
ENVIRONMENTALLY BASED ASSESSMENT PRACTICES: VIABLE ALTERNATIVES TO STANDARDIZED ASSESSMENT FOR ASSESSING EMERGENT LITERACY SKILLS IN YOUNG CHILDREN

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Ecological validity is an important construct in the assessment of young children. The argument is made that using environmentally based assessment practices as well as understanding the child's ecology will help assure that assessments are carried out in an ecologically valid manner. The discussion focuses on play-based assessment, curriculum-based assessment, and dynamic assessment. Each of these approaches is based on authentic procedures and is typically carried out in the child's natural environment. In addition, there is a discussion of how specific environments can be delineated as well as stressing the importance of developing operational definitions of specific skills in the natural environment.

Over the past quarter-century, researchers and practitioners of assessment have increasingly come to realize the need to consider factors external to the child being assessed. Carlson, Scott, and Eklund (1980) noted that in addition to conducting accurate and valid evaluations of behavior, practitioners of assessment should also be able to interpret their results within a child's broader sociocultural

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context. They argued that those involved in assessment must therefore broaden the scope of their knowledge and practice beyond commonly used standardized or norm-based assessment measures. Furthermore, they should employ techniques enabling the examination of the impact of children's relationships to the broader contexts in which they function on their behavior.

Groth-Marnat (2000) notes that the traditional standardized and/or psychometric measures used in assessment are often of limited practical utility, as they seldom mirror the demands of everyday situations. He points out that despite a lack of research linking such measures to performance in activities of daily living, including work, education, and recreation, performance in these areas is often predicted using these measures. Arguing that "a clear agenda for clinical assessment would be to continue making further efforts to enhance the ecological validity of instruments," Groth-Marnat predicts that consideration of ecological validity, among other factors, may challenge the dominance of norm-referenced assessment instruments in the future (p. 357).

An environmentally based approach to assessment differs significantly from that embodied by the majority of norm-referenced assessment instruments that are designed to obtain samples of performance or behavior without regard for the context in which the performance is elicited. A comprehensive ecological approach to assessment, on the other hand, views the child as one part of a larger interactive and reciprocal system in which the child exerts influence on, and is in return influenced by, various factors in the environment.

According to Schmuckler (2001), ecological validity has been a concern of psychologists since the early 1940s (Brunswik, 1943; Lewin, 1943). Early discussions of ecological validity focused mainly on its implications for psychological research, with concerns raised over "the environmental context of...research and the impact that [a particular] setting had on the study" being conducted (Schmuckler, 2001, p. 420). Since that time, the nature of the stimuli and settings used in laboratory research and their potential impact on the generalizability of that research have received considerable attention. The many areas of psychological research in which issues of ecological validity and generalizability have been raised and addressed include perceptual development (Gibson, 1991; Neisser, 1976), mental retardation (Brooks & Baumeister, 1977), and children's ability to serve as witnesses (Ceci, 1991; Loftus & Ceci, 1991).

At present, our concern lies not with the ecological validity of laboratory research, but rather with that of the assessment techniques

commonly used with children. Assessment of children's functioning in a variety of areas, including the cognitive, preacademic and academic, socioemotional, and behavioral domains, is often conducted in situations that bear little resemblance to the natural environments in which they function. Several authors (Chaytor & Schmitter-Edgecombe, 2003; Spooner & Pachana, 2006; Wood & Lioffi, 2006) have recently suggested the importance of ecological validity in the conduct of neuropsychological assessment. We would assert that ecological validity is equally important in the assessment of young children, and that environmentally based assessment approaches provide a meaningful strategy for helping to assure ecological validity. The full extent to which this may impact the external validity of these assessment methods is unknown. A recent review by Chaytor and Schmitter-Edgecombe (2003) suggests that in the case of individuals with central nervous system lesions, the data obtained from assessments conducted in isolated testing situations may not be particularly strong predictors of a person's ability to carry out activities of daily living in their natural environments. They suggest that the verisimilitude or appearance of truth of an assessment instrument is of clinical importance in the determination of cognitive functioning. In this context, verisimilitude can be seen as the extent to which the cognitive demands in the testing situation are similar to the cognitive demands in a natural environment (Franzen & Wilhelm, 1996).

The purpose of this article is to examine the use of environmentally based assessment methods to assess the skills and cognitive abilities shown in young children to predict later literacy competence. We believe that such an approach addresses the verisimilitude of the data used to determine a child's pre-literacy skills and abilities as well as establishes a firmer basis for an ecological validity of their assessment.

