

## **SPOTLIGHT ON THE Malawi Developmental Assessment Tool (MDAT)**

### **A) Context**

#### **What is your program and context?**

First Steps is an Early Childhood social behavior change intervention, supporting children aged from birth to three years old, implemented by Save the Children with a national partner, Umuhuza, in Rwanda. It aims to achieve improvements in parenting practices, child development indicators, and increase emergent literacy promotion in the home for children aged 0-3 years old through community-based parenting education sessions combined with the radio program, home visits. It consists of an 18-week training of parents to better support their children's physical, socio-emotional, cognitive and language development skills.

#### **Why did you chose to use the MDAT?**

We were looking for an observational tool to measure early childhood development to avoid relying on parent self-report.

The benefits of the MDAT over other observational tools for this evaluation are that:

- it has been used previously in Rwanda, and data from other evaluations in Rwanda may be able to be used to benchmark impact and set cut-offs for developmental trajectories in Rwanda to convert effect sizes into a more meaningful measure;
- it is appropriate for the age group, 6 to 36 months of age (it can be used from 0 to 6 years of age);<sup>1</sup>
- it is free and open source, takes less time to administer, and is more appropriate to the context than other available observational measure of child development, such as the Bayley-III.<sup>2</sup>

#### **What key research question(s) are you using this tool to answer?**

Does the Intera za Mbere intervention improve child development outcomes relative to children not enrolled in the program?

Is the relative gain in early childhood development from the full intervention compared to light-touch version warrant the additional costs of the full version?

### **B) Tool Properties**

#### **What is the tool designed for?**

The MDAT is a performance measure to assess child development through direct observation of the child, designed to be culturally appropriate for use in rural Africa.<sup>3</sup> The

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<sup>1</sup> The Malawi Developmental Assessment Tool (MDAT): The Creation, Validation, and Reliability of a Tool to Assess Child Development in Rural African Settings, by Melissa Gladstone, Gillian A. Lancaster, Eric Umar, Maggie Nyirenda, Edith Kayira, Nynke R. van den Broek, and Rosalind L. Smyth. Published by PLoS Med. 2010 May 25;7(5):e1000273.

<sup>2</sup> According to Fernald et al 2017 (p. 45), "Although [the Bayley-III] is well-validated in the United States and has been used in many different countries, several studies have found bias when applying the tool in different contexts and cultures".

A toolkit for Measuring Early Childhood Development in Low- and Middle-Income Countries by Lia C. H. Fernald, Elizabeth Prado, Patricia Kariger, and Abbie Raikes. Published by the World Bank. Available online at: <https://openknowledge.worldbank.org/bitstream/handle/10986/29000/WB-SIEF-ECD-MEASUREMENT-TOOLKIT.pdf?sequence=1&isAllowed=y>

tool assesses development in four domains: gross motor skills, fine motor skills, language skills, and social skills. While there is no specific cognitive domain in the task, several tasks in each domain to assess cognitive skills, e.g. the ability to follow directions, leaning to stack items, or remembering items in a list.

**Which version did you use? (if applicable)**

The tool has undergone minor revisions since creation; we used the most recent version available (versions are unnamed: contact developer, Melissa Gladstone, for details). The version used had 157 items across four domains: 36 social, 42 fine motor, 40 language, and 39 gross motor.

**What impact evaluation can you use the MDAT to measure?**

The MDAT is a tool to assess development of children; it can be used in any impact evaluation where child development is a primary outcome.

**Administration and Training: (What is the process of administration and training)**

Enumerators/assessors, who have had not previous experience, require a minimum of two weeks of training (10 days) to develop the knowledge of how to use the tool. The training also requires a significant practical component in which assessors practice administering the tool and receive feedback to standardize administration between assessors.

Assessment uses locally available materials: assessment kits can be adapted to the local context. It is critical, however, that kits are appropriately adapted to ensure meaningful results on the assessment. For example, commonly used household items such as cups, soap, cooking utensils will look different in each country and perhaps in rural areas versus urban. For example, in a training in Rwanda, children in urban areas identified a figure of a man on a bicycle as someone on a motorcycle (which are ubiquitous in urban areas of Rwanda), but children in rural areas identified it as someone on a bicycle (which are more common in rural areas of Rwanda). To account for this it is essential to have a relevant comparison sample.

The assessment takes between 30 minutes ( for younger children) and 1 hour for older children, depending on the age of the child. The assessment requires a dedicated space big enough for a small mat and for the assessor, the mother or caregiver, and the child to sit, and the child to move around in safety.

