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The Relationship Between Receptive Vocabulary
and Letter Recognition

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Marshall University

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By

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Running head: RECEPTIVE VOCABULARY AND LETTER RECOGNITION

The Relationship Between Receptive Vocabulary
and Letter Recognition

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Abstract

The West Virginia Educare Program has randomly chosen 150 children from 2 ½ to 5 years of age to participate in an academic readiness study. These children came from a 6 county pilot community program collaborative, including the counties of Cabell/Wayne, Monongalia, Roane, Upshur, Webster, and Summers. The Bracken-R, the PPVT-III, and Carolina Curriculum for Pre-Schoolers with special needs were used to assess all subjects. For this study, the letter recognition subset of the Bracken-R and the raw score of the PPVT-III were used to determine if a correlation exists between receptive vocabulary and letter recognition. This study found a moderate correlation between receptive vocabulary and letter recognition.

The Relationship Between Receptive Vocabulary and Letter Recognition

Although language is often taken for granted, a moment's reflection will show how important it is in our lives. In some form or another, it dominates our social and cognitive processes. It is difficult to imagine what life would be like without it. Indeed, most consider it to be an essential part of what it means to be human, and in part it is what sets us apart from other animals. Not surprisingly, then, it is a major component of understanding human behavior (Harley, 1995).

One reason why language is taken for granted is that it usually happens so effortlessly, and, most of the time, so accurately. Indeed, when listening to someone speak, or looking at a page, one cannot help but understand it. It is only in exceptional circumstances, such as children acquiring language, that the complexities of language are recognized (Harley, 1995).

Research has shown using the PPVT-R that children's receptive vocabulary is affected by their mothers' age, education, and economic status, the safety of their neighborhoods, and whether there is a father figure in the home (Luster, Bates, Fitzgerald, Vanderbelt, & Key, 2000). Another study using the PPVT-R demonstrated a correlation between parental control and receptive vocabulary in preschool children (Cooney, 1993).

A recent study identified an important role of parents, that of being their child's first teacher, providing their children with learning opportunities during the preschool years (Diamond, Reagan, & Bandyk, 2000). Recent reports revealed families are enrolling record numbers of young children in preschool programs. That number represents 80% of the children from affluent families and approximately 40% of the children from the poorest families

(Diamond et al, 2000). More than 50% of the three to five year old children in the United States are enrolled in preschool programs (Diamond et al, 2000).

Reynolds (2001), conducted a study of nine hundred eighty-nine low income, mostly African-American, students of the Chicago Child/Parent Center Program. Launched in 1967, the comprehensive preschool program is the second oldest federally funded early education effort in the country after Head Start. But, until now, no one had looked at the long-term effects. The follow-up after 15 years was conducted in a comparison of 550 peers who attended no preschool or a regular preschool. The program participants were more likely to have completed high school (49.7% versus 38.5%). Those who participated in a year or two of preschool plus the grade school program were less likely to repeat a grade or need special education (Lord & Schnaiberg, 2001).

A study called Project Self Help (Connors, 1993), a school-based family literacy program, served parents and other caretakers, elementary school children, and preschool children two days per week during the school year. A summer reading program was also available to families. The preschool children who were in no other program were assessed with an indicator of reading readiness, the comparison subtest of the Merrill Language Screening Test (1980); the receptive vocabulary subtest of the Test of Language Development (1988); and an inventory of letter recognition (Connors, 1993).

The preschool children, on average, made gains on all literacy assessments from fall to spring. The inventory of letter identification showed the largest gain. This result reflects the focus of classroom instruction on reading readiness activities, such as alphabet identification. Gains in comprehension and print awareness also reflected the program's reading readiness objectives (Connors, 1993).

There have been many studies of the relationship between alphabet knowledge and reading, but few systematic studies of children's acquisition of the alphabet knowledge itself, particularly in preschool children. It has been reported that letter-name knowledge is the best single predictor of beginning reading (Worden & Boettcher, 1990).

The role of alphabet knowledge in beginning reading is a matter of controversy. Walsh, Price, and Gillingham (1988) argued that knowledge of letter names eases the process of learning to read by "vesting the symbols", thus facilitating the rapid and efficient information processing necessary for reading (Worden & Boettcher, 1990, p.278). Ehri (1983) has made a persuasive argument for why letter-name knowledge should help beginning readers associate the alphabetic symbols with their sounds. She pointed out "most, if not all, of the names contained sounds commonly symbolized by the letters in word spellings" (Worden & Boettcher, 1990, p. 278). Ehri characterized the set of letter names as the foundation children need to induce the letter-sound system involved in reading. This alphabetic theory has also been proposed as relevant to the beginning stage of spelling (Worden & Boettcher, 1990, p.278).

