but there is only one toy. This time the other child takes the toy away from you and starts playing with it without asking you...What would you do?”. Older children (10-17-years-old) were read a slightly different vignette to be developmentally appropriate. Children’s responses were coded as “appropriate” or “inappropriate”, with appropriate answers reflecting prosocial skills (e.g., “share” or “talk to the child”) and aggressive behaviors (e.g., “yell” or “force the child to give the toy back”) coded as inappropriate. Examples of children’s appropriate and inappropriate responses were contextualized to Ghanaian behavioral norms by the local research team during the enumerator training (4 items, $M = 2.83$, $Min = 0$, $Max = 4$, $SD = 1.29$, $\alpha = .72$).

Self-Esteem. Children 10-17-years-old ($n = 2,331$) responded to the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), an instrument that has been validated globally and shown invariance across 53 nations (Schmitt & Allik, 2005). Children were asked to what extent they agree or disagree (1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree) with a series of 10 statements. Examples include “At times I think I am no good at all (reverse coded)” and “On the whole, I am satisfied with myself” (10 items, $M = 28.40$, $Min = 11$, $Max = 40$, $SD = 3.81$, $\alpha = .64$).

Child Cognitive and Academic Skills

Literacy and numeracy assessments differed in the number and difficulty of items based on three age groups (5-9-year-olds, 10-14-year-olds, 15-17-year-olds). To account for this, final

literacy, numeracy, and executive function summary scores were age-standardized within the three age groups ($M = 0$, $SD = 1$). In sum, composite scores for academic and cognitive outcomes represent children's skills relative to their near-age peers.

Literacy. Literacy was directly assessed using five subtasks adapted from the International Development and Early Learning Assessment (IDELA), Early Grade Reading Assessment, MICS6, and the Young Lives Panel Study – all measures previously used and validated in sub-Saharan African contexts ((Halpin et al., 2019; Hamadani et al., 2010; Pisani et al., 2018; UNICEF, 2015; Wolf et al., 2017). Subtasks included oral vocabulary (2 items for 5-9-year-olds, 1 item for 10-17-year-olds), non-word reading (50 items), spelling (10 items), oral reading and comprehension (4 items), and phonological awareness (3 items).

Numeracy. Numeracy was directly assessed using items from the IDELA, Early Grade Math Assessment, and Young Lives Panel Study. Subtasks included counting (20 items), number discrimination (7 items), missing number patterns (5 items), number sorting (6 items), word problems (5 items), and operations (4 addition items, 4 subtraction items, 2 multiplication items, 1 division item).

Executive Function. Executive function was directly assessed using two subtasks: working memory (10 items for 10-17-year-olds, 6 items for 5-9-year-olds) using a backward digit span task and short-term memory (7 items for 10-17-year-olds, 5 items for 5-9-year-olds) using a forward-digit span task. In both assessments, children were read strings of numbers ranging from two to six digits, progressively increasing in complexity.

Child and Household Characteristics

Child and household characteristics include *child age* (in years), *child gender* (0 = Female, 1 = Male), *caregiver age* (in years), *caregiver gender* (0=Female, 1=Male), *caregiver*

education level (0 = no formal education, 1 = early childhood education, 2 = primary school, 3 = junior high school, 4 = high school, 5 = higher education). Child and caregiver age were mean-centered to ease interpretation. In addition to demographic information, we included scales used in the caregiver survey. *Caregiver violent discipline practices* (9 items) were self-reported by caregivers using the UNICEF MICS survey (UNICEF, 2015) which asks caregivers whether they, or anyone else in the household, used a certain discipline practices in the past month, such as “Did you hit or slap [child] on the face, head or ears in the past month?”. *Caregiver cognitive stimulation* (6 items) was measured by caregiver-reported engagement in stimulating activities with their children in the home using the MICS (Hamadani et al., 2010). Examples of stimulating activities include reading, telling stories, or singing songs. *Caregiver emotional supportiveness* (6 items) was assessed using an adapted version of a scale from the Early Childhood Longitudinal Study–Kindergarten Cohort (Chapman, 2010). The scale consists of five hypothetical questions answered on a four-point scale (1 = very often true, 2 = often true, 3 = sometimes true, and 4 = never true). Example items include: “I encourage [child] to talk about his/her troubles” and “Even if I am really busy, I make time to listen to [child]”. *Household poverty level* was assessed using the Poverty Probability Index Scorecard for Ghana, developed and validated by IPA and GSS (Ghana Statistical Service, 2015; Innovations for Poverty Action, 2017). The scorecard includes ten items asking families questions such as “Does any member of your family own a gas stove” with a “yes” or “no” answer corresponding to a certain number of points. The items are subsequently summed, with values ranging from 0-100, corresponding to a poverty likelihood percentage. For example, if a family scores a 3/100, they are 88.9% likely to live below the national poverty line and 55% likely to live in extreme poverty. We reverse-coded the score so that higher values indicated a greater likelihood of living in poverty. Finally,

household food security (8 items) was measured using the FAO FIES scale (Cafiero et al., 2018) which includes questions such as “In the past [12 months], did you or any household member go to sleep at night hungry because there was not enough food?”.

