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Emotional and Behavioral Problems among Impoverished Kenyan Youth: Factor Structure and Sex-Differences

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Abstract

Data on youth emotional and behavioral problems from societies in Sub-Saharan Africa are lacking. This may be due to the fact that few youth mental health assessments have been tested for construct validity of syndrome structure across multicultural societies that include developing countries, and almost none have been tested in Sub-Saharan Africa. The Youth Self-Report (YSR), for example, has shown great consistency of its syndrome structure across many cultures, yet data from only one developing country in Sub-Saharan Africa have been included. In this study, we test the factor structure of YSR syndromes among Kenyan youth ages 11–18 years from an informal settlement in Nairobi, Kenya and examine sex-differences in levels of emotional and behavioral problems. We find the eight syndrome structure of the YSR to fit these data well (Root Mean Square Error of Approximation=.049). While Kenyan girls have significantly higher internalizing (Anxious/Depressed, Withdrawn/Depressed, Somatic) problem scores than boys, these differences are of similar magnitude to published multicultural findings. The results support the generalizability of the YSR syndrome structure to Kenyan youth and are in line with multicultural findings supporting the YSR as an assessment of emotional and behavioral problems in diverse societies.

Keywords

confirmatory factor analysis; sex-differences; Kenya; Youth Self-Report

Our knowledge about youth emotional and behavioral problems from developing countries in Sub-Saharan Africa, such as Kenya, is limited, and parallels the dearth of available treatment services in that region. Some progress in the assessment of youth emotional and behavioral problems in Kenya has been made in recent years (Ndeti et al. 2008; Ndeti et

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al. 2009), with several studies reporting on youth who experienced adversity and violence (Ndeti et al. 2007; Ndeti et al. 2005; Pfefferbaum et al. 2006; Syengo-Mutisya et al. 2008). However, none of these studies tested the validity of their assessment instruments prior to conducting epidemiologic analyses. Despite efforts to quantify the prevalence of emotional and behavioral problems among Kenyan youth, there remains a pressing need for assessments that can be compared to findings from developed countries (Benjet 2010). In addition, little is known about emotional and behavioral problems among some of the most vulnerable Kenyan youth, including those living in informal settlements (known locally as slums) in the capital city, Nairobi.

The Youth Self Report (YSR; Achenbach and Rescorla 2001) is one of the world's most widely used self-assessments of youth emotional and behavioral problems. The YSR is part of the Achenbach System of Empirically Based Assessments (ASEBA): a family of empirically-based quantitative instruments that are sensitive to sex-differences in psychopathology and also include scales such as the Child Behavior Checklist and the Teacher's Report Form (Achenbach and Rescorla 2001). First developed and tested among United States populations, the YSR has since been translated into over 60 languages with published studies of its use in over 40 societies. Multicultural comparisons of YSR normative samples from over 20 societies have shown that the factor structure (Ivanova et al. 2007) and epidemiology (Rescorla et al. 2007) of emotional and behavioral problems are remarkably consistent across diverse societies from mostly developed and a few developing countries. As important as these data are, the bulk of the samples used for the YSR multicultural studies were from developed countries, and only one included society was from Sub-Saharan Africa; an unpublished dissertation using the YSR in Ethiopia from the mid-1990s (Mulatu 1997). While Ethiopia and Kenya share a border, they do not share ethnic groups nor languages, and Ethiopia was never colonized like Kenya was by the British. Amharic is the official language of Ethiopia and English and Kiswahili are the official languages of Kenya. Today English is pervasive in both societies among those with a high school education, but this was likely not the case in the mid-1990s when the Ethiopian YSR data were collected on youth ages 11–18. Although the validity of the YSR has not been tested in other Sub-Saharan societies, a few recent studies using the YSR have been published from two other East African societies neighboring Kenya (Amony-P'olak et al. 2007; Klasen et al. 2010), yet again in languages other than Kiswahili.

The paucity of data from Sub-Saharan Africa reflects the many challenges facing mental health clinicians and researchers in developing countries including limited financial resources and mental health professionals. In developing countries, like Kenya, mental health is rarely incorporated into general medical practice, and even less so for youth (Kieling et al. 2011). Validation and use of an evidence-based mental health assessment for youth could greatly improve the recognition that mental health services are needed for youth in Kenya. Utilizing the YSR in research in Kenya is also important because of the opportunity for comparison with the wealth of YSR data from other societies around the world as global mental health awareness expands (Patel et al. 2011). Kenyan researchers can help educate local policy makers to promote mental health care as part of overall health. The lack of clinical expertise and research data in Kenya conspire to make psychometric testing of assessments, such as the YSR, challenging. Before undertaking more comprehensive

epidemiological studies on youth mental health in Kenya, it is necessary to test aspects of construct validity of evidence-based assessment instruments, like the YSR.

A precedent for testing one aspect of construct validity for the YSR has been set by Ivanova et al. (2007) in their confirmatory factor analyses (CFA) of the YSR in 23 societies worldwide. They report results from 23 separate CFAs using identical statistical protocols. Their primary fit indices indicated good fit (Root Mean Squared Error of Approximation < .06) for all societies, while their secondary fit indices indicated acceptable to good fit in all but one society (Greece: Comparative Fit Index < .80; Table 1). The overall median factor loading for all societies combined was .59, with median item loading ranging from .53 to .67 (Table 2). Their factor loadings on the 89 items that make up the eight syndromes were all statistically significant on their respective factors for 19 out of the 23 societies. However, there was one very low individual item loading at .08 from Ethiopia and one very high item loading outside of the admissible parameter space at 1.07 for Norway (Ivanova et al. 2007). Based on the results of the aforementioned multicultural CFAs, we hypothesize that the YSR syndrome structure with eight factors of youth emotional and behavioral problems will have acceptable to good fit statistics among our sample of Kenyan youth. Confirmation of the eight factor model within our Kenyan sample, only the second to be tested in Sub-Saharan Africa, will support the YSR as a useful assessment instrument for youth emotional and behavioral problems in Kenya with possible extension to neighboring Kiswahili-speaking societies in the future.

In this study, we are also interested in how problems reported by impoverished Kenyan youth are different between girls and boys and also how they compare with problems reported on the YSR in other societies. We hypothesize that girls will report higher internalizing symptoms and boys may report higher externalizing symptoms, based on the multicultural data detailing patterns of internalizing and externalizing symptoms of girls and boys from other societies (Achenbach and Rescorla 2010). We hypothesize that our Kenyan youth sample will report higher levels of somatic symptoms, based on studies finding youth exposed to trauma, violence, stress, adversity, and mental problems have high levels of somatic symptoms (Bailey et al. 2005; Crawley et al. 2013; Gobble et al. 2004; Hensley and Varela 2008; Shaw 2003). Within Kenyan youth, we also expect to find higher levels of YSR symptoms among a clinic-based sample compared to a random sample (Achenbach and Rescorla 2001, 2010). Scores for boys and girls on each empirically-derived and DSM-oriented scale can be categorized into clinical, borderline, and normal ranges based on cut-off values from this multicultural research that established norms for societies with relatively low, medium, or high YSR problem scores (Achenbach and Rescorla 2007; Rescorla et al. 2007). After applying the multicultural norms, we test our final research question of whether there sex-differences remain among Kenyan youth. Comparing the raw scores and categorization of emotional and behavioral problems of Kenyan youth with multicultural youth is valuable in beginning to understand cultural similarities and differences given Kenya is unique as a developing country from Sub-Saharan Africa.

