International Journal of Child Care and Education Policy
2008, Vol. 2, No.1, 1-14

How Can Public Policy Improve Quality of Early Care and Education?

Aletha C. Huston
University of Texas at Austin
USA

The major purpose of this paper is to suggest ways that public policy can improve the quality of child care and early education for children from infancy to school age. Quality can be defined by such structural features as group composition, caregiver qualifications, and health and safety practices, and by such process indicators as sensitive, responsive, stimulating activities and interactions. Both predict children's development. Among the structural indicators, specific training in early education is the most consistent predictor of children's development, but small ratios and group sizes may also be important, especially for infants and toddlers. Early care and education policies in the U.S. have two means of affecting quality: providing funds and regulation or setting standards. When government agencies fund programs directly, they can hold the programs to structural and process quality standards. Regulations and standards can affect quality largely by dictating such structural features as teacher qualifications, child-to-adult ratios, and group sizes. Quality in all programs for young children can be enhanced by integrating child care and early education into a single system of early education and care.

Key words: quality, policy, early care and education

In this article, I consider policies designed to provide early care and education to children from birth to age 5. The major purpose is to suggest ways that public policy can improve the quality of child care and early education for children from infancy to school age. For the most part, I discuss the current situation in the United States, but I draw occasionally from information about other countries, recognizing wide variation across nations in the types of programs and policies affecting young children (e.g., Melhuish & Petrogiannis, 2006).

Throughout the last century, two streams of early care and education policy evolved and operated relatively independently in the United States and many other countries even though they affected the same children. The child care stream was fed by changes in maternal employment that necessitated nonmaternal care for children at younger and younger ages and/or temporary suspension of employment for parents. In some countries, public funds support family leave and child care centers, but that is generally not true in the U.S. Instead, subsidies and tax credits covering some or all of the cost of child care constitute the major public policy to support maternal employment, though the states are also involved in regulating child care settings.

I am grateful to the Priscilla Pond Flawn endowment for supporting the preparation of this paper.

Correspondence concerning this article should be addressed to Aletha Huston, Priscilla Pond Flawn Regents Professor of Child Development, Department of Human Ecology, University of Texas at Austin, 1 University Place A2700, Austin TX 78712-0141, USA. Electronic mail may be sent to achuston@mail.utexas.edu.

The early education stream grew out of public concern with developmental enrichment for children. Although a private "nursery school" system evolved in the early 20th century for children of middle class families, the public concern with developmental enrichment has been directed almost entirely to children living in poverty and other risky circumstances or to children with disabilities. Head Start and other early intervention programs represent one set of government efforts to provide developmental enrichment. Child care and early education policies have followed different paths, in part because their goals are different—promoting maternal employment or promoting child development (Phillips, 1991).

Separating policies for child care from early education is not only artificial, but harmful. Child care, and even more clearly "day care", carries a connotation of warehousing children, seeking to keep them safe from harm while their parents work. The policy goal is sometimes framed as finding minimum thresholds for avoiding harm. The images associated with education, on the other hand, include stimulation, creative activities, and learning opportunities that lead to optimal, not minimally satisfactory, levels of development for children.

In fact, there is no inherent difference between child care and early education. Either can be a rich experience that contributes to children's development or not, depending on what goes on in the setting. Current policies in the U.S., however, often perpetuate the two streams in ways that act to the detriment of experiences for many young children. Some other countries are organizing systems to integrate programs for preschool children (infancy to school entry). For example, the United Kingdom, New Zealand, and Sweden each operate all early childhood programs under a single education ministry or department (Melhuish & Petrogiannis, 2006). Some states and localities in the U.S. have also begun to move in this direction (for example, by providing similar training to Head Start, child care centers, and Pre-Kindergarten programs), but the chasm continues to be wide.

As these moves toward integration proceed, new questions have arisen about the role of public policy in promoting high quality early education and care. There is widespread agreement that program quality matters for children's healthy cognitive, social, and emotional development (Barnett, 1995; Hyson, Copple, & Jones, 2006; Lamb & Ahnert, 2006; Vandell & Wolfe, 2000), but upon careful examination, it is clear that the definitions of quality vary. There are also questions about the extent to which public policy can affect quality.

The primary question addressed in this article is whether and how public policies can engender high quality in child care and early education settings. I begin by examining definitions of quality; then I review briefly what we know about how quality affects children's development. In the final section, I consider how current public policies influence quality of care and, by extension, children's development.

What Is Quality?

Many people in the field of early childhood development believe that we have a shared understanding of quality, but definitions do vary. The most common distinction is structure vs. process. Structural criteria include education and training of personnel, safety and health practices, and group composition (child-to-adult ratio and group size) (e.g., Fiene, 2002). The purpose of structural criteria is to protect children from harm, but also to promote positive experiences for children in classrooms and other child care settings. Process indicators assess these experiences directly by describing the activities and interactions in the setting.

