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Caregiver cognitive sensitivity: Measure development and validation in Early Childhood Education and Care (ECEC) settings☆

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ABSTRACT

Cognitive sensitivity refers to a person's ability to create a cognitively stimulating environment when interacting with a less experienced partner while being attuned to this partner's emotional state. We developed the Educator Cognitive Sensitivity (ECS) scale to measure the quality of individual educator's interactions with children in Early Childhood Education and Care settings (ECEC). The ECS scale was designed to be easy to train and quick to administer. Three hundred and fifty educators from 135 classrooms in 69 ECEC providers in Toronto were observed and coded using the ECS scale. Results show that it has excellent internal consistency with all items loading onto a single factor. In terms of concurrent validity, it was moderately correlated to the different subscales of the Classroom Assessment Scoring System and a short form of the Infant/Toddler Environmental Scale-Revised. Variance Component Analysis revealed that the majority of variance in ECS scores is explained by differences between educators, calling into question the practice of assessing quality of interaction at the classroom level. The relatively efficient ECS scale is a promising new measure of interaction in ECEC settings.

1. Introduction

A large proportion of children in the United States and Canada spend significant amounts of time in Early Childhood Education and Care (ECEC) settings (e.g., Sinha, 2014; Statistics Canada, 2006; US Census Bureau, 2010). To understand whether these settings support children's development we need measures of quality that are theoretically and empirically based and efficient to administer. The goal of the present study was to adapt an existing measure of cognitive sensitivity, collected at the person (i.e., not classroom) level, to the ECEC context. Cognitive sensitivity refers to a person's ability to create a cognitively stimulating environment when interacting with a less experienced partner while being attuned to this partner's internal state, both cognitive and emotional. Below we explain how cognitive sensitivity fits within current thinking about quality in ECEC settings and what the new measure adds to the field.

1.1. How is quality defined and measured?

Quality in ECEC settings is typically conceptualized as consisting of process and structural quality indicators (Vandell & Wolfe, 2000). Process quality indicators reflect the quality of exchanges between educators and children, whereas structural quality features describe the aspects of the classroom that are more regulateable (Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010). While process quality appears to have a direct effect on children's outcomes, structural quality is thought to have an indirect effect, mediated by process quality (Friedman & Amadeo, 1999; NICHD, 2002). For example, NICHD (2002) found that educators' social competence mediated the correlation between educator/child ratios and children's engagement (Hestenes, Kontos, & Bryan, 1993) and cognitive outcomes.

Research findings suggest that process quality indicators, and educator–child interactions in particular, are key drivers of children's outcomes in pre-kindergarten settings (Mashburn et al., 2008). Process quality indicators were shown to correlate with children's cognitive activity (Howes & Smith, 1995), cognitive and language outcomes (NICHD, 2000) and children's behavior and social skills (Peisner-Feinberg et al., 2001). In pre-kindergarten education settings, Burchinal et al. (2008) found that when positive climate and high quality instruction were provided, children were more likely to make academic (language, literacy, math)

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and social gains concurrently and later on in kindergarten. This occurred within the context of sensitive, responsive, and respectful interactions that promoted children's communication and reasoning skills. Additionally, when educators provide high-quality emotional and instructional support children's developmental outcomes are better (Downer, Sabol, & Hamre, 2010; Pianta, La Paro, Payne, Cox, & Bradley, 2002). For example, the instructional support that educators provide to children in terms of the language they use, the quality of feedback, and the promotion of reasoning and analysis of information play a significant role in shaping children's receptive language, problem solving and early literacy skills (Mashburn et al., 2008). In fact, distal factors, such as teachers' educational attainment, have been shown to become non-significant once more proximal factors, such as educator–child interactions, are accounted for (Early et al., 2007).

However, not all studies find significant associations between measures of educator–child interactions and child outcomes. For example, in two recent systematic-reviews/meta-analysis, researchers found that measures that capture process quality showed few and weak associations with child outcomes (Perlman et al., 2016, for the Classroom Assessment Scoring System, CLASS; Pianta, Karen, LaParo, & Hamre, 2008, and Brunsek et al., 2017 for the Early Childhood Environment Rating Scale, ECERS/ECERS-R, Harms, Cryer, & Clifford, 2003; Harms, Clifford, & Cryer, 2014). Inconsistencies in findings may be due to variations and limitations in how quality of educator–child interactions is conceptualized and measured as discussed next.

Frequently used measures of quality, such as the Infant Toddler Environment Rating Scale and its Revised form (ITERS/ITERS-R; Harms et al., 2003) and the Early Childhood Environment Rating System and its Revised forms (ECERS/ECERS-R; Harm and Clifford, 1985; Harms et al., 2003, 2014) examine multiple aspects of the child's environment. However, researchers have found substantial overlap between the items on these scales (Bisceglia, Perlman, Schaack, & Jenkins, 2009; Perlman, Zellman, & Le, 2004; Scarr, Eisenberg, & Deater-Deckard, 1994). This suggests that there may be more efficient ways to capture classroom quality.

Another limitation is that these measures generally assess quality at the classroom, rather than individual educator-level. For example, the quality of educator/child interaction has been explored in ECEC settings using the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008). This measure captures three main classroom characteristics: emotional climate, management, and instructional support (La Paro, Pianta, & Stuhlman, 2004). Similar to the ECERS-R/ITERS-R mentioned above, the CLASS assesses interactions at the classroom level, rather than the interaction styles of individual educators. However, ECEC classrooms are staffed by multiple adults. Generating classroom level scores requires coders to aggregate the interaction styles of different educators within a classroom in a way that has yet to be tested empirically. As a result, similar classroom level scores may represent very different profiles of educator interaction styles. For example, a classroom with three educators who all have medium cognitive sensitivity scores could have a similar CLASS score to one with an educator with low, medium, and high cognitive sensitivity scores. However, children in these classrooms may have very different experiences.

To begin to understand how the interaction styles of individual educators come together to form classroom quality, interaction quality must first be measured at the educator level. One educator level measure is the Caregiver Interaction Profile (CIP) scale (Helmerhorst, Riksen-Walraven, Vermeer, Fukkink, & Tavecchio, 2014). Helmerhorst et al. (2014) report that the majority of the variance in educator–child interactions is found at the educator-level. Thus, the interaction styles of educators within a classroom seem to vary significantly calling into question the practice of aggregating quality of interaction across educators to the classroom-level.

Finally, existing measures are very labor intensive in terms of training and implementation times. For example, the ECERS-R/ITERS-R takes 3–5 h to administer per classroom. The CLASS requires a 3-h observation period and includes a meticulous manual and coding system. Measures like the CLASS and ITERS-R/ECERS-R have made a major contribution to research on ECEC settings and have been instrumental in shaping policy discussion and research about quality in ECEC settings. Nonetheless, there is a need for a psychometrically sound observational instrument designed to efficiently assess *individual* educators' interaction styles. Our goal was to develop such a measure ensuring that it is efficient to collect so that it can be used for both research and quality improvement purposes. Given the theoretical and empirical support for the importance of educator/child interactions in general, and the construct of cognitive sensitivity in particular, to children's socio-cognitive development, we focused on it as the construct of interest.

