EARLY LITERACY INDIVIDUAL GROWTH AND DEVELOPMENT INDICATORS (EL-IGDIs) AS PREDICTORS OF READING SKILLS IN KINDERGARTEN THROUGH SECOND GRADE

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Abstract. Background, purpose. One outcome of the current emphasis on preschool early literacy performance and its relation to later academic success in reading was the development of Early Literacy Individual Growth and Development Indicators (EL-IGDIs). The purpose of the current study is to examine the predictive validity of EL-IGDI performance on reading skill development in kindergarten through 2nd grade for one school district. Method. All children attending Early Childhood classes in a Midwestern suburban school district were given the EL-IGDIs in their pre-kindergarten year, the Dynamic Indicators of Basic Early Literacy (DIBELS) in kindergarten through 2nd grade, and the Measures of Academic Progress (MAP) Survey with Goals Test for Reading at the end of 2nd grade. This longitudinal study began with 83 children; 65 children continued through 2nd grade in the district. Results, conclusion. The EL-IGDIs were moderately predictive of reading skills on the DIBELS and MAP measures, and the EL-IGDIs of Picture Naming and Alliteration were much better predictors than the EL-IGDI of Rhyming for these children. The conclusion that the EL-IGDIs were moderately predictive of reading skills in kindergarten through 2nd grade is consistent with the limited number of available predictive validity studies for the EL-IGDIs. At the same time the results in this study are less consistent than other similar studies. This study’s findings may be influenced by this district’s established successful approach to reading instruction which, beginning in kindergarten, matches instruction to individual children’s academic needs.

Keywords: early literacy, EL-IGDIs, predictive validity, DIBELS, MAP Survey with Goals Reading

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Increasing interest on the impact of preschool participation and preschool quality on school readiness has been apparent in the last 15 years. As noted by Missall and McConnell (2010), “In short, recent years have seen increased focus on child performance and program accountability prior to and beginning with kindergarten. Specifically, it has become critical to have child-specific information about early literacy skills development that is predictive of later academic success” (p.182). The approach to assessment which allows for screening and monitoring such information about skill development is known as General Outcomes Measurement (GOM). GOM has its roots in the decades of research validating curriculum-based assessment (CBM) as an evidence-based approach to measuring student progress in core academic skill areas.

General Outcomes Measurement is an approach to assessment in which students’ progress toward long-term educational goals is closely monitored over time (Hojnoski & Missall, 2006). The ultimate goal is to measure students’ performance in relation to a behavior of interest that is inherently tied to the curriculum, and this is accomplished by repeatedly using comparable stimulus materials over time in order to assess students’ academic progress (Phaneuf & Silberglitt, 2003). This approach, which monitors both individual and group progress over time, offers a quick and relatively inexpensive method for schools to determine if their students are currently on-track towards meeting established goals (Missall, McConnell, & Cadigan, 2006).

The most well-known application of the GOM approach is the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 1996), a set of quick, efficient indicators of school children’s progress in early literacy skills. DIBELS has been validated for screening, progress monitoring, and instructional decision-making (Good, Simmons, & Kame‘enui, 2001). Now in the 6th edition, the DIBELS has been “widely promoted and used by schools to track and facilitate adequate yearly progress in early reading because of its demonstrated link to reading competence and high-stakes testing at the end of Grade 3” (VanDerHeyden & Snyder, 2007, p. 529).

Because the preschool years present a critical opportunity to positively impact developmental trajectories (VanDerHeyden & Snyder, 2007),
the Individual Growth and Development Indicators (IGDIs) were developed in the mid-to-late 1990’s by researchers affiliated with the Early Childhood Research Institute on Measuring Growth and Development at the University of Minnesota (1998). The Early Literacy IGDIs (EL-IGDIs), a subset of the more developmentally comprehensive IGDIs, use a model procedurally similar to the DIBELS to assess early literacy indicators in children ages 3-5 and were developed with the intent of creating a meaningful link between early education and formal school (Hojnoski & Missall, 2006). The EL-IGDIs of Picture Naming, Rhyming, and Alliteration allow quick and efficient assessment of skills indicative of progress toward the outcome of literacy. In a field-based application of the EL-IGDIs, Phaneuf and Silberglitt (2003) demonstrated their effectiveness for monitoring the growth and development of preschoolers, and in Missall et al. (2007) preschool administration of the EL-IGDIs correlated moderately, in nearly all instances, with locally developed kindergarten measures of the alphabetic principle and phonological awareness, as well as first grade oral reading. At this time, studies using the EL-IGDIs have consistently found them to be sensitive to monthly rates of growth and significantly correlated with age (Phaneuf & Silberglitt, 2003; Missall et al., 2007). However, no benchmark scores for on-track or at-risk have been established, as they have for the DIBELS. Specifically it is unclear which scores and how much growth represents “enough” for success in learning to read, in part because the monthly rate of growth varies per measure and per sample (Missall et al., 2007). As well, studies examining the EL-IGDIs’ relationships with later reading progress are just beginning (Missall et al., 2007).

