Elevating Trust by increasing Instruction hours-German G8 Reform *

Adrija Roy

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Abstract

For this project I examine the the effect of a major German high school implemented between 2001 and 2008 in most of the federal States on student's trust attitude. The reform reduced the secondory education by one year from 9 to 8 which lead to the increase in the weekly instruction hours. Since the policy G8 reform was implemented in diffrent time over the period of 7 years I use difference in difference approach with time as year of high school entry and State as fixed effects. I get a significant reult on students' trust attitude. I also tried to look into some of the potential mechanisms in line with other existing literatures.

*Adrija Roy, University of Bonn. Email: s6adroyy[at]uni-bonn[dot]de.

1 Introduction

A growing body of emperical literature has emphasized trust plays important role in economic development and direct efect on total factor productivity.(**knack1997does**). At the individual level, there is evidence linking trust and subjective well-being.(**helliwell2010trust**). Education plays a crucial role in shaping children's trust behavior in a positive way,(**glaeser2007does**). Raising instruction time in high school is often considered with having several positive effects for students' outcomes, especially regarding improvements in cognitive skills and performance.(**huebener2017** and eventually making schooling more efficient. Even though many countries are attracted by the idea of reaping the benefits of increased instruction time in school (**oecd2016**),outcomes other than student performance might be affected as well.(**dahmann2014impact**; **dahmann2018cross**).

Here aim is to analyse whether higher instruction hours affected students' self rated trust, measured as trust in people and strangers.The remainder of the paper is structured as follows. In Section2 provides some literatures overview on different outcomes affected by schooling and also review existing literature on the German G8-reform whereas Section3 briefly summarizes the main characteristics and features of the very reform. Afterwards, Section4 introduces the data set used and Section5 gives reasoning on empirical strategy and lastly a short description of the results6 and7. Below the appendix section shows the graph for the treatement status with recpect to the variables used and the tables described in the paper.

2 Related literature

On the determinants of trust,(**alesina2002trusts**)argue that individual experiences like traumatic events or (historically rooted) discrimination as well as one's community environment are among the strongest factors reducing trust.Accordingly (**glaeser1999social**)find less trustworthy behavior between people from different races or nationalities what has also been shown by (**Borgonovi2012**) in a cross-European country comparison. (**dohmen2008representative**) using 2003 and 2005 waves of the SOEPdata set, that female people, elderly as well as tall ones are usually associated with exhibiting more trust. On the other hand, trust seems to be strongly connected to personality traits as shown by (**dohmen2008representative**) and (**becker2012relationship**). The former authors examine the effect of psychological traits as

measured by the "Big Five"concept and argue that more conscientious or more neurotic people trust less whereas individuals who are more agreeable or more open to experiences tend to trust more.

Moreover, there exists some evidence that schooling might affect social preferences including trust as well as altruism and reciprocity. Focusing on the effect of schooling on an individual's trust formation, current literature usually indicates that schooling and education in general have a positive impact on individual trust attitudes (see for example(**oreopoulos2011priceless**)).

3 The G8 reform

The G8 reform analyzed in this study affects only one of these tracks, the academic high school (*Gymnasium*), which constitutes the high-ability school track that upon competition leads to the Abitur, the university entrance qualification that is required for admission to the university. Typically, academic high school lasted nine years, implying a total of thirteen years of schooling. Between 2001 and 2008, 13 out of 16 German federal states reduced the length of academic track schooling from nine to eight years reducing overall schooling from 13 to 12 years. most of the additional workload usually being concentrated between grades seven to nine thus students are especially exposed to a higher workload between ages 13 and 16 (see for example (**dahmann2014impact**; **dahmann2018cross**)).

4 Data

Analysis is based on a sample of same-aged students taken from the German Socio-Economic Panel (SOEP) study, a representative household panel survey.[1]Adolescents, who respond to the SOEP youth questionnaire in the year they turn seventeen, answer survey questions relating to trust preferences in every wave starting in 2006. Hence, restricted to the data from 2006 through 2018, [2] and select all adolescents who were attending academic high school (*Gymnasium*) at the time of the survey or had earned a high school diploma.

