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Preliminary Measurement Properties of the Early Childhood Occupational Profile (ECOPE)

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Preliminary Measurement Properties of the Early Childhood Occupational Profile (ECOPE)

Abstract

Background: This study established the preliminary psychometric properties of the Early Childhood Occupational Profile (ECOPE; Moore & Bowyer, 2018) and investigated the perspectives of occupational therapists on the clinical utility of the tool.

Method: An embedded mixed methods research design was used to support the use of different research questions and unique sets of data. National and international occupational therapists administered the ECOPE on video case studies and on children from their caseload. These data were analyzed using the Rasch goodness of fit statistics to evaluate the validity and reliability of the ECOPE. The participating occupational therapists also completed an anonymous survey to gather information on the clinical utility of the tool.

Results: The Rasch goodness of fit statistics indicated the ECOPE strongly measures the construct of occupational participation and reliably detects differences in young children's occupational participation skills. Qualitative data from occupational therapists indicated the ECOPE has strong clinical utility and a positive impact on treatment planning.

Conclusion: This study established the preliminary reliability, validity, and clinical utility of the ECOPE. The ECOPE is an occupation-based assessment that reflects the distinct value of occupational therapy while evaluating the young child's occupational participation skills in the natural contexts of home or community.

Comments

The author reports no potential conflicts of interest.

Keywords

early childhood, occupation-based assessments, occupational participation

Cover Page Footnote

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Credentials Display

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An analysis of occupational performance is a recommended component of the American Occupational Therapy Association (AOTA) assessment guidelines and reflects best practices as outlined in the *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2020). Occupational performance is one component of the child's occupational participation. The concept of occupational participation refers to the engagement in occupation during the daily routines of learning, play, and activities of daily living (Taylor, 2017a). In the current practice area of early childhood (birth to 3 years of age), there are a multitude of assessments that measure performance skills and developmental milestones. There are few occupation-focused assessment tools that measure the young child's occupational participation skills.

The current occupational therapy literature highlights the need to develop pediatric assessments that measure the young child's occupational participation (Arbesman et al., 2013; Brown & Bourke-Taylor, 2014; Hilton et al., 2013). The current use of bottom-up, developmental and performance skill-based assessments in early childhood practice does not yield information on the child's occupational participation skills (Brown & Chien, 2011). Occupation-focused assessments are needed to provide information on the young child's occupational participation skills and the subsequent development of occupation-based interventions.

The purpose of this study was to examine the reliability and validity of the Early Childhood Occupational Profile (ECOPE; Moore & Bowyer, 2018). The ECOPE is a theory-based, occupation-focused assessment tool for young children birth to 3 years of age. The ECOPE is based on the model of human occupation (MOHO; Taylor, 2017a) and is similar in format to an existing MOHO pediatric assessment, the Short Child Occupational Profile version 2.2 (SCOPE; Bowyer et al., 2008).

The current study addressed the following research questions through an embedded mixed methods research design:

1. Does the ECOPE measure the construct of occupational participation in children birth to 3 years of age as measured by the Rasch goodness of fit statistics?
2. Does the ECOPE reliably detect differences in young children's occupational participation?
3. What are clinicians' perspectives on the clinical utility of the ECOPE?

Literature Review

Support for Occupation-Based and Occupation-Focused Assessments

Occupational therapy scholars and researchers asserted the necessity of occupation-based assessments as part of the evaluation process. Occupation-based assessments communicate the value of occupational therapy services and the use of occupation as a means to health (Coster, 2008; Law et al., 2005). The use of these assessments enables the evaluating therapist to design and implement occupation-based interventions as part of the treatment process (Chien & Brown, 2017). Occupation-based assessments focus on a client's experience of occupation rather than deficits in performance areas (Brown & Chien, 2011; Chien & Brown, 2017). The terminology of top-down versus bottom-up approaches to measurement is often used to support the central concepts of occupation-based assessment. Chien and Brown (2017) suggested the bottom-up approach to assessment focuses on performance components, such as strength, range of motion, or balance, as the essential components of occupational performance. In contrast, the top-down approach incorporates a more global perspective and focuses on the occupational participation of the individual: the meaningful roles, performance contexts, and daily activities of the individual (Brown & Chien, 2011).

Professional literature from AOTA and the American Occupational Therapy Foundation (AOTF) similarly supported the development and use of occupation-based assessment measures. The “Occupational Therapy Research Agenda” includes an item specific to the “develop outcome instruments sufficiently responsive to measuring change in daily life activities, including activity and participation” (AOTA & AOTF, 2011, p. S5). In addition to the “Occupational Therapy Research Agenda,” AOTA (2017) evaluation guidelines require occupational therapy evaluations to include an analysis of occupational performance in the occupational profile. The ECOPE was developed to meet the need to measure the young child’s occupational participation skills and inform the accurate analysis of occupational performance.

Occupation-Based Assessments in Early Childhood Practice

The use of occupation-based assessments in early childhood practice is limited. Yet, researchers and scholars have long asserted the need for such measurements in working with young children birth to 3 years of age. Coster (1998) promoted the concepts of an occupation-based, top-down approach to measurement and asserted that the dominance of the developmental model in pediatric practice interferes with the implementation and use of pediatric occupation-based assessment tools. She suggested the hierarchical and linear developmental model emphasizes underlying impairments at the level of performance skills (e.g., sensory processing or motor control deficits) and provides limited information on the young child’s occupational participation.

