

ORIGINAL ARTICLE

Psychometric characteristics of the Child Occupational Self-Assessment (COSA), Part Two: Refining the psychometric properties

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Abstract

Self-assessment is an appropriate way to support *client-centered practice* and promote personal development in young occupational therapy clients. This study, the second study in a series of two, sought to refine the psychometric properties based on previous analysis of the Child Occupational Self-Assessment (COSA), a self-report tool based on the *Model of Human Occupation*. The COSA comprises 24 statements, which the child rates in terms of personal competence and importance. The Rasch Rating Scale Model was used to evaluate the measurement properties of the Competence and Values scales that result from these self-ratings. The original three-point rating scale was expanded to four response categories in this study, which resulted in improved reliability and sensitivity. In this second study, the items once again coalesced to form measures of competence and values, and the order of items from less to more competence and value was similar to that in the first study, supporting the internal validity of the COSA scales. The results provide evidence that the COSA can be used as meaningful and reliable client-directed assessment tool as well as an outcome measure.

Key words: *Client-centered practice, Model of Human Occupation, pediatric OT, self-assessment*

Introduction

Occupational therapists around the globe espouse the value of practicing in a client-centered manner, and best practice in occupational therapy involves clients in all stages of the occupational therapy process including evaluation, intervention, and outcome assessment (1–4). In addition to facilitating client participation, the use of psychometrically sound client-directed assessments and outcome measures supports evidence based practice. Refining the Child Occupational Self-Assessment (COSA) (5) ensures that clinicians have a high-quality occupational therapy assessment available when seeking to involve pediatric clients in the occupational therapy process.

Ideally, client-directed assessment equalizes power imbalances between the therapist and the client and gives the client the opportunity to self-direct. As Pollock (6) wrote, “the use of rater [therapist] judgment in scoring assessments may only reinforce

the passivity of clients and the sense of the professional as the answer to the problem” (p. 298). Empowering and enabling young clients through self-directed assessment to identify their needs and goals and recognizing the clients as experts on their own lives are both components of a client-centered approach to practice (7,8).

Children have the right to be involved in making decisions that affect their lives (9,10), including occupational therapy evaluation and intervention. Previous research has demonstrated that children as young as five are able to discriminate among choices, communicate their unique preferences, and hold a stable view of themselves over time (9,11,12). However, therapists often cite client competence in decision-making as a barrier to client participation in assessment and goal setting (13,14). It is important to consider that “individuals who appear to lack the competence to decide may simply be reflecting a previous lack of opportunity for learning how to make good decisions” (12, p. 347). Occupational

therapists can use valid and reliable self-reports not only to involve young clients in therapy but to support the acquisition of personal development skills such as decision-making, problem-solving, self-mastery, and self-determination (12,15,16).

The COSA includes a wide scope of occupational performance areas and skills and assesses the variety of occupations addressed by pediatric therapists. The COSA is intended to be used alongside traditional therapist-based measures to purposefully insert the child's perspective into the evaluation and intervention process (17,18). Moreover, the COSA can be re-administered as a client-directed outcome measure.

Background of the COSA

The COSA is based on concepts from the model of human occupation (MOHO) (19). MOHO inherently supports a client-centered approach since it "views each client as a unique individual whose characteristics determine the rationale for and nature of the therapy goals and strategies" and because it "views what the client does, thinks, and feels as the central mechanism of change" (20, p. 163). MOHO also recognizes that successful engagement in occupations occurs in an environment that supports and provides opportunities for culturally meaningful participation. Inherent in this way of understanding a client is the recognition that the therapist can support a young client to engage successfully in the occupational process of self-reflection and self-report.

The COSA items are constructed to represent major components of childhood occupational performance and participation. The items reflect everyday activities and are intended to capture the client's performance and participation in his/her school, home, and community. The overall scores obtained from the COSA reflect MOHO concepts of occupational identity and competence (19). Occupational identity refers to a sense of capacity for doing occupations related to valued roles and relationships. Clients reveal which activities are essential and contribute to their sense of occupational identity through their responses on the Values scale. Occupational competence refers to maintaining routines, meeting expectations for role performance, and having a sense of control and satisfaction when participating in occupations over time. Clients' responses on the COSA regarding their abilities are intended to capture their sense of occupational competence. By capturing competence and value regarding everyday occupations, the COSA provides young clients with the opportunity to contribute

information during the occupational therapy process.

