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ECRP Early Childhood Research & Practice

Lilian G. Katz, Editor | Jean Mendoza, Susan Fowler, Associate Editors | Laurel Preece, Managing Editor | Established February 27, 1999 | ISSN 1524-5039

...a peer-reviewed multilingual journal on the development, care, and education of young children



Volume 14 Number 1


# Child Care in the American South: Poverty, Costs, and Quality

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## Abstract

High-quality child care has been shown to improve the academic success and life adjustments of children living in poverty. During the past decade, many American states have adopted voluntary Quality Rating and Improvement (QRI) systems in an attempt to increase the level of quality in child care. Using data compiled by the National Association of Child Care Resource & Referral Agencies and the U.S. Department of Labor's Bureau of Labor Statistics in 2010, this study examined potential correlations between a variety of economic variables and the use or non-use of QRI systems in 14 states in the southern United States. Analyses of these data revealed no statistically significant relation between these states' implementation of QRI systems and several variables: full-time annual child care cost (center-based care or family child care) for infants and for 4-year-olds, annual infant care costs as a percentage of annual family median income (married-couple families and families headed by single females), annual child care worker wages, and annual mean wages for all occupations. The article concludes with recommendations for future research.

## Introduction

The cost and quality of child care are vital issues to many American families with children. Of the nearly 74 million children in the United States, more than 25% are preschoolers under age 5 years. In 2008, approximately 7.5 million preschoolers resided in 14 states in the American South characterized by high poverty levels (Children's Defense Fund, 2010; Espinosa, 2010). The states were Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. This study examined potential correlations between a variety of economic variables and the use or non-use of Quality Rating and Improvement (QRI) systems in 14 states in the southern United States.

## Review of Related Research

In the United States, the incidence of poverty is not equally distributed across the states; poverty is more prevalent in the American South (Espinosa, 2010). Many young children under age 5 years live in poverty in 14 southern states. According to the Children's Defense Fund (2010), the annual poverty level for a family of two persons is $14,570, and the poverty level for a family of four persons is $22,050. The annual poverty level for a family of eight persons is $37,010. Based on annual poverty levels, poverty rates from 2008 for children under age 5 years ranged from 16.2% to 33.2% in the 14 southern states (Children's Defense Fund, 2010). See Figure 1 below.

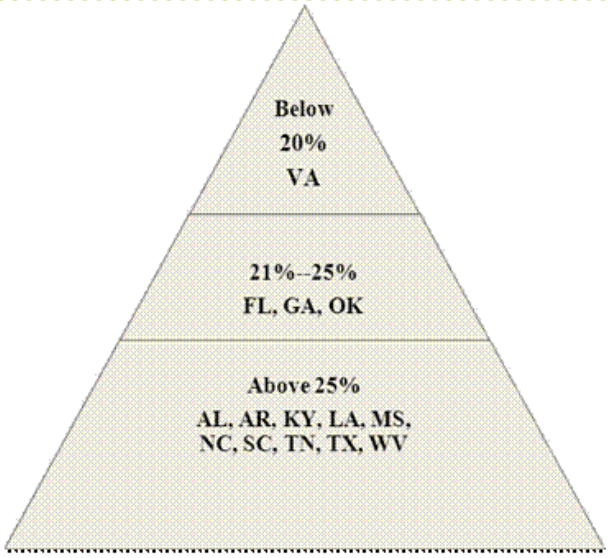


*Figure 1. Poverty rates in 2008 for children under age 5 years in 14 southern U.S. states.*

The increase in poverty in the United States during the past few years has led to impoverished environments for many children (Connolly, Hayden, & Levin, 2007). Poverty presents stressors to children's optimal growth and development through strained parental support, a lack of learning opportunities, and a reduction of material resources (Espinosa, 2010). Children in poverty may lack adequate nutrition and health care, may live in dangerous neighborhoods, and may be reared by parents with unstable employment (Douglas-Hall & Chau, 2008). Children living in poverty are at risk for school failure (Bowman, 2010) and may experience negative differences in life outcomes for cognitive, social, behavioral, and health factors (Edelman & Grace, 2010). These life outcomes may be marked by teen pregnancy, criminal activity, and substance abuse in greater proportion than for peers who have not lived in poverty (Pungello, Campbell, & Barnett, 2006).