Recent works highlighted the need to assess children’s participation as a meaningful outcome measure. Houtrow and Coster (2019) emphasized the measurement of impairment, activity limitations, and participation in alignment with the World Health Organizations International Classification of Functioning Disability and Health levels (WHO, 2007). Similarly, a qualitative exploration of parent’s perspectives indicated the need to develop measures that assess the physical and social aspects of the family’s environment and of children’s participation (Bedell et al., 2011). The ECOPE addresses the components of participation and the environment as it applies to young children and their families.

Five systematic reviews further supported the need for occupation-based assessments and intervention in early childhood practice. Arbesman et al. (2013) highlighted the need for occupation-centered practice to support young children’s occupational participation in the context of the family. Hilton et al. (2013) completed a review of 12 articles addressing the development and testing of instruments for children and youth. Their review suggested the need for continued development of pediatric assessments with a focus on occupational participation (Hilton et al., 2013). Brown and Bourke-Taylor (2014) completed a systematic review of 35 articles pertaining to instrument development. One of their seven recommendations was to increase instrument development research to address the needs of young children and their families. Calder et al. (2017) indicated the need for multi-dimensional outcome measures in early childhood services. Outcome measures that include the domains of activity, participation, and environment align with the core practice elements of early childhood intervention. Cahill et al.’s (2020) systematic review indicated the efficacy of occupation-based interventions to support the behavior, social participation, and mental health of children and youth.

The Distinct Role of Occupational Therapy in Early Intervention

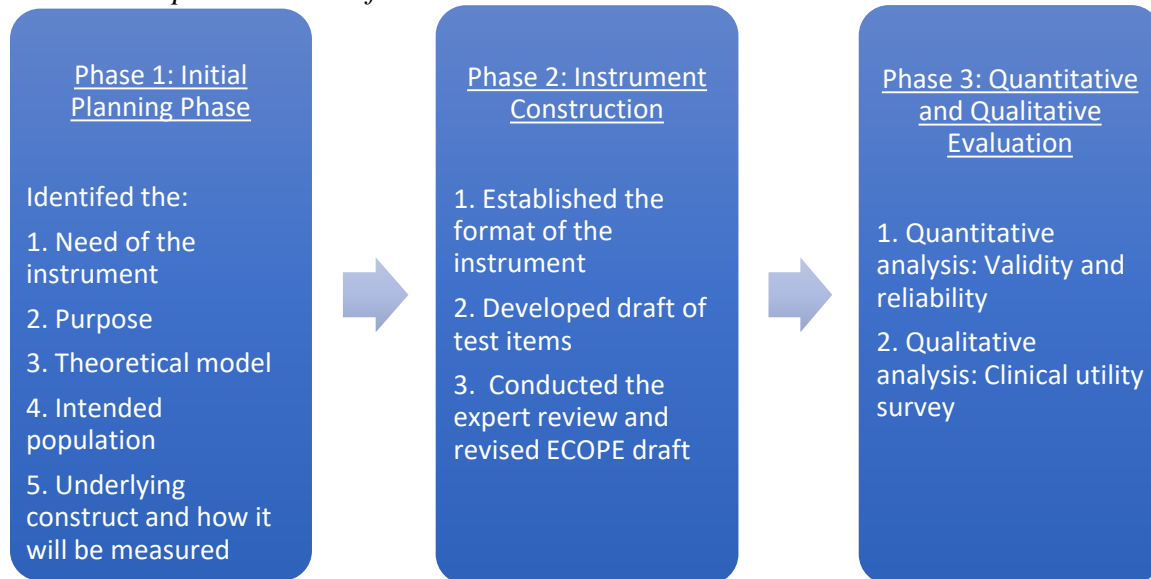
Occupational therapists provide a unique contribution in the delivery of early intervention (EI) services (Muhlenhaupt et al., 2015). EI is a federally mandated program serving infants and young children who experience or are at risk of experiencing intellectual or developmental delays. The program is implemented on the state level and serves children from birth to 3 years of age in their natural settings of home or community. In recent years, there has been a concerted effort from AOTA to enhance the role of

occupational therapy and equip therapists to serve in EI programs. The AOTA document “Practice Advisory: OT Practitioners in Early Intervention” (Fabrizi et al., 2020) is a comprehensive resource outlining the role of occupational therapy in EI with supporting references and research. Similar work by AOTA and other professional organizations established comprehensive competencies across professional disciplines providing EI services (Bruder et al., 2019). These four competencies include: coordination and collaboration, family-centered practice, evidence-based practice, and professionalism and ethics (Bruder et al., 2019). The role of occupational therapists was further elucidated to include the evaluation of the child and family strengths, concerns, and priorities. Furthermore, the recommendation is for occupational therapists to use evidence-based assessment methods that respect and facilitate the family’s active partnership and participation in the assessment process (Bruder et al., 2019).