**Evaluation of the tool in context. (Include links if any to evaluations of the tool performance in your context)**

The tool has not been formally validated in Rwanda but has been used by FXB/Boston College in the evaluation of Sugira Muryango, by Partners in Health, and by Save the Children in the evaluation of Intera za Mbere.

**Reliability and Validity (Briefly share about the reliability and validity tests done on the tool if you have them)**

The reliability and validity of the tool was assessed in Malawi.<sup>4</sup> In its application in Rwanda, we can see from the baseline data that the tool was administered with

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<sup>3</sup> Gladstone et al 2010, citation above.

<sup>4</sup> See: The Malawi Developmental Assessment Tool (MDAT): The Creation, Validation, and Reliability of a Tool to Assess Child Development in Rural African Settings, by Melissa Gladstone, Gillian A. Lancaster, Eric Umar, Maggie Nyirenda, Edith Kayira, Nynke R. van den Broek, and Rosalind L. Smyth. Published by PLoS Med. 2010 May 25;7(5):e1000273.

- a) high inter-rater reliability,
- b) the scores have a normal distribution
- c) and increase with age,
- d) Scores also correlate with variation in other variables correlated with development (caregiver level of education, availability of books and toys, and interactions with children).

### **C) Critique of the tool**

#### **Did the tool help you answer your research question as you expected?**

We have not yet completed the endline assessment, so we do not have data on how sensitive the instrument will be to change over time, or to the effect of the intervention. To be updated.

#### **What were the limitations of using this tool in your context?**

Given the materials and space required for administration, we found it logistically easier to administer the tool in a central location (e.g. have families come to a central location in their village for the assessment) instead of the home. This is not necessarily a limitation, as it allows for more efficient assessment.

The tool requires a significant investment in training of enumerators and takes more time to administer relative to parent-report assessments, which makes it more costly than some other developmental assessment measures.

Sugira Muryango found that the tool was not as sensitive to the effect of their intervention over a one-year time frame (from the end of the evaluation to the assessment) as the Ages and Stages Questionnaire (ASQ) parent-report assessment. They found significant improvements in ASQ scores between the intervention and control group over time, but only positive trends and not significant differences in MDAT scores. This may be a limitation of the tool, or simply a true measure of effect.

This may be because:

1. The MDAT measures slightly different domains of development than the ASQ,
2. The MdAT measures the outcome with less bias than the parent-report measure and the true effect is smaller than that measured by the ASQ,
3. The intervention hasn't translated to significant developmental changes over this time frame or for this age range<sup>5</sup>.

A longitudinal follow-up of the Sugira Muryango evaluation cohort will be needed track and trace development and compare performance scores from the MDAT and with parental report from the ASQ. Continued assessment at an additional time point three years from the end of the evaluation will evaluate the predictive validity of the tool over this longer time period.

#### **Given what you know now about the tool performance, would you use it again?**

We would like to measure child performance directly, not just through parental report, and this tool allows us to do that. We are yet to trial available alternatives.

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<sup>5</sup> This is the case for other assessments such as the Bayley. According to Fernald et al (2017), "In both high- and low-income countries, the predictive validity of general mental development assessments, such as the Bayley Scales of Infant Development (BSID) (Bayley 2006), is low to moderate for children under age two years, with correlations in the range 0 to 0.5, and increases for children around age three to five years, to correlations in the range 0.5 to 0.8 (Figure 3.1)." (p 30-31)

**What would you do differently if using the same tool for assessment in your intervention?**

We need to consider both the timing of the assessment, and the triangulation of the information. Combining multiple assessment types or methodologies is a strategy recommended by the World Bank Toolkit<sup>6</sup> to better capture the child's true ability.

**Did you need to supplement the use of this tool with another to have a complete picture of the outcomes of your intervention? If Yes, which tool and why?**

Yes, we are planning to use an additional (parent-report) measure of social development at endline, and to capture additional detail on the social-emotional domain, which is particularly important to this intervention.

**Would you recommend this tool to other innovators with a similar intervention to yours?**

Yes, we would recommend the tool as a way to capture the performance of pre-school children.

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<sup>6</sup> P 63, A toolkit for Measuring Early Childhood Development in Low- and Middle-Income Countries by Lia C. H. Fernald, Elizabeth Prado, Patricia Kariger, and Abbie Raikes. Published by the World Bank. Available online at: <https://openknowledge.worldbank.org/bitstream/handle/10986/29000/WB-SIEF-ECD-MEASUREMENT-TOOLKIT.pdf?sequence=1&isAllowed=y>