

The Missouri Quality Rating System School Readiness Study

Dr. Kathy R. Thornburg, Principal Investigator

Dr. Wayne A. Mayfield

Dr. Jacqueline S. Hawks

Center for Family Policy & Research

University of Missouri

Dr. Kathryn L. Fuger

Institute for Human Development

University of Missouri—Kansas City

The Mid-America Regional Council's
Metropolitan Council on Early Learning
commissioned this research.

This research was funded with the generous support of:

The George K. Baum Family Foundation

The Kansas Health Foundation

The John W. and Effie E. Speas Trust - Bank of America Trust Department

The Francis Family Foundation

The Hall Family Foundation

October 2009

Purpose of Study

Although almost all states have committed to developing and implementing Quality Rating Systems (QRS), no studies have documented the association between QRS ratings and child outcomes. In other words, are children who attend five-star programs more prepared for school than children attending two-star programs? The purpose of this study is to determine the extent to which Missouri QRS ratings are associated with measurable gains in children's school readiness.

Research Question

Do preschool children who attend higher quality programs as measured by the Missouri QRS show greater gains in school readiness than their peers who attend lower quality programs?

Study Participants

Thirty-eight licensed early childhood programs—32 centers and 6 family child care homes—participated in the study. The programs came from the Kansas City area, St. Joseph, and Columbia, MO. Parental consents were received from 514 families to have children ages 3 to 5 participate in the study. The final sample of children with complete pretest and posttest data was 350 from 66 different classrooms. Because of the school readiness measures used, children who had severe disabilities or who did not speak English were not included in the study. Only children who attended a program full-time (25 hours or more a week) were recruited into the study.

Of the 350 participating children, 45% were female, 11% had special needs, 30% were eligible for free/reduced lunch, and 41% were minority. The specific race/ethnicity of the children was 59% White, 29% Black, 6% multiracial, 4% Latino/Hispanic, and 2% Asian. The mean number of monthly absences for all children was 1.77 days ($SD = 1.59$).

Measures and Assessments

Program Measure

Depending on program type, programs were assessed with the Missouri Quality Rating System (MO QRS) using either the center and group home model or the home-based model. Although the models share the same components, the progressive requirements within each of the components are designed to recognize the unique aspects of different program types. The models require documentation that programs meet the stated education and training requirements through the Professional Achievement & Recognition System (PARS). In addition, trained observers also assess the learning environment and verify family involvement and business/administrative practices.

The shared components of Missouri's models are as follows:

- Administrator Education and Training
- Staff Education
- Education Specialization
- Annual Training
- Learning Environment
- Intentional Teaching
- Family Involvement
- Business and Administrative Practices

The requirements in each component are organized hierarchically for Tiers 1-5. The tiers within each component are assigned a point value. The total point value for all components results in an overall star rating (1 to 5 stars). Programs were rated between January and May 2009. The MO QRS models are available at <https://www.openinitiative.org/content.aspx?file=QRSModels.txt>.

Child Measure

Because school readiness covers many aspects of development, a wide range of measures was selected, including assessments that cover vocabulary, early literacy skills, basic knowledge (shapes, colors), math skills, fine and gross motor skills, and social-emotional development. Table 1 presents the measures used to assess children’s school readiness.

Child assessments were conducted on an individual basis by experienced assessors in the fall of 2008 and in the spring of 2009. Each assessment session lasted approximately 40 minutes. To assess children’s social-emotional development, teachers completed the *Devereux Early Childhood Assessment (DECA)* in the spring and fall.

To obtain child demographic data, parents completed a brief family survey that asked for race/ethnicity and gender. Parents also consented to have programs share information about their eligibility for free/reduced lunch with researchers.

Programs provided data on children’s special needs status, eligibility for free/reduced lunch status, as well as the number of times the child was absent each month.

