



# Large loss in studying time during the closure of schools in Switzerland in 2020

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## ARTICLE INFO

### Keywords:

Coronavirus  
Education  
School closure  
Studying time

## ABSTRACT

The majority of European, as well as many other, countries responded to the outbreak of the new coronavirus with a closure of schools and universities. The expectation of policy makers was that schools and universities would continue to provide lessons online and that students would engage in home learning. How much home learning has there been? We use nationally representative, longitudinal data on 14- to 25-year-old Swiss students to analyze the effects of school closures on studying time. Our results show that students reduced, on average, their studying time from 35 to 23 hours per week. This reduction was stronger for students in secondary school age than for students older than 18. Contrary to our expectations, these reductions in studying time did not vary between male and female students. In addition, children from families with highly educated parents reduced their studying time in absolute terms more than children from families with low educated parents. In relative terms, reductions in children's studying time did not vary by parental education. We also found some variation in the reduction in studying time across the three linguistic regions in Switzerland. Taken together, our findings show that studying time was considerably reduced during the closure of schools. We therefore conclude by suggesting political measures that can compensate for the loss in studying time a generation of Swiss students experienced between March and July 2020.

## 1. Introduction

As many other countries, Switzerland responded to the outbreak of the new coronavirus by closing its primary, secondary, and tertiary education institutions in March 2020. The schools were closed abruptly and remained closed until May 11, 2020 in the case of the obligatory schools. Students were expected to continue learning from home. In May, students returned partially into obligatory schools until the summer holidays. Regular schooling in obligatory schools was only continued after the summer holidays (August 2020). Non-obligatory schools remained closed until June 6, 2020 and many universities continue to provide classes mainly online during the fall term 2020. The switch to home learning was abrupt and it is unclear how well schools and universities as well as students and their parents were prepared for home learning.

Two previous studies have investigated home learning during the closure of schools in Europe; however, these studies measured home learning only during and not before the closure of schools. Bol (2020) gathered data on home schooling of boys and girls in primary and

secondary education during the closure of schools in the Netherlands. He found children from socioeconomically advantaged families to have received more parental support. In addition, he reported that parents were better able to help their daughters than their sons. Using data on England, Bayrakdar and Guveli (2020) found that children from socioeconomically advantaged families spent more time studying at home than children from socioeconomically disadvantaged families during the closure of schools.

Using a longitudinal design, a previous study on Germany (Wößmann et al., 2020) showed that students in primary and secondary school did reduce their studying time from 7.4 to 3.6 hours per day during the school closures. However, this study asked parents retrospectively about the amount of time their children spent on school activities before the school closures, a procedure that is likely to lead to recall bias. We provide evidence on the effects of school closures on studying time using longitudinal and nationally representative data on Switzerland. These data allow us to compare the time investments of the same students before and during the school closures.

In a longitudinal design, Jäger and Blaabæk (2020) compared the

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<https://doi.org/10.1016/j.rssm.2020.100554>

Received 22 September 2020; Received in revised form 28 September 2020; Accepted 29 September 2020

Available online 8 October 2020

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use of library resources before and during school closures in Denmark. They found an increase in socioeconomic differences in library takeout due to the closure of schools. They argued that this finding demonstrated an increase in socioeconomic differences in learning opportunities. However, it is unclear which use of books children actually make. Our study focuses on an outcome more directly related to children's educational performance: the time students invest into studying (Fiorini & Keane, 2014; Hsin & Felfe, 2014).

## 2. Data and methods

### 2.1. Data

We use data from the Swiss Household Panel (SHP; Tillmann et al., 2016), which is a multi-topic survey asking all members of sampled households aged 14 and older. The SHP is based on a probability-based, random sample, which is representative for the Swiss residential population. The panel design allows us to estimate change score models (Morgan & Winship, 2015, chapter 11.3). We rely on two waves of the data, one conducted just before the closure of schools (between September 2, 2019 and March 3, 2020; "pre-corona wave") and one conducted during the closure of schools (between May 12, 2020 and June 30, 2020; "corona wave"). Data were collected during the time of partial school closures but the question about the studying time referred explicitly to the studying time during the full school closures.