The most widely used set of observational measures of child care quality include both structure and process. For example, the Early Childhood Environment Rating Scale (ECERS) for child care

centers classes of 3- to 5-year-olds, the Infant/Toddler Environment Rating Scale (ITERS) for classes of younger children, and the Family Child Care Environment Rating Scale (FCCERS, see http://www.fpg.unc.edu/~ecers) all assess social interactions and learning activities as well as structure, health and safety. Similarly, the National Association for the Education of Young Children (NAEYC), which offers accreditation to child care centers meeting high standards, defines quality by a large number of criteria that include health and safety, teacher qualifications, organizational structure, ratios, and group sizes as well as process measures of teacher-child interaction, instruction in a range of skills, and relationships of teachers to families and communities (see http://www.naeyc.org/accreditation).

The core of most process definitions of quality consists of adult-child interactions that are warm, accepting, responsive, and cognitively stimulating. For example, the NICHD Early Child Care Research Network designed an observational system that could be applied across centers, family child care homes, and relative care—the Observational Record of the Childcare Environment (ORCE) (NICHD Early Child Care Research Network, 1996, 2000). The criteria vary across child age groups because of changing needs as children develop, but for all age groups they include indicators of sensitive and responsive adult-child interactions, language stimulation, and adult involvement.

Focused vs. Broad Definitions

Despite some common criteria across process definitions, experts in the field disagree on a few important points. With the recent emphasis on preparing children to meet the academic demands of school, some early educators strongly promote highly focused curricula emphasizing literacy, and, to a lesser extent, numerical skills, particularly in programs for children from low-income families or other circumstances that increase the risk of school failure. For example, in Texas, one widely-used model for four-year-olds is the Texas Early Education Model (Landry et al., 2005), which requires use of research-based formal curricula with a heavy emphasis on literacy. The process indicators of interest are the degree to which children are exposed to activities specified in the curricula of interest.

A contrasting view is embodied in the concept of "developmentally appropriate practices" based on knowledge about age-related patterns of development and learning, knowledge about individual children's interests and capabilities, and knowledge about the social and cultural context in which children live. Among the many implications of this view, perhaps the most important are that different domains of development—intellectual, social, emotional, and physical—are closely interrelated and that children learn from active, playful involvement in their environments (National Association for the Education of Young Children, 1996). Although developmentally-appropriate practices do not exclude particular content emphases or curricula, this view does suggest that a narrow focus on training particular skills is less beneficial for overall development, including success in school, than is a broader set of activities with more opportunities for children to follow individual interests.

A similar view appears in a recent review of early education. On the basis of the best current knowledge of child development, the authors propose that programs give priority to teacher-child relationships and to developing competencies that have the greatest long-term value. These include such cognitive essentials as representational thinking, self-regulation, and planning; emotional competence in the form of emotional security and emotion regulation; and using modes of learning that are effective for young children (e.g. pretend play and other forms of representation) (Hyson, Copple, & Jones, 2006).

Goals of Early Education and Care

Part of the disagreement about what defines

quality results from different goals and priorities for early care and education. Is the goal "school readiness"? If so, what types of experiences best prepare children for school? Should children be prepared to learn to read? Should early education promote social and emotional health and development? Should it enrich children's understanding of their own culture, or the cultures of others? Should it offer a safe, secure environment where children can be happy and parents can be free of worry while they are working? Which of these goals should have priority?

Conclusion

Quality of early care and education can be defined by such structural features as group composition, caregiver qualifications, and health and safety practices, all of which are amenable to be influenced by public policy. Standards based on these structural features are designed to affect process—the everyday experiences of children—as evidenced in observable learning experiences and social interactions between adults and children, between children and learning materials, and between children and their peers. Although there is broad agreement on some aspects of process quality, experts disagree on the degree to which environments should provide academically-focused, structured activities as opposed to play and unstructured time.

Quality and Child Development

The literature on quality effects on child development addresses different questions when the topic is "child care" than when the subject matter is "early education." Within each, both structural and process indicators of quality have been investigated. The most interesting current question is not "Is there an effect?" but "What types of early care environments lead to what types of changes or developments for children?"

Structural Quality

On the whole, observational studies show that settings with better-trained teachers, lower adult-to-child ratios, and smaller group sizes are associated with better cognitive and social development for children (Lamb & Ahnert, 2006). In one large-scale investigation, for example, three-year-old children who had attended child care centers that met nationally-recommended guidelines for structural quality had more advanced cognitive and social development than those attending lower quality centers (NICHD Early Child Care Research Network, 1998). By contrast, in family child care settings where individuals care for groups of children in their home, caregiver training and child-to-adult ratios were not good predictors of children's cognitive or social development (Clarke-Stewart, Vandell, Burchinal, O'Brien, & McCartney, 2002).

Studies showing correlations of quality with child development do not allow us to conclude that these quality indicators *cause* better development for children because all observational studies are vulnerable to biases from selection. That is, the quality of child care that children receive can be affected by their parents' characteristics as well as their own behavior. For example, parents who select good child care may be more intelligent, warmer, more mentally healthy, more involved with their children, and more likely to provide an enriched environment at home, all of which might explain their children's better development. Children's own abilities and behavior can also influence parents' choice of early care settings. The standard method of controlling for such selection effects is to include measured parent and child characteristics as covariates in analyses of observational studies, but that method can only partly account for potential biases because there will always be unmeasured characteristics of parents, children, and settings whose influence is unknown.