Method

Participants

Throughout January 2008, the largest informal settlement in Nairobi experienced extreme post-election violence following the highly contested Kenyan presidential election. We sampled 11–18 year olds from this informal settlement six months after the violence ended. The majority of sampled youth lived in the informal settlement while a small percentage (5%) attended school in the informal settlement but lived in neighboring low income areas. We expected this population of youth to be at risk for high YSR emotional and behavioral problem scores due to their level of poverty and recent exposure to war-like violence. While poverty and violence were common throughout Kenya, some areas of Kenya did not experience post-election violence, and urban impoverished youth were not representative of the entire population of Kenyan youth.

The study included a school-based sample of 242 youth and a community-based sample of 59 treatment-seeking youth for a total of 301 youth. The 242 students were randomly sampled from one school within the informal settlement with primary classes 5 through 8 and only secondary forms 1 and 2 because the secondary school was new. Each primary class had four classrooms while secondary form 1 had three classrooms and secondary form 2 had two classrooms. One whole classroom from each primary class and secondary form was chosen at random to participate in this study. This school-based sample began with 325 11–18 year-olds and was reduced to 242 completing the YSR assessment due to 81 parents not responding to consent requests and two parents refusing consent (75% response rate). Non-response in the school-based sample was related to the level of involvement of the classroom teacher as evidenced by nearly 100% of students in class 5 returning the signed consent form from their parents while other classes had lower response rates. The final 242 school-based youth were 51% female with a mean age of 13.3 years (range 11–18).

Our community-based sample came from a larger, home-based, research and treatment study for posttraumatic stress disorder involving a sample of 552 six-18 year-olds. Participants in this larger study were randomly sampled from an existing demographic surveillance system within the informal settlement. Full details of this community-based study are published elsewhere (blind citation). Among these community-based youth, 338 were within the appropriate age range to complete the YSR (11–18 years). Eighty one of these 338 (24%) 11–18 year-olds were identified as needing treatment for potential posttraumatic stress disorder using the UCLA PTSD Reaction Index (Steinberg et al. 2004) and were invited to see a Kenyan psychologist for further assessment and treatment. Of these 81 youth, 22 were lost to follow up (73% response rate), leaving us with 59 community-based, treatment-seeking youth to complete the YSR. We considered our response rates of 75 and 73% to be acceptable for the circumstance and population. An unrelated study assessing mental health symptoms in school children conducted in Western Kenya around the same time had a similar (72%) response rate (Okech 2012). Our final 59 treatment seeking youth were 54% female with a mean age of 12.8 years (range 11–17); not different from the age, $t(98) = -1.67, p = .10$, nor gender, $\chi^2(1, N = 301) = .22, p = .64$, of the school-based sample. Also, there was no difference in the mean ages between the boys and girls in the community-based

sample, $t(57) = 1.29, p = .20$). Although they lived in the community near the school, none of the final 59 community-based, treatment-seeking youth were also in our school-based sample, but 50 (21%) of our school-based youth were identified as needing treatment for potential posttraumatic stress disorder using the UCLA PTSD Reaction Index. These youth received treatment as part of a different study.

The factor structure of the YSR syndromes was tested on the full sample of 301 youth (242 from the school and 59 from the community) and also on just the school-based sample of 242 youth. All youth were included in analyses to test the independent and interacting effects of gender and sample on the mean YSR problem scores. Only the school-based sample of 242 youth was used to test sex-differences in problem scores because these youth were likely to be more representative of the informal settlement population.

Ethics and Assessment

Ethical and scientific research approval was obtained through the Kenyatta National Hospital / University of Nairobi Institutional Review Board in Kenya. Assent and consent documents were in both English and Kiswahili on the same form, as English is the official language of Kenya, and both languages are taught in school and spoken by upper primary and secondary students. Exams for entry into secondary school are all in English, therefore, secondary students are fluent and upper primary students have advanced English language skills but may not be fluent, thus necessitating the Kiswahili on the same form. The English ability of the parents was unknown, therefore necessitating Kiswahili on the consent form. Verbal and written explanations of the study were provided to all youth and their parents. For the school-based sample, youth gave assent in their classroom, and notes were sent home with each student to explain the study and to request parents or guardians to come to the school for an informational meeting where consent was obtained. After the initial informational meeting, notes were sent home twice more to reach parents who failed to respond to the initial request. For the community-based sample, youth gave assent and parents gave consent in the home. Interviewers were Kenyan men and women either currently enrolled in University or having completed at least a Bachelor's degree. All interviewers were trained by Africa Mental Health Foundation research staff.

The YSR was translated into Kiswahili by a formally trained translator, back translated independently by three lay people, and finalized through consensus by the translators and the developer of the YSR, Professor Achenbach, to ensure the interpretation of instructions and items were understood by local Kenyans and were similar to those originally intended by the developer. Instances of culturally-specific modifications included American English colloquialisms being removed or synonyms replacing original English words to be translated. There is extensive literature supporting the need for culturally-specific modifications to be made to Western assessments such as re-wording of items and instructions, reordering of items, or even modifications to the assessment procedures be made (Holding et al. 2004; Malda et al. 2010; van de Vijver and Tanaka-Matsumi 2008). As mentioned in relation to the assent and consent, another culturally-specific modification to the administration of the YSR was our decision to include English and Kiswahili on the same form to allow these school-going youth the flexibility to use both languages

interchangeably as they do in their daily life. The YSR assessments were conducted during September and October 2008. Each question on the YSR was read aloud by the interviewer in both Kiswahili and English as the youth read along and completed the self-report forms. This assessment procedure differs from the YSR used in the West as a self-report form, to be completed by the youth on their own. Our local knowledge of potentially large discrepancies in literacy levels among youth in the same grade supported our decision to have two trained interviewers lead each classroom in completing the YSR during school hours, while non-participating students remained in the back of the classroom. The community-based treatment-seeking sample of 59 youth completed the YSR in much smaller groups at the same school on Saturdays led by a single trained interviewer.