High-quality family- and center-based child care programs can enhance the academic success and life adjustments of children living in poverty (Espinosa, 2010). Children who participated in high-quality programs were more likely to demonstrate greater language abilities, experience fewer grade retentions, and have less need for remediation services in elementary school (Lynch, 2005). High-quality early childhood intervention programs have proven effective for poor children by improving educational achievement with positive effects that continue for years (Brooks-Gunn, 2003).



Several studies have indicated that high-quality early care and education programs can improve the cognitive and social development of children living in poverty (Barnett, 2008; Bowman, 2010; Deming, 2009). For example, the High/Scope Perry Preschool Study randomly assigned 123 poor children to the High/Scope preschool program or no-program control groups. Longitudinal results found that participants who were enrolled in the high-quality preschool showed a history of greater educational success and economic development, as well as fewer criminal arrests compared to participants who did not attend the program (Schweinhart, 2003).

Offered in 20 centers, the Chicago Child Parent Center (CPC) program emphasized optimal child development and parental involvement strategies for low-income preschool children (Bracey, 2004). In the Chicago Longitudinal Study, results from CPC program participants at age 26 indicated positive effects on school achievement and child well-being. Economic benefits included higher earnings and tax revenues from the CPC participants, as well as reduced costs for the criminal justice system (Reynolds, Temple, White, Ou, & Robertson, 2011).

The Abecedarian Project randomly assigned 57 infants to a high-quality early intervention program and 54 infants to a control group with no early intervention program. The program served children from poor and vulnerable families and spanned a period of 5 years. Longitudinal results found greater educational success for participants assigned to the early intervention program. As adults, more participants had completed high school, attended college, and held skilled jobs (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002) than did those in the control group.

Since passage of the federal "No Child Left Behind" Act of 2001, local and state governments as well as organizations such as the National Association for the Education of Young Children (NAEYC) have proposed and implemented standards for early learning (Epstein, 2007). Standards-based educational reform focuses on identifying and teaching for required levels of knowledge, skills, and performance for children (Wiggins & McTighe, 2005). In support of the emphasis on academic goals and objectives, the standards-based reform

movement also seeks to address the quality of child care and early education programs (Voltz, Sims, & Nelson, 2010).

Since 1998, Quality Rating and Improvement (QRI) systems have been established to systematically identify and reward high-quality, standards-based child care programs across the nation (NAEYC, 2010). QRI systems include assessments addressing a range of elements of child care quality. While state-established QRI systems' elements of child care quality may differ, general agreement exists across instruments concerning the importance of small class size and low child-staff ratios, staff education and training, safe and clean environments, and classrooms and outside play areas well equipped with easily accessible materials (Zellman & Perlman, 2008; Livermore & Cohen, 2007).

QRI systems compile and share relevant data, such as child-teacher ratios and characteristics of classroom environments, to inform parents and other consumers about the quality of child care in their states. QRI systems across the nation are similar in that they seek to include and rate the components of research-based standards, assessment instruments, parent outreach, provider outreach and support, and quality improvement in child care programs.

With assessment systems that rate each child care provider, QRI systems provide information, analysis, and resources to stakeholders, especially parents seeking child care (Tout & Boller, 2010), and they furnish information on the quality of child care settings to parents and other consumers (Adams, Tout, & Zaslow, 2007). The quality of child care differs across the states (Bowman, 2010), and evidence suggests that parents may not be able to distinguish high-quality care from moderate- or poor-quality care; the determining features for high-quality care may not be obvious to parents (Helburn & Howes, 1996; Zellman & Perlman, 2008). QRI systems are intended by the states that implement them to encourage continuous quality improvement through focus on observation, evaluation, recognition, and reward, including financial incentives (McDonald, 2010). Many states reward higher-quality child care providers through higher subsidy rates of reimbursement (Douville-Watson, Watson, & Wilson, 2003). Some states complement QRI systems by furnishing technical assistance, financial grants, or professional development scholarships to enhance quality (Satkowski, 2009).