1.2. Developmental research and theory point to cognitive sensitivity as a promising construct and measure

The significance of adult-child interactions to children's development has both theoretical and empirical support. A highly influential theory in child development, the bioecological model of development (Bronfenbrenner & Morris, 1998), describes child development as a product of an individual's characteristics and features of his/her environment. This model serves as a framework for understanding the importance of stimulating and responsive caregiver-child exchanges to children's social, cognitive, and language development (NICHD & Duncan, 2003). Furthermore, the parenting literature suggests that children's social and cognitive development is established through multiple social interactions, in which the child takes an active role (Rogoff et al., 1993). These social exchanges are more likely to be internalized when the "expert" (e.g., parent or educator) operates within the child's *zone of proximal development*; which represents the distance between what a child is able to do on his/her own and what they are capable of when assisted by a more competent partner (Fernyhough, 2008; Vygotsky, 1978). Knowledgeable partners, such as teachers and parents, can foster a cognitively stimulating environment by correctly assessing the child's current cognitive level and sensitively responding in accordance with that knowledge (Prime, Pauker, Plamondon, Perlman, & Jenkins, 2014). Parental sensitivity toward children's cognitive *and* affective states promotes children's social and cognitive development (Bernier, Carlson, & Whipple, 2010; Laranjo, Bernier, Meins, & Carlson, 2010). Prime, Perlman, Tackett, and Jenkins (2014) adopted the term Cognitive Sensitivity to describe such responsiveness, and developed an observational measure that captures an individual's ability to correctly assess the knowledge and state of mind of his or her partner while cooperating to reach a shared goal. Given growing interest in this construct we focused on it in developing our new measure.

Prime, Perlman, et al. (2014) defined Cognitive Sensitivity as being comprised of three overlapping skills: Mutuality Building, Mind-Reading and Communicative Clarity. In order to make these terms more accessible to early child educators and other professionals we refer to them also as: back-and-forth interaction, understanding children's thoughts and feelings, and speaking to children using language they can understand. Below we describe each one and apply it to the ECEC context.

Mutuality building (back-and-forth interaction) refers to positive, cooperative relationships in which both partners are mutually responsive to one another (Aksan, Kochanska, & Ortmann, 2006). In the classroom environment, this skill manifests itself in the educator's ability to invite children into tasks by picking up on their interests, asking questions, and being warm, flexible, and patient. These behaviors in turn, enhance children's engagement in a specific task or within an interaction. *Mind-reading (understanding children's thoughts and feelings)* refers to the degree to which an individual is aware of their interaction partner's level of knowledge and abilities. In the family context, this skill is defined as the parents' ability to perceive the child as an independent mental agent and is referred to as mind-mindedness (Laranjo et al., 2010; Lundy, 2013; Meins, Fernyhough, Arnott, Leekam, & DeRosnay, 2013). In the ECEC context, an educator who is adept in mind-reading will be able to take the child's perspective, and correctly gauge his/her emotional state, knowledge and cognitive level across settings domains. Understanding a child's current level of functioning in a specific area enables the educator to select activities and materials that best support that child's learning. In addition, an educator's ability to communicate with children about their feelings and those of others by using reflective language (e.g., 'I see that you are upset, maybe it's because you are tired/you want Johnny's toy') helps children identify emotions first in themselves and later on in others.

Finally, *communicative clarity (speaking to children using language they can understand)* conveys the extent to which a person adjusts their verbal output to promote meaningful communication with a less knowledgeable partner. In the classroom, communicative clarity is a by-product of the educator's mind-reading ability, allowing him/her to tailor instructions and feedback in a way that the child will understand and that promotes the child's autonomy. For example, while completing a puzzle together, the educator breaks her instructions down into small steps, allowing the child to perform the task on his/her own. Communicative clarity and feedback quality are especially important to the academic gains of school aged children with high effect sizes across multiple meta-analyses studies (d = .75, d = .73, respectively; Hattie, 2008).

The mutuality and mind-reading literatures already show considerable overlap (e.g. Bernier et al., 2010; Meins et al., 2013) and together with communicative clarity they index responsivity. Thus, not surprisingly, the parent–child Cognitive Sensitivity scale is made up of a single factor (Prime et al., 2015). In the context of the ECEC literature this is consistent with research on other measures cited above indicating that global measures consist of a single factor (e.g., the ECERS, Scarr et al., 1994; ECERS-R, Perlman et al., 2004 and ITERS-R, Bisceglia et al., 2009). Thus, we hypothesized that the three components of the ECS scale will load onto a single factor.

The Cognitive Sensitivity scale, and the educator version we developed utilize a thin-slice methodology which relies on a brief excerpt of an individual's dynamic interaction or communication to capture that person's behavior (Ambady, Bernieri, & Richeson, 2000). This method relies on coders' intuitive and automatic judgments of individual's affectiveness, personality, quality of relationships, etc. based on brief observations (Ambady, 2010). Thin-slice coding does not require coders to follow very rigid and meticulous manuals while maintaining validity and reliability standards. Ambady and Rosenthal (1992) conducted a meta-analysis of 38 studies on the predictive accuracy of the thin-slice coding methodology of various social interaction features such as warmth, tone of voice, social cues. Results indicated a significant effect size (r = .39) that highlights the predictive value of drawing inferences using this approach. Further, thin-slice coding appears to be more accurate than much more labor intensive counts of micro-level behaviors (Ambady, LaPlante, & Johnson, 2001). Thus, thin-slice methodology is more efficient in terms of training and coding time.

The validity and reliability of the Cognitive Sensitivity scale were established using a thin-slice coding approach based on a 5-min task within the context of sibling interaction (Prime, Perlman et al., 2014; Prime et al., 2015). Ratings using a thin-slice approach, as well as the psychometric properties of the scale were comparable to a far more labor intensive snapshot coding approach (Prime, Perlman et al., 2014; Prime et al., 2015). Since then, other research has been conducted with the Cognitive Sensitivity scale in varied contexts (sibling interaction: Pauker, Perlman, Prime, & Jenkins, 2017; Prime, Pauker, et al., 2014; Prime, Perlman, et al., 2014; and mother–child interactions: Prime et al., 2015). Findings have supported the predictive validity of the scale (Prime, Perlman, et al., 2014) as well as a protective effect of family members' cognitive sensitivity on children's language skills in the context of risky family environments (Prime, Pauker, et al., 2014).

The work presented in this study reflects our adaptation of the Cognitive Sensitivity scale to the ECEC context. The changes we introduce to the original measure are both in terms of the process of conducting the observation and the content of the scale (i.e., increase in the number of items to account for differences in the context). Specifically, to minimize disruption in the ECEC context and enhance participation rates, live observations were utilized, in place of videotaped interactions of structured activities. To ensure that coders had sufficient opportunity to observe educator behavior to code it reliably, only educators who had been in the classroom for a minimum of 45 min were coded. This is consistent with instructions used in coding the Caregiver Interaction Scale (Arnett, 1989), which was the most similar measure to the ECS in the ECEC literature. Finally, guided by the relevant literature (e.g., Visible Learning, Hattie, 2008) items capturing language promotion (Girolametto, Weitzman, & Greenberg, 2003), educator responsivity, cognitive stimulation, sensitivity (Burchinal & Cryer, 2004), and proactiveness (Hattie, 2008) were added to the original Cognitive Sensitivity scale. The manual for the ECS scale, provided in Appendix B, includes a brief explanation and example of each skill evaluated in the ECS scale.