A previous study (*Psychometric Characteristics of the Child Occupational Self-Assessment (COSA) Part One: An initial examination of the psychometric properties*) explored the psychometric properties of the COSA. The results of this study indicated that the items worked well together to constitute measures of occupational competence and values, and produced a valid self-assessment. However, the instrument was not sufficiently reliable and sensitive to discriminate among clients, which limited its utility as an outcomes measure. The authors recommended that the Competence and Values three-point rating scales be expanded to four response choices in order to improve the COSA's sensitivity to change.

Based on the results of the first study, each rating was expanded from 3 to 4 response choices. The additional response category should improve discrimination along the continuum of value for occupation and occupational competence. Moreover, the responses were rephrased to minimize the effects of social desirability on how clients would respond. In addition to the rating changes, appropriate modifications for administration of the COSA were further clarified and open-ended questions were added to the end of the assessment.

The 24 items on the COSA must be rated in terms of how well they do the activity (Competence) and how important it is to them (Values). To assist clients with the conceptualization of each continuum, a series of familiar symbols (i.e. faces and stars) is used for each response option. A variety of modifications and simple language ensures clients of all abilities have an opportunity to voice their opinions. Figure 1 contains sample items from the scale and the corresponding self-rating format.

Rasch measurement

Assessing validity is an ongoing process in which an instrument's internal coherence, convergence and divergence with other measures, and predictive ability is tested over time (22). These strategies are all designed to provide evidence that the measure captures an underlying construct (23). Measuring the underlying construct involves consideration of several factors that are readily addressed through the Rasch Rating Scale Model (RSM) (24,25). In keeping with recommendations for assessment development in the field of occupational therapy (26,27), Rasch analysis was the measurement approach used to examine the COSA. Rasch analysis converts the ordinal ratings made by respondents on the COSA items into interval scores, which is a requirement for measurement (28,29).

Myself	I HAVE A BIG PROBLEM DOING THIS	I HAVE A LITTLE PROBLEM DOING THIS	I DO THIS OK	I AM REALLY GOOD AT DOING THIS	NOT REALLY IMPORTANT TO ME	IMPORTANT TO ME	REALLY IMPORTANT TO ME	MOST IMPORTANT OF ALL TO ME
Keep my body clean					★	★★	★★★	★★★★
Dress myself					★	★★	★★★	★★★★
Eat my meals without any help					★	★★	★★★	★★★★
Use money to buy things by myself					★	★★	★★★	★★★★
Get my chores done					★	★★	★★★	★★★★

Figure 1. Rating scales and example items on the COSA (Version 2.0).

Items of each scale must define the single underlying construct they are designed to measure to constitute valid measures. Rasch analysis tests whether the items of each of scale are unidimensional—that is, whether they coalesce to constitute a single underlying dimension or dominant construct (23,30). Rasch analysis also determines whether each participant's response pattern is as would be expected given the underlying structure of the scale; when this is so it indicates that the scale provided a valid measure of the participant. When items and participants are said to fit, they meet the criteria for validity.

The mean square fit statistic (MnSq) is used to assess the fit of items and persons; it is accompanied by a standardized mean square (Zstd), which indicates significance (23,30). Values above the ideal MnSq of 1.0 indicate the proportion of random variance. In this study, MnSq values above 1.4, where random variance exceeds 40% (31), and associated with Zstd greater than positive 2.0 were taken to indicate a misfit (i.e. that an item was not a valid indicator of a construct or that a client was not validly measured). In addition to the basic fit statistics, which are described above, unidimensionality of the scale can be further assessed by doing a Principal Component Analysis (36) of the standardized residual correlations, which reveals any distinct dimensions that would indicative multidimensionality.

Rasch analysis also yields calibrations, which identify where each item and participant fall along the single dimension representing the construct on a continuum from less to more. Item calibrations (item measures) indicate how much of the underlying construct an item represents. The validity of a scale can be assessed by the ordering of its items. Items with higher measures represent more and items with lower measures represent less of the construct. Items should be logically distributed across the continuum and be consistent within the same population over time.

Person calibrations estimate the position of each person assessed on the same continuum from less to more of the construct. The more of the underlying construct the person possesses, the higher a person's calibration (referred to as the person measure). Likewise, persons with lower measures have less of the construct being measured. The interval unit of measure used by Rasch for calibrating items and measuring person ability is the logit (log-odds transformation of the probability of a response).

Rasch analysis can also indicate the number of statistically distinct levels of items or person measures that are distinguishable by a rating scale (33). The number of levels, or strata, represent respectively the spread of items and the sensitivity with which the scale can detect differences among persons measured by the scale.