Recent evaluation studies of QRI systems have examined their impact on child outcomes as well as improvements in the quality of child care. For example, in Missouri, Thornburg, Mayfield, Hawks, and Fuger (2009) found that children enrolled in programs rated as low quality experienced negative influences in emotional and social development and that poor children enrolled in programs rated as high quality made improvements in social and emotional development and in literacy skills. Evaluations of QRI systems in North Carolina and Oklahoma found that QRI ratings did, indeed, reflect valid differences in the quality of child care in each of the two states (Tout, Zaslow, Halle, & Forry, 2009).

No coordinated national system for providing child care exists in the United States. Costs and quality of care fluctuate from state to state (Jones, 2010). In an analysis of data from the National Association of Child Care Resource & Referral Agencies (NACCRRA), the Family Enrichment Network (2010) found that the costs of child care continue to increase even during the current economic recession. High-quality child care tends to have lower child-staff ratios and better trained staff and is usually more costly than low-quality child care (Zellman & Perlman, 2008).

Little empirical information exists regarding relationships between child care costs and quality (Zellman & Perlman, 2008). Because parents with young children in the American South (as elsewhere) require child care in order to pursue their own education and employment to escape poverty, an examination of the relationship between child care costs and quality in that region is needed.

Using data compiled by NACCRRA and the U.S. Department of Labor's Bureau of Labor Statistics in 2010, this study examined data for 14 southern states for potential correlations between the use or non-use of QRI systems and a variety of economic variables:

- higher average annual fees for infants or for 4-year-olds in full-time family care
- higher average annual fees for infants or for 4-year-olds in full-time center care
- higher median annual income of married-couple families and families headed by single females
- higher state annual mean wages for child care workers
- higher state annual mean wages for all occupations

## Data Collection

Data were retrieved from NACCRRA (2010a) for examination and analysis. A nonprofit organization founded in 1987, NACCRRA provides training, resources, technical support, and research regarding child care and early education. The organization conducts primary research and collects data related to child care from government sources, generating reports that furnish information to states and to child care agencies and networks throughout the nation (NACCRRA, 2010a).

The report *Child Care in America 2010 State Fact Sheets* (NACCRRA, 2010b) was utilized for information regarding full-time child care fees for family care and center care. The report also provided data concerning

annual family income and costs of child care as a percentage of family income (NACCRRA, 2010b).

Information concerning the location and wages of child care workers was accessed from the U.S. Department of Labor's Bureau of Labor Statistics (BLS) report *Occupational Employment and Wages May 2010 39-9011 Childcare Workers* (U.S. Department of Labor BLS, 2010a). The key federal source for the field of labor economics, the BLS measures employment and unemployment, occupations and locations, and wages throughout the nation. The report *Occupational Employment Statistics: May 2010 State Occupational Employment and Wage Estimates* (U.S. Department of Labor BLS, 2010b) was accessed for data from each of the 14 southern states.

## Findings

### Child Care Fees and Use of QRI Systems

For 2010, two southern states—Mississippi and South Carolina—recorded average annual full-time family child care fees for a 4-year-old of $3,000-$4,000. Seven of the states—Alabama, Arkansas, Georgia, Louisiana, Oklahoma, Tennessee, and West Virginia—reported average annual full-time family child care fees for a 4-year-old of $4,000-$5,000. Florida, Kentucky, North Carolina, and Virginia listed average annual full-time family child care fees for a 4-year-old of $5,000-$6,000. The 2010 average annual full-time family child care fees for a 4-year-old in Texas were not reported (NACCRRA, 2010b).