With few exceptions, all respondents from the pre-corona wave ( $N = 8,782$ ) were invited to complete the SHP corona wave. In total, 5,859 individuals responded to the corona wave (response rate 66.7%). There is very small evidence of selection bias (Voorpostel et al., 2020). Contrary to the pre-corona wave (for the majority a telephone survey, a web survey for the rest), the corona wave was self-administered (push-to-web), with two thirds of the respondents using the web and one third the paper questionnaire. While there is evidence that paper-and-pencil and web data collection methods produce equivalent answers (Weigold, Weigold, & Russell, 2013), it is unclear if there are different effects from switching from an interviewer-administered or from a self-administered survey mode. We, therefore, control for survey mode in the pre-corona wave in our multivariate analysis.

The analysis sample is restricted to those respondents who are younger than 26 years and who are currently attending secondary or tertiary education institutions. In total, we observe 261 students, who were between 14–25 years old in 2020.

### 2.2. Variables

Our main outcome variable is the *hours students spend studying per week*. We observe this variable for the same individuals before and during the closure of schools. Importantly, the question refers to the combined time spend in school/ online lessons and spend on homework. The corona questionnaire asked: "The following questions refer to the period when your school or university is/was closed because of the Covid-19 pandemic. How many hours did you usually spend on your studies per week?" In the pre-corona wave the question asked was: "How many hours do you usually spend on your studies per week?"

We look at differences by *age* to see whether the change in studying time differs between students in secondary and in tertiary education. To separate these two groups, we distinguish between students aged 14–18 and students aged 19–25.

We measure *gender* to look at differences between male and female students.

We measure *parental education*, using the highest level of education of the mother and the father of a respondent. We distinguish between three levels of parental education (low, medium, and high). A low level of parental education is defined if both parents completed only a lower track of the Swiss school system. A medium level of parental education is obtained if one of the parents completed at least the upper level of

secondary school (*Matura*, comparable to A-levels in England). A high level of parental education is achieved if one of the parents completed a university degree.

Finally, we test for differences across *language regions* in Switzerland. The linguistic regions are differentiated by the language in which the interview was conducted (French, German, or Italian). These language regions signify cultural differences.

As a control variable, we include a dummy for the survey having been conducted per telephone in the pre-corona wave. Descriptive statistics on all variables used in the analysis are reported in Table S1 in the *Online Supplement*.

### 2.3. Methods

The aim of the analysis is to estimate the effects of school closures on studying time. For this purpose, we compare the means of studying time before and during school closures. Based on these means, we calculate the changes in studying time as our estimates of the causal effects of school closures. As a robustness check, we estimate the change in studying time at the individual level and whether this change is a function of age, gender, parental education, and language region. Both approaches support the same conclusions. In all estimations, we use weights to obtain nationally representative estimates.

## 3. Results

### 3.1. Loss in studying time

We report weighted means (standard deviations and standard errors are available in Table S2 in the *Online Supplement*) on studying time before and during the school closures. In addition to the average change in studying time, we look at differences in the change in studying time by age, gender, parental education, and linguistic region within Switzerland.

Fig. 1 shows a large drop in studying time due to the school closures. On average, students studied  $35.37 - 23.04 = 12.33$  h per week less during the closure of schools. In other words, students studied about one third less during the closure of schools. This is an enormous drop in studying time, which should be worrisome as it is likely to have translated into a drop in the development of subject knowledge as well as in the development of cognitive and non-cognitive skills (Fiorini & Keane, 2014; Hsin and Felfe 2015). Skills are important for labor market careers (Heckman, 2006).