[1]Use data from the SOEP, data for years 1984-2020, version 37, SOEP, 2021.

[2]Exclude data of recent immigrants and refugee samples.Also exclude data from 2019 and 2020 since some states swished back to the G9 scheme

To identify whether a student is subject to higher school intensity, used the information on the federal state of residence and the year of high-school entry. In case information on the latter is not provided, the year of high-school entry is imputed from the date of birth. Exclude students from Rhineland-Palatine where the reform has not been implemented state-wide, and students from Hesse who entered academic high school in 2004 and 2005 when schools operated under both schemes (G8 and G9). Individuals who repeated one or more grades is also excluded to avoid noise from different levels of schooling experienced.

Trust. Standard trust questions were included using three statements about whether "people can be generally trusted," whether "nowadays one can't rely on anyone," and whether "if dealing with strangers, it is better to be careful before trusting them." Answers were given on a seven-point Likert scale ranging from "agree completely" to "totally disagree." collapsed multiple measures of trust into one index and standardized it so that, by construction, trust has a mean zero and a standard deviation of one.

5 Empirical strategy

In order to estimate a causal effect of schooling intensity on trust, we exploit the aforementioned G8 reform, in particular, we exploit the fact that the reform was implemented at different points in time across federal states. We apply a difference-in-differences strategy of the following form

$$y_{ist} = \gamma_s + \tau_t + \alpha G8_{st} + \beta X_{ist} + \epsilon_{ist} \tag{1}$$

where y_{ist} is the degree of trust at age 17 of student i living in state s who has entered high school at time t. $G8_{st}$ is a binary variable that identifies whether the student was affected by the G8 reform. Control group are students who entered academic high school before the reform yeras and graduate after nine years of high school, i.e., facing a lower schooling intensity. In contrast, our treatment group comprises students who entered academic high school after the reform and graduate after only eight years of academic high school, i.e., facing a higher schooling intensity. α is the coefficient of core interest and provides the reform's effect on student's trust. γ_s is a set of state fixed effects that captures general differences between

states, like time constant differences in state's education systems. A set of time fixed effects (τ_t) capture general differences between cohorts over time as well as student trust shocks common to all federal states, e.g.resulting from policy changes applying to all federal states.

The set of individual control variables X_{ist} contains gender, childhood environment, previous educational performance, parental education dummy (at least one parent has an academic high school degree or higher), father's occupational status dummy (blue-collar occupation), the employment status of the mother and a dummy for being raised by a single parent, religion dummy. Finally ϵ_{ist} is the error term. As the error term is likely to be correlated within states, following the recommendation of (**bertrand2004much**) and cluster the standard errors at the level of the policy change.

6 Results

6.1 Graphical evidence

Figure1 in the appendix depicts a graphical illustration of the reform's effect on trust. As the reform was implemented at different points of time, the estimated event study-style specifications with saturated leads and lags. I have used four lags periods and seven leads. Although the graph doesnot totally provide the validity of event study, I sticked to this for the purpose of theis project. What can be noticed is the positive effct of trust post reform which also matches the result of main regression table.