The YSR obtained 11–18 year olds' self-ratings of 105 emotional, behavioral, and social problem items that respondents rated as 0=not true, 1=somewhat or sometimes true, and 2=very true or often true over the preceding 6 months. Guided by psychometric theory, the YSR problem items were developed, piloted, and tested for psychometric properties. The problem items clustered to form the following eight syndromes which were empirically derived through exploratory factor analyses and CFAs (Achenbach and Rescorla 2001): Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule Breaking Behavior, and Aggressive Behavior. The sum of scores on the Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints syndromes formed the broadband Internalizing scale while the sum of scores on the Rule-Breaking Behavior and Aggressive Behavior syndromes formed the broadband Externalizing scale. The final broadband scale, Total Problems, comprised the sum of all problem items. In addition to the empirically-derived syndromes, six *DSM*-oriented scales were comprised of the YSR items selected by international experts as being very consistent with *DSM-IV* diagnostic categories. The six *DSM*-oriented scales were named Affective, Anxious, Somatic, Attention Deficit Hyperactivity, Oppositional Defiant, and Conduct. For both the eight empirically-derived syndromes as well as the six *DSM*-oriented scales, cut-offs designated a borderline range (93rd–97th percentile) and a clinical range (97th percentile) (Achenbach and Rescorla 2001).

The eight empirically derived YSR syndromes and the three broadband scales had good psychometric properties (test-retest reliabilities measured by Pearson's correlation and internal consistencies measured by Cronbach's alpha) in US samples (Achenbach and Rescorla 2001) and multicultural samples from over 20 societies (Ivanova et al. 2007; Rescorla et al. 2007). Correlations reported in the US sample range from .67 to .89, and alphas range from .71 to .95 (Achenbach & Rescorla, 2001). In this study, we considered alphas less than .5 unacceptable, greater than or equal to .5 and less than .6 poor, greater than or equal to .6 and less than .7 acceptable, and greater than or equal to .7 good. Our school-based sample indicates good internal consistencies for three of the eight empirically derived YSR syndromes (Somatic Complaints, Attention Problems, and Aggressive Behavior), acceptable internal consistencies for another three syndromes (Anxious/Depressed, Social Problems, and Thought Problems), poor internal consistency for Withdrawn/Depressed (the scale with the fewest number of items), and unacceptable internal consistency for Rule-Breaking Behavior. The internal consistencies for the three

broadband scales were all good (Internalizing alpha = .80, Externalizing alpha = .71, Total Problems alpha = .90). These findings are comparable to those from published multicultural analyses of the internal consistency of the YSR. Although society and syndrome specific alphas were not published, alphas averaged over all societies ranged from .62 (acceptable) to .82 (good) for the eight syndromes and from .86 to .94 for the three broadband scales (Rescorla et al. 2007).

Statistical Analyses

To test the multicultural robustness of the eight-syndrome structure of the YSR in our Kenyan sample, we measured one aspect of construct validity using the same CFA procedures as Ivanova et al. (2007). We first transformed item ratings to 0 versus 1 or 2 as specified by Achenbach and Rescorla (2001) in order to use tetrachoric correlations for the CFA. We then used MPlus 5.0 (Muthen and Muthen 2007) to run CFA with a weighted least squares mean- and variance-adjusted chi-square estimator to account for the non-normal distribution of item ratings and because it was robust with moderate sample sizes. Each item on the YSR was allowed to load on only a single factor, the eight latent factors were correlated, and all item error variances were uncorrelated. A diagram of the latent factor model depicting correlations has been published elsewhere (Ivanova et al. 2007). The results of the CFA were evaluated using the same fit indices as Ivanova et al. (2007). The primary fit index was the Root Mean Square Error of Approximation (RMSEA) (Browne and Cudeck 1993), which is considered the best index of fit for the weighted least squares mean- and variance-adjusted estimator, with values $<.06$ indicating good fit (Yu and Muthen 2002). As secondary fit indices, we used the Comparative Fit Index (CFI) (Bentler 1990) and the Tucker-Lewis index (TLI) (Tucker and Lewis 1973). There is some debate over the criterion set for good and acceptable fit of our chosen secondary fit indices. Browne and Cudeck established a criterion of $>.90$ to indicate good model fit and $.80$ to $.90$ for acceptable fit (Browne and Cudeck 1993). Hu and Bentler argued for a more strict cutoff of $>.95$ for good model fit (Hu and Bentler 1999). However, one study has criticized this more conservative cutoff as incorrectly rejecting correctly specified complex models possibly due to the fact that Hu and Bentler's model was misspecified and not well suited to evaluate goodness of fit (Marsh et al. 2004). Ivanova and colleagues argued that their CFA models were complex and therefore interpreted their findings using Browne and Cudeck's relaxed criteria rather than Hu and Bentler's strict criteria. Since we used the same complex model for our CFA, it is still under debate as to the appropriate cutoff for these fit indices, and we want to compare our results to those from the multicultural study, we also applied the lower cutoffs established by Browne and Cudeck to describe our model fit.

In order to test another important aspect of construct validity of the YSR, we examined whether the community-based clinic sample had higher scores on the YSR empirically-based and broadband syndromes compared to the school-based sample. YSR items were treated as their original values of 0, 1, or 2 and summed for a total score for each syndrome. To test this question, we ran factorial Analysis of Variance (ANOVA) incorporating the independent and interacting effects of gender and sample on each of the syndrome scores. When the interaction term was not significant, we ran two-way ANOVAs to test the independent effects of gender and sample in the same model without their interaction.

After testing these aforementioned aspects of construct validity, we tested sex-differences in YSR problem scores in our sample of 242 school-based youth. Cohen's *d* for effect size (Cohen 1988), independent *t*-tests and resulting two-tailed *p*-values were used to compare the differences in mean raw scores between girls and boys. Achenbach and Rescorla (2007) divided multicultural societies into three norm groups based on mean Total Problems scores. Societies in the middle-scoring norm group had mean Total Problems scores within ± 1 standard deviation (*SD*) of an 'omnicultural' (overall) mean, while societies in the low-scoring norm group had mean Total Problems scores $> 1SD$ below the omnicultural mean, and societies in the high-scoring norm group had Total Problems scores $> 1 SD$ above the omnicultural mean (Achenbach and Rescorla 2007). These groupings, in addition to sex, were taken into account when establishing cutoff values for scores in the normal, borderline, or clinical range. No normative data for Kenyan youth existed, and we did not assume Kenyan youth were in the same norm group as Ethiopian youth (the only Sub-Saharan African country with normative data). The mean (*SD*) Total Problems raw scores for our school-based sample of Kenyan girls was 56.3 (24.1) and Kenyan boys was 46.6 (25.0). The published multicultural supplement reported mean Total Problems raw scores for societies classified as 'high-scoring' at 50.1 (23.0) for girls and 47.1 (23.4) for boys (Achenbach and Rescorla 2007). This might suggest that our sample of impoverished Kenyan youth would also be classified as 'high-scoring' and would indicate application of high-scoring norms to determine proportions in the normal, borderline, or clinical range. Since we still do not have a normative sample from Kenya, we applied all three sets of multicultural norms to our data when testing sex-differences in the proportion of youth scoring in the borderline or clinical range (Achenbach and Rescorla 2007). We applied the high-scoring norms for our final analyses because our sample had average total problems scores that were closest to the high-scoring multicultural data, and this allowed us to be most conservative in our estimation of the proportion of youth in the clinical range. We used the Fisher's exact correction to the chi-squared test statistic to compare the estimated proportions between Kenyan girls and boys, implemented in SPSS version 15. To correct for our 17 repeated statistical tests, we applied a conservative $p < 0.003$ (.05/17) based on the Bonferroni correction.