We analyze whether the change in studying time differed by age. Fig. 2 reports estimates of studying time for students aged 18 and younger, who are likely to be in secondary school, and students aged 19 and older, who are more likely to attend university or other institutions of tertiary education. We expect that the latter group reduced their studying time less than the children aged 14–18 because the older students attend tertiary education institutions voluntarily and are more

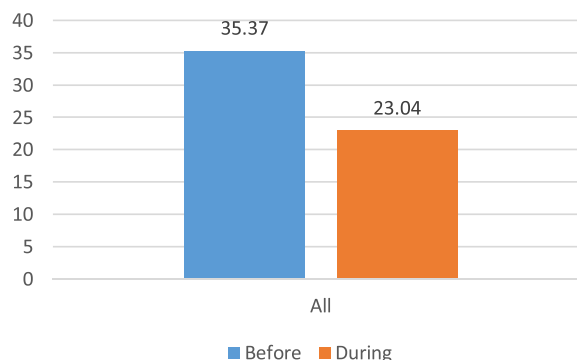


Fig. 1. The means of studying time before and during the closure of schools.

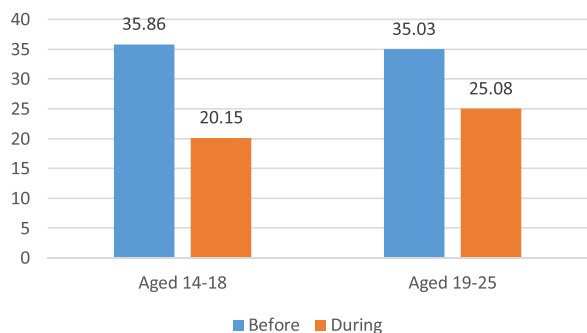


Fig. 2. Differences in studying time before and during the closure of schools by age.

autonomous in their work habits.

There are, as expected, strong differences by age. Younger students reduced their studying time considerably more than older students. The group of students aged 14–18 reduced their studying time by  $35.86 - 20.15 = 15.71$  h per week. The older students reduced their studying time only by  $35.03 - 25.08 = 9.95$  h per week.

Next, we analyze whether the change in studying time differed by gender. Fig. 3 reports estimates of studying time before and during the school closures separately by gender. Recent research on education has identified male students as a group with particularly low non-cognitive skills (Bertrand & Pan, 2013; DiPrete & Jennings, 2012). We therefore expect a stronger reduction in studying time for male students than for female students, who are more independent and able to study on their own.

There is no evidence for gender differences in the reduction in studying time. Male students reduced their studying time by  $34.76 - 23.37 = 11.39$  h per week. Female students studied  $36.05 - 22.68 = 13.37$  h per week less during the school closures. This difference is small and statistically insignificant.

Fig. 4 turns to the question whether the reduction in studying time varied by parental education. We expect that children from socioeconomically advantaged families reduced their studying time less than children from socioeconomically disadvantaged families. This may be the case for instance due to the higher involvement of parents in socioeconomically advantaged families in the education of their children (Lareau, 2003). In addition, the compensatory effect hypothesis (Bernardi & Grätz, 2015) predicts that socioeconomically advantaged families have the resources to respond to disadvantageous life events by increasing their educational investments. In addition, learning loss during the summer holidays is smaller in socioeconomically advantaged than in socioeconomically disadvantaged families (Alexander, Entwisle, & Olson, 2007; Holtmann & Bernardi, 2019).

Contrary to our expectations, we find a larger reduction in studying time in absolute terms for students from socioeconomically advantaged than for students from socioeconomically disadvantaged families.

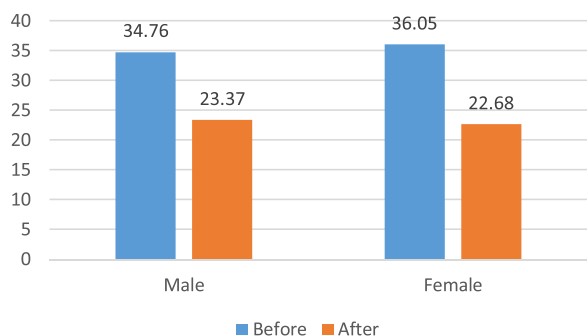


Fig. 3. Gender differences in studying time before and during the closure of schools.

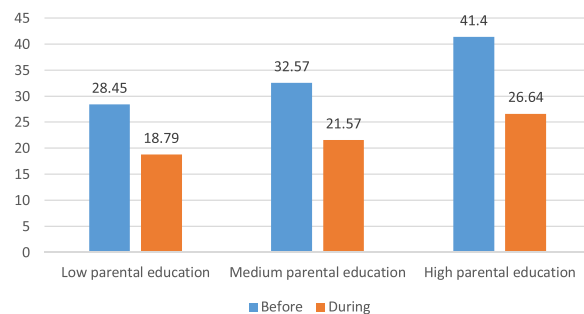


Fig. 4. Socioeconomic differences in studying time before and during the closure of schools.