PREDICTION OF LITERARY COMPETENCE

To put this discussion into context, it is important to briefly discuss several variables that have consistently been shown to predict later literacy competence. According to Byrnes (2001), these variables include letter knowledge (alphabetic awareness), awareness of print, phonemic or phonological awareness, and oral language skills. *Letter knowledge* refers to a child's ability to recognize, distinguish among, and name the letters of the alphabet. Several authors (Adams, 1990; Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 1998) have

indicated that this ability, which is typically moderately correlated with early reading skills, can be used as a predictor of early reading achievement. Like letter knowledge, *awareness of print* predicts early reading achievement, and as with letter knowledge, moderate correlations tend to be found between these two variables (Snow et al., 1998). Awareness of print refers to a child's ability to recognize that books are read from front to back and (in Western languages) from left to right, and that written words have meaning (Strickland & Schickedanz, 2004). *Phonemic* or *phonological awareness* involves the ability to hear and discriminate sounds associated with a particular language, and includes "the general ability to attend to sounds of language as distinct from its meaning, noticing similarities between words and their sounds, enjoying rhymes, counting syllables and so forth" (Snow et al., 1998, p. 52). Typically, studies examining the relationship between phonemic awareness and reading achievement have found a significant correlation (approximately $r = .42$) between the two variables (e.g., Adams, 1990; Snow et al., 1998; Tunmer, Herriman, & Nesdale, 1988; Vellutino & Scanlon, 1991). Given the strength of this correlation, much of the literature on reading interventions to date has focused primarily on improving ability in this area. *Oral language* refers to abilities such as naming pictures, reconstructing what has previously been said, and using words to effectively communicate one's thoughts. Generally, expressive language abilities are more predictive of reading achievement than receptive abilities (Byrnes, 2001).

Several of the variables discussed above have traditionally been assessed using a variety of norm-referenced, standardized instruments. For example, many standardized measures of pre-academic concepts and academic achievement either contain specific letter-naming subtests (e.g., the Bracken Basic Concepts Scale—Revised [BBCS-R; see Bracken, 1998]) or incorporate letter naming tasks into the initial stages of word recognition subtests (e.g., the Woodcock-Johnson Tests of Achievement, third edition [WJ-III; see Woodcock, McGrew, & Mather, 2001]; the Wechsler Individual Achievement Test, second edition [WIAT-II; see The Psychological Corporation, 2001]). Similarly, a wide variety of tests attempt to assess phonemic or phonological awareness skills; among the most commonly used of these instruments is the Comprehensive Test of Phonological Processing (CTOPP; see Wagner, Torgesen, & Rashotte, 1999), which contains a variety of tasks measuring the various components of phonological processing ability, including word and non-word blending and segmenting skills, phonological memory, and rapid naming ability. A variety of specific tests, such as the Oral and Written

Language Scales (OWLS; Carrow-Woolfolk, 1996) enable the assessment of expressive and receptive language skills; additionally, a number of comprehensive cognitive and achievement batteries that are normed for use with young children include measures of oral language skills, including the Wechsler Preschool and Primary Scale of Intelligence, third edition (WPPSI-III; The Psychological Corporation, 2002), the WJ-III, and the WIAT-II.

While we believe that standardized assessment methods are certainly useful in making normative comparisons between children and their peers, it is important to remember that these approaches do not always provide comprehensive measures of children's level of functioning; rather, they provide samples of behavior that are likely to be limited in scope. For example, each of the standardized measures of letter-naming skills referenced above utilizes only a subset of the 46 upper- and lower-case English-language letters. Similarly, the task demands of oral language tests or subscales are likely to be limited, requiring only brief (often one-word) responses to stimuli rather than more lengthy statements.

While researchers continue to disagree on the extent to which standardized measures of cognitive and academic abilities are useful in predicting later academic performance, a number of studies have indicated that, when compared against other predictor variables in multiple regression analyses, standardized cognitive test scores often account for greater portions of achievement variance than do other factors, such as teacher ratings or academic self-concept (Eaves, Williams, Winchester, & Darch, 1994; Schicke & Fagan, 1994). However, it must be noted again that such tools do not provide a comprehensive picture of children's functioning in their natural environments and therefore do not provide sufficient information to enable the creation of comprehensive profiles of children's actual skills. This is particularly true when, as previously mentioned, test analogues of the skills being assessed are not representative of the full skill set required in the classroom. Assessment practices that are based in the natural environment, on the other hand, can address these concerns by literally incorporating the environment into the assessment, drawing on materials from a child's curriculum and classroom for use in assessing the development of preacademic and academic skills. Thus, it would seem that incorporating environmentally based assessment techniques into comprehensive evaluations is likely to provide more thorough and ecologically valid profiles of children's functioning, which can in turn be used to design and implement appropriate interventions to remediate areas of need.