One can determine whether items are appropriately targeted to the levels of the trait represented by

the participants since items and persons are calibrated on the same continuum. Ideally, an instrument should have items whose mean is near the mean of the participants. Furthermore, the items should spread out so that they cover the range of participant variability in order to avoid ceiling or cellar effects.

When using a rating such as the response scale for Competence and Values on the COSA there are two criteria for appropriate use of the rating. First, respondents should make somewhat equitable use of all ratings and, second, the ratings should be used in the order intended to show more of the trait being measured (33). The Rasch model assumes that each consecutive response choice represents a larger amount of the underlying construct. For instance, in the COSA, "Not important" should indicate a lower level of value than "Important". Second, the rating assumes that clients with more occupational competence should select self-ratings that reflect higher occupational competence. Finally, the fit statistic for each rating response is used to assess whether participants have a shared understanding of the meaning of each of the rating scale categories. These assumptions for ordered response use are met when (34,35):

- The average client measure in each category is ordered from less to more as the rating scale intends, and
- Step measures indicate that moving from one rating response to the next indicates a change in the intended direction.
- In addition, the fit statistic for the response categories indicates that clients share a common understanding of the rating categories when the outfit MnSq is < 2 for each rating scale category (34).

Study aims

The purpose of this second study in a series of two was to examine the psychometric properties of a revised version of the COSA. This study asked the same series of specific questions outlined in *Psychometric Characteristics of the Child Occupational Self-Assessment (COSA) Part One: An initial examination of the psychometric properties*, including:

1. Does each rating scale (Competence and Values) function as intended? Will each rating category be used in a similar way by all participants as indicated by ordered step measures, ordered average measures, and fit statistics?

2. Does each rating scale show evidence of an underlying unidimensional construct?
3. Do the rating scales effectively discriminate between participants?
4. Are most participants validly measured as indicated by fit statistics?
5. Are the scales targeted appropriately to participants?

Two additional questions specific to this study were:

1. Is there evidence that the changed rating worked as intended and improved the scale as evidenced in more equitable use of the ratings and improved participant separation?
2. Do the item hierarchies in this sample replicate those found in Study One?

Material and methods

Sample

This second study sought to capture a greater variability of participants than the previous study. Approval by the University of Illinois at Chicago Institutional Review Board was received prior to the data-collection process. A convenience sample of 43 occupational therapy clients was gathered. The sample was drawn from the caseloads of seven therapists who were interested in using the COSA in practice and willing to contribute data to the research project. Therapists using the COSA followed the administration directions outlined in the assessment manual (5). All 43 participants were occupational therapy clients seen in a variety of settings, including schools and hospital inpatient clinics. Table I gives more demographic information.

Data analysis

The data from the COSA's two scales were analyzed using WINSTEPS Version 3.49 software program (36). For purposes of the analysis, numerical scores were assigned to the COSA ratings. The Competence ratings were given the scores: 1 = *I have a big problem doing this*, 2 = *I have a little problem doing this*, 3 = *I do this ok*, and 4 = *I am really good at doing this*. The Values ratings were scored as: 1 = *Not really important to me*, 2 = *Important to me*, 3 = *Really important to me*, and 4 = *Most important of all to me*.

Results

Competence ratings

As shown in Table II, observed category counts in the four-point Competence ratings indicate that

Table I. Client demographics.

	n = 43
Sex	
Male	30 (69.8%)
Female	13 (30.2)
Age	
Range	8–17
Mean	12.21
Mode	12
Diagnosis	
Developmental Delay	21 (48.8%)
Neurological	8 (18.6)
Mental/psychological	7 (16.3)
Orthopedic/Musculoskeletal	2 (4.7)
Medical	2 (4.7)
Other	2 (4.7)
Missing	1 (2.3)
Ethnicity	
Caucasian	27 (62.8%)
African-American	10 (23.3)
Multiracial	3 (7.0)
Hispanic	2 (4.7)
Missing	1 (2.3)
Setting	
School	32 (74.4%)
Inpatient hospital/Rehabilitation center	7 (16.3)
Private home	2 (4.7)
Other	2 (4.7)

Table II. Frequencies, fit statistics and step measures for the competence ratings.

Response Category	Observed count	Observed average measure	Outfit MnSq	Step measure
1—Big problem	111	−0.45	1.05	None
2—Little problem	243	0.07	0.84	−0.94
3—OK at doing	318	0.72	1.12	0.09
4—Good at doing	258	1.28	1.03	−0.85

participants used the ratings fairly equitably. Both the average measures and step measures were ordered. Finally, the outfit MnSq for each category was below 2, indicating that response categories were used as expected.