Results

Our CFAs converged and our primary fit index indicated good model fit for the eight-syndrome structure of the YSR for the full sample and the school-based subsample (Table 1). Our secondary fit indices yielded acceptable model fit for both the full sample and the school-based subsample, and all fit indices were within the range of values reported by Ivanova and colleagues from 23 societies (Table 1). Factor loadings in the full sample ranged from .22-.81, in the school-based subsample ranged from .22-.84, and both samples had median factor loadings within the range reported by Ivanova and colleagues from 23 societies (Table 1). None of our YSR items had a negative residual variance, all item loadings were statistically significant ($p < .012$), and all item loadings were within the admissible parameter space (Table 2).

Our factorial ANOVAs yielded one significant interaction between gender and sample in its association with the mean score from the Anxious/Depressed syndrome ($F(1)=5.45$, two-tailed $p=.02$) with the clinic sample having a significantly higher mean Anxious/Depressed

score for boys only (Table 3). The other seven empirically-derived syndromes had higher mean scores among the clinic sample for both boys and girls (Table 3) with six of these seven syndromes (Somatic, Social, Thought, Attention, Aggressive, and Rule-Breaking) having mean differences that reached significance (all two-tailed $p < .05$) in the two-way ANOVAs. As expected, the two-way ANOVAs also showed mean scores to be significantly higher in the clinic sample on the broadband Internalizing ($F(1)=6.35$, two-tailed $p=.012$), Externalizing ($F(1)=6.42$ two-tailed $p=.012$) and Total Problems ($F(1)=9.52$, two-tailed $p=.002$) scales (Table 3).

Looking at sex-differences within the school-based sample, Kenyan girls had significantly higher scores on the three empirically-derived internalizing syndromes (Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints) as well as the two internalizing *DSM*-oriented scales (Affective and Anxious Problems) compared to Kenyan boys (Table 3). However, there were no significant sex-differences in scores on the two externalizing empirically-derived syndromes (Rule-Breaking Behavior and Aggressive Behavior) or the two externalizing *DSM*-oriented scales (Oppositional Defiant and Conduct Problems; Table 3). Finally, regardless of whether we used cutoffs based on the low-scoring, middle-scoring, or high-scoring norms, we found no significant sex-differences in the proportion of youth meeting criteria for borderline/clinical levels of any of the eight syndromes or six *DSM*-oriented scales (all two-tailed $p > .05$). Table 4 shows the normal, borderline, and clinical classification for the 242 school-based youth using norms for high-scoring societies.

Although no significant sex-differences were found in the proportion of youth meeting criteria for borderline/clinical levels of problems, it is important to highlight the fact that even with the most conservative (high-scoring) multicultural norms applied, the proportion of youth in the school-based sample with borderline/clinical levels of Somatic Complaints was much higher than expected and exceptionally higher than any of the other problem scales (Table 4). Forty five percent (108/242) of youth scored in the borderline/clinical range on the empirically-derived Somatic Complaints syndrome, while the proportion of youth classified in the borderline/clinical range on the other seven empirically-derived syndromes ranged from 1% for Rule-Breaking Behavior to 14% for Social Problems (Table 4).

Discussion

The YSR is one of the most widely used assessment instruments for youth emotional and behavioral problems and has a proven multicultural factor structure in many developed societies and a few developing societies. This study assessed the factor structure of the YSR among 301 Kenyan youth (combining a treatment-seeking and a school-based sample) from an informal settlement. CFA revealed good fit for the eight-syndrome structure of the YSR, consistent with multicultural research findings in 23 other ethnically and geographically diverse societies (Ivanova et al. 2007). Our clinic sample had significantly higher YSR problem scores than the random school-based sample, as expected (Achenbach and Rescorla 2001), on six of the eight empirically derived scales, all three broadband scales, and just for boys on one of the remaining scales, adding more evidence of construct validity for the YSR in this Kenyan population. Our findings lend further support to the generalizability of the

eight-syndrome structure of youth emotional and behavioral problems across diverse societies.

In our school-based sample, girls obtained significantly higher scores than boys on Total Problems, Internalizing, Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints, and on the *DSM*-oriented Affective, Anxious, and Somatic scales. The tendency for girls to report more internalizing problems than boys is common across nearly all multicultural societies (Rescorla et al., 2007). We did not find sex-differences on any of the externalizing syndromes within our Kenyan sample, and the evidence is mixed as to whether or not there are significant sex-differences for YSR externalizing problems in other societies. Rescorla et al. (2007) found significant sex-differences on externalizing syndromes in some, but not all, of the 24 societies, revealing that in some societies boys did not have higher scores on YSR externalizing syndromes as compared to girls. In addition, the normative sample of US youth reported nearly identical broadband Externalizing scores (difference = .1) between boys and girls and found girls to have slightly higher, although not significant, self-reported Aggressive Behavior (difference=.5) compared to boys (Achenbach and Rescorla 2001). Since the cut-offs for borderline and clinical classification of problems account for sex-differences in the self-reporting of emotional and behavioral problems (Achenbach and Rescorla 2001, 2007), it was expected that once norms were applied to data, the sample would yield similar percentages of boys and girls in the borderline and clinical ranges of problems. In fact, this is exactly what we found in our Kenyan data, resulting in a lack of significant sex-differences between the proportion of youth in the borderline/clinical range on the eight syndromes and six *DSM*-oriented scales. These results suggest a minimal effect of culture on sex-differences in reporting of emotional and behavioral problems among these Kenyan youth.