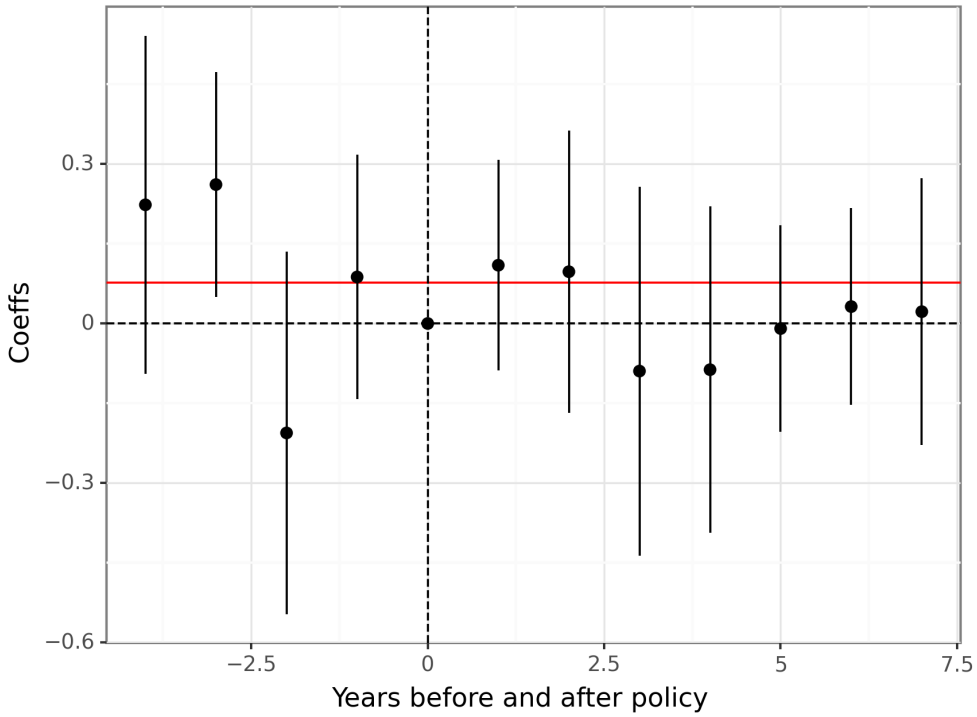

Figure 1: Event Study plot with leads and lags

6.2 Main results

Table1 presents the estimates of equation (1). Using the controls as shown in the table I get highly significant result. The controls is similar to the paper by (**dohmen2008representative**). Although the study was not related to G8 reform Yet it showed women have more trust as contrary to the result present here. The negative effect for females on the other side could be because of the differential impact the reform had for boys and girls, with the latter often experiencing a decline in school performance (**dahmann2017does**). Significant effects for students with higher educated parents and those with a working-class father. While the former in general exhibit a substantially higher degree of trust, the latter trust less what could be related to less support these children receive at home to cope with the increased pressure at school as proposed by **dahmann2014impactempty citation**. Overall, it can be seen that the reform had an important and significantly sizeable effect on student's self rated trust.

6.3 Mechanisms

In this project I tries to look into the mechanisms which might cause the increse in trust.Tables3,2 shows the results. Although no significant results were found may be beacuse of the lower sample size. Althogh postive it shows low impact for treated. There are researches which have shown low impact of the leisure time activites of children due incresed pressure. There are many other mechanisms which can be explored like the "Bive-five" as a mechanism design which I am yet to explore. Or any other in-school programes but the data set used does not contain such information.

6.4 Robust Check

Since trust was measured in the likert scale, here I used the ordered logit model to check the robustness of the main regression model, it can be expected to receive better or similar result. Table4 shows the trust is still significant which hints to the fact the main regression is robust to model slection. There is possibility to also check the palcebo by looking at the trust attitude of the non-gymnasium students which is yet to be explored.

7 Conclusion

Drawing on data from the SOEP and using a difference-in-differences design,it is hown that the reform led to a significant increase in self rated trust of almost 0.15 of a standard deviation with significant differential effects emerging for students with less educated parents or those being considered as low-performing. Investigate some potential mechanisms, including changes in time allocation and school-related changes and it appears to be the case that our result was driven by school-related characteristics which could not be entirely captured with our data. In addtition extending gratitude to(**GaudeckerEconProjectTemplates**) for the project template making the work easier.

