



The quality of toddler child care and cognitive skills at 24 months: Propensity score analysis results from the ECLS-B



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ARTICLE INFO

Article history:

Received 15 July 2011

Received in revised form 21 August 2013

Accepted 5 September 2013

Keywords:

Toddler care
Child care quality
ECLS-B
Cognitive skills
Propensity scores

ABSTRACT

Over half of the toddlers in the US experience routine nonparental care, but much less is known about early care than about preschool care. This study analyzed 2-year-old child care and child outcome data from the nationally representative ECLS-B sample of children born in 2001. At two-years of age, 51% of children experienced exclusive parental care, 18% relative care, 15% family child care, and 16% center care. More children in nonparental care were in medium quality care (61%) than in high quality (26%) or low quality (13%) care. Low-income children were more likely than non-low income children to be cared for by their parents and, when in care, were more often in lower quality care. The impact of toddler care quality on cognitive skills was estimated using propensity score adjustments to account for potential selection confounds due to family and child characteristics. Children's cognitive scores were higher in high or medium quality care than in low quality care, but no evidence emerged suggesting that poverty moderated the quality effects. Nevertheless, this suggests that increasing the proportion of low-income children in high quality care could reduce the achievement gap because low-income children are very unlikely to experience high quality care.

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1. Introduction

The care of infants and toddlers has undergone significant changes over the last 40 years. In decades past, the vast majority of 12–24-month-old children were cared for at home by their mothers. By the mid 2000s, however, less than half of infants and toddlers in the US stayed at home with their mothers, indicating that the majority of 1- to 2-year-old US children receive part- or full-time care by people other than their parents (Laughlin, 2010). Ensuring that infants and toddlers benefit from positive early experiences is important to parents, and is of growing concern for policy makers. Since most child care research focuses on the preschool period, little is known about the impact of nonparental child care experiences during the infant and toddler period, especially at the national level. The purpose of this study is to extend our understanding of the impact of child care experiences for infants and toddlers by analyzing a nationally representative data source on children's early development, the Early Childhood Longitudinal Study-Birth cohort of children born in 2001 (Flanagan & West, 2005). Propensity score methods are used to reduce bias in the estimation of the effect of

child care quality on the cognitive development of 2-year-old children owing to parental selection of different types and quality of child care.

1.1. High quality child care

The quality of care received by infants and toddlers is thought to be crucial to their development, and in order to provide maximal developmental benefit, child–adult interactions must be continually sustained and grow increasingly complex over time (Bronfenbrenner & Morris, 2006). Increasing complexity arises when caregiver–child interactions are scaffolded to reflect the child's understanding of relationships and objects. Constructionist theorists extend the interaction-based child care quality model to argue that young children construct their own learning by interacting with and operating in their natural environments (Bodrova & Leong, 2006; Piaget, 2007; Vygotsky, 1978). These theories have been influential in shaping our understanding of the quality of child care, and specifically the importance of both the quality of adult–child interactions and the child's opportunity to interact with varied and rich materials within the child care classroom. In prior child care research, developmentally supportive environments were found to be rich in spoken language experiences; encourage children to safely explore their physical, social, and

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intellectual environment; and contain play environments that stimulate children's cognitive development (National Institute of Child Health and Human Development, Early Child Care Research Network [NICHD ECCRN], 2000a; Vandell, 2004). We define high quality child care as care that occurs in safe settings where children are provided with rich play environments and reciprocal interactions that encourage exploration and learning.

1.2. Child care quality and children's cognitive development

Studies of preschool children consistently find a positive association between child care quality and children's cognitive skills (Burchinal & Cryer, 2003; Burchinal, Kainz, & Cai, 2011; Camilli, Vargas, Ryan, & Barnett, 2010; Gormley, Gayer, Phillips, & Dawson, 2005; Howes et al., 2008; Mashburn et al., 2008; NICHD ECCRN & Duncan, 2003; NICHD ECCRN, 2000a, 2002, 2005; Peisner-Feinberg & Burchinal, 1997; Peisner-Feinberg et al., 2001; Pianta, Barnett, Burchinal, & Thornburg, 2009; Reynolds, Temple, Robertson, & Mann, 2002; Vandell, 2004; Votruba-Drzal, Coley, & Chase-Lansdale, 2004). However, much less is known about child care quality effects on infant and toddler cognitive development. Experimental studies, which eliminate bias due to parental selection into different types of child care, find that, at 36 months, children's cognitive skills are enhanced by high-quality child care, with effect sizes ranging from $d = .12$ in the Early Head Start Study (Love et al., 2005) to $d = .83$ in the Infant Health and Development Program (McCormick et al., 2006) to $d = 1.23$ in the Abecedarian study (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001). The quality of care in these interventions was likely to be high due to involvement of research staff and use of evidence-based curricula, but child care quality was not actually measured in the treatment or control conditions in the Abecedarian and Infant Health and Development Program interventions.