Missing Data

Our full analytic sample includes children with data available for at least one item from the SDQ ($N = 4,723$, 99.5% of all participant children). Item-level missingness was low, with the highest number of missing observations per item reaching 80 (item 11 “Has at least one good friend”). Sample sizes vary across research questions and corresponding analyses. RQs 1-3 include children with complete or pairwise-complete SDQ data. Due to limitations of the modeling procedure (see below), listwise deletion was employed for the exploratory analyses corresponding to RQ4, which includes all children with available data on social-emotional and academic outcomes (RQ4a; 93.4% of full sample) and child and family characteristics (RQ4b; 93.6% of full sample).

Analytic Strategy

A series of exploratory and confirmatory factor analyses and factor score regression models were employed to test RQs 1-4. Analyses were conducted in R with the psych (Revelle, 2023), lavaan (Rosseel, 2012), and semTools (Jorgensen et al., 2022) packages.

RQ1 and RQ2: Factor Analysis

To test the dimensional structure of the parent-reported SDQ in this sample, the a priori hypothesized five-factor structure was tested using CFA on the full analytic sample following the procedure detailed below. To address RQ2, cases were first randomly split into index and reserve samples of equal size ($n = 2,362$), with the index samples used for EFA and reserve samples employed for CFA. Prior to conducting EFAs, a smoothed, pairwise-complete, polychoric

correlation matrix was obtained as is appropriate when using ordinal variables. Exploratory analyses were conducted using Promax oblique rotation, with successively more factors extracted until there was evidence of over-extraction. For each sample, the factor solution retained for confirmatory analysis was that which had the greatest number of reliable factors while approaching simple structure (i.e., each factor needed more than 3 salient [$>.40$] items and few--if any--cross-loaders). Reliability was evaluated by assessing the ordinal alpha (Zumbo et al., 2007) and categorical omega (see Flora, 2020) among saliently-loading items, where values $>.70$ evinced sufficient internal consistency. In the event that salient items produced a reduction in factor reliability, those items were iteratively dropped from that factor and reliability was re-evaluated.

Confirmatory analyses were used to verify the factor solution obtained with EFA. Analyses were conducted directly on the reserve sample data via weighted least squares estimation with mean and variance adjusted (i.e., WLSMV), which is appropriate for ordinal items (DiStefano et al., 2018). Children with complete item-level parent-reported SDQ data were included in analyses, as required for this estimator. Model fit was evaluated using approximate fit indices, where CFI $>.95$, RMSEA $<.06$, and SRMR $<.08$ were taken as evidence of good fit (Hu & Bentler, 1999). The chi-squared test statistic for each model was also examined, although it is well established that this value will likely show a significant discrepancy between the model and the data for large sample sizes such as in this study (Brown & Moore, 2012). Solutions meeting these criteria were retained for interpretation and further analysis.

RQ3: Measurement Invariance

Two series of multiple-group CFAs (MG-CFAs) were estimated with the full analytic sample to test for measurement invariance by age and gender. Gender was defined as male or

female, and younger children were defined as those aged 5-9 whereas older children were those age 10 and above. The traditional process of measurement invariance testing (e.g., Millsap & Yun-Tein, 2004) whereby cross-group equality constraints are sequentially introduced for thresholds, factor loadings, and uniqueness cannot be conducted for our data; threshold equivalence is not testable for 3-category indicators (Wu & Estabrook, 2016). Therefore, each test began with a configural model whereby groups had the same pattern of indicators loading on to the respective factors, followed by a model with factor loadings and thresholds constrained to equality across groups, and finally the addition of residual variance equality constraints. Default identification constraints were employed; syntax for each test was produced automatically using the `meansEq.syntax()` function from the `semTools` R package (Jorgensen et al., 2022) according to the formulation suggested by Wu and Estabrook (2016). Likelihood ratio tests of nested models were conducted to evaluate whether the additional constraints provided a statistically significant decrement in fit (i.e., nonsignificant tests provide evidence of invariance). Detecting misfit using the chi-square statistic is likely given our large sample size (Chen, 2007; Sass et al., 2014); therefore, we also examined change in model fit indices. Recommended cut-offs vary, with a common criteria suggesting that less than or equal to a -.010 change in CFI and a 0.015 change in RMSEA (Chen, 2007; Cheung & Rensvold, 2002).

RQ4: Convergent and Discriminant Validity

Factor score regression models were employed to look at convergent and discriminant validity of concurrently assessed social and emotional constructs. Factor scores were created using the factor structure obtained from RQs 1-3. Multiple regression models investigated how parent-reported SDQ factors are associated with social and academic outcomes. SDQ factors scores were also regressed onto child gender, child age, caregiver age, caregiver gender,

caregiver education level, household poverty, household food insecurity, caregiver home stimulation, caregiver violent discipline practices, and caregiver emotional supportiveness. To account for children nested within families, cluster-robust standard errors were estimated using a sandwich estimator and statistical significance was evaluated using Hochberg's adjusted Bonferroni procedure to account for multiple tests per model (Anderson, 2023).