Table 1. Description of Child Outcome Measures

Measure	What is assessed	Description	
<i>Peabody Picture Vocabulary Test, 4th Ed. (PPVT-4)</i> ¹	Ability to understand spoken words (receptive vocabulary)	<ul style="list-style-type: none"> • National norms • Average score = 100 	<ul style="list-style-type: none"> • Standard deviation = 15 • Scores range from 20-160
<i>Test of Early Reading Ability, 3rd Ed. (TERA-3)</i> ² Reading Quotient	Overall measure of early literacy skills	<ul style="list-style-type: none"> • National norms • Average score = 100 	<ul style="list-style-type: none"> • Standard deviation = 15 • Scores range from 41-164
TERA-3 Alphabet subtest	Knowledge of letters and sounds	<ul style="list-style-type: none"> • National norms • Average score = 10 	<ul style="list-style-type: none"> • Standard deviation = 3 • Scores range from 1-20
TERA-3 Conventions subtest	Knowledge of print conventions (e.g., print goes left to right; upper vs. lower case; purpose of punctuation)	<ul style="list-style-type: none"> • National norms • Average score = 10 	<ul style="list-style-type: none"> • Standard deviation = 3 • Scores range from 1-20
TERA-3 Meaning subtest	Print awareness; knowledge of print functions; early comprehension skills	<ul style="list-style-type: none"> • National norms • Average score = 10 	<ul style="list-style-type: none"> • Standard deviation = 3 • Scores range from 1-20
Applied Problems subtest ³ (<i>Woodcock-Johnson III Tests of Achievement</i>)	Math skills (e.g., counting, addition, subtraction)	<ul style="list-style-type: none"> • National norms • Average score = 100 	<ul style="list-style-type: none"> • Standard deviation = 15 • Scores range from 40-160
Shape identification ⁴	Ability to name simple shapes	<ul style="list-style-type: none"> • Criterion-referenced 	<ul style="list-style-type: none"> • Scores range from 0-6
Color identification ⁵	Ability to name basic colors	<ul style="list-style-type: none"> • Criterion-referenced 	<ul style="list-style-type: none"> • Scores range from 0-6
Uppercase alphabet ⁶	Ability to identify uppercase letters	<ul style="list-style-type: none"> • Criterion-referenced 	<ul style="list-style-type: none"> • Scores range from 0-26
Fine motor ⁷	Fine motor skills (e.g., cutting, drawing)	<ul style="list-style-type: none"> • Criterion-referenced 	<ul style="list-style-type: none"> • Scores range from 0-10
Gross motor ⁷	Gross motor skills (e.g., jumping, hopping)	<ul style="list-style-type: none"> • Criterion-referenced 	<ul style="list-style-type: none"> • Scores range from 0-22
<i>Devereux Early Childhood Assessment (DECA) Total Protective Factors</i> ⁸	Overall positive social and behavioral skills	<ul style="list-style-type: none"> • National norms • Average score = 50 	<ul style="list-style-type: none"> • Standard deviation = 10 • Scores range from 28-72
DECA Initiative scale	Motivation, persistence	<ul style="list-style-type: none"> • National norms • Average score = 50 	<ul style="list-style-type: none"> • Standard deviation = 10 • Scores range from 28-72
DECA Self-control scale	Ability to self-regulate (e.g., cope with frustration, show patience)	<ul style="list-style-type: none"> • National norms • Average score = 50 	<ul style="list-style-type: none"> • Standard deviation = 10 • Scores range from 28-72
DECA Attachment scale	Ability to engage in mutual, positive relationships with adults	<ul style="list-style-type: none"> • National norms • Average score = 50 	<ul style="list-style-type: none"> • Standard deviation = 10 • Scores range from 28-72
DECA Behavioral Concerns	Incidence of emotional and behavioral problems	<ul style="list-style-type: none"> • National norms • Average score = 50 • Standard dev. = 10 	<ul style="list-style-type: none"> • Scores range from 31-72 • Higher scores indicate more problem behaviors

Main Findings

Some Definitions

Low, Medium, High QRS

Table 2 shows how programs scored on the QRS. Because there were very few programs scoring at the 1 and 5 star levels, we created three categories of quality based on star rating: Low (1-2 stars); Medium (3 stars); and high (4-5 stars). Table 2 also shows the number of children and programs associated with these QRS categories. Because some children are missing data on some outcome

Table 2. Number of Programs and Children by QRS Star Rating

QRS Star Rating	Number of centers	Number of homes	Number of children	QRS category	Total number of programs	Total number of children
1	1	0	9	Low	9	73
2	8	0	64			
3	16	3	209	Medium	19	209
4	6	2	59	High	10	68
5	1	1	9			

measures, sample sizes vary with the instrument. Table 3 shows child characteristics by QRS categories. The three QRS categories did not differ significantly with respect to gender, age, percentage of children with special needs, or percentage of children in poverty.

Table 3. Characteristics of Children by QRS Category

Characteristic	Low QRS sample	Medium QRS sample	High QRS sample
% female	41.1%	46.9%	44.1%
Mean age (in months) at pretest	Mean = 53.44 (SD = 5.52)	Mean = 51.89 (SD = 5.82)	Mean = 52.62 (SD = 5.22)
% minority	26.0%	44.0%	33.8%
% eligible for free/reduced lunch	31.5%	29.2%	32.4%
% with special needs	11.0%	12.0%	6.9%
Mean number of monthly absences (in days)	Mean = 2.31 (SD = 1.83)	Mean = 1.58 (SD = 1.53)	Mean = 1.74 (SD = 1.37)

However, there were significant differences in the percentage of minority children and mean number of monthly absences. Accordingly, the analyses controlled for differences in these variables.

Poverty

For purposes of this study, we define *children in poverty* as those whose families qualify to receive free or reduced lunch based on Child and Adult Care Food Program information. Children who do not qualify for free or reduced lunch are considered not in poverty.

Overall Results

In this section, results for all children are presented from three different statistical comparisons: children in Low QRS vs. High QRS programs; children in Low QRS vs. Medium QRS programs; and children in Medium QRS programs vs. High QRS programs. Repeated measure ANCOVAs were used to determine whether one group gained more from pretest to posttest than another. For the standardized measures, minority status and mean number of monthly absences were used as covariates; for non-standardized measures, age of child was also included. The magnitude of the gains is presented in effect size using Cohen's *d* (see text box below). Table A1 in the Appendix presents descriptive statistics for all child outcome measures by QRS category; Table A2 in the Appendix presents the same statistics by poverty status.

Effect size measures are used to get a better idea of how big differences found in research are. For example, in this study, one might ask just how big *is* the effect on children's social skills for those attending High QRS programs versus children in Low QRS programs. The following guidelines are useful for interpreting Cohen's *d* effect sizes: less than 0.20 represents a small effect; 0.50 is a medium effect; and 0.80 is a large effect.