In 2010, five southern states—Arkansas, Louisiana, Mississippi, South Carolina, and Tennessee—recorded average annual fees of $4,000-$5,000 for full-time fees for a 4-year-old in center care. Five states—Alabama, Georgia, Kentucky, Oklahoma, and West Virginia—reported average annual full-time center care fees for a 4-year-old of $5,000-$6,000. In Florida, Texas, and Virginia, average annual full-time center care fees for a 4-year-old ranged from $6,000-$7,000. One state, North Carolina, recorded average annual full-time center care fees for a 4-year-old in excess of $7,000 (NACCRRA, 2010b).

Using child care data furnished by NACCRRA (2010b), the mean average annual full-time fees for a 4-year-old in family child care were calculated at $4,770; and the mean average annual full-time fees for a 4-year-old in center care were calculated at $5,546 for 2010.

The average annual full-time fees for a 4-year-old in family child care in 2010 in the southern states ranged from $3,780 to $5,985. The average annual full-time fees for a 4-year-old in center care in 2010 in the southern states ranged from $4,460 to $7,260. See Table 1 for analyses of ranges.

**Table 1**

Ranges in Southern States' Average Annual Full-time Fees in 2010 for a 4-Year-Old

| Fees | Range ($) | Difference ($) |
|---|---|---|
| Family Child Care | 3,780-5,985 | 1,888 |
| Center Care | 4,460-7,260 | 2,800 |

As of September 2009, 6 of the 14 southern states had voluntarily adopted and implemented QRI systems for the purpose of enhancing the quality of child care (Children's Defense Fund, 2010). See Table 2 below.

**Table 2**

Southern States' QRI System Status in September 2009

| State | QRI System? |
|---|---|
| AL | No |
| AR | No |
| FL | No |
| GA | No |
| KY | Yes |
| LA | Yes |
| MS | Yes |
| NC | Yes |
| OK | Yes |
| SC | No |
| TN | Yes |
| TX | No |
| VA | No |
| WV | No |

Because implementing components of quality may lead to higher expenses for family child care providers in states with QRI systems, it was hypothesized that annual full-time family child care fees for a 4-year-old would be higher for states with QRI systems than for those with no QRI systems. To examine this directional

hypothesis, a Mann-Whitney nonparametric test was used to compare the two independent groups. The *n*1 group was composed of the seven states with no QRI systems. (The relevant data for the state of Texas were not reported for 2010.) The group designated *n*2 contained the six states implementing QRI systems. The test statistic for the Mann-Whitney test was *U* with the probability (*p*) value for a one-tailed test of statistical significance set at equal to or less than the level of 0.05 ($p \leq .05$), the level generally used for educational research. See Table 3 below. With the calculated *U* score, the resultant *p* value was not equal to or less than the level of 0.05. The approximate *z* score or standard score was also calculated with its resultant *p* value not equal to or less than the level of 0.05. Therefore, results indicated no statistical support for the directional hypothesis of higher average annual (2010) full-time family care fees for a 4-year-old in southern states implementing QRI systems.

**Table 3**

Analysis of Fees for Family Care in 2010 from Southern States with and without QRI Systems

| Group Sizes | Statistics | Probability Values |
|---|---|---|
| *n*1 = 7 (Southern states without QRI systems; TX data not available) | *U* = 25.000000 | *p* = 0.314103 |
| *n*2 = 6 (Southern states with QRI systems) | *z* = 0.571429 | *p* = 0.283855* |

*Approximate value.

Because child care centers in states implementing QRI systems are likely to incur additional costs for addressing quality components, it was hypothesized that average annual full-time fees would be higher in those states compared to states with no QRI systems. To examine the directional hypothesis of higher average annual 2010 full-time center care fees for a 4-year-old in southern states with QRI systems, a Mann-Whitney nonparametric test was used to compare the two independent groups. The larger group, *n*1, was composed of the eight states without QRI systems; *n*2 was composed of the six states implementing QRI systems. The test statistic for the Mann-Whitney test was *U* with the probability (*p*) value for a one-tailed test of statistical significance set at equal to or less than the level of 0.05 ($p \leq .05$), the level generally used for educational research. With the calculated *U* score, the resultant *p* value was not equal to or less than the level of 0.05. See Table 4 below. The approximate *z* score or standard score was also calculated with its resultant *p* value not equal to or less than the level of 0.05. Therefore, results indicated no statistical support for the directional hypothesis of higher mean average annual full-time center-care fees for a 4-year-old in southern states with QRI systems in 2010.

