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General intelligence in friendship selection: A study of preadolescent best friend dyads

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ABSTRACT

Research on the topics of general intelligence and friendship formation separately has elicited a tremendous amount of attention across decades of psychological scholarship. To date, however, less effort has been aimed at uniting these lines of inquiry. In particular, do friendship bonds emerge, based in part, on shared levels of cognitive ability? Several disparate lines of evidence suggest this might be the case, however, a need remains to replicate this work using large national samples coupled with psychometrically sound measurement. The current study helps to fill this void in the literature using a national sample of American children. Our results reveal that preadolescent friendship dyads are robustly correlated on measures of general intelligence, and the effects withstand correction for potentially confounding variables.

1. Introduction

Social science researchers have been interested in the formation, maintenance, and constituent effects of human social relationships for nearly a century (e.g., Almack, 1922; Kandel, 1978; Richardson, 1939). Friendship groups, in particular, have elicited a large volume of scholarly attention. One quality of human friendship that has become clear over the decades is that friendship bonds do not randomly emerge in the population (Barnes, Beaver, Young, and TenEyck, 2014; Barnes, Boutwell, Beaver, Gibson, Wright, 2014; Beaver et al., 2009; Burgess, Sanderson, & Umana-Aponte, 2011). Rather, various characteristics of individuals, including personality, cognitive, and behavioral tendencies inform who associates with whom. Estimating the extent to which self-selection into friendships occurs based on personality (and behaviors) is important and interesting in its own right. Understanding selection processes for peer groups is also important when trying to estimate the socializing impact that peers have on one another (Barnes, Beaver, et al., 2014; Barnes, Boutwell, et al. 2014; Meldrum, Miller, & Flexon, 2013). Failure to correct for selection effects in friendship formation—assuming that they exist—could bias parameter estimates in studies seeking to quantify the effects of friend behavior on individual outcomes (Meldrum et al., 2013).

Despite the importance of social network and friendship research in the social sciences, scholars have been slower to directly examine friendship similarity for what is arguably one of the most potent predictors of human outcomes: general intelligence (Ritchie, 2015). There are at least two reasons to assume that friendship formation is driven, in part, by general intelligence. First, there is an established literature regarding the similarity of mating partners on measures of intelligence (Plomin & Deary, 2015). If individuals select mates from their immediate peer groups (Harris, 1995, 2001), then one might suspect that this similarity between mates could extend to other members of a group of friends (Bearman, Moody, & Stovel, 2004). Second, intelligence is a key correlate of success across the life course, in particular predicting a range of important behavioral outcomes, as well as educational attainment and socioeconomic success (Beaver et al., 2013; Boutwell et al., 2017; Gottfredson, 1997, 2004; Ritchie, 2015). Thus, not only are individuals of higher intelligence likely to encounter one another increasingly as they age (at college, places of employment, etc.), but they are perhaps more likely to share interests and abilities that draw them together (Gottfredson, 1997).

While some early work on the topic (Challman, 1932; Richardson, 1939) revealed relatively equivocal results, more recent work has begun to uncover some overlap in the cognitive abilities of friends (Burgess et al., 2011). Clark and Ayers (1992), using a small sample of American junior high school students (approximately 130 students),

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revealed some evidence of similarity between friends on a measure of verbal achievement, particularly for Caucasian dyads (relative to African American dyads) and female dyads (relative to male dyads). More recently, and using a larger sample with reliable and valid intelligence measures, Burgess et al. (2011) performed an extensive analysis of over 5000 (respondents and their nominated friends) British children unveiling a number of important findings related to friendship formation and degree of homophily that exists among friends. Most relevant for our concerns was the subset of results suggesting that friends were similar in terms of their intelligence levels (β's around 0.20 depending on the model), a resemblance that seemed magnified as the closeness of the friendship increased (Burgess et al., 2011).

Though not directly examining intelligence, Barnes, Beaver, et al. (2014), analyzed data from a national sample of American siblings in order to examine resemblance of friends for measures of academic achievement (GPA). Friendship pairs were distinguished by having similar levels of academic achievement, and while GPA is only a crude proxy for intelligence, the results are nonetheless suggestive that friendship selection is based, in part, on shared intellectual ability (see also, Hamm, 2000). With these results in mind, the current study expands this nascent body of literature by examining the intellectual similarity of friends in a national sample of American children.