Results

RQ1: Five-Factor Structure

Our first confirmatory factor analysis did not support the 5-factor structure reported by Goodman (2001) as evidenced by poor model fit (CFI = 0.70; RMSEA = 0.121; SRMR = 0.145; $\chi^2(265) = 8736.13$) with ordinal alphas below acceptable thresholds for four out of the five subscales (Emotional Problems $\alpha = .74$, Conduct Problems $\alpha = .65$, Hyperactivity $\alpha = .51$, Peer Problems $\alpha = .27$, Prosocial Behaviors $\alpha = .67$). The lack of reliability of the subscales in combination with the poor model fit led us to an exploratory approach to determine the latent factor structure of the SDQ in this sample.

RQ2: Factor Structure and Internal Consistency

EFA using the index sample revealed that the 3-factor solution had the most saliently loading items while making theoretical sense and remaining parsimonious. This solution was tested via CFA on a reserve sample, which resulted in good model fit (CFI = 0.967; RMSEA = 0.045; SRMR = 0.060; $\chi^2(186) = 1025.47, p < .001$). The full 3-factor solution, as estimated on the full sample, is presented in Figure 1 and forms the basis of the measurement invariance and validity testing.

The first factor we extracted included a mix of prosocial and self-regulation items; including, all prosocial items (*reverse coded*), items from the conduct problems scale

(“Generally obedient (*reverse*)”) and the hyperactivity scale (“Thinks things out before acting (*reverse*)”) and (“Sees tasks through to the end (*reverse*)”). The second factor included items from the conduct problems (“Often has temper tantrums or hot tempers”, “Often fights with other children”, and “Often lies or cheats”), hyperactivity (“Restless” and “Fidgeting”), and peer problems (“Picked on or bullied”) scales. The third factor included items from primarily the emotional problems (“Many worries”, “Often unhappy”, “Nervous or clingy”, “Many fears”) scale with one item from conduct problems scale (“Steals”) and one item from the hyperactivity scale (“Easily distracted, concentration wanders”). Item 1 (“Considerate (*reverse*)”), item 3 (“Many headaches”) and item 6 (“Solitary”) did not load onto any factors. Item 23, “Gets on better with adults than other children”, reverse-loaded onto the first factor and was removed. Moving forward, we refer to factor 1, the mix of prosocial and self-regulatory behaviors, as “Responsibility”, or more accurately “Responsibility Problems” as these items are reverse-coded, factor 2 as “Externalizing Problems”, and factor 3 as “Internalizing Problems”. In the discussion, we elaborate on our conceptualization of these factors. Each of the three scales produced acceptable levels of internal consistency (Responsible Behaviors $\alpha = .76$, $\omega = .76$; Externalizing Behaviors $\alpha = .84$, $\omega = .78$; Internalizing Problems ($\alpha = .80$, $\omega = .72$).

RQ3: Measurement Invariance

Multiple-group confirmatory factor analyses were evaluated to examine whether the 3-factor structure obtained from RQ2 evinced equivalent fit for boys and girls and for older versus younger children. Results (see Table 3 and Table 4) support the conclusion of measure invariance by gender and age, given the appreciably small differences in fit indices upon inclusion of restrictive equality constraints. Hence, this suggests that using the same dimensional

structure and factor scores will not introduce systematic error (i.e., bias) if making age and gender comparisons, or including age and gender as covariates in regression models.

RQ4: Convergent and Discriminant Validity

Conflict Resolution

Higher caregiver-reported responsibility problems and externalizing problems were associated with higher reports of *appropriate* child-assessed conflict resolution, while more internalizing problems were associated with less conflict resolution skills. These associations are small but statistically significant. The results did not change when we controlled for child age and gender.

Self-Esteem

Caregiver-reported responsibility problems and internalizing problems were associated with significantly lower child-reported self-esteem. In contrast, higher levels of reported externalizing behaviors were associated with higher self-esteem, an association that remained significant when controlling for child age and gender.

Academic and Cognitive Outcomes

As shown in Table 5, the responsibility problems factor was significantly associated with children's directly assessed literacy, numeracy, and executive function skills with more responsibility problems corresponding to lower literacy, numeracy, and executive functioning skills. The externalizing problems factor negatively associated with literacy skills, but not numeracy or executive function. The internalizing problems factor was not associated with the academic and cognitive outcomes.

Child- and Household-level Covariates

Caregiver-Reported Responsibility Problems. Older children, children with male primary caregivers, and children with higher levels of caregiver-reported emotional support had lower responsibility problem factor scores. Child gender, caregiver education, cognitive home stimulation, caregiver harsh discipline, household food insecurity, and household poverty were not significantly associated with responsibility problems (see Table 6).

Caregiver-Reported Externalizing Problems. Older children, older caregivers, male caregivers, more cognitive stimulation at home, and more emotional support were significantly associated with fewer externalizing problems. Further, male children, harsh discipline practices and household food insecurity were related to more externalizing problems. Caregivers with higher levels of education reported *more* externalizing problems and higher household poverty, was associated with *less* caregiver-reported externalizing problems, albeit weakly.

Caregiver-Reported Internalizing Problems. Higher levels of caregiver-reported emotional supportiveness and home cognitive stimulation were associated with fewer caregiver-reported internalizing problems. Caregivers reported younger children having slightly less internalizing problems. Like externalizing behaviors, household poverty had an inverse relationship with internalizing problems, with a higher probability of poverty predicting less internalizing problems, also weakly. Household food insecurity and harsh discipline practices were related to more caregiver-reported internalizing problems. We also find that higher caregiver education levels are associated with *more* internalizing problems. Caregiver gender, child gender, and caregiver age were not related to children's internalizing problems (see Table 6).