Results for the Competence Scale

Items. Two of the 24 items, “Get enough sleep” and “Choose thing that I want to do” misfit on the Competence scale. This represents 8% of the COSA items, and is slightly larger than an expected Type I error rate of 5%. All other items met the criteria for fit (Table III). The Competence items had a mean MnSq of 1.01, indicating that overall the Competence items had a close to ideal fit for the Competence rating scale.

Twenty-three Competence items had point-biserial correlation coefficients ranging from 0.06 to 0.71,

Table III. Competence item measures and fit statistics.

Item	Item Measure	Standard Error	Infit		Outfit	
			MnSq	Zstd	MnSq	Zstd
1. Keep My Body Clean	−0.24	0.19	0.71	−1.6	0.68	−1.5
2. Dress Myself	−0.51	0.20	1.06	0.3	1.11	0.5
3. Eat My Meals Without Any Help	−0.64	0.21	0.94	−0.2	0.86	−0.5
4. Use Money To Buy Things By Myself	0.15	0.18	1.27	1.4	1.23	1.1
5. Get My Chores Done	0.28	0.18	0.73	−1.6	0.75	−1.3
6. Get Enough Sleep	−0.24	0.19	1.67	2.9	1.65	2.4
7. Have Enough Time To Do Things I Like	−0.13	0.19	1.0	0.1	1.02	0.2
8. Take Care Of My Things	0.02	0.19	1.02	0.2	1.03	0.2
9. Move My Body From One Place To Another	−0.47	0.20	1.06	0.4	0.99	0.0
10. Choose Things I Want To Do	−0.92	0.22	1.57	2.1	1.63	1.9
11. Keep My Mind On What I Am Doing	0.71	0.18	0.86	−0.7	0.89	−0.5
12. Do Things With My Family	−0.87	0.22	1.50	1.9	1.35	1.2
13. Do Things With My Friends	−0.59	0.21	1.13	0.6	1.04	0.3
14. Do Things With My Classmates	0.35	0.18	1.00	0.0	0.95	−0.2
15. Follow Classroom Rules	0.22	0.18	1.06	0.4	1.10	0.5
16. Finish My Work In Class On Time	0.61	0.18	0.81	−1.0	0.88	−0.6
17. Get My Homework Done	0.28	0.18	1.16	0.9	1.09	0.5
18. Ask My Teacher Questions When I Need To	0.08	0.18	1.14	0.8	1.16	0.8
19. Make Others Understand My Ideas	0.54	0.18	0.67	−1.9	0.68	−1.7
20. Think Of Ways To Do Things When I Have A Problem	0.61	0.18	0.70	−1.7	0.74	−1.4
21. Keep Working On Something Even When It Gets Hard	0.84	0.18	0.61	−2.3	0.61	−2.2
22. Make My Body Do What I Want It To Do	−0.55	0.20	1.23	1.1	1.23	0.9
23. Use My Hands To Work With Things	−0.24	0.19	0.74	−1.4	0.92	−0.3
24. Finish What I Am Doing Without Getting Tired Too Soon	0.71	0.18	0.65	−2.1	0.62	−2.2

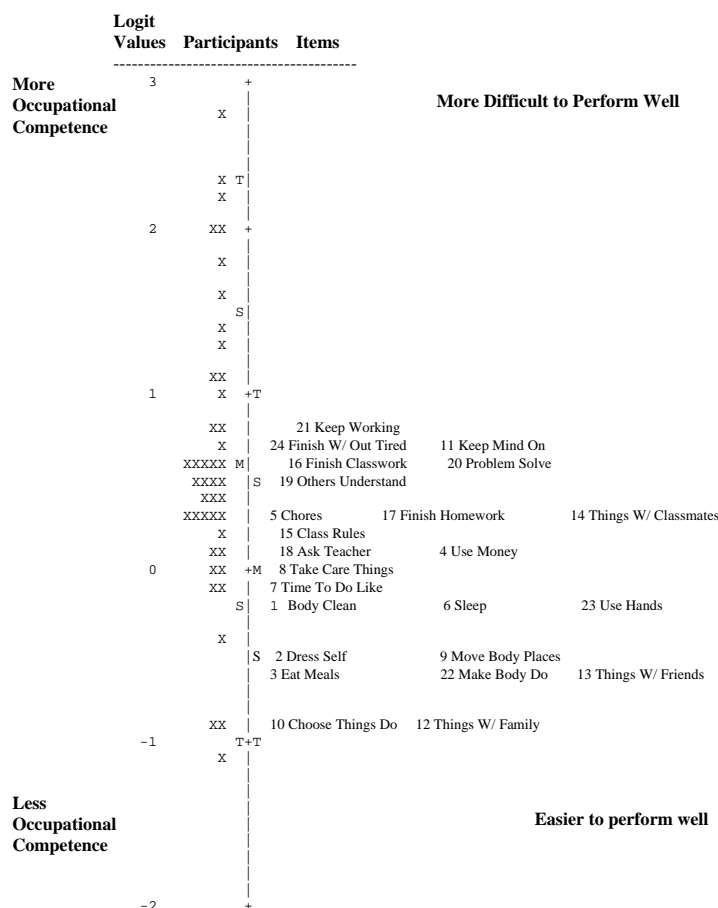
while the misfitting item “Choose things that I want to do” had a negligible negative item point-biserial correlation coefficient of -0.02 . This negative value can be indicative of a violation of unidimensionality. However, a Principal Component Analysis (PCA) of the standardized residual correlations for the COSA did not reveal distinct patterns that would have indicated multidimensionality (32).