The goals of the current study were threefold:

1 Adapt the Cognitive Sensitivity scale to the ECEC context, in order to create an observational measure of educators cognitive sensitivity skills for use in infant and toddler classrooms. Our goal was for this measure to require shorter administration and training times than frequently used measures in the field, and to test its psychometric properties.
2 Test the ECS scale's concurrent validity by comparing it with other scales that capture process and structural quality measures. Given the content of the ECS scale we expected stronger associations with other measures of process quality than with structural quality.
3 Examine differences in educator–child interaction scores between individuals, classrooms, and centers by exploring the distribution of the variance of educator cognitive sensitivity across these three levels. Based on past research we expected the majority of the variance to be accounted for at the individual educator level.

2. Material and methods

2.1. Sample

Data were collected as part of a larger study evaluating the ECEC accountability system operated by the City of Toronto (Perlman, Brunsek, Hepditch, Gray, & Falenchuck, 2017). To ensure that the original sample of 240 infant and toddler classrooms from 110 centers reflected the proportion of community based ECEC programs in Toronto, centers were selected using a multi-stage, stratified random sampling procedure. All participating centers were part of the City of Toronto Quality Ratings and Improvement System, which captures approximately 70% of all centers in Toronto. First, centers that had an infant classroom were selected, then toddler classrooms were selected from within these centers. This was done to increase

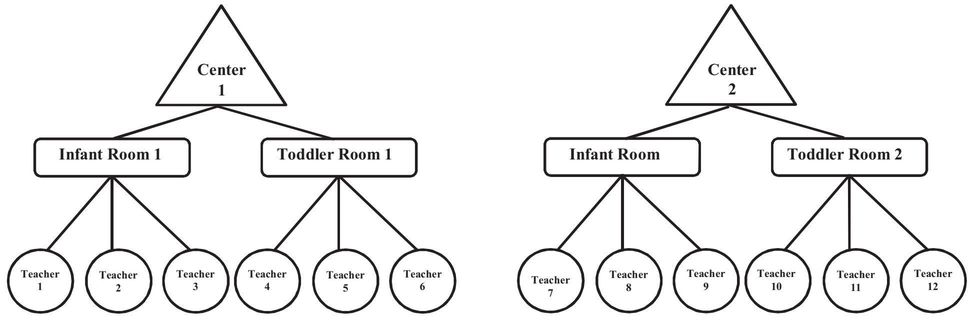

Fig. 1. Study multilevel data structure. This figure illustrated the nested nature of the study design, with teachers nested within classrooms, nested within centers.

the efficiency of data collection by allowing us to collect data in two rooms per center. Due to time and resource constraints, the subsample available for analysis for this paper consists of 350 educators from 135 infant and toddler classrooms in 69 of the original centers. Classrooms were assessed between January and May 2013.

2.2. Data structure

The data used in this study was nested in structure. Specifically, multiple caregivers were nested within classrooms, and two classrooms, infant and toddler, were evaluated within each center. This study design allowed us to compute individual educators scores, in addition to classroom-level and center-level scores (see Fig. 1). The following variables were examined at the educator-level: highest education level, experience, salary, and ECS. Given the nature of the following measures, CLASS, ITERS-R, and educator:child ratios, they were rated at the classroom-level. When we tested associations between the ECS scores and measures taken at the classroom-level, we averaged the ECS scores of all the educators in a given classroom, so that measures were at the same level.

2.3. Procedure

Individual educators were observed in their classroom interacting with children. The original Cognitive Sensitivity scale evaluated individuals based on a 5-min observation period that was captured within a semi-naturalistic environment (i.e., completing a task). However, to avoid disrupting the ongoing flow of activities in the ECEC classrooms, the current study conducted live and natural observations (i.e., no task was assigned) in classrooms. Research assistants were in each classroom for a period of 3 h and data collection took place between 8 am to 11 am. During that time they collected data on a number of quality indicators (e.g., educator:child ratios) as described below. Consistent with recommended guidelines for collection using the Caregiver Interaction Scale (Arnett, 1989), we required that only educators who were in the classroom for a minimum of 45 min be rated. This ensured that coders had an opportunity to adequately observe the interaction style of each educator they rated. In each classroom, one coder assessed all educators. At the end of the observation session coders rated each educator on 23 different ECS scale items (see Appendix A for scale items) using a 5-point Likert scale.

These coders also collected subscales from the ITERS-R that focus on the physical environment and educator:child ratios. A different set of coders completed the CLASS measure in each classroom. Educators were given a questionnaire to complete independently. The survey response rate was 76%. These measures are described in detail below.

Table 1
Educator characteristics.

Variable	*n*	%
Education		
None	1	0.3
High school/equivalent	39	11.1
Some college, no degree	42	12
Community college	126	36
BA	51	14.6
MA	9	2.6
Age		
>20 years old	13	3.4
20–29 years old	55	15.7
30–39 years old	57	16.3
40–49 years old	84	24
50–59 years old	49	14
Over 59 years old	9	2.6
Salary level		
<$15k	18	5.1
$15k–19,999	14	4
$20k–24,999	34	9.7
$25k–29,999	29	8.3
$30k–34,999	49	14
$35k–39,999	26	7.4
$40k–44,999	26	7.4
$45k–49,999	12	3.4
>$50k	18	5.1
Position		
Head or co-head teacher	42	12
Teacher	98	28
Assistant teacher	93	26.6
Classroom aid	2	0.6
Other (supply, student)	37	10.6

2.4. Participants

A total of 350 educators were observed and coded. Ninety-nine percept of the participants were female. Educators participating in the study had a mean of 11.46 years ($SD = 7.92$) of experience working in ECEC settings and were working, on average, 33.85 h ($SD = 10.64$) per week in the observed center. Educator characteristics including age, education level, and salary are described in Table 1. The years of experience variable was not normally distributed and as a result, was transformed into an ordinal variable with each level representing five years of experience (i.e., 1 = 0–5 years of experience; 2 = 5.01–10 years of experience; 3 = 10.01–15 years of experience). The majority of educators (58%) reported speaking another language in addition to English, with Bengali, Spanish, and Urdu being the most common.

2.5. Measures

2.5.1. Educator cognitive sensitivity

As noted above, the Educator Cognitive Sensitivity (ECS) scale was adapted from the Cognitive Sensitivity scale (Prime, Perlman et al., 2014). The adaptation was informed by conducting a thorough literature search on the quality of ECEC programs, as well as by consulting with experts in the field and piloting preliminary items. Face validity was examined during pilot testing and administering and coding the scale items. This initial scale, which was comprised of 23 items, measured the areas of Mind-Reading, Mutuality Building, and Communicative Clarity, as well as responsivity, proactiveness and language promotion. For example, coders were asked to rate educators on their propensity to encourage turn-taking with children, promote language skills, and expand on concepts learned (e.g., when a child is placing beads onto a pipe-cleaner, the educator might scaffold a child who is struggling by holding the pipe-cleaner steady for the child. At the same time, they might discuss the colors and shapes of the beads, help the child count the number of beads on the pipe-cleaner, etc.). These items were pilot tested by coding the interactions of 21 educators and showed excellent initial internal consistency (α = .96). A higher score on this scale represents higher cognitive sensitivity skills.

