Intelligence 46 (2014) 179–187

Contents lists available at ScienceDirect

Intelligence

A closer look at the role of parenting-related influences on verbal intelligence over the life course: Results from an adoption-based research design

Kevin M. Beaver [a,b,*], Joseph A. Schwartz [c], Mohammed Said Al-Ghamdi [b], Ahmed Nezar Kobeisy [b], Curtis S. Dunkel [d], Dimitri van der Linden [e]

[a] College of Criminology and Criminal Justice, Florida State University, Tallahassee, FL 32306-1127, USA
[b] Center for Social and Humanities Research, King Abdulaziz University, Jeddah, Saudi Arabia
[c] School of Criminology and Criminal Justice, University of Nebraska at Omaha, Lincoln, NE 68588-0561, USA
[d] Department of Psychology, Western Illinois University, Macomb, IL 61455, USA
[e] Institute of Psychology, Erasmus University, Rotterdam, The Netherlands

ARTICLE INFO

Article history:
Received 17 January 2014
Received in revised form 21 May 2014
Accepted 3 June 2014
Available online 5 July 2014

Keywords:
Add Health
Adoption
Family
Intelligence
Parenting

ABSTRACT

The association between family/parenting and offspring IQ remains the matter of debate because of threats related to genetic confounding. The current study is designed to shed some light on this association by examining the influence of parenting influences on adolescent and young adult IQ scores. To do so, a nationally representative sample of youth is analyzed along with a sample of adoptees. The sample of adoptees is able to more fully control for genetic confounding. The results of the study revealed that there is only a marginal and inconsistent influence of parenting on offspring IQ in adolescence and young adulthood. These weak associations were detected in both the nationally representative sample and the adoptee subsample. Sensitivity analyses that focused only on monozygotic twins also revealed no consistent associations between parenting/family measures and verbal intelligence. Taken together, the results of these statistical models indicate that family and parenting characteristics are not significant contributors to variation in IQ scores. The implications of this study are discussed in relation to research examining the effects of family/parenting on offspring IQ scores.

1. Introduction

Of all the debates that have been waged in science, perhaps the most contentious one of all revolves around the factors that are responsible for producing variation in human intelligence (Miele, 2002). In what would eventually evolve into the nature–nurture debate, some of the earliest and most heated disputes centered on whether environmental or genetic factors were involved in the etiology of intelligence. Findings from a large body of contemporary empirical research, however, have revealed that the nature–nurture debate represents a false dichotomy and that variation in intelligence is produced by a multifactorial arrangement of genetic and environmental factors that work both independently and interactively (Devlin, Daniels, & Roeder, 1997; Tucker-Drob, Briley, & Harden, 2013). As a result, more recently the debate transformed into one of relative influence, with arguments centered on the influence of genetic factors in comparison with the influence of environmental factors. With research consistently revealing that genetic factors account for more than one-half of the variance in intelligence (Deary, Johnson, & Houlihan, 2009; Tucker-Drob et al., 2013), the new focal point of concern has been on trying to identify the specific socialization factors that might be involved in the development of intelligence (Nisbett et al.,

* Corresponding author at: College of Criminology and Criminal Justice, Florida State University, 145 Convocation Way, Tallahassee, FL 32306-1273, USA. Tel.: +1 850 644 9180; fax: +1 850 644 9614.
E-mail address: kbeaver@fsu.edu (K.M. Beaver).

http://dx.doi.org/10.1016/j.intell.2014.06.002
0160-2896/

2012). Addressing this issue has proven to be quite difficult as isolating the effects of socialization factors from potential confounding influences continues to represent a threat to the existing literature (Johnson, Turkheimer, Gottesman, & Bouchard, 2009; McGue, Osler, & Christensen, 2010).

Perhaps nowhere is this more problematic than when it comes to examining the influence of parenting and family-related factors on variation in intelligence. At first glance this would seem to be a bit of an overstatement as there is a long line of scholarship revealing that a range of parenting and family influences are associated with variation in intelligence and cognitive ability (Bradley et al., 1993; DeBaryshe, Patterson, & Capaldi, 1993; Steinberg, Lamborn, Dornbusch, & Darling, 1992). For instance, a wide range of heterogeneous studies have found empirical evidence linking variation in human intelligence to parental encouragement (Campbell & Mandel, 1990; Koutsoulis & Campbell, 2001), involvement (Fan & Chen, 2001; Marchant, Paulson, & Rothlisberg, 2001; Steinberg et al., 1992), autonomy support (Joussemet, Koestner, Lekes, & Landry, 2005), and affection (Guo & Harris, 2000; Wadsworth, 1986) along with a broad range of other family and parenting measures.

