Personality and Individual Differences 69 (2014) 144–149

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

The stability of self-control across childhood

Michelle Anne Coyne [a,*], John Paul Wright [a,b,1]

[a] University of Cincinnati, School of Criminal Justice, ML 210389, 665 Dyer Hall, Clifton Avenue, Cincinnati, OH 45221-0389, United States
[b] Center for Social and Humanities Research, King Abdulaziz University, Jeddah, Saudi Arabia

ARTICLE INFO

Article history:
Received 26 August 2013
Received in revised form 30 April 2014
Accepted 20 May 2014
Available online 14 June 2014

Keywords:
Self-control
Stability
Genetic and environmental contributions
Childhood

ABSTRACT

While the link between low self-control and several behavioral and social problems is widely supported, debate remains regarding the stability of and the genetic and environmental sources of variation in self-control. Using data from the Early Childhood Longitudinal Study, Kindergarten Class 1998–1999 restricted data set, a sample of 360 twins was compared to a sample of 423 non-twins in order to examine the stability in self-control. The twin sample was also used to examine the genetic and environmental sources of stability in self-control. Findings indicated two stable classes for both the twin and singleton samples, and substantial stability in average self-control from kindergarten through fifth grade in both samples. The ACE decomposition model indicated strong genetic contributions to self-control (76%) with the remaining variation attributed to non-shared environment. Overall, the data suggest that self-control is identifiable early in life, stable across childhood, increasingly influenced by genes, and thus, is a critical focus for early intervention.

1. Introduction

Self-control refers to the ability of individuals to appropriately modulate emotional responses to internal and external stimuli, and to conform to proximate social expectations. Low self-control is typically characterized by problems with impulsivity, inappropriate risk-taking, the inability to delay gratification, and limited emotional sensitivity toward others (Gottfredson & Hirschi, 1990; Vazsonyi & Huang, 2010). A host of empirical studies across disciplines has established an association between low self-control and anti-social/problem behaviors, specifically noting that low self-control is a strong predictor of concurrent and future problem behavior and deviance (Baron, 2003; Lamont & Van Horn, 2013; Pratt & Cullen, 2000). This link is supported in psychological research as well, which consistently shows that a diminished capacity to exert self-control is associated with disturbances in emotional regulation, with substance abuse, and with externalizing problem behaviors (Barkley, 2005; Moffitt, Poulton, & Caspi, 2013; Vaughan, DeLisi, Beaver, Wright, & Howard, 2007; Wills, Ainette, Mendoza, Gibbons, & Brody, 2007; Zhou et al., 2007). Although there is agreement about the importance of self-control in a variety of life outcomes, debate remains regarding the magnitude of stability in self-control over time, and the source of stability in self-control (DeLisi, 2005; Moffitt,1993; Na & Paternoster, 2012).

Using the Early Childhood Longitudinal Study of the Kindergarten Class, 1998–1999 (ECLS-K), the same data as the current study, Beaver and Wright (2007) analyzed the stability of self-control from kindergarten through first grade using parent and teacher-reported measures from the Social Skills Rating System (SSRS). Structural equation modeling revealed substantial relative stability in their sample of nearly 17,000 children, with stability coefficients ranging from 0.84 to 0.96. Other studies have analyzed self-control over longer periods of time. Using a national sample of youth and semi-parametric group modeling techniques, Hay and Forrest (2006) examined the stability of self-control over 8 years of age (ages 7–15 years) across five waves of data. The year-to-year correlations revealed moderate stability in self-control, however, the semi-parametric trajectory analysis revealed high levels of relative stability in 84% of the sample with only a small group of respondents experiencing significant change in self-control across time. Similar recent studies (Hopwood et al., 2011; Vazsonyi & Huang, 2010) have reported parallel findings, indicating that self-control exhibits relative stability across childhood and adolescence.

While most studies find that self-control is time-stable, some studies have found evidence of change. Burt, Simons, and Simons (2006) examined the stability of self-control in a sample of 750 African American children. The authors administered a 39-item scale measuring low self-control when children were 10 years of age and then 2 years later. Self-control was coded into quartiles for both

* Corresponding author. Tel.: +1 4407244825.
E-mail addresses: coyneme@mail.uc.edu (M.A. Coyne), john.wright@uc.edu (J.P. Wright).
[1] Tel.: +1 (513) 556 5829; fax: +1 (513) 556 3303.

http://dx.doi.org/10.1016/j.paid.2014.05.026
0191-8869/

waves, and stability was measured by determining whether the participants had shifted quartiles over time. Results indicated that less than 50% of the entire sample remained in the same quartile as they began. Those in the highest and lowest quartiles of self-control shifted the least, however only 33% of those in the middle quartiles remained in the same quartile over the 2 years time period. A handful of other studies also report that self-control changes across different periods of time, and generally point to the possibility that self-control is relatively dynamic (Na & Paternoster, 2012; Turner & Piquero, 2002; Winfree, Taylor, He, & Esbensen, 2006).

Debate also remains regarding the source of variation in self-control. Although environmental factors such as parenting and peer networks may be salient in the development of self-control, various studies have found that self-control is under substantial genetic influence (Moffitt, 2005; Wright & Beaver, 2005; Wright et al., 2012). Genetic influences may help to explain not only why individuals vary in their levels of self-control but also why stability and change in self-control occurs (Bakermans-Kranenburg & Van Ijzendoorn, 2011; Dunn & Plomin, 1990). A number of studies have examined the genetic contributions of antisocial and aggressive behaviors (Hopwood et al., 2011; Tuvblad, Narusyte, Grann, Sarnecki, & Lichenstein, 2011), indicating that traits such as aggression and antisocial behavior are dominated by genetic influences, with estimates typically ranging from 50% to 95% (Rhee & Waldman, 2002).