Low vs. High QRS Results

Compared to their peers in 1- and 2-star programs, children in 4- and 5-star programs showed statistically **significant gains on overall social and behavioral skills** ($p < .001$; effect size = .80), **motivation** ($p < .001$; effect size = .79), **self-control** ($p = .003$; effect size = .65), and **positive adult relationships** ($p = .034$; effect size = .45). In general, children in high quality programs experienced greater gains on

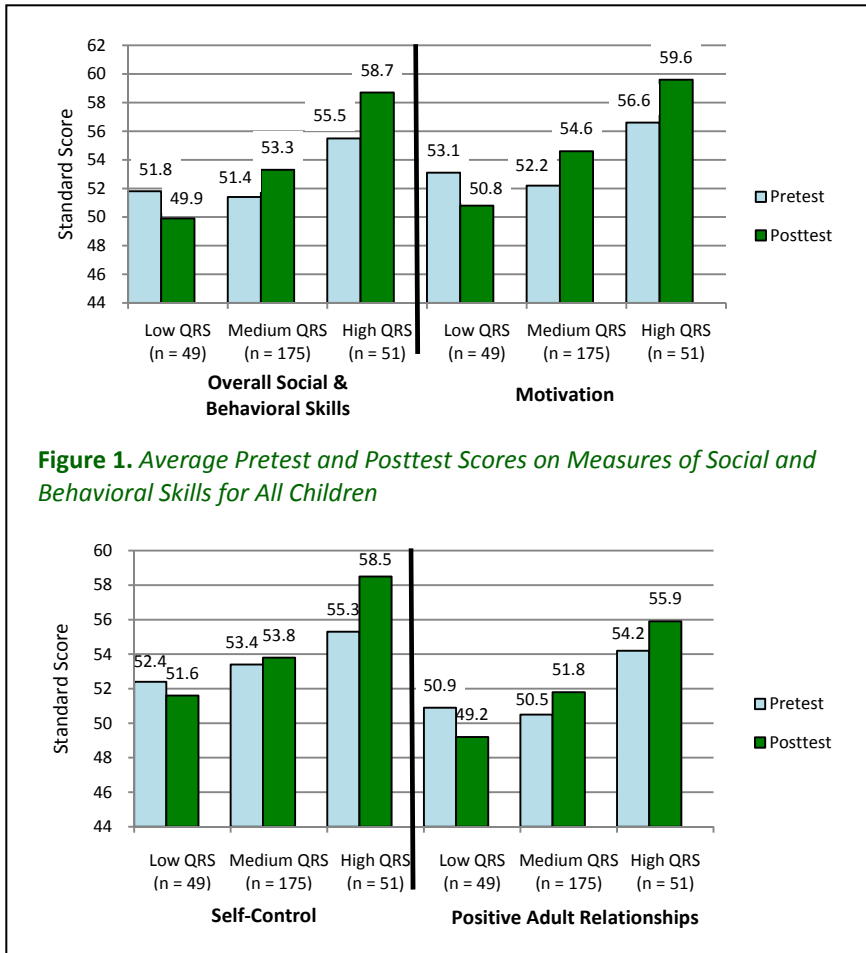


Figure 1. Average Pretest and Posttest Scores on Measures of Social and Behavioral Skills for All Children

important social-emotional skills that are necessary for success in school and life than children in low quality programs. The effect sizes for these differences in gains range from medium to large. Figure 1 presents scores pre- and posttest on these social and behavioral measures for children in low, medium, and high quality programs. Figure 2 presents the same data in terms of gains. Note that children in low quality programs actually score lower over time, resulting in negative gains.

Low vs. Medium QRS Results

Compared to their peers in 1- and 2-star programs, children in 3-star programs showed statistically **significant gains on overall social and behavioral skills** ($p = .008$; effect size = .36) and **motivation** ($p = .001$; effect size = .43). For positive adult relationships, the gains were marginally significant ($p = .053$

effect size = .26). These effect sizes represent small to medium differences.

Compared to peers in low quality programs, children in Medium QRS programs showed fewer gains on know-

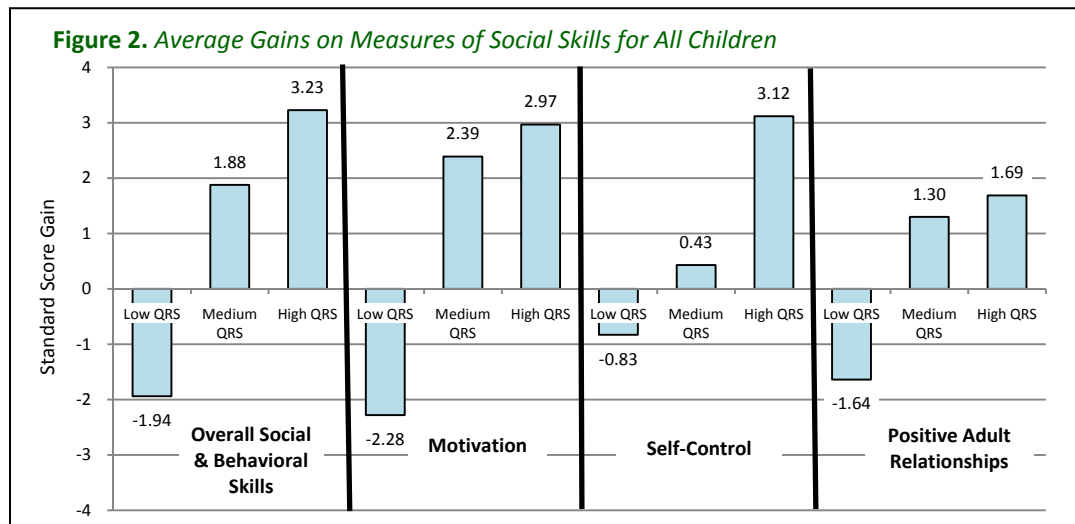


Figure 2. Average Gains on Measures of Social Skills for All Children

ledge of print conventions ($p = .043$; effect size = -.25). The effect size suggests a relatively small effect on this attribute.

