Research in Developmental Disabilities 35 (2014) 1789–1801

Contents lists available at ScienceDirect

Research in Developmental Disabilities

Socioeconomic status, child enrichment factors, and cognitive performance among preschool-age children: Results from the Follow-Up of Growth and Development Experiences study☆

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ARTICLE INFO

Article history:
Received 22 June 2012
Received in revised form 4 February 2014
Accepted 5 February 2014
Available online 27 March 2014

Keywords:
Neurodevelopmental
Epidemiology
Sociodemographic determinants
Differential Ability Scales

ABSTRACT

Lower cognitive performance is associated with poorer health and functioning throughout the lifespan and disproportionately affects children from lower socioeconomic status (SES) populations. Previous studies reporting positive associations between child home enrichment and cognitive performance generally had a limited distribution of SES. We evaluated the associations of SES and child enrichment with cognitive performance in a population with a wide range of SES, particularly whether enrichment attenuates associations with SES. Children were sampled from a case–control study of small-for-gestational-age (SGA) conducted in a public hospital serving a low SES population (final $n = 198$) and a private hospital serving a middle-to-high SES population (final $n = 253$). SES (maternal education and income) and perinatal factors (SGA, maternal smoking and drinking) were obtained from maternal birth interview. Five child home enrichment factors (e.g. books in home) and preschool attendance were obtained from follow-up interview at age 4.5 years. Cognitive performance was assessed with the Differential Ability Scales (DAS), a standardized psychometric test administered at follow-up. SES and enrichment scores were created by combining individual factors. Analyses were adjusted for perinatal factors. Children from the public birth hospital had a significantly lower mean DAS general cognitive ability (GCA) score than children born at the private birth hospital (adjusted mean difference −21.4, 95% CI: −24.0, −18.7); this was substantially attenuated by adjustment for individual SES, child enrichment factors, and preschool attendance (adjusted mean difference −5.1, 95% CI: −9.5, −0.7). Individual-level SES score was associated with DAS score, beyond the general SES effect associated with hospital of birth. Adjustment for preschool attendance and home enrichment score attenuated the association between individual SES score and adjusted mean DAS-GCA among children born at both of the hospitals. The effect of being in the lower compared to the middle tertile of SES score was reduced by approximately a quarter; the effect of being in the upper compared to the middle tertile of SES score was reduced by nearly half, but this

☆ The findings and conclusions in this study are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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http://dx.doi.org/10.1016/j.ridd.2014.02.003
0891-4222/

comparison was possible only for children born at the private hospital. A child's individual SES was associated with cognitive performance within advantaged and disadvantaged populations. Child enrichment was associated with better cognitive performance and attenuated the SES influence. Health care providers should reinforce guidelines for home enrichment and refer children with delays to early intervention and education, particularly children from disadvantaged populations.

1. Introduction

Socioeconomic status is influenced by factors at the individual level, such as household income, parental education, and parental occupation, and at a broader level, by factors such as neighborhood of residence (Krieger, Williams, & Moss, 1997; Subramanian, Chen, Rehkopf, Waterman, & Krieger, 2005). Several studies have reported that children's educational attainment and performance on tests of cognitive ability vary with socioeconomic status, with children from disadvantaged homes and neighborhoods having lower achievement than children from advantaged homes and neighborhoods (Bradley & Corwyn, 2002; Duncan, Brooks-Gunn, & Klebanov, 1994; Jefferis, Power, & Hertzman, 2002; Kiernan & Huerta, 2008; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998; Linver, Brooks-Gunn, & Kohen, 2002; McCulloch & Joshi, 2001; Network, 2005; Power, Jefferis, Manor, & Hertzman, 2006; Santos et al., 2008; Yeung, Linver, & Brooks-Gunn, 2002). Disparities in children's achievement by socioeconomic status appear in early childhood (Hillemeier, Farkas, Morgan, Martin, & Maczuga, 2009; Yeung & Pfeiffer, 2009), before entry to school, and school achievement gaps have been shown to persist and even widen with time (Jefferis et al., 2002; Yeung & Pfeiffer, 2009). These gaps have negative implications for children's employment and earning potential and are also associated with poorer adult health status and shorter life expectancy (Lager, Bremberg, & Vagero, 2009; Osler, Andersen, Batty, & Holstein, 2005; Poulton et al., 2002).

The underlying reasons for the strong associations observed between SES and child cognitive performance is complex and likely multi-factorial. This relationship is illustrated as a conceptual model in Fig. 1. The level of cognitive enrichment a child receives may be one of the key mediating factors in the association between SES and cognitive performance. Indeed, several

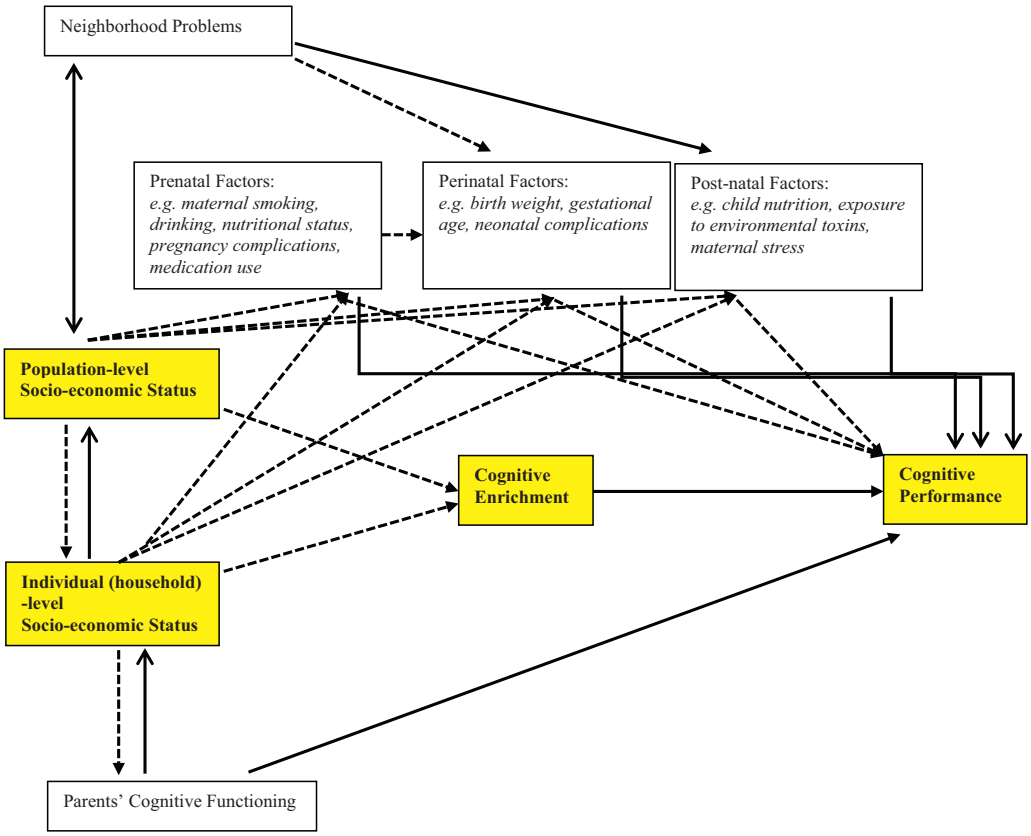

Fig. 1. Conceptual framework for relationship between population and individual socio-economic status, cognitive enrichment, and cognitive performance. Bold lines indicate direct effect. Dashed lines indicate indirect effect.