One method for controlling some selection biases is to observe changes in children over time, asking

whether children in higher quality settings gain more than those in lower quality settings. Using this method, Blau (1999) examined changes in children's skills and behavior in a nationally representative longitudinal study. Unfortunately, he used very weak indicators of quality—parent reports of staff-child ratios, group size, and caregiver training. The results showed little relation of these quality indices to child development.

The best method for inferring a causal effect of quality on child development is a random assignment experiment, but they are rare in the child care literature. In one early experiment, children were randomly assigned to classrooms with different group sizes, ratios, and levels of teacher training. Children in small groups with better-trained teachers gained more on measures of both cognitive and social skills over the year; small ratios were also related to better performance for very young children (Ruopp, Travers, Glantz, & Coelen, 1979).

Teacher training, ratios, and group sizes are all "distal" measures of quality. They do not affect children directly. Instead, they may set the stage for higher quality experiences or for better process quality, making it more likely that teachers will be sensitive and responsive and will provide learning experiences. One investigation demonstrated this pathway showing that structural quality predicted process, which mediated the effects on children's development (NICHD Early Child Care Research Network, 2002).

Process Quality

There is no question that programs with high process quality, however it is defined, have children perform better on cognitive and language skills as well as demonstrate more positive social behavior when they are observed a few years later (NICHD Early Child Care Research Network, 2005; Peisner-Feinberg et al., 2001; Votruba-Drzal, Coley, & Chase-Lansdale, 2004) (see Lamb & Ahnert, 2006 for thorough review). Observed quality is more consistently related to cognitive development and academic skills than to social behavior in some studies (e.g., NICHD Early Child Care Research Network, 2005). Although the possibility of selection bias makes it difficult to draw causal conclusions from these observational studies, a number of investigations address that problem. In the NICHD Study of Early Child Care, for example, the average quality of care that children experienced predicted changes in cognitive performance from age 2 to 4 ½, demonstrating a modest effect of observed child care quality (NICHD Early Child Care Research Network & Duncan, 2003).

Specific features of quality appear to be important for particular areas of development. For example, in a large longitudinal study in the United Kingdom, overall process quality, as measured by the ECRS, predicted improvements in children's socioemotional skills, but a separate set of scales designed to measure program activities that addressed literacy and other skills specified in the UK national curriculum predicted improvements in cognitive and language skills (Sylva et al., 2006).

Early Educational Interventions

Much stronger evidence that quality "causes" improved development comes from true experiments evaluating early interventions designed primarily for children living in poverty or other conditions that may impair optimal early development. Since the 1960s, many high quality early education programs have been established and evaluated, often with random assignment designs or other strong methods and long-term follow-ups of participants. Many include interventions with parents and home environments as well as group experiences for children that encompass a range of philosophies and curricula. In most cases, it is assumed that programs are high quality, so positive effects on children's development are taken as evidence for the value of quality. As a result, it is difficult to draw any conclusions about what

features of programs may be more or less important. For instance, there have been few, if any, efforts to compare programs using different approaches or educational philosophies.

The cumulative picture from these evaluations shows clear positive effects on children's cognitive development and school progress during elementary school, as well as lasting effects on high school completion, employment and earnings, and reduced adult crime and delinquency. There is also a fair amount of support for their effects on social and emotional development and children's well-being (Barnett, 1995; Heckman, 2006; Karoly, Kilburn, & Cannon, 2005). The long-term follow-ups demonstrate that early education programs are cost-effective, producing financial benefits for society and for the participants that greatly exceed the cost of the programs (Barnett, 1995; Karoly et al., 2005).

Head Start is the largest and oldest national early intervention program for preschool children (3-5 years old) in the U.S. It was evaluated many times over the years, providing a great deal of valuable information, but leaving open questions about its causal effects on children's development (Love et al., 2007). The Head Start Impact Study was initiated by the U.S. Congress in the 1990s to provide a test of program effects using a random assignment experiment. When programs had more applicants than they could accept[1], children were randomly selected for participation. At the end of the year, Head Start participants performed better than controls on measures of reading and vocabulary, and 3-year-olds had fewer behavior problems. They also had better access to dental care, reflecting one of the broader goals of Head Start to enhance health and well-being (U.S. Department of Health and Human Services, 2005).

Reactions to the report can be characterized as "half full" or "half empty" because the effect sizes were small even though they were statistically significant (e.g., Ludwig & Phillips, 2007; Nathan, 2007). Those advocating for the half-full view point out that the effect sizes are probably an underestimate because many of the control group children entered other Head Start or early education programs. Another argument is that even small effect sizes can have long term importance; children in locations with access to Head Start at its inception had lower mortality rates and slightly better educational outcomes as adults than did comparable children without access (Ludwig & Miller, 2007; Ludwig & Phillips, 2007). The "half empty" view emphasizes the failure to raise children's achievement sufficiently and the uneven quality of programs. Besharov and Higney (2007), for example, conclude that the program needs better quality control before it is expanded and that we need more research to understand what types of programs are most effective for what types of objectives and for diverse groups of children.

