



R. Chandrashekar B.E., M.S.<sup>1</sup>; J Rippetoe, B.S.<sup>1</sup>, S. Arnold PT, PhD<sup>1</sup>, E. Smith, PhD.<sup>2</sup> TH Kolobe PT, PhD, FAPTA<sup>1</sup>

<sup>1</sup>Department of Rehabilitation Sciences, University of Oklahoma Health Sciences Center

<sup>2</sup>College of Education, University of Illinois at Chicago, Chicago, IL

## INTRODUCTION

- Despite significant improvements in the field of data collection and analysis, there is still an inadequacy in validated evaluative tools for use with children<sup>2,3</sup>
- Evidence from multiple studies show that context affects child performance, suggesting that accounting for context when measuring child performance is important<sup>5-8</sup>
- The School Outcomes Measure (SOM<sup>TM</sup>)<sup>13</sup>, a minimal dataset was developed to address the limitations of the existing tools.
- One of the limitations of the SOM<sup>TM</sup> is the difficulty in interpreting the scores/results as it was developed based on the Classical True Score Theory (CTST)
- Often overlooked is the extent to which items within outcome tools represent the construct of interest. Especially constructs such as *learning* and *behavior* are difficult to capture, quantify, and interpret.
- The purpose of this study was to examine, evaluate, and interpret the dimensionality of the Expresses Learning and the Behavior subscales of the SOM<sup>TM</sup>.

## METHODS AND SUBJECTS

### Design

- Repeated measures design

### Participants

- PTs and OTs from five large school districts and independent cooperatives across the United States completed the SOM on 573 students age 3 to 21 years who were receiving school-based therapy.

### Measures

- The SOM<sup>TM</sup> consists of five subscales: Mobility, Self-Care, Assuming a Student's Role, *Expresses Learning*, and *Behavior*.

### Procedures

- The Rasch Model was used to examine the unidimensionality and the rating scale functioning (item fit and hierarchy) of the SOM's Expresses Learning and Behavior subscales.
- A principal component analysis (PCA) was used to examine the construct validity of the two subscales.
- The items fit, item fit statistics, and the PCA were conducted using the Winsteps software.

## RESULTS

Table 1: Overall rating scale functioning of the *Learning* subscale

Category label	Outfit Mean square	Andrich threshold
1	2.65	NONE
2	1.16	-3.28
3	0.72	-1.52
4	0.81	-0.04
5	0.79	1.25
6	1.13	3.59

Table 2: Item-fit of the *Learning* subscale

ITEM	LOGIT SCORE	OUTFIT MEAN SQUARE	OUTFIT Z-STANDARDIZED
Item 45: Physically accesses a picture board with any body part (elphyacc1)	-2.86	2.85	5.97
Item 46: Physically accesses an electronic device with any body part (elphyacc2)	-3.25	2.00	2.93
Item 47: Produces words and numbers (or prewriting activities) using handwriting (elhandwrite)	+1.03	0.91	-0.62
Item 48: Produces words and numbers (or prewriting activities) using computer (elcomputer)	+1.19	1.52	2.96
Item 49: Copies classwork 1. From the chalkboard (elcopy1)	+1.85	0.47	-3.28
Item 50: Copies classwork 2. From a book or work page (elcopy2)	+2.04	0.52	-3.33

### PCA of the *Learning* subscale

- PCA analysis of this dimension revealed that, elcopy1 and elcopy2 were loading differently when compared to the remaining 4 items of this dimension.
- The disattenuated correlation for both clusters of items with varying loading was 0.9722, which indicates that unidimensionality was maintained
- Yen's Q3 showed that item 49 (elcopy1) and item 50 (elcopy2) were redundant with a relatively high correlation of 0.64

## RESULTS

Table 3: Overall rating scale functioning of the *Behavior* subscale

Category label	Outfit Mean square	Andrich threshold
1	0.90	NONE
2	0.90	-3.74
3	0.94	-1.67
4	0.88	0.03
5	0.94	1.36
6	1.23	4.02

Table 4: Item-fit of the *Behavior* subscale

ITEM	LOGIT SCORE	OUTFIT MEAN SQUARE	OUTFIT Z-STANDARDIZED
Item 51: Follows basic rules of the game (brules)	+0.72	1.01	0.22
Item 52: follows classroom procedures (bprocedures)	+0.12	0.68	-5.00
Item 53: Responds to social engagement from others (bresponds)	-0.74	1.30	3.58
Item 54: Wait turn/Takes turn (bturn)	-0.35	0.73	-3.93
Item 55: stays on task in the classroom (bontask)	+0.93	0.96	-0.46
Item 56: Maintains acceptable behavioral control in school (bcontrol)	-0.64	1.61	6.74
Item 57: interacts cooperatively and appropriately with other students (binteracts)	-0.39	0.82	-2.60
Item 58: follows directions (bdirections)	+0.35	0.65	-5.57

### PCA of the *Behavior* subscale

- PCA analysis of this dimension revealed that all the items were loading differently forming three different clusters of items
- The disattenuated correlation values for three clusters of items were 0.9241, 1.0000, and 1.0000, which indicates that unidimensionality was maintained.
- Yen's Q3 showed that items 51 and 52 were redundant with a correlation of 0.34

## DISCUSSIONS AND CONCLUSIONS

- These analyses suggest that the subscales measure the constructs of learning and behavior of students with disabilities.
- The analyses also identified misfitting items that are likely to obscure change scores for these children.
- To improve the accuracy of the subscale scores and improve the scales' sensitivity to change the misfitting items must be revised or removed.
- The Rasch analyses also generated information about the difficulty hierarchy of items within the subscales

## RELEVANCE TO ALLIED HEALTH

The revised subscales should help PT, OT, speech language pathologists, and teachers to accurately capture and document the outcomes of services they provide for children with disabilities in schools while the information about item difficulty can be used to plan interventions.

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