This study examines the predictive validity of EL-IGDIs for one Midwestern suburban school district. The main research question is “Do the EL-IGDIs significantly predict 2nd grade MAP reading test score?” The correlations between EL-IGDIs in the pre-kindergarten year with later measures of reading skill in kindergarten through 2nd grade will also be determined. The longitudinal data begins with the first year that EL-IGDIs were added to the district’s routinely administered assessment measures.
METHOD

Participants

Eighty-three children in a Midwestern suburban school district who attended the district’s Early Childhood classes during their pre-kindergarten year, that is they were eligible to begin kindergarten the next fall, and then continued on in the same district were participants; by 2nd grade the number of participants was 65 children. However, because not all children were present for each assessment, the actual number of participants varies somewhat at each assessment period. In this district 47.5% of students are Caucasian, 3.2% Black, 34.3% Hispanic and 11.5% Asian/Pacific Islander and the low-income rate is 39.9%.

Each Early Childhood classroom contained children from four “eligibility” categories: Typical, At-Risk, Speech, or Special Education. Twenty-seven children without identifiable risk factors were in the Typical category; 17 children identified as at-risk for school success were in the At-Risk category; 18 children receiving speech and language services in addition to at-risk status were in the Speech category, and 21 children, receiving more comprehensive special education services, were in the Special Education category.

Measures

Early Literacy Individual Growth and Development Indicators (EL-IGDIs). The EL-IGDIs were developed in the later 1990s as a General Outcomes Measurement (GOM) to assess and monitor growth and development of early literacy skills (Missall & McConnell, 2010). EL-IGDIs include measures for Picture Naming, Rhyming, and Alliteration, have scripted instructions, each can be administered in several minutes, and are usually administered three times a year. The Get it, Got it, Go! Website, http://getgotgo.net, provides free access to general information, training guides, all materials, and high level support for teachers and others using the EL-IGDIs. Overall, evidence suggests that the EL-IGDIs have “strong theoretical connections and adequate psychometric properties with preschool-aged children” (Missall et al., 2007, p. 435). Picture Naming (PN) measures expressive language or spoken vocabulary
by asking the child to name pictured objects; Rhyming (RHY) measures the ability to identify pictures of words that rhyme, and Alliteration measures the ability to identify pictures of words that begin with the same initial consonant sound.

**Dynamic Indicators of Basic Early Literacy Skills (DIBELS).** The DIBELS (Good & Kaminski, 1996) is a set of quick, efficient indicators which assesses school children’s progress in core components of reading skill from kindergarten through 6th grade. DIBELS measures are brief, usually one-minute, and usually administered three times per year. The DIBELS for kindergarten through 2nd grade which were included in this study were Letter Name Fluency (LNF), Phonemic Segmentation Fluency (PSF), Nonsense Word Fluency (NSF), and Oral Reading Fluency (ORF). The DIBELS website, http://dibels.uoregon.edu provides free background information, materials and training, as well as access to national DIBELS data.

**Measures of Academic Progress (MAP).** MAP is a diagnostic and computerized assessment in Reading and Mathematics developed by the Northwest Evaluation Association (NWEA). Extensive descriptive information regarding the assessments, their administration, psychometrics, and interpretation is available at the MAP Website www.nwea.org. The specific assessment used in this study was the 2nd grade Survey with Goals Test for Reading. This computerized, adaptive assessment provides an overall score combining performance on measures including phonics, vocabulary, and comprehension. The overall score, the RIT Scale, was developed from Item Response Theory and is an equal interval scale (The RIT Scale, n.d.)