Early Head Start, a parallel program for children from birth to age 3, was also evaluated in a smaller-scale experiment testing three different models that offered different combinations of home-based intervention and center-based programs. The program led to some improvement in children's cognitive and language development and attention, as well as to reduced aggression (Love et al., 2005).

In recent years, prekindergarten (Pre-K) programs for four-year-olds have proliferated in many states, often as part of the public school system. A series of studies in Oklahoma, one of two states offering free prekindergarten to all children, produced evidence for program effectiveness. Because schools use birthdates as a basis for determining eligibility, it was possible to compare skills of children who had finished Pre-K with others who were almost identical in age, but were just entering Pre-K because their birthdays fell on either side of the age cut-off for eligibility. The authors demonstrated that Pre-K improved children's performance on tests of reading, spelling, and math when they reached kindergarten (Gormley & Gayer, 2005; Gormley, Gayer, Phillips, & Dawson, 2005).

Conclusion

Structural indicators of quality are associated with positive cognitive and social development, probably because they can set the conditions for quality processes in the classroom. Observational studies offer ample evidence that process quality is related to cognitive and language development, and fairly consistent evidence that it predicts social development. Experiments and other methods that reduce selection bias demonstrate clearly that well-designed early education programs can improve children's cognitive and academic skills and may also lead to improvements in health and social behavior. Given the solid evidence that quality matters, what can public policy do to promote quality in the wide range of settings serving young children?

How Can Policy Produce Quality?

In the United States, public policy affecting early care and education is made at several levels of government. The federal government administers some programs directly (e.g., Head Start) and offers financial assistance directly to parents through the tax system and through subsidies to parents with low incomes. State governments, local governments, and public school systems each have policies that generate and fund programs as well as regulating them. In many cases, state and local government units are responsible for administering federal funds and federally-mandated programs. In each case, there are two major policy levers available: funding and regulation (or setting standards).

Child Care

As child care has expanded, it has increasingly become a market-based system that is highly decentralized and variable. It is often described as an "industry" rather than as a service. It takes place in organized centers, both nonprofit and for-profit, in "day care homes," in homes of relatives and in the child's own home. The providers range from highly trained teachers to adults with no training. Parents contract directly with child care providers; there are few programs run by public agencies.

Government plays two principal roles in this system: financial assistance and regulation. The government offers some financial assistance directly to parents through tax credits or subsidies, but individual parents pay about 90% of the costs of child care in the U.S. Some states also use financial incentives to care providers. For example, a number of states offer "tiered reimbursement," or higher rates of payment for subsidized children if centers meet certain quality standards (Greenberg et al., 2002). Some localities offer stipends for participating in training opportunities or wage supplements to child care teachers who get additional educational credentials.

All of the states except one have some regulations and standards governing health and safety, child-to-adult ratios and group sizes in child care centers. Some also have requirements for teacher qualifications, and some regulate family child care homes, but the requirements vary greatly across states. For example, the maximum number of infants (under one year of age) per adult ranges from 3 to 6 (National Association for Regulatory Administration, 2005). States can also designate programs as meeting quality standards beyond the minimum requirements. For example, Texas has a four-star system rating centers that serve subsidized children. The criteria can include structural features as well as direct indicators of process quality, as defined by such certifying organizations as the National Association for the Education of Young Children (NAEYC). At least one state has instituted a system of recognition based on the later school performance of children in a program.

Early Education

Most of the programs that are explicitly designed for early education (as opposed to caring for children while parents work) are funded directly by federal,

state, or local agencies. Federal funding for Head Start programs is awarded to local organizations that provide the programs. It comes with requirements designed to assure that these programs fulfill the goals of Head Start to promote children's health and development, but quality is still highly variable. Many prekindergarten programs are run by public school systems, with varying levels of requirements for structure and teacher training. When public entities provide funding, they have the power to institute standards to promote quality, though cost concerns always weigh heavily in such decisions.

Conclusion

In summary, policymakers can use two fundamental policy levers: funding and regulation (or setting standards) to influence quality of early care and education. Most funding and regulatory policies are designed to affect such structural indicators of quality as teacher qualifications, ratios, and group sizes, on the assumption that the result will be quality of process. In the final section of this paper, I examine what we know about the effectiveness of different policy levers and about the degree to which structural indicators of policy translate into quality process and benefits for children.

Does Structure Affect Process?

Teacher Qualifications

In general, observed quality of care is better in settings with better-educated teachers, but this is not always the case. It is usually impossible to determine whether the teachers' education is critical, or whether other factors associated with education account for the better quality that is correlated with education. Most of these studies are limited to child care centers, and many deal only with preschool children (age 3 to 5 years) (see Bogard, Traylor, & Takanishi, 2008).