In keeping with thin-slice methodology (Ambady et al., 2000), coders were asked not to take notes throughout the observation period, and when coding to quickly rate each behavior on a scale from '1′ ('Not true at all') to '5′ ('Very true') based on their impression of that specific educator. In cases where coders did not observe certain behaviors, they were asked to generalize and hypothesize based on their judgments of that educator. Non-expert thin-slice coders were found to be able to automatically integrate relevant information to make intuitive judgments that are more accurate than expert coders when evaluating social interactions (Waldinger, Schulz, Hauser, Allen, & Crowell, 2004). A mean score was computed for each educator by averaging all items on the ECS scale. Scoring the ECS scale took coders approximately 5 min per educator.

Measure training included 3 h of reviewing individual items of the ECS scale, and 3 h of coding and reviewing 5-min video clips. Coders consisted of a team of three research assistants who were trained by an expert coder (the first author). Initial inter-rater reliability was calculated based on the coding of five videos. However, because the demands of live coding are quite different from those based on videos of structured tasks, we also tested inter-rater reliability for each of the coders against our "gold standard" coder in the field just prior to the onset of data collection. To avoid coder drift, inter-rater reliability of live coding sessions 10% of the observation sessions were double coded throughout the data collection period. For both the video and live coding Cronbach's alpha values were computed for each item as well as for the overall scale score and were expected to be equal or greater than 0.8. For items that were below the reliability level, the coder and gold standard coder discussed the nature of that item and what behavior it purports to capture. All coders reached reliability with videos and during live coding sessions.

2.6. Concurrent validity measures

2.6.1. Classroom Assessment Scoring System: Toddler Version (CLASS Toddler)

The CLASS Toddler (La Paro, Hamre, & Pianta, 2012) measure is an observational instrument developed to assess classroom quality in toddler-aged (i.e., 15–36 months) ECEC classrooms. As a result of differences in parental leave policies, Canadian children tend to enter child care at later ages than they do in the US (Ray, Gornick, & Schmitt, 2010), where the CLASS was developed. As a result, the decision was made to use the Toddler Version of the CLASS for our entire sample. This version measures key dimensions of interactions among educators and children within classrooms: i) Positive Climate, ii) Negative Climate, iii) Teacher Sensitivity, iv) Regard for Child Perspectives, v) Behavior Guidance, vi) Facilitation of Classroom Routines, vii) Facilitation of Learning and Development, viii) Quality of Feedback, and ix) Language Modeling. Each dimension was scored on a 7-point scale. Observers viewed each of the 9 dimensions as holistic descriptions of the average child's experiences in the classroom that fell in the "low" (1, 2), "mid" (3, 4, 5), and "high" (6, 7) range. Coders' reliability was tested using 5–20 min segments of video footage that were chosen randomly from 1 to 2 h of video footage gathered from different classrooms provided by the developers of the CLASS measure (La Paro & Pianta, 2003). The CLASS mean score was 3.97 (*SD* = .06, range 2.03–5.23) with no significant difference between scores in infant and toddler rooms. Therefore, results are only reported for the full sample of classrooms. Coders' percent agreement with the gold-standard ranged from 83% to 93%, exceeding the 80% minimum. In order to minimize drift, a follow-up reliability test was carried out in the middle of the data collection period. All coders met reliability standards.

2.6.2. Infant/Toddler Environment Rating Scale – revised (ITERS-R)

The ITERS-R (Harms et al., 2003) is a 39-item inventory that provides a global measure of infant- or toddler-aged (i.e., birth to 30 months of age) classroom environments within child care centers. The 39-items are categorized into 7 subscales: i) Space and Furnishings, ii) Personal Care Routines, iii) Listening and Talking, iv) Activities, v) Interaction, vi) Program Structure, and vii) Parents and Staff. Each item is scored on a 7-point scale with the following categories for each indicator: inadequate (1), minimal (3), good (5), and excellent (7).

In this study, we used a short version of the ITERS-R that focused on the classrooms' physical environment. Use of a short form of the ITERS-R is supported by past research that found that the average based on a shortened version of the ITERS-R correlates highly with the average based on the full ITERS-R (Bisceglia et al., 2009). The physical environment items used in this study are quick to collect, reducing the data collection time of the ITERS-R from 3 to 5 h to approximately 30 min. Specifically, 21 items were selected from the following subscales of the ITERS-R: Space and Furnishings, Personal Care Routines, and Activities. Using the short version allowed us to capture a comprehensive picture of the physical environment with limited resources. Item scores were averaged to yield a mean score for each subscale included in this study. All items were also averaged to create a mean classroom score.

The mean score for the full sample on the ITERS-R measure was 3.51 (*SD* = .54, range 2.42–4.8), with no significant differences between infant and toddler rooms scores. Therefore, only results for the full sample will be reported. Coders' reliability was obtained using live coding with an expert coder who was trained by the creators of the instrument. All coders exceeded the minimum reliability standard of 80% agreement as the average percent agreement was 87%.

2.6.3. Educator:child ratios

Educator:child ratios were collected by a research assistant approximately every half hour during the observation period. Ratios were collected an average of 6.5 times per classroom, across all classrooms. These were averaged to create a classroom-level score. The mean number of children per educator for the full sample was 2.7 (*SD* = .98, range .89–5.09). The mean number of children per educator was 2.05 (*SD* = .56, range 1.06–3.45) in infant, and 3.33 (*SD* = .89, range 0.89–5.09) in toddler rooms. This difference is driven by different licensing requirements for the different age groups. For both age groups the ratios are better than the minimum ratios required for licensing (1:3 for infants and 1:5 for toddlers) by the Ontario government (Child Care and Early Years Act, 2014).

2.6.4. Educator survey

Educators who were in the room for longer than 45 min were asked to complete a survey that included basic demographic questions such as gender, age, languages spoken, in addition to questions about their training and education.

2.7. Data analysis plan

Exploratory Factor Analysis (EFA) was conducted in SPSS 23 to explore the structure of the ECS scale. Oblique promax rotation was used to allow different factors to correlate. Maximum Likelihood extraction method was utilized due to the normal distribution of the data. A single factor CFA was carried out in Stata 12 (SE) to confirm the structure of the ECS scale as found in EFA results. The overall goodness of fit of the model was estimated with the following fit indices (Hu & Bentler, 1999): (1) the Root Mean Square Error of Approximation (RMSEA; cutoff point – less than 0.06), (2) Comparative Fit Index (CFI; cutoff point – above 0.95, and (3) Standardized Root Mean Square Residual (SRMR; cutoff point – less than 0.08). Internal consistency and inter-rater reliability were tested using Cronbach's alpha based on Generalizability Theory (Cronbach, Rajaratnam, & Gleser, 1963). Concurrent validity with gold-standard measures and with other structural quality indicators were tested using a series of Pearson correlations. Finally, a variance component analysis was conducted in Stata 12(SE).