Students with low educated parents reduced, on average, their studying time from 28.45 to 18.79 weekly hours, implying a reduction of  $28.45 - 18.79 = 9.66$  h. Their counterparts with medium-educated parents reduced their studying time by  $32.57 - 21.57 = 11.00$  weekly hours. Children of highly educated parents studied  $41.40 - 26.64 = 14.76$  h less per week. Therefore, students with highly educated parents reduced their studying time most in absolute terms.

Two qualifications of this finding are, however, in order. First, students with highly educated parents started from a higher level and studied even during the closure of schools more than children with low and children with medium educated parents. Second, socioeconomic differences in changes in studying time during school closures could be due to “regression to the mean” (Campbell & Kenny, 1999), i.e. the tendency of respondents with higher initial levels on a variable to decrease their levels over time and the opposite tendency among respondents with low initial levels. In relative terms, the socioeconomic differences are small. Children from low educated parents reduced their studying time by  $9.66/28.45 = 0.34$  whilst children from highly educated parents reduced their studying time by  $14.76/41.40 = 0.36$ . Hence, all students studied about 1/3 less due to the school closures.<sup>1</sup>

Finally, we turn our attention to a contextual factor that may moderate the reduction in studying time. Switzerland includes three different linguistic regions. These language regions show cultural differences. In addition, the regions were affected to different degrees by the new coronavirus with German-speaking Switzerland being affected much less than their Italian- and French-speaking counterparts. What is more, in each region of Switzerland media from the neighboring country sharing the same language is consumed. In Fig. 5, we report variation in

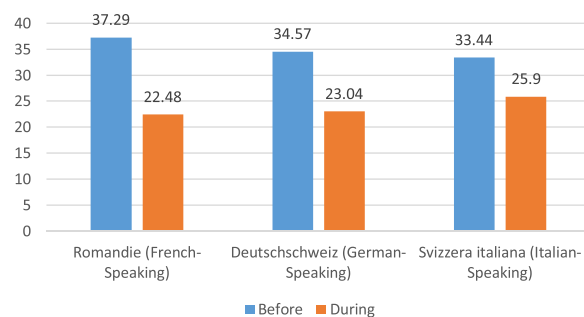


Fig. 5. Variation in studying time across linguistic regions in Switzerland.

<sup>1</sup> We can also compare how much children with highly educated parents studied more than children with low educated parents in relative terms before and during the school closures. Before school closures, they studied  $41.40/28.45 = 1.46$  times more, during the school closures they studied  $26.64/18.79 = 1.42$  more. This is certainly a very small difference.

studying time across French-speaking, German-speaking, and Italian-speaking Switzerland.

The results show variation in studying time across these three linguistic regions. In the French-speaking part of Switzerland studying time was reduced by  $37.29 - 22.48 = 14.81$  h. In the German-speaking part the reduction was  $34.57 - 23.04 = 11.53$  h and therefore slightly but not significantly smaller. However, students in Italian-speaking Switzerland reduced their studying time by only  $33.44 - 25.90 = 7.54$  h per week. In other words, students in Italian-speaking Switzerland reduced their studying time only by half the amount of students in French-speaking Switzerland. Our sample in the Italian-speaking part of Switzerland includes, however, only 14 respondents. Therefore, there is some uncertainty in the estimate for this group of respondents.

### 3.2. Multivariate results

In the previous section, we focused on weighted means in studying time because these statistics can be easily understood by the general public. In this section, we estimate the group differences discussed above within a multivariate linear regression framework. Our model estimates the change in studying time during the school closures.

The results reported in Table 1 lead to the following conclusions, which are fully in line with those reported in section 4.1. First, younger students reduced their studying time by about six hours more than older students. This difference is statistically significant.