**Table 4**

Analysis of 2010 Full-time Center Care Fees for 4-Year-Olds from Southern States with and without QRI Systems

| Group Sizes | Statistics | Probability Values |
|---|---|---|
| *n*1 = 8 (Southern states without QRI systems) | *U* = 34.00000 | *p* = 0.1142190 |
| *n*2 = 6 (Southern states with QRI systems) | *z* = 1.29099 | *p* = 0.0983528* |

*Approximate value.

## Family Income and Use of QRI Systems

To further investigate child care costs for southern families, data were collected from the report *Child Care in America 2010 State Fact Sheets* (NACCRRA, 2010b) regarding median family income for married-couple families with children under age 18 years. The national 2010 median annual family income for married-couple families with children under age 18 years was $76,393. Table 5 below shows median married-couple family income in 2010 for the southern states categorized by QRI system states and non-QRI system states.

**Table 5**

Southern States' Married-Couple Median Family Income in 2010

| State | Median Income Married QRI System ($) | Median Income Married No QRI System ($) |
|---|---|---|
| AL | | 70,125 |
| AR | | 61,478 |
| FL | | 73,439 |
| GA | | 76,669 |
| KY | 68,069 | |
| LA | 73,457 | |
| MS | 65,181 | |
| NC | 72,780 | |

| | | |
|---|---|---|
| OK | 63,779 | |
| SC | | 72,122 |
| TN | 68,413 | |
| TX | | 69,613 |
| VA | | 90,141 |
| WV | | 61,115 |

Higher median married-couple family income was hypothesized for states implementing QRI systems than for states with no QRI systems. To examine the directional hypothesis of higher married-couple family median income in 2010 for southern states implementing QRI systems, a Mann-Whitney nonparametric test was used to compare the two independent groups. The larger group, $n1$, was composed of the eight states with no QRI systems; $n2$ was composed of the six states implementing QRI systems. The test statistic for the Mann-Whitney test was $U$ with the probability ($p$) value for a one-tailed test of statistical significance set at equal to or less than the level of 0.05 ($p \leq .05$), the level generally used for educational research. With the calculated $U$ score, the resultant $p$ value was not equal to or less than the level of 0.05. The approximate $z$ score or standard score was also calculated with its resultant $p$ value not equal to or less than the level of 0.05. See Table 6 below. Therefore, results indicated no statistical support for the directional hypothesis of higher median married-couple family income in 2010 for southern states implementing QRI systems.

**Table 6**

Analysis of Married Median Family Income in 2010 from Southern States with and without QRI Systems

| Group Sizes | Statistics | Probability Values |
|---|---|---|
| $n1 = 8$ (Southern states without QRI systems) | $U = 29.00000$ | $p = 0.28638$ |
| $n2 = 6$ (Southern states with QRI systems) | $z = 0.645497$ | $p = 0.259303$* |

*Approximate value.

Nationally, the 2010 cost of full-time care for an infant in a center as a percentage of median income for married-couple families with children under age 18 ranged from 7% to 18% (NACCRRA, 2010b). Table 7 below disaggregates cost of full-time center care for an infant as a percentage of median married-couple family income for 2010 for southern states with and without QRI systems.