In the case of younger children (12–24 months), the focus of the present paper, associations between child care quality and cognitive skills are rarely investigated, and were observed in a handful of non-experimental studies. These include both small, single-site studies (Burchinal, Roberts, Nabors, & Bryant, 1996) and larger multisite studies using data collected in the 1990s (NICHD ECCRN, 2006; NICHD ECCRN & Duncan, 2003). Child samples in prior work were primarily low income (e.g., Early Head Start) or from middle-class backgrounds (e.g., National Institute of Child Health and Development Study of Early Child Care and Youth Development [NICHD-SECCYD]) and thus not fully representative. While studies using the National Longitudinal Study of Youth (Han, Waldfogel, & Brooks-Gunn, 2001) are nationally representative, they do not adequately address associations between child care quality and cognitive skills due to the fact that child care quality was not measured. In addition, few large observational studies use statistically rigorous methods to account for parental selection into differing levels of child care quality, types of care, and quantity of care (an exception is work by Dearing, McCartney, and Taylor (2009) with the NICHD-SECCYD sample). The present study therefore uses propensity scores to examine the effect of early child care on cognitive skills at 24 months for children in the ECLS-B, a nationally representative sample of children born in 2001.

1.3. Other facets of child care that may relate to cognitive skills

In order to account for the relation between child care quality and cognitive skills in an unbiased manner, it is necessary to also account for other facets of early child care that, in prior work, have been linked to children's cognitive skills. Principal among these are the amount of time children spend in child care, the age at which

they enter care, and the type of care they receive. Of these, the type of care a child receives (center care or not) may be particularly important because being in center care is associated with increases in cognitive skills (Clarke-Stewart, Gruber, & Fitzgerald, 1994). While center care predicts cognitive skills over and above the measured quality of care in many studies (Brooks-Gunn, Han, & Waldfogel, 2002; NICHD ECCRN & Duncan, 2003; NICHD ECCRN, 2000b, 2006), other research finds no cognitive benefit (measured at age 3) for center care vs. mother-only care during the first year of a child's life (Han et al., 2001). Loeb, Bridges, Bassok, Fuller, and Rumberger (2007) found that first entering center care between ages 2 and 3 resulted in greater cognitive gains than entering center care in the year prior to kindergarten. Beginning center care prior to two years of age yielded no additional cognitive benefits. Studies that simultaneously examined the amount of time children spent in child care and the quality of child care found only a quality effect on cognitive outcomes (NICHD ECCRN, 2000b, 2006; NICHD ECCRN & Duncan, 2003).

Given the above evidence, it is questionable how important these other dimensions of child care are in terms of predicting cognitive skills over and above the measured quality of child care. However, these dimensions of child care may be linked with cognitive skills, and cannot be ignored since doing so may bias any estimates of the effects of child care quality. The present study therefore tests whether these dimensions are related to cognitive skills.

1.4. Differential effects of child care on low-income children

Whether or not child care quality has an overall impact on cognitive skills, it is important to test for the effect of quality on low-income children, since public policies are often targeted toward children from low-income backgrounds. Additionally, estimating the relative magnitudes of effect for low-income and middle-income children is useful for understanding the ability of subsidized, high-quality child care for low-income children to narrow achievement gaps. Some evidence from the preschool period suggests that high-quality care might be a protective factor for low-income children (Burchinal, Roberts, Zeisel, Hennon, & Hooper, 2006). Quality of care appears to be related to cognitive development for all children (Vandell, 2004), but may be a stronger predictor for low-income children in the first year of grade school (Dearing et al., 2009). Although Dearing et al. (2009) considered early care, they did not isolate it from later child care, instead measuring child care quality by the number of times a child experienced high-quality care from 6 to 54 months. It is, thus, important to know whether high-quality infant/toddler care is protective separate from high-quality preschool care.

1.5. Present study

This study has two aims. First, descriptive information about toddler care experiences are provided using the nationally representative Early Childhood Longitudinal Survey-Birth Cohort (ECLS-B) to address the need for more information about the type, quantity, and especially quality of child care for toddlers in the US. Second, it addresses the understudied question of whether early cognitive development is related to the quality of toddler care. The ECLS-B provides rich information on children's socio-demographic and psychological characteristics that enable us to use propensity score procedures to reduce bias in estimating the relation between measured child care quality and children's cognitive development from 9 to 24 months of age. We hypothesize that higher quality child care promotes toddlers' cognitive development.

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