ENVIRONMENTALLY BASED ASSESSMENT PRACTICES

Examination of the literature on early childhood assessment reveals that several researchers and theorists have previously described environmentally based approaches to assessment. Most common in the literature are those that are based upon or derived from children's play. These play-based approaches, which were first developed in the 1970s and 1980s (Belsky, Garduque, & Hrncir, 1984; Belsky & Most, 1981; Rubenstein & Howes, 1976; Watson & Fischer, 1977), were initially used primarily in laboratory settings, rather than in classrooms or other natural environmental settings. Typically, these approaches allowed researchers to assess and study cognitive and social development in infants and young children using behavioral coding methods, as well as to examine and understand the children's interaction with social agents in the environment. This early work provided the basis for play-based approaches that were designed for use in early intervention and early childhood settings. Most notable in this regard is the work of Fewell (1986) and Linder (1990).

Fewell (1986) developed the Play Assessment Scale, an assessment measure that uses sets of toys provided by the examiner to the child being assessed in order to elicit a wide range of play skills. As the child plays with the toys, the examiner observes and records the child's responses. In an approach reminiscent of Vygotsky's (1978) scaffolding techniques, both spontaneous and prompted plays are used to assess the child's developmental status. Although play skills are the primary focus of such an assessment, this approach can also provide insight into the child's hand and toy preferences, as well as his/her style of communication. Linder (1990) later built on this approach to assessment, developing a system known as transdisciplinary play-based assessment, or TPBA. In TPBA, as in Fewell's approach, children's abilities and development are assessed through observations of their behaviors during play. The parents and professionals from different disciplines participate in the assessment, both providing and eliciting information about the child's cognitive, socio-emotional, language, and sensorimotor development through their participation. The status of children's development across these domains can provide important information regarding their readiness to acquire preliteracy and early literacy skills. Although not explicitly addressed in theorists' descriptions of these play-based approaches, the theorists' conceptualizations of these approaches do not preclude the use of these techniques to determine the degree to which a child has acquired more academically oriented skills.

Another assessment technique that acknowledges the role that environmental modifications play in shaping performance is that of dynamic assessment. Carol Lidz, one of dynamic assessment's most prolific advocates, notes that dynamic assessment is characterized by its interactive nature (Lidz, 1995). In dynamic assessment, the examiner does not remain detached from and external to the performance being assessed; rather, the examiner "functions as an assessment tool, responding to observations and inferences about the learner and functioning in a way to reveal learning processes and to facilitate change" (Lidz, 1995, p. 144). According to Lidz (1997), dynamic assessment procedures accomplish this through the use of three basic steps:

1. administration of a static pretest to measure baseline performance;
2. implementation of an intervention that draws on the information obtained via the static measure in order to alter performance; and
3. retesting with the static measure to assess both the nature and the degree of any changes in performance after the intervention has been implemented.

In contrasting dynamic and static assessment, Lidz notes that the former attempts to measure active learning processes, while the latter focuses on the product yielded by assessment. In other words, while static or norm-based assessment procedures are results-driven, dynamic assessment examines the process underlying those results. Lidz argues that the focus on process inherent in dynamic assessment gives it value as an assessment technique. This idea is consistent with that of Miller (1994), who argues that assessment should not be viewed as an end in itself, but rather as one step in a process that ultimately leads to increased competency. A similar notion is voiced by Bracken and Walker (1997), who, in describing the role of assessment in preschool settings, note that the true potential of assessment techniques lies not in their ability to provide diagnostic labels for use in classification of children, but rather in their ability to utilize data to guide the provision of appropriate services through the modification of educational environments. Finally, Lidz (1995) cautions against the tendency to view dynamic assessment as a single procedure rather than as a more inclusive method of assessment. She points out that dynamic assessment is more accurately described as an attitude toward assessment than as a specific procedure, and

that a variety of procedures and protocols can be used to achieve its goals.