Discussion

This study provides evidence on the reliability and validity of the parent-reported SDQ in northern Ghana and adds to the literature on the cultural applicability of global psychosocial measures. Accurately measuring children's social and emotional outcomes has important practical implications--it enhances our understanding of core components of child development across diverse contexts and informs the design and implementation of interventions. The 5-factor structure proposed by the SDQ developers did not adequately fit our data; rather, through exploratory and confirmatory factor analyses, we identified a 3-factor model representing two existing constructs in the SDQ (externalizing problems and internalizing problems, with some differences in which items were included in those factors), and a third, new factor we called Responsibility Problems.

Applying a Socio-cultural Lens to the SDQ Factor Structure in Ghana

The SDQ measures five distinct social-emotional constructs, but the tool developers later suggested a 3-factor structure would be suitable for sub-clinical populations (Goodman et al., 2010)³. However, the 3-factor structure we found differs in important ways from the one proposed by Goodman and colleagues and may help shed light on differences in the conceptualization of social and emotional behaviors in collectivist contexts.

Factor 1: Conceptualizing "Responsibility" as a Combination of Prosocial and Self-Regulated Behaviors

Both the five and three-factor SDQ structure proposed by Goodman and colleagues include a prosocial subscale to reflect children's social strengths. Our "Responsibility", or when reversed coded, "Responsibility Problems" factor, included the prosocial subscale and items

³ As a robustness check, we ran a CFA on the 3-factor structure outlined by Goodman and colleagues (2010) and found our final factor structure to be a better fit.

from the hyperactivity subscale (“Thinks things through before acting” and “Sees tasks through to the end”) and conduct problems subscale (“Generally obedient”). This factor—which combines prosocial and self-regulated behaviors—has been observed in other psychometric studies of the SDQ in SSA (Tubbs Dolan, 2018), ethnographic research in the region (Ariapa & Akongo, 2021; Jukes et al., 2018), and school curricula, suggesting that this trait is generalizable to other contexts that hold similar values.

In neighboring northern Nigeria, Tubbs-Dolan (2018) found a factor structure of the teacher-reported SDQ that closely resembled ours, with 19 of 21 items loading in the same way (see Supplementary Materials), including a combination of prosocial and self-regulation items on the first factor. Akpa et al. (2016) also investigated the factor structure in southern Nigeria and their results did not mirror ours so precisely. Regional cultural differences could explain this deviation, as northern Nigeria and northern Ghana share important cultural (majority Muslim) and social (low-SES, rural, agrarian) characteristics unique from their southern counterparts. Testing for measurement invariance *within* SSA countries, especially in contexts with varying degrees of Western socio-cultural influence, is a rich area for future research.

Our findings align with rich qualitative findings: interviews with teachers and caregivers in Tanzania and Kenya found that social and emotional competencies such as respect, obedience, and attentive listening were reported as most important for children’s well-being and success. In particular, caregivers and teachers operationalized respect as a combination of obedience, responsibility, and fear of God (Ariapa & Akongo, 2021). This departs from WEIRD operationalizations of prosocial behavior, which tend to prioritize traits such as sharing and volunteering (Ariapa & Akongo, 2021; Jukes et al., 2018). Moreover, the Ghanaian primary school curriculum explicitly includes sections on “Responsibility” and “Being a Responsible

Family Member”, teaching specific behaviors such as obedience, respect for family members, performing assigned duties, taking initiative, and helping needy relatives (pg. 32 and pg. 44, NaCCA, 2019). These behaviors combine what has been conceptualized as two distinct constructs, namely prosocial and self-regulated behaviors, into a potentially distinct and important social and emotional construct in SSA. While this construct may not have a Western equivalent, it likely reflects skills valued in collectivist contexts.

Factors 2 and 3: Caregiver-Reported Internalizing Problems and Externalizing Problem Behaviors May Manifest Differently in Northern Ghana

Our second and third factors represent caregiver-reported externalizing behaviors and internalizing problems, and while we chose to conceptualize these constructs as internalizing and externalizing problems, the items loaded in different ways than the original internalizing and externalizing factors proposed by Goodman and colleagues (2010). First, our externalizing factor included an item from the peer problems subscale “picked on or bullied”, which is part of the internalizing factor in WEIRD contexts. Being bullied can contribute to both internalizing and externalizing symptoms (Eastman et al., 2018; Kim et al., 2006) and a child can be both a bully and a victim of bullying (O’Brennan, Bradshaw, & Sawyer, 2009). In Ghana, being bullied may be more closely associated with externalizing problems--either because children with conduct or hyperactivity problems (items from both subscales loaded on the externalizing factor) may be more likely to be bullied or because in a collectivist society, not getting along with peers more broadly, may be perceived as a conduct problem (Chen, Lee, & Chen, 2018). Ghanaian caregivers perceive being bullied, or not getting along with peers more broadly, as a conduct problem. Second, the item “steals” loaded onto internalizing problems instead of externalizing, which may indicate that stealing is not solely a behavioral problem as much as a socioeconomic problem in

our sample. In WEIRD contexts, experiencing food insecurity may contribute to internalizing problems (Slopen et al., 2010), indeed, food insecurity was significantly associated with internalizing problems in our sample. Third, the item “gets on better with adults” reverse loaded onto the responsibility problems factor in our sample and did not load onto any factor in other validation studies in collectivist contexts (Akpa et al., 2016; Kashala et al., 2005), which suggests that it was perhaps interpreted as a positive quality and one that aligns with our larger hypothesis that adult-helping behaviors (e.g. obedience) may be seen as prosocial by Ghanaian caregivers.

