CHELLO:

The Child/Home Environmental Language and Literacy Observation

There is now strong and compelling evidence that links the quality of developmentally appropriate language and literacy experiences, and school readiness skills (Dickinson & Neuman, 2006; Neuman & Dickinson, 2001). Children who arrive in kindergarten with a foundation of pre-literacy skills, and the interest and motivation to learn, are better prepared for the complex task of learning to read than those who lack these foundational skills (Wasik, Bond & Hindman, 2006). This research underscores the significance of ensuring that all children—especially low-income children-are provided with quality early childhood experiences shown to be highly associated with language and literacy outcomes.

Yet these experiences continue to elude many children, particularly those who might benefit the most in the early years. For example, studies have reported a paucity of books available in early childhood settings (Neuman, Celano, Greco, & Shue, 2001), limited experiences in daily storybook reading (Dickinson & Tabors, 2001), few opportunities devoted to informational texts and other genres (Duke, 2000), limited to no choice time in literacy-related play (Christie, 1991). Moreover, research (Bruner, 1980; Hart & Risley, 1995) has documented that many early care and education settings may not offer the amount and quality of linguistic input needed to enhance children's

vocabulary and language repertoire known to serve as an important foundation for literacy learning.

Research on home-based care, in particular, reveals a disturbing profile of limited language and early literacy opportunities. A number of multi-city studies (Galinsky, Howes, Kontos, & Shinn, 1994; Helburn, 1995; Kontos, 1992), for example, have reported the paucity of learning and play materials in home-based settings. According to Fuller, Kagan, Caspary and Gauthier (2002), children from low-income families in home care arrangements displayed significantly lower rates of cognitive and language growth than others who attended center-based care. These quality factors are particularly worrisome given that more than 2.5 million children come from families with incomes below 200 percent of the poverty line (Kids Count Data Book, 2005).

Recognizing the critical importance of literacy learning for children's future, and the gap that already exists prior to school entry (Hart & Risley, 1995), it is clear that we must reach our youngest children early on to help them develop language, print, and motivational dispositions for reading and writing success. To date, however, we have lacked highly reliable and valid instruments to assess the quality of language and literacy experiences in home-based settings.

In this paper, we describe the development and validity of a new procedure for assessing the language and literacy environment in home-based child care settings: the CHELLO, the Child/Home Environmental Language and Literacy Observation. Designed to measure the "print richness" in family and group child care settings for children ages birth through five, the measure is specifically targeted to environmental features associated with positive early literacy outcomes.

Existing Observational Measures of Quality in Home-based Settings

CHELLO is unique among extant techniques in its focus on language and literacy experiences in family and group child care homes. Other tools used in home-based settings measure the overall quality focusing on the physical environment, structural characteristics of settings, and process characteristics, including caregiver-child interactions.

Among measures that examine the overall quality is the Family Day Care Rating Scale (FDCRS) (Harms, Cryer, & Clifford, 2007). A widely-used measure, FDCRS defines quality of family day care comprehensively. The 32 items of the scale cover six categories: Space and Furnishings for Care and Learning, Basic Care, Language and Reasoning, Learning Activities, Social Development and Adult Needs. Each item is described in four levels of quality—inadequate and minimal focus on the provision of basic materials and health and safety precautions; good and excellent focus on positive interaction, planning and personalized care as well as quality materials. Although the FDCRS assesses the quality of language and reasoning interactions, it does not measure the existence of print materials or instructional activities related to literacy development, such as interactive story book reading.

Based on the Home Observation for Measurement of the Environment (HOME) inventory (Caldwell & Bradley, 2003), child care versions of the HOME inventories (Bradley, Caldwell & Corwyn, 2003) measure the quality of care individual children receive in family child care arrangements. Designed for use in settings with children between three to six years of age, the Early Childhood CC-Home contains 58 items

clustered into eight subscales: Learning Materials, Language Stimulation, Physical Environment, Caregiver Responsivity, Academic Stimulation, Modeling of Social Maturity, Variety in Experience, and Acceptance of Child. Throughout the course of the 45-90 minute visit, observations of caregiver-child interaction and discussions with the caregiver are probed and interpreted from a child's point of view A binary-choice (yes-no) format is used in scoring items. As a global measure of quality, the CC-Home inventory is not intended to provide deep or intensive coverage to any one aspect of care. Although it examines the presence of toys, books, and language stimulation as a global measure of quality, it does not attempt to measure the activities and interactions targeted to children's literacy engagement with materials and resources.

Another observation measure used in multiple sites is the Early Language and Literacy Classroom Observation (ELLCO) (Smith & Dickinson, 2002). This tool examines the quality of the language and literacy experiences in a classroom. The Literacy Environment Checklist assesses the visibility of such literacy-related materials as books, alphabet, word cards, teacher dictation, alphabet puzzles, and writing implements. The ELLCO also includes 14 observational ratings that span activities including reading aloud, writing, assessments, presence or absence of technology which are examined along a rubric of 1(deficient) to 5 (exemplary).

