

Towards a Model for Predicting Mississippi Public School Children's Academic Performance

Willie Johnson, Ph.D.¹
Melvin Davis, Ph.D.²
Nanetta Payne, Ph.D.²
Sam Mozee, M.P.P.A.²

¹Dr. Willie Johnson can be reached at Jackson Public Schools District.

²Dr. Melvin Davis, Dr. Nanetta Payne, and Sam Mozee are employees of Jackson State University.

Abstract. Regular developmental screenings of children have become a centerpiece of recommended practice because developmental outcomes are improved with early identification and intervention. The current study investigated kindergarten teachers' rating of students' work habits as a viable addition to these screenings. Kindergarten and first grade archival data were retrieved for 172 inner-city children, and a multiple regression analysis was conducted. Teachers' rating of work habits explained 35% of academic performance in the first grade. Consistency of these findings with previous research is noted. Also, the findings' policy implications are discussed.

Introduction

Early childhood has historically used informal assessment in the form of naturalistic observations and anecdotal records. Current recommendations from the field and professional literature, however, indicate the need for assessment systems that use ongoing, multiple methods for gathering information (NAEYC & NAECS/SDE, 2003). This level of assessment has become a pivotal component of all programs serving children because the academic demand placed on children continues to increase. And, as the demand increases, identifying those who are least likely to be academically successful becomes more important.

Regular screenings for academic problems and formative assessments of student progress in research-based core curricula are now considered critical components of high-quality instruction during primary grades. Screening is a very general type of assessment that addresses common questions parents and professionals have about the development of young children. The ultimate purpose of screening in early childhood is rapid assessment of large groups of children to identify those who need more in-depth assessment of special needs. Such screening is ideally brief and cost-effective so that large numbers of children can be assessed in a relatively short period of time. The procedures and tests used in screening are developed to be quickly and easily administered without highly specialized training. It is well-documented in educational and medical professional literature that developmental outcomes for young children with delays and disabilities are improved with early identification and intervention (Shonkoff & Meisels, 2000).

More than any other type of assessment, screening has become a centerpiece of recommended practice in early childhood programs across both regular and special education programs. Federal regulations require screening for all preschoolers in Head Start programs and for infants and toddlers in Early Head Start. Performance Standards indicate that comprehensive screening is to be conducted for every child within 45 days of enrollment, including all areas of development, hearing, vision, and behavior.

A recent trend in primary school academics is Response to Intervention (RTI), a three-tiered model of instruction where screening assessments are used periodically to identify students who are not making expected progress. Assuming that all children in a class are receiving high quality instruction in the core curriculum (tier I), screening assessments are expected to indicate students that are not learning at the expected rate. The subgroup of students receives more specific assessment and more frequent assessment (tier II) for the purpose of remediating academic problems early and preventing referral to special education (tier III).

Early identification of children's learning difficulties has typically been based on two methods: screening batteries and teacher predictions of students' current or future performance (Teisl, Mazzocco & Myers, 2001). Some studies (Coleman & Dover, 1993; Quay & Steele, 1998) reported that teacher ratings of performance were superior to screening tests. Other studies (Fletcher & Satz, 1984) reported that screening tests were superior to teacher ratings. Teisl, Mazzocco & Myers (2001) completed a study, which highlighted the predictive value of kindergarten teachers' ratings of pupils for later first grade academic achievement. Teachers rated 234 students on their math and reading performance on a scale from 1 (below average) to 5 (above average) and these ratings were correlated with the students' first grade performance on two standardized measures: Test of Early Mathematics Ability (TEMA-2), and Letter Word Identification (LWID). Correlations were $r = .34$ ($p < .0001$) for TEMA-2 scores, and $r = .48$ ($p < .0001$) for LWID scores. The authors concluded that these type of teacher ratings could be used to determine which children should receive cognitive screening measures to further enhance identification of children at risk.