High total problems scores were expected because our Kenyan youth were impoverished and had recently experienced war-like violence. High total problems scores in our sample were driven by high levels of internalizing problems, while externalizing problem were similar to published multicultural normative levels from many societies (Achenbach and Rescorla, 2007). High internalizing problems were driven by high levels of somatic complaints. These findings underscore the importance that Kenyan clinicians use a comprehensive mental health assessment tool, such as the YSR, to obtain standardized data on a broad spectrum of mental problems, including somatic complaints, rather than opting for a brief screener of a single mental problem with limited multicultural support. Many studies have found that the clinical presentation of anxiety and depression among developing societies is associated with the reporting of somatic complaints (Patel 2001). High levels of somatic complaints have been reported for other disadvantaged and lower socioeconomic youth populations (Bernstein et al. 1997; Canino 2004; Due et al. 2003; Taylor et al. 1996) and also specifically among youth who have survived war or other traumatic events (Hensley and Varela 2008; Munyandamutsa et al. 2012; Thabet et al. 2004; Tol et al. 2010; Vermunt et al. 2008). The Kenyan youth in our sample experienced risks associated both with poverty and with war-like violence. The unrest surrounding the post-election violence disrupted the lives of these youth and exposed them to atrocities not experienced by most youth in developed countries. The combination of abject poverty and a

warlike environment may have contributed to the high level of somatic complaints. However, it may be difficult to differentiate between somatic complaints related to the expression of psychopathology and those related to non-psychiatric causes like infectious disease.

While this study has strengths such as the assessment of a population from Sub-Saharan Africa with a well standardized instrument, it also has some limitations. First, we may have introduced a Western symptom structure bias to our tests of construct validity by adding the additional 59 treatment seeking youth. However, these 59 youth were comparable on gender and age distribution to the school-based sample and came from the informal settlement community surrounding the school. The treatment-seeking youth all had high levels of posttraumatic stress symptoms as measured by the UCLA PTSD Index (Steinberg et al. 2004) as well as higher scores on the YSR syndrome scales than the school-based youth, thus providing greater variability in scores for confirmatory factor analyses. The treatment seeking youth completed the YSR before receiving treatment and their baseline measures were included in the CFA to maximize the power of the analysis. Therefore, this study may have benefited by including the treatment seeking sample because more variability in problem scores ensured enough higher problem scores for a meaningful CFA. Second, the benefit of using one instrument to assess a broad range of more common problems among self-reporting 11–18 year olds was counter balanced by our inability to detect rarer problems such as autism or primary psychotic disorders and our lack of data on younger children ages 1.5–10 years because they are not valid self-reporters. Future research is needed from parent reports on their children using the Child Behavior Checklist For Ages 1.5–5 and the Child Behavior Checklist for Ages 6–18 (Achenbach and Rescorla 2001).

Another limitation of this study was that we relied mostly on an etic approach to testing components of construct validity of the YSR in Kenya through our use of an assessment developed in the United States and applying it to a different cultural context. The alternative emic approach focuses on extracting unique symptoms that help explore the meanings of the constructs underlying these mental problems within the specific cultural group being studied. Our exploration of certain aspects of construct validity using an etic approach is a first step towards better understanding the local mental health needs, and future research may benefit from the addition of an emic approach to determine if there are any culturally specific descriptions of youth emotional and behavioral problems that might be helpful in identifying cases in Kenya. If previous research had found clear evidence against the similarity of patterns of emotional and behavioral problem on the YSR across different societies, perhaps we would have chosen a more emic approach to start. However, the eight empirically-derived syndromes of the YSR were supported in all societies in the published multicultural data (Ivanova et al. 2007) and now also in these Kenyan data. Thinking specifically about our high levels of somatic complaints, it would be worthwhile moving forward to conduct an emic approach to help tease apart variables that may be related to high levels of self-reported somatic complaints.

As mentioned, there was no normative sample of Kenyan youth for us to directly compare to our impoverished violence-exposed sample. However, a study is planned to administer the YSR to a regionally-representative sample of Kenyan youth. Given the fact that over 60% of

the societies in the published multicultural study scored within the middle-scoring group, including Kenya's neighboring country of Ethiopia (Rescorla et al. 2007), it is likely that Kenyan youth assessed from a normative sample would be categorized as a middle-scoring society as well. On the other hand, it is also possible that studies from developing countries have oversampled youth with higher socioeconomic status relative to the country overall due to the fact that most selections were from youth attending school. Our application of high-scoring norms resulted in conservative estimates of the proportions of emotional and behavioral problems, thus instilling confidence that our reported high levels of internalizing problems including somatic complaints, particularly among girls, warrant attention.

Conclusions

These data add to the growing literature on youth emotional and behavioral problems from developing countries, and specifically help to fill the knowledge gap regarding Sub-Saharan Africa. Our confirmation of the eight-syndrome structure of the Youth Self-Report lends further support to the international generalizability of this structure of youth emotional and behavioral problems. Our data also indicate very high levels of somatic complaints among impoverished Kenyan youth, which merit further investigation.

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References

- Achenbach, T.M.; Rescorla, L.A. *Manual for the ASEBA School-Age Forms & Profiles*. Burlington: University of Vermont, Research Center for Children, Youth, & Families; 2001.
- Achenbach, T.M.; Rescorla, L.A. *Multicultural Supplement to the Manual for the ASEBA School-Age Forms & Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families; 2007.
- Achenbach, T.M.; Rescorla, L.A. *Multicultural Supplement to the Manual for the ASEBA Preschool Forms & Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families; 2010.
- Amone-P'olak K, Garnefski N, Kraaij V. Adolescents caught between fires: cognitive emotion regulation in response to war experiences in Northern Uganda. *Journal of adolescence*. 2007; 30(4): 655–669.10.1016/j.adolescence.2006.05.004 [PubMed: 16857252]
- Bailey BN, Delaney-Black V, Hannigan JH, Ager J, Sokol RJ, Covington CY. Somatic complaints in children and community violence exposure. *J Dev Behav Pediatr*. 2005; 26(5):341–348. [PubMed: 16222173]
- Benjet C. Childhood adversities of populations living in low-income countries: prevalence, characteristics, and mental health consequences. *Curr Opin Psychiatry*. 2010; 23 (4):356–362.10.1097/YCO.0b013e32833ad79b [PubMed: 20520546]
- Bentler P.M. Comparative fit indexes in structural models. *Psychol Bull*. 1990; 107(2):238–246. [PubMed: 2320703]
- Bernstein GA, Massie ED, Thuras PD, Perwien AR, Borchardt CM, Crosby RD. Somatic symptoms in anxious-depressed school refusers. *J Am Acad Child Adolesc Psychiatry*. 1997; 36(5):661–668. S0890-8567(09)62833-1 [pii]. 10.1097/00004583-199705000-00017 [PubMed: 9136501]

