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Intelligence

Evaluating the unique effects of cognitive ability and parental socioeconomic status on adult dietary behaviors and receipt of preventive health services ☆

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ABSTRACT

Some research has shown that both cognitive ability and parental socioeconomic status (parental SES) predict dietary behaviors and receipt of preventive health services later in life. However, previous research has not attempted to disentangle these effects while also examining important mediators such as education level and income. Based on a sample of 4078 individuals drawn from the National Longitudinal Survey of Youth 1979, we examined the unique effects of *g* and parental SES on adult dietary behaviors and receipt of preventive health services. Overall, the results suggest that there is essentially little *direct unique* effect of cognitive ability or parental SES on adult dietary behaviors and receipt of preventive health services. However, the *total effects* of cognitive ability and parental SES on adult dietary behaviors and receipt of preventive health services showed that higher levels of cognitive ability and parental SES were associated with healthier dietary habits and receipt of health services due to their effects on educational attainment and adult income. The findings may have implications for health education materials and access to healthcare.

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Chronic health conditions, such as cardiovascular disease, cancer, and diabetes, account for approximately 70% of deaths in the US each year (Kung, Hoyert, Xu, & Murphy, 2008). Critically, individual differences in health behaviors, such as dietary choices, have been linked to risk of chronic disease and mortality (Eyre, Kahn, & Robertson, 2004; Malik et al., 2010; Mente, de Koning, Shannon, & Anand, 2009; Roberts & Barnard, 2005). Similarly, receipt of preventive health services (e.g., routine health exams and screening tests) can facilitate better management or early detection of chronic diseases, thus reducing the risk of mortality (Eyre et al., 2004). Although social and economic factors influence these behaviors, identifying the individual factors and characteristics that are also related to these health behaviors may lead to a better understanding of why certain individuals are more likely to experience chronic disease and/or early mortality.

Cognitive epidemiologists have shown that cognitive ability is associated with mortality (e.g., Deary, Batty, Pattie, & Gale, 2008) and morbidity (e.g., Der, Batty, & Deary, 2009). However, the specific ways by which ability might influence mortality and morbidity are still being elucidated. A promising pathway is emerging with recent research showing that cognitive ability is associated with certain dietary behaviors such that higher levels of cognitive ability are associated with healthier dietary choices. For example, Batty, Deary, Schoon, and Gale (2007) found that higher levels of cognitive ability predict an increase in consumption of fruits and vegetables and a decrease in consumption of fried foods and other unhealthy foods. In this longitudinal study, cognitive ability was assessed in early adulthood (age 20) and dietary behaviors (the frequency of consumption of 15 specific food items) were assessed at age 30.

Similarly, Chandola, Deary, Blane, and Batty (2006) also found that cognitive ability in childhood had a small, positive effect on fruit and vegetable consumption in adulthood (mid 30s). Cognitive ability during early adolescence has also been associated with a reduction in the intake of stimulant drinks during late adolescence (Ciarrochi, Heaven, & Skinner, 2012). The current study expands on this line of research by examining three specific dietary behaviors that have not been previously studied: soda consumption, fast food consumption, and frequency of skipping meals. These behaviors have been shown to be risk factors for chronic diseases such as metabolic disorders and cardiovascular diseases (Deshmukh-Taskar, Nicklas, Radcliffe, O'Neil, & Liu, 2013; Malik et al., 2010; Pereria et al., 2005).

Less research has examined the association between ability and preventive health services. However, it has been posited that individuals with higher levels of g have increased capacity for reasoning, learning, and problem solving, thus enabling them to better comprehend and translate information about health into positive health behaviors (e.g., Der et al., 2009; Gottfredson, 2004). At the aggregate level, cross-sectional studies have shown that average levels of state IQ are positively associated with state level rates of receipt of preventive health services such as immunizations, mammograms, colonoscopies, and annual dental care (Reeve & Basalik, 2010, 2011). To our knowledge, no previous research has examined the association between cognitive ability scores and the receipt of preventive health services at the individual level. However, measures of 'health literacy' have been found to primarily assess cognitive ability (Reeve & Basalik, 2014). Thus, using health literacy as a proxy for ability, it is relevant to note that a number of studies have documented a positive association between health literacy and the receipt of preventive health services (e.g., Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). Thus, the current study seeks to replicate and expand on prior research by using a true measure of cognitive ability to study the longitudinal association between ability and receipt of preventive health behaviors.

