University Library

MINERVA ACCESS

A gateway to Melbourne's research publications

Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:
Cobb-Clark, DA;Dahmann, SC;Kamhöfer, DA;Schildberg-Hörisch, H

Title:
Surveillance and Self-Control

Date:
2024-05-01

Citation:
Cobb-Clark, D. A., Dahmann, S. C., Kamhöfer, D. A. & Schildberg-Hörisch, H. (2024). Surveillance and Self-Control. The Economic Journal, 134 (660), pp.1666-1682. https://doi.org/10.1093/ej/uead111.

Persistent Link:
https://hdl.handle.net/11343/339590

This is the accepted version of a manuscript that has been uploaded to an institutional repository to meet ARC funding requirements to make this research open access.

Once available, the final version of this manuscript can be found at the journal website here:

https://doi.org/10.1093/ej/uead111

Please cite this article as below:

Cobb-Clark, D. A., Dahmann, S. C., Kamhöfer, D. A., & Schildberg-Hörisch, H. (2023). Surveillance and Self-Control. *The Economic Journal*. https://doi.org/10.1093/ej/uead111

DRAFT

Surveillance and Self-Control

Deborah A. Cobb-Clark[1,4,5,*], Sarah C. Dahmann[2,4,5,**],

Daniel A. Kamhöfer[3,5,***], and Hannah Schildberg-Hörisch[3,4,5,6,****]

Abstract: This paper studies important determinants of adult self-control using population-representative data and exploiting Germany's division as quasi-experimental variation. We find that former East Germans have substantially more self-control than West Germans and provide evidence for government surveillance as a possible underlying mechanism. We thereby demonstrate that institutional factors can shape people's self-control. Moreover, we find that self-control increases linearly with age. In contrast to previous findings for children, there is no gender gap in adult self-control and family background does not predict self-control.

Keywords: self-control; determinants; Germany; surveillance; institutions

Classification: D90, P39

*Correspondence address: deborah.cobb-clark@sydney.edu.au

**sarah.dahmann@unimelb.edu.au

***kamhoefer@dice.hhu.de (Corresponding author)

****schildberg-hoerisch@dice.hhu.de

We thank the Editor, Steffen Huck, and five anonymous referees for many helpful suggestions which improved the paper considerably. We are grateful to the German Institute for Economic Research (DIW Berlin) for enabling us to introduce the Brief Self-Control Scale into the Innovation Sample of the Socio-Economic Panel and for providing us access to sensitive information via SOEPremote. We especially thank David Richter for help with the implementation. For useful comments, we thank Andreas Lichter as well as participants of several workshops and conferences. The authors are grateful for research support from the Australian Research Council (CE140100027, DP200100979, CE200100025). Parts of the analysis presented here are based on the working papers "Self-Control: Determinants, Life Outcomes and Intergenerational Implications" (IZA Discussion Paper 12488, July 2019) and "The Determinants of Population Self-Control" (IZA Discussion Paper 15175, March 2022). The views expressed herein are solely those of the authors.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

© 2023 Royal Economic Society. Published by Oxford University Press. All rights reserved.
For permissions please contact journals.permissions@oup.com.

1 Introduction

The incentive to self-regulate is shaped by numerous factors outside the control of individuals and their families. In particular, local environments and cultural influences combine to provide the context in which people's self-control develops. Children, for example, develop the capacity for self-control sooner in cultures which highly value self-control (Oh and Lewis, 2008). Those growing up in socially cohesive neighbourhoods have more capacity for self-control (Pratt *et al.*, 2004), with neighbourhood effects operating primarily through their role in either helping or hindering parents' efforts to instil self-control in their children (Stults and Swagar, 2021). Political, social, and economic institutions also matter because they determine the 'rules of the game' (North, 1990)—often with powerful consequences. Bernheim *et al.* (2015), in particular, argue that poverty can damage self-control by trapping people in low-asset environments that undermine the ability to exercise self-control.

Researchers have repeatedly demonstrated the importance of self-control for people's life outcomes. People with more self-control have healthier lifestyles, higher educational attainment, more labour market success, enhanced financial well-being, and higher levels of life satisfaction (see, e.g., Cobb-Clark *et al.*, 2022; Duckworth and Seligman, 2005; Kaur *et al.*, 2015; Moffitt *et al.*, 2011; Tangney *et al.*, 2004). There is also extensive evidence regarding the individual- and family-level drivers of children's and adolescents' self-control. However, our understanding of the institutional determinants of self-control is much more limited and based on correlational evidence. 'Institutional factors' broadly refer to the political, economic, social, cultural, and environmental conditions and institutions that affect individuals but are largely beyond their control.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

In this article, we exploit quasi-experimental variation generated by a key institutional change—Germany's division and later reunification (e.g., Alesina and Fuchs-Schündeln, 2007; Becker *et al.*, 2020)—to provide evidence that institutions can shape self-control. We identify local-level government surveillance as a possible mechanism underlying East Germans' higher levels of self-control than those of former West German residents. Our main data source is the 2017 Innovation Sample of the German Socio-Economic Panel (SOEP-IS). The SOEP-IS data are population-representative and now include a well-established measure of trait self-control—the Brief Self-Control Scale (BSCS) (Tangney *et al.*, 2004). Based on the Self-Control Scale, the most widely used measure of trait self-control in psychological research (Hoyle and Davisson, 2016), the BSCS provides a validated measure that can be implemented in large-scale surveys.

Our analysis proceeds in two parts. We begin by analysing the role of age, gender, and parental background as possible individual-level drivers of self-control. The results from this analysis not only provide important context for understanding the institutional change we consider, they also make a contribution by extending previous studies that rely on small and often selective samples of children and adolescents. Our data, in contrast, provide population-representative evidence on adult self-control. Understanding self-control at a societal level is crucial for investigating open empirical questions around, for example, the link between gender differences in self-control and the gap in men's and women's outcomes or Gottfredson and Hirschi's (1990) conjecture that self-control increases across the life cycle.

We find that there is substantial heterogeneity in adult self-control. Self-control increases linearly with age, confirming Gottfredson and Hirschi's (1990) hypothesis. Interestingly, the

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

self-control distribution is virtually identical for men and women suggesting that gender differences in self-control are not a source of gender gaps in health-related behaviours, education, or labour market outcomes. This absence of a gender gap in adult self-control contrasts with the disparities found in girls' and boys' ability to self-regulate (see, e.g., Silverman, 2003; Matthews *et al.*, 2009). Similarly, our results indicate that family background is a much weaker predictor of self-control in adulthood than in childhood (Miech *et al.*, 2001; Noble *et al.*, 2005). Together, these findings highlight the importance of population-representative empirical evidence for adults in enhancing our understanding of heterogeneity in self-control.

We then demonstrate that institutional factors have the potential to shape a population's capacity for self-control. Exploiting the quasi-experimental variation generated by Germany's division after World War II, we document that, nearly 30 years after Germany's reunification, former East German residents have self-control scores that are, on average, 0.25 standard deviations (std.) higher than those of former West German residents. This is a substantial difference that corresponds to the same effect as being 15 years older. It is, perhaps, not surprising that living in the suppressive, communist regime of the former German Democratic Republic (GDR) has led to higher levels of self-control. After all, GDR residents had to gauge carefully what they said and did in order to avoid risking their educational and labour market prospects, protect their families, and preserve their individual freedom (Fulbrook, 2008).

Investigating this potential mechanism further, we analyse the consequences of systematic government surveillance at the local level as a specific measure of the regional differences in the level of suppression. Specifically, we match data on the number of so-called 'unofficial informers' for the GDR's Ministry for State Security to the SOEP-IS data. We find that,

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

at the local level, a higher number of unofficial informers is associated with a higher level of self-control. This result provides suggestive evidence that the suppression in the GDR is a possible driver of the higher levels of self-control among former East German residents in comparison to their counterparts in West Germany.

Our analysis of individual and institutional determinants of self-control extends the previous literature and provides a novel perspective on the broader influences shaping a population's capacity for self-control. Evidence on the consequences of institutional factors in shaping self-control seems key given the potential for clever policy design to improve outcomes for vulnerable groups by changing the context in which they operate. Moving beyond individuals and families to consider self-control across society as a whole is important since life outcomes like educational attainment, labour market success, and health status that are intimately linked to self-control can also drive a society's overall productivity and hence living standards.