Medium vs. High QRS Results

Compared to their peers in 3-star programs, children in 4- and 5-star programs showed marginally significant gains on self-control ($p = .064$ effect size = .23). This difference represents a small effect.

Results for Children in Poverty

In this section, results will be presented comparing children in poverty from the three QRS categories. In other words, for children in poverty, were there differences in gains based on program quality level?

Low vs. High QRS Results

Compared to their peers in 1- and 2-star programs, children in poverty who attended 4- and 5-star programs showed statistically **significant gains from pretest to posttest on overall social and behavioral skills** ($p = .035$; effect size = .79), **motivation** ($p = .037$; effect size = .78), and **vocabulary** ($p = .022$; effect size = .74). The effect sizes for these differences in gains approach large. In addition, compared to peers in low quality programs, children in poverty from high quality programs showed marginally significant gains in knowledge of letters/sounds ($p = .063$ effect size = .61), gross motor skills ($p = .086$; effect size = .57), and self-control ($p = .085$ effect size = .64).

Figure 3 shows gains on the social and behavioral measures. Note that for these measures, the large gains typically occurred in high quality programs. Figure 4 presents gain scores for vocabulary, Figure 5 shows gains in knowledge of letters/sounds, and Figure 6 displays gains in gross motor skills.

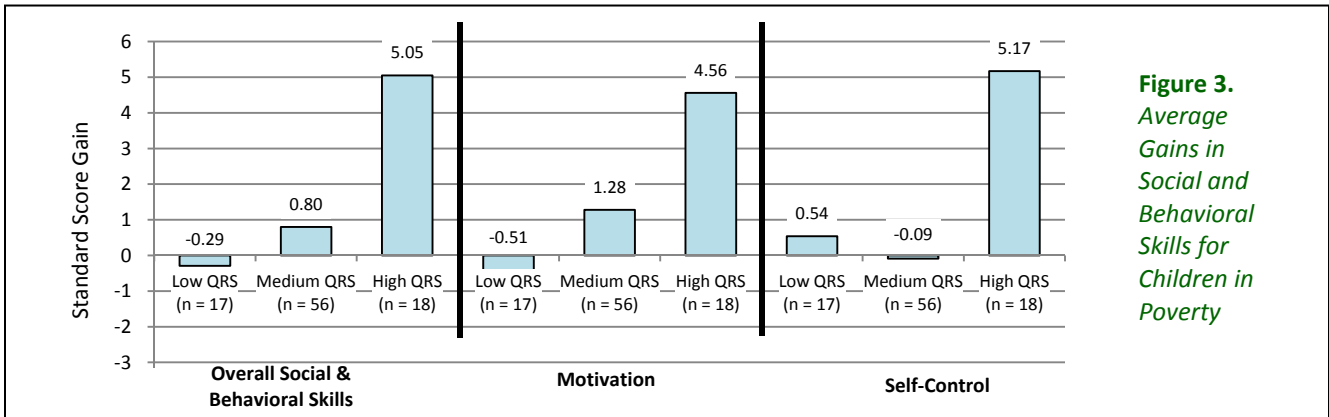


Figure 3.
Average Gains in Social and Behavioral Skills for Children in Poverty

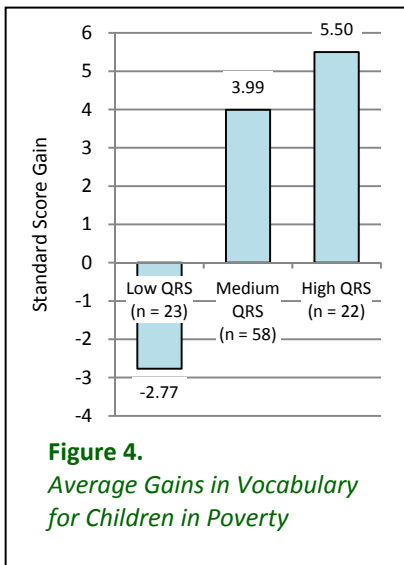


Figure 4.
Average Gains in Vocabulary for Children in Poverty

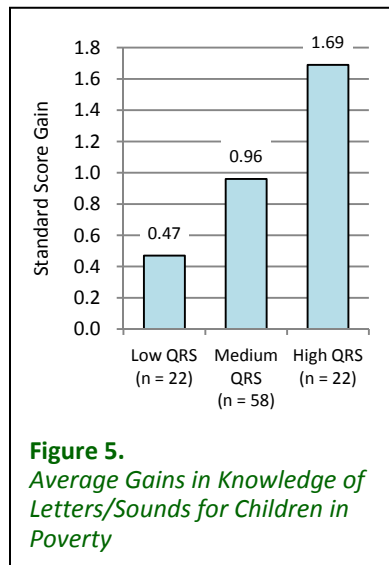


Figure 5.
Average Gains in Knowledge of Letters/Sounds for Children in Poverty

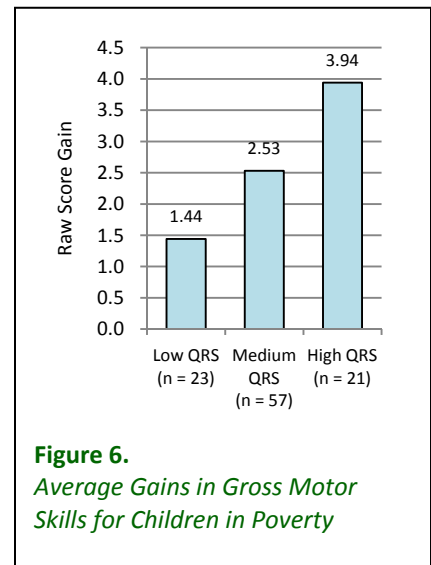


Figure 6.
Average Gains in Gross Motor Skills for Children in Poverty

Low vs. Medium QRS Results

Compared to their peers in 1- and 2-star programs, children in poverty attending 3-star programs showed statistically **significant gains on vocabulary** ($p = .006$; effect size = .64). This effect size represents a medium effect on children's vocabulary development.