Formal education, defined by years in school or by degrees obtained, is not consistently related to classroom quality. In some investigations, teachers with more educational credentials provide better classroom environments (e.g., Burchinal, Cryer, Clifford, & Howes, 2002), but in two recent papers that included analyses of multiple Pre-Kindergarten and early education programs, teachers' education was not consistently linked to observed classroom quality (Early et al., 2007; Early et al., 2008). It seems reasonable that college education in and of itself does not prepare someone to be an early childhood educator. The effects of education are likely to depend on the types of courses and specific educational experiences that may contribute to quality teaching (Bogard, Traylor, & Takanishi, 2008).

One way to isolate the effects of education is to compare states with different requirements. In the Fragile Families Study, children from low-income families were observed in child care in 14 different states. In states with higher teacher education requirements, family child care settings and nonprofit centers had higher quality, but there was no relation of requirements to quality in for-profit centers (Rigby, Ryan, & Brooks-Gunn, 2007).

Blau (1997) analyzed two large-scale observational studies to determine the relation of both teacher qualifications and group composition to classroom quality. To control for confounding variables associated with differences among centers, he compared analyses that included variation across centers with analyses comparing classrooms within centers. In both studies, teacher education had small effects that were statistically nonsignificant when teachers within the same center were compared, but specific training workshops did matter. Classrooms in which teachers had more training from workshops were scored higher on observed quality than those with lower levels of training in the same center (Blau, 1997). Of course, this analytic approach probably underestimates the effects of policy on quality because variation across centers reflects differences in standards for hiring or training teachers as well as for ratios and group sizes. If some centers require

educational credentials or provide opportunities for training and others do not, then the superior quality of some centers may be partly due to better-trained and educated teachers.

Specific training in early childhood, early education, or particular curriculum approaches does appear to have the intended effects, though the changes in classroom process are sometimes limited to the content areas emphasized in the training. In a meta-analysis of 15 quasi-experimental studies of specialized training, caregivers' competence in the classroom improved substantially, particularly when there was fixed curriculum content (Fukkink & Lont, 2007). For example, teachers trained in specific literacy curricula increase the time spent on literacy activities in the classroom (Dickinson & Caswell, 2007; Jackson et al., 2006; Landry et al., 2005). Similarly, in a true random assignment study (as opposed to quasi-experimental) of centers serving children from low-income families, training in one of three literacy curricula led to increases in literacy-related activities in the classroom; two of the curricula also led to improved child performance on tests of literacy skills (Layzer, Layzer, Goodson, & Price, 2007).

Although recent teacher training programs emphasize literacy activities and curriculum, many professionals believe that the quality of teacher-child relationships and classroom climate are central to both intellectual and social development. In one survey of Pre-Kindergarten programs, children who experienced high-quality classroom instruction and supportive teacher-child relationships gained most in academic skills, but these gains were not related to teacher qualifications or ratios (Howes et al., 2008). A classroom-based experiment demonstrated that training and mentoring designed to improve Head Start teachers' emotionally supportive classroom practices improved positive classroom climate, teacher sensitivity, and behavior management (Raver et al., 2008).

Child-to-Adult Ratio and Group Size

Overall, it appears that reasonable ratios and group sizes may be necessary, but not sufficient conditions to promote high quality educational and social interactions in the classroom. Although low child-to-adult ratios are correlated with higher quality, the reasons for the correlation are not entirely clear (see Lamb & Ahnert, 2006). In many studies, child-to-adult ratios alone do not predict classroom quality, but the range of ratios studied may be limited (e.g., Burchinal et al., 2002; Howes et al., 2008). Having fewer children per adult offers more opportunity for one-on-one attention to children, but does not guarantee it. In addition, there may be thresholds above which more children per adult make quality much more difficult to maintain.

Ratio and group size may be more important determinants of quality for infants and toddlers than for older children. Quality care for an infant or a very young child requires more individual adult-child interaction than is the case for a 3- or 4-year-old. A caregiver can read a book to a group of 3-year-olds, but it is much more difficult to have a social interaction or play a game with more than one baby at a time.

In the NICHD Study of Early Child Care, observed quality was defined by caregiver sensitivity, responsiveness, and involvement. For infants, quality was higher in home settings than in centers; the difference was explained by the difference in number of children per adult (NICHD Early Child Care Research Network, 1996). By age 4 ½, however, quality in centers was higher than in home settings despite their larger groups and ratios (Dowsett, Huston, Imes, & Gennetian, 2008). In center and home settings caring for 2-year-olds, there was more positive teacher-child engagement with individual children when settings had fewer children per adult, but there was also less frequent prosocial peer interaction. In child care homes with fewer children per adult, caregivers scolded children less, and children spent less time unoccupied (Malerba, 2005).

In one interesting experiment, groups with three children per adult were compared to those with five children per adult. For infants and toddlers, the lower child-caregiver ratio produced a significantly higher quality of caregiver-child interaction and more cooperation by children than did the higher ratio; ratios had little effect on quality in groups of children age 3 and older (de Schipper, Riksen-Walraven, & Guerts, 2006).