3. Results

3.1. Factor structure – ECS scale

In order to investigate the psychometric properties of the ECS scale, we first explored the factor structure of the scale. A series of EFA's were performed to investigate and refine the structure of the instrument. In Ontario, legislated age groupings divide classrooms into infants (servicing newborns 0–18 months olds) and toddlers (servicing 18–30 months olds). Separate analyses were conducted for infant and toddler rooms as age differences may drive significant differences in educators' ECS scale scores. A similar approach was taken by Scarr et al. (1994). All EFA's were performed using oblique promax rotations that allowed extracted factors to correlate with each other. A Maximum Likelihood extraction method was utilized as this was the best fit for our normally distributed data (Fabrigar, Wegener, MacCallum, & Strahan, 1999).

For the infant rooms sample, the initial eigenvalues suggested a 3-factor solution that explained 70% of the variance. The first factor included very high loadings for most items (0.47–0.84), while for the second factor, the majority of factor loadings were below the cutoff point of .4 (Stevens, 1992). The third extracted factor included the two items that did not load well onto the first factor. Therefore, these two items, which refer to negative educator interaction behavior, were dropped from the scale. Next, the refined scale was analyzed enforcing a 1-factor solution. Results indicated that a single factor solution explained 55% of the variance, with high factor loadings ranging from 0.57 to 0.87.

An EFA for the toddler rooms generated similar results to the infant rooms sample, with initial eigenvalues that extracted 3factors and explained 68% of the variance. Similar to the infant room EFA, the first factor had very high factor loadings for most items that ranged between 0.60 and 0.84. The second factor was spurious as it had very low (<.4) or negative factor loadings for all items, and the third factor included only two items (referring to negative educator interaction). Therefore, these two items were dropped from further analysis. Next, the refined scale was run enforcing a 1-factor solution. Results indicated that a single factor solution explained 57% of the variance, with high factor loadings ranging from 0.61 to 0.85. The final ECS scale included 21 items. The scale composite score was created by taking the mean across all 21 items for each educator.

The results of the EFA analyses for both the infant and toddler samples showed a unidimensional structure for the instrument. As a result, a single CFA analysis with the combined sample was conducted. The initial CFA run for the full sample showed poor model fit (CFI = 0.81, RMSEA = 0.13, SRMR = 0.08). The modification indices were examined to explore the reasons for the poor model fit. All modification indices were related to covariances between the error terms of the observed variables, which indicate high correlations between some of the items in the scale. After the model was rerun with all of the covariances suggested by the modification indices, the model fit was satisfactory (CFI = 0.97, RMSEA = 0.06 and SRMR = 0.04). The factor loadings for the full single sample CFA are presented in Table 2. The implications of these findings for future revisions of the measure are raised in the discussion section.

Table 2
Educator Cognitive Sensitivity Scale – factor structure.

Item	Factor loading
1. This educator communicates clearly	0.72
2. This educator promotes children's language skills	0.79
3. This educator uses positive nonverbal communication	0.66
5. This educator uses meta-cognitive language/mental state talk when interacting with children	0.72
6. This educator reminds children about goals of the tasks/activities (meta-level) they are engaged in	0.76
7. This educator is responsive to children's request for help, even those that are subtle and/or nonverbal	0.78
9. This educator gives positive feedback to reinforce children	0.73
10. This educator is able to rephrase his/her language when interacting with children to enhance understanding.	0.30
11. This educator is proactive in preventing problem behaviors before they escalate	0.72
12. This educator is sensitive to what children know and/or understand	0.78
13. This educator reminds a child when it's his/her turn	0.67
14. This educator is engaged and child-focused	0.84
15. This educator is child minded	0.83
16. This educator promotes children's autonomy	0.74
17. This educator is warm and affectionate	0.75
18. This educator is responsive to child's non-verbal seeking behavior	0.79
19. This educator is responsive to child's lost need-behavior	0.72
20. This educator is responsive to child's verbal seeking behavior	0.68
21. This educator facilitates children's activities in a responsive way	0.77
22. This educator teaches by providing additional information about activities they are engaged in	0.72
23. This educator is clear in his/her request for help when guiding children through an activity/task	0.70

Table presents all items.

Table 3
Educator Cognitive Sensitivity Scale – descriptives.

Item	*M*	*SD*	Min.	Max.
1. This educator communicates clearly	3.49	0.67	2	5
2. This educator promotes children's language skills	3.08	0.73	1	5
3. This educator uses positive nonverbal communication	3.16	0.76	1	5
4. This educator uses negative nonverbal communication	1.29	0.51	1	4
5. This educator uses meta-cognitive language/mental state talk when interacting with children	2.74	0.68	1	4
6. This educator reminds children about goals of the tasks/activities (meta-level) they are engaged in	2.54	0.66	1	4
7. This educator is responsive to children's request for help, even those that are subtle and/or nonverbal	2.99	0.67	1	4
8. This educator gives negative feedback when interacting with children	1.31	0.52	1	4
9. This educator gives positive feedback to reinforce children	3.09	0.74	1	5
10. This educator is able to rephrase his/her language when interacting with children to enhance their understanding.	2.93	0.74	1	4
11. This educator is proactive in preventing problem behaviors before they escalate	2.65	0.67	1	4
12. This educator is sensitive to what children know and/or understand	3.20	0.64	1	4
13. This educator reminds a child when it's his/her turn	2.59	0.69	1	4
14. This educator is engaged and child-focused	3.29	0.69	1	5
15. This educator is child minded	3.35	0.69	1	5
16. This educator promotes children's autonomy	3.25	0.67	1	5
17. This educator is warm and affectionate	3.33	0.71	1	5
18. This educator is responsive to child's non-verbal seeking behavior	2.85	0.68	1	4
19. This educator is responsive to child's lost need-behavior	2.29	0.58	1	4
20. This educator is responsive to child's verbal seeking behavior	3.03	0.68	1	5
21. This educator facilitates children's activities in a responsive way	2.30	0.66	1	4
22. This educator teaches by providing additional information about activities they are engaged in	2.51	0.72	1	4
23. This educator is clear in his/her request for help when guiding children through an activity/task	2.71	0.76	1	4

3.2. *Final ECS scale*

The mean score for the full sample on the ECS scale was 2.93 (*SD* = 0.39, range 1.65–4.13). Infant and toddler classroom mean scores on the ECS were not statistically different providing further support for analyzing them together. Descriptives for the full sample are provided in Table 3.

3.3. *Internal consistency*

Internal consistency of the ECS scale was evaluated using Cronbach's alpha coefficient. This procedure was performed using the 21-item scale. The Cronbach's alpha value was excellent for the ECS composite with $\alpha = .96$, with item-total correlations ranging from .60 to .82. Cronbach's alpha values in infant and toddler classrooms were identical ($\alpha = .96$).

3.4. *Inter-rater reliability*

The inter-rater reliability value was calculated using only the final 21-item scale based on the Generalizability Theory (Cronbach et al., 1963) and was good, $\alpha = .85$.