**Procedures**

All data were collected as part of the district’s approach to reading instruction which matches instruction to a data-based model using the DIBELS in kindergarten through 2nd grade (K-2). The data were collected, as part of the district’s ongoing assessment procedures, from 10/05 through 6/09 for all children who attended Early Childhood classes in their pre-kindergarten year and subsequently up to 2nd grade in the same district. The EL-IGDIs of Picture Naming, Rhyming, and Alliteration were administered several times each to children across fall, winter, and
spring of the pre-kindergarten year by their classroom teachers. The materials, training guides, and administration procedures established by the developers were followed. After considering the results from a previous analysis of the EL-IGDI and K-1 DIBELS scores (McCormick & Haack, 2008), the following measures were selected for this study: Picture-Naming from both February (PN Feb) and April (PN Apr), Rhyming from January (RHY Jan), and Alliteration from both February (ALL Feb) and April (ALL Apr).

District-wide application of the DIBELS in kindergarten through grade 2 has been in place for about 10 years. The following indicators were used in this study from the kindergarten year: Letter Naming Fluency in fall (LNF K-1) and winter (LNF K-2), Phoneme Segmentation Fluency in winter (PSF-K2) and Nonsense Word Fluency in spring (NWF K-3). The indicators from first grade were Nonsense Word Fluency in winter (NWF 1-2) and spring (NWF 1-3) and Oral Reading Fluency in winter (ORF 1-2) and spring (ORF 1-3). The indicator from second grade was Oral Reading Fluency given in winter (ORF 2-2) and spring (ORF 2-3).

The MAP Survey with Goals Test for Reading was given in spring of second grade. The available scores include both the normative RIT score (MAP RIT) and the MAP percentile score (MAP %).

Results

Pearson Correlations among all variables showed that all DIBELS scores in this analysis were significantly intra-correlated (p < .01), and all DIBELS variables were also significantly correlated (p < .01) with the 2nd grade MAP scores. All except one of the El-IGDI intra-correlations were significant (p < .01) and ranged from .348 to .815. The single exception was that Rhyming in January was not significantly correlated with the IGDI Alliteration score in February, r = .240 (p > .01).

Pearson Correlations between the EL-IGDIs variables and the K-2 variables indicated that the EL-IGDIs are moderately correlated, in many instances, with the reading outcomes in kindergarten through 2nd grade, including overall reading performance at the conclusions of 2nd grade. Each of the five EL-IGDIs shows moderate correlation with one to all of the DIBELS scores. The Alliteration IGDI was significantly correlated with all DIBELS measures in kindergarten and first grade, as well as the MAP
scores in 2nd grade. The Picture Naming IGDI showed significant correlations with Letter Naming Fluency (NWF K-1), Phonemic Segmentation Fluency (PSF K-2), and Nonsense Word Fluency (NWF K-3) and Oral Reading Fluency in 1st and 2nd grades (ORF 1-2; ORF 2-3). The Rhyming IGDI was significantly correlated with only the indicator of Phonemic Segmentation Fluency in winter of kindergarten (PSF K-2); thus, PSF K-2 was the only DIBELS indicator to significantly correlate with all IGDIs in the analysis. The Alliteration IDGI showed the greatest number of significant correlations with K-2 DIBELS and the 2nd grade MAP (see Table 1).

**Table 1.** Correlations (N = 63-83) between the EL-IGDI scores and the K-2 DIBELS and MAP scores

<table>
<thead>
<tr>
<th>K_2 Variables</th>
<th>Pre-kindergarten IGDI variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DIBELS &amp; MAP</td>
</tr>
<tr>
<td></td>
<td>PN Feb</td>
</tr>
<tr>
<td>LNF K-1</td>
<td>.465**</td>
</tr>
<tr>
<td>LNF K-2</td>
<td>.182</td>
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<tr>
<td>PSF K-2</td>
<td>.262*</td>
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<tr>
<td>NWF K-3</td>
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<tr>
<td>NWF 1-2</td>
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</tr>
<tr>
<td>ORF 1-2</td>
<td>.256*</td>
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<tr>
<td>NWF 1-3</td>
<td>.113</td>
</tr>
<tr>
<td>ORF 1-3</td>
<td>.231</td>
</tr>
<tr>
<td>ORF 2-2</td>
<td>.197</td>
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<tr>
<td>ORF 2-3</td>
<td>.305*</td>
</tr>
<tr>
<td>MAP RIT</td>
<td>.361**</td>
</tr>
<tr>
<td>MAP %</td>
<td>.373*</td>
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</table>

*p < .05; ** p < .01.