Researchers have often attempted to estimate children's alphabet knowledge by asking them to name a subset of upper case letters as part of various early reading assessment instruments. However, their approach may overestimate children's alphabet knowledge if lower case skills lag behind upper case letter acquisition. For example, a pallet assessment on a subset of letters reported that kindergarten and first grade children recognize fewer lower case than upper case letters and that there was no gender differences in alphabet acquisition (Worden & Boettcher, 1990).

West Virginia Child Care Programs

Just two years ago, West Virginia's child care system was dismal at best. As the 1990's came to an end, West Virginia's child care program has been enormously enriched with unspent welfare funds, \$10 million in improvement for 1999 and \$22 million committed for the year 2000 (West Virginia Kids Count, 1999).

The West Virginia Commission on Services for Young Children was established by the West Virginia Legislature in 1997 to examine ways to better serve the children of West Virginia. The commission sponsored a series of public forums and focus groups to get input on preschool programs. Nine meetings were held throughout the state in early fall, 1998. Attendees represented parents, teachers, child care providers, Head Start programs, health and social service agencies, legislators, and civic organizations. A statewide steering team compiled the comments from the forums and used them to develop a West Virginia Educare initiative (West Virginia Children's Cabinet [WVCC], 1993).

The goal of the West Virginia Educare Program is to promote the social, emotional, physical, and cognitive skills of young children that will help them succeed in kindergarten and later in life. Any West Virginia child from birth to under five years of age in a participating area is eligible for the West Virginia Educare Programs. Their families will also be eligible for services through Educare. These services may include child and family health and mental health, occupational, physical and speech/language therapies, nutrition, adult and parent education developmental screening, financial and social services, assistive technology, transportation and transition services into and out of the West Virginia Educare Programs. The parents or guardians of any West Virginia child in the six pilot community program collaboratives, including Cabell/Wayne County, Monongalia County, Roane County, Upshur County, Webster County,

and Summers County, may enroll their children in the pilot child care and early education programs. There will be a total of forty-one pilot Educare Programs in the six communities serving approximately 1,770 children (WVCC, 1998). The enrollment is voluntary and the families can choose from Head Start, public schools, private pre-school, or other child care centers that meet the program requirements. Children and families from all income levels are eligible for the West Virginia Educare Programs. The families will help offset the cost of services by their contributions based upon their ability to pay (WVCC, 1998).

Purpose for Study

In reviewing the preceding research, no research was found to be available on the correlation between preschool children's letter recognition and their receptive vocabulary. Therefore, this research questioned if a correlation existed between the subject's letter recognition and receptive vocabulary. This was part of the West Virginia Educare initiative.

Method

Subjects

Lists of all children (by initials) in all the Educare Initiative programs were obtained and used to select a random sample of 150 children. Consent forms and informational brochures were mailed to all the Educare Initiative programs to distribute to the parents of the selected preschool children. The preschool children between two and one-half and five years of age were selected from the six pilot community collaboratives, including Cabell/Wayne County, Monongalia County, Roane County, Upshur County, Webster County, and Summers County.

There were seventy-two children in this study, thirty-three females and thirty-nine males. The parents' educational levels ranged from \$10,000 to \$20,000 per year to over \$50,000 per year.

Instrumentation

The Bracken-R, the PPVT-III, and Carolina Curriculum for Pre-Schoolers with special needs were used to assess all subjects as a part of the larger overall study. For the purposes of the current study, the Bracken-R and PPVT-III results were used to assess the relationship between receptive vocabulary and letter recognition.

Bracken-R. The Bracken-R (Revised BBCS-R) is a developmentally sensitive measure of children's basic concept acquisition, receptive language skills, and pre-academic skills. The BBCS-R is used to assess these basic concepts of children in the age range of two years, six months through seven years, eleven months. The BBCS-R uses eleven subtests: colors, letters, numbers, counting, size, comparisons, shapes, direction/position, self/social awareness, texture/material, quantity, and time/sequence. The Bracken-R is administered individually and the concepts are orally presented in complete sentences in a multi-choice visual format (Bracken, 1998). Administration time for the entire BBCS-R should be about 30 minutes and the SRC should be 10 to 15 minutes.

Bracken (1998) reports that a study by Breen (1984) indicated a high positive correlation between the BBCS and school readiness skills assessed on the Metropolitan Readiness Test. In another study by Sterner and McCalleum in 1998, it was reported that the BBCS was a significantly better predictor of arithmetic, reading, and spelling achievement than the Gesell Developmental Exam (Bracken, 1998).

The standardization and related validity and reliability research for the BBCS-R took place in the fall of 1997 and involved more than 1,100 children between the ages of two years, six months and eight years, zero months. This standardization sample was representative of the general U.S. population and was stratified by age, gender, race/ethnicity, region, and parent

education level. The demographic percentages were based on the 1995 U.S. Census update (Bracken, 1998). The children in the standardization sample were required to be in the age range of two years, six months and seven years, eleven months, 30 days, understand and speak English and be able to attend to and take the test in English in the standard fashion without modification (Bracken, 1998).