2 Data

2.1 The Socio-Economic Panel Innovation Sample

Our analysis draws on data from the Innovation Sample of the German Socio-Economic Panel (SOEP). The SOEP is an annual household panel survey that is representative of the German population (Goebel *et al.*, 2019). Its Innovation Sample (SOEP-IS) was established in 2011 as a means of exploring novel survey items (Richter and Schupp, 2015). In 2017, SOEP-IS respondents were for the first time administered the Brief Self-Control Scale (BSCS) (see

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Tangney *et al.*, 2004), making the SOEP-IS the first large-scale population-representative dataset to contain a direct measure of people's trait self-control.

Our data make it possible to study self-control at the population level. Previous studies have linked self-control and closely related concepts to behaviour using cohort-representative data sources such as the National Longitudinal Survey of Youth (NLSY; Nofziger, 2008; Perrone *et al.*, 2004), the Health and Retirement Study (HRS; Mezuk *et al.*, 2017; Schlafmann, 2020), and the National Longitudinal Study of Adolescent to Adult Health (Add Health; Wolfe and Hoffmann, 2016). In contrast, the SOEP-IS data are representative of the entire adult population by design. Moreover, the BSCS has been psychometrically validated and is specifically designed to capture trait self-control across domains (Tsukayama *et al.*, 2012; Tangney *et al.*, 2004). Lacking similar measures, previous researchers have instead turned to proxies of self-control derived from domain-specific measures of behavioural and attitudinal problems. Embedding the BSCS in a rich panel study, like the SOEP, allows us to study the role of key demographic characteristics such as age, gender, and parental background in shaping adults' self-control.[1] Finally, changing political regimes make Germany a particularly interesting context for studying institutional determinants of self-control.

Our estimation sample is selected as follows. In 2017, 2,090 SOEP-IS respondents first surveyed in 2012 and 2013 were administered the BSCS. We necessarily drop 129 respondents (6.2 percent) who failed to provide complete information for all 13 items of the BSCS. This leaves us with a final estimation sample of 1,961 individuals from 1,269 households that we augment with additional biographic data. In Online Appendix Table A2, we show

[1] Details of our measures are discussed in the relevant sections below. Online Appendix Table A1 provides an overview.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

that our final estimation sample of respondents with valid BSCS scores is also population-representative.[2]

2.2 The Brief Self-Control Scale

Following the standard approach for measuring personality traits in personality psychology and economics (e.g., Almlund *et al.*, 2011; Borghans *et al.*, 2008; Heckman *et al.*, 2021), we construct a measure of trait self-control using responses to a validated battery of questions about people's capacity for self-control.[3] Survey-based measurement has the advantage of allowing us to embed our self-control measure in a population-representative survey. Meta-analysis reveals that survey-based measures of self-control also have the advantage of having higher convergent validity than do task-based or experimental measures (Duckworth and Kern, 2011).[4]

More precisely, we construct a measure of trait self-control using the brief (13-item) version of the well-established Self-Control Scale (Tangney *et al.*, 2004). The 13-item scale is highly correlated with the full 36-item version (Tangney *et al.*, 2004), but is more suitable for large-scale representative surveys. The BSCS is designed to be domain-general (Tangney

[2]We compare our final estimation sample with the SOEP-Core, which is representative of the German population. We find few statistically significant differences in mean characteristics. Most of these disparities are very small—suggesting that the samples are generally well balanced (see Appendix A.1 of Cobb-Clark *et al.*, 2022, for a more extensive discussion).

[3]An alternative approach models self-control limitations as time-inconsistent discounting (e.g., Phelps and Pollak, 1968; Laibson, 1997; O'Donoghue and Rabin, 1999). In order to measure self-control limitations, people's incentivised choices in economic experiments are observed when they are confronted with monetary or effort trade-offs over time in multiple price list or convex time budget elicitation tasks (e.g., Andreoni and Sprenger, 2012; Andreoni *et al.*, 2015; Augenblick *et al.*, 2015; Augenblick and Rabin, 2019). See Cobb-Clark *et al.* (2022) for a more detailed discussion of the two measurement approaches and conceptualisations of self-control problems. In Cobb-Clark *et al.* (2021), we show that the survey-based BSCS used in the present study characterises individuals in a way that is consistent with the conceptual framework of O'Donoghue and Rabin (1999).

[4]However, compared to experimental measures of self-control, survey-based measures are unincentivised and more subjective. For example, respondents may differ in their scale use (see, e.g., Coenen *et al.*, 2021) and self-reports can differ from third-party reports (see, e.g., Feng *et al.*, 2022).

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

et al., 2004) and indeed has high predictive validity across remarkably diverse domains (de Ridder *et al.*, 2012; Cobb-Clark *et al.*, 2022), internal consistency (Tangney *et al.*, 2004; Bertrams and Dickhäuser, 2009), as well as test–retest reliability both after three (0.87, Tangney *et al.*, 2004) and seven weeks (0.82, Bertrams and Dickhäuser, 2009).

The BSCS (Tangney *et al.*, 2004) is introduced by the following instructions: 'Using the scale provided, please indicate how much each of the following statements reflects how you typically are.' People respond using a five-point Likert scale ranging from 1 ('not at all') to 5 ('very much') to the following 13 items:

1. I am good at resisting temptation.
2. I have a hard time breaking bad habits. (reversed item)
3. I am lazy. (reversed item)
4. I say inappropriate things. (reversed item)
5. I do certain things that are bad for me, if they are fun. (reversed item)
6. I refuse things that are bad for me.
7. I wish I had more self-discipline. (reversed item)
8. People would say I have iron self-discipline.
9. Pleasure and fun sometimes keep me from getting work done. (reversed item)
10. I have trouble concentrating. (reversed item)
11. I am able to work effectively towards long-term goals.
12. Sometimes, I cannot stop myself from doing something, even if I know it is wrong. (reversed item)
13. I often act without thinking through all the alternatives. (reversed item)

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Importantly, most of the BSCS items do not specifically refer to self-control, reducing the chances of deliberate non-response or social desirability-induced response bias.[5] We construct an aggregate measure of self-control by standardising each individual item and summing over all 13 items, whereby questions marked as 'reversed item' enter the final self-control score reversed. To facilitate interpretation, we standardise the aggregate scores to be mean zero and standard deviation one.[6] Online Appendix Figure A1 presents the distribution of both the individual items as well as the aggregated self-control score, highlighting a substantial degree of variation in self-control.

3 Results

3.1 Demographics and Family Background

We begin by investigating several key individual-level determinants of self-control, focusing in particular on people's demographic characteristics and family background. Previous studies of the role of age, gender, and parental education in shaping self-control are largely based on samples of children or adolescents. In contrast, our analysis investigates their role in shaping self-control in the adult population.

We regress our measure of self-control simultaneously on four individual-level determinants: age, gender, and paternal and maternal education. The resulting estimates are reported in Table 1.[7] Column 1 presents our baseline results, while the estimates in column 2 additionally control for fixed effects for people's state of residence in 2017.

[5] Only items 7 and 8 refer to self-discipline explicitly. The questions are therefore asked in two blocks (block 1: questions 1–6 and 9–13; block 2: questions 7 and 8) separated by other questions.
[6] Standardising only the aggregated score, but not the single items before aggregation, does not change the results.
[7] Online Appendix Table A3 displays the correlations between self-control and these determinants.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Table 1. *Individual-level determinants of self-control*

	(1)	(2)
	Dependent variable:	self-control
	without controls	with state FE
Age (in years)	0.016***	0.016***
	(0.001)	(0.001)
Female	0.041	0.045
	(0.040)	(0.040)
Mom > basic school	−0.032	−0.044
	(0.057)	(0.058)
Dad > basic school	0.026	0.016
	(0.056)	(0.056)
Constant	−0.869***	−0.859***
	(0.089)	(0.110)
State fixed effects		yes
Observations	1,961	1,961
Adj. R^2	0.09	0.10

Notes: Own calculations based on SOEP-IS, wave 2017. The dependent variable, self-control, is standardised to mean 0 and standard deviation 1. In column 1, we regress self-control on the variables stated on the left of the table using OLS and no further control variables. In column 2, additionally control for state of residence in 2017 fixed effects. Standard errors clustered at household level in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Previous research on the development of self-control as people age largely focuses on children and adolescents.[8] The way that self-control evolves into middle- and old-age remains a matter of debate. Our results suggest that age is an important determinant of adults' self-control as well; each additional year of age results in a 0.016 std. increase in the capacity for self-control. Moreover, the relationship between age and self-control is highly linear across the life cycle (i.e., ages 17 to 92). In particular, Figure 1 depicts the point estimates from a regression of self-control on all determinants (similar to column 2 of Table 1) and a full

[8]Many of the specific skills necessary to exercise behavioural self-control begin to emerge in infancy with some (e.g., inhibitory control) developing earlier than others (e.g., executive skills) (Lengua *et al.*, 2015). Most children rapidly develop the capacity for self-control between the ages of 3 and 7 (Montroy *et al.*, 2016). Still, during adolescence the development of self-control is not a linear process. Adolescent-specific changes in brain circuity leave teenagers more sensitive to environmental cues (both negative and positive)—and less able to regulate their responses—than both children and adults (Casey, 2015).