The Competence items had a reliability of 0.85 with item measures ranging from -0.92 to 0.84 . Items were differentiated into three statistically different groups (strata), with an item separation of 2.34.

Participants. Two participants misfit (4%), but this is not significant as it is less than an expected Type I error rate of 5%. Person reliability was 0.88 and separation was 2.68, resulting in almost four (3.9) distinct strata, or groups of participants.

Variable map. The mean of the person measures on the Competence variable map (Figure 2) was 0.63 with a standard deviation of 0.83, which was greater than the item mean of 0. However, the spread of the Competence rating scale captured the ability level of most clients. No ceiling or cellar effects were observed as 95% of the participants were within two standard deviations of the mean.

On the Competence variable map (Figure 2), items with lower measures reflect less competence. In this study, the items that were identified as the easiest to perform well were “Choose things that I like to do” and “Do things with my family”. The items that were more difficult to perform well were “Keep working on something even when it gets hard”, “Finish what I am doing without getting tired too soon”, and “Keep my mind on what I am doing”.



* Each X represents 1 participant; M=Mean, S= 1 standard deviation, and T=2 standard deviations

Figure 2. Competence variable map.*

Values ratings

Table IV shows that the Values response categories were used with equal frequency by respondents. Observed average measures and step measures were ordered. Respondents understood the ratings in the same way, as all response categories had outfit MnSq below 2.

Results for the Values Scale

Items. Four items misfit (16.6%) (indicated by MnSq and Zstd) on the Values rating scale. “Choose things that I want to do” was one misfitting Values item that also misfit on the Competence scale. Other misfitting Values items included “Do things with my family”, “Move my body from one place to another”, and “Use money to buy things by myself” (Table V). Overall fit for all the items on the Values scale was close to ideal, with a mean infit MnSq of 0.98.

While 23 of the Values items had a point-biserial correlation coefficient value ranging from 0.00 to 0.83, the misfitting item “Choose things that I want to do” had a negative item point-biserial correlation coefficient on the Values scale of -0.36 . The Principal Components Analysis (PCA) for the Values scale also revealed a pattern in which items related to school and higher level processing skills had positive loadings, and most items that pertained to self-care and personal life had negative loadings. All items misfitting on the Values scale had negative loadings. The negative point-biserial correlation coefficient and the pattern of findings in the PCA could indicate multidimensionality of the Values scale (32). The Values items had a reliability of 0.82 with item measures ranging from -1.33 to 0.58. The items were differentiated into three statistically different groups (strata).

Participants. Five participants (11%) misfit on the Values scale, more than the expected 5% Type I error rate. A decision was made to keep these responses in this analysis as they did not contribute enough error to warrant exclusion from the analysis, as the reliability of both items and persons was good.

Person reliability was 0.91, and the separation translated to four distinct groups of clients.

Variable map. The Values variable map (Figure 3) showed the average person measure as 0.11 and a standard deviation of 0.96. The item mean was 0 with a standard deviation of 0.47. The spread of the rating scale accurately captured the values of all but one of the participants, with no floor or cellar effects observed.

On the Values variable map items with lower measures indicate greater importance (Figure 3). The activities that were most important to this sample were “Choose things that I want to do” and “Do things with my family”. These two items were also the easiest items to perform well on the occupational competence continuum. The activities that had high measures and were valued by the fewest participants were “Make others understand my ideas”, “Get my chores done”, “Keep working on something even when it gets hard”, and “Do things with my classmates”.