The literature supported the development of the ECOPE as an occupation-based, early childhood assessment tool. The ECOPE incorporated the seminal concepts presented in the literature on occupation-based assessments. The assessment categories in the ECOPE are distinct to occupational therapy, and analysis of these factors offers an occupation-focused perspective on the child’s abilities. The ECOPE incorporates performance components (e.g., motor skills, communication skills, or process skills), but the emphasis lies on how these components impact occupational participation rather than on a specific developmental level of motor or communication skills. The ECOPE promotes collaboration with family members throughout the assessment process and the results provide information on occupational participation and facilitate occupation-focused treatment planning for the young child. Lastly, the perspectives of therapists were collected and emphasized throughout the scale development process for the ECOPE.

The Scale Development Process for the ECOPE

Current literature informed the multi-phase development process for the ECOPE. Benson and Clark’s (1982) foundational work on instrument development, Kielhofner’s research text (Taylor, 2017b), and DeVellis’ (2017) scale development text provided guidance for development of the ECOPE. Benson and Clark proposed a four-phase development process, while Kielhofner’s work proposed a multi-phase development process that is described as recommended steps rather than a prescribed, systematic method (Taylor, 2017b). DeVellis (2017) provided specifics on developing test items and the use of expert reviewers in scale construction. The scale development process for the ECOPE incorporated the phases proposed by Benson and Clark, the specific steps recommended by Kielhofner, and the use of expert reviewers as recommended by DeVellis. Figure 1 illustrates the scale development process for the ECOPE and a summary of each phase follows.

Figure 1*Scale Development Process for the ECOPE*

Note. This figure illustrates the three phases of scale development. The steps completed in each phase of scale development are listed.

Phase 1: Initial Planning Phase (Completed in 2017)

Phase 1 served as the initial planning stage in development of the ECOPE and was completed in 2017. The ECOPE aims to supplement the use of developmental assessments in early childhood and is based on the MOHO (Taylor, 2017a) and the Short Child Occupational Profile version 2.2 (SCOPE; Bowyer et al., 2008). It is designed to measure the occupational participation of the young child birth to 3 years of age.

Phase 2: Instrument Construction (Completed in 2017–2018)

In Phase 2, instrument construction and an expert review were completed in 2018. The test items for the ECOPE were created by the primary researcher and based on the test items and format of the SCOPE version 2.2 (Bowyer et al., 2008). The ECOPE test items are similar in format, structure, and wording to the SCOPE test items and reflect the unique needs of the early childhood population.

Format of the Instrument. The ECOPE consists of 25 test items organized into six categories. These categories reflect concepts consistent with the MOHO (Taylor, 2017a) and include: volition, habituation, communication and interaction skills, process skills, motor skills, and the environment. Each of the conceptual categories contains four test items, and the category of environment contains five test items. Each test item is scored using a letter scale of four ordered categories. The letter scales have corresponding numerical ratings, which enable the generation of an overall rating score across all categories. Figure 2 provides an example of the test item of exploration from the volition section of the ECOPE.

Figure 2*ECOPE Test Item of Exploration*

Exploration: <i>The young child engages in visual, tactile, motoric and/or oral exploration of objects, persons, and the environment.</i>	
Facilitates	The young child spontaneously initiates and persists in exploration of objects, persons, and the environment.
Allows	The young child requires occasional support, cues, and/or encouragement to initiate and persist in exploration of objects, persons, and the environment.
Inhibits	The young child requires substantial support, cues, and/or encouragement to initiate and persist in exploration of objects, persons, and the environment.
Restricts	The young child does not respond to or attempt to interact in any way with objects, persons, and the environment.

Expert Review Survey Results. A panel of experts reviewed the ECOPE draft and provided qualitative and quantitative feedback on the test items. The panel of experts was comprised of licensed, practicing occupational therapists with a minimum of 3 years of experience in early childhood practice settings. The quantitative survey questions included a 4-point ranking scale in which expert reviewers ranked each test item as to the relevance of each item to the overall construct of occupational participation. This ranking technique is prevalent in the nursing literature on scale development and generated a score known as the content validity index (CVI; Polit & Beck, 2006; Polit et al., 2007). The item-level CVIs (I-CVIs) informed the revision of specific ECOPE items that did not receive a high relevancy score by the expert reviewers. I-CVIs were calculated by dividing the number of highly relevant or quite relevant responses by the total number of responses. For example, when all four reviewers rated an item as 3 (*quite relevant*) or 4 (*highly relevant*), the I-CVI score was 1.0 ($4 \div 4 = 1.0$). Eight ECOPE test items received a score of less than 1.0 for the I-CVI. These eight test items were revised and incorporated the qualitative feedback on the specific items.

These revisions included word choice, clarification of the target skill, and clarifications to the FAIR rating scale. For example, in the process skills section of the ECOPE, the test items of plan and make decisions and problem-solving were significantly revised to reflect an appropriate measurement of these skills for infants and children under 12 months of age. Based on expert reviewer feedback, revisions were also made to definitions and criteria on the FAIR rating scales to ensure there was consistent use of language and terminology.