Widely used in pre-k classrooms (i.e. it is required in Early Reading First grants), many of the ELLCO's observational ratings are not appropriate to the context of home-based child care. Some items, for example, focus on classroom management, curriculum, and organized reading instruction, and do not relate well to the more informal arrangements in family/group child care. Further, only one rating scale attempts to

capture the dynamics of language interactions, informal conversations or learning through play.

Consequently, although each of these extant measures in early childhood research and practice have effectively examined some specific aspects of the language and literacy environment, they vary in purpose (global quality versus targeted language and literacy practices), target audience (home-based caregivers; center-based caregivers), and focus (structural versus process characteristics). None, however, have been specially targeted to examine the environmental structure and process language and literacy features in what is known most inclusively as family, friend, and neighbor care. That is the function CHELLO is designed to fill.

Theoretical Framework of the CHELLO

The CHELLO includes two interdependent tools: the Literacy Environment Checklist which measures the quality of resources, and organization of space in home-based care settings, and the Group/Family Observation and Provider Interview which measures the quality of instructional supports, and the affective environment for literacy learning. Together, these measures examine environmental factors that have been strongly linked to literacy development as detailed below, providing information that may be used for examining current practice, and for tracking progress over time.

Physical Design Features that Support Literacy Practices. The instrument is based on the theoretical assumptions of ecological psychology (Day, 1983; Gump, 1989). From this perspective, environment plays a central role in learning and behavior. The organization, structure, and complexity of the setting influence patterns of activity, and engagement. For example, a fairly sizable number of studies (Morrow, 1990; Neuman &

Roskos, 1992; 1997; Vukelich, 1994) have revealed the powerful impact of access to literacy tools on young children's involvement in literacy activities. This research indicates that in settings carefully constructed to include a wide access of literacy tools, books, and play materials, children read more (Neuman & Roskos, 1992), and engage more in literacy-related play themes (Morrow, 1990), with resulting effects on literacy improvement (Neuman & Roskos, 1990).

The use of space in settings influences learning (Neuman, Roskos, Wright, & Lenhart, 2007; Roskos & Neuman, 2001). Children use space and its boundaries to regulate and guide their own responses. For example, studies (Morrow, 1988; Neuman & Roskos, 1997) find that smaller, well defined niches and nooks seem to encourage greater language and collaboration with peers and adults. Children are likely to use these more intimate settings to interact in longer and richer conversation with others.

Relatedly, studies (Fernie, 1985; Neuman & Roskos, 1990) show evidence of behavioral consequences. Some materials seem to encourage more sustained activity than others, and invoke children's attention at different ages (Rosenthal, 1973). Materials that involve children in constructive activity, for example, tend to generate more language than "pull toys." Some materials elicit greater social interaction and cooperation like block building, whereas others encourage more solitary and or parallel play, such as puzzles (see review, Roskos & Neuman, 2001).

The placement of objects (Neuman & Roskos, 1993), as well, influences children's engagement in play. Children become more involved in sustained play when objects are clustered together to create a schema or meaning network. For example, in one study (Neuman & Roskos, 1993), placing props associated with mailing letters

together in a play setting (envelopes, writing instruments, stamps and stationary) led to

longer play episodes than when these props were scattered throughout the room. Further,

props that were authentic, familiar, and useful to common literacy contexts like

telephones in the kitchen area, or mailboxes in the office area, encouraged more complex

language interactions and routines.

The proximity of quality books at children's eye view supports involvement in

literacy-like enactments (Morrow & Weinstein, 1986; Neuman, 1999). In one of the first

interventions studies of its type, Morrow and Weinstein (1986) examined the impact of

creating library corners in early childhood settings. These library corners were specially

constructed to include the following elements: (a) a clear location with well defined

borders; (b) comfortable seating and cozy spots for privacy; (c) accessible, organized

materials; and (d) related activities that extended whole- and small-group book activities.

Morrow and Weinstein found that the frequency of use rose significantly when library

corners were made more visibly accessible and attractive. Similarly in a large-scale study

in 500 child care settings (Neuman, 1999), library settings were created to "put books in

children's hands." Observations indicated that children spent significantly more time

interacting with books when they were placed in close proximity to children's play

activities.

Consequently, there is clear and abundant evidence that certain design features in

environments support young children's literacy engagement and subsequent achievement.

Physical design features, uses of space, and resources, may help to focus and sustain

children's activity, providing greater opportunity to engage in language and literacy

behaviors. This research indicates, therefore, that a more deliberate approach to the

selection and arrangement of materials, according to specific design criteria, may enhance children's uses of literacy objects and related print resources.

Interactional Supports for Literacy Learning. Environments include not only physical settings but psychological settings for literacy learning as well (Tharp & Gallimore, 1988). Children are influenced by the participants present in a setting, their background experiences, and their values, and it is the integration of place, people, and occasion that support opportunities for learning. These individuals act as social and psychological resources that provide information and feedback through demonstrations and interactions. From a Vygotskian perspective (Vygotsky, 1978), the participants in the setting have the potential to help children perform at a higher level than they would be able to by interacting with their physical environment alone. It is the contrast between assisted and unassisted performance that differentiates learning from development.