The present study investigated the predictive value of kindergarten teachers' assessment of work habits relative to children's academic performance in the first grade. If teachers' assessment of work habits was determined to be an accuracy predictor, it could be added to the list of very early "predictors" of future academic achievement.

Method

Description of Sample. Using archival data, 172 first graders were identified at three inner city schools. Kindergarten teachers' assessment of work habits and term grades in the first grade were retrieved for these students. Also, they were assigned an ID to indicate whether they had completed kindergarten and the first grade at the same school. Although demographic information was not obtained for these students, their community, known as Washington Addition, is an area that is 99.1% minority, with 27.6% of its residents unemployed, 31.2% high school graduates, 40.6% female-headed households with no husband present, an average per capita income of \$8,192 dollars, 43.4% of area residents participating in the Food Stamp/SNAP benefits program, and 59.5% of all residents below the poverty line (Census 2010).

Research Design. The current study used a correlational research design. More specifically, regression was used to investigate teachers' assessment of students' work habits as a predictor of academic performance in the first grade.

Procedure. Prior to gaining access to the archival data, study variables were identified: First grade, Terms 1 – 4 grades for language arts, reading, and mathematics; average for Terms 1 – 4; Kindergarten teacher's assessment of 14 work habits for Terms 1 – 4; school, kindergarten and first grade at same school, and only first grade at targeted school. Data were compiled and placed into a spreadsheet. Also, data were checked for accuracy.

Variables. Teacher assessed 14 behaviors for each student; things like: Gives attention, follows directions, makes use of time, demonstrates accuracy in assignments, participates in class, works for neatness, etc. The scale for this assessment included: E – Excellent; S – Satisfactory; I – Improvement Needed; and U – Unsatisfactory. This alpha scale was converted to a numeric scale: 0 (unsatisfactory), 1 (improvement needed), 2 (satisfactory), or 3 (excellent).; and the 42 entries or assessment of work habits were combined and divided by 42 to produce a composite score for teachers’ assessment of work habits. Other variables included first grade average grade for language arts, reading, and mathematics.

Results

Kindergarten teachers in the targeted public school system uses an academic rubric (3 – Meeting grade level expectations; 2 – Making progress/improvement needed; 1 – Unsatisfactory; N/A – Not assessed) to assess students’ mathematics and reading/language arts abilities/progress. In addition to using this rubric, they also assessed students on 14 work habits (See Table 1 below). Assessment of these 14 work habits were combined and divided by 14 to produce a composite work habit score.

Table 2 shows that this composite work habits changed very little; .04 from Term 1 to Term 2, and .01 from Term 1 to Term 4. Surprisingly, the average score for the risk index did not reach satisfactory by Term 4 (1.87 versus 2.0 for satisfactory). Thus, enhancement of work habits appears not to be a priority for Kindergarten instruction.

Table 1. Work habits

- 1. Completes assignments – CA
- 2. Complies with classroom rules – CCR
- 3. Controls talking – CT
- 4. Demonstrates accuracy in assignments – DAA
- 5. Exercises self-control – ESC
- 6. Follows directions – FD
- 7. Gives attention – GA
- 8. Has and takes care of materials – HTCM
- 9. Makes use of time – MUT
- 10. Participates in class – PC
- 11. Shows courtesy and respect – SCR
- 12. Works for neatness – WN
- 13. Works independently – WI
- 14. Works well with others – WWO

Note: Each work habit was assessed 0 (unsatisfactory), 1 (improvement needed), 2 (satisfactory), or 3 (excellent).

Table 2. Composite work habit by Term

Term	Mean	σ
1	1.86	.34
2	1.90	.31
3	1.82	.37
4	1.87	.34

The composite work habits score was investigated as a predictor of academic performance in the 1st grade, which is defined as the average grade across subject areas for Terms 1 – 4. The composite work habit score accounted for a significantly proportion of academic performance's variance, $F(1, 170) = 92.70$, $p < .000001$, $r^2 = .353$, $B = 17.69$ (See Table 3). Thus, teacher's assessment of kindergarten students' work habits emerged as a significant predictor of academic performance in the first grade.