Convergent and Discriminant Validity in Context

While seemingly counterintuitive based on existing literature, our convergent and discriminant validity findings may reflect unique cultural dynamics. In terms of academic and cognitive competencies, only responsibility problems were significantly associated with children’s literacy, numeracy, and executive functioning skills. One explanation for the lack of association could be due to caregivers primarily observing children’s behavior in the home, where they spend the most time with children, but children’s behavior can (normatively) vary across settings (De Los Reyes et al., 2015); meaning that behavior observed in school settings may better predict academic performance. These between-setting differences may be especially pronounced in collectivist cultures, where adapting one’s behavior to fit the context is encouraged and demonstrates the positive traits of flexibility and social awareness, unlike in individualistic societies where consistency across settings is praised as authenticity (Henrich, 2020). If this is the case, then we might expect to see a stronger association between teacher-reported externalizing behaviors and internalizing problems in school settings and children’s academic skills. Another possible explanation could be that self-regulation items specific to

academic success (e.g. “sees tasks through to the end”, “thinks things through before acting”, and “general obedience”) loaded onto the responsibility problems factor, and not the externalizing factor, which may explain the stronger association between academic and cognitive skills with responsibility problems. In the original design of the SDQ, externalizing problems included the hyperactivity/inattention subscale, but in our sample the inattention items loaded onto the responsibility problems factor. Likewise, executive function was measured using short-term and working memory subtasks, which may be more related to attention than hyperactivity.

The positive association between externalizing behaviors and self-esteem could stem from the societal approval of children who show these traits in challenging environments, indeed, these behaviors may be interpreted by caregivers as indicators of assertiveness or resilience (Chen, Lee, & Chen, 2018). Conversely, the negative association between responsibility problems and self-esteem may reflect the high expectations placed on children in to contribute within the family system--indeed, in Ghana, fulfilling familial responsibilities is critical to the meaning children attach to their lives and recognition within their community (Twum-Danso Imoh & Okyere, 2020).

Child and Household Characteristics Associated with Social and Emotional Behaviors

Several key differences emerged between the existing evidence in peri-urban Ghana regarding associations between social and emotional behaviors and child and household characteristics, pointing to factors associated with *cultural context*—beyond country-level differences—as important drivers for child development. In peri-urban Ghana, boys showed lower social and emotional growth on a direct assessment of prosocial behavior (Wolf et al., 2021), but in our sample, gender was not associated with responsibility problems. This could be due to the difference between responsibility problems and a measure of solely prosocial

behaviors. Alternatively, children's responsibility problems were caregiver-reported, and girls may be subject to higher expectations of helping at home.

This hypothesis is supported by the fact that male caregivers reported *fewer* externalizing behaviors and *fewer* responsibility problems. Informant discrepancies, specifically between mothers and fathers, are well-established in WEIRD contexts and could be due to either differing gendered interpretations of expressed behavior, different thresholds of what constitutes a problem behavior, and/or the contexts in which caregivers spend time with their children (De Los Reyes, 2011; De Los Reyes et al., 2015). Traditional gender roles held in northern Ghana may contribute to these discrepancies as female caregivers spend more time at home with their children. More research on informant discrepancies across different cultural contexts is needed to deepen our understanding of how variations in norms and caregiver roles shape perceptions of children's behavior.

Beyond gender differences, increased caregiver emotional supportiveness associated with fewer responsibility and externalizing problems and fewer internalizing problems. The relationship between caregiver emotional support and child behavior and mental health is well-established in WEIRD contexts (Boudreault-Bouchard et al., 2013; Mccarty et al., 2005; Shaw et al., 2004). In SSA, the importance of nurturing and responsive care for young children's healthy development is well-documented (Britto et al., 2017; Suntheimer et al., 2024), yet less is known about how this parenting dynamic changes as children get older. One study in northern Ghana, drawing from the same sample, used emotional support as a mediating variable and did not find an association with children's academic or socio-emotional outcomes (Ahun et al., 2024). This may suggest that caregiver emotional support has important direct effects on children's social and emotional functioning, but other factors may be at play for academic and cognitive skills.

Further examination of caregiver mental health could deepen our understanding of how it relates to emotional supportiveness in the SSA context, pointing to a rich area for future research.