Discussion

The Competence and Values four-point ratings functioned as intended, with each response indicating higher levels of occupational competence or values. Each response option was used with equal or similar frequency, and participants understood the rating scales in the same way and found each response option meaningful. Both ratings were confirmed as effective measures of occupational competence or value for occupation.

The expansion to a four-point rating scale improved the reliability of the COSA and enhanced its sensitivity to detect differences in participants (See Table VI). Competence item reliability improved from 0.74 in the previous study to 0.85 in this study, and the number of distinct Competence item groups increased from two to three. Values items reliability and strata increased to 0.82 and three respectively, from 0.78 and two found in the first study. Increased item separation indicates that the items are able to capture most clients’ abilities, as evidenced by the majority of client measures occurring within ± 2

Table IV. Frequencies, fit statistics and step measures for the values ratings.

Response category	Observed count	Observed average measure	Outfit MnSq	Step measure
1—Not really important to me	242	-0.78	0.90	None
2—Important to me	256	-0.32	0.94	-0.59
3—Really important to me	237	0.46	0.82	0.02
4—Most important of all to me	269	1.05	1.13	0.57

Table V. Values item measures and fit statistics.

Item	Item Measure	Standard Error	Infit		Outfit	
			MnSq	Zstd	MnSq	Zstd
1. Keep My Body Clean	-0.02	0.18	0.61	-2.3	0.57	-2.2
2. Dress Myself	0.09	0.18	0.76	-1.2	0.85	-0.6
3. Eat My Meals Without Any Help	0.19	0.18	0.71	-1.5	0.97	0.0
4. Use Money To Buy Things By Myself	0.04	0.18	1.64	2.8	1.66	2.5
5. Get My Chores Done	0.51	0.19	0.78	-1.0	0.77	-1.0
6. Get Enough Sleep	-0.34	0.18	0.77	-1.3	0.77	-0.9
7. Have Enough Time To Do Things I Like	-0.64	0.18	0.84	-0.8	0.85	-0.5
8. Take Care Of My Things	-0.06	0.18	0.79	-1.1	0.73	-1.2
9. Move My Body From One Place To Another	0.10	0.18	1.74	3.2	1.85	3.1
10. Choose Things I Want To Do	-1.33	0.21	1.59	2.1	3.06	3.8
11. Keep My Mind On What I Am Doing	0.28	0.18	0.62	-2.1	0.59	-2.0
12. Do Things With My Family	-1.16	0.20	1.74	2.8	2.21	2.8
13. Do Things With My Friends	-0.16	0.18	1.20	1.0	1.49	1.9
14. Do Things With My Classmates	0.48	0.19	1.15	0.8	1.46	1.8
15. Follow Classroom Rules	0.17	0.18	1.01	0.1	0.92	-0.3
16. Finish My Work In Class On Time	-0.02	0.18	1.18	0.9	1.20	0.9
17. Get My Homework Done	0.07	0.18	0.58	-2.4	0.56	-2.2
18. Ask My Teacher Questions When I Need To	0.37	0.18	0.88	-0.6	0.80	-0.9
19. Make Others Understand My Ideas	0.58	0.19	0.54	-2.5	0.50	-2.5
20. Think Of Ways To Do Things When I Have A Problem	0.27	0.18	0.79	-1.1	0.77	-1.0
21. Keep Working On Something Even When It Gets Hard	0.48	0.19	0.81	-0.9	1.14	0.7
22. Make My Body Do What I Want It To Do	-0.18	0.18	1.26	1.3	1.13	0.6
23. Use My Hands To Work With Things	-0.09	0.18	0.75	-1.3	0.70	-1.4
24. Finish What I Am Doing Without Getting Tired Too Soon	0.37	0.18	0.77	-1.1	0.72	-1.2

standard deviations of the mean on the variable maps (see Figures 2 and 3). Participants were also more reliably measured and differentiated in distinct groups by both rating scales. Respondents were separated into almost 4 strata on the Competence scale and 4 strata on the Values scale, an increase from the 2 and 3 strata observed in Study One. Finally, participant reliability improved on both scales, from .72 to .88 on the Competence scale, and from .80 to .91 on the Values scale. Although the spread of item difficulty on both the Competence and Values scale was limited, the COSA was still able to differentiate the respondents into distinct groups.

This study replicated the hierarchy of occupational competence and value for occupation originally defined in the first study further supporting the validity of the scale. The easiest items to perform well on the continuum of occupational competence in this study related to relationships and managing basic self-care, while items associated with managing responsibilities and sustaining effort were more difficult.