- Browne, MW.; Cudeck, R. Alternative ways of assessing model fit. In: Bollen, KA.; Long, JS., editors. Testing structural equation models. Newbury Park, CA: Sage; 1993. p. 136-162.
- Canino G. Are somatic symptoms and related distress more prevalent in Hispanic/Latino youth? Some methodological considerations. *J Clin Child Adolesc Psychol.* 2004; 33(2):272–275.10.1207/s15374424jccp3302_8 [PubMed: 15136191]
- Cohen, J. Statistical power analysis for the behavioral sciences. 2. Hillsdale: Erlbaum; 1988.
- Crawley SA, Caporino NE, Birmaher B, Ginsburg G, Piacentini J, Albano AM, Kendall PC. Somatic Complaints in Anxious Youth. *Child Psychiatry Hum Dev.* 2013.10.1007/s10578-013-0410-x
- Due P, Lynch J, Holstein B, Modvig J. Socioeconomic health inequalities among a nationally representative sample of Danish adolescents: the role of different types of social relations. *J Epidemiol Community Health.* 2003; 57(9):692–698. [PubMed: 12933775]
- Gobble R, Swenny C, Fishbein M. The impact of the September 11, 2001 terrorist attacks and aftermath on the incidence of recurrent abdominal pain syndrome in children. *Clin Pediatr (Phila).* 2004; 43(3):275–277. [PubMed: 15094952]
- Hensley L, Varela RE. PTSD symptoms and somatic complaints following Hurricane Katrina: the roles of trait anxiety and anxiety sensitivity. *J Clin Child Adolesc Psychol.* 2008; 37(3):542–552. 795170414 [pii]. 10.1080/15374410802148186 [PubMed: 18645745]
- Holding PA, Taylor HG, Kazungu SD, Mkala T, Gona J, Mwamuye B, Stevenson J. Assessing cognitive outcomes in a rural African population: development of a neuropsychological battery in Kilifi District, Kenya. *J Int Neuropsychol Soc.* 2004; 10(2):246–260.10.1017/s1355617704102166 [PubMed: 15012845]
- Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling-a Multidisciplinary Journal.* 1999; 6(1):1–55.10.1080/10705519909540118
- Ivanova MY, Achenbach TM, Rescorla LA, Dumenci L, Almqvist F, Bilenberg N, Verhulst FC. The generalizability of the Youth Self-Report syndrome structure in 23 societies. *J Consult Clin Psychol.* 2007; 75(5):729–738. 2007-13640-006 [pii]. 10.1037/0022-006X.75.5.729 [PubMed: 17907855]
- Kieling C, Baker-Henningham H, Belfer M, Conti G, Ertem I, Omigbodun O, Rahman A. Child and adolescent mental health worldwide: evidence for action. *Lancet.* 2011; 378(9801):1515–1525.10.1016/s0140-6736(11)60827-1 [PubMed: 22008427]
- Klasen F, Oettingen G, Daniels J, Adam H. Multiple trauma and mental health in former Ugandan child soldiers. *Journal of Traumatic Stress.* 2010; 23(5):573–581.10.1002/jts.20557 [PubMed: 21053376]
- Malda M, van de Vijver FJ, Srinivasan K, Transler C, Sukumar P. Traveling with cognitive tests: testing the validity of a KABC-II adaptation in India. *Assessment.* 2010; 17 (1):107–115.10.1177/1073191109341445 [PubMed: 19745212]
- Marsh HW, Hau KT, Wen Z. In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling.* 2004; 11(3):320–341.
- Mulatu, MS. Dissertation. Queen's University; Ontario, Canada: 1997. Stress, coping, and adaptation of Ethiopian adolescents: Testing the applicability of the transactional model of stress and coping.
- Munyandamutsa N, Mahoro Nkubamugisha P, Gex-Fabry M, Eytan A. Mental and physical health in Rwanda 14 years after the genocide. *Soc Psychiatry Psychiatr Epidemiol.* 2012; 47(11):1753–1761.10.1007/s00127-012-0494-9 [PubMed: 22402589]
- Muthen, LK.; Muthen, BO. Mplus User's Guide. 5. Los Angeles, CA: Muthen & Muthen; 2007.
- Ndetei DM, Khasakhala L, Nyabola L, Ongecha-Owuor F, Seedat S, Mutiso V, Odhiambo G. The prevalence of anxiety and depression symptoms and syndromes in Kenyan adolescents. *Journal of Child & Adolescent Mental Health.* 2008; 20(1):33–51.
- Ndetei DM, Khasakhala LI, Mutiso VN, Mbwanyo AW. Recognition of depression in children in general hospital-based paediatric units in Kenya: practice and policy implications. *Ann Gen Psychiatry.* 2009; 8:25. 1744-859X-8-25 [pii]. 10.1186/1744-859X-8-25 [PubMed: 19863784]

- Ndetei DM, Ongecha FA, Khasakhala L, Mutiso V, Othieno CJ, Syanda J, Kokonya DA. Traumatic Experiences of Kenyan Secondary School Students. *Journal of Child & Adolescent Mental Health*. 2007; 19(2):147–155.
- Ndetei DM, Rono RC, Mwangi SW, Ototo B, Alaro J, Esakwa M, Mutiso V. Psychological effects of the Nairobi US embassy bomb blast on pregnant women and their children. *World Psychiatry*. 2005; 4(1):50–52. [PubMed: 16633506]
- Okech JA. A Multidimensional Assessment of Children in Conflictual Contexts: The Case of Kenya. *International Journal for the Advancement of Counselling*. 2012; 34(4):331–348.10.1007/s10447-012-9166-4
- Patel V. Cultural factors and international epidemiology. *British medical bulletin*. 2001; 57:33–45. [PubMed: 11719922]
- Patel V, Boyce N, Collins PY, Saxena S, Horton R. A renewed agenda for global mental health. *Lancet*. 2011; 378(9801):1441–1442.10.1016/s0140-6736(11)61385-8 [PubMed: 22008422]
- Pfefferbaum B, North CS, Doughty DE, Pfefferbaum RL, Dumont CE, Pynoos RS, Ndetei D. Trauma, grief and depression in Nairobi children after the 1998 bombing of the American Embassy. *Death Studies*. 2006; 30(6):561–577. [PubMed: 16773776]
- Rescorla LA, Achenbach TM, Ivanova MY, Dumenci L, Almqvist F, Bilenberg N, Verhulst F. Epidemiological comparisons of problems and positive qualities reported by adolescents in 24 countries. *J Consult Clin Psychol*. 2007; 75(2):351–358. 2007-04141-016 [pii]. 10.1037/0022-006X.75.2.351 [PubMed: 17469893]
- Shaw JA. Children exposed to war/terrorism. *Clin Child Fam Psychol Rev*. 2003; 6(4):237–246. [PubMed: 14719636]
- Steinberg AM, Brymer MJ, Decker KB, Pynoos RS. The University of California at Los Angeles Post-traumatic Stress Disorder Reaction Index. *Current Psychiatry Reports*. 2004; 6(2):96–100. [PubMed: 15038911]
- Syengo-Mutisya CM, Kathuku DM, Ndetei DM. Psychiatric morbidity among sexually abused children and adolescents. *East Afr Med J*. 2008; 85(2):85–91. [PubMed: 18557252]
- Taylor DC, Szatmari P, Boyle MH, Offord DR. Somatization and the vocabulary of everyday bodily experiences and concerns: a community study of adolescents. *J Am Acad Child Adolesc Psychiatry*. 1996; 35(4):491–499. S0890-8567(09)63519-X [pii]. 10.1097/00004583-199604000-00015 [PubMed: 8919711]
- Thabet AA, Abed Y, Vostanis P. Comorbidity of PTSD and depression among refugee children during war conflict. *Journal of Child Psychology and Psychiatry*. 2004; 45(3):533–542. [PubMed: 15055372]
- Tol WA, Reis R, Susanty D, de Jong JT. Communal violence and child psychosocial well-being: qualitative findings from Poso, Indonesia. *Transcult Psychiatry*. 2010; 47 (1):112–135. 47/1/112 [pii]. 10.1177/1363461510364573 [PubMed: 20511255]
- Tucker LR, Lewis C. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*. 1973; 38(1):1–10.
- van de Vijver, FJR.; Tanaka-Matsumi, J. Cross-cultural research methods. In: McKay, D., editor. *Handbook of research methods in abnormal and clinical psychology*. Thousand Oaks, CA: Sage; 2008. p. 463-481.
- Vermunt LC, Buysse CM, Joosten KF, Hazelzet JA, Verhulst FC, Utens EM. Behavioural, emotional, and post-traumatic stress problems in children and adolescents, long term after septic shock caused by Neisseria meningitidis. *Br J Clin Psychol*. 2008; 47(Pt 3):251–263.10.1348/014466507X258868 [PubMed: 18039432]
- Yu, CY.; Muthen, BO. Evaluation of model fit indices for latent variable models with categorical and continuous outcomes (Technical Report). Los Angeles: UCLA, Graduate School of Education and Information Studies; 2002.