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

set of three-year age bins. Given the cross-sectional nature of our data, it is not possible to identify age effects separately from cohort and period effects (see, e.g., Heckman and Robb, 1985; Dohmen *et al.*, 2017; Fitzenberger *et al.*, 2022). In particular, age and cohort effects coincide in our cross-sectional data and individuals from different cohorts will be exposed to institutional change at different ages in their life. Nonetheless, in our view, the strong linearity in the age pattern of self-control suggests that the relationship is likely largely driven by ageing as opposed to cohort or period effects for which linearity seems less likely. Adults' capacity for self-control appears to continue to evolve even as they enter old age. This linear increase of self-control in age in a nationally representative, adult sample is evidence in favour of the hypothesis by Gottfredson and Hirschi (1990, p. 107) in their General Theory of Crime that self-control is likely to increase with age since 'socialization continues to occur throughout life'.

There is also evidence of gender differences in children's capacity for self-control. Gender gaps in self-control emerge as early as age 3 (Cameron Ponitz *et al.*, 2008), persist into kindergarten (Matthews *et al.*, 2009), and at least partially explain why eighth-grade girls receive higher grades than boys despite doing worse on IQ and only marginally better on standardised achievement tests (Duckworth and Seligman, 2006). In contrast, we find no evidence of gender differences in average self-control (see Table 1) or the distribution of self-control (Kolmogorov–Smirnov test, $p = 0.791$) among the adult population. The slight developmental advantage that girls have during childhood and adolescence in self-regulation and delaying gratification (Silverman, 2003) is no longer evident once they reach adulthood.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

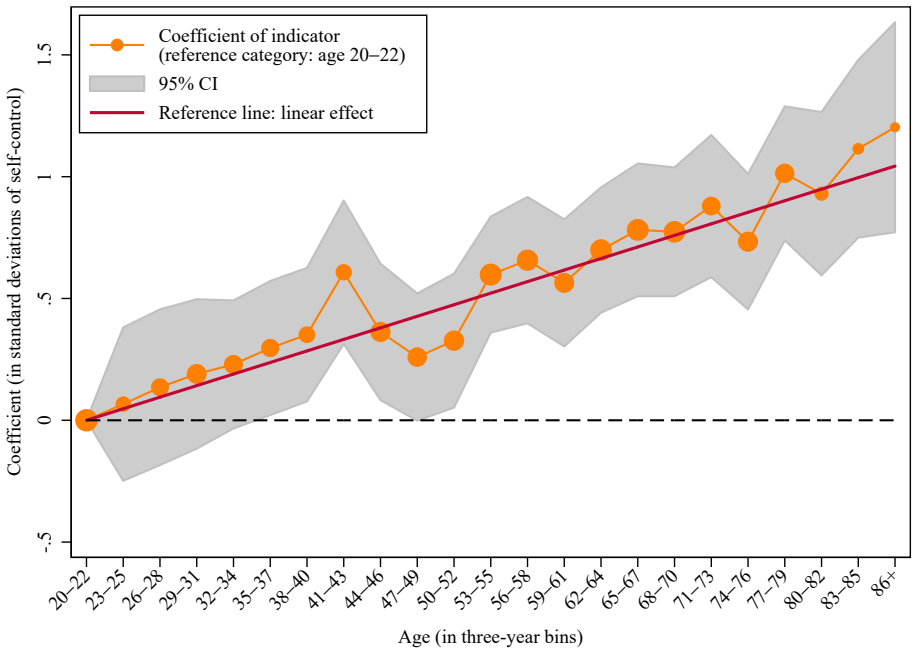


Figure 1. *Linearity of self-control in age*

Notes: Own illustration based on SOEP-IS, wave 2017. 1,953 observations. The plot shows the association between self-control and age for three-year age bins. The orange markers give coefficient estimates (in standard deviations of self-control) stated on the y-axis for each age bin on the x-axis. The coefficient is obtained by regressing self-control on the full set of three-year age-bin indicators and control variables (cf. column 2 in Table 1). The size of the markers indicates the number of observations in the bin, ranging from 19 observations for the 86+ bin to 119 observations for the 53–55 bin. The 95 percent confidence interval (for standard errors clustered on household level) is given in grey. The association between self-control and a linear term for age in years, similar to Table 1, column 2 is plotted in red. Unlike in Table 1, the indicator for people born after 1989 is not included in the specification, as this would change the intercept for markers indicating ages above 29 years. The linear age effect in this figure is 0.016 as in Table 1.

Interestingly, Falk *et al.* (2018) find that adult women are less, not more, patient than men on average across the world, though the gender disparities are small.[9]

Although there is evidence that children's capacity for self-control increases with maternal education and families' socioeconomic status (Miech *et al.*, 2001; Montroy *et al.*, 2016; Noble *et al.*, 2005; Evans, 2003), our results indicate that the effect of parental years of education is

[9] A further possible reason why empirical results on determinants of self-control may deviate for children and adults are differences in the way self-control is measured.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

statistically insignificant, suggesting that family background may be a much weaker predictor of self-control in adulthood than it appears to be in childhood.

Importantly, the estimated effects of age, gender, and parental education are not sensitive to controlling for state of residence in 2017 fixed effects (see column 2, Table 1). Taken together, our results highlight that some of the disparity in self-control associated with family background and gender that is commonly observed in childhood disappears in adulthood.

3.2 Government Surveillance and Self-Control in the German Democratic Republic

To investigate the role of the broader political, economic, and social context in shaping self-control, we exploit the quasi-experiment generated by Germany's division after World War II (see, e.g., Alesina and Fuchs-Schündeln, 2007; Becker *et al.*, 2020, for a more detailed discussion). For more than four decades, between 1949–1990, Germany was divided into two separate states consistent with the zones the Allied Forces agreed on after World War II. The United States, the United Kingdom, and France established the Federal Republic of Germany—a liberal democracy with a free market—in the Western part of the occupied zones. The Soviet Union, on the other hand, established the German Democratic Republic (GDR) in the Eastern part of the occupied zones—a communist state with a one-party system and a state-run, plan-based economy. This division had fundamental consequences for the way that East and West Germans' lives unfolded after the war.

As our estimation sample includes respondents from both states until Germany's reunification in 1990, we are able to compare the level of self-control between people who were subject to vastly different political, social, and economic systems.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Attributing differences in self-control to Germany's division requires that pre-division population self-control was the same in the areas that later became East and West Germany—an assumption that cannot be tested. Becker *et al.* (2020) document pre-division differences in economic structures, political preferences, cultural traits, and gender roles. Moreover, East and West Germany were differentially affected by World War II and the East-West German migration between 1945 and the building of the Berlin Wall in 1961 was likely selective with respect to political and economic preferences. We will address concerns about possible pre-existing differences in self-control by going beyond the dichotomous East-West comparison. In particular, we relate differences in self-control within the GDR to government surveillance intensity and document a quick convergence in the self-control of East and West Germans after reunification.