Limitations

We recognize several important limitations to this study that underscore the challenges in developing and validating a measure of social and emotional behavior across diverse contexts. First, although our sample is large and age-and language-diverse, it is not representative of Ghana nationally nor the surrounding regions. Our sample was drawn from previous intervention studies in northern Ghana and the households who were targeted for the intervention and who opted to participate may differ in important ways from those who did not. Second, our study is cross-sectional and does not allow us to establish invariance across time and all associations examined in the convergent validity section of our analysis are only correlational; thus it is not possible to ascertain the direction of the effects. Third, our sample is limited to caregiver and child-reports. Including teachers, school records, and more child-reported social and emotional behaviors would have allowed us to conduct more thorough validity testing. Additionally, while caregiver reports can provide valuable insight into children's behavior, they may not be wholly representative of children's social and emotional skills, particularly regarding how those skills may manifest in school contexts. Lastly, and mostly applicable to our fourth research question, the use of listwise deletion is a limitation as it assumes that data are missing at random, which can introduce bias if non-respondents systematically differ from respondents. Nonetheless, this study provides important insights and directions into assessing social-emotional skills across diverse cultural and contextual, using a large sample of children across several developmental stages.

Conclusions and Future Directions

Increased demand for school-based SEL and mental health interventions has spread across the globe. Generating evidence of the efficacy of these programs in low-resource contexts, and SSA specifically, currently rely on measures developed in North America or Europe; even though only a handful of these measures are validated in their own contexts (Halle & Darling-Churchill, 2016). Our study explores the cultural validity of a widely used measure by assessing and interpreting the factor structure within a particular cultural context. Factor structures that diverge from those validated in WEIRD contexts and seen as not working may be picking up on unique values and expressions of social and emotional behaviors. Future psychological measurement work in non-WEIRD contexts should combine ethnographic research, where possible, to better inform the development and testing of measures. Measures that can be used across cultural contexts are valuable to understand universally salient attributes of child development and to allow for cross-context comparisons to ascertain relative needs. On the other hand, culturally informed measures are urgently needed. As our study shows, valued context-specific constructs that are associated with children's academic and cognitive outcomes may be overlooked without consideration of the cultural context. Understanding how to best promote children's well-being starts with measures that capture what well-being means within the context.

Further, how social and emotional behaviors present and are valued *within* a cultural context will be an important area for future psychological measurement work. Variation in behavior between settings, such as home and school, in cultures that value social cohesion over individual expression needs further examination in order to understand the setting-specific behaviors that are most predictive of positive outcomes. Measures that reflect the social and emotional skills most valued within a home or school will be essential for the next stage of SEL

research and critical for the design and implementation of impactful interventions.

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Table 1.*Descriptive Statistics of Observed Sample*

	N	Mean/%	St. Dev	Min	Max
Child Age	4,712	10.3	3.4	5	17
Child Sex (% Female)	4,723	44.5%			
Conflict Resolution	4,567	2.8	1.3	0	4
Self-Esteem	1,997	28.4	3.8	11	40
Literacy	4,723	0.1	0.1	0	0.7
Numeracy	4,723	0.4	0.2	0	0.7
Executive Function	4,723	0.4	0.2	0	1
Caregiver Age	4,451	42.8	11.9	19	100
Caregiver Sex (% Female)	4,456	58.1%			
Caregiver Education Level	4,433	0.7	1.2	0	5
HH Size (# of children < 18 years)	4,723	3.2	1.4	1	12
Food Insecurity	4,723	4.6	2.6	0	8
Poverty	4,456	72.7	15.6	19	100
Discipline Practices	4,723	2.8	2.0	0	9
Home Stimulation	4,723	3.4	1.9	0	6
Emotional Supportiveness	4,723	17.6	2.9	4	24

Table 2.*Results From Exploratory Factor Analysis of the SDQ*

SDQ item	Factor loading		
	1	2	3
Factor 1: Prosocial/Responsibility (R)			
4. Shares readily with other children (R)	.52	-.04	.06
7. Generally obedient (R)	.67	.07	-.07
9. Helpful if someone is hurt (R)	.60	.10	-.10
11. Has at least one good friend (R)	.43	-.15	.18
14. Generally liked by other children (R)	.68	.11	-.11
17. Kind to younger children (R)	.65	.14	-.01
20. Often volunteers to help others (R)	.60	.04	.06
21. Thinks things out before acting (R)	.58	-.03	-.06
25. Sees tasks through to the end (R)	.65	.09	-.06
Factor 2: Externalizing			
2. Restless, overactive.	.00	.63	-.07
5. Often has temper tantrums or hot tempers.	.03	.47	.05
10. Constantly fidgeting or squirming.	.05	.56	.09
12. Often fights with other children.	.05	.76	-.07

18. Often lies or cheats.	.02	.72	-.06
19. Picked on or bullied by other children.	.00	.74	-.03

Factor 3: Internalizing

8. Many worries.	.08	-.05	.78
13. Often unhappy, downhearted.	.10	.35	.43
15. Easily distracted, concentration wanders.	-.02	.16	.59
16. Nervous or clingy in new situations.	-.07	-.02	.72
22. Steals from home, school or elsewhere	.00	.15	.53
24. Many fears, easily scared.	-.05	-.11	.73

Did not load

1. Considerate of other people's feelings (R)	.32	.04	.06
3. Often complains of headaches.	-.24	.22	.09
6. Rather solitary, tends to play alone.	.08	.30	.27
23. Gets on better with adults than with other children.	-.45	.09	.10

Note. $N = 2361$ (index sample). EFA conducted with promax rotation. Factor loadings above .40 are in bold. Reverse-coded items are denoted with an (R).