Table 1

Fit Statistics and Median Factor Loadings from Confirmatory Factor Analyses of Youth Self-Report Comparing Kenyan Youth to Youth from 23 Societies Reported by Ivanova et al., 2007

	Kenyan Youth		Ivanova et al., 2007
	Full Sample N=301	School- Based N=242	Range for 23 societies
Fit statistics			
Root Mean Square Error of Approximation (RMSEA)	.049	.049	.035 (Ethiopia) – .050 (Jamaica)
Tucker Lewis Index (TLI)	.903	.878	.841 (Greece) – .952 (Australia)
Comparative Fit Index (CFI)	.892	.874	.752 (Greece) – .913 (Iran)
Median Factor Loadings	.56	.53	.53 (Greece) – .67 (Finland)

Note. RMSEA<.06 indicates good fit. TLI and CFI>.90 indicates good fit and between .80–.90 indicates acceptable fit.

Table 2
Item Loadings and Standard Errors for Confirmatory Factor Analysis of the Eight Youth Self-Report Syndromes

Syndrome and Item ^a	Item Loading	Standard Error
Anxious/Depressed	0.55	0.06
Y14 Cries a lot	0.45	0.06
Y29 Fears	0.28	0.08
Y30 Fears School	0.62	0.08
Y31 Fears doing bad	0.55	0.06
Y32 Must be perfect	0.22	0.09
Y33 Feels unloved	0.48	0.07
Y35 Feels worthless	0.54	0.06
Y45 Nervous, tense	0.78	0.05
Y50 Fearful, anxious	0.68	0.05
Y52 Feels too guilty	0.62	0.05
Y71 Self-Conscious	0.54	0.06
Y91 Suicidal ideation	0.75	0.06
Y112 Worries	0.68	0.05
Withdrawn/Depressed	0.53	0.06
Y42 Rather be alone	0.43	0.07
Y65 Refuses to talk	0.56	0.06
Y69 Secretive	0.41	0.08
Y75 Shy, timid	0.50	0.06
Y102 Lacks energy	0.66	0.06
Y103 Sad	0.69	0.05
Y111 Withdrawn	0.44	0.07
Somatic Complaints	0.62	0.06
Y47 Nightmares	0.69	0.06
Y51 Feels dizzy	0.80	0.05
Y54 Overtired	0.66	0.07
Y56A Aches, pains	0.65	0.06
Y56B Headaches	0.63	0.07

Syndrome and Item ^a	Item Loading	Standard Error
Y56C Nausea	0.76	0.05
Y56D Eye problems	0.38	0.08
Y56E Skin problems	0.57	0.07
Y56F Stomachaches	0.59	0.07
Y56G Vomiting	0.51	0.07
Social Problems	0.49	0.07
Y11 Too dependent	0.29	0.07
Y12 Lonely	0.56	0.06
Y25 Doesn't get along	0.57	0.06
Y27 Jealous	0.55	0.07
Y34 Others to get him	0.52	0.06
Y36 Accident prone	0.42	0.07
Y38 Gets teased	0.53	0.06
Y48 Not liked	0.60	0.06
Y62 Clumsy	0.61	0.06
Y64 Prefers younger	0.43	0.07
Y79 Speech problems	0.30	0.07
Thought Problems	0.56	0.07
Y9 Can't get mind off	0.45	0.07
Y18 Harms self	0.81	0.07
Y40 Hears things	0.45	0.07
Y46 Twitching	0.62	0.06
Y58 Picks skin	0.40	0.08
Y66 Repeats acts	0.51	0.07
Y70 Sees things	0.51	0.08
Y76 Sleeps less	0.59	0.07
Y83 Stores things	0.47	0.08
Y84 Strange behavior	0.76	0.06
Y85 Strange ideas	0.64	0.06
Y100 Trouble sleeping	0.57	0.06
Attention Problems	0.50	0.07

Syndrome and Item ^a	Item Loading	Standard Error
Y1 Acts young	0.25	0.08
Y8 Can't concentrate	0.58	0.06
Y10 Can't sit still	0.55	0.06
Y13 Confused	0.60	0.06
Y17 Daydreams	0.53	0.06
Y41 Impulsive	0.69	0.06
Y61 Poor schoolwork	0.31	0.08
Rule-Breaking Behavior	0.52	0.09
Y26 Lacks guilt	0.45	0.08
Y39 Bad friends	0.43	0.08
Y43 Lies, cheats	0.60	0.06
Y63 Prefers older kids	0.35	0.08
Y67 Runs away	0.67	0.10
Y72 Sets fires	0.59	0.09
Y81 Steals at home	0.59	0.08
Y82 Steals outside home	0.45	0.11
Y90 Swearing	0.68	0.06
Y96 Thinks sex too much	0.41	0.11
Y101 Truant	0.59	0.13
Y105 Uses drugs	0.47	0.14
Aggressive Behavior	0.57	0.07
Y3 Argues a lot	0.59	0.06
Y16 Mean to others	0.52	0.07
Y19 Demands attention	0.39	0.08
Y20 Destroys own things	0.66	0.06
Y21 Destroys others' things	0.57	0.07
Y22 Disobedient at home	0.56	0.07
Y23 Disobedient at school	0.58	0.07
Y37 Gets in fights	0.48	0.08
Y57 Attacks people	0.56	0.07
Y68 Screams a lot	0.58	0.07

Syndrome and Item^a	Item Loading	Standard Error
Y86 Stubborn, sullen	0.60	0.06
Y87 Mood changes	0.68	0.06
Y89 Suspicious	0.54	0.06
Y94 Teases a lot	0.74	0.06
Y95 Temper	0.55	0.07
Y97 Threatens others	0.58	0.08
Y104 Loud	0.47	0.06

Note. Numbers in boldface are the average item loading or standard error averaged across the items for each syndrome. All item loadings were statistically significant at $p < 0.012$.