Second, there are no gender differences in the reduction in studying time. Female students reduced their studying time by about two hours more per week than male students, which runs counter to our expectations and is a substantively small difference. In addition, the difference is statistically insignificant.

Third, there is a statistically significant difference of 4.5 h in the reduction in studying time between students with low and students with highly educated parents. This difference runs in the opposite direction of what theories of educational inequality lead us to expect: children from highly educated parents reduced their studying time by 4.5 h more than children from low educated parents.

Fourth, the reduction in studying time was stronger in the French- and in the German-speaking regions than in the Italian-speaking region of Switzerland. As noted above, our sample of students from Italian-

**Table 1**  
Change in studying time due to the school closures as a function of covariates.

	Change in studying time due to the school closures
Aged 14–18	–6.177* (2.007)
Female	–1.972 (1.936)
Medium parental education <sup>a</sup>	–0.322 (2.786)
High parental education <sup>a</sup>	–4.534* (2.209)
German-speaking Switzerland <sup>b</sup>	2.584 (2.125)
Italian-speaking Switzerland <sup>b</sup>	8.399* (4.210)
Survey mode telephone (pre-corona)	–4.080 (3.547)
Constant	–5.025 (4.249)
N	261
R <sup>2</sup>	0.076

Notes: Standard errors in parentheses.

<sup>a</sup> Reference category is low parental education.

<sup>b</sup> Reference category is French-speaking Switzerland.

\*  $p < 0.05$ .

Source: Swiss Household Panel.

speaking Switzerland includes, however, only 14 respondents.<sup>2</sup>

## 4. Conclusion and policy recommendations

The closing of schools and universities in Switzerland was accompanied by a drastic reduction in studying time. This loss in studying time is likely to lead to a reduction in cognitive and non-cognitive skills and, therefore, a reduction in the labor market returns of students affected by the school closures (Heckman, 2006). For this reason, it is urgent that policy makers as well as educational professionals think about how they can compensate for the learning loss experienced by a generation of students.

There are many ways in which students can increase their studying time in the coming months. For instance, fall and winter holidays could be shortened. In addition, it is possible to open schools on Saturdays and to offer additional tutoring sessions for children who have fallen behind.

Apart from the main finding of a loss in studying time during the closure of schools, two further findings stand out. First, we found no evidence for gender differences in the reduction in studying time. Second, we found the reduction in studying time to be smaller in families with low than in families with highly educated parents in absolute terms. In relative terms, we found no variation in the reduction in studying time by parental education. In any case, these findings contrast with our expectation of a stronger reduction in studying time due to the school closures in socioeconomically disadvantaged than in socioeconomically advantaged families.

Our finding of no socioeconomic differences in the change in studying time favoring the children from highly educated parents is at odds with results reported in previous studies on England (Bayrakdar & Guveli, 2020) and the Netherlands (Bol, 2020). It should, however, be noted that both these studies measured the studying time only during the closure of schools. A further difference between ours and previous studies is that we focused on rather old students. Our sample included 14–25 year old students whilst previous research focused on younger children in primary and secondary education.

A limitation of our study is that we do not know how efficiently students used their studying time. The efficient use of studying time may differ by parental education. If children of higher educated parents studied more efficiently during the home schooling than children with less educated parents, educational inequality by parental education could have increased during the school closures. We cannot test for this possibility with our data.

Nevertheless, our study suggests that the loss in studying time is a widespread phenomenon and requires a general response rather than targeted interventions. On the other hand, we found differences by age and across linguistic regions within Switzerland. With respect to the regional differences, we can only speculate about the reason. Italian-speaking students in Switzerland were certainly more exposed to Italian media and more affected by the events taking place in Italy. They may have therefore understood the situation as more severe than their German- and French-speaking counterparts and have stayed more at home.

The age differences clearly demonstrate that students in secondary schools were affected most by the school closures. Students in tertiary education institutions were better prepared to learn autonomously. Efforts in support of students should therefore be focused upon secondary school students.

<sup>2</sup> Our sample includes apprentices, as they also take part in theoretical courses. We tested the robustness of our results to the exclusion of apprentices. This model, reported in Table S3 in the *Online Supplement*, supports all our conclusions with the exception that differences by parental education are smaller and not statistically significant.