Table 3.*Model Fit for Gender Measurement Invariance Models*

Model	Model Fit			Fit Difference				
	CFI	TLI	RMSEA	$\Delta\chi^2$	df	p	Δ CFI	Δ RMSEA
Constrained Thresholds	0.970	0.965	0.043	-	-	-	-	-
Constrained Thresholds & Loadings	0.970	0.968	0.042	13.94	18	.73	-0.000	-0.001
Constrained Thresholds, Loadings, & Residuals	0.970	0.969	0.041	39.44	39	.45	-0.000	-0.001

Note. Δ (Delta) indicates change/difference between additional constraints.

Table 4.*Model Fit for Age Group Measurement Invariance Models*

Model	Model Fit			Fit Difference				
	CFI	TLI	RMSEA	$\Delta\chi^2$	df	p	Δ CFI	Δ RMSEA
Constrained Thresholds	0.969	0.965	0.043	-	-	-	-	-
Constrained Thresholds & Loadings	0.969	0.967	0.042	22.82	18	.20	-0.000	-0.001
Constrained Thresholds, Loadings, & Residuals	0.968	0.969	0.042	65.23	39	.01	-0.001	-0.000

Note. Δ (Delta) indicates change/difference between additional constraints.

Table 5.*Regression Analysis with Standardized Coefficients*

	ISELA Conflict Resolution Subscale	Rosenberg Self- Esteem Scale	Literacy	Numeracy	Executive Function
Responsibility Problems	0.07*** (0.02)	-0.33*** (0.14)	-0.06* (0.02)	-0.08*** (0.02)	-0.12*** (0.02)
Externalizing Problems	.12*** (0.03)	.29*** (0.09)	-0.08* (0.074)	-0.06 (0.04)	-0.04 (0.03)
Internalizing Problems	-0.10** (0.04)	-0.55*** (0.07)	0.05 (0.03)	0.03 (0.04)	0.01 (0.03)
R-squared	0.041	0.15	0.01	0.01	0.01
Sample size	4,277	1,901	4,037	3,664	4,419

Note: Robust standard errors in parentheses. *** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$. All outcome variables are standardized. Rosenberg Self-Esteem Scale was only administered to adolescents (10-17 years old).

Table 6.

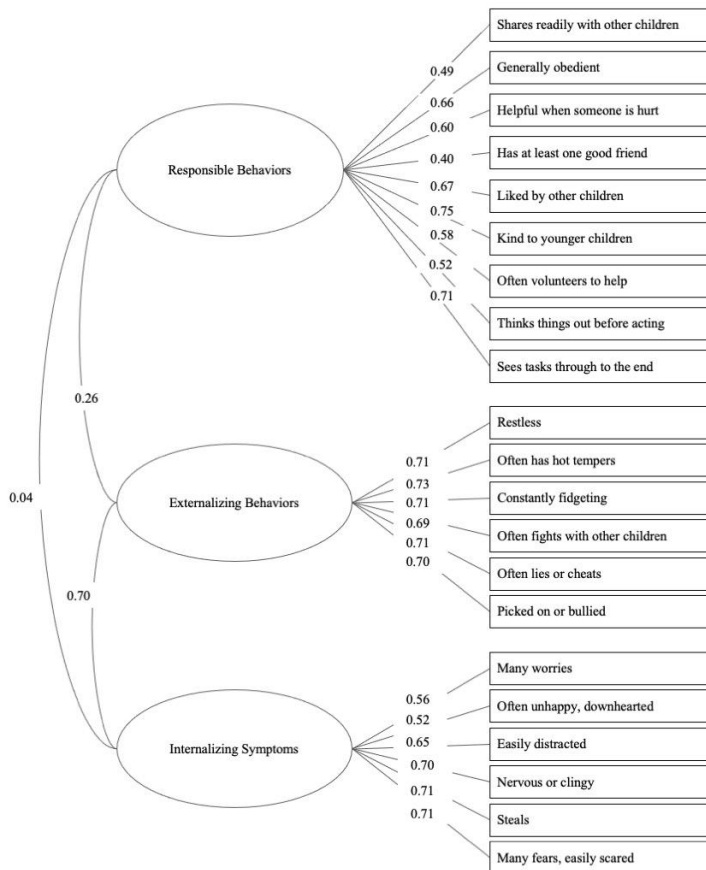
Multiple Regression Results of SDQ Factor Scores as Predicted by Child and Household Characteristics

	Responsibility	Externalizing	Internalizing
Child gender (male)	-0.02 (0.03)	0.06* (0.03)	-0.01 (0.03)
Child age (c)	-0.02*** (0.00)	-0.019** (0.00)	-0.01* (0.00)
Caregiver age (z)	-0.00 (0.00)	-0.00** (0.00)	-0.00 (0.00)
Caregiver gender (male)	-0.14*** (0.03)	-0.17*** (0.03)	-0.02 (0.03)
Caregiver education	-0.00 (0.00)	0.04** (0.01)	0.03* (0.01)
Home stimulation (z)	0.00 (0.01)	-0.05*** (0.01)	-0.02+ (0.01)
Emotional support (z)	-0.27*** (0.01)	-0.13*** (0.01)	-0.13*** (0.01)
Harsh discipline (z)	-0.02 (0.01)	0.11*** (0.01)	0.12*** (0.01)
HH poverty (z)	0.00 (0.00)	-0.00*** (0.00)	-0.00** (0.00)
HH food insecurity (z)	-0.02 (0.01)	0.06*** (0.00)	0.10*** (0.01)
R-squared	0.12	0.10	0.07

Note. N= 4,131. Robust standard errors in parentheses. *** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$ (z)=standardized. (c) = mean-centered

Figure 1.