Differences in self-control between East and West Germans. We begin by regressing self-control (measured in 2017) on indicators for the place of residence in 1989 (i.e., shortly before the fall of the Berlin Wall) and age in column 1 of Table 2. The omitted reference category in Table 2 is having lived in West Germany in 1989 and we consider indicators for: (i) having lived in East Germany in 1989 (i.e., in the former GDR); (ii) having lived outside of Germany in 1989; and (iii) being born after 1989.[10] We find that those who were GDR residents in 1989 have significantly higher levels of self-control even about 30 years after Germany's reunification than those who were not. Specifically, former East German residents have self-control scores that are 0.25 std. higher than those of former West German residents (column 1 of Table 2), which corresponds to the same effect as being 15 years older. Those who lived outside of Germany score 0.20 std. higher than former West German

[10] We exclude eight respondents for whom the place of residence in 1989 is unknown.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

residents.[11] There is no statistically significant difference in the self-control of former West German residents and those born after 1989 anywhere in Germany.

Table 2. *Differences in self-control between East and West Germans*

	(1)	(2)	(3)	(4)
	Dependent variable: self-control			
	Specification			
	baseline	age–East interaction	current region	current state FE
Age (in years)	0.017***	0.016***	0.017***	0.017***
	(0.002)	(0.002)	(0.002)	(0.002)
Residence in 1989: East	0.247***	0.043	0.257***	0.244***
	(0.060)	(0.216)	(0.081)	(0.089)
Residence in 1989: outside of Germany	0.198**	0.188**	0.199**	0.200**
	(0.086)	(0.086)	(0.087)	(0.087)
Residence in 1989: not yet born	0.091	0.060	0.093	0.088
	(0.093)	(0.098)	(0.094)	(0.095)
Age × residence in East in 1989		0.004		
		(0.004)		
Currently residing in East			−0.012	
			(0.072)	
State fixed effects				yes
Observations	1,953	1,953	1,953	1,953
Adj. R^2	0.10	0.10	0.10	0.10

Notes: Own calculations based on SOEP-IS, wave 2017. In column 1, we regress self-control on age and the three place of residence in 1989 indicators stated on the left using OLS. The reference category is 'having lived in West Germany in 1989'. Column 2 replicates the specification in column 1, but additionally controls for an age-in-years–East interaction. Note that although individually not significant, the joint influence of the East indicator and the age–East interaction term on self-control is statistically different from zero (the p-value of an F-test is <0.01). In column 3, we control for an indicator whether the respondent lives in an East German state in 2017 (otherwise 0). Column 4 controls for the specific state of residence in 2017. Compared to the results in Table 1, we lose eight out of a total of 1,961 observations because of missing information on the place of residence in 1989. Standard errors clustered at household level in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

[11] This group consists of 132 respondents who moved to Germany after 1989. In total, 94 of them originate from former socialist countries (mostly the USSR), while the remaining 38 respondents originate from other countries (mostly Türkiye). Re-running the specification in column 1 of Table 2 when splitting up the 'outside of Germany' category into indicators for having a former socialist country of origin and another country of origin, only the slightly higher coefficient of originating from a former socialist country is significantly larger than the one for former West German residents. The higher level of self-control for migrants from former socialist countries is reassuring, as many of the factors we suspect to have affected East Germans also apply to them. However, this interpretation is tentative because of the sample size and as migrants may be positively selected on self-control in general.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

One potential explanation for the higher self-control of former East German residents is that people's self-control is heightened the longer they were exposed to the GDR regime. We investigate this possibility by examining self-control patterns across birth cohorts. To the extent that it is the length of exposure that matters, we would expect the East-West gap in self-control to be greatest for people born earliest. We test this hypothesis by re-estimating our models allowing for an interaction between age (continuous) and residential location in 1989 in column 2 of Table 2. We find that the estimated age–location interaction is positive, but statistically insignificant and economically unimportant, ruling out a simple linear exposure story.[12]

Alternatively, self-control may respond to the specific circumstances in which one grows up. Figure 2 depicts the difference in the average self-control of former East versus West Germans, by birth cohort and additionally highlights four distinct historical periods: before 1949 (when the GDR was established); 1949–1961 (when the Berlin Wall was built); 1962–1990 (while the Berlin Wall existed, the Berlin Wall fell in November 1989); and post-1990 (when Germany was reunified).[13] We find that the East-West gap in self-control is absent only among those born after Germany's reunification. Otherwise, East-West differences in self-control appear remarkably constant across birth cohorts.

The effect of having lived in the GDR on self-control remains significant even when conditioning on respondents' current location (see Table 2, columns 3 and 4). Thus, it appears that it is residence in the former GDR—irrespective of its length or timing—which is linked to higher self-control. We can only speculate about reasons for this finding. It may

[12] Although the East indicator is not statistically significant in this specification, the joint influence of the East indicator and the age–East interaction term on self-control is (joint F-test, $p < 0.01$).
[13] For those born after the reunification, we use the place of residence in 2017 to assign them to either East or West Germany in Figure 2. People who lived outside of Germany in 1989 are excluded in Figure 2.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

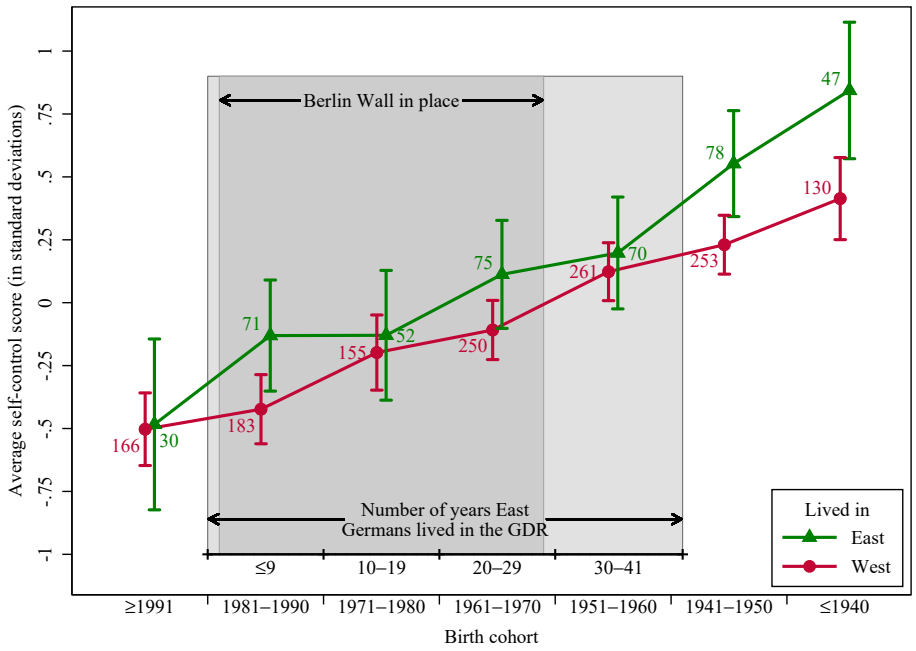


Figure 2. *Trends in self-control of East and West Germans by birth cohort*

Notes: Own illustration based on SOEP-IS, wave 2017. Respondents with a missing place of residence and who resided outside of Germany in 1989 are excluded from the analysis. 1,821 observations. The plot presents the average self-control in standard deviations on the y-axis for ten-year birth-cohort bins on the x-axis, separately for East and West Germans. The area shaded in light grey shows the time-span of Germany's division (1949–1990) when East Germans were born in the German Democratic Republic (GDR). Within this time-span, the area shaded in dark grey indicates the years the Berlin Wall was in place (1961–1989). The x-axis ranges from young birth cohorts on the left-hand side to older cohorts on the right-hand side. That is, the longer East German individuals lived in the GDR the closer to the right the marker is plotted. We calculate the means by regressing self-control on separate birth-cohort bin indicators for East and West Germans (without a constant). The spikes give the 95% confidence intervals of the coefficients. Testing for the equality of the self-control distributions for East and West Germans using a Kolmogorov–Smirnov test yields a p-value of 0.003 for the cohorts born before the reunification in 1990 and a p-value of 0.273 for the cohorts born afterwards. Pairwise t-tests of the East and West interactions with the cohort indicators have p-values of 0.008 (cohort $\leq$1940), 0.009 (1941–1950), 0.560 (1951–1960), 0.077 (1961–1970), 0.652 (1971–1980), 0.027 (1981–1990), and 0.919 ($\geq$1991). The number adjacent to each marker indicates the number of individuals born in this birth-cohort bin in East and West Germany, respectively, with available information on self-control.

be, for example, that the penalties for having limited capacity for self-control may have been sufficiently high to give people an incentive to quickly develop the capacity for self-control.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Our results are consistent with previous evidence that Germany's division had a role in influencing important aspects of people's preferences and personality.[14] Our finding that living in the GDR also heightened people's capacity to exercise self-control is new, though perhaps not surprising. The GDR was characterised by civic suppression. Given the regime's high level of control over education, employment, and even private consumption (i.e., the state granted the right to buy a car), the regime could—and did—use its power to punish people who openly criticised the state or the ruling Socialist Unity Party (SED). Many parents therefore encouraged their children to avoid the potential penalties imposed by the GDR's regime by suppressing their own thoughts and desires (Jahn, 2014). There was an incentive for people to be circumspect in their opinions and behaviour so as not to jeopardise their educational and career opportunities, preserve their individual freedom (Bruce, 2012; Fulbrook, 2008), and protect their families and friends (Jahn, 2014).