Table 3. Regression model

r	r^2	F	$df1$	$df2$	$sig.$
.594	.353	92.70	1	170	.000001

- a. Dependent variable: First Grade Academic Average
- b. Independent Variable (Predictor): Composite Work Habits Score

Since the students were divided into those who completed Kindergarten and the 1st grade at the same school ($n = 107$) and those who completed only the 1st grade ($n = 65$) at the targeted school, the relationship between successive attendance and 1st grade academic performance was explored. The difference in academic performance approached significance, $t(170) = 1.66$, $p < .09$, $M_{Continuous} = 87.05$, $M_{1st\ grade\ only} = 84.80$. Thus, there appears to be some advantage to attending Kindergarten and the 1st grade at the same school.

Discussion

As previously stated, increased academic demands placed on children heighten the need for early identification of children who are least likely to be academically successful. Add socio-economic factors to the increased academic demands, and the need intensifies. Clearly, inner-city children residing in communities, where the unemployment rate is 28%, 31% of the residents completed high school, the average per capita income is \$8,192, and 60% of the residents are below the poverty line face a different set of challenges when responding to increased academic demands. Strategies for responding to these increased academic demands should be laid before these children enter the first grade..

Current results support Coleman and Dover (1993), Quay and Steele (1998), and Teisl, Mazzocco, and Satz's (2001) findings that teacher ratings of students' performance have predictive value. Using kindergarten teachers' ratings of pupils' math and reading grade achievement, Teisl et. al reported a predictive value that ranged from 11% to 23%. Thus, teachers' rating explained up to 23% of the change in Test of Early Mathematics Ability scores in the first grade. In the current study,

teachers' rating of work habits explained 35% of the change in first grade academic performance as measured by average grade. However, despite this strong predictive value for teachers' rating of students' work habit, mean work habit score did not change significantly from Term 1 to Term 4. Thus, student work habit does not appear to be on the radar as a factor that can influence academic performance.

Policy Implications

The findings presented above have several policy implications that relate to the use of assessment tools at the kindergarten/first grade level. The first implication relates to the selection of assessment tools in determining the academic needs of kindergarten/early elementary school children. In isolation, the use of the student work habits' composite index significantly predicted future academic achievement at the kindergarten/first grade level. This finding is not necessarily surprising in that several existing Mississippi policy documents advocate the use of a variety of techniques to assess early childhood skill levels, and to identify areas influencing future academic achievement (Johnson, 2004; Bounds, 2006; Burnham, et. al., 2012). These same policy documents also advocate the use of observational reports and other age-appropriate checklists as means for assessing a student's educational, social, and emotional development. Therefore, the use of an assessment measure such as the student "work habits index" can be an appropriate tool (when used in conjunction with other educational tools) for trying to predict and/or gauge student academic performance.

The appropriateness of using the work habits index is directly related to the next policy implication; that is, classroom teachers' possessing the knowledge and ability to properly use and interpret the work habits index. As results from this study indicated, a teacher's assessment of a student's work habits emerged as a significant predictor of academic performance in the first grade. The policy implication is that training teachers to properly use the work habits index can be beneficial in identifying students showing signs of future academic difficulties. Performance assessments and screening assessments have been recognized by the Mississippi State Board of Education as examples of effective programs and services targeting at-risk students (MDE, 2009). As discussed earlier in this study, there is some research evidence that teacher ratings of performance can be an effective tool in pre-identifying educationally at-risk students. (Coleman, & Dover, 1993; Quay, & Steele, 1998; Teisl, Mazzocco, & Myers, 2001). Providing teachers with training in using and interpreting the student work habits index can provide education policy makers with a tool that has demonstrated statistical evidence of its ability to predict future academic performance; thus, helping to provide a more effective and efficient tool for guiding the use of limited educational resources.

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