Subsidies and Funding Levels

Funding levels constitute a major barrier to improving quality. Personnel are the principal expense in programs for young children. Hiring and retaining teachers with good qualifications is problematic given the very low salaries that are paid to many child care providers and early education teachers. Teacher turnover, resulting at least partly from low wages, is correlated with low quality of programs (Whitebook, Howes, & Phillips, 1998). Reducing child-to-adult ratios increases personnel costs, leading to the realistic concern that fewer children will be served because of increased costs to parents or to public entities.

Nonetheless, there is evidence that funding matters. In a 14-state comparison, more generous subsidy policies (that is, greater investment and higher income thresholds) were associated with higher quality of care in nonprofit centers, but not in for-profit centers, perhaps because the latter had few subsidized children. It was also true that states with more stringent ratios had fewer subsidized children in center care (Rigby et al., 2007).

In an analysis of Head Start programs across regions, Currie and Neidell (2007) found that former Head Start children had higher reading and vocabulary scores when they had attended programs in areas where Head Start spending was higher. Moreover, when programs devoted higher shares of their budgets to a broad range of services, children had fewer behavior problems and were less likely to have been retained in grade when they reached elementary school.

Although federally-funded tax credits and child care subsidies come to parents with no requirements for the quality of care to be purchased, there is evidence that subsidy policies may affect quality, probably because they enable parents to choose from a wider range of options. Low-income families who receive subsidies increase their use of center-based care as opposed to care by relatives or home providers (Crosby, Gennetian, & Huston, 2005; Fuller, Kagan, Caspary, & Gauthier, 2002). Although quality within each type of care is highly variable, there is evidence that centers used by low-income families offer higher average quality than do the home settings they use (Li Grining & Coley, 2006).

Cash incentives to teachers for acquiring educational credentials are used in some locations to improve both stability of the workforce and teacher qualifications. An evaluation of such a program in one state indicated improved retention for teachers who received such incentives. The effect was particularly strong for experienced teachers with more than a high school education and for teachers earning between $7.20 and $9.60 an hour (Gable, Rothrauff, Thornburg, & Mauzy, 2007).

Conclusion

The major purpose of this paper is to suggest ways that public policy can improve the quality of child care and early education for children from infancy to school age. I begin with the assumption that integrated early education and care policies have the best chance of yielding quality in the range of settings serving young children. Quality of early care and education can be defined by such structural features as group composition, caregiver qualifications, and health and safety practices, and by process indicators of the learning experiences and social interactions in

the setting. Although many experts agree on the fundamentals of quality, there is some disagreement about the extent to which early education programs should follow structured curricula designed to teach academic skills or should provide less structured opportunities for children to play, explore and follow individual interests.

There is strong evidence that high quality programs can improve children's cognitive and social development. Among the structural indicators, specific training for caregivers is the most consistent predictor of children's development, but small ratios and group sizes may also be important for infants and toddlers. When structural indices of quality affect development, they do so because they affect processes of adult-child interaction and classroom activities.

Early care and education policies in the U.S. have two means of affecting quality: providing funds and regulation or setting standards. There is no "system" of early care and education, but instead a decentralized set of actors and activities with multiple goals, funding sources, and venues. Nevertheless, funding policies can affect quality either by financing programs directly or by providing financial assistance to parents. Head Start and prekindergarten programs are examples of publicly-funded programs that can be subjected to more stringent quality requirements than typically occur in child care settings. Regulations and standards can affect quality largely by dictating such structural features as teacher qualifications, child-to-adult ratios, and group sizes. In turn, some of these structural indicators affect process. It appears that specific training for teachers and providers is especially important. For infants and toddlers, ratios and group size may be more important.

Looking to the future, integrating policies for early care and education has the potential to improve quality in many settings that provide care for young children, regardless of whether the major purpose is allowing parents to work or providing developmental enrichment for children. All settings should provide rich and supportive child-rearing environments—a goal which public policies promoting quality can help to achieve.

References

Barnett, W. S. (1995). Long-term effects of early childhood programs on cognitive and school outcomes. *The Future of Children, 5*, 25-50.

Besharov, D. J., & Higney, C. A. (2007). Head Start: Mend it, don't expand it (yet). *Journal of Policy Analysis and Management, 26*, 678-680.

Blau, D. M. (1997). The production of quality in child care centers. *The Journal of Human Resources, 32*, 354-387.

Blau, D. M. (1999). The effect of child care characteristics on child development. *The Journal of Human Resources, 34*, 786-822.

Bogard, K., Traylor, F., & Takanishi, R. (2008). Teacher education and PK outcomes: Are we asking the right questions. *Early Childhood Research Quarterly, 23*, 1-6.

Burchinal, M. R., Cryer, D., Clifford, R. M., & Howes, C. (2002). Caregiver training and classroom quality in child care centers. *Applied Developmental Science, 6*, 2-11.

Clarke-Stewart, K. A., Vandell, D. L., Burchinal, M. R., O'Brien, M., & McCartney, K. (2002). Do regulable features of child-care homes affect children's development? *Early Childhood Research Quarterly, 17*, 52-86.