3.5. *Validity*

Concurrent validity of the ECS scale was computed by correlating the ECS composite score with other measures of quality taken at the classroom-level (i.e., the CLASS, ITERS-R, educator:child ratio; see descriptives in Table 4). In order to examine the correlations between classroom-level measures and the educator-level ECS, ECS composite scores were aggregated within classrooms to produce a mean ECS score for each room.

3.5.1. *CLASS*

The CLASS and the ECS scale measure similar aspects of educator–child interactions, however, as discussed earlier, they do so using a very different coding strategy and different units of analysis. The ECS was significantly correlated with all but one of the CLASS subscales (see Table 5). Correlations ranged between .41 and .55. The ECS scale score was negatively and significantly correlated with negative climate ($r = -.34$).

Table 4
Descriptives of the CLASS, ITERS-R, and ratio.

Variable	*M*	SD
Educator Cognitive Sensitivity	2.92	.52
CLASS	3.81	.73
Positive Climate	5.73	.94
Negative Climate	1.18	.31
Teacher Sensitivity	4.97	1.39
Regard for Children	4.65	1.21
Behavioral Guidance	4.24	.97
Facilitation of Learning	3.73	1.05
Quality of Feedback	2.29	.81
Language Modelling	3.02	.87
Emotional and Behavioral Support	3.01	.74
Engaged Support for Learning	4.01	.79
ITERS-R	3.43	.55
Space and Furniture	4.01	.79
Personal Care Routines	2.15	.62
Activities	4.03	.82
Educator:Child Ratio	2.97	1.03

3.5.2. *ITERS-R*

All correlations between the ECS scale with the ITERS-R subscales were significant and positive ranging between .21 and .40 (see Table 2).

3.5.3. *Educator:child ratio*

All associations between the ECS Scale and the educator:child ratio measure were non-significant (see Table 6).

3.5.4. *Educator characteristics*

The association between the ECS scale and educator-level of education was non-significant (See Table 6). Bivariate correlations between the ECS scale and educator salary ($r = .16$) and years of experience ($r = .15$) were significant and positive, although small.

3.6. *Variance component analysis*

The multilevel nested structure of our data allowed us to explore how variance in ECS scale scores was distributed across educators within the same classroom, across classrooms within the same center, and across different centers. This provides useful information about how similar educators are within classrooms and whether

Table 5
ECS Pearson correlations with CLASS and ITERS-R subscales.

CLASS subscales	ECS
Positive Climate	.41**
Negative Climate	−.34**
Teacher Sensitivity	.49**
Regard for Child Perspective	.49**
Behavior Guidance	.50**
Facilitation of Learning and Development	.55**
Quality of Feedback	.16
Language Modeling	.46**
Emotional and Behavioral Support	.53**
Engaged Support for Learning	.50**
Total CLASS score	.54**
ITERS-R Subscales	ECS
Space and Furnishing	.21*
Personal Care Routines	.23*
Activities	.34**
ITERS-R Total Score	.40**

* $p < .05$.
** $p < .01$.

Table 6
ECS Pearson correlations with ratio and teacher characteristics.

Educator:child ratio	ECS
Only teachers	−.004
Teachers & volunteers	.03
Educator characteristics	ECS
Years of experience in childcare	.15*
Highest level of education	.15
Salary	.16*

* $p < .05$.

measuring their interaction styles with children at the classroom level has an empirical foundation.

A Variance Component Analysis (VCA) was conducted using Stata 12 (SE) software. Seventy-nine percent of the variance in ECS was accounted for by individual differences between educators within the same classroom. That is, different educators within each classroom vary substantially in terms of their interaction styles with students. Three percent of the variance was explained by differences between classrooms within the same center. This component of the variance was not statistically significant, suggesting that, on average, classrooms within centers share similar cognitive sensitivity levels. Lastly, 18% of the variance was explained by differences in ECS scale scores between centers. This component of the variance was statistically significant, suggesting that on average, centers differ in terms of the level of cognitive sensitivity exhibited by the educators who staff them.

An additional VCA was conducted for CLASS scores. Since this is a classroom-level measure, variance could only be explored across classrooms and centers. Results showed that 52% of the variance was between classrooms and 13% of the variance in scores was between centers. It should be noted that in multilevel modeling the error goes into the lowest level of analysis. This may inflate the proportion of variance accounted for the lowest level used in any analysis (i.e., educator for ECS, classroom for CLASS). The amount of variance accounted for at the lowest level in the ECS analysis is higher than it is for the CLASS (79% vs. 52%), thus increasing our confidence in the finding of the importance of educator as the unit of analysis for quality of interactions in ECEC settings.

4. Discussion

The findings reported in the current study provide preliminary empirical support for the validity of the ECS scale using a community sample in Toronto, Canada. Overall, the psychometric properties of the ECS were strong, suggesting that it is made up of one factor in both infant and toddler rooms. The finding that behaviors captured by the scale make up a single scale is consistent with findings by other researchers (e.g., Scarr et al., 1994) that measures of quality in the ECEC settings may represent a single construct. It may also suggest that "good things come in packages" in that an educator who tends to be warm may also tend to be affectionate, speak more to children, follow their lead, and scaffold their learning more effectively.

The ECS scale was significantly correlated with our two primary criterion measures in the expected directions. Specifically, eight of the nine correlations between the ECS and the CLASS subscales were statistically significant, and medium in magnitude. The ECS scale and the CLASS capture the extent to which educators provide cognitively stimulating environments while being emotionally attuned to children during interactions. The fact that the correlations between the ECS scale and the CLASS are significant and of medium magnitude supports the hypothesis that the two measures capture similar theoretical constructs. However, they also clearly differ from one another in meaningful ways. These differences may be explained, at least in party, by the fact that the ECS scale is assessed at the educator-level while the CLASS is assessed at the classroom-level and/or by the difference in coding demands between the two measures.

Smaller, but significant, magnitude correlations were reported for the ECS and the three ITERS-R subscales that were included in the current study. The correlation of between the combined ITERS-R subscales used in this study and the ECS scale was moderate. The somewhat lower correlations between the ECS and ITERS-R, compared to the ECS and CLASS, likely reflect that closer alignment in content between the ECS scale and CLASS vs. the short form of the ITERS-R used in this study. The findings that the ECS is correlated with both CLASS and ITERS-R may be another manifestation of the idea that "good things come in packages" noted above, whereby classrooms that do well on one aspect of quality may also tend to do well on other aspects of quality. However, the somewhat higher correlations between the ECS and CLASS subscales compared to the ITERS-R subscales, also highlight that there are differences in domains of quality.

The ECS scale was correlated with educator years of experience and salary. Perhaps more experienced educators are able to automatize the many daily routines in the ECEC setting allowing them to better attend to children's needs and cues. Years of experience may be reflected in educators' salary. Our findings support this interpretation as salary and experience were significantly associated with one another. However, our correlational data do not allow us to disentangle the direction of these effects. Phillips et al. (2001) found that educator salary was the strongest predictor of quality of care in both infant and toddler rooms, even after accounting for other structural indicators. These authors draw on previous research findings that suggest that higher wages contribute to more stable care. Such stability also enables the formation of strong attachment relationships between educators and children, and in turn, translates into better quality of care overall (e.g., Barnas & Cummings, 1994; Howes, Hamilton, & Matheson, 1994). Additionally, Phillips et al. (2001) propose that educator salary may serve as a proxy for other components of the ECEC classroom routine that were not examined in this study.