Hierarchical multiple regression analysis using SPSS, in which the 2nd grade MAP RIT score was the dependent variable, entered the EL-IGDI variables in Model 1, then added the kindergarten variables (DIBELS) in Model 2, added the first grade variables (DIBELS) in Model 3, and finally in Model 4 entered all the variables (EL-IGDIs, K-2 DIBELS). The results indicated that Model 1 (EL-IGDIs only) and Model 2 (adding kindergarten DIBELS) did not have significant predictive value for the MAP; only Models 3 (adding 1st grade DIBELS) and Model 4 (adding 2nd grade DIBELS) did significantly predict the MAP score (see Table 2).
Table 2. Hierarchical Regression Summary Analysis (N = 25-39) for K-2 Variables on 2nd grade MAP Reading Test

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>R Square change</th>
<th>F change</th>
<th>Sig. F change</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>.442</td>
<td>.196</td>
<td>.196</td>
<td>.337</td>
<td>.269</td>
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<tr>
<td>2</td>
<td>.600</td>
<td>.360</td>
<td>.164</td>
<td>.856</td>
<td>.145</td>
</tr>
<tr>
<td>3</td>
<td>.804</td>
<td>.646</td>
<td>.286</td>
<td>.046</td>
<td>.004**</td>
</tr>
<tr>
<td>4</td>
<td>.865</td>
<td>.749</td>
<td>.103</td>
<td>.729</td>
<td>.019*</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01.

Model 1. Variables entered: PN Apr, RHY Jan, ALL Feb, ALL Apr

DISCUSSION

One outcome of the increasing recognition that preschool is an opportune time to promote literacy development was the development of the Early Literacy Individual Growth and Development Indicators (EL-IGDIs) as a General Outcomes Measure (GOM) for 3-5 year old children. As a GOM tool, developed in the later 1990's, for screening, monitoring, and ultimately intervention, many studies have focused on the development and psychometric properties of the EL-IGDIs. Missall et al. (2007) were among the first to examine the longitudinal associations between EL-IGDIs and kindergarten through grade 1 reading skills, and Missall and McConnell (2010) point out that currently only tentative information about the EL-IGDIs as they relate to later reading performance is available.

Because the school district in this study has successfully used DIBELS during kindergarten through 2nd grade for screening, monitoring, and guiding instruction for learning to read (McCormick & Haack, 2005), the district chose to see if the EL-IGDIs would provide similar instructionally
useful information at the preschool level. The purpose of this study was to examine the EL-IGDIs as predictors of kindergarten through 2nd grade reading skills in this school district.

Overall the correlation results indicate that the EL-IGDIs during the pre-kindergarten year are moderately predictive of later outcomes in reading skills from kindergarten through 2nd grade. This summary result is consistent with the results from Missall et al. (2007) which examined the predictive validity of the EL-IGDIs using measures approximate to the skills measured by DIBELS in kindergarten and first grade. Several other studies have also shown similar conclusions (McConnell, Wackerle-Hollman, & Bradfield, 2009; Missall, 2006).

However, the results of this study show less consistently significant correlation results for the EL-IGDIs as predictors of later reading skill than in other studies. Mid-kindergarten Phonemic Segmentation Fluency (PSF K-2) was the only DIBELS measure to significantly correlate with each of the EL-IGDIs in the analysis, and the only significant correlation for the Rhyming IGDI among all the kindergarten through 2nd grade variables. Picture Naming and Alliteration were more consistently predictive of later reading skills, and both PN and ALL were significantly correlated with performance on MAP at the end of 2nd grade. In contrast, the McConnell et al. (2009) study showed all three of the EL-IGDIs significantly correlated at the .01 level with kindergarten DIBELS scores for Letter Naming Fluency (LNF), Phonemic Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF).

Similarly, the results in this current study regarding RHY contrast with Missall’s study (2006) in which the correlation between RHY and NWF in first grade was significant (r = .5, p < .05). In the current study the correlations between RHY and NWF were not significant, at either the fall assessment in kindergarten (r = .001) or the spring assessment in kindergarten (r = .030). An explanation for this difference in outcome between the results of this study and other results with the Rhyming IGDI is not readily apparent. Possibilities include the degree to which rhyming skills are a necessary precursor for later skills needed for learning to read and complications with the indicator and its administration. What is clear is that these findings underscore the point that actual EL-IGDI performance varies per measure and sample (Missall et al., 2006).
The hierarchical multiple regression analysis did not find performance on the EL-IGDIs to significantly contribute to the MAP RIT score in 2nd grade; the MAP RIT score was significantly predicted only when the 1st and 2nd grade variables were added to the model. Of important consideration for this result is this district’s approach to reading instruction which includes using DIBELS performance in K-2 to identify students at-risk and monitor their progress during supportive instructional intervention. The successful impact of using K-2 DIBELS to guide reading instruction toward 3rd grade reading achievement on the Illinois State Achievement Test (ISAT) for this district has been previously documented (McCormick & Haack, 2005). As a result of this successful approach to reading skill instruction the correlations between the EL-IGDIs and later reading skills may be lower than in other studies because the children in this district who score the lowest are receiving effective instruction, often overcoming skill weaknesses and successfully developing reading skills.