The Values item hierarchy was also similar to the first study's description, as some of the least important items were doing chores and doing things with classmates, and one of the most important items was doing things with family. Participants in this study did identify personal choice as most

important, which was defined as only a moderate value in the previous study. However, the clients in this study were seen by occupational therapists in more specialized settings, which may have been highly structured and provided fewer opportunities (i.e. center schools, inpatient hospital) for personal choice within daily routines. As a result, personal choice may stand out for them as a highly valued activity. Items referring to managing time and sustaining effort were again cited as moderate values in this study. Therefore, it is determined that the item hierarchies in this study are meaningful and similar to those defined in the first study.

The evidence for the Competence scale is consistent with the conclusion that the items form a unidimensional scale, meaning the items and rating scales validly measure the construct of occupational competence. On the Values scale, the misfitting items, negative biserial and principal components analysis could indicate multidimensionality, but other findings should also be considered. First, the previous study did not provide evidence for multidimensionality of the Values scale and the item hierarchies were similar for both studies. Second, the mean item MnSq was close to ideal for the Values scale in this analysis. Therefore, while the present findings suggest further examination of the scale with a larger participant pool, the preponder-

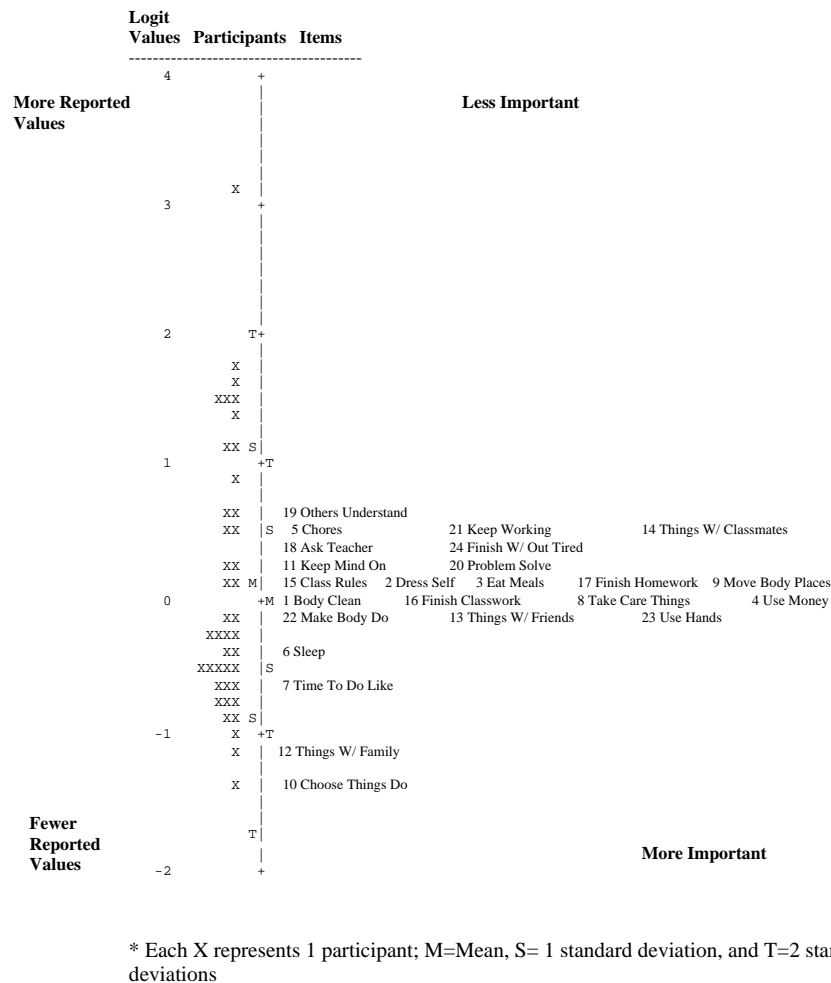


Figure 3. Values variable map.*

ance of evidence still suggests that the COSA items represent a unidimensional construct of occupational competence and value for occupation.

Some further examination of misfitting items identified in this sample is warranted. The misfitting Competence items in this study “Choose things that I want to do” and “Get enough sleep” also had a MnSq that exceeded 1.4 in the first study. However, some patterns can be discerned in the unexpected responses that contributed to the items fit statistics, and these individual responses may be clinically valuable (37). For example, three of the five clients with the most unexpected responses to the Competence item “Get enough sleep” had ADHD, which may be indicative of the irregular sleep patterns associated with this disorder. Five clients found the Competence item “Choose things that I want to do” more difficult than was expected; this may provide therapists with important information for planning interventions with these clients, such as incorporating opportunities for making choices into their environment. These two items should be further

analyzed with more respondents to determine whether they violate unidimensionality or are simply sensitive to diagnostic differences in clients.