8 Appendix

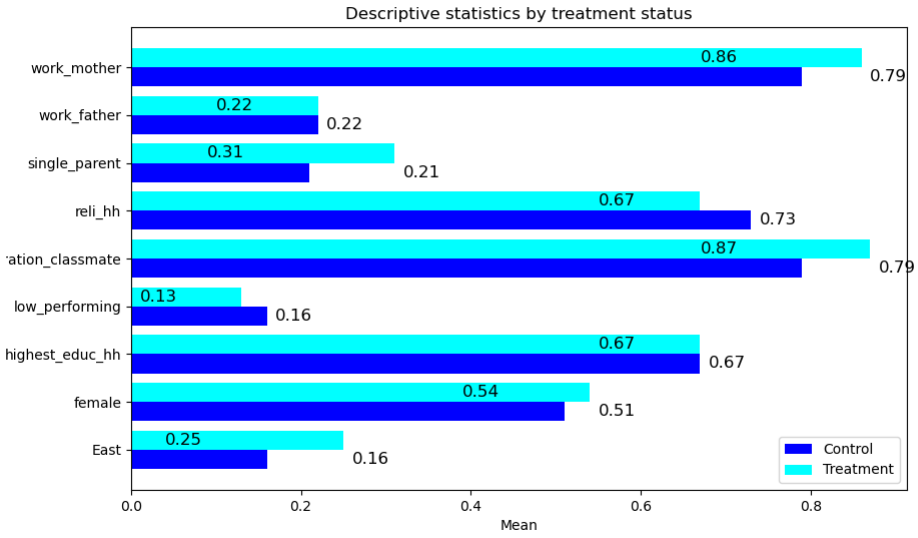

Figure 2: Descriptive statistics by treatment status

Dep. Variable:	std_trust_var	**R-squared:**	0.075
Model:	OLS	**Adj. R-squared:**	0.053
Method:	Least Squares	**F-statistic:**	2.376e+11
Date:	Fri, 31 Mar 2023	**Prob (F-statistic):**	3.53e-77
Time:	01:39:38	**Log-Likelihood:**	-1502.9
No. Observations:	1100	**AIC:**	3060.
Df Residuals:	1073	**BIC:**	3195.
Df Model:	26		
Covariance Type:	cluster		

	coef	**std err**	**z**	**P> |z|**	**[0.025**	**0.975]**
Intercept	0.4718	0.187	2.524	0.012	0.105	0.838
C(year_hgsch_entry)[T.1999.0]	-0.7764	0.232	-3.353	0.001	-1.230	-0.323
C(year_hgsch_entry)[T.2000.0]	-0.5513	0.223	-2.472	0.013	-0.989	-0.114
C(year_hgsch_entry)[T.2001.0]	-0.4625	0.174	-2.654	0.008	-0.804	-0.121
C(year_hgsch_entry)[T.2002.0]	-0.5929	0.217	-2.729	0.006	-1.019	-0.167
C(year_hgsch_entry)[T.2003.0]	-0.6572	0.162	-4.061	0.000	-0.974	-0.340
C(year_hgsch_entry)[T.2004.0]	-0.6090	0.227	-2.688	0.007	-1.053	-0.165
C(year_hgsch_entry)[T.2005.0]	-0.6797	0.289	-2.350	0.019	-1.247	-0.113
C(year_hgsch_entry)[T.2006.0]	-0.4982	0.169	-2.953	0.003	-0.829	-0.168
C(year_hgsch_entry)[T.2007.0]	-0.7969	0.133	-6.004	0.000	-1.057	-0.537
C(year_hgsch_entry)[T.2008.0]	-0.3486	0.169	-2.066	0.039	-0.679	-0.018
C(year_hgsch_entry)[T.2009.0]	-0.5777	0.216	-2.672	0.008	-1.002	-0.154
C(year_hgsch_entry)[T.2010.0]	-0.6464	0.203	-3.177	0.001	-1.045	-0.248
C(year_hgsch_entry)[T.2011.0]	-0.5376	0.137	-3.931	0.000	-0.806	-0.270
C(year_hgsch_entry)[T.2012.0]	-0.4233	0.201	-2.108	0.035	-0.817	-0.030
C(year_hgsch_entry)[T.2013.0]	0.4497	0.215	2.091	0.037	0.028	0.871
C(year_hgsch_entry)[T.2014.0]	0.5540	0.183	3.027	0.002	0.195	0.913
Treat	0.1537	0.054	2.851	0.004	0.048	0.259
female	-0.0556	0.056	-0.987	0.324	-0.166	0.055
East	-0.2482	0.042	-5.867	0.000	-0.331	-0.165
low_performing	0.0242	0.106	0.229	0.819	-0.183	0.231
highest_educ_hh	0.2298	0.042	5.463	0.000	0.147	0.312
work_father	-0.2871	0.070	-4.096	0.000	-0.424	-0.150
work_mother	0.1418	0.070	2.013	0.044	0.004	0.280
reli_hh	0.0594	0.057	1.044	0.297	-0.052	0.171
single_parent	-0.0282	0.080	-0.351	0.726	-0.186	0.129
migration_classmate	-0.1611	0.093	-1.728	0.084	-0.344	0.022