The role of local government surveillance. Systematic civic suppression represents one important channel through which living in the GDR may have affected self-control. We investigate this possibility by considering the relationship between self-control and the level of local government surveillance, a key measure of suppression. We measure local government surveillance by the number of so-called 'unofficial informers' (*Inoffizielle Mitarbeiter*) of the Ministry for State Security of the GDR, also known as the Stasi. Unofficial informers were ordinary citizens who, while living their daily lives, also reported the behaviour of their co-workers, neighbours, friends, and even family members to their local contact person at the

[14] Previous research on preferences and other personality traits has documented disparities between East and West Germans in their preferences for: redistribution and state intervention (Alesina and Fuchs-Schündeln, 2007); solidarity (Ockenfels and Weimann, 1999; Brosig-Koch *et al.*, 2011); trust and reciprocal behaviour (Lichter *et al.*, 2021a), trust, cooperation, and risk attitudes (Rainer and Siedler, 2009; Heineck and Süssmuth, 2013; Neugart, 2021); locus of control, neuroticism, conscientiousness, impulsivity, and openness (Friehe and Pannenberg, 2020; Friehe *et al.*, 2015; Kleinjans and Gill, 2018).

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Stasi. While some reports centred on criticism of the local party representative or the party leadership, others were based on more personal matters. There was a great deal of geographic diversity in the concentration of unofficial informers, see Appendix Figure A2. Unlike the GDR's centralised political system, the Stasi's organisation was decentralised with Stasi offices determining informer numbers (Lichter *et al.*, 2021a). Informer density may have been driven by both broad contextual factors (e.g., population size, political opposition, districts' strategic relevance, etc.) and the loyalty of the local leadership (Childs and Popplewell, 1999; Lichter *et al.*, 2021a). While it cannot be ruled out that informer density was endogenous, Lichter *et al.* (2021a) provide suggestive evidence that the informer density is not correlated with the local economic and political situation before World War II or with other policies, which were usually set by the central government.

To relate government surveillance to self-control, we match information on the average number of unofficial informers per 1,000 inhabitants over the years 1980–1988 in GDR counties (taken from Lichter *et al.* (2021b)) to our survey data including self-control in 2017 (see Online Appendix B for details). This way, we can match 299 individuals in our data who lived in East Germany in 1989.

The average number of unofficial informers across the individuals in our sample is 3.3 per 1,000 inhabitants. While this may not seem like a particularly large number, each unofficial informer could spy on dozens of people. Moreover, as nobody knew who worked as an unofficial informer, the existence of this large network of informers resulted in a system of widespread mistrust in the society. In fact, this mistrust was not only a byproduct of the surveillance, but part of the suppression itself. The relevance of informers is also reflected in

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

the positive and significant Pearson correlation coefficient between the number of informers and arrests (both per capita) of 0.22 (p-value<0.01).[15]

The relationship between government surveillance intensity and self-control is plotted in Figure 3. The figure shows (on the y-axis) the average self-control of individuals experiencing the informer density falling into the specific bin given on the x-axis. The size of the circles reflects the relative number of observations (shown inside each circle) in each surveillance density bin. The estimate of linear fit stems from a regression model where the dependent variable is standardised self-control and the variable of interest is the number of unofficial informers per 1,000 inhabitants. We control for year of birth fixed effects and federal state fixed effects. Age is not only a determinant of self-control (see Table 1), but may also vary across counties. For instance, more rural counties may have an older population and the need to operate large networks of unofficial informers might have been less urgent in those counties. Controlling for state fixed effects is a conservative approach that minimises the chances that variation in government surveillance intensity is picking up other regional variation that may correlate with self-control.

Informer density and self-control are positively related. The estimated coefficient of unofficial informer density is 0.159 ($p = 0.033$) (see Figure 3). That is, an increase in surveillance by one unofficial informer per 1,000 inhabitants, about one-third of the mean, is associated with an increase in average self-control of about 0.16 std. The pattern in Figure 3 confirms that the relationship between the number of unofficial informers and self-control is not driven by outliers and is generally linear within the usual range of the unofficial informer density. Using a quadratic specification to capture the relationship between unofficial informers and

[15] Information on county-level arrests is taken from Lichter *et al.* (2021b).

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

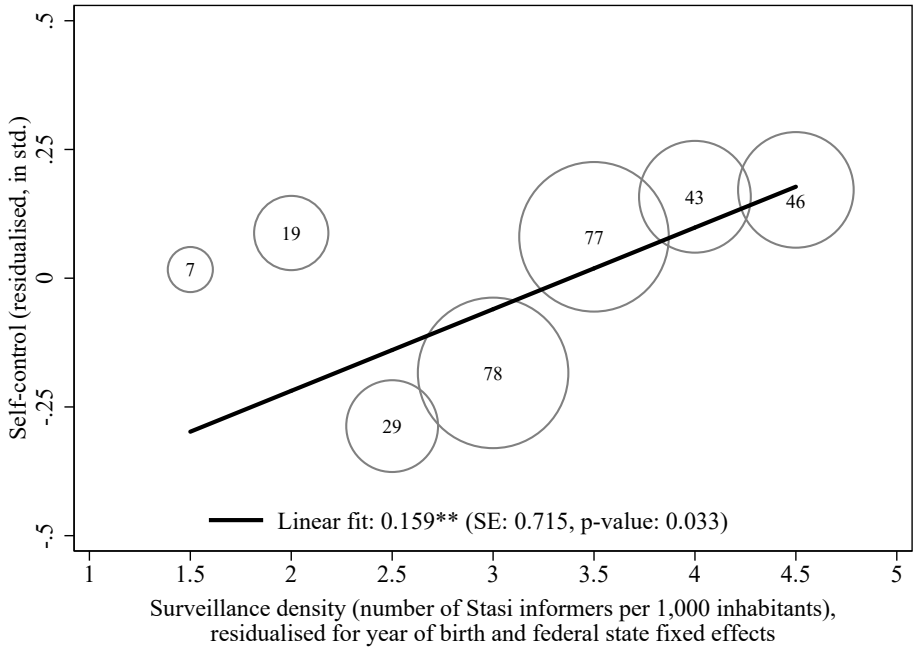


Figure 3. *Government surveillance density and self-control in the GDR*

Notes: Own illustration based on SOEP-IS, wave 2017, and data on the number of Stasi informers taken from Lichter *et al.* (2021b) (based on Müller-Enbergs, 2008). The data were matched on county level and analysed using SOEPremote, a special mode of online access for sensitive information. 299 observations. Self-control is measured in 2017, the number of informers is the average between 1980 and 1988. We assign the informer density based on the county of residence in 2017 for respondents who lived in the GDR in 1989 and still live in an East German federal state in 2017 since retrospective information on the county of residence during the existence of the GDR is not available. This figure shows the relationship between self-control and the number of unofficial informers of the Stasi (per 1,000 inhabitants). The black line gives the slope of the number of Stasi informers when standardised self-control is regressed on the number of Stasi informers as well as year of birth and federal state fixed effects. To account for control variables in the figure, we regress self-control and the number of Stasi informers separately on the year of birth and state fixed effects and take their respective residuals. The self-control residual is again standardised (plotted on the y-axis). We add the mean value of the Stasi informer density to the Stasi informer density residual (plotted on the x-axis) to ensure a meaningful range of the x-axis. By the Frisch–Waugh–Lovell Theorem, the coefficient of the Stasi informer density residual on the self-control residual is identical to the coefficient of the Stasi informer density when self-control is regressed on the Stasi informer density and year of birth and state fixed effects. For visualisation, the values on the x-axis are collapsed to 0.5 bins. The markers give the average self-control for all respondents in counties with an informer density within this bin. The size of the makers is proportional to the number of respondents (given by the number stated within the markers) in the informers' density bin. The slope is stated on the bottom of the plot. Using the standardised number of informers per 1,000 inhabitants (mean 0, standard deviation 1) instead, yields a linear fit of 0.188** ($p = 0.033$). The standard error (SE) refers to the Stasi informers coefficient and is clustered on county level; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

self-control does not provide a better fit compared to the linear model (results available upon request).