Crosby, D. A., Gennetian, L., & Huston, A. C. (2005). Child care assistance policies can affect the use of center-based care for children in low-income families. *Applied Developmental Science, 9*(2), 86-106.

Currie, J., & Neidell, M. (2007). Getting inside the "Black Box" of Head Start quality: What matters and what doesn't. *Economics of Education Review, 26*(1), 83-99.

de Schipper, E. J., Riksen-Walraven, J. M., & Guerts, S.

A. E. (2006). Effects of child-caregiver ratio on the interactions between caregivers and children in child-care centers: An experimental study. *Child Development, 77*, 861-874.

Dickinson, D. K., & Caswell, L. (2007). Building support for language and early literacy in preschool classrooms through in-service professional development: Effects of the Literacy Environment Enrichment Program (LEEP). *Early Childhood Research Quarterly, 21*, 243-260.

Dowsett, C. J., Huston, A. C., Imes, A. E., & Gennetian, L. (2008). Structural and process features in three types of child care for children from high and low income families. *Early Childhood Research Quarterly, 23*(1), 69-93.

Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., et al. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development, 78*(2), 558-580.

Early, D. M., Maxwell, K. L., Clifford, R. M., Pianta, R. C., Ritchie, S., Howes, C., et al. (2008). Teacher education and child outcomes: A reply to the commentary. *Early Childhood Research Quarterly, 23*(1), 7-9.

Fiene, R. (2002). *13 Indicators of quality child care: Research update.* Washington, DC: U.S. Department of Health and Human Services.

Fukkink, R. G., & Lont, A. (2007). Does training matter? A meta-analysis and review of caregiver training studies. *Early Childhood Research Quarterly, 22*, 294-311.

Fuller, B., Kagan, S. L., Caspary, G., & Gauthier, C. A. (2002). Welfare reform and child care options for low-income families. *Future of Children, 12*(1), 97-119.

Gable, S., Rothrauff, T. C., Thornburg, K. R., & Mauzy, D. (2007). Cash incentives and turnover in center-based child care staff. *Early Childhood Research Quarterly, 22*, 363-378.

Gormley, W. T., & Gayer, T. (2005). Promoting school readiness in Oklahoma. *Journal of Human Resources, 40*, 533-558.

Gormley, W. T., Gayer, T., Phillips, D. A., & Dawson, B. (2005). The effects of universal Pre-K on cognitive development. *Developmental Psychology, 41*(6), 872-884.

Greenberg, M. T., Levin-Epstein, J., Hutson, R. Q., Ooms, T. J., Schumacher, R., Turetsky, V., et al. (2002). The 1996 welfare law: Key elements and reauthorization issues affecting children. *Future of Children, 12*(1), 27-57.

Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science, 312*, 1900-1902.

Howes, C., Burchinal, M., Pianta, R., Bryant, D., Early, D., Clifford, R., et al. (2008). Ready to learn children's pre-academic achievement in pre-Kindergarten programs. *Early Childhood Research Quarterly, 23*(1), 27-50.

Hyson, M., Copple, C., & Jones, J. (2006). Early childhood education and development. In K. A. Renninger & I. Sigel (Eds.), *Child psychology in practice: Vol. 4. Child psychology in practice* (6th ed., pp. 3-47). New York: Wiley.

Jackson, B., Larzelere, R., St. Clair, L., Corr, M., Fichter, C., & Egertson, H. (2006). The impact of Heads Up! Reading on early childhood educators' literacy practices and preschool children's literacy skills. *Early Childhood Research Quarterly, 21*(2), 213-226.

Karoly, L. A., Kilburn, M. R., & Cannon, J. S. (2005). *Early childhood interventions: Proven results, future promise*. Santa Monica, CA: Rand Corporation.

Lamb, M. E., & Ahnert, L. (2006). Nonparental child care: Context, concepts, correlates, and consequences. In K. A. Renninger & I. E. Sigel (Eds.), *Handbook of child psychology: Vol. 4. Child psychology in practice* (6th ed., pp. 950-1016). Hoboken, NJ: Wiley.

Landry, S. H., Swank, P. R., Anthony, J., Assel, M. A., Gunnewig, S., & McManis, L. (2005). *An experimental study evaluating a state-funded*

prekindergarten program: Bringing together subsidized childcare, public school, and Head Start. Houston TX: Children's Learning Institute, University of Texas Medical School at Houston.

Layzer, J. I., Layzer, C. J., Goodson, B. D., & Price, C. (2007). *Evaluation of child care subsidy strategies: Findings from project upgrade in Miami-Dade County*. Boston: Abt Associates.

Li Grining, C. P., & Coley, R. L. (2006). Child care experiences in low-income communities: Developmental quality and maternal views. *Early Childhood Research Quarterly, 21*, 125-141.