**Table 7**

Southern States' 2010 Infant Care Cost as a Percentage of Median Income for Married-Couple Families

| State | Infant Care as % of Married Couple Median Income in States with QRI System | Infant Care as % of Married Couple Median Income in States with No QRI System |
|---|---|---|
| AL | | 8 |
| AR | | 9 |
| FL | | 11 |
| GA | | 9 |
| KY | 9 | |
| LA | 8 | |
| MS | 7 | |
| NC | 12 | |
| OK | 11 | |
| SC | | 8 |
| TN | 9 | |
| TX | | 11 |
| VA | | 10 |
| WV | | 11 |

Because child care programs may encounter greater expenses to address quality components in states with QRI systems, it was hypothesized that cost of full-time center-based infant care as a percentage of median married-couple family income would be higher in states implementing QRI systems than in states with no QRI systems. To examine this directional hypothesis, a Mann-Whitney nonparametric test was used to compare the two independent groups. The larger group, $n1$, was composed of the eight states with no QRI systems; $n2$ was composed of the six states with QRI systems. The test statistic for the Mann-Whitney test was $U$ with the probability ($p$) value for a one-tailed test of statistical significance set at equal to or less than the level of 0.05 ($p \leq .05$), the level generally used for educational research. With the calculated $U$ score, the resultant $p$ value was not equal to or less than the level of 0.05. The approximate $z$ score or standard score was also calculated with its resultant $p$ value not equal to or less than the level of 0.05. See Table 8 below. Results indicated no statistical support for the directional hypothesis of higher married-couple family median income percentage in 2010 for full-time center care of an infant in southern states implementing QRI systems.

**Table 8**

Analysis of Infant Care Cost as a Percentage of Median Income in 2010 for Married-Couple Families from Southern States with and without QRI Systems

| Group Sizes | Statistics | Probability Values |
|---|---|---|
| $n1 = 8$ (Southern states without QRI systems) | $U = 26.50000$ | $p = 0.377289$ |
| $n2 = 6$ (Southern states with QRI systems) | $z = 0.322749$ | $p = 0.373443$* |
| *Approximate value. | | |

In 2010, the U.S. national median annual family income for families headed by single females with children under age 18 years was $23,761.00 (NACCRRA, 2010b). Table 9 shows median annual family income in 2010 for families headed by single females with children under age 18 years for southern states with and without QRI systems.

**Table 9**

Southern States' 2010 Median Annual Income for Families Headed by Single Females

| State | Median Income for Families Headed by Single Female QRI System ($) | Median Income for Families Headed by Single Female No QRI System ($) |
|---|---|---|
| AL | | 19,039 |
| AR | | 18,619 |
| FL | | 26,615 |
| GA | | 24,504 |
| KY | 19,113 | |
| LA | 18,261 | |
| MS | 17,338 | |
| NC | 22,400 | |
| OK | 19,611 | |
| SC | | 21,311 |
| TN | 20,470 | |
| TX | | 22,793 |
| VA | | 28,434 |
| WV | | 17,029 |

It was hypothesized that states implementing QRI systems would show higher median annual income for single female-headed family income in 2010 than would states with no QRI systems. To examine the directional hypothesis of higher median single female-headed family income in 2010 for southern states implementing QRI systems, a Mann-Whitney nonparametric test was used to compare the two independent groups. The larger group, $n1$, was composed of the eight states with no QRI systems; $n2$ contained the six states with QRI systems. The test statistic for the Mann-Whitney test was $U$ with the probability ($p$) value for a one-tailed test of statistical significance set at equal to or less than the level of 0.05 ($p \leq .05$), the level generally used for educational research. With the calculated $U$ score, the resultant $p$ value was not equal to or less than the level of 0.05. The approximate $z$ score or standard score was also calculated with its resultant $p$ value not equal to or less than the level of 0.05. See Table 10. Results indicated no statistical support for the directional hypothesis of higher 2010 annual median income for single female-headed families in southern states implementing QRI systems than for states without QRI systems.

**Table 10**

Analysis of 2010 Annual Median Income of Families Headed by Single Females in Southern States with or without QRI Systems

| Group Sizes | Statistics | Probability Values |
|---|---|---|
| $n1 = 8$ (Southern states without QRI systems) | $U = 33.0000$ | $p = 0.141192$ |
| $n2 = 6$ (Southern states with QRI systems) | $z = 1.1619$ | $p = 0.122639$* |

*Approximate value.

National figures for the cost of full-time care for an infant in center care as a percentage of median annual income in 2010 for families headed by single females with children under age 18 ranged from 26% to 67% (NACCRRA, 2010b). Table 11 below shows a disaggregation of those figures for the 14 southern states with and without QRI systems.