Medium vs. High QRS Results

Compared to their peers in 3-star programs, children in poverty who attended 4- and 5-star programs showed statistically **significant gains on self-control** ($p = .013$ effect size = .61). This difference represents a medium effect. In addition, compared to peers in medium quality programs, children in poverty showed marginally significant gains in overall social and behavioral skills ($p = .079$ effect size = .42).

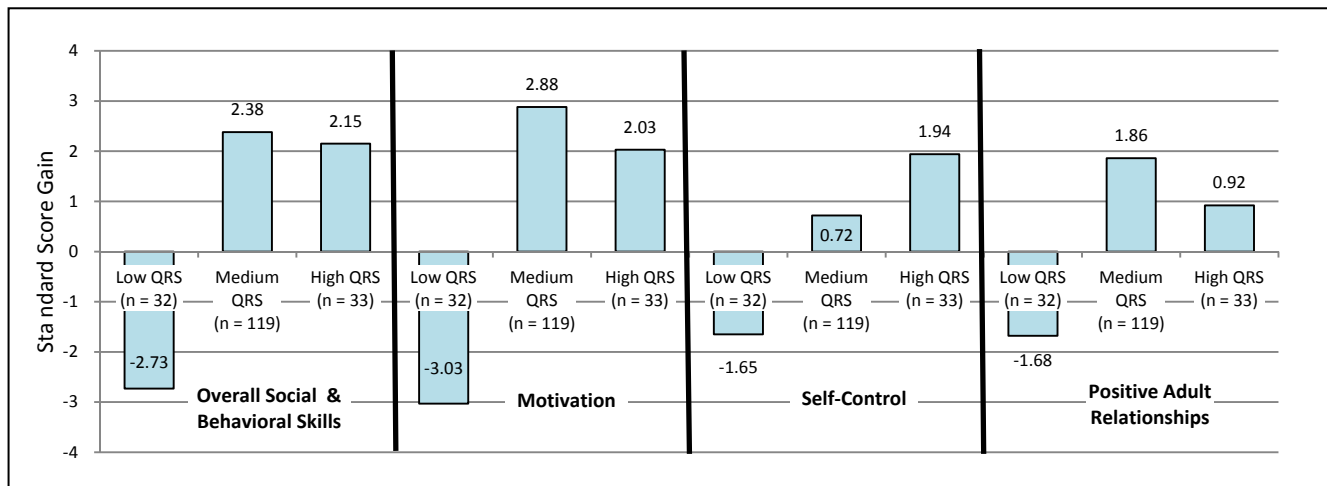
Results for Children Not in Poverty

In this section, results will be presented comparing children not in poverty from the three QRS categories. In other words, for children not in poverty, were there differences in gains based on program quality level?

Low vs. High QRS Results

Compared to their peers in 1- and 2-star programs, children not in poverty who attended 4- and 5-star programs showed statistically **significant gains from pretest to posttest on overall social and behavioral skills** ($p = .003$; effect size = .79), **motivation** ($p = .003$; effect size = .79), and **self-control** ($p = .012$; effect size = .66). The effect sizes for these differences in gains range from medium to large. In addition, compared to peers in low quality programs, children not in poverty from high quality programs showed marginally significant gains in print awareness/comprehension skills ($p = .071$; effect size = .38). The effect size for this gain is between small and medium. Figure 7 presents gains on the social and behavioral measures. Note that for low quality programs, children not in poverty were rated as losing social and emotional skills over time. Figure 8 presents gain scores for print awareness/comprehension skills.

Figure 7. Average Gains in Social and Behavioral Skills for Children Not in Poverty



Compared to peers in low quality programs, children not in poverty attending high QRS programs showed marginally significantly fewer gains on fine motor skills ($p = .051$; effect size = -.42) and gross motor skills ($p = .062$; effect size = -.40).

Low vs. Medium QRS Results

Compared to their peers in 1- and 2-star programs, children not in poverty attending 3-star programs showed statistically **significant gains on overall social and behavioral skills** ($p = .004$; effect size = .49), **motivation** ($p = .001$; effect size = .57), and **positive adult relationships** ($p = .049$; effect size = .33). These effect sizes represent medium effects for gains in social skills.

Compared to peers in low quality programs, children not in poverty attending medium QRS programs showed fewer gains on knowledge of print conventions ($p = .036$; effect size = -.31) and gross motor skills ($p = .05$; effect size = -.29). The effect sizes suggest relatively small effects on these skills.

Medium vs. High QRS Results

There were no significant differences for children not in poverty attending medium vs. high quality programs.

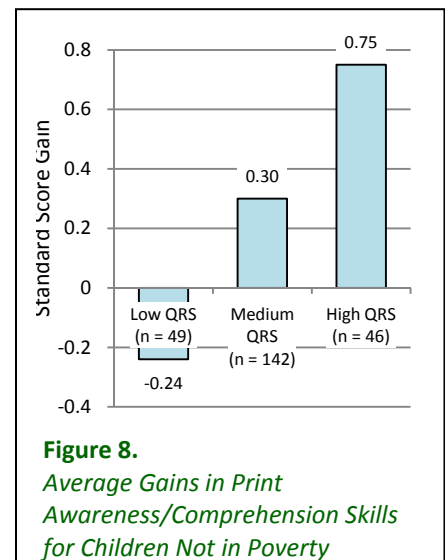


Figure 8. Average Gains in Print Awareness/Comprehension Skills for Children Not in Poverty

Limitations

The percentage of programs in each of the three QRS categories is not likely to be representative of what would be expected from a random sample of early childhood programs in the state because this study took place in three communities that have experienced a number of initiatives designed to raise program quality. In particular, we would expect there to be a higher percentage of lower quality programs in the state than the percentage that was found in this study.