## Declaration of Competing Interest

The authors reported no declarations of interest.

## Acknowledgments

This study has used pre-release data collected by the Swiss Household Panel (SHP), which are available at <https://forscenter.ch/projects/swiss-household-panel/>. The SHP is based at the Swiss Centre of Expertise in the Social Sciences (FORS) and financed by the Swiss National Science Foundation. We would like to thank Marieke Heers and Robin Tillmann for their comments and suggestions on an earlier version of this study.

## Funding

Grätz acknowledges financial support by the Swiss National Science Foundation (SNSF) under grant agreement PZ00P1\_180128 and by the Swedish Forskningsrådet om Hälsa, Arbetsliv och Välfärd (FORTE) under grant agreement 2016-07099.

## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.rssm.2020.100554>.

## References

Alexander, K. L., Entwisle, D. R., & Olson, L. S. (2007). Lasting consequences of the summer learning gap. *American Sociological Review*, 72, 167–180.

- Bayrakdar, S., & Guveli, A. (2020). *Inequalities in home learning and schools' provision of distance teaching during school closure of COVID-19 lockdown in the UK. ISER Working Paper Series*.
- Bernardi, F., & Grätz, M. (2015). Making up for an unlucky month of birth in school: Causal evidence on the compensatory advantage of family background in England. *Sociological Science*, 2, 235–251.
- Bertrand, M., & Pan, J. (2013). The trouble with boys: Social influences and the gender gap in disruptive behavior. *American Economic Journal Applied Economics*, 5, 32–64.
- Bol, T. (2020). Inequality in homeschooling during the Corona crisis in the Netherlands: First results from the LISS panel. *SocArXiv*. <https://doi.org/10.31235/osf.io/hf32q>.
- Campbell, D. T., & Kenny, D. A. (1999). *A primer on regression artifacts*. London: Guilford Press.
- DiPrete, T., & Jennings, J. (2012). Social/ behavioral skills and the gender gap in early educational achievement. *Social Science Research*, 41, 1–15.
- Fiorini, M., & Keane, M. (2014). How the allocation of children's time affects cognitive and noncognitive development. *Journal of Labor Economics*, 32, 787–834.
- Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, 312, 1900–1902.
- Holtmann, A.-C., & Bernardi, F. (2019). The equalizing effect of schools and its limits. In R. Becker (Ed.), *Research handbook on the sociology of education*. Edward Elgar Press.
- Hsin, A., & Felfe, C. (2014). When does time matter? Maternal employment, children's time with parents, and child development. *Demography*, 51, 1867–1894.
- Jæger, M. M., & Blaabæk, E. H. (2020). Inequality in learning opportunities during Covid-19: Evidence from library takeout. *Research in Social Stratification and Mobility*. <https://doi.org/10.1016/j.rssm.2020.100524>.
- Lareau, A. (2003). *Unequal childhoods*. Berkeley, CA: University of California Press.
- Morgan, S. L., & Winship, C. (2015). *Counterfactuals and causal inference*. Cambridge University Press.
- Tillmann, R., Voorpostel, M., Kuhn, U., Lebert, F., Ryser, V. A., Lipps, O., ... Antal, E. (2016). The Swiss household panel study: Observing social change since 1999. *Longitudinal and Life Course Studies*, 7(1), 64–78.
- Voorpostel, M., Tillmann, R., Lebert, F., Kuhn, U., Lipps, O., ... Refle, J.-E. (2020). *Swiss household panel Covid-19 study user guide*. Lausanne: FORS.
- Weigold, A., Weigold, I. K., & Russell, E. J. (2013). Examination of the equivalence of self-report survey-based paper-and-pencil and internet data collection methods. *Psychological Methods*, 18(1), 53–70.
- Wößmann, L., Freundl, V., Grewenig, E., Lergetporer, P., Werner, K., & Zierow, L. (2020). Bildung in der Coronakrise: Wie haben die Schulkinder die Zeit der Schulschließungen verbracht, und welche Bildungsmaßnahmen befürworten die Deutschen? *Ifo-Schnelldienst*, 9-2020.