Re-estimating our model using a standardised measure of unofficial informers allows us to draw comparisons between our results and a handful of studies that investigate the effect of government surveillance in the GDR on personality traits. We find that a one standard deviation increase in the number of unofficial informers relates to a 0.19 std. increase in self-control. Our effect size is roughly comparable to Lichter *et al.* (2021a) who find that a one standard deviation increase in surveillance density decreases individuals' reciprocal behaviour by 0.18 and trust by 0.10 std. In contrast, surveillance is not significantly related to locus of control or negative reciprocity (Friehe *et al.*, 2015).

In our view, the positive correlation between more intensive government surveillance and greater capacity for self-control is suggestive evidence that the suppression in the GDR is a possible driver of the higher levels of self-control among former East versus West German residents. This result is not causal, of course. First, we exploit only geographic variation in the intensity of surveillance across GDR counties and the density of informers may itself be a result of dissident behaviour in the local area (see the discussion above and Lichter *et al.*, 2021a). Although this cannot be ruled out, the number of informers over time (where available) is rather constant (Lichter *et al.*, 2021a). In our view, this lack of adjustment over time makes it less likely that the number of informers is a function of the local tendency to dissent (Friehe *et al.*, 2015). Second, we assign the unofficial informer density to individuals using their county of residence in 2017. If the tendency to relocate after reunification correlates with self-control, our point estimate might be biased. However, if people with higher self-control were more likely to relocate, our estimate would provide a lower bound of

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

the true effect. It is also the case that our sample size of approximately 300 people makes a certain degree of caution inevitable when interpreting the results. For these reasons, we view the heightened self-control associated with increasing population surveillance as suggestive evidence that civic suppression may partly drive the overall difference in the self-control of East and West Germans.

It is important to stress, however, that government surveillance, although one important aspect of the GDR's political system, is by far not the only way that East and West Germany differed. In East Germany, product choice was more limited, for example, while travel was restricted and incomes were lower. All of these may have contributed to people developing more self-control simply because they could not consume as freely as many of their West German counterparts growing up in a capitalist society.

4 Conclusions

Self-control is shaped not only by people's personal circumstances and family background, but also by the broader context in which they live their lives. Political, economic, social, cultural, and environmental conditions and institutions all combine to either help or hinder people in making choices consistent with their long-term goals. Our interest lies in understanding the scope for institutional factors to determine levels of self-control at a population level. We investigate this issue by exploiting unique population-representative data on self-control and the quasi-experimental variation generated by the reunification of Germany.

Our main contribution is to demonstrate that institutional factors can have a role in determining people's self-control. This represents an important extension of previous studies

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

focused solely on the individual, family, or neurological foundations of self-control. Specifically, we use the quasi-experiment generated by Germany's division to demonstrate that former East German residents have substantially higher levels of self-control than West Germans. Both share the same cultural and historical background, but lived in very different economic, political, and social environments for more than 40 years. We demonstrate that, among GDR residents, there is a positive correlation between more intensive government surveillance and heightened self-control indicating that civic suppression may be one mechanism behind East Germans' greater self-control. Our conclusion is that people seem to become more self-controlled if institutional factors make the costs of low self-control particularly high.

Our comparison of East and West Germany provides new insights into the compound institutional effect of having lived in the GDR. While the intensity of government surveillance is one plausible mechanism explaining higher self-control among residents of the former GDR, self-control does not vary systematically with length and timing of exposure to the GDR. Thus, it may be that people's self-control adapted quickly after reunification to the broader context in which they were operating. At the same time, the higher levels of self-control among those East Germans who were socialised in the GDR persist nearly 30 years after reunification, even though institutional factors in East and West Germany have largely converged over this period.

Moreover, any heightened capacity for self-control among residents of the former GDR does not imply that we should necessarily observe better life outcomes for them today. Self-control is only one significant predictor of life outcomes among many others (see, e.g., Cobb-Clark *et al.*, 2022). Our results are not incompatible with the broader observation that

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

today East Germans face, on average, lower wages, higher unemployment, and lower wealth (see, e.g., BMWi, 2017). East Germans' higher levels of self-control seem to at most only partly compensate for other more adverse circumstances such as macroeconomic conditions.

Our analysis of the self-control capacity of adults also represents an important contribution. Previous studies have largely focused on heterogeneity in children's and adolescents' self-control. Our results highlight that some of the disparity in self-control associated with family background and gender that is commonly observed in childhood disappears in adulthood. Given the numerous choices that adults make not only for themselves, but also for their families, employers, and communities, it is imperative that we study the determinants of self-control in adult populations as well as in children.

In this regard, our contribution is enhanced by the fact that we provide—for the first time—population-representative evidence on the determinants of self-control. Population-representative data are extremely useful in shedding light on how self-control develops over the life cycle. We find that older people have higher levels of self-control which is good news for ageing societies given the link between greater self-control and improved health, better labour market performance, reduced criminality, and greater overall well-being (see, e.g., Cobb-Clark *et al.*, 2022; Duckworth and Seligman, 2005; Kaur *et al.*, 2015; Moffitt *et al.*, 2011; Tangney *et al.*, 2004).

Future research exploring these conclusions in more depth and in other contexts would be especially valuable. We need to know more about the range of institutional factors that are likely to determine self-control. The COVID-19 pandemic, for example, may leave an imprint on people's self-control since the public-health measures adopted to fight its spread (e.g., social distancing, face masks, etc.) require a degree of constant self-control. More

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

broadly, we need to understand the potential for policy initiatives to enhance self-control by redefining the 'rules of the game' and altering the institutional context in which people operate.

5 Supplementary data

The authors were granted an exemption to publish their data because access to the data is restricted. However, the authors provided the Journal with temporary access to the data, which allowed the Journal to run their codes. The codes are available on the Journal repository. The data and codes were checked for their ability to reproduce the results presented in the paper. The replication package for this paper is available at the following address: https://doi.org/10.5281/zenodo.10352574.

Affiliations

[1]The University of Sydney, Australia

[2]The University of Melbourne, Australia

[3]Heinrich Heine University Düsseldorf, Germany

[4]ARC Centre of Excellence for Children and Families over the Life Course, Australia

[5]IZA—Institute of Labor Economics, Bonn, Germany

[6]Max Planck Institute for Research on Collective Goods, Bonn, Germany

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

References

Alesina, A. and Fuchs-Schündeln, N. (2007). 'Goodbye Lenin (or not?): The effect of communism on people's preferences', *American Economic Review*, vol. 97(4), pp. 1507–1528.

Almlund, M., Duckworth, A.L., Heckman, J.J. and Kautz, T. (2011). 'Personality psychology and economics', in (E. A. Hanushek, S. Machin and L. Woessmann, eds.), *Handbook of the Economics of Education*, pp. 1–181, vol. 4, Amsterdam, The Netherlands: Elsevier, doi:10.1016/B978-0-444-53444-6.00001-8.

Andreoni, J., Kuhn, M.A. and Sprenger, C. (2015). 'Measuring time preferences: A comparison of experimental methods', *Journal of Economic Behavior & Organization*, vol. 116, pp. 451–464.

Andreoni, J. and Sprenger, C. (2012). 'Estimating time preferences from convex budgets', *American Economic Review*, vol. 102(7), pp. 3333–3356.

Augenblick, N., Niederle, M. and Sprenger, C. (2015). 'Working over time: Dynamic inconsistency in real effort tasks', *The Quarterly Journal of Economics*, vol. 130(3), pp. 1067–1115.