A number of researchers have argued that while environmentally based or dynamic assessment techniques can provide valuable information about all children, they are particularly well suited for use with individuals whose unique characteristics make the use of standardized or norm-referenced assessment inappropriate. Lopez (1997) states that process assessment using authentic materials (i.e., those actually used in children's academic environments) provides a useful alternative to standardized assessment for students who are bilingual or whose proficiency with the English language is limited. Process assessment, similar to dynamic assessment, is concerned with the way in which a child gains information. Additionally, it has been repeatedly noted that dynamic assessment techniques can be used effectively with individuals with a wide range of disabilities; many of these studies have focused on the use of dynamic assessment with children with autism or other disorders in which communication is impaired, as more traditional psychometric methods are often inappropriate for use with these children (Nigam, 2001; Snell, 2002). More recently, a study conducted by Swanson and Howard (2005) examined whether dynamic assessment techniques contributed unique variance to the prediction of academic achievement in the areas of both reading and mathematics. They found that, in fact, dynamic assessment had unique predictive power for both reading and mathematics achievement beyond that of the psychometric intelligence and working memory tasks that were also administered to subjects as part of the study. Therefore, based on this body of literature, it would seem that dynamic assessment techniques provide valuable information beyond that which can be gained through the use of more traditional assessment measures.

Another assessment approach that is more directly tied to a child's environment is criterion-referenced assessment or its more specific form, curriculum-based measurement (CBM). Rather than relying on normative comparison data, this approach enables direct assessment of the level at which a child has learned to perform a basic academic skill (i.e., at a frustration, instructional, or mastery level) using assessment probes drawn from that child's curriculum. Shinn (2004) refers to this as a "dynamic indicators of basic skills" model of assessment; he notes that, in a CBM approach, the short academic probes used serve as "educational thermometers" that can identify the presence and severity of academic problems without concern for their etiology (p. 675). Implementation of curriculum-based assessment and measurement is best done by requiring children to

demonstrate specific skills under stimulus conditions that are similar to those typically encountered by children as they perform the skill in their day-to-day environment. Doing so enables the assessment of current levels of performance with that material and in that environment, and facilitates both the setting of, and progress toward, individual educational goals for each child using the baseline information. Traditionally, skills to be assessed have been taken directly from the class- or school-specific curricula, or drawn from local or state educational benchmarks. Other, less specific preacademic measures have also been used as the source of criteria for assessment, such as the BRIGANCE Developmental Inventory of Early Development—Revised (Brigance, 1991) and the Hawaii Early Learning Profile (HELP; Parks et al., 1994). More recently, Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Kaminski & Good, 1996) has proven to be both a technically sound and pragmatic method of measuring and monitoring children’s progress in developing phonemic awareness and oral reading fluency skills (Good, Gruba, & Kaminski, 2001). Good et al. (2002) note that DIBELS “was developed to monitor growth in the acquisition of critical early literacy skills to (a) identify children in need of intervention and (b) evaluate the effectiveness of intervention strategies” (p. 701); the approach fulfills these goals by making use of brief, easy-to-administer, and locally normed assessment tasks that measure children’s phonological awareness, alphabetic principle knowledge, and accuracy and fluency rates during oral reading of connected text. Multiple forms of each task are made available in order to facilitate ongoing progress monitoring.

Deno (2003) notes that curriculum-based measurement techniques differ from more general curriculum-based assessment procedures in the following ways:

- they are psychometrically sound;
- they utilize standard task types and specific methods for selection of assessment stimuli, task administration, and scoring; and
- they involve repeated direct observations of equivalent tasks.

In general, the use of CBM also involves the development of local norms, which permit children’s performances on the CBM measures to be measures against those of their local peers, rather than against a larger standardized sample (Elliott & Fuchs, 1997). This approach has been found to be valid and effective for use in assessing academic problems and monitoring the effectiveness of interventions for those

problems (e.g., Fewster & Macmillan, 2002; Stecker & Fuchs, 2000) for children as young as kindergarten age (e.g., VanDerHeyden, Witt, Naquin, & Noell, 2001). Thus, CBM has been employed extensively by professionals who work with both typically developing children and those with special needs. (A detailed treatment of CBM's characteristics and applications is beyond the scope of this article; interested readers are referred to the works of Shinn [2002], Deno [2003], and Fuchs [2004], among others, for further information on this topic.) In recent years, CBM's utility as a progress monitoring technique has gained further attention due to its use in Response to Intervention (RTI) or Problem-Solving Models (PSM) of learning disability identification (Marston, Muyskens, Lau, & Canter, 2003). Because Public Law 108-446, the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), now permits the use of RTI methods in addition to more traditional psychometric discrepancy-based models in determining whether individuals meet criteria for identification with specific learning disabilities, it is almost certain that the prominence of CBM methods, both in the research literature and in practice, will continue to increase.