The items misfitting on the Values scale may also provide clinically useful information. The item “Choose things that I want to do” misfit due to nine clients who considered this item less important than was expected. Only four of these clients (45%) were Caucasian, which does not match the demographic composition of the sample. Clinicians may need to consider the implication of cultural values for individual client priorities and beliefs when considering goals for therapy, such as valuing interdependence and community over autonomy and personal choice. No patterns could be discerned from the unexpected client responses to the Values items “Move my body from one place to another” and “Use money to buy things by myself”. However, clinicians did report that the meaning of the item “Move my body from one place to another” was unclear, and it is recommended that this item should be re-worded to reflect functional mobility more

Table VI. A comparison of reliability, separation index, and strata.

	Study One (Keller, Kafkes, & Kielhofner)	Study Two (Keller & Kielhofner)
Competence items		
Reliability	0.74	0.85
Separation Index	1.67	2.34
Strata	2	3
Competence participants		
Reliability	0.72	0.88
Separation Index	1.59	2.68
Strata	2	4
Values items		
Reliability	0.78	0.82
Separation Index	1.88	2.15
Strata	2	3
Values participants		
Reliability	0.80	0.91
Separation Index	2.02	3.19
Strata	3	4

clearly. It is also recommended that the item "Use money to buy things by myself" should be clarified to reflect the skill of making a purchase rather than the availability and/or use of money. Finally, six clients unexpectedly responded to "Do things with my Family", and stated that doing things with friends was a more important value. These clients were sharing important information about their social relationships that therapists should consider when structuring interventions and setting goals, such as focusing on community activities that enable clients to be with friends. As none of these Values items misfit in the first study, further analysis with a larger and more varied sample is needed to determine their validity on the COSA Values scale.

Irrespective of item misfit, the COSA rating scales were able to capture clients' perspectives with no ceiling or floor effects observed in this study. The number of misfitting clients on the Competence scale was within the Type I error rate. Although 11% of clients misfit using the Values scale, these clients' abilities were still captured by the rating scale and items. In addition, as value is a highly personalized construct, we could expect a higher number of unexpected responses on this scale due to differences in individual social and physical environments.

Future research on the psychometric properties of the COSA is required. Ultimately, the COSA should be both a psychometrically sound client-directed assessment as well as a useful clinical tool. It is recommended that future research be conducted on alternative formats of administration, client, and therapist perspectives on the use of the COSA, and psychometric analysis of larger datasets. Large

datasets would allow the creation of paper keyforms, like those recently developed for the Occupational Performance History Interview—II (38) and the Occupational Self-Assessment (39). Paper keyforms allow the therapist to generate a client measure and an individual standard error in the clinic without the use of Rasch analysis. This client measure could be used to track progress and document outcomes while supporting evidence-based practice at an individual or institutional level. Research on repeated measures using the COSA will be important to make a final determination of the utility of the COSA as an outcomes measure. Specifically, such research will need to demonstrate that the item hierarchy remains stable over time and that differences within subjects are detected when they are expected.

Further exploration of the Values item hierarchy would also prove to be both clinically and theoretically useful. Previous research on the Occupational Self-Assessment revealed that there may be a universal hierarchy of occupational values that transcends culture (40). Understanding how young occupational therapy clients value occupation and how those values are reported across age, impairment, or culture would contribute to our understanding of occupational identity. Moreover, it will be important to further explore the meaning of the Values scales, since the client's score in this scale reflects the extent to which a client endorses the importance of items, reflecting performance and participation. As such, the scale probably taps into a client's hope or expectation for quality of life. Change in this score could be clinically significant.

Conclusion

This paper supports the conclusion that the COSA is meaningful and reliable self-assessment tool that can be used to effectively capture young clients' perspectives regarding their occupational competence and value for common and important activities and roles. The COSA can function as both an assessment tool and client-directed outcome measure, as each rating scale demonstrates the capacity to separate clients into distinct groups, improving the instrument's sensitivity to detect change. Further research is needed to confirm that the constructs of occupational competence and value for occupation as defined by the items are unidimensional. Since all items appear to provide clinically useful information, no decision was made at this time to eliminate any items.

Finally, evidence from both studies indicates that the COSA provides a useful structure to incorporate client-directed decision-making in occupational

therapy evaluation, intervention, and outcomes, and provides young clients with the opportunity to practice the self-determination skills of problem-solving, goal setting, and identity clarification in the context of occupational therapy.

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