ECS scores were not significantly associated with education level and educator:child ratios. The ratios observed in this sample were very good and perhaps all exceeded a threshold for achieving the level of quality observed in this sample. However, as noted earlier, findings concerning the relationship between process and structural quality indicators have been inconsistent. Specifically, there is some evidence that education and training serve as strong predictors of classroom care quality, as well as sensitive educator-child interactions (e.g., Ghazvini & Mullis, 2002).

However, other researchers (Phillipsen, Burchinal, Howes, & Cryer, 1997; Slot, Leseman, Verhagen, & Mulder, 2015) found limited or no associations between education and process quality. Clearly more research is needed to shed light on associations between process and structural quality variables.

The nested structure of our data allowed us to examine the distribution and amount of variance in ECS scale scores that was explained by educators, classrooms, and centers. The variance component analysis findings demonstrated the importance of measuring individual-level differences in educator interaction styles, as the majority of the variance in ECS scores was accounted for by these differences. This finding, which echoes previous research (Helmerhorst et al., 2014), raises concern about the practice of aggregating quality to the classroom and center level, which is routinely done in U.S. as well as in Toronto, as part of ECEC accountability systems (see Tout et al., 2010 for examples of aggregation to the center level as part of Quality Ratings and Improvement Systems in the U.S.). Including educator-level measures is clearly important and much more research on the issue of the level at which quality exists (i.e., is it at the person-, classroom- or center-level?) needs to be conducted as this has implications on policy for the oversight of ECEC programs as well as for quality improvement efforts.

Study results indicate that educators' ECS scores did not represent the full spectrum of the 5-point Likert scale, with very few educators achieving high scores. In fact, only 6 of the 350 educators who participated in this study had an average score of 4 or higher on the ECS scale. Scores on the CLASS and ITERS-R, both rated on a 7-point scale, were also fairly low. Clearly, there is room for improvement in quality for many of the centers included in this study. Since this sample was selected randomly, rather than self-selected, it likely reflects the quality of programs in Toronto more accurately than most study samples. The one exception to the medium quality scores was educator:child ratios, which were quite good and exceeded the minimum required by the Ontario government (Child Care and Early Years Act, 2014; Infants, $M = 2.05$, $SD = .56$; Toddlers $M = 3.33$ $SD = .89$) in both infant and toddler rooms. It is possible that centers directed additional educators to the classrooms being assessed as part of this study because our study was conducted in conjunction with the City of Toronto's ECEC quality assurance arm. Scores on the CLASS and ITERS-R in this sample are consistent with research from other localities (Cryer & Phillipsen, 1997; Helburn et al., 1995; Kamerman & Gatenio-Gabel, 2007; Peisner-Feinberg et al., 2001). Taken together, these findings highlight the need for intervention and training in this domain to improve the quality of educator-child interactions in ECEC settings.

Finally, one of our goals was to develop a measure that would reduce the training and data collection burdens associated with existing measures of educator–child interaction. By drawing on research on the thin-slice methodology we were able to develop a measure that requires only 6 h of training and 45-min of observation (which can be done simultaneously for multiple educators) and only requires 5 min of coding per educator. This reduces administration burden significantly compared to the frequently used measures in this field, without compromising standards of inter-rater reliability and other psychometric properties.

Since collecting the data presented in this paper, we have initiated ECS data collection in child care centers in Toronto as part of an intervention study aimed to improve the way that educators interact with children. In this study, we have shifted to collecting 5-min video clips of educators interacting with children around structured tasks that we provide (e.g., cutting shapes with playdough) and during routine events such as transitions or snack times. Preliminary results suggest that this is a workable approach that reduces the data collection time to even less than 45-min of observation, while providing video records of the interaction that can be used for intervention or other research purposes. This is an interesting avenue of research that we are pursuing further.

Our study also has several limitations. The current study did not include child outcome measures which are needed to establish predictive validity of the ECS scale. While we know that the Cognitive Sensitivity measure we developed in the context of the family has good predictive validity, this is an important next step in the development and testing of the ECS scale. Another limitation is that results from the CFA analysis suggest that this instrument can be further shortened, as many items have high correlations with one another. However, since in this study the coding was conducted live, we are not able to refine the measure and then recode. We plan to explore ways to reduce redundancy in items with future samples of educators, starting with the intervention study sample mentioned above that will allow us to test the validity of shortened versions of the ECS.

An additional limitation was our use of the short form of the ITERS-R, that captures mainly aspects of the physical environment rather than the interactions in classrooms. Clearly, using the short form substantially reduced the costs of collecting the ITERS-R. Furthermore, as mentioned in the methods section, scores captured in this short form have been shown to accurately reflect the average quality score that would have been captured by the full-form of the ITERS-R (Bisceglia et al., 2009). Nevertheless, relying on measures that are more closely aligned conceptually for validation purposes is better and we weigh the higher association with the CLASS heavily in interpreting our findings. Finally, as the subjects in the current study were the educators, consent to collect information about individual children was not obtained and we do not have information related to children's ages. In Ontario, Infant classrooms are licensed to care for children between 0 and 18 months of age. However, due to the availability of one year of parental leave, in general infant classrooms in Canada provide care for very young infants much less frequently than centers in the United States do. In fact, across Canada only 10% of parents who use child care report that their child is below 12-months of age (Sinha, 2014). To address the possible impact of age on educator–child interactions, we tested potential differences across infant and toddler classrooms, which were found to be very similar in terms of their quality.

5. Conclusion

Despite these limitations, initial psychometric properties and the results of the concurrent validity testing reported here suggest that the ECS is a promising new measure of an important aspect of educator–child interaction. Aggregating quality to the center-level is routinely done in the ECEC sector. However, our findings using the ECS scale suggest that this practice may be problematic and needs to undergo further empirical testing. Finally, one of the major strengths of the ECS scale is that compared to existing measures, it is relatively efficient to train and administer. This efficiency makes using the ECS scale more feasible and increases its potential impact in both research and applied settings.

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Appendix A. Educator Cognitive Sensitivity – scale items

Give your impression of how this person would interact with his/her partner on a day-to-day basis, based on what you have seen:	(Not at all true) (very true)				
1. This teacher communicates clearly.	1	2	3	4	5
2. This teacher promotes children's language skills.	1	2	3	4	5
3. This teacher uses positive nonverbal communication.	1	2	3	4	5
4. This teacher uses meta-cognitive language/mental state talk when interacting with children.	1	2	3	4	5
5. This teacher reminds children about goals of the tasks/activities (meta-level) they are engaged in.	1	2	3	4	5
6. This teacher is responsive to children's request for help, even those that are subtle and/or nonverbal.	1	2	3	4	5
7. This teacher gives positive feedback to reinforce children.	1	2	3	4	5
8. This teacher is proactive in preventing problem behaviors before they escalate.	1	2	3	4	5
9. This teacher is sensitive to what children know and/or understand.	1	2	3	4	5
10. This teacher is able to rephrase his/her language when interacting with children to enhance their understanding	1	2	3	4	5
11. This teacher reminds a child when it's his/her turn.	1	2	3	4	5
12. This teacher is engaged and child-focused	1	2	3	4	5
13. This teacher is child minded	1	2	3	4	5
14. This teacher promotes children's autonomy	1	2	3	4	5
15. This teacher is warm and affectionate	1	2	3	4	5
16. This teacher is responsive to child's non-verbal seeking behavior	1	2	3	4	5
17. This teacher is responsive to child's lost need-behavior	1	2	3	4	5
18. This teacher is responsive to child's verbal seeking behavior	1	2	3	4	5
19. This teacher facilitates children's activities in a responsive way.	1	2	3	4	5
20. This teacher teaches by providing additional information about activities they are engaged in.	1	2	3	4	5
21. This teacher is clear in his/her request for help when guiding children through an activity/task.	1	2	3	4	5

Two items were removed from the final ECS scale.