The dynamic, play-based, criterion-referenced, and curriculum-based measurement methods described above have been successfully used with a variety of school-age (i.e., K-12) populations. It would therefore seem to be a prudent approach to draw on the underlying principles and techniques that characterize these assessment methods in designing appropriate early literacy skill assessment for preschool-aged children as well. When possible, these skills should be drawn from the curriculum that is intended for use with the child being assessed. This significantly increases the likelihood that the skills being assessed are operationally defined in a meaningful manner, and can therefore be assessed under ecologically valid conditions. The success of a criterion-referenced approach is therefore dependent on the validity of the skills to be assessed, with ecological validity heightened when skill assessments are conducted in the actual environments where children would typically employ the skills being assessed.

In light of the above descriptions of curriculum-based, play-based, criterion-based, and dynamic assessment methodologies, it appears clear that these approaches are not incompatible, but rather complementary. Additionally, all of these approaches yield valuable information that is unavailable through, and that complements the information yielded by, traditional psychometric approaches to assessment. It therefore seems appropriate to use these approaches in tandem so as to obtain the broadest possible perspective on a

given child, and to use this knowledge to develop sound interventions that will enhance that child's potential for learning.

DELINEATING ENVIRONMENTS

In order to implement an environmentally based approach to assessment, it is necessary to provide a mechanism by which meaningful units of a child's environment can be identified. By doing so, it becomes possible not only to assess a child's level of cognitive and emergent literacy skills, but also to examine the degree to which the environment provides opportunities for the child to acquire those skills. A delineation of units of the child's environment is also logical in light of the legal requirements first set forth in the Individuals with Disabilities Education Act (IDEA, 1997) and more recently renewed in the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) to provide early intervention services in the natural environment. Moreover, given the developing research base on authentic and/or externally valid intervention practices, analysis of the environment takes on added relevance (Dunst et al., 2001; Dunst, Hamby, Trivette, Raab, & Bruder, 2000). This approach suggests that pre-academic and academic skills, including emergent literacy skills, should be taught in context. It then logically follows that those skills should, to the extent possible, be assessed in context.

The early work of Roger Barker (1968) on behavior setting theory provides a basis for identifying standard units of the environment. More recently, Tisot and Thurman (2002) elaborated on Barker's framework by suggesting that early intervention professionals can use behavior setting theory in order to provide a framework for parents to define the units of their child's natural environment. In defining behavior settings, Barker has suggested that

a behavior setting has two components: (1) one or more standing patterns of a behavior and (2) a milieu. A standing pattern of behavior refers to the molar behavior associated with or expected in a given environment that remains constant even when different individuals occupy the setting. For example, eating, talking, sitting, and preparing and serving food make up basic components of the standing pattern of behavior in a restaurant. The milieu refers to the physical structure of the environment. To use the restaurant example, tables, chairs, tablecloths, silverware, etc. would represent the milieu. (Tisot & Thurman, 2002, p. 66)

Additionally, Thurman and Widerstrom (1990) have suggested that parents can provide information to early intervention professionals on the behavior settings that their child typically enters through interviews or journal keeping. Another (although more labor-intensive) strategy would be for those professionals to conduct observations of the child and family during their typical daily transactions. Thurman and Widerstrom (1990) note that a good indicator of the significance of a particular setting to a given child is the frequency with which the child enters that setting; they caution, however, that frequency alone may not be the sole, or major, determinant of significance. Presumably, some of these significant settings will provide opportunities for young children to be exposed to activities that can be linked, either explicitly through instruction and scaffolding or implicitly through the child's learning, to emergent preacademic skills, including (but not limited to) literacy skills. Through systematic observation in these settings, it is possible to gain insight into the degree to which a child has acquired emergent literacy skills, as well as the other ways in which that child experiences and interacts with his or her environment.

DELINEATING SKILLS

As was discussed earlier, the assessment of skills in the natural environment increases the ecological validity of the skill being assessed. On the other hand, some would argue that this more informal approach to assessment may compromise other forms of validity as well as reliability. Thus, it is important to develop operational definitions of the skills to be observed. Recent works by Fiorello and Thurman (2001) and Sher, Fiorello, Thurman and Flanagan (2004) have provided an approach by which specific cognitive skill can be identified and then assessed in classrooms. Their works translate skills assessed by the Woodcock-Johnson Test of Cognitive Abilities, third edition (Woodcock et al., 2001) into actual observable classroom behaviors. A practitioner can then assess the extent to which a child exhibits these skills, or to which a particular classroom setting provides opportunities for children to use each skill. Although their approach was developed with early primary classrooms in mind, it is applicable to other settings as well (e.g., preschool classrooms, home environments, and shopping malls). To gain additional insight into a child's cognitive and emergent literacy abilities, play-based and curriculum-based assessments can also be employed. Once data are obtained using these approaches, the examiner can conduct a dynamic assessment to gain an understanding of how the child employs these skills

in the learning environment. Subsequently, a CBM- or DIBELS-like system can be used to monitor the child's progress toward preacademic goals that have been established using the information gathered during the assessment process.