Phase 3: *Quantitative and Qualitative Evaluation (Completed in 2020)*

The current research study was completed in Phase 3 of the scale development process. The purpose of the current study was to examine the validity, reliability, and clinical utility of the ECOPE. The study used an embedded mixed methods research design to address the research questions. Nationally and internationally licensed occupational therapists administered the ECOPE assessment and generated data for psychometric analysis. The participants also completed the clinical utility survey providing further qualitative data on the tool's utility in clinical practice. This study completed the process of scale development and positioned the ECOPE for further clinical use and psychometric testing.

Method

This study investigated the validity, reliability, and clinical utility of the ECOPE through an embedded mixed methods research design (Burke Johnson & Onwuegbuzie, 2004; Creswell & Clark, 2017; Schoonenboom & Burke Johnson, 2017). The embedded design supported the use of different research questions that require unique sets of data (Creswell & Clark, 2017). The primary aim of this study was quantitative: to analyze the validity and reliability of the ECOPE. To expand and enhance the psychometric results, a qualitative component gathered clinicians' perspectives on the clinical utility of the ECOPE. This embedded design was further characterized as a simple, concurrent mixed methods design with a results point of integration (Schoonenboom & Burke Johnson, 2017). The quantitative and qualitative data were gathered simultaneously and analyzed separately. The analysis from both data sets were integrated in the results section of the research study. Both data sets were needed to answer the research questions regarding reliability and validity of the ECOPE and to understand how clinicians use the tool in practice (clinical utility).

Participants

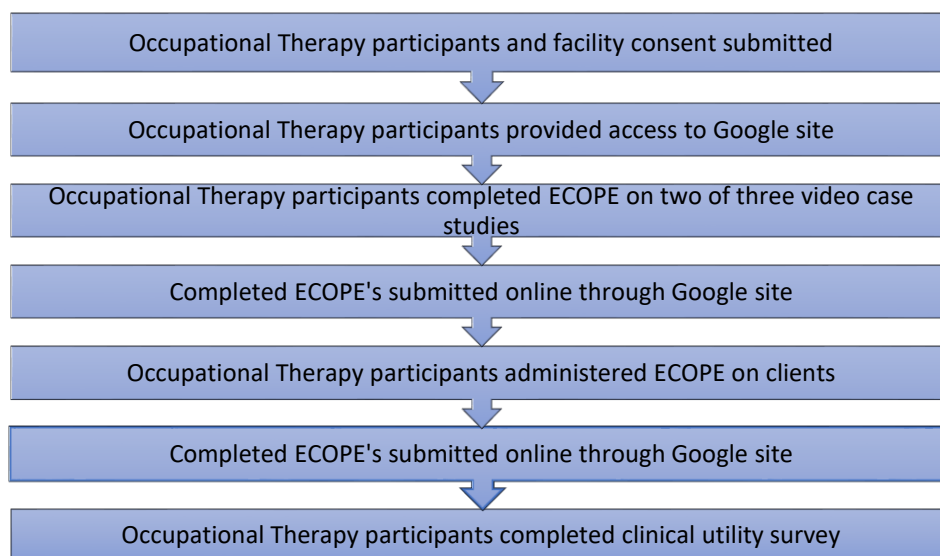
Following approval by the university institutional review board, purposive, convenience, and snowball sampling methods were used to recruit occupational therapists working with children birth to 3 years of age. English-speaking occupational therapists who currently held a state or international professional license and work with children birth to 3 years of age were eligible to participate in the study.

Study Procedures

Figure 3 depicts the study procedures.

Figure 3

Study Procedures



Note. This figure illustrates the sequence of study procedures and data collection.

Secure Google Site

The consented participants accessed the secure Google site designed by the primary researcher. The Google site was designed so that the participants first accessed overview documents for the study and a participation checklist to ensure familiarity with the study guidelines. The Google site contained

information on study procedures, the current ECOPE draft, and the User's Guide for the ECOPE. The Google site offered a secure location for uploading and storing documents for the purposes of the study.

Video Case Studies

As part of the study, the participants viewed at least two of three videos of young children birth to 3 years of age. The primary researcher used convenience sampling techniques to recruit the child participants and created the videos with all necessary consent and release forms obtained. The videos showed a typically developing child, birth to 3 years of age, engaged in preferred activities in their natural environment. These activities included: outdoor play, sensory play, and motor exploration activities. The study participants completed the ECOPE based on the video case studies and submitted completed assessments on the secure web site.

Administration of the ECOPE

Following completion of the case study video activity, the participants completed the ECOPE on clients from their caseload. The study participants were provided with a script for recruitment and an IRB approved consent information letter for parents and caregivers of children on whom the ECOPE was administered. The participants were advised to complete the ECOPE outside of a scheduled treatment session, based on their knowledge of the young child. The participants were requested to complete the ECOPE on a minimum of three children of different ages from birth to 3 years of age. The Google site enabled the participants to electronically submit completed ECOPE assessments for data collection and to keep a copy for treatment planning purposes.

Clinical Utility Survey

A survey was used to capture the perspectives of the participants on the clinical utility of the ECOPE. The participants had access to the survey via a link on the secure Google site. The participants completed the clinical utility survey after completing the video case studies and administrations of the ECOPE.