The Bracken's reliability and validity have both been rated as high. The Bracken's reliability was estimated by examining its internal consistency and test-retest stability. BBCS-R ranges of internal reliabilities reported a 0.78 to 0.98 for the subjects, and 0.96 to 0.99 for the total test (Bracken, 1998).

The BBCS-R demonstrated strong content validity as a result of a thorough examination of early childhood curricular material, psychoeducational tests, and the systematic review of early childhood education. Estabrook (1984, p. 128), in a review of the BBCS, described the instrument as the most comprehensive measure of basic concepts available (Bracken, 1998).

Criterion validity has two types: concurrent and predictive validity. The BBCS-R and the BBCS were studied for concurrent validity. It was found that the BBCS-R produced mean scores that are comparable to the BBCS scores. Also, the BBCS-R's usefulness as a cognitive screener was demonstrated when scores were compared with scores on an intelligence test (Wechsler Preschool and Primary Scale of Intelligence-Revised) and a test of cognitive achievement (Differential Ability Scales) (Bracken, 1998).

Sterner and McCallum (1999) used the BBCS and the Gesell Development Exam to predict the academic achievement of eighty kindergarten children. Using a step-wise multiple regression, the BBCS was the principal predictor of students' reading, spelling, and arithmetic achievement (Bracken, 1998).

As a measure of construct validity, a study of the relationship between the BBCS-R and the PPVT-III was conducted with three to six year old children. The two tests were administered in a counterbalanced order. There was a correlation of .79 between the two total test scores and a correlation of .64 between the BBCS-R SRC and PPVT-III total test scores. The results suggest that both tests were measuring highly similar constructs, presumably receptive language (Bracken, 1998). For the purposes of this study, only the letter recognition subtest of the Bracken-R will be used to answer the correlation question.

PPVT-III. The PPVT-III test is designed for persons aged two and one-half through 90 plus years. It serves two purposes: 1) as an achievement test of receptive (listening) vocabulary attainment for standard English; and 2) as a screening test of verbal ability (Dunn and Dunn, 1997). The test items on the PPVT-III consist of two separate parts, the stimulus word and four picture test plates. The stimulus word is depicted by one of four illustrations and there are three distractor items per picture plate (Merkle, 2000).

The PPVT-III was standardized nationally on a stratified sample from the U.S. Census data from March, 1994, consisting of 2,725 persons - 2,000 children and adolescents, and 725 persons over the age of nineteen (Merkle, 2000).

The internal reliability addresses the internal consistency of the items in a test. The more reliable the test, the more accurately performance on any subset of items can be predicted from performance on the other items. The PPVT-III internal consistency median value is .95 (Williams & Wang, 1997). The split-half reliability for the twenty-five standardization age groups of both forms A and B range from .86 to .97 with a median reliability of .94 (Williams & Wang, 1997). All persons in the standardization sample took both test forms A and B in a counterbalanced design to test alternate form reliability. The correlations range from .88 to .96

with a median correlation of .94. This indicates that forms A and B are indeed parallel forms (Williams & Wang, 1997).

Rational evidence of content validity as achievement test of listening vocabulary is provided by the detailed process of selecting suitable words from the *Webster's New Collegiate Dictionary* and by close examination that would suggest the PPVT-III does measure what it claims to measure (Merkle, 2000).

Procedures

Permission from the parents of the chosen Educare children was obtained prior to testing. The program site was contacted to set up time for testing. The day of the testing the supervised graduate students identified themselves to the staff of the site, found and set up the testing space in a manner consistent with test protocols. The PPVT-III was administered first as a measure of receptive vocabulary.

After a break, the Bracken-R was administered. Following testing, the child was taken back to the appropriate room and teacher. Evaluators were instructed to give liberal and genuine praise of the child to the teacher.

Following supervision with Dr. Boyles, the parents were called to inform them of their child's test results. The parents were assured of strict confidentiality and a survey of their educational and income level was taken.

With the current study, the results of the PPVT-III were used to assess the child's receptive vocabulary. The results of the letter recognition subtest of the Bracken-R SRC were used to assess the child's letter knowledge. A correlation coefficient was computed to determine the strength and direction of the relationship between the letter recognition and receptive language.

Results

A Pearson correlation coefficient was calculated for the relationship between subjects' receptive vocabulary and their letter recognition. A moderate positive correlation was found ($r = .386$, $p < .01$), indicating a significant linear relationship between the two variables. This would indicate a moderate and positive relationship between the subjects' letter recognition and their receptive vocabulary. Cronk (1999) indicates any correlation less than .3 is considered weak. Generally, correlations greater than .7 are considered strong. Correlations between .3 and .7 are considered moderate. There were five cases excluded due to incomplete data. Means and standard deviation for the Bracken-R letter subset and PPVT-III are shown on Table 1. Table 1 indicates that the standard deviation is larger than the mean. This is attributed to the large percentage (22.2%) of the subjects who knew no letters. Forty-four and four tenths percent (44.4%) of the subjects knew one or no letters.