A great corpus of research (Neuman & Dickinson, 2001; Dickinson & Neuman, 2006) identifies the types of supports that promote children's language and literacy development. Essentially, they highlight both instructional and relational components. Since language represents the foundational basis for literacy learning in the early years, there is evidence that the amount of verbal input in settings enhances children's language development (Hart & Risley, 1995; Hoff-Ginsberg, 1991). Children whose teachers engage them in rich dialogues have higher scores on tests of both verbal and general ability (Whitehurst et al., 1988). This is especially the case when discussions consist of teachers encouraging, questioning, predicting and guiding children's exploration and problem-solving (Palinscar, Brown, & Campione, 1993). Such verbal interactions

contribute to children's vocabulary growth which, in turn, is strongly correlated with phonological awareness, comprehension, and subsequent reading achievement.

Teachers also engage in activities that are highly supportive of literacy development. Reading stories to children on a regular basis is regarded as one of the more potent supports for literacy learning (Snow, Burns, & Griffin, 1998). Studies (Dickinson & Smith, 1994) have shown that a teacher's style or approach to reading storybooks to children impacts their language and literacy development. Shared book reading activities, such as dialogic reading (Whitehurst et al., 1988), and repeated readings (Morrow, 1988) have been widely studied and identified as an important source of knowledge about vocabulary, about letters, and about the characteristics of written language.

Teachers attention to and support of emergent writing (Neuman, et al., 2007), as well, has also been shown to strongly connect with children's developing phonological awareness, phonemic awareness, and readiness skills. Activities that involve 'driting (drawing and writing), and teacher scaffolding help to build the alphabetic principle (Adams, 1990)--the insight that letters and sounds are integrally connected. Further, teachers' interactions in literacy-related play have been shown to relate to children's length of utterances, and sustainability in play themes (Neuman & Roskos, 1992). Taken together, activities that engage children in reading, writing, talking, and playing create occasions for meaningful communicative interactions involving language and print.

This research highlights the central role of the caregiver who evokes children's interest and engagement in literacy learning. According to Bus, Van Ijzendoorn, and Pellegrini (1995), children build a mental representation of their interactions with

caregivers that influence their expectations, and responses to activities. When children feel secure, they engage in learning; when insecure in situations, they may use digressive tactics to avoid activity. For example, in a cross-sectional study of interactive reading with 18-, 32-, and 66-month children, Bus and van Ijzendoorn (1995) found that the atmosphere surrounding book reading was more positive among securely attached caregiver-child dyads than anxiously attached dyads. For securely attached children, book reading was an ultimately an enjoyable task, tied to learning improvement; for insecure children, it was negative, with caregivers often using verbal and nonverbal cues to discipline behavior.

Other studies (Hamre & Pianta, 2005; Miles & Stipek, 2006; Pianta, La Paro, Payne, Cox, & Bradley, 2002), as well, support the linkage between children emotional security and cognitive activity. In child care settings rich with creative play activities and staffed by teachers who provide children with emotional security, Howes and Smith (1995) report that children not only thrive socially but cognitively as well. Similarly Peisner-Feinberg and her colleagues (Peisner-Feinberg et al., 2001) found that the influence of close attachment between caregivers and children yielded even stronger positive effects for children from disadvantaged backgrounds. Recent studies (Hamre & Pianta, 2005) have shown that these emotional supports may have important moderating effects during the elementary school years as well.

From an ecological perspective, therefore, the physical and psychological environment plays a vital role in children's learning about literacy. These supports mediate opportunities for literacy engagement, and practice, and will likely influence

children's attitudes and efforts to engage in literacy activities despite difficulties they may encounter as they get older in learning to read.

Building on the work of extant measures, and the research evidence on language and literacy development, CHELLO was designed to measure the quality of the language and literacy environmental supports in home-based care settings. It was developed to gauge the quality of current practices strongly associated with positive literacy outcomes as well as to measure improvements of practices over time. With these considerations in mind, the purpose of this study was to (a) describe the development and validation of the CHELLO; and (b) examine its psychometric properties. Given such evidence, the CHELLO could become a highly useful tool to better understand the quality of language and literacy environments in home-based care settings.

Method

Study 1: Initial Phase of Development

Sample

Ten home-based providers were selected to participate in the first phase of instrument development. Referred by the local resource and referral agency, each was considered to be an exemplary home-based provider. Recognizing that the provision of high-quality family/group child care is a skilled occupation requiring specific skills, intentions, and knowledge (Doherty, Forer, Lero, Goelman, & LaGrange, 2006; Kontos, 1992), our goal was to better understand how language and literacy environments in quality home-care settings might differ from classroom-based practices.

Based on the literature in family day care, we reasoned that while space might be at a premium, caregivers might use their physical environment for multiple purposes to engage children in activities that might be appropriate for a range of different developmental interests, and needs. Our purpose, therefore, was to observe how providers might use their environment to support these early language and literacy experiences.