Omnibus:	13.948	**Durbin-Watson:**	1.882
Prob(Omnibus):	0.001	**Jarque-Bera (JB):**	14.315
Skew:	-0.279	**Prob(JB):**	0.000779
Kurtosis:	2.964	**Cond. No.**	209.

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)

Table 1: *Python:* Estimation results of the main two way fixed effect regression.

Dep. Variable:	volunteer_work	**R-squared:**	0.034
Model:	OLS	**Adj. R-squared:**	0.025
Method:	Least Squares	**F-statistic:**	7.335
Date:	Fri, 31 Mar 2023	**Prob (F-statistic):**	0.000491
Time:	01:39:43	**Log-Likelihood:**	-698.72
No. Observations:	1089	**AIC:**	1419.
Df Residuals:	1078	**BIC:**	1474.
Df Model:	10		
Covariance Type:	cluster		

	coef	**std err**	**z**	**P> |z|**	**[0.025**	**0.975]**
Intercept	0.2484	0.087	2.843	0.004	0.077	0.420
Treat	0.0129	0.019	0.668	0.504	-0.025	0.051
female	-0.0304	0.034	-0.883	0.377	-0.098	0.037
East	-0.0529	0.049	-1.083	0.279	-0.149	0.043
low_performing	-0.0861	0.037	-2.326	0.020	-0.159	-0.014
highest_educ_hh	0.0724	0.037	1.941	0.052	-0.001	0.146
work_father	0.0546	0.035	1.562	0.118	-0.014	0.123
work_mother	0.0487	0.033	1.482	0.138	-0.016	0.113
reli_hh	0.0830	0.031	2.663	0.008	0.022	0.144
single_parent	-0.0940	0.032	-2.893	0.004	-0.158	-0.030
migration_classmate	-0.0321	0.029	-1.089	0.276	-0.090	0.026

Omnibus:	9317.043	**Durbin-Watson:**	1.866
Prob(Omnibus):	0.000	**Jarque-Bera (JB):**	174.047
Skew:	0.710	**Prob(JB):**	1.61e-38
Kurtosis:	1.652	**Cond. No.**	11.5

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)

Table 2: *Python:* Mechanism- Volunteer work (outside school)

Dep. Variable:	sport_active	**R-squared:**	0.027
Model:	OLS	**Adj. R-squared:**	0.018
Method:	Least Squares	**F-statistic:**	34.46
Date:	Fri, 31 Mar 2023	**Prob (F-statistic):**	3.97e-08
Time:	01:39:44	**Log-Likelihood:**	-441.99
No. Observations:	1089	**AIC:**	906.0
Df Residuals:	1078	**BIC:**	960.9
Df Model:	10		
Covariance Type:	cluster		