Augenblick, N. and Rabin, M. (2019). 'An experiment on time preference and misprediction in unpleasant tasks', *The Review of Economic Studies*, vol. 86(3), pp. 941–975.

Becker, S.O., Mergele, L. and Woessmann, L. (2020). 'The Separation and Reunification of Germany: Rethinking a Natural Experiment Interpretation of the Enduring Effects of Communism', *Journal of Economic Perspectives*, vol. 34(2), pp. 143–171.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Bernheim, B.D., Ray, D. and Yeltekin, S. (2015). 'Poverty and self-control', *Econometrica*, vol. 83(5), pp. 1877–1911, ISSN 0012-9682.

Bertrams, A. and Dickhäuser, O. (2009). 'Messung dispositioneller Selbstkontroll-Kapazität: Eine deutsche Adaptation der Kurzform der Self-Control Scale (SCS-K-D)', *Diagnostica*, vol. 55(1), pp. 2–10, doi:10.1026/0012-1924.55.1.2.

BMWi (2017). 'Annual Report of the Federal Government on the Status of German Unity in 2017', Berlin, Germany: Federal Ministry for Economic Affairs and Energy (BMWi), Federal Government Commissioner for the New Federal States.

Borghans, L., Duckworth, A.L., Heckman, J.J. and Ter Weel, B. (2008). 'The economics and psychology of personality traits', *Journal of Human Resources*, vol. 43(4), pp. 972–1059.

Brosig-Koch, J., Helbach, C., Ockenfels, A. and Weimann, J. (2011). 'Still different after all these years: Solidarity behavior in East and West Germany', *Journal of Public Economics*, vol. 95(11-12), pp. 1373–1376.

Bruce, G. (2012). *The Firm: The Inside Story of the Stasi*, Oxford, UK: Oxford University Press, 1st edn., ISBN 978-0-19-989657-8.

Cameron Ponitz, C.E., McClelland, M.M., Jewkes, A.M., Connor, C.M., Farris, C.L. and Morrison, F.J. (2008). 'Touch your toes! Developing a direct measure of behavioral regulation in early childhood', *Early Childhood Research Quarterly*, vol. 23(2), pp. 141–158, ISSN 08852006, doi:10.1016/j.ecresq.2007.01.004.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Casey, B.J. (2015). 'Beyond simple models of self-control to circuit-based accounts of adolescent behavior', *Annual Review of Psychology*, vol. 66(1), pp. 295–319, ISSN 0066-4308, doi:10.1146/annurev-psych-010814-015156.

Childs, D. and Popplewell, R. (1999). *The Stasi: The East German Intelligence and Security Service*, New York, NY: Palgrave.

Cobb-Clark, D.A., Dahmann, S.C., Kamhöfer, D.A. and Schildberg-Hörisch, H. (2021). 'Sophistication about Self-Control', IZA Discussion Paper 14609. Bonn, Germany: IZA.

Cobb-Clark, D.A., Dahmann, S.C., Kamhöfer, D.A. and Schildberg-Hörisch, H. (2022). 'The Predictive Power of Self-Control for Life Outcomes', *Journal of Economic Behavior & Organization*, vol. 197, pp. 725–744.

Coenen, J., Golsteyn, B.H.H., Stolp, T. and Tempelaar, D. (2021). 'Personality traits and academic performance: Correcting self-assessed traits with vignettes', *PLOS ONE*, vol. 16(3), p. e0248629.

de Ridder, D.T.D., Lensvelt-Mulders, G., Finkenauer, C., Stok, F.M. and Baumeister, R.F. (2012). 'Taking stock of self-control: A meta-analysis of how trait self-control relates to a wide range of behaviors', *Personality and Social Psychology Review*, vol. 16(1), pp. 76–99, doi:10.1177/1088868311418749.

Dohmen, T., Falk, A., Golsteyn, B.H.H., Huffman, D. and Sunde, U. (2017). 'Risk Attitudes Across The Life Course', *The Economic Journal*, vol. 127(605), pp. F95–F116.

Duckworth, A.L. and Kern, M.L. (2011). 'A meta-analysis of the convergent validity of self-control measures', *Journal of Research in Personality*, vol. 45(3), pp. 259–268.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Duckworth, A.L. and Seligman, M.E.P. (2005). 'Self-discipline outdoes IQ in predicting academic performance of adolescents', *Psychological Science*, vol. 16(12), pp. 939–944, doi:10.1111/j.1467-9280.2005.01641.x.

Duckworth, A.L. and Seligman, M.E.P. (2006). 'Self-discipline gives girls the edge: Gender in self-discipline, grades, and achievement test scores.', *Journal of Educational Psychology*, vol. 98(1), pp. 198–208, ISSN 1939-2176, 0022-0663, doi:10.1037/0022-0663.98.1.198.

Evans, G.W. (2003). 'A multimethodological analysis of cumulative risk and allostatic load among rural children.', *Developmental Psychology*, vol. 39(5), pp. 924–933, ISSN 1939-0599, 0012-1649, doi:10.1037/0012-1649.39.5.924.

Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D. and Sunde, U. (2018). 'Global evidence on economic preferences', *The Quarterly Journal of Economics*, vol. 133(4), pp. 1645–1692.

Feng, S., Hana, Y., Heckman, J.J. and Kautz, T. (2022). 'Comparing the reliability and predictive power of child, teacher, and guardian reports of noncognitive skills', *Proceedings of the National Academy of Sciences*, vol. 119(6), pp. 1–8.

Fitzenberger, B., Mena, G., Nimczik, J. and Sunde, U. (2022). 'Personality Traits Across the Life Cycle: Disentangling Age, Period and Cohort Effects', *The Economic Journal*, vol. 132(646), pp. 2141–2172, ISSN 0013-0133, doi:10.1093/ej/ueab093.

Friehe, T. and Pannenberg, M. (2020). 'Time preferences and political regimes: evidence from reunified Germany', *Journal of Population Economics*, vol. 33, pp. 349–387.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Friehe, T., Pannenberg, M. and Wedow, M. (2015). 'Let bygones be bygones? Socialist regimes and personalities in Germany', SOEPpapers on Multidisciplinary Panel Data Research 776. Berlin, Germany: DIW.

Fulbrook, M. (2008). *The people's state: East German Society from Hitler to Honecker*, New Haven, CT: Yale University Press, ISBN 978-0-300-14424-6.

Goebel, J., Grabka, M.M., Liebig, S., Kroh, M., Richter, D., Schröder, C. and Schupp, J. (2019). 'The German Socio-Economic Panel (SOEP)', *Jahrbücher für Nationalökonomie und Statistik / Journal of Economics and Statistics*, vol. 239(2), pp. 345–360.

Gottfredson, M.R. and Hirschi, T. (1990). *A General Theory of Crime*, Stanford, CA: Stanford University Press, ISBN 978-0-8047-1773-1 978-0-8047-1774-8.

Heckman, J. and Robb, R. (1985). 'Using longitudinal data to estimate age, period and cohort effects in earnings equations', in (W. M. Mason and S. E. Fienberg, eds.), *Cohort Analysis in Social Research: Beyond the Identification Problem*, pp. 137–150, New York, NY: Springer, doi:10.1007/978-1-4613-8536-3_5.

Heckman, J.J., Jagelka, T. and Kautz, T.D. (2021). 'Some Contributions of Economics to the Study of Personality', in (O. P. John and R. W. Robins, eds.), *Handbook of Personality – Theory and Research*, New York, NY: The Guilford Press, fourth edn., doi:https://doi.org/10.1016/j.econedurev.2016.11.004.

Heineck, G. and Süssmuth, B. (2013). 'A different look at Lenin's legacy: Social capital and risk taking in the two Germanies', *Journal of Comparative Economics*, vol. 41(3), pp. 789–803, ISSN 01475967, doi:10.1016/j.jce.2013.02.005.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Hoyle, R.H. and Davisson, E.K. (2016). 'Varieties of Self-Control and Their Personality Correlates', in (K. D. Vohs and R. F. Baumeister, eds.), *Handbook of Self-Regulation: Research, Theory and Applications*, pp. 396–413, New York, NY: The Guilford Press, third edn., doi:10.1016/B978-0-444-53444-6.00001-8.