Procedures

From the review of the literature as well as extant measures (e.g. the observational categories from the ELLCO), we outlined a set of physical environmental characteristics and caregiver behaviors associated with positive literacy outcomes. On the basis of this initial protocol, two-hour observations were scheduled with each provider. The purpose of our observations was to gather in-depth, contextually specific examples and descriptors of how home-based caregivers used the environment, how they might provide teaching supports and how they seemed to plan activities based on multiple-aged children's interests. Simultaneously, our observations were also designed to capture additional dimensions of literacy-related activity or behaviors that might not have been considered when establishing these pre-selected characteristics.

Non-participant observations were used to guide the collection of data. With caregiver permission, throughout the observations, we took pictures, made drawings of environmental features, and recorded interactions that related to literacy engagement. Following our observations, we conducted informal conversations to elicit further information on any additional dimensions of the environment that needed to be considered. Observations and conversations revealed that caregivers were highly

intentional in the way they used space and materials, in the ways they supported children's learning, in their approaches to teaching, and opportunities for children to engage in language and literacy learning.

Item Development

Based on a structure developed by the ELLCO (Smith & Dickinson, 2002), items were constructed to examine the physical environment, supports for learning, and teaching strategies. We developed two interdependent tools: The Literacy Environment Checklist; and the Group/Family and Provider Interview.

The Literacy Environment Checklist: Focused exclusively on the physical environment, the checklist was designed to examine the availability, condition, and materials for children's language and literacy uses. It measures five components of the environment: the book area (four items); book use (six items); writing materials (six items), educational toys (three items), and technology (three items). Designed to take less than ten minutes, the checklist records the presence or absence of 22 items in the environment.

Observers score items on a dichotomous (yes=1; no=0) scale (with the exception of three 3-point scaled items). Items are added up to derive a total score ranging from 0-26.

Group/Family Observation Subscales. The Group/Family Observation section of the CHELLO is organized across a set of 13 observational components in three subscales. Observational components of the CHELLO examine: (1) Physical Environment for Learning (three ratings); (2) Support for Learning (three ratings) and (3) Teaching

Strategies (seven ratings).   Within each observational rating, there are three to four items that are scored to provide more detailed descriptions of each of the components (see Appendix for example).

The Physical Environment for Learning subscale captures the extent to which the environment supports children's learning. It examines the organization of the environment, accessibility of materials, and daily routines that provide both structure and choice. These design features, in addition to the use of time, space, and resources, are known to relate to children's engagement in language and literacy behaviors.

The Support for Learning subscale examines the relationship between the provider and the child and the quality of interactions. Observational ratings include adult affect, adult-child interactions and adult control behaviors, recognizing the important linkages between children emotional security and cognitive activity (Pianta et al., 2002). Close emotional attachments between caregivers and children have been shown to strongly influence social, cognitive development, and language and literacy learning.

The Teaching Strategies subscale measures the extent to which providers make use of effective instructional and support strategies to enhance children's language and literacy development. It examines seven features of teaching: Vocabulary Building; Responsive Strategies; Use of Print; Storybook/storytelling Activities; Writing Activities; Progress-monitoring; and Family Support and Interaction. As noted in the research literature above, verbal interactions, interactive book reading activities, opportunities to engage in developmental writing, and parental involvement mediate opportunities for literacy engagement and are known to influence literacy outcomes.

These observational ratings are examined using a 1 (deficient) to 5 (exemplary) scale. Rubrics were first developed for exemplary categories (indicated by a score of 5) using examples from the literature and exemplary practices among family caregivers, followed by basic (3) ratings indicating some evidence; and deficient (1) ratings, representing minimal to no evidence of the practice.

Augmenting the Group/Family Observation section is a Provider Interview (see Appendix). Here, there are six questions that seek to elicit information relate to the Observation scale that may not have been evident throughout the observation. Consequently, almost every provider question is cross-referenced to specific items on the scale. For example, "How do you communicate with the children's families?" is designed to provide information for items on Family Support and Interaction. The interview might reveal that the provider sends home a weekly newsletter with strategies for promoting children's language and literacy activities, or schedules home visits with families. After recording the responses, observers are asked to fill in gaps on the observation scales.

<u>Scoring of Observation Subscales</u>. Each item is rated on a 1 to 5 scale with rubric descriptions anchored at odd numbers (1, 3, and 5). An average score is derived by adding items and dividing by the number of items for each of the 13 observational ratings. Scores are calculated for each section: The Physical Environment; Support for Learning; and Adult Teaching Strategies. An overall CHELLO score is derived by adding the Literacy Environment Checklist score and the Group/Family Observation Score together, for a total possible score of 91.