2. The current study

Though not exhaustive, our review of the evidence suggests several key points. First, there is a converging line of research suggesting—both directly and indirectly—that friends tend to share similar levels of intellectual ability. The study by Burgess et al. (2011), in particular, suggests that close friends overlap in their cognitive skills. Yet, more work is needed on this topic. In particular, it is important to further investigate peer similarity for intelligence using large American samples, with valid measures and sufficient power in order to further replicate prior work. Our analysis fills this need using a large sample of American pre-adolescents along with robust measurement of various traits that might confound an otherwise apparent relationship between the intelligence of friends. We discuss our data in more detail below, followed by a presentation of our results.

3. Methods

3.1. Data and procedures

In order to investigate peer similarity for measures of intelligence, we analyzed data drawn from the National Institute of Child Health and Human Development's (NICHD) Study of Early Child Care and Youth Development (SECCYD). Data were collected from 1991 through 2007, with the primary goal being to examine the relationship between early childcare and various developmental outcomes across childhood and into adolescence. Study families were recruited at hospitals in 10 cities that were selected after the lead investigators reviewed applications submitted by researchers at major universities across the continental United States. Although the data cannot be considered nationally representative, the selected sites represent a diverse set of cities. Prior research is available documenting additional detail regarding the sampling frame and selection procedures for the SECCYD (NICHD Early Child Care Research Network, 2001).

The current study focuses primarily on data collected when study children were in the fourth grade, as at this period of data collection study children and their best friends completed separate IQ assessments. Of the 1364 study families that completed the initial one-month interview, complete data for the variables utilized in the current study were available for 810 participants and their best friends. To consider whether the sample of 810 participants was different from the 554 additional participants that are not included in our analyses, we made comparisons with respect to five demographic variables measured at the 1-month post-birth interview: child's sex, child's race, family structure, maternal age, and maternal education. The 554 participants excluded from our analyses (either because they dropped out of the study prior to the fourth grade or had missing data on key variables) were more likely to be non-White ($X^2 = 20.46$, $p < 0.001$) and male ($X^2 = 8.01$, $p < 0.01$); less likely to have a traditional two-parent nuclear family structure ($X^2 = 37.95$, $p < 0.001$); had younger mothers at the time they were born ($t = 7.59$, $p < 0.001$); and had mothers with lower levels of education at the time they were born ($t = 7.67$, $p < 0.001$). We include controls for each of these variables in our statistical models (for additional details and sample description see Meldrum, Petkovsek, Boutwell, & Young, 2017).

3.2. Measures

3.2.1. Study child intelligence

For the focal respondents in the study, intelligence was assessed during the fourth grade using the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) (see also, Duckworth, Quinn, & Tsukayama, 2012; Meldrum et al., 2017; Russo, De Pascalis, Varriale, & Barratt, 2008 for additional detail). Four WASI subtests were administered when the respondents were in the fourth grade and included Vocabulary (ability to name objects and define words), Block design (ability to copy abstract designs using blocks), Similarities (ability to describe similarities between two concepts), and Matrix reasoning (nonverbal reasoning and visual organizational skills). Using the subtests, the SECCYD research team computed a Full-Scale intelligence score that is available to researchers using the data. The standardized scores ranged from 62 to 146 and were coded such that higher scores correspond to higher levels of intelligence.

3.2.2. Best friend intelligence

At the fourth grade assessment, the best friend of each study child completed a variety of inventories at the same time as the study child (administration took place in separate rooms). The identification of the child's best friend for recruitment purposes was based on discussion with the mothers/caregivers of each study child, input from the study children themselves, and certain selection criteria. This selection criteria required that the friend be of similar age to the study child (less than two years older or younger), with additional preference being given to 1) a same sex best friend, 2) whom the study child had known for at least six weeks and, 3) whom the study child spends time with at least once per week. All of the friends recruited for participation met the age criteria, and almost all friends were same sex best friends (97%). Additional inquiry into whether each best friend met the preferred criteria of 1) the study child having known the best friend for at least six weeks and 2) the study child spending time with the friend at least once per week showed that 85% of the best friends who participated met these criteria. In initial models, we controlled for whether the best friend did or did not meet the additional preferred criteria, finding that the addition of this control did not alter the strength of the association between child intelligence and best friend intelligence. As such, we chose not to include this control in the models we present in the paper.

Intelligence of each best friend was assessed (at the same time as the intelligence of the study children) based on scores from the Peabody Picture Vocabulary Test III (PPVT-III; Dunn & Dunn, 1997). The PPVT-III is a vocabulary test that exists in two parallel forms, form IIIA and IIIB. Only form IIIA, however, was used in the SECCYD. The form contains four training items and 204 test items. Each item consists of four illustrations and respondent selects the picture that best represents the meaning of a stimulus word presented orally by the examiner. Using age-based norms, standardized scores were created with a mean of 100 and a standard deviation of 15. Actual scores in the current sample range from 63 to 155, with higher values indicating a higher intelligence.