Results

Demographic Information on Submitted ECOPE's

Twenty-two occupational therapy participants submitted 63 deidentified ECOPE assessments. These assessments were completed on children from the videos posted on the secure website and on clients from each therapist's caseload. The 22 occupational therapy participants were all female and included therapists from the United States, Europe, the United Kingdom, and Australia. The practice settings of the occupational therapy participants included: EI programs, pediatric outpatient clinics, developmental centers, and hospital facilities. The years of clinical experience varied among the occupational therapy participants as new graduates were included in recruitment efforts. Data collection began in August of 2019 and was completed in August of 2020.

Submitted ECOPE's included a fairly even distribution of male and female child participants and included children of various ages, diagnoses, and ethnic backgrounds. The majority of child participants were aged 30–36 months and 16–22 months. The ethnic background of most of the child participants was Caucasian or ethnicity was unknown. The most common diagnoses of the child participants included: none/unknown, autism spectrum disorder, cerebral palsy, and developmental delay. If more than one diagnosis was listed for a child participant, the primary diagnosis was used in demographic characteristics and data analysis. Table 1 provides a summary of the demographic information on the child participants.

Table 1*Categorical Demographics for the Child Participants*

Characteristic	Respondents <i>n</i> (%)
Gender	33 (52.4)
Female	30 (47.6)
Male	
Child's Age in Months	
2–8	8 (12.7)
9–15	7 (11.2)
16–22	16 (25.4)
23–29	4 (6.3)
30–36	28 (44.4)
Child's Ethnic Background	
African American	4 (6.3)
Alaska Native	1 (1.5)
Asian	3 (4.6)
Bulgarian	3 (4.6)
Caucasian	22 (34.9)
Hispanic	5 (7.9)
Unknown	25 (39.7)
Child's Primary Diagnosis	
Autism	6 (9.5)
Cerebral Palsy	6 (9.5)
Developmental Delay	6 (9.5)
Down Syndrome	1 (1.5)
Genetic Disorder	2 (3.2)
None/Unknown	37 (58.7)
Prematurity	4 (6.3)
Schizencephaly	1 (1.5)

Note. Respondents *N* = 63.

Rasch Analysis***Construct Validity of the ECOPE***

To address the first research question regarding the construct validity of the ECOPE, two types of Rasch analysis were completed: goodness of fit statistics and person and item outfit measures.

Goodness of Fit Statistics. The Rasch Rating Scale Model goodness of fit statistics was used to analyze how well each assessment item fit with the underlying construct of occupational participation. The fit statistics is used as a quantitative indicator of the construct validity of the measurement tool. The Rasch Rating Scale Model reports two forms of fit statistics known as infit and outfit MnSq. The outfit MnSq indicates outlier items that may have been scored in an unexpected way, based on the expected response pattern (Linacre, 2020). The infit MnSq is sensitive to the pattern of responses to items by each person, or test respondent (Linacre, 2020).

The MnSq values for the ECOPE indicated strong construct validity and person and item fit reliability. The reliability scores of 0.93 for person label variables and 0.91 for item response are high scores, given the proximity to 1.0 (ideal reliability score). The infit MnSq and outfit MnSq for both person and item variables fall within the ideal range of 0.6–1.4 (Van Zile-Tamsen, 2017). Table 2 illustrates goodness of fit scores for person and item responses.

Table 2
Goodness of Fit Statistics for the ECOPE

	Separation Statistic	Reliability	Infit MnSq	Z Std	Outfit MnSq	Z Std
Person Label Variables						
Mean	3.68	0.93	0.96	-0.2	1.13	0.0
SD			0.36	1.3	0.74	1.4
Item Response Variables						
Mean	3.11	0.91	1.12	0.0	1.32	0.2
SD			0.24	1.3	0.39	1.2

Note. Person label variables $N = 62$ and item response variables $N = 25$.

Person and Item Outfit Measures. Figures 4 and 5 offer a visual depiction of the outfit measures for person and item variables. The item fit illustration in Figure 4 indicated items 16, 14, and 11 are farthest from the target outfit score of 0. The majority of the 25 items on the ECOPE fall within the acceptable range of variance and contribute to an overall item response mean outfit score of 1.32 (within the recommended range of 0.6–1.4).