<u>Piloting and Revision</u>

Home-based providers from our observations reviewed the instrument for accuracy, clarity, and inclusiveness and provided detailed written comments. Simultaneously, the instrument was disseminated to directors of four local resource and referral agencies for feedback and comments. This feedback was used to clarify and revise items. Subsequently, the authors then each piloted the revised instrument in three family day care settings in three cities to refine the instructions and descriptors, and to determine the approximate length of the observation.

Results

Observational reports, feedback, and provider comments from these pilot sites were reviewed collectively by authors. Minor refinements were made to indicators on the Group/Family Observation, and to probes on the Provider Interview. Pilot testing revealed that the Literacy Environment Checklist took approximately 10-12 minutes to complete, while the Group/Family Observation, followed by the Provider Interview, approximately 1 to 1½ hours. In total, CHELLO was projected to take about 2 hours to administer.

Study 2: Field-Testing of CHELLO

The purpose of this study was to field-test the CHELLO in home-based settings to examine the reliability and validity of this observational tool for measuring the "print richness" of home-based settings.

Sample

The sample included 128 home-based care settings in four urban communities: Detroit, Flint, Grand Rapids, and Lansing. These family-group child care settings were recruited by the local resource and referral agency as part of a larger study on

professional development directed by the first author. The sample represented settings in

high priority areas of concentrated poverty and in catchment areas of low school

achievement.

Center providers were all female. Over half of the providers (58 percent) were

Caucasian; 37 percent African-American, 4 percent Hispanic, and 1 percent, Asian.

Nearly half (46 percent) had a high school degree or less, 31 percent had taken some

early childhood classes, 17 percent had earned a Child Development Associates degree, 6

percent had taken non-credit coursework, and 7 percent had a bachelor's degree in an

area outside of education. None of the caregivers had a state-earned specialization in

early childhood. Providers' average age was 39. Approximately half of the sample had

worked in child care 11 years or more; and the other half between 5-10 years.

Procedures

Using trained observers, a sample of home-based settings was observed in early

fall, 2005 to establish the inter-reliability the CHELLO. Training for the observers

involved a full-day seminar. To become certified, observers had to give the same score

for at least 80 percent of items from videotapes of segments from home-based settings,

the remaining items had to be coded within one score of the lead trainer.

Following the analysis of inter-relater reliability, 20 observers were trained, and

certified. These observers were dispatched to observe the entire sample of 128 home-

care providers. For their first three observations, a novice observer was paired with a

previously certified observer. Well after data collection had begun, observers coded

several care settings in pairs, and their agreement was checked to ensure that there was no

slippage in reliability. Data collection was completed across the four cities over a six

week period in late fall.

Results

In these analyses, we report on the inter-rater reliability, and internal consistency of

the CHELLO, as well as the correlations among the interdependent tools.

Inter-rater reliability. To establish inter-rater reliability, observers independently

rated 30 home-based settings in pairs. Cohen's kappa statistic (Cohen, 1960; 1968) was

used to calculate reliability. This approach for calculating reliability is recommended to

estimate the degree of consensus between two judges after correcting the percent-

agreement figure for the amount of agreement that could be expected by chance alone. In

other words, the kappa is the proportion of agreement after chance agreement has been

excluded. The kappa has also been typically considered a more conservative estimate of

inter-rater reliability, and hence, tends to under-estimate item agreement (DiEugenio &

Glass, 2004).

However, kappa does not take into account the degree of disagreement between

observers, and all disagreement is treated equally as total disagreement. Therefore, it is

preferable to use weighted kappa to allow for degrees of agreement rather than simple

agree/disagree classification (Sims & Wright, 2005). This indicator assigns different

weights to subjects for whom the raters differ by so that different levels of agreement can

contribute to the value of kappa.

In the case of CHELLO, weighted kappas were calculated separately for the

Literacy Environment Checklist and the Group/Family Observation because the scores of

these two sections are not on the same measurement scale. For the Literacy Environment

Checklist, the weighted kappa was highly substantial at 0.84. Inter-rater reliability for the

Group/Family Observation was moderately high with a weighted kappa of 0.54.

Landis and Koch (1977) suggest that kappa values from 0.41-0.60 are moderate,

and that values above 0.60 are substantial. Consequently, given that the kappa statistic

for the Literacy Environment Checklist was well above the 0.60 level, and the

Group/Family Observation approached the substantial figure, the results indicate an

acceptable level of inter-rater reliability.

Internal Consistency. Using the full administration of the CHELLO for all 128

home-based settings, we then examined the internal consistency of the instrument.

Internal consistency measures the degree to which the tool and the subscales within them

appear to measure a common construct.

We recognized, however, that although coefficient alpha is used considerably in

the field, it is not ideal for environmental measures. Ideally, alpha is designed for

measures that contain effect not cause indicators. As Bollen (2002) cautions, indicators

may group together for many reasons (e.g. number of books; condition of books), some

of which may have little to do with presumed outcomes.

However, coefficient alpha can provide useful information on whether indicators

are connected to one another, and in this respect, help to support the selection of

indicators based on our theoretical principles and previous research. With these

considerations, therefore, we examined these measures using Cronbach's alpha,

analyzing each tool separately.