Summary

This study found that preschool children attending higher quality early childhood programs, as measured by the MO QRS, made greater gains in social and emotional development than their peers in lower quality programs. In fact, children in lower quality programs were rated as actually losing social and behavioral skills over time. In particular, gains in the ability to self-regulate, which is crucial for children's school readiness, were positively associated with children attending high quality programs.

The findings regarding children in poverty point out the important role that early childhood programs can play in enhancing the school readiness of children from low-income families. With respect to social and behavioral skills, children in poverty clearly benefit from high quality programs. For this population, gains in social and emotional development occurred only in high QRS programs and not in medium or low QRS programs. However, both medium and high quality programs made substantial impacts on vocabulary development for children in poverty, whereas low quality programs showed a negative impact on these children's vocabulary. Although the study did not address how overall quality may be related to vocabulary use and learning in early childhood programs, it appears that medium and high quality programs provide settings that enhance children's exposure to and use of new vocabulary, which is an important precursor to the development of good reading skills. For knowledge of letters/sounds and gross motor skills, children gained no matter the quality of the programs. However, the higher the quality of the program, the greater the gains that children made in these two areas. Overall, high quality programs help children in poverty to gain more skills in social-emotional development, early literacy, and physical development.

Children who are not in poverty also showed benefits from higher quality programs. In particular, children not in poverty attending medium or high quality programs showed gains in social and behavioral skills, as well as print awareness/comprehension. However, children not in poverty who attended low quality programs actually lost skills in both these areas.

Policy Implications

Given that the results of this study show that some aspects of children's school readiness are *hurt* by low quality programs, it is imperative that all children have the opportunity to attend medium or high quality programs. Children in poverty are particularly at-risk for falling behind in school readiness and thus need access to higher quality early childhood programs. Currently, the state provides child care assistance (subsidies) for low-income families to send their children to center-based, home-based, and unregulated programs. In fact, 32% of these children in poverty attend programs that are unregulated (not licensed.)⁹ Because being licensed is a requirement to enter QRS, there are no data on the quality of unregulated programs as measured by MO QRS, although it is assumed that many of these programs are of low quality. To most wisely use the available child care assistance resources, the state should focus on paying for children in poverty to attend high quality programs—with the ultimate intention of shrinking the school readiness gap.

Although providing subsidies to programs that achieve a certain level of quality could be a potent incentive for programs to increase their quality, it is also important to provide lower quality programs with the tools and resources to improve. State initiatives designed to enhance quality—including technical assistance, scholarships, and curriculum training—need to be expanded if we want *all* Missouri's children to be ready for school.

Appendix

Table A1. Descriptive Statistics for Child Outcome Measures by QRS Category

Measure	QRS category								
	Low			Medium			High		
	Pretest mean	Posttest mean	<i>n</i>	Pretest mean	Posttest mean	<i>n</i>	Pretest mean	Posttest mean	<i>n</i>
PPVT-4 standard score	100.45 (13.67)	102.06 (15.74)	73	101.39 (16.40)	102.96 (15.13)	203	106.41 (16.64)	108.47 (15.62)	68
TERA Reading Quotient	94.59 (15.02)	98.49 (12.35)	71	93.63 (13.80)	97.22 (15.01)	200	95.19 (15.28)	100.29 (17.38)	68
TERA Alphabet subtest	9.66 (3.35)	10.20 (3.17)	71	9.02 (3.07)	10.10 (3.39)	200	9.56 (3.52)	10.59 (3.88)	68
TERA Conventions subtest	8.78 (2.40)	9.65 (2.63)	71	8.89 (2.27)	9.19 (2.58)	200	9.14 (2.28)	9.72 (3.13)	68
TERA Meaning subtest	9.16 (2.82)	9.55 (1.58)	71	9.04 (2.64)	9.44 (2.19)	200	9.05 (2.69)	9.84 (2.39)	68
WJ III Applied Problems subtest	104.63 (14.49)	105.87 (11.08)	72	103.51 (14.05)	104.45 (13.98)	198	107.41 (11.66)	108.36 (11.91)	67
Shape identification	4.29 (1.85)	5.10 (1.29)	73	4.18 (1.90)	4.78 (1.66)	202	4.46 (1.69)	4.99 (1.43)	66
Color identification	5.39 (1.29)	5.85 (0.38)	73	5.38 (1.62)	5.70 (1.13)	202	5.55 (1.37)	5.85 (0.54)	66
Uppercase alphabet	13.95 (10.42)	18.16 (9.07)	73	13.61 (10.42)	18.23 (9.56)	201	13.90 (9.70)	18.60 (8.29)	66
Fine motor	5.35 (2.43)	7.44 (2.09)	73	5.02 (2.31)	6.80 (2.00)	203	5.05 (2.24)	6.84 (1.89)	66
Gross motor	10.75 (6.73)	15.06 (6.53)	72	12.23 (6.62)	15.67 (6.18)	198	13.19 (6.46)	16.61 (5.93)	66
DECA Total Protective Factors	51.81 (8.04)	49.87 (7.62)	49	51.41 (9.76)	53.29 (10.26)	175	55.47 (8.22)	58.70 (7.07)	51
DECA Initiative scale	53.08 (7.97)	50.80 (8.04)	49	52.18 (9.27)	54.57 (9.34)	175	56.64 (7.96)	59.61 (6.69)	51
DECA Self-control scale	52.40 (9.48)	51.57 (7.38)	49	53.37 (9.68)	53.80 (10.55)	175	55.33 (8.37)	58.45 (7.83)	51
DECA Attachment scale	50.87 (6.46)	49.23 (7.08)	49	50.46 (10.49)	51.76 (9.98)	175	54.18 (9.13)	55.87 (7.63)	51
DECA Behavioral Concerns	53.38 (8.34)	52.97 (7.86)	49	51.49 (9.94)	51.39 (10.48)	175	50.40 (9.81)	51.26 (10.76)	51