As noted above, the specific nature of ability's influence on adult health is still being discovered. Part of the reason it is difficult to gain a clear understanding is that cognitive ability is confounded with socioeconomic factors (e.g., income and education level; Murray, 1998), and these factors are associated with the same health behaviors, including dietary choices (Darmon & Drewnowski, 2008; Hanson & Chen, 2007). Likewise, socioeconomic factors have also been associated with receipt of health services, such that those of higher socioeconomic status (SES) are more likely to receive routine and preventive health services than those of lower SES (Coughlin, King, Richards, & Ekwueme, 2006; Lasser, Himmelstein, & Woolhandler, 2006; Sambamoorthi & McAlpine, 2003). Furthermore, since SES indicators (e.g., income and education) are also highly correlated with g, it has been posited that g is one of the underlying causes of the relationship between SES and health (Gottfredson, 2004; Gottfredson & Deary, 2004).

Due to the interconnected nature of g and socioeconomic factors throughout life, longitudinal designs are needed to disentangle their effects on dietary behaviors and receipt of preventive health services. Additionally, datasets that measure both antecedents (i.e., g and parental SES) as well as potential mediators (i.e., measures of personal SES in adulthood) are needed. Thus, the objective of the current study is to examine

the *unique and independent statistical effects* of cognitive ability and SES (measured in adolescence) on adult dietary behavior and receipt of preventive health services. Our conceptual model is shown in Fig. 1.

It is expected that both cognitive ability and parental SES will yield positive unique associations with dietary behaviors and receipt of preventive health services in adulthood. Furthermore, it is expected that educational attainment and adult income will partly mediate these statistical effects. We expect that educational attainment will have a small to medium positive effect on adult dietary behaviors and receipt of preventive health services (Chandola et al., 2006; Reeve & Basalik, 2010, 2011). Although previous research examining dietary behaviors and receipt of preventive health services has not included income, we expect adult income to have a small positive or no effect on these behaviors based on research with other health outcomes (Meisenberg, 2010; Neiss, Rowe, & Rodgers, 2002). We expect that among the antecedent variables in our model, educational attainment will have the largest direct effect on the outcomes. Furthermore, since research suggests that educational attainment and adult income are mediators in the relationship between g and adult dietary behaviors and receipt of preventive health services, we predict that the effects of g on adult dietary behaviors and receipt of preventive health services will be largely indirect via educational attainment and adult income. Consistent with previous research, we expect that the total effect of g on adult dietary behaviors and receipt of preventive health services will be larger than the total effect of parental SES.

1. Methods

1.1. Sample

Data were drawn from the National Longitudinal Survey of Youth 1979 (NLSY79). The first wave of data from NLSY79 was collected in 1979 and consists of a nationally representative sample of 12,686 individuals who were aged 14–21 at the time of the initial survey. Sponsored by the US Department of Labor, the NLSY79 collects information about employment, education, health, and various attitudes and beliefs. Participants were interviewed annually until 1994 when interviews were conducted biennially (Center for Human Resource Research, 2012). As the dependent variables for the current study were assessed in the 2010 interview, the present study only includes participants who had complete data for measures of cognitive ability and parental SES at baseline and completed the interview in 2010 ($N = 4921$). From this target sample, we then removed participants who had missing educational attainment or income data ($N = 835$). An additional 8 participants who did not have data for health insurance status were deleted. Thus, our operational sample was $N = 4078$. Due to a small number of missing responses to the dependent variables, the specific sample size for each analysis is reported in the tables. The average age of participants at baseline (i.e., the 1979 assessment) was 17.50 years ($SD = 2.24$), and the 2010 follow-up was conducted when these people were 45–52. Approximately half of the participants were female (51.2%) and the majority of participants were White (55.6%), 26.2% were Black, and 18.2% were Latino.