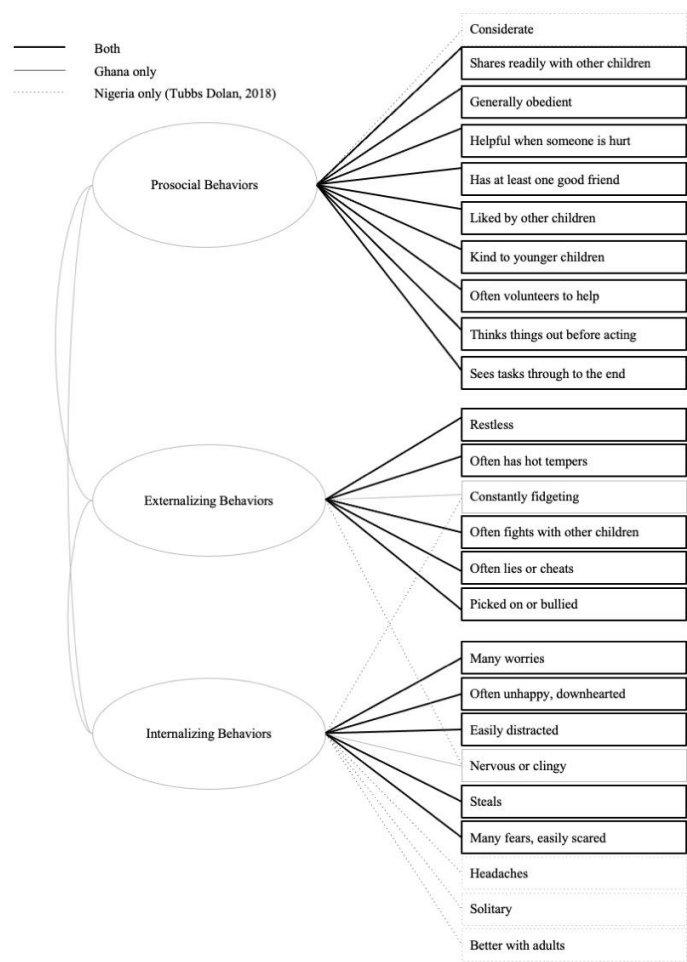
Final Confirmatory Factor Structure



Note. Confirmatory Factor Analysis was conducted on full, complete sample ($N = 4,723$). CFI = 0.969, RMSEA = 0.043, $\chi^2(186) = 1731.54$.

Supplementary Materials

Figure 1.
Comparison between final factor structure from parent-report SDQ in northern Ghana and teacher-report SDQ in northern Nigeria



Note. Compared factor structure taken from Tubbs-Dolan, C. (2018).

Supplementary Materials

Table 1.

Summary of recent SDQ Validation Studies in Sub-Saharan Africa

Study	Location	Version	Sample	Factor Structure	Internal Consistency (alphas)
Aaro et al., (2022)	South Africa	Child-reported	3,542 8th graders	CFA only, found 3 factor structure (prosocial, external, and internalizing problems) to be better fit than the 5-factor structure.	Prosocial = 0.72 Externalizing = 0.57 Internalizing = 0.63
Akpa et al. (2016)	Nigeria	Child-reported	1,244 children (10-19 years old)	EFA produced a three-factor model. The first factor was composed of both conduct and peer problem items, the second factor was prosocial items (specifically helping behaviors), and the third was a mix of prosocial and self-regulation items (reverse inattention/hyperactivity items).	Factor 1 = 0.81 Factor 2= 0.56 Factor 3= 0.59
Mellins et al. (2018)	South Africa	Caregiver-reported	1,581 children (4-6 years old)	CFA of 5-factor model showed a poor fit. Scales with adequate internal consistency (prosocial, conduct problems, and emotional problems) were tested and found to product a good fit	Prosocial = 0.57 Conduct problems = 0.51 Emotional problems = 0.62 Hyperactive/inattentive = 0.42 Peer problems = 0.38
Nakigudde et al. (2016)	Uganda	Caregiver-reported	154 children (5-9 years old)	1 factor and 4 factor CFA (difficulties items), both showing a poor fit	Prosocial= 0.48 Conduct problems= 0.39 Emotional problems = 0.60 Hyperactivity/inattention= 0.25 Peer problems = 0.42
Tubbs-Dolan (2018)	Nigeria	Teacher-reported	480 children (5-10 years old)	EFA produced a 3 factor model comprised of externalizing, prosocial, and internalizing problems. Hyerpactivity items loaded onto the externalizing and prosocial scales.	Externalizing behaviors = 0.62 Social behaviors = 0.93 Internalizing behaviors = 0.71

