Many children experience cognitive difficulties and feelings of worthlessness, but what aspects of these symptoms are indicative of depression pathology? Improved adult identification of atypical cognitive problems and worthlessness feelings that lead to increased depression risks in the lives of surrounding youth would be useful.

The Beck Depression Inventory (BDI) and Center for Epidemiological Studies Depression (CESD) are two depression measures used to self-report feelings of worthlessness and cognitive symptoms as a component of youth depression. Using Item Response Theory, item discrimination and difficulty parameters, I aim to identify which cognitive and worthlessness symptoms on the BDI and CESD are indicative of atypical depressive symptoms among 88 Guyanese youth.

Among 207 Hong Kong outpatients, the BDI and CESD items measured normal to severe depression symptoms with 9 values of approximately -1 and 2.3, and 1.5 to 2.5, respectively. Feelings of worthlessness, past failure, on the BDI had the highest discrimination (2.17 to 2.33) relative to other depressive symptoms for 4,025 individuals in Brazil, and 560 US students between 8th and 12th grade. Similarly, past failure assessment was highly weighted and atypical to atypical depressive symptoms in a sample of 351 Puerto Rican students. In addition, cognitive problems of indecision or “negative thoughts” were also highly weighted.

To understand symptoms leading to increased depression risk, I assessed symptoms of indecision and inattention to represent cognitive difficulties among youth. Feelings of worthlessness were operationalized by youth's symptoms of past failure, self-criticalness, comparison to other children, and feelings that others didn't like them.

Using item discrimination and difficulty parameter analyses, I hypothesize that feelings of worthlessness will have item discrimination estimates > 2.20 and concentration problems > 1.40 among Guyanese orphans. I expect that items measuring past failure will assess for severe levels of depression. I also expect that symptoms of indecision, inattention, self-criticalness, worthlessness, feelings of comparison to other children, and feelings that others didn't like them will assess the depression symptoms at moderate 9 values (θ = 2.0 to 2.00).

### Methods

#### Sample
- 88 Guyanese orphans were interviewed (n=23 ages 5-11; n=65 ages 12-18)
- Youth responses to 12 items on the Beck Depression Inventory (BDI) and Center for Epidemiological Studies Depression (CESD) Scale comprise concentration disturbance and feelings of worthlessness.
- The 3 concentration disturbance items are BDI 13, BDI 19, CESD 5. The 9 feelings of worthlessness/guilt items are BDI 3, BDI 5, BDI 6, BDI 7, BDI 8, BDI 14, CESD 4, CESD 6, CESD 19.
- Responses to the 12 depression items range from ‘not at all’ to ‘a lot’ (0-4). 

#### Procedures
- Using the statistical tool IRTPRO item discrimination parameter and item difficulty parameter were derived from youth 4-choice responses.
- Most severe symptoms of depression were represented by concentration disturbance and feelings of worthlessness at 9 values > 0.

#### Measures
- Item discrimination parameters identified how distinct the item responses are across escalating symptoms, from mild to severe, levels of depression.
- Item difficulty parameters were used to assess worsening symptoms by identifying items that are endorsed at the most severe levels of depression (greater levels of θ).
- Different levels of theta: mild, θ = 0.0 to 0.8, moderate, θ = 2.0 to 2.00, severe, θ = 2.01 to 3.00.
- Item information function values with above a 30% probability for endorsing the item at a specific level of θ were analyzed to identify what specific levels of depression severity are the items most informative.

### Results

#### Item Discrimination Parameter
- Feelings of worthlessness items CESD 4, I felt like I was just as good as the other kids, and CESD 19, I felt like things I did before didn't work out right, prompt youth to compare themselves to their peers. These two comparative items were high performing on item discrimination parameters. Adults can recognize peer comparison as a indicator that the child feels increased levels of worthlessness and are at a greater risk for experiencing depression.

#### Item Difficulty Parameter
- Two concentration disturbance items, BDI 19 and CESD 5, assessed moderate levels of depression (θ = 0.4-0.8). Five feelings of worthlessness items assessed moderate levels of depression (θ = 0.0-0.4).
- The concentration disturbance item BDI 13 (indiscrimination) and the feelings of worthlessness item BDI 3 (past failure) was assessing at more severe levels of depression compared to the other concentration disturbance and feeling of worthlessness items θ = 0.4-0.6 and θ = 0.8-1.2 respectively. Children are aware and reporting of their past failures when they are severely depressed.

- Adults such as teachers, parents, or practitioners could potentially use this information to recognize that feelings of past failures and inattention are useful targets for questioning and probing about depression risk.

### Conclusion

- In a sample of 68 Guyanese orphans, the findings show that youth are endorsing feelings of worthlessness when they compare themselves to their peers.
- The findings show that endorsing symptoms of past failure and inattention are associated with severe levels of depression.
- Consistent with findings from 4,025 individuals in Brazil, 560 US students between 8th and 12th grade and 351 Puerto Rican students, young youth who endorse the concentration and worthlessness items of indecision, inattention, self-criticalness, comparison to other children, and feelings that others didn't like them are experiencing moderate levels of depression. Youth who endorse past failure were likely to experience more severe levels of depression.
- The most severe depression levels were assessed by the overall symptom of worthlessness.
- Item discrimination and item difficulty parameter results consistently support that youth are aware and able to report on their concentration difficulties and feelings of worthlessness to understand their depression risk. Future research should consider these analyses among different sample groups, and analyze worthlessness and concentration disturbance items using item discrimination, item difficulty and item response frequencies across different depressive measures, such as the Children's Depression Inventory (BDI) or the DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure.

### References


### Table 1. Range of item difficulty parameters of CESD and BDI in Guyanese Orphans by concentration disturbance and feeling of worthlessness items

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