Virtually all of these studies, however, are host to the same problem — that is, they do not employ genetically sensitive research designs capable of controlling for genetic influences. This is particularly problematic for two main reasons. First, one of the most widely reported findings in the intelligence literature is that about 60–80% of the variance in intelligence is the result of genetic influences (Deary et al., 2009; Jensen, 1998; Nisbett et al., 2012; Plomin & Spinath, 2004; Tucker-Drob et al., 2013). Second, the family and parenting measures that are typically examined in relation to intelligence have also been found to be substantially heritable, with estimates suggesting that about 25% of the variance in these measures being attributable to genetic factors (Kendler & Baker, 2007). The end result is that studies that do not use a genetically sensitive research design are unable to rule out the potential that genetic confounding is driving the association between parenting/family variables and measures of intelligence. In a recent comprehensive review of the field of intelligence, Nisbett and colleagues (2012) echoed these methodological concerns when they noted that "there is no way of knowing how much of the IQ advantage for children with excellent environments is due to the environments per se and how much is due to the genes that parents creating those environments pass along to their children" (p. 136). Of course, genetic confounding is only a concern if genetic influences on intelligence overlap with the genetic influences on family/parental socialization measures. Importantly, there is some emerging evidence suggesting that this might be the case.

To illustrate, in a recent study Trzaskowski et al. (2014) examined genetic influences on family socioeconomic (SES) status and childhood intelligence. To do so, they analyzed a sample of children from the Twins Early Development Study using Genome-wide Complex Traits Analysis (GCTA). The results generated from the GCTA analysis revealed that the genes accounting for variance in intelligence are the same genes that account for variance in family SES, with genetic correlations ranging between .66 and 1.00. Moreover, between 56 and 94% of the covariance between SES and childhood intelligence was due to shared genetic influences.

Furthermore, these results strongly indicate that in order to estimate the effects of family SES on intelligence a genetically informative research design must be employed. Whether these findings would apply to a broader range of family and parenting variables remains to be determined, but the available evidence in relation to other phenotypes, such as personality traits, has revealed similar findings (Harden, Mendle, Hill, Turkheimer, & Emery, 2008; McGue et al., 2010; Wright & Beaver, 2005). For instance, without controlling for genetic influences, family/parenting factors have been shown to have a consistent and statistically significant influence on variation in levels of self-control and other individual-level traits and behaviors (Armour & Haynie, 2007; Gibbs, Giever, & Martin, 1998; Hay, 2001). After adequately controlling for genetic influences, though, the effects of these family/parenting influences often dissipate from statistical significance (Harden et al., 2008, Harris, 1995, 1998; Wright & Beaver, 2005).

Taken together, these findings suggest that when it comes to isolating the effects of family/parenting influences on individual-level traits, including intelligence, a methodology capable of controlling for genetic confounding must be employed. The current study is designed to take a step in that direction by estimating the influence of family and parenting variables on measures of intelligence drawn from adolescence and adulthood, net of genetic confounding. What is unique about this study is that a sample of adoptees is analyzed which allows genetic confounding to be eliminated.

Limiting the final analytic sample to adoptees results in a powerful research design which is ideal for isolating the effects of parental socialization techniques on a particular outcome that has been found to be under genetic influence. While adoptees share 50% of their genes with their biological mother and the remaining 50% with their biological father, they do not share any genetic material with their adoptive parents as long as their adoptive parent(s) is not biologically related to them. Based on this simple observation, it becomes possible to isolate the effects of parental socialization practices carried out by adoptive parents on genetically influenced outcomes without the threat of genetic confounding. More specifically, since adoptees and their adoptive parents do not share any genetic material unless they are adopted by a biological relative (e.g., an aunt), any observed association between parenting practices and intelligence would be robust to genetic confounding. Should the adoptee be adopted by a biological relative, then family and parenting parameter estimates could be upwardly biased owing to genetic confounding. Importantly, the adoption-based research design has been used widely and has been described as a powerful and highly conservative quasi-experimental research design (Deater-Deckard & Plomin, 1999; Moffitt, 2005; Natsuaki et al., 2013; Rutter, 2006; Rutter, Pickles, Murray, & Eaves, 2001).

Previous studies have used adoption-based research designs to examine genetic and environmental influences on IQ. For example, Loehlin, Horn, and Willerman (1989) employed data from the Texas Adoption Project to estimate genetic and environmental contributors to change in IQ over a ten-year time period. The results of their analysis revealed that family factors and genetic influences were related to variation in IQ at the first wave of data collection. At the second wave of data, however, genetic influences became even stronger. While this study did not directly examine