Appendix B. Educator Cognitive Sensitivity – coding manual

1. Clear communication

This educator provides children with information that is clear, specific and understandable. He/she uses sufficient information and age-appropriate language (depends on the age of students), and does this in a supportive manner.

2. Promotes language skills

This educator introduces new concepts, labels unfamiliar objects, uses a variety of words (that are developmentally appropriate), and repeats words when appropriate (when introducing new concepts).

3. Positive nonverbal communication

This educator uses positive expression and gesturing when:

- explaining a task
- providing positive feedback
- giving instructions
- having a conversation with a child

Example: being animated when communicating with child; within a task-pointing, directing child to look at stimuli, modeling).

It should be noted that even if the teacher displays flat affect or his/her personality is not as bubbly when he/she points, it is considered positive as long as he/she is not being rude, annoyed, or aggressive.

4. Meta-cognitive language/mental state talk

This educator is using mental state talk when interacting with children. That is, he/she reflects the needs, desires, feelings, and emotions of children in words, reasons with and communicates his/her mental state back to the children. Examples: I see that you are sad (emotion); oh, you need (desire) this red block to finish your castle; you think (belief) this color is red, right?; we should put these toys away because (reasoning) we are about to start our lunch-break.

Any usage of the words- need, want, think, know.

Any usage of reasoning, emotion (e.g., love, hate, fear) or feelings (e.g., bad, good, well).

5. Communicating "big picture" about the task/activity

Provides children extended learning opportunities about the task at hand. (Example: while playing in a sand box, the educator should engage the children through asking them questions about what they are building, what part are they building right now, or what else do they need to add in order to make the castle (e.g., windows, roof). Most educator–child interactions should have a rationale, a goal behind them. Therefore, these goals should be constantly promoted and communicated to the children in an explicit way.

6. Responsiveness to help seeking behavior

When asked verbally or non-verbally by a child for assistance, this educator responds immediately and appropriately in any form. (Examples: reassures child verbally or non-verbally, approaches child, guides child in task.)

7. Positive feedback

This educator compliments on children's actions/responses/behaviors by making positive statements or physical gestures. It should be noticed that the educator is expected to explicitly provide positive feedback for **most** responses that children provide when being asked (e.g., verbal: "great answer", "good job", that's right", "yes!"; non-verbal: high-five, pat on back) before moving on with the curriculum or task.

8. Proactive, prevents problem behaviors

This educator is able to pick-up on early stages of problems or situations where they might be more likely to occur (e.g., children are not engaged in class activity) and attends to that situation immediately before it escalates. This teacher also sets clear rules in his/her classroom regarding: what is a proper behavior, manners, turn-taking, and enforces them in a sensitive way.

9. Sensitive to children's knowledge

This educator can take children's perspective with respect to what they know or understand in any given task. When helping children, this educator can gauge their level of understanding and what they need to be helped with. For example, breaking down tasks effectively, talking simply and in appropriate pace, giving easy directions, being able to pick up when a child does not understand.

Having child mindedness = getting into the child's mind to understand what they want, need, and understand.

10. Rephrasing language

When communicating with children, the educator should be able to rephrase his/her statements when needed and say them in a simpler way, or in a way that the children can relate to. Example: when an educator sees a child who struggles to follow the instruction of finding a yellow building-block among other colored blocks, he/she can say: "Find the one that is the same color as the sun".

11. Turn taking directions

When engaged in an activity, the educator is promoting a collaborative interaction (i.e., promoting mutuality). This can be done verbally ("it's your turn", "next is my turn") or non-verbally (gesturing at the child who has the turn).

12. Engaged and child-focused

This educator focuses his/her attention on what the child is doing, "following" the child in his/her activity because it is the educator's major motivation is to be immersed in the child's activity, thus, keeping a high level of engagement with what the child is doing.

13. Child minded

This educator is aware of child's emotional/affective states and recognizes the child's internal mental state (i.e. bored, worried, excited, tired).

14. Promotes child's autonomy

This educator will perform non-verbal/verbal behaviors in order to encourage children to perform actions by themselves.)

15. Warm and affectionate

There are signs of close proximity with the child, caring/loving looks towards the child and encouraging comments.

16. Responsive to child's non-verbal seeking behavior

This educator responds with verbal or instrumental help when a child gets stuck with play and sends clear behavioral cues that he/she needs assistance. Example: Looking at the educator and waiting for his/her feedback, while holding a piece of Lego seeming not to know how to start building something. The child approaches the educator holding up his/her zipper in front of him/her, seeming not to know how to do it up. The child is trying to get the square block in the circle hole, stops and looks at the educator.

17. Responsive to child's lost needing-behavior

This educator will spontaneously intervene to meet child's needs (i.e. child is unhappy, frustrated, lost, and/or hurt). This person will anticipate the child's need for help and offer assistance without being requested to do it. Examples: child picks up play dough but does not start playing and appears to the observer that he/she needs guidance or encouragement; another child picks up a Lego piece to build the Lego man and stops, seeming to not know how to start but without gesturing to the educator he needs help.

18. Responsive to child's verbal seeking behavior

This educator will offer verbal and/or instrumental help if a child verbally refers to the educator asking for help or comments on how difficult a task is.

19. Facilitates child's actions

This educator performs behaviors in order to respond to child's needs during task. Although child has a clear agenda, he/she seems stuck, but will not provide the educator with any clear signals. This educator can pick up that child is stuck and provide assistance. Example: child is engaged in building with Lego blocks, but struggles in attaching one of the parts. Educator approaches child and scaffolds him/her in his/her task; child is engaged in inserting geometric shaped Lego blocks into their matching holes in a box. While the child attempts, unsuccessfully, to insert a triangle-shaped Lego block into a square hole, the educator rotates the box such that, the triangular hole will be the closest one to the child.

20. Provides direct instruction

This educator gives step-by-step structured instructions and repeats them when teaching a new concept or when introducing a new activity. He/she adds new information to the activity children are engaged in an explicit, systematic manner. Example: When reading a story, the teacher refers to concepts from the narrative such as: body parts, vegetable names, or emotions through demonstration, systematic repetition, or questions.

21. Clarity in asking for help

When this educator interacts with children he/she guides them through the activity by asking clear questions. Example: "Where should the yellow block go?" What do we do with our plate after we finished eating?"

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