PUTTING IT ALL TOGETHER

It is clear that norm-referenced assessment instruments are useful in determining children's general levels of cognitive, academic, socio-emotional, and motor development relative to those of their same-age or same-grade peers. However, it is equally apparent that such instruments, by their very nature, are not well suited to determining the degree to which children can successfully navigate and meet specific environmental demands. As has been suggested in this article, it is often preferable to use assessment methods that take into account and attempt to incorporate curricular material and authentic stimuli from children's own environments. Dynamic, criterion-referenced, and/or curriculum-based assessment strategies offer some possible methods by which authentic, externally valid approaches can be utilized in assessment.

Given the plethora of research findings and educational initiatives that support early assessment of pre-academic and emerging academic skills, it is likely that efforts to assess those skills at the preschool level will increase in both frequency and intensity. In particular, early assessment of pre-literacy and emerging literacy skills has been championed by a variety of educational stakeholders, including parents, educational professionals, and government agencies, all of whom are increasingly concerned about the timely development of literacy skills. How, then, can the techniques discussed in this article be incorporated into the assessment of pre-literacy and emerging literacy skills? A number of suggestions for using these principles in skill assessment are listed below.

Reviewing the literacy principles previously discussed in light of the principles of environmentally based assessment suggests several ways in which assessment techniques can naturally follow from practices already in place in most classrooms. Letter knowledge, for example, can be assessed using letters in classroom displays, books that children have been exposed to and have enjoyed, or other printed materials, ranging from printed nametags to class schedules to labels on toys or games in the classroom. Similarly, print awareness can be easily assessed using books and other classroom-based materials. The play-based techniques described earlier can be adapted so that books

or other sources of text, rather than more conventional toys, are supplied to children; the children can then be observed interacting with the materials to determine whether they show awareness of the conventions of print (e.g., holding the book the right way, turning the pages, scanning pictures and text). Basic story comprehension skills can be assessed by asking children to answer questions about characters and events and make predictions about what will happen next. Phonemic awareness activities at the pre-literacy or emerging literacy level could involve having children identify rhyming text in a book or to point out words that start with a target letter or sound in print. General oral language skills can be assessed in virtually all classroom situations, both by structuring situations designed to elicit the use of specific vocabulary or language skills that have been taught or emphasized in the classroom, and by carefully observing children's spontaneous use of language in less structured situations. It should be noted that these techniques are well suited for use with individualized instruction practices, as they permit the same stimuli to be used to assess the development of diverse skills at a variety of difficulty levels. For example, the front cover of Dr. Seuss's *Hop on Pop* could be used to assess print awareness (e.g., by asking a child to point to the title), letter or word knowledge (e.g., by asking a child to name or point to selected letters or words), or phonemic awareness (e.g., by asking a child to name the rhyming words, or to identify the sound that the letter P makes).

It is clear from the above descriptions that environmentally based assessment methods are closely related to effective early education and intervention teaching methods. Often, incorporating such techniques into the preschool classroom requires reconceptualization, rather than alteration, of existing didactic practices. For example, rather than using some of the aforementioned strategies as informal, unrecorded "checks" on children's skill development, teachers can record and use the data provided by these exercises for purposes of ongoing progress monitoring. Brief and simple "pre-DIBELS" tasks measuring emerging literacy skills, such as accuracy and fluency in letter naming and using familiar classroom/and or instructional stimuli can also be used to measure skills and guide further instruction. Finally, thorough observation of children's environments *and* behaviors (both expected and actual) by parents, teachers, and/or other educational professionals provides a context for further assessment and intervention efforts by enabling identification of salient environmental features that may positively or negatively affect skill development, or that can be used in constructing meaningful assessment tasks. Thus, rather than serving as isolated and static "snapshots"

of a child's performance, these environmentally based techniques yield assessment data situated in a rich context that allows for valid and meaningful progress monitoring and intervention.

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