In one of the few tests specifically focusing on self-control, Beaver, Wright, DeLisi, and Vaughan (2008) examined the genetic and environmental contributions to variation in self-control. In addition to finding strong stability in self-control across a two-year time period, their Cholesky decomposition model indicated that 82% of the variation in self-control was attributable to genetic factors, with the remaining variation due to non-shared environmental factors. Similar studies have reported parallel results—namely that the self-control is relatively stable over time and is genetically influenced (Haberstick, Schmitz, Young, & Hewitt, 2005; Hopwood et al., 2011). Overall, there is ample support that genetic factors are a source of variation in self-control.

Previous studies on the stability of self-control exhibit several limitations, including the use of non-representative samples (Arneklev, Cochran, & Gainey, 1998; Burt et al., 2006) and relatively short periods of analysis (Beaver & Wright, 2007; Beaver et al., 2008; Benes, 1995). Another limitation is the inconsistency in reporting sources (Cairns & Cairns, 1994; Verhust & Van e Ende, 1992; Youngstrom, Loeber, & Stouthamer-Loeber, 2000). Most studies, for example, have used parent or self-reports (Tuvblad et al., 2011; Van Hulle, Lemery-Chalfant, & Goldsmith, 2007; Winfree et al., 2006). While self-reports are important, they often lack reliability over time (Youngstrom et al., 2000). Moreover, parent reports have been shown to produce downwardly biased estimates of youth problem behavior (Harris, 1998; Verhust et al., 1992). Given the limitations and mixed findings regarding the studies of stability and the source of variation in self-control, further investigation is warranted.

As Wright and Beaver (2005) and Beaver and Wright (2007) have examined stability in self-control and genetic underpinnings with the same sample, the current study represents an extension to these previous studies, following individuals from kindergarten up through the fifth grade. With these data, we were able to examine the stability of self-control across 5 years of time as well as assess the source of variation in self-control with measures from reliable teacher-reports.

2. Methods

2.1. Participants

Data for this study came from the ECLS-K, the largest nationally representative sample of kindergartners, parents, teachers, and schools in the United States. The ECLS-K is sponsored by the U.S. Department of Education and the National Center for Education Statistics with the goal of providing reliable data that can help researchers describe and understand children's development and early experiences. The data provide detailed information about the subjects' cognitive, social, emotional, and physical development as well as information about their school and home environments. Information was collected through teacher and school administrator questionnaires, parent and child interviews, and trained evaluators in the schools.

The initial data were collected in the fall of 1998 when the children first entered kindergarten. Data were collected later in the spring of 1999 and then in the fall (1999) and spring (2000) of first grade. Follow-up data were collected in the springs of third grade (2002), fifth grade (2004), and eighth grade (2007). Because the eighth grade wave used different measures of self-control, it was excluded from this study. The current study used the following 4 waves of data: fall of kindergarten (1998), spring of first grade (2000), spring of third grade (2002), and the spring of fifth grade (2004).

In order to examine the influence of genetics on the variation in self-control, all twins were parceled out from the larger sample in order to run an ACE decomposition model. The twin sample included 360 twin individuals in the initial kindergarten wave. All twin individuals in the sample were matched resulting in 180 twin pairs. Of the 360 individual twins, 118 were monozygotic twins (59 twin pairs) and 242 were dizygotic twins (121 twin pairs). In order to create an equivalent analytical sample, we took a randomly generated 2% of the larger sample of 21,194 children that had no missing responses on any outcome variables ($n = 423$). No statistically significant differences were found between the twin sample and singleton sample on measures of race, age, and gender. Thus, the twin sample and the singleton sample closely resemble one another on key demographic variables as shown in Table 1.

2.2. Measures

The ECLS-K contains several measures of self-control and problem behaviors and has been used by other researchers (Beaver & Wright, 2007; Lamont & Van Horn, 2013; Wright & Beaver, 2005) to assess stability in self-control and related behaviors. The ECLS-K uses an adapted version of Gresham & Elliot, 1990) widely used Social Skills Rating Scale (SSRS). This scale is a multi-rater, standardized assessment which measures how often children exhibit certain behaviors and has been regarded as comprehensive, valid, and reliable (Demaray, Ruffalo, Carlson, & Busse, 1995; Mask, Albertus, BffiKinbine, & Naibi, 1996). The SSRS uses a Likert scale

Table 1
Twin and singleton sample descriptives: gender, race, age, self-control.

	Twins ($N = 360$)		Singletons ($N = 423$)	
	Mean	Standard deviation	Mean	Standard deviation
Gender (0 = male)	0.58	0.50	0.46	0.50
Race (0 = white)	0.37	0.48	0.47	0.50
Age (Years)				
Kindergarten	5.72	0.35	5.70	0.37
1st grade	7.26	0.34	7.26	0.37
3rd grade	9.27	0.34	9.28	0.38
5th grade	11.26	0.34	11.25	0.36
Self-control (4–16)				
Kindergarten	12.51	2.23	12.25	2.26
1st grade	13.03	1.97	12.58	2.37
3rd grade	12.92	2.14	12.67	2.08
5th grade	13.04	2.02	12.66	2.18