Figure 4
Item Response Mean Outfit Scores

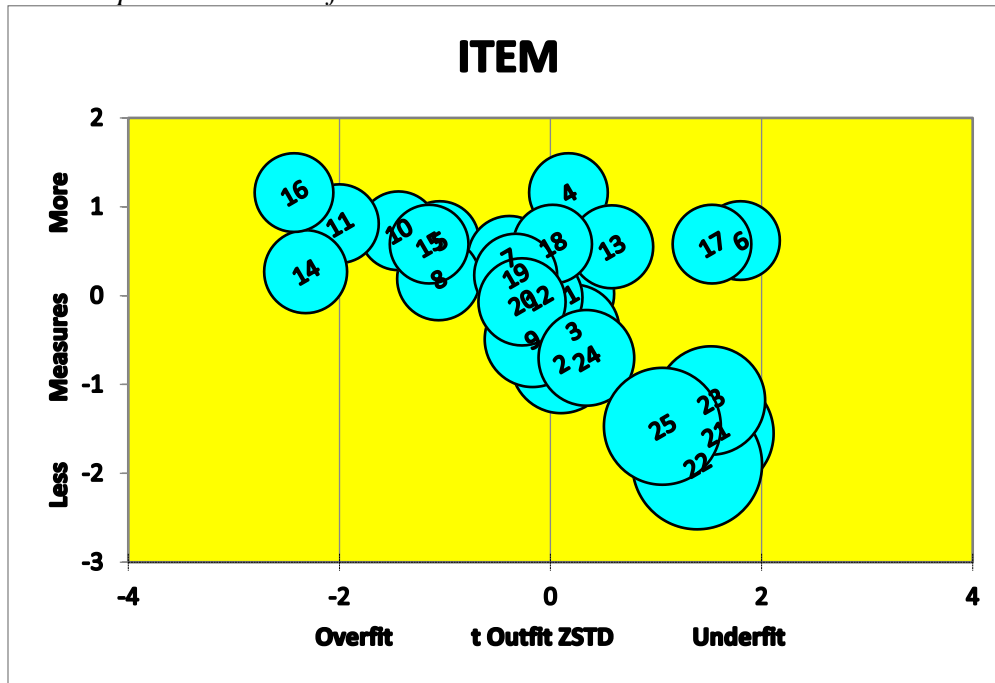
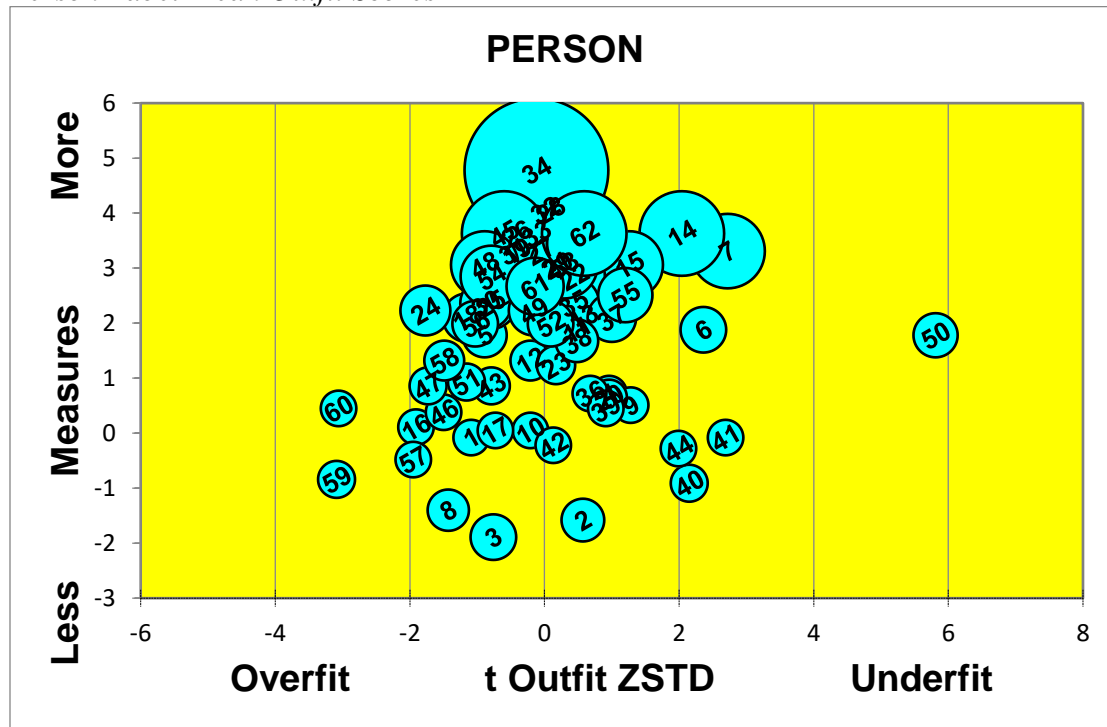


Figure 5 illustrates the person variable outfit scores and indicated that persons 6, 7, 41, 50, 59, and 60 scored outside of the expected response pattern. The majority of other person scores fall closer to the ideal outfit score of 0. Despite the outliers, the overall person mean outfit score of 1.13 falls within the acceptable range of 0.6–1.4.

Figure 5*Person Label Mean Outfit Scores***Reliability of the ECOPE**

To address the second research question regarding the ability of the ECOPE to reliably detect differences in children's occupational participation skills, the Rasch separation statistic was completed.

Separation Statistic. The separation statistic scores indicated the assessment is able to discriminate between differences in occupational participation and complexity of participant responses. An item separation statistic greater than 3.0 with reliability greater than 0.90 indicates that the item structure will remain stable in a new sample (Bond & Fox, 2012). The ECOPE item separation statistic of 3.11 and reliability of 0.91 indicated the item structure will accurately measure occupational participation in a new sample. A person separation statistic of greater than 2.0 with a reliability greater than 0.80 indicates a high level of generalizability for new samples (Van Zile-Tamsen, 2017). The ECOPE person separation statistic of 3.68 and reliability of 0.93 indicated a high level of stability across new samples. Both the item and person separation statistics indicated adequate reliability for the ECOPE.

A secondary consideration of separation indices indicated how well the instrument differentiates between levels of test takers and the range of item difficulty. The person level separation statistic of 3.68 indicated that at least three levels of person response patterns were identified. Given that the assessment was administered on typically developing children and on children with a known diagnosis, the score of 3.68 indicated the assessment is useful for measuring the range of abilities present in the participant sample. Similarly, the separation statistic for item variables indicated at least three levels of item difficulty were recognized.