Literacy Environment Checklist. Table 1 reports descriptive statistics for the

sample of home-based providers. Subscales, by and large, were within average ranges,

with the exception of toys. In this instance, there was clearly a ceiling effect: All care settings had at least some cognitively stimulating toys.

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Insert Table 1 about here

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To examine the internal consistency of the Checklist, we created three summary variables: the Books subtotal included items from the Book Area and Book Use sections; the Writing subtotal included items from Writing Materials and Writing around the Room; and a Total score. The toy and technology sections were excluded in this analysis since both sections are each made up of only three items. Our rationale for exclusion of these section rests with the formula for Cronbach's alpha. The formula takes into account both the number of items within a scale/section as well as the correlations between these items in order to calculate uni-dimensionality. The fewer number of items, the less reliable a scale will be, even if there is a high estimated correlation between the individual items. However, these items are included in the Total score.

Table 2 shows the alphas for the subtotals as well as the total score. Cronbach's alpha for the total score shows good internal consistency (α= .78). All item-total correlations were moderate to high (r=.28 to r=. 43). (Item total correlations are not included here due to space considerations).

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Cronbach's alpha of .76 showed good internal consistency for the Books subtotal. Item-total correlations ranged from a moderate (r= .31) for Item 5 in the Book Use section ("Are books located throughout the setting?") to a high (r=.78) for Item 1 in the Book Area section ("Is an area set aside just for book reading?").

Cronbach's alpha for the Writing subtotal was .67, which is somewhat low but still within an acceptable range of internal consistency. Item-total correlations were moderate (r= .39) ("Is there an alphabet in children's eye view?") to high (r= .78) ("Is there a place set aside for writing?").

Overall, the Literacy Environment Checklist reflected good internal consistency (r=.78), indicating that items appeared to measure a common set of characteristics in the physical environment.

Group/Family Observation. Table 3 reports descriptive statistics for the Group/Family Observation. Most of the scores were in the average range, with the exception of the Uses of Print, and Progress-monitoring strategies. In both cases, scores approached a floor effect. In these home settings, providers showed limited evidence of using print to label parts of the environment, or print for functional purposes, including literacy-related props, books, or signs. Similarly, there was minimal evidence of documentation for monitoring children's progress and development through observations, narratives, or portfolios.

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Table 3 about here

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Based on the theoretical assumptions and related research on which the instrument was constructed, we created three summary variables for the Group/Family Observation: The Physical Environment for Learning, Support for Learning, and Adult Teaching Strategies.

Table 4 reports the internal consistency obtained for the Group/Family Observation. Cronbach's alpha of .91 for the Physical environment for Learning showed good internal consistency for this composite. All item-total correlations were high—with correlation coefficients ranging from .57 indicating the degree to which children had sufficient time for self-directed activities and independent explorations to .86, whether the environment was intentionally organized with cognitively stimulating interest areas that support language and literacy development.

Insert Table 4 about here

Similarly, the internal consistency was high for the other two composites, Supports for Learning, and Adult Teaching Strategies with .92 and .93, respectively. All item-total correlations for Supports for Learning were substantial, ranging from .66 (evidence for bringing the home culture and language into the setting), to a high of .85 (the degree to which providers regularly give children opportunities to initiate and actively influence verbal exchanges).

Item-total correlations for Adult Teaching Strategies were moderate to high (r= .41 to r= .80). Moderate correlations were reported for providers acknowledging

children's accomplishments with special comments (r= .49), and using print to label objects in the room (r= .41) to high correlations that encouraged children to use language (.80), engage in representational thinking (r= .75) for genuine purposes (r= .76).

Cronbach's alpha of .96 shows very good internal consistency for all items combined on the Group/Family Observation. All item-total correlations for the Group/Family Observation were moderate to high (r=.55 to r= .80). Overall, these data indicate moderate to high internal consistency for items on the Literacy Environment Checklist (α= .78) and the Group/Family Observation (α= .96).

In sum, although these results do not represent reliability per se, they do indicate that these scales appear to logically cluster around a common set of characteristics associated with the research in language and literacy.

Correlations Among the Interdependent Tools.

In Table 5, we report correlations among the two measures that constitute the CHELLO instrument. In this analysis, the variables include the two subscales from the Literacy Environment Checklist, Books and Writing, and the three summary variables from the Group/Family Observation.

Books and Writing subtotals were moderately correlated with each of the summary variables in the Observation. Highest correlations were between the Physical Environment for Learning and Books and Writing (r= .60 and r= .47, respectively); the lowest correlation, though still significant, was between the Support for Learning and Writing (r=.20).

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Insert Table 5 about here

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 Correlations indicated that the two tools were related: Total scores for the Literacy Environment were significantly correlated with each summary score on the Observation (r=.67, r= .33, and r= .47 respectively for the Physical Environment for Learning, Support for Learning, and Teaching Strategies). Total scores of the Literacy Environment and the Group/Family Observation were correlated (r=.52). This moderate correlation provides support for the fact that the two tools, while complementary, may be measuring somewhat different aspects of the environment, and should be examined separately.