Jahn, R. (2014). *Wir Angepassten: Überleben in der DDR*, Munich, Germany: Piper, ISBN 978-3-492-05631-1.

Kaur, S., Kremer, M. and Mullainathan, S. (2015). 'Self-control at work', *Journal of Political Economy*, vol. 123(6), pp. 1227–1277, doi:10.1086/683822.

Kleinjans, K.J. and Gill, A. (2018). 'Institutions, parental selection, and locus of control', *Applied Economics Letters*, vol. 25(15), pp. 1041–1044, ISSN 1350-4851, doi:10.1080/13504851.2017.1391998.

Laibson, D. (1997). 'Golden eggs and hyperbolic discounting', *The Quarterly Journal of Economics*, vol. 112(2), pp. 443–478.

Lengua, L.J., Moran, L., Zalewski, M., Ruberry, E., Kiff, C. and Thompson, S. (2015). 'Relations of growth in effortful control to family income, cumulative risk, and adjustment in preschool-age children', *Journal of Abnormal Child Psychology*, vol. 43(4), pp. 705–720, ISSN 0091-0627, 1573-2835, doi:10.1007/s10802-014-9941-2.

Lichter, A., Löffler, M. and Siegloch, S. (2021a). 'The Long-Term Costs of Government Surveillance: Insights from Stasi Spying in East Germany', *Journal of the European Economic Association*, vol. 19(2), pp. 741–789, ISSN 1542-4766, doi:10.1093/jeea/jvaa009.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Lichter, A., Löffler, M. and Siegloch, S. (2021b). 'Replication Files for: The Long-Term Costs of Government Surveillance: Insights from Stasi Spying in East Germany. Harvard Dataverse: https://doi.org/10.7910/DVN/WMVC4U', doi:10.7910/DVN/WMVC4U.

Matthews, J.S., Ponitz, C.C. and Morrison, F.J. (2009). 'Early gender differences in self-regulation and academic achievement', *Journal of Educational Psychology*, vol. 101(3), pp. 689–704, ISSN 1939-2176, 0022-0663, doi:10.1037/a0014240.

Mezuk, B., Ratliff, S., Concha, J.B., Abdou, C.M., Rafferty, J., Lee, H. and Jackson, J.S. (2017). 'Stress, self-regulation, and context: Evidence from the Health and Retirement Survey', *SSM – Population Health*, vol. 3, pp. 455–463, ISSN 2352-8273, doi:https://doi.org/10.1016/j.ssmph.2017.05.004.

Miech, R., Essex, M.J. and Goldsmith, H.H. (2001). 'Socioeconomic status and the adjustment to school: The role of self-regulation during early childhood', *Sociology of Education*, vol. 74(2), pp. 102–120, ISSN 0038-0407, doi:10.2307/2673165.

Moffitt, T.E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R.J., Harrington, H., Houts, R., Poulton, R., Roberts, B.W., Ross, S., Sears, M.R., Thomson, W.M. and Caspi, A. (2011). 'A gradient of childhood self-control predicts health, wealth, and public safety', *Proceedings of the National Academy of Sciences*, vol. 108(7), pp. 2693–2698, ISSN 0027-8424, doi:10.1073/pnas.1010076108.

Montroy, J.J., Bowles, R.P., Skibbe, L.E., McClelland, M.M. and Morrison, F.J. (2016). 'The development of self-regulation across early childhood.', *Developmental Psychology*, vol. 52(11), pp. 1744–1762, ISSN 1939-0599, 0012-1649, doi:10.1037/dev0000159.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Müller-Enbergs, H. (2008). *Inoffizielle Mitarbeiter des Ministeriums für Staatssicherheit. Teil 3: Statistik*, Berlin, Germany: Ch. Links Verlag.

Neugart, M. (2021). 'The legacy effect of socialism on risky savings', *Applied Economics*, vol. 53(33), pp. 3810–3831, doi:10.1080/00036846.2021.1887448.

Noble, K.G., Norman, M.F. and Farah, M.J. (2005). 'Neurocognitive correlates of socioeconomic status in kindergarten children', *Developmental Science*, vol. 8(1), pp. 74–87, ISSN 1363-755X, 1467-7687, doi:10.1111/j.1467-7687.2005.00394.x.

Nofziger, S. (2008). 'The "cause" of low self-control: The influence of maternal self-control', *Journal of Research in Crime and Delinquency*, vol. 45(2), pp. 191–224, ISSN 0022-4278, 1552-731X, doi:10.1177/0022427807313708.

North, D.C. (1990). *Institutions, Institutional Change and Economic Performance*, Cambridge, UK: Cambridge University Press.

Ockenfels, A. and Weimann, J. (1999). 'Types and patterns: An experimental East-West-German comparison of cooperation and solidarity', *Journal of Public Economics*, vol. 71(2), pp. 275–287.

O'Donoghue, T. and Rabin, M. (1999). 'Doing it now or later', *American Economic Review*, vol. 89(1), pp. 103–124, doi:10.1257/aer.89.1.103.

Oh, S. and Lewis, C. (2008). 'Korean preschoolers' advanced inhibitory control and its relation to other executive skills and mental state understanding', *Child Development*, vol. 79(1), pp. 80–99, ISSN 0009-3920.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Perrone, D., Sullivan, C.J., Pratt, T.C. and Margaryan, S. (2004). 'Parental efficacy, self-control, and delinquency: A test of a general theory of crime on a nationally representative sample of youth', *International Journal of Offender Therapy and Comparative Criminology*, vol. 48(3), pp. 298–312, doi:10.1177/0306624X03262513.

Phelps, E.S. and Pollak, R.A. (1968). 'On second-best national saving and game-equilibrium growth', *The Review of Economic Studies*, vol. 35(2), pp. 185–199.

Pratt, T.C., Turner, M.G. and Piquero, A.R. (2004). 'Parental socialization and community context: A longitudinal analysis of the structural sources of low self-control', *Journal of Research in Crime and Delinquency*, vol. 41(3), pp. 219–243, ISSN 0022-4278, 1552-731X, doi:10.1177/0022427803260270.

Rainer, H. and Siedler, T. (2009). 'Does democracy foster trust?', *Journal of Comparative Economics*, vol. 37(2), pp. 251–269, ISSN 0147-5967, doi:10.1016/j.jce.2008.09.003.

Richter, D. and Schupp, J. (2015). 'The SOEP Innovation Sample (SOEP IS)', *Schmollers Jahrbuch: Journal of Applied Social Science Studies / Zeitschrift für Wirtschafts- und Sozialwissenschaften*, vol. 135(3), pp. 389–400.

Schlafmann, K. (2020). 'Housing, Mortgages, and Self-Control', *The Review of Financial Studies*, vol. 34(5), pp. 2648–2687, ISSN 0893-9454, doi:10.1093/rfs/hhaa096.

Silverman, I.W. (2003). 'Gender differences in delay of gratification: A meta-analysis', *Sex Roles*, vol. 49(9), pp. 451–463, ISSN 1573-2762, doi:10.1023/A:1025872421115.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024

Stults, B.J. and Swagar, N. (2021). 'The role of neighborhood context in the relationship between parenting effectiveness and self-control', *Crime & Delinquency*, vol. 67(10), pp. 1459–1490, doi:10.1177/0011128720951436.

Tangney, J.P., Baumeister, R.F. and Boone, A.L. (2004). 'High self-control predicts good adjustment, less pathology, better grades, and interpersonal success', *Journal of Personality*, vol. 72(2), pp. 271–324, doi:10.1111/j.0022-3506.2004.00263.x.

Tsukayama, E., Duckworth, A.L. and Kim, B. (2012). 'Resisting Everything Except Temptation: Evidence and an Explanation for Domain-specific Impulsivity', *European Journal of Personality*, vol. 26(3), pp. 318–334, doi:10.1002/per.841.

Wolfe, S.E. and Hoffmann, J.P. (2016). 'On the measurement of low self-control in Add Health and NLSY79', *Psychology, Crime & Law*, vol. 22(7), pp. 619–650, doi:10.1080/1068316X.2016.1168428.

ORIGINAL UNEDITED MANUSCRIPT

Downloaded from https://academic.oup.com/ej/advance-article/doi/10.1093/ej/uead111/7478028 by University of Melbourne user on 12 January 2024