Clinical Utility Survey Responses

To address the third research question and gather information on the clinical utility of the ECOPE, descriptive statistics and a qualitative analysis were used. Ten occupational therapy participants completed the clinical utility survey. No demographic data were collected on these participants to ensure the

anonymity of submitted ECOPEs. The clinical utility survey collected data via closed and open-ended questions.

Closed-Ended Survey Questions

Table 3 displays the descriptive results of the closed-ended survey questions. Overall, responses indicated the participants either strongly agree or agree that the ECOPE is a useful tool with appropriate time requirements for administration and interpretation. Similarly, responses indicated the tool is useful for understanding the young child's occupational participation skills and is easy to use in clinical practice.

Table 3

Results from Closed-Ended Clinical Utility Survey Questions

Closed-Ended Survey Questions	Participant Responses <i>n</i> (%)				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The results of the ECOPE are useful in understanding the occupational participation skills of children birth to three years of age.	2 (20)	7 (70)	1 (10)	0 (0)	0 (0)
2. The ECOPE is easy to use in my clinical practice setting.	6 (60)	3 (30)	1 (10)	0 (0)	0 (0)
3. The amount of time required to administer the ECOPE is appropriate.	7 (70)	3 (30)	0 (0)	0 (0)	0 (0)
4. The amount of time required to interpret the ECOPE is appropriate.	5 (50)	5 (50)	0 (0)	0 (0)	0 (0)

Note. Survey respondents *N* = 10.

Open-Ended Survey Questions

NVivo software version 12 (QSR International, 2020) was used to code responses to the open-ended survey questions and the inductive content analysis process guided interpretation of the data (Elo & Kyngäs, 2008). The inductive content analysis process involved three phases: preparation, organizing, and reporting. In the preparation phase, the data were downloaded from PsychData® (<https://www.psychdata.com>) into an Excel spreadsheet. The Excel spreadsheet was then imported into NVivo for organization. In the organizing phase of inductive content analysis, the primary researcher used open coding techniques to note headings while reviewing the text. The primary researcher completed multiple reviews of the text to ensure that established headings accurately captured the themes present in the data. In the second step of the organizing phase, categories were established from the list of headings. Similar headings were collapsed into a single category to create a framework of broad, higher order categories that aligned with the proposed open-ended questions. The primary researcher used NVivo's highlight and select features to code responses and organize them into the established categories. The inductive content analysis phase of abstraction was used to describe the categories using content specific wording from responses and from the established survey questions. Because of the small sample size (*N* = 10), five categories or primary themes were generated: strengths of the ECOPE, weaknesses of the ECOPE, effectiveness of the rating scale, using the ECOPE in practice, and impact of the ECOPE on treatment planning.

Consistent with the inductive content analysis process, subcategories, or secondary themes, were generated for each main theme based on word counts and frequency of presented concepts in the verbatim

data. The titles of secondary themes are summations of the concepts presented in the verbatim data responses. Table 4 provides a summary of the identified primary and secondary themes.

Table 4

Primary and Secondary Themes of the Clinical Utility Survey

	Primary Theme	Secondary Theme(s)
Theme 1	Strengths of the ECOPE	A. The ECOPE is easy to use and score B. The ECOPE is helpful for comparing performance across multiple areas to generate goals and assist intervention planning C. The ECOPE covers a range of developmental and theoretical concepts
Theme 2	Weaknesses of the ECOPE	None
Theme 3	Effectiveness of the rating scale	D. Habituation test item descriptions and rating scale criteria are problematic
Theme 4	Using the ECOPE in practice	E. The ECOPE is useful as a supplemental assessment F. The ECOPE is useful in facilitating communication with parents and professionals
Theme 5	Impact of the ECOPE on treatment planning	G. The ECOPE provides helpful information to facilitate a holistic, top-down evaluation approach

Discussion

Validity of the ECOPE

In this embedded, mixed methods research design, qualitative and quantitative results are integrated to capture a broader perspective of the ECOPE. Qualitative results were considered secondary and aimed to supplement the quantitative data on validity and reliability. Quantitative results indicated the ECOPE is a valid measure of the construct of occupational participation in young children birth to 3 years of age. The construct of occupational participation was measured with the Rasch Rating Scale Model goodness of fit statistics and item and person outfit measures. Goodness of fit statistics calculated reliability and infit and outfit scores for both person and item variables. The ECOPE results for both person and item fit statistics fell within the ideal range for these markers, indicating strong construct validity and person and item fit reliability. The person and item fit measures that fell outside of the ideal outfit range indicate a need for revision and additional analysis of underlying factors.

Qualitative data on the clinical utility of the ECOPE supplemented the validity data and supported the premise that the instrument is well received by clinicians. The survey participants reported that the ECOPE includes essential and theory-based developmental concepts and facilitates a top-down approach to treatment. In addition, the clinicians reported the ECOPE assisted with identification of a child's strengths and facilitated collaboration with parents and caregivers to establish therapeutic goals. Use of the ECOPE as a secondary assessment in conjunction with standardized developmental assessments was well supported by the occupational therapy participants. Several of the participants also reported use of the ECOPE supports development of a comprehensive and client centered occupational profile.