	coef	**std err**	**z**	**P> |z|**	**[0.025**	**0.975]**
Intercept	0.8846	0.049	17.937	0.000	0.788	0.981
Treat	0.0123	0.019	0.649	0.516	-0.025	0.049
female	-0.0532	0.017	-3.091	0.002	-0.087	-0.019
East	-0.0942	0.038	-2.446	0.014	-0.170	-0.019
low_performing	-0.0596	0.024	-2.447	0.014	-0.107	-0.012
highest_educ_hh	0.0540	0.021	2.510	0.012	0.012	0.096
work_father	-0.0243	0.035	-0.693	0.488	-0.093	0.044
work_mother	0.0103	0.024	0.429	0.668	-0.037	0.057
reli_hh	-0.0324	0.021	-1.564	0.118	-0.073	0.008
single_parent	-0.0002	0.027	-0.009	0.993	-0.053	0.053
migration_classmate	-0.0176	0.022	-0.796	0.426	-0.061	0.026

Omnibus:	317.763	**Durbin-Watson:**	1.974
Prob(Omnibus):	0.000	**Jarque-Bera (JB):**	650.155
Skew:	-1.771	**Prob(JB):**	6.62e-142
Kurtosis:	4.337	**Cond. No.**	11.5

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)

Table 3: *Python:* Mechanism- School sport(inside school)

Dep. Variable:	trust_var	**Log-Likelihood:**	-2823.1
Model:	OrderedModel	**AIC:**	5700.
Method:	Maximum Likelihood	**BIC:**	5835.
Date:	Fri, 31 Mar 2023		
Time:	01:39:41		
No. Observations:	1100		
Df Residuals:	1073		
Df Model:	27		

	coef	**std err**	**z**	**P> |z|**	**[0.025**	**0.975]**
Treat	0.3546	0.118	3.001	0.003	0.123	0.586
female	-0.1008	0.106	-0.952	0.341	-0.308	0.107
East	-0.3636	0.145	-2.511	0.012	-0.647	-0.080
low_performing	0.0236	0.150	0.157	0.875	-0.271	0.318
highest_educ_hh	0.4360	0.123	3.538	0.000	0.194	0.677
work_father	-0.5144	0.140	-3.667	0.000	-0.789	-0.239
work_mother	0.1865	0.143	1.305	0.192	-0.094	0.467
reli_hh	0.0557	0.122	0.457	0.648	-0.183	0.295
single_parent	-0.0341	0.119	-0.287	0.774	-0.267	0.199
migration_classmate	-0.2790	0.156	-1.783	0.075	-0.586	0.028
3/4	-4.8974	0.446	-10.977	0.000	-5.772	-4.023
4/5	-0.1075	0.325	-0.330	0.741	-0.745	0.530
5/6	-0.6704	0.303	-2.213	0.027	-1.264	-0.077
6/7	-0.5363	0.219	-2.452	0.014	-0.965	-0.108
7/8	-0.6662	0.182	-3.670	0.000	-1.022	-0.310
8/9	-0.6282	0.142	-4.415	0.000	-0.907	-0.349
9/10	-0.5582	0.111	-5.032	0.000	-0.776	-0.341
10/11	-0.7991	0.107	-7.477	0.000	-1.009	-0.590
11/12	-0.8097	0.097	-8.385	0.000	-0.999	-0.620
12/13	-0.6514	0.083	-7.890	0.000	-0.813	-0.490
13/14	-0.6718	0.082	-8.178	0.000	-0.833	-0.511
14/15	-0.6276	0.084	-7.476	0.000	-0.792	-0.463
15/16	-0.5318	0.090	-5.928	0.000	-0.708	-0.356
16/17	-0.5274	0.108	-4.876	0.000	-0.739	-0.315
17/18	-0.1924	0.121	-1.585	0.113	-0.430	0.045
18/19	-0.0462	0.170	-0.272	0.786	-0.379	0.287
19/20	-0.1163	0.274	-0.424	0.671	-0.654	0.421

Table 4: *Python:* Robustcheck