**Slide 1:**

Hello everyone. This is Nusrat Jahan. It is an absolute honour to be here and present our work. Thank you for this opportunity. Today we will discuss the preliminary results of our efforts to culturally adapt and psychometrically calibrate the Communication scale.

**Slide 2:**

Communication is a process of exchanging thoughts, ideas, feelings, facts and expecting the responses of others. However, in our day to day life, we often see a major communication barrier exists among adults and adolescents. Differences in communication skills may be one root cause of this barrier.

**Slide 3:**

In the continuation of this thought, Barkman and her team developed the communication scale to measure the communication skills among adolescents to understand why this barrier exists. It has 23 items with a 5-point Likert type scale ranging from (what to what?). The total score range is between 0 to 92 where a higher score would indicate a high level of communication skills. In their original paper, they reported the internal consistency coefficient Cronbach’s alpha was .79 indicating satisfactory reliability.

**Slide 4:**

In Bangladesh, there is a dearth of proper psychometrically calibrated tools to measure communication skills among adolescents. To fill in this gap we translated the Communication scale in Bangla following the international test commission guideline and psychometrically validated it. We conducted a cross-sectional survey where we collected data from 232 participants from 5 schools following a convenience sampling method. Our sample size target is 500. Data collection is still ongoing and today, we are presenting our preliminary data analysis results. Completion of our survey took approximately 10-15 minutes

**Slide 5:**

As I said before we have followed the international test commission guideline while we adapt the communication scale. The Flowchart in the right panel shows the steps of adaptations. In our pilot, we calculated the intraclass correlation which is an established coefficient of test-retest reliability and found a moderate ranging reliability for the Bangla Communication Scale. As such, we commenced the Field study. In our field study sample, the internal consistency Cronbach alpha was .76.

**Slide 6:**

We conducted the item analysis using the Item response theory. Data were analyzed using R with the “mirt” package. We used the Graded Response Model to fit our data in the IRT paradigm. IRT parameters were estimated using the Maximum Likelihood method with the MHRM algorithm. To check the sampling adequacy, we conducted a monty calro simulation where we found the root mean squared error became stabilize for a sample size range 200-250 for a graded response model with23 items and 5 points Likert type response scale. Our current sample size is within the range.

Slide 7:

Here we summarize the sample demographics. In our sample, there were 160 females with an average age of 15.79 years and 39 males with an average age of 15.34. Majority of our participants were from the middle social class.

Slide 8:

Item Response Theory provides several visual aspects to vet different properties of an item. We at first looked into the option characteristics curve. In an option characteristic curve, we get the probability plots of endorsing a particular response option depending on participants latent traits, in our case communication skills. In the right panel plot, we have plotted the participants’ communication skills on the x-axis and the probability of endorsing a particular response option on the y axis. In an ideal scenario for a good quality item with 5. Point Likert type response scale, we expect one non-increasing monotonic and one non-decreasing and curve for the two extremities of the response scale. And three unimodal ordered curves for the rest of the three response options.

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In the Bangla Communication scale 12 items were displaying such option characteristics curve.

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And 11 items had improper option characteristics curve

Slide 11

We also inspected the item information curve. In the right panel, you can see we have plotted the latent communication trait on the x-axis and plotted the amount of information a particular item is carrying across the latent continuum on the y-axis. We considered any item with the information below .20 as the less informative item. Based on this guideline we identified 11 items as informative items

Slide12

And 12 items were considered as less informative items.

Slide 13

From these inspections, we discarded items with improper option characteristics curves and less informative items to increase the precision of the measurement tool. As such 11 items were retained and here we present the IRT parameters and item fit parameters of the revised model with 11 items

Item discrimination range of the revised model ranged between .70-1.71 which was within the common suggestion of Baker. Item Difficulty threshold ranged between -.460 to 3.20 indicating our items covered a good range of difficulty across the latent trait. All Item fit statistics, standardized outfit, infit and RMSEA were within the suggested guideline of Orlando and Thissen indicating all retained items were a good fit to our model.

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We also looked into the person fit of our model. Person fit is validity evidence that out model is a good fit to the participants themselves. We used Zh statistics. A good person-fit would yield a Zh statistics larger than -2. In the plot, we can see that most of the Zh values for the participants are larger than -2 indicating our fitted model is a good fit for the participants themselves.

Slide15:

The test information Plot tells us how much information a particular test carries across the ability continuum. Here we can see our revised model is carrying information over a good range of latent traits: communication skills. The information curve is rather steady and carried the highest information in the theta range, between -3 to.5 which is adequate to differentiate between different levels of communication skills.

Slide 16:

Lastly, we divided our sample into two groups boys and girls and assessed the differential item functioning. We employed logistic regression in estimating the underlying communication skills and used chi-square statistics to assess the item equivalence. We found all items were functioning equivalently for both groups.

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We are at the end of our talk. Thank you for your patience and for being here with me. Today, we discussed the adaptation and psychometric calibration of the Communication scale among adolescents. Our initial item analysis only retained 11 good quality items. These items covered a good range of underlying communication skills and showed no differential item functioning. However, we will continue our data collection to further latent structure analysis as a substantial number of items are discarded hinting at plausible multidimensionality.

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These are the references I have used in this talk

Slide 19

Once again, thank you very much, the floor is now open to the Q& A session.