Note. Standard deviations are in parentheses below means. All means are adjusted for differences in monthly absences and minority status; means for shape identification, color identification, uppercase alphabet, fine motor, and gross motor include child age as a covariate.

Table A2. Descriptive Statistics for Child Outcome Measures by QRS Category and Poverty Status

Measure	Low						Medium						High					
	Poverty			Non-poverty			Poverty			Non-poverty			Poverty			Non-poverty		
	Pretest mean	Posttest mean	n	Pretest mean	Posttest mean	n	Pretest mean	Posttest mean	n	Pretest mean	Posttest mean	n	Pretest mean	Posttest mean	n	Pretest mean	Posttest mean	n
PPVT-4 standard score	95.68 (15.40)	92.91 (17.42)	23	103.04 (12.39)	106.66 (12.98)	50	91.93 (12.65)	95.92 (14.59)	58	105.12 (16.11)	105.73 (14.40)	145	92.64 (13.52)	98.14 (16.44)	22	112.72 (14.49)	113.17 (12.95)	46
TERA Reading Quotient	88.95 (16.90)	94.81 (13.55)	22	97.61 (13.58)	100.60 (11.55)	49	88.82 (11.78)	90.94 (14.50)	58	95.88 (13.61)	99.61 (14.45)	142	85.85 (11.17)	92.17 (17.76)	22	99.63 (15.27)	104.20 (16.09)	46
TERA Alphabet subtest	8.94 (3.16)	9.41 (3.14)	22	10.08 (3.43)	10.64 (3.15)	49	7.75 (2.66)	8.71 (3.07)	58	9.49 (3.06)	10.64 (3.35)	142	7.67 (2.88)	9.36 (3.89)	22	10.51 (3.49)	11.19 (3.78)	46
TERA Conventions subtest	7.92 (2.56)	8.46 (3.03)	22	9.16 (2.28)	10.29 (2.27)	49	8.02 (2.25)	8.37 (2.54)	58	9.22 (2.17)	9.48 (2.52)	142	7.89 (1.83)	8.17 (3.21)	22	9.75 (2.27)	10.48 (2.87)	46
TERA Meaning subtest	7.97 (3.11)	9.73 (1.37)	22	9.74 (2.52)	9.50 (1.67)	49	8.07 (2.48)	8.70 (2.32)	58	9.44 (2.60)	9.74 (2.06)	142	7.84 (2.63)	8.80 (2.69)	22	9.57 (2.59)	10.32 (2.12)	46
WJ III Applied Problems subtest	98.83 (17.81)	100.25 (11.50)	22	107.43 (12.27)	108.55 (10.17)	50	98.42 (12.44)	100.80 (13.94)	58	105.53 (14.11)	105.90 (13.73)	140	100.55 (11.97)	102.54 (11.31)	21	110.54 (10.30)	110.99 (11.39)	46
Shape identification	3.59 (2.22)	4.54 (1.53)	23	4.63 (1.57)	5.38 (1.07)	50	3.66 (1.96)	4.31 (1.91)	58	4.38 (1.83)	4.97 (1.50)	144	3.81 (1.56)	4.55 (1.53)	21	4.76 (1.70)	5.19 (1.36)	45
Color identification	5.05 (1.70)	5.72 (0.52)	23	5.54 (1.04)	5.92 (0.28)	50	5.07 (2.01)	5.57 (1.29)	58	5.53 (1.42)	5.75 (1.06)	144	5.32 (1.44)	5.72 (0.87)	21	5.58 (1.35)	5.90 (0.29)	45
Uppercase alphabet	13.28 (9.42)	18.15 (9.24)	23	14.48 (10.92)	18.25 (9.08)	50	9.85 (10.18)	15.08 (10.70)	58	14.97 (10.16)	19.46 (8.77)	143	9.84 (9.44)	15.91 (8.55)	21	16.05 (9.37)	19.89 (8.04)	45
Fine motor	4.94 (2.26)	6.45 (2.41)	23	5.55 (2.51)	7.93 (1.79)	50	4.58 (2.32)	6.29 (2.23)	58	5.18 (2.28)	7.01 (1.85)	145	4.34 (1.99)	6.48 (1.90)	21	5.41 (2.32)	6.99 (1.89)	45
Gross motor	13.05 (6.68)	14.49 (6.15)	23	9.61 (6.63)	15.31 (6.73)	49	12.61 (6.98)	15.14 (6.48)	57	12.15 (6.49)	15.89 (6.07)	141	13.09 (6.22)	17.03 (5.52)	21	13.09 (6.63)	16.43 (6.14)	45
DECA Total Protective Factors	50.29 (8.83)	50.00 (5.98)	17	52.68 (7.58)	49.95 (8.45)	32	51.59 (9.36)	52.39 (9.41)	56	51.31 (9.98)	53.69 (10.66)	119	54.84 (8.40)	59.89 (6.26)	18	55.84 (8.22)	57.99 (7.49)	33
DECA Initiative scale	50.57 (8.02)	50.06 (6.11)	17	54.39 (7.71)	51.36 (8.92)	32	52.22 (9.74)	53.50 (9.07)	56	52.15 (9.08)	55.03 (9.48)	119	55.94 (8.63)	60.50 (5.98)	18	57.10 (7.69)	59.13 (7.10)	33
DECA Self-control scale	50.74 (10.24)	51.28 (5.14)	17	53.48 (9.01)	51.83 (8.40)	32	52.68 (8.70)	52.59 (8.97)	56	53.64 (10.14)	54.36 (11.22)	119	54.91 (8.03)	60.08 (6.69)	18	55.56 (8.66)	57.50 (8.38)	33
DECA Attachment scale	52.49 (8.26)	51.11 (7.14)	17	50.07 (5.32)	48.39 (7.09)	32	51.61 (9.23)	51.69 (9.54)	56	49.91 (11.01)	51.77 (10.22)	119	53.64 (8.79)	56.63 (6.93)	18	54.44 (9.44)	55.36 (8.06)	33
DECA Behavioral Concerns	54.62 (8.34)	52.32 (6.58)	17	52.52 (8.37)	53.13 (8.56)	32	53.24 (10.41)	53.18 (10.79)	56	50.74 (9.65)	50.59 (10.27)	119	52.00 (9.67)	53.54 (12.54)	18	49.45 (9.92)	50.00 (9.58)	33