Discussion

The Child/Home Environmental Language and Literacy Observation (CHELLO) was designed to measure one aspect of home-based care: The quality of the language and literacy environment. Based on a convergence of research on the ecological and psychological factors associated with early literacy development, the tool was created to examine the physical environment, and the instructional and affective supports for literacy learning in home-base settings. Using the structure of the ELLCO-a widely used measure of language and literacy environments for center-based care-we constructed two interdependent tools to examine the unique characteristics and quality supports for literacy learning that occur in home-based care.

As a result of observing, piloting, and gaining feedback from home caregivers, as well as directors in resource and referrals agencies in several cities, we feel confident that the CHELLO has content validity, and may accurately represent language and literacy

practices in these settings. In this respect, it represents an extension of previously designed instruments that have been able to examine the physical environmental factors associated with literacy learning (e.g. books in the environment) to examine the more interactional (e.g. responsive language), and affective supports (e.g. adult affect) that are critically related to children's language and literacy development.

Further, evidence from our analyses indicated that it was possible to reliably observe these characteristics and supports within a reasonable amount of time, approximately 1 ½ to 2 hours. Reliability was predicated on the training of observers in a day-long seminar, with sufficient video examples to ensure appropriate calibration to the rubrics throughout the instrument. Subsequent uses of the instrument, like all observational measures, require the appropriate training of observers who are well-versed in early literacy and early childhood.

Analyses of the internal consistency among items on both the Literacy Environmental Checklist and the Observation indicated moderate to strong correlations. Although there were two items that demonstrated a floor effect (Progress Monitoring, and Uses of Print in the Environment) and one item, a ceiling effect (Cognitively Stimulating Toys), most items demonstrated adequate range and variability. Further, total scores on the Literacy Environment and Group/Family Observation tools were moderately to strongly related, providing some support for the fact that these instruments tapped somewhat different aspects of the environment which can be analyzed separately. At the same time, it also indicated their interdependence in assessing the language and literacy environment.

There is still much work to be done, however, to determine the utility and reliability of CHELLO. Although the internal consistency among the items was substantial, we were unable to carry out a factor analysis due to the sample size, which would have been a preferred way to demonstrate the structural validity of the measure. To assess reliability of the measure, short-term test-retest still needs to be accomplished. In addition, further research is needed to examine its potential relationship with well-established measures in the field, such as the Family Day Care Rating Scale (FDCRS) (Harms et al., 2007), to better understand how the language and literacy environment might relate to the overall quality of home-based care.

Possibly the most important test of the tool awaits further analyses: To evaluate the quality of the language and literacy supports in the home with its capacity to predict children's literacy development. Given that children in many of these settings are in multiple care arrangements, this analysis must be conducted with care, recognizing the wide variations in attendance patterns in home-based care. Some of the children in our study, for example, combined pre-K and home-based care; in other cases, children attended as many as 12 hours per day.

Although the development and validation of the CHELLO was based on the extant literature, experiences of exemplary teaching, and feedback from supervisors in the field, our analysis was confined to home-based settings in high poverty communities. Further research is needed, therefore, to examine its application to a wider variety of community settings, and its sensitivity to tap quality language and literacy environments that might occur in moderate to higher-income areas. In addition, our analysis was restricted to paid family and group care, and not the broader context of kith and kin.

Given the enormous numbers of children in kith and kin care (Kids Count Data Book, 2005) it is essential to collect additional evidence of its validity and reliability in more informal care settings.

Further research will be needed to determine the utility of the instrument in helping supervisors in home-based programs, as well as its potential for family literacy programs and community-based agencies to examine, evaluate, and improve environmental changes in home-based child care settings. Such an instrument might prove highly useful in quantifying the effects that varying degrees of professional development or other interventions might have on improving practices and ultimately child outcomes.

Nationally, approximately 1.5 million children under age six are receiving their care exclusively in home-based settings, with an additional five million splitting their time between these and other arrangements (Kids Count Data Book, 2005). Despite these sizable numbers and the nation's concern that all children come to school ready to learn, there have been strikingly few organized efforts (Doherty et al., 2006) to improve and enhance the quality of the care these settings deliver. Measuring the quality of the language and literacy environment, therefore, represents an initial but an important first step in strengthening and reinforcing their effectiveness, and in providing greater opportunities for children—particularly those who come from low-income circumstances—to achieve the language and literacy skills they will need to succeed in school.