**Table 11**

2010 Cost of Full-time Fees for an Infant in Center Care as a Percentage of Median Income of Families Headed by Single Females with Children under Age 18 in Southern States with and without QRI Systems

| State | Child Care % Single QRI System | Child Care % Single No QRI System |
|---|---|---|
| AL | | 28 |
| AR | | 31 |
| FL | | 30 |
| GA | | 27 |
| KY | 32 | |
| LA | 31 | |
| MS | 26 | |
| NC | 38 | |
| OK | 35 | |
| SC | | 27 |
| TN | 29 | |
| TX | | 34 |
| VA | | 31 |
| WV | | 39 |

Because child care programs in states with QRI systems may incur expenses related to addressing quality components, it was hypothesized that the 2010 cost of full-time center care for an infant as a percentage of median annual income for families headed by single females with children under 18 would be higher in states implementing QRI systems than for states with no QRI systems. To examine this directional hypothesis, a Mann-Whitney nonparametric test was used to compare the two independent groups. The larger group, $n1$, was composed of the eight states with no QRI systems; $n2$ contained the six states with QRI systems. The test statistic for the Mann-Whitney test was $U$ with the probability ($p$) value for a one-tailed test of statistical significance set at equal to or less than the level of 0.05 ($p \leq .05$), the level generally used for educational research. With the calculated $U$ score, the resultant $p$ value was not equal to or less than the level of 0.05. The approximate $z$ score or standard score was also calculated with its resultant $p$ value not equal to or less than the level of 0.05. See Table 12 below. Therefore, results indicated no statistical support for the directional hypothesis that cost of full-time center care for an infant as a percentage of median annual income for families headed by single females with children under 18 would be higher in southern states implementing QRI systems than in states without QRI systems.

**Table 12**

Analysis of Cost of Full-time Center Care for an Infant as a Percentage of Median Annual Income for Families Headed by Single Females with Children under 18 in Southern States with and without QRI Systems

| Group Sizes | Statistics | Probability Values |
|---|---|---|
| $n1 = 8$ (Southern states without QRI systems) | $U = 28.0000$ | $p = 0.331002$ |
| $n2 = 6$ (Southern states with QRI systems) | $z = 0.516398$ | $p = 0.302788$* |

*Approximate value.

## Child Care Worker Wages and Use of QRI Systems

Data regarding child care workers' wages were collected from the U.S. Department of Labor BLS (2010a), which organized the 2010 annual mean wage of child care workers into six national wage ranges. See Table 13 below. The three lowest wage ranges ($17,210–18,260, $18,310–18,740, and $18,830–19,940) contained southern states with and without QRI systems. The third highest wage range ($19,970–21,390) contained only southern states without QRI systems. The two highest wage ranges ($21,500–22,500 and $22,720–25,180) included none of the southern states. Thus, the highest wage range for child care workers in the American South (which was not the highest wage range for child care workers in the United States as a whole) included only states without QRI systems.

**Table 13**

Annual Mean National Wage Ranges in 2010 of Child Care Workers in the Southern States*

| State | $17,210–18,260 | $18,310–18,740 | $18,830–19,940 | $19,970–21,390 | $21,500–22,500 | $22,720–25,180 |
|---|---|---|---|---|---|---|
| AL | No | | | | | |
| AR | No | | | | | |
| FL | | | | No | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| GA | | No | | | | |
| KY | | | Yes | | | |
| LA | | Yes | | | | |
| MS | Yes | | | | | |
| NC | | | Yes | | | |
| OK | | Yes | | | | |
| SC | | No | | | | |
| TN | Yes | | | | | |
| TX | | | No | | | |
| VA | | | | No | | |
| WV | | No | | | | |

*No = Non-QRI System. Yes = QRI System.

The U.S. Department of Labor BLS (2010b) computed the national annual mean wage in 2010 for all occupations at $44,410. The BLS also provided state data concerning mean annual wage for all occupations. Table 14 below provides 2010 annual mean wages for all occupations for the 14 southern states with and without QRI systems.