Love, J. M., Chazan-Cohen, R., Raikes, H., Aber, J. L., Bishop-Josef, S. J., Jones, S. M., et al. (2007). Forty years of research knowledge and use: from Head Start to Early Head Start and beyond. In J. L. Aber, S. J. Bishop-Josef, S. M. Jones, K. T. McLearn, & D. A. Phillips (Eds.), *Child development and social policy: Knowledge for action* (pp. 79-95). Washington, DC: American Psychological Association.

Love, J. M., Kisker, E. E., Ross, C., Raikes, H., Constantine, J., Boller, K., et al. (2005). The Effectiveness of early Head Start for 3-year-old children and their parents: Lessons for policy and programs. *Developmental Psychology, 41*(6), 885-901.

Ludwig, J., & Miller, D. L. (2007). Does Head Start improve children's life chances? Evidence from a regression discontinuity design. *Quarterly Journal of Economics, 122*, 159-208.

Ludwig, J., & Phillips, D. (2007). The benefits and costs of Head Start. *Social Policy Report: Society for Research in Child Development, 21*(3), 1-19.

Malerba, C. A. (2005). *The determinants of children's and adults' behavioral processes in home and center based child care.* Unpublished doctoral dissertation, University of Texas, Austin.

Melhuish, E. C., & Petrogiannis, K. (2006). *Early childhood care and education: International perspectives*. London: Routledge.

Nathan, R. P. (2007). How should we read the evidence about head start? Three views. *Journal of Policy Analysis and Management, 26*, 673-690.

National Association for the Education of Young Children. (1996). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8.* Washington, DC: National Association for the Education of Young Children.

National Association for Regulatory Administration. (2005). *2005 National child care licensing study.* Retrieved February 19, 2008, from http://nara.affiniscape.com

NICHD Early Child Care Research Network. (1996). Characteristics of infant child care: Factors contributing to positive caregiving. *Early Childhood Research Quarterly, 11*, 269-306.

NICHD Early Child Care Research Network. (1998). Child outcomes when child-care classrooms meet recommended guidelines for quality. *American Journal of Public Health, 89*, 1072-1077.

NICHD Early Child Care Research Network. (2000). Characteristics and quality of child care for toddlers and preschoolers. *Journal of Applied Developmental Science, 4*, 116-135.

NICHD Early Child Care Research Network. (2002). Structure→Process→Outcome: Direct and indirect effects of caregiving quality on young children's development. *Psychological Science, 13*(3), 199-206.

NICHD Early Child Care Research Network. (2005). Early child care and children's development in the primary grades: Follow-up results from the NICHD study of early child care. *American Educational Research Journal, 42*(3), 537-570.

NICHD Early Child Care Research Network, & Duncan, G. J. (2003). Modeling the impacts of child care quality on children's preschool cognitive development. *Child Development, 74*, 1454-1475.

Peisner-Feinberg, E. S., Burchinal, M. R., Clifford, R. M., Culkin, M. L., Howes, C., Kagan, S. L., et al. (2001). The relation of preschool child-care quality to children's cognitive and social developmental trajectories through second grade.

Child Development, 72(5), 1534-1553.

Phillips, D. A. (1991). With a little help: Children in poverty and child care. In A. C. Huston (Ed.), *Children in poverty: Child development and public policy* (pp. 158-189). New York: Cambridge University Press.

Raver, C. C., Jones, S. M., Li-Grining, C. P., Metzger, M., Champion, K. M., & Sardin, L. (2008). Improving preschool classroom processes: Preliminary findings from a randomized trial implemented in Head Start settings. *Early Childhood Research Quarterly, 23*(1), 10-26.

Rigby, E., Ryan, R. M., & Brooks-Gunn, J. (2007). Child care quality in different state policy contexts. *Journal of Policy Analysis and Management, 26*, 887-907.

Ruopp, R., Travers, J., Glantz, F., & Coelen, C. (1979). *Children at the center: Summary findings and policy implications of the National Day Care Study.* Cambridge, MA: Abt Associations.

Sylva, K., Siraj-Blatchford, I., Taggart, B., Sammons, P., Melhuish, E., Elliot, K., et al. (2006). Capturing quality in early childhood through environmental rating scales. *Early Childhood Research Quarterly, 21*(1), 76-92.

U.S. Department of Health and Human Services, Administration on Children and Families (2005). *Head Start impact study: First year findings*. Washington, DC: Administration for Children and Families, Office of Planning, Research and Evaluation.

Vandell, D. L., & Wolfe, B. (2000). *Child care quality: Does it matter and does it need to be improved?* Madison, WI: Institute for Research on Poverty, University of Wisconsin-Madison.

Votruba-Drzal, E., Coley, R. L., & Chase-Lansdale, P. L. (2004). Child care and low-income children's development: Direct and moderated effects. *Child Development, 75*, 296-312.

Whitebook, M., Howes, C., & Phillips, D. (1998). *Worthy work, unlivable wages. The National Child Care Staffing Study, 1988-1997.* Washington, DC: Center for the Child Care Workforce.

Note

[1] The investigators helped programs generate waiting lists by recruiting interested parents, so the sample of programs was representative of the nation.