Note. Standard deviations are in parentheses below means. All means are adjusted for differences in monthly absences and minority status; means for shape identification, color identification, uppercase alphabet, fine motor, and gross motor include child age as a covariate.

Acknowledgments

The authors would like to acknowledge the support of all of the persons who helped make this project a success. Our first “thank you” goes to the generous funders and to Dr. Jim Caccamo and others at MARC for believing in the importance of this study.

The directors of all of the programs that agreed to participate, the teachers and their coaches, parents who gave permission to have their children assessed, AND the children themselves—a great big THANK YOU. Without each of you, the project would not have occurred.

A project this large takes many individuals behind the scenes as well as in the classrooms to make it happen. In addition to the co-authors listed on the cover, I would like to thank Terri Tatum, Heather Lowery, and Jo Ann Dennings at the Center for Family Policy & Research for their work on this project. In addition, the team at the OPEN Initiative managed the process and data for the QRS and worked with the directors to make this a good experience for them. Thank you, OPEN team, for all of your work to make this project a success—Denise Mauzy, Terri Foulkes, Amber Sparks, Christy McCord, Alli Stamschorr, Nick March, Kristin Ley, Sarah Hicks, Lara Thompson, and Lorentz Morrow. The observers, assessors, and other assistants at the Institute for Human Development deserve much credit for their work on this project. Without these professionals and their tireless work, we would have no results. Thanks to Melissa Newkirk, Dawana Stephens, Mary Ann Heryer, Jan Schwarz, Mike Abel, Jodi Arnold, Dianna Duke, Mrudhula Vajjha, Miranda Horrell, Amy Stanfill, Rachel Roozrokh, Joni Breidenthal, Phyllis Field, Marty Allee, Angela Updyke-Brunet, Becky West, Cindy Dover, Danica Love, Jenn Frank-Dull, Kathleen Cross, Kate Ghio, Loretta Bunn, and Polly Prendergast. And, a special thanks to Michelle Mathews who trained the observers.

So, from the funders to the children, we owe our gratitude. I know I speak for all of the dedicated persons who touched this project when I say:

*Our hope is that the results of this study will show policymakers, community leaders, families, and early childhood professionals the importance of providing high quality early childhood programs for **all** young children, but especially those from families in poverty. Together, we need to make it a reality!*

Kathy Thornburg
October 2009

Endnotes

- ¹Dunn, L. M., & Dunn, L. M. (2007). *Peabody Picture Vocabulary Test-Fourth Edition*. Minneapolis, MN: Pearson.
- ²Reid, K. D., Hresko, W. P., & Hammill, D. D. (2001). *Test of Early Reading Ability, 3rd ed. (TERA-3)*. Austin, TX: Pro-Ed.
- ³Woodcock, R.W., McGrew, K.S., & Mather, N. (2001). *Woodcock-Johnson III Tests of Achievement*. Itasca, IL: Riverside.
- ⁴Center for Family Policy & Research. (2008). *Basic shape identification measure*. Columbia, MO: Author.
- ⁵Center for Family Policy & Research. (2008). *Basic color identification measure*. Columbia, MO: Author.
- ⁶Center for Family Policy & Research. (2008). *Upper-case alphabet identification measure*. Columbia, MO: Author.
- ⁷Center for Family Policy & Research. (2008). *Brief fine and gross motor skill assessment*. Columbia, MO: Author.
- ⁸LeBuffe, P. A. & Naglieri, J. A. (1999). *Devereux Early Childhood Assessment technical manual*. Lewisville, NC: Kaplan.
- ⁹Missouri Department of Social Services, Early Childhood and Prevention Services Section. (2009, August). *Block grant child care monthly management report*. Jefferson City, MO: Author.



University of Missouri
1400 Rock Quarry Rd.
Columbia, MO 65211
(573) 882-9998
Fax: (573) 884-0598
<http://CFPR.missouri.edu>

Suggested citation:

Thornburg, K. R., Mayfield, W. A., Hawks, J. S., & Fuger, K. L. (2009). *The Missouri quality rating system school readiness study*. Columbia, MO: Center for Family Policy & Research.