Reliability of the ECOPE

The results from the Rasch Rating Scale Model measure of separation statistics indicated the ECOPE reliably detected differences in the occupational participation skills of young children. Both the person and item measures fell within the expected range for separation statistics.

Analysis of the qualitative data further supported the quantitative data and indicated occupational therapists found the tool to be useful in identifying a child's strengths and areas for development. The occupational therapists reported the ECOPE was helpful in evaluating very young children (less than 8 months of age) and children with very mild developmental delays. Qualitative results indicated occupational therapists recognize the tool's ability to supplement standardized developmental scores with observational, child-centered, and occupation-based information.

Clinical Utility of the ECOPE

The perspective of the occupational therapists was an integral part of the instrument development process (Bowyer et al., 2012; Kemp, 2020; Toomey et al., 1995). From the beginning of this scale development process, the occupational therapists perspective has remained a priority. Occupational therapists served as expert reviewers and contributed to early revisions of the ECOPE in 2017 and 2018. The therapist perspective was again captured in the current clinical utility survey. It was imperative that occupational therapists who use the assessment be provided with an opportunity to offer feedback and recommendations throughout the scale development process. A tool with limited clinical utility yet strong psychometrics will not be well used in practice. The ECOPE was created to support the theory-based clinical reasoning and treatment planning of occupational therapists. As a consequence, a preliminary analysis of clinical utility, in addition to psychometric studies, was completed to ensure viability of the tool for clinical practice.

The overall results of the survey indicated the ECOPE met essential criteria for effective clinical utility: The results are useful for clinical practice, the assessment is easy to use, and the amount of time required to administer and interpret results is appropriate. Additional inductive content analysis of open-ended survey questions generated key themes relevant to current use and future improvements to the ECOPE. The therapists reported the assessment was easy to use and score and that it offered a holistic view of the child. In addition, the therapists felt the ECOPE was helpful for intervention planning and provided an opportunity to include the child's strengths in the assessment process. The therapists reported multiple positive impacts of the ECOPE on treatment planning. These included: facilitating a focus on areas omitted with standardized developmental assessments, facilitating a top-down assessment process, and inclusion of areas such as volition and habituation in treatment planning and assessment.

Limitations

Several limitations were inherent in the study. These included: generalizability of results given the sample size of the quantitative and qualitative components, the limitations of ministeps software, the preliminary nature of the results, sampling bias, and challenges of the research design. The generalizability of the results is limited by the small sample size in both the quantitative and qualitative components of the study. In addition, further analysis is warranted on specific test or person variables that presented as outliers in the data set. In-depth analysis of this data would further enhance the reliability and validity of the scale.

It is beyond the scope of this study to definitively establish the reliability and validity of the instrument. The ongoing nature of scale development is an evolutionary process and reliability and validity continue to be established with consistent use of the instrument. This study serves as a preliminary

psychometric and qualitative analysis of the ECOPE. The results should be interpreted with caution and considered an initial psychometric analysis. Widespread use of the instrument by clinicians will provide opportunities to further analyze the validity and reliability of the instrument.

Future Research

Future research endeavors will serve to further establish the reliability, validity, and clinical utility of the ECOPE. Specific studies are needed on the functionality of the FAIR rating scale to determine how the scale was used by the respondents. This analysis will yield data on whether certain categories from the rating scale were used more or less than others and what factors contribute to these use patterns. The functionality analysis will guide further revisions of the rating scale to enhance the clarity and distinct details of each rating scale category. In addition, future studies with a singular focus on qualitative or quantitative data with larger sample sizes would provide essential information for the scale development process. More complex analysis of the clinical utility of the instrument could inform future revisions and use of the tool. Inclusion of member checks or verification of identified themes would also strengthen the qualitative analysis process. Similarly, focused quantitative studies and analysis of how clinicians' use the tool would enhance the strength of the ECOPE in clinical practice.

Conclusion

This study established the preliminary reliability, validity, and clinical utility of the ECOPE. The ECOPE is an occupation-based assessment that reflects the distinct value of occupational therapy while evaluating the young child's occupational participation skills in the natural contexts of home or community. The ECOPE addresses the need for development and use of occupation-based assessments in pediatric practice as reported in the literature. An embedded mixed methods research design was used to establish preliminary psychometric properties and clinical utility of the tool. Rasch analysis goodness of fit statistics indicated the ECOPE strongly measures the construct of occupational participation and reliably detects differences in young children's occupational participation skills. Qualitative data from occupational therapists indicated the ECOPE has strong clinical utility and a positive impact on treatment planning. The tool fills a unique niche in pediatric occupational therapy practice as a valid, reliable, and occupation-based supplement to standardized developmental assessments. Supplemental information from the ECOPE enhances standardized developmental scores and supports occupation-based interventions and treatment planning. As a consequence, the unique developmental trajectory of the young child is understood and supported in the natural contexts of the family and community systems. The literature strongly supports the development and use of occupation-based assessments with young children birth to 3 years of age. This study established the ECOPE as a reliable, valid, and clinically useful tool for the early childhood population.

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