Also important to note is that the EL-IGDIs are a work in progress. Mis-sall and McConnell (2010) point out that research into questions regarding normative standards of growth for evaluating individual children’s performance, how the EL-IGDIs relate to later measures of reading, and issues of adding EL-IGDIs as a central feature in Response to Intervention (RTI) models of early childhood education require future research.

Informed by the results of this study, this district continues to administer the EL-IGDIs in the pre-kindergarten year as a general guide for the preschool curriculum. At some future time the district may develop benchmark scores for identifying at-risk status within the district. Overall, the results of this study clearly point out that performance on the skills assessed by the EL-IGDIs is but one component of the complex task of learning to read.

References


ANKSTYVOSIOS ASMENS RAŠTINGUMO PLĖTROS IR VYSTYMOSI RODIKLIŲ (EARLY LITERACY INDIVIDUAL GROWTH AND DEVELOPMENT INDICATORS (EL-IGDIS)) PROGNOZINĖ VERTĖ NUMATANT SKAITYMO ĮGŪDŽIUS NUO VAIKŲ DARŽELIO IKI ANTROS KLASĖS

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Santrauka. Tyrimo tikslas. Šiuo metu plačiai diskutuojama apie raštingumo vystymą jau ikimokykliniame amžiuje ir tokio ugdymo sąsajas su vėlesne mokinių akademinė sekmė. Dėl ankstyvojo raštingumo tyrimų poreikio buvo sukurtas metodas šiems gebėjimams vertinti – ankstyvosios asmens raštingumo plėtros ir vystymosi rodikliai (Early Literacy Individual Growth and Development Indicators (EL-IGDIs)). Šio tyrimo tikslas – įvertinti EL-IGDIs prognozinį validumą bei numatyti skaitymo įgūdžių vystymąsi nuo vaikų darželio iki antros klasės. Metodika. Tyrimo dalyvavo vaikai, lankantys Ankstyviosios vaikystės klasės Vidurio Vakarų regiono priemiesčio mokyklose (JAV). Pradėjantys lankyti darželį vaikai buvo įvertinti taikant EL-IGDIs. Nuo vaikų darželio iki antrosios klasės vaikai buvo vertinti taikant Dinaminius pagrindinio ankstyvojo raštingumo rodiklius (The Dynamic Indicators of Basic Early Literacy (DIBELS)). Antrosios klasės pabaigoje vaikai buvo įvertinti taikant Akademijos progreso rodiklių tyrimo skaitymo tikslų testą (The Measures of Academic Progress (MAP) Survey with Goals Test for Reading). Tęstinio tyrimo pradžioje tyrimo imtį sudarė 83 vaikai, visuose tyrimo etapuose dalyvavo 65 vaikai. Rezultatai, išvados. EL-IGDIs rodikliai vidutiniškai tiksliai prognozavo skaitymo įgūdžius DIBELS ir MAP testuose. EL-IGDIs paveikslėlių įvardijimo ir aliteracijos subtestų rezultatai buvo tiksliai nei rimavimo subtesto. Šiuo tyrimu nustatyta vidutinė EL-IGDIs prognozinė vertė numatant skaitymo įgūdžius nuo vaikų darželio iki antrosios klasės atitinka kitų negausių EL-IGDIs prognozinio validumo tyrimų rezultatus. Šio tyrimo rezultatus galėjo pakeisti ir tyrimo regione įdiegtos sėkmingos skaitymo ugdymo programas – jos prasideda vaikų darželyje ir atsižvelgia į individualius vaikų akademinius poreikius.

Pagrindiniai žodžiai. Ankstyvasis raštingumas, EL-IGDIs, prognozinis validumas, DIBELS, akademinių proceso rodiklių tyrimo skaitymo tikslų testas.

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