^a Abbreviated versions of items on the Youth Self-Report (Achenbach & Rescorla, 2001).

Table 3
 Youth Self-Report Syndrome Scores for Kenyan Girls and Boys in Random School-Based and Community-Based Clinic Samples

	Random School-Based Sample N=242				Community-Based Clinic Sample N=59						
	Girls		Boys		Girls vs. Boys		Girls		Boys		
	mean	sd	mean	sd	effect size	t- value	p- value	mean	sd	mean	sd
<i>Empirically-Derived Syndromes</i>											
Anxious / Depressed	10.1	4.2	6.9	4.1	0.78	6.08	<0.003	9.9	4.7	9.6	5.0
Withdrawn / Depressed	6.1	2.8	4.8	3.0	0.45	3.51	<0.003	6.6	3.1	5.6	2.4
Somatic Complaints	8.0	4.2	5.9	4.2	0.50	3.86	<0.003	8.9	4.5	8.6	3.9
Social Problems	6.2	3.5	5.4	3.4	0.24	1.84	0.066	6.9	3.5	7.0	4.8
Thought Problems	4.7	4.1	4.5	3.5	0.05	0.39	0.695	5.8	4.4	6.7	5.1
Attention Problems	4.5	3.4	4.3	3.2	0.07	0.55	0.581	6.5	3.4	5.5	4.6
Rule-Breaking Behavior	3.5	2.6	3.6	3.3	0.02	-0.15	0.878	4.3	3.8	5.4	4.8
Aggressive Behavior	7.6	4.6	7.0	4.7	0.12	0.96	0.336	9.5	4.7	7.9	6.2
Internalizing Problems	24.2	9.4	17.6	9.5	0.70	5.47	<0.003	25.4	10.8	23.7	9.8
Externalizing Problems	11.1	6.4	10.6	7.5	0.07	0.58	0.564	13.8	8.1	13.3	10.5
Total Problems	56.3	24.1	46.6	25.0	0.40	3.08	<0.003	64.6	26.3	61.8	33.3
<i>DSM-Oriented Scales</i>											
Affective	7.8	4.4	5.5	4.1	0.54	4.19	<0.003	9.5	4.6	8.6	5.2
Anxious	4.9	2.3	3.7	2.2	0.53	4.11	<0.003	4.8	2.5	4.6	2.8
Somatic	5.4	3.0	4.1	3.2	0.41	3.18	<0.003	6.3	3.2	6.1	3.0
Attention Deficit Hyperactive	3.8	2.7	3.7	2.9	0.05	0.39	0.696	4.9	2.4	4.6	3.2
Oppositional Defiant	2.4	1.8	2.2	1.7	0.11	0.84	0.405	3.5	2.3	2.6	2.3
Conduct	4.0	3.4	3.9	3.9	0.00	0.04	0.970	5.5	4.2	5.7	4.9

Note. sd: standard deviation. Internalizing is the sum of scores on the Anxious/Depressed, Withdrawn/Depressed, & Somatic Complaints syndromes. Externalizing is the sum of scores on the Rule-Breaking Behavior and Aggressive Behavior syndromes. Total Problems is the sum of all problem items. After a Bonferroni correction for multiple hypothesis testing (0.05/17), comparisons were considered statistically significant at $p < 0.003$.

Table 4

Normal, Borderline and Clinical Classifications Based on High-Scoring Norms Applied to Youth Self-Report of Emotional and Behavioral Problems of Kenyan Youth from the School-Based Sample

	Total α		Boys		Girls	
	N	%	N	%	N	%
Empirically-Derived Syndromes						
Anxious/Depressed						
Normal	212	87.6	108	90.8	104	84.6
Borderline	21	8.7	7	5.9	14	11.4
Clinical	9	3.7	4	3.4	5	4.1
Withdrawn/Depressed						
Normal	224	92.6	113	95.0	111	90.2
Borderline	11	4.6	3	2.5	8	6.5
Clinical	7	2.9	3	2.5	4	3.3
Somatic Complaints						
Normal	134	55.4	69	58.0	65	52.9
Borderline	63	26.0	27	22.7	36	29.3
Clinical	45	18.6	23	19.3	22	17.9
Social Problems						
Normal	207	85.5	106	89.1	101	82.1
Borderline	14	5.8	4	3.4	10	8.1
Clinical	21	8.7	9	7.6	12	9.8
Thought Problems						
Normal	219	90.5	110	92.4	109	88.6
Borderline	9	3.7	3	2.5	6	4.9
Clinical	14	5.8	6	5.0	8	6.5
Attention Problems						
Normal	239	98.8	118	99.2	121	98.4
Borderline	0	0.0	0	0.0	0	0.0
Clinical	3	1.2	1	0.8	2	1.6
Rule-Breaking Behavior						

	Total ^a		Boys		Girls	
	N	%	N	%	N	%
Normal	239	98.8	116	97.5	123	100.0
Borderline	3	1.2	3	2.5	0	0.0
Clinical	0	0.0	0	0.0	0	0.0
Aggressive Behavior						
Normal	232	95.9	116	97.5	116	94.3
Borderline	5	2.1	1	0.8	4	3.3
Clinical	5	2.1	2	1.7	3	2.4
Internalizing Problems ^b						
Normal	119	49.2	72	60.5	47	38.2
Borderline	44	18.2	17	14.3	27	22.0
Clinical	79	32.6	30	25.2	49	39.8
Externalizing Problems ^c						
Normal	229	94.6	114	95.8	115	93.5
Borderline	5	2.1	2	1.7	3	2.4
Clinical	8	3.3	3	2.5	5	4.1
Total Problems ^d						
Normal	184	76.0	95	79.8	89	72.4
Borderline	34	14.1	17	14.3	17	13.8
Clinical	24	9.92	7	5.88	17	13.82

^aTotal sample size = 242 school-based youth.

^bInternalizing is a compilation of Anxious/Depressed, Withdrawn/Depressed, & Somatic Complaints.

^cExternalizing is a compilation of Rule-Breaking Behavior & Aggressive Behavior.

^dTotal problems is the sum of all problem item scores.