Discussion

The results indicate that increased letter recognition is related to a higher receptive vocabulary. It is not clear if better letter recognition, either upper or lower case, increases the subjects' receptive vocabulary or if a better receptive vocabulary implies better letter recognition. Further research into the subjects' age, letter recognition (upper or lower case), and orthographic skills would expand the limits of this study. This study simply shows that there is a moderate positive correlation.

The testing environment was kept as distraction free as possible. This environment did vary and may have had an effect on the outcome. In addition, the number of days of preschool attendance was unknown. This study cannot be generalized to the entire state of West Virginia due to the frequency of above average family income.

A future study that looks at how a subject learns the connection between the letters of a word and the meaning and sound of the word, in order to store in memory an orthographic representation of the word, would be very interesting. Since orthographic skills (visual matching) are involved in the processing of letters and letter patterns into words and word parts, it would be instructive to see how this would help both beginning and experienced readers with fluency.

Phonics, letter recognition, and visual matching skills (orthographic) may yield information on preschool children's risk of poor reading skills. The expansion of this study may help identify these children for future special reading programs.

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Table 1

Mean and Standard Deviation for the Letter Recognition Subset of the Bracken-R and the Raw Score of the PPVT-III

Test	Mean	SD
Raw Score PPVT-III	52.31	17.95
Letters Bracken-R	4.75	5.26

Note: Correlation is significant at the 0.01 level (2 tailed).

Appendix

Frequencies

Statistics

	Gender	Raw Score	Letters	Category
N	Valid	72	72	72
	Missing	9	9	9
Mean		1.54	52.31	4.75
Std. Deviation		.50	17.95	5.26
Range		1	63	16

Frequency Table

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	33	40.7	45.8
	Male	39	48.1	100.0
	Total	72	88.9	100.0
Missing	System	9	11.1	
Total		81	100.0	

Raw Score

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 18	3	3.7	4.2	4.2
22	1	1.2	1.4	5.6
23	1	1.2	1.4	6.9
25	3	3.7	4.2	11.1
27	3	3.7	3.2	15.3
29	1	1.2	1.4	16.7
32	1	1.2	1.4	18.1
34	2	2.5	2.8	20.8
35	1	1.2	1.4	22.2
37	1	1.2	1.4	23.6
39	2	2.5	2.8	26.4
40	2	2.5	2.8	29.2
42	2	2.5	2.8	31.9
44	1	1.2	1.4	33.3
45	3	3.7	4.2	37.5
47	2	2.5	2.8	40.3
51	1	1.2	1.4	41.7
52	2	2.5	2.8	44.4
53	2	2.5	2.8	47.2
55	4	4.9	5.6	52.8
56	2	2.5	2.8	55.6

58	2	2.5	2.8	58.3
60	1	1.2	1.4	59.7
62	1	1.2	1.4	61.1
63	3	3.7	4.2	65.3
64	2	2.5	2.8	68.1
65	3	3.7	4.2	72.2
66	1	1.2	1.4	73.6
67	3	3.7	4.2	77.8
68	1	1.2	1.4	79.2
69	4	4.9	5.6	84.7
70	1	1.2	1.4	86.1
72	1	1.2	1.4	87.5
75	2	2.5	2.8	90.3
76	2	2.5	2.8	93.1
78	1	1.2	1.4	94.4
79	2	2.5	2.8	97.2
80	1	1.2	1.4	98.6
81	1	1.2	1.4	100.0
Total	72	88.9	100.0	
Missing System	9	11.1		
Total	81	100.0		

Letters

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	16	19.8	22.2
	1	16	19.8	22.2
	2	5	6.2	6.9
	3	4	4.9	5.6
	4	4	4.9	5.6
	5	3	3.7	4.2
	6	3	3.7	4.2
	7	1	1.2	1.4
	8	3	3.7	4.2
	10	4	4.9	5.6
	11	1	1.2	1.4
	12	1	1.2	1.4
	14	7	8.6	9.7
	15	1	1.2	1.4
	16	3	3.7	4.2
Total	72	88.9	100.0	
Missing System	9	11.1		
Total	81	100.0		

Category

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 2 yr. Old	11	13.6	15.3	15.3
3 yr. Old	25	30.9	34.7	50.0
4 yr. Old	27	33.3	37.5	87.5
5 yr. Old	9	11.1	12.5	100.0
Total	72	88.9	100.0	
Missing System	9	11.1		
Total	81	100.0		