**Table 14**

National Annual Mean Wages in 2010 of All Occupations for the Southern States with and without QRI Systems

| State | Mean Annual Wage QRI System ($) | Mean Annual Wage No QRI System ($) |
|---|---|---|
| AL | | 38,590 |
| AR | | 35,460 |
| FL | | 40,270 |
| GA | | 42,270 |
| KY | 37,970 | |
| LA | 37,980 | |
| MS | 33,930 | |
| NC | 40,500 | |
| OK | 36,940 | |
| SC | | 37,920 |
| TN | 38,330 | |
| TX | | 42,220 |
| VA | | 47,840 |
| WV | | 35,370 |

Potential correlation between southern states' annual mean wages and their implementation of QRI systems was also investigated. To examine the directional hypothesis of higher 2010 annual mean wage for all occupations in southern states implementing QRI systems than for southern states with no QRI systems, a Mann-Whitney nonparametric test was used to compare the two independent groups. The larger group, $n1$, was composed of the eight states without QRI systems; $n2$ contained the six states with QRI systems. The test statistic for the Mann-Whitney test was $U$ with the probability ($p$) value for a one-tailed test of statistical significance set at equal to or less than the level of 0.05 ($p \leq .05$), the level generally used for educational research. With the calculated $U$ score, the resultant $p$ value was not equal to or less than the level of 0.05. The approximate $z$ score or standard score was also calculated with its resultant $p$ value not equal to or less than the level of 0.05. See Table 15 below. Results indicated no statistical support for the directional hypothesis of higher 2010 annual mean wage for all occupations for southern states implementing QRI systems.

**Table 15**

Analysis of 2010 Annual Mean Wage (All Occupations) from Southern States with and without QRI Systems

| Group Sizes | Statistics | Probability Values |
|---|---|---|
| $n1 = 8$ (Southern states without QRI systems) | $U = 32.0000$ | $p = 0.172494$ |
| $n2 = 6$ (Southern states with QRI systems) | $z = 1.0328$ | $p = 0.15085$* |

*Approximate value.

## Discussion

This paper examined child care costs and related variables from 14 American southern states with and without QRI systems. Analyses of figures for these states from 2010 discovered no statistically significant relation between states' implementation of QRI systems and several variables: full-time annual child care cost (center-

based care or family child care) for infants and for 4-year-olds, annual infant care costs as a percentage of annual family median income (married-couple families and families headed by single females), annual child care worker wages, and annual mean wages for all occupations.

The current findings appear to call into question the claim by Zellman and Perlman (2008) that high-quality child care is generally more costly than low-quality child care for states. Bowman (2010) proposed that child care quality differed across states; the current findings suggest that, across the 14 southern states, differences in child care costs and related variables may not be related to whether or not a state has implemented a QRI system.

However, limitations of the present study included small sample size (14 states out of 50), lack of empirical data regarding states' inspection and monitoring of family and center-based child care, and lack of information directly from parents. Additional analysis of this topic is needed. Quantitative research using QRI system ratings and published fee structures might examine a large, random sample of families to determine any relationship between child care costs and quality of care not reflected in the comparisons made in this paper. Further insight might be gained from qualitative case studies conducted at family and center care programs in states with and without QRI systems.

Additional relevant factors for research on QRI systems include the use of subsidies for child care, families' use of relative care for infants or preschool-age children, and other informal child care arrangements. Mixed-method research designs that incorporate both quantitative and qualitative components could provide intriguing information. An explanatory sequential design for research could collect and analyze quantitative data from states implementing QRI systems compared to states with no QRI systems and follow with qualitative interpretation. Investigating relationships between costs and quality of care together with parents' perceptions about costs and quality could provide detailed information pertinent to policy decisions, especially considering the recent economic downturn. Because the costs and quality of child care are crucial to the academic achievements and life outcomes of young children living in poverty in the American South, further study of this important topic is needed.

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