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Table 1

Descriptive Statistics for Literacy Environmental Checklist

Variable	Mean	S.D.	Minimum	Maximum
Book area	2.45	1.58	0	5
Book Use	5.83	1.93	0	9
Writing Area	2.27	1.40	0	5
Toys	2.79	.48	1	3
Technology	1.60	.92	0	3
Total	14.92	4.34	3	24

Table 2

Cronbach's alpha for the Literacy Environment Checklist (N=128)

Composite Variable	No. of items	Alpha
Books Subtotal	10	.782
Writing Subtotal	6	.687
Literacy Environment Checklist	22	.824
Total Score		

Table 3 *Descriptive Statistics for the Group/Family Observation*

Variable	Mean	S.D.	Minimum	Maximum
Physical Environment for Learning				
Organization of the Environment	2.81	.99	1	5
Materials in the Environment	2.93	1.00	1	5
Daily Schedule	2.91	.89	1	5
Support for Learning				
Adult Affect	3.53	.86	1.67	5
Adult/child interaction	3.36	.92	1.50	5
Adult Control Behaviors	3.16	.94	1	5
Teaching Strategies				
Vocabulary Building	2.63	1.09	1	5
Responsive Strategies	3.25	.89	1	5
Use of Print	1.66	.89	1	5
Storytelling/Storybook Reading	2.67	.94	1	5
Writing Activities	2.34	1.04	1	5

Progress Monitoring	1.88	.93	1	5
Family Support and Interaction	3.26	1.09	1	5
Total	48.93	12.19	24.92	81.83

Table 4

Cronbach's alpha for Group/ Family Observation data (N=128)

Composite Variable	**No. of items**	**Alpha**
Physical Environment for Learning subtotal	11	.909
Support for Learning subtotal	10	.903
Adult Teaching Strategies subtotal	22	.938
Group/ Family Observation score	43	.965

Table 5

Correlations of-CHELLO subscales (N=128)

Composite Variable	Literacy Environment Checklist					Group/ Family Observation	
	Books	*Writing*	*Total*	*Physical Environment*	*Support for Learning*	*Adult Teaching Strategies*	*Total*
Literacy Environment Checklist: *Books*	-	-	-	.60*	.30*	.41*	.44*
Literacy Environment Checklist: *Writing*	-	-	-	.46*	.20*	.32*	.41*
Literacy Environment Checklist Total	-	-	-	.67*	.33*	.47*	.52*
Group/ Family Observation: *Physical Environment for*	.68*	.61*	.75*	-	-	-	-

Learning

Group/ Family Observation:	.40*	.33*	.47*	-	-	-	-

Support for Learning

Group/ Family Observation:	.66*	.58*	.72*	-	-	-	-

Adult Teaching Strategies

Group/ Family Observation Total	.67*	.58*	.74*	-	-	-	-

*Statistically significant

Appendix A: Sample Items on the CHELLO*

Literacy Checklist

I. BOOK AREA

1. Is an area set aside for book reading?
   If there is no book area, move to Section II.

Dedicated book area	Area <u>shared</u> with other materials	No area
2	1	0

2. Is the book area orderly and inviting?
   For example, the books are organized and displayed on a bookshelf or bookcase.

Yes	No
1	0

3. Is the book area comfortable?
   For example, there are items like pillows, cushions, or soft materials in the area so that children can look at books comfortably.

Yes	No
1	0

4. Are books in the book area easily accessible to children?
   For example, children can reach books on their own, without adult assistance.

Yes	No
1	0

BOOK AREA TOTAL: _____

Provider Interview:

How do you view your role with the children? If you could use one word to describe your relation to the children, what would that be? (Related to Classroom Observation Elements: II.1, II.2, II.3, III.2)
Probe: Do you see your primary role as provider? Nurturer? Helper? What special strengths do you bring to this role?

Group/Family Observation

I. The Physical Environment for Learning

	5 4 Exemplary	3 2 Basic	1 Deficient
1. Organization of the Environment	There is **strong** evidence of an intentional approach to the organization of the physical environment.	There is **some** evidence of an intentional approach to the organization of the physical environment.	There is **minimal** evidence of an intentional approach to the organization of the physical environment.
Evidence: *Status and organization of furnishings, observations of traffic flow, activities and materials available to children.* **Notes:**	a. *Environment is clean, and in good repair with adequate lighting, space, and temperature control.* b. *Environment is intentionally organized with cognitively stimulating interest areas that support language and literacy development.* c. *Furnishings are child-oriented, and age appropriate.* d. *Space is available for children to engage in active learning and movement as well as for quiet reflection and relaxation.*	a. *Environment is mostly clean, and in good repair with adequate lighting, space, and temperature control.* b. *Environment is for the most part intentionally organized with cognitively stimulating interest areas that support language and literacy development.* c. *Some furnishings are child-oriented, and age appropriate.* d. *Some reorganization of space may be needed to better allow children to engage in active learning and movement or for quiet reflection and relaxation.*	a. *Environment is not as clean as would be appropriate for children. Some furnishings may require repair and there is inadequate lighting, and temperature control.* b. *Environment is not organized with cognitively stimulating interest areas appropriate to the ages of children served by the provider (i.e. writing table, toy rack).* c. *Furnishings do not appear to be child-oriented, and age appropriate.* d. *The room may be too barren or crowded for children to engage in active learning and movement or for quiet reflection and relaxation.*

*CHELLO may be purchased through Paul H. Brookes Publishers, Baltimore MD.