Arrival of Young Talent: The Send-down Movement and Rural Education in China: Reply

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Abstract

Chen et al. (2020A) find that the arrival of urban youths during the send-down movement benefited the education of rural children as an unintended consequence. Gong et al. (2020) questioned our results and raised four issues on variable coding, identification, mechanism, and welfare implications. All these four issues are either fully acknowledged or extensively discussed in our paper. Most of the comments or arguments in Gong et al. (2020) rely on anecdotal stories or personal experiences without presenting data-based empirical evidence as a support. Some of them are misleading or simply wrong. In this reply, we will make more clarifications and provide more evidence to show that the four issues raised in Gong et al. (2020) neither invalidate our empirical design nor change our key findings.

1 Introduction

In 1968, two years after the start of the Cultural Revolution, China’s central government launched the “send-down movement,” which mandated about 16 million urban youth to temporarily resettle in rural areas. In Chen et al. (2020A), we provide systematic and statistical evidence on an important finding: the arrival of sent-down youths (SDYs) unintendedly improved the education of millions of children in rural China. The intended goal of sending SDYs down to the countryside was not to educate rural children, but to urge them to receive ideological education from poor peasants. Due to their advantage in education, some of SDYs were assigned to teaching rural kids instead of doing farm work. A large number of well-educated youths suddenly arrived at poor villages all over the country, making hundreds of millions of rural children accessible to education otherwise unavailable.

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Gong et al. (2020) (GLLWZ henceforth) raised a number of critiques in their comment on Chen et al. (2020A). This reply aims to respond to their critiques in great details and also further clarify the empirical design, identification assumption, and contribution of our study. We start our reply with a summary of GLLWZ’s major critiques and our brief replies, and then present our detailed point-by-point responses.

1. “The paper’s handling of data leads to inadequate measurement of the key dependent variable of individual educational attainment.” They claimed that during the movement period, the system of schooling years for primary, junior high, and senior high education shifted from previous 6-3-3 to 5-2-2, thus the 6-3-3 coding in our paper is inadequate, and the recoding into 5-2-2 will make our key estimates statistically insignificant and even negative.

   - Our brief reply: Our paper made a lengthy footnote (footnote 21) to acknowledge the shifts in the system of schooling years during the movement and explain why we used the 6-3-3 coding as a baseline specification. More importantly, being aware of the potential coding errors, we provided additional supportive results in our paper that are immune to the coding issue, such as using graduation from or attendance into junior or senior high school as the dependent variable. In an econometric sense, their proposed recording only reflects a national change of schooling years during the Cultural Revolution, or cohort-level shifts, thus should not significantly change our results because we already controlled for cohort-fixed effects in all our regressions. This is indeed the case: when we recode our years of schooling in the way as GLLWZ proposed, we obtain a somewhat smaller estimate than our original one (2.233 versus 3.237, see below) but it remains highly significant. We CANNOT replicate the insignificant and negative result they reported. We have to point out that different from their claim, the shift of the schooling system during the movement or Cultural Revolution period was neither universally applied nor fully implemented across regions (we will provide strong evidence for it). So the real case about years of schooling during our sample period is something between 6-3-3 and 5-2-2, varying at cohort-region levels (so far such a dataset is unavailable). To some extent, our estimates based on 6-3-3 and 5-2-2 coding respectively provide an upper-bound and lower-bound estimation of the treatment effect on years of schooling, which both point to a significantly positive effect.

2. “The parallel-trend assumption for their identification strategy does not hold cleanly. The treatment variable . . . was not exogenous or random.” They argue that the great leap forward in
basic education in rural areas during the Cultural Revolution, which almost overlapped with the send-down movement, contributed to the increase in education attainment of rural kids.

- Our brief reply: As is well known, the identification strategy—cohort difference-in-differences (DID)—does not require the densities of SDYs to be exogenous or random, but does depend upon the parallel trends. We emphasized this point for multiple times in our paper, and used different data and added more controls to ensure that the parallel trend hold. Regarding the confounding effects of great leap forward in basic education in rural areas overlapping with the send-down movement, our paper devoted an entire subsection (Section IV.C) to addressing this issue and showed strong robustness to inclusion of the effects of rural expansion in basic education. Their comments failed to offer any concrete argument against either the results or empirical designs shown in Section IV.C.

3. They questioned our mechanisms because they argue: (1) SDYs were not well-educated, (2) not many of them became teachers, and (3) they did not live with farmers.

- Our brief reply: We do not need many SDY to be well-educated or become rural teachers to make our mechanism work. A rural teacher can teach a class of 30–50 students at one time and multiple classes per week. Therefore, even a small proportion of reasonably educated SDYs could provide an important supplement to the under-supply of teachers in most rural areas at that period. Our mechanism does not require SDYs to live with farmers even though most SDYs did reside in the villages and closely interacted with peasants in our sample period. We find solid evidence that their claim that SDYs did not live with farmers was only valid before the starting of the massive send-down movement in 1968. Also, our sample focuses on SDYs sent to rural villages rather than those working on state farms.

4. They criticized us for not conducting welfare analysis that takes into account the social cost of the send-down movement.

- Our brief reply: We have never denied the huge social cost of the movement and actually reviewed a large literature studying the negative consequences of the movement on SDYs. In the conclusion of our paper, we clearly acknowledged our limitation that we only examine the benefit side of the send-down movement on rural children without evaluating its huge social costs (such as deprivation of educational opportunities of SDYs themselves). The purpose of our paper is not to make a welfare analysis of the movement, but to uncover its unintended consequences on rural education, which has not been done in the previous literature. The
presence of huge social costs itself cannot negate the positive effects of the movement on educational attainment of millions of rural people, which helps us to understand the formation of human capital stock in rural China in pre-reform era and its long-term impacts on the reform era.

We have to emphasize that all these four issues are either fully acknowledged or extensively discussed in our paper. Using the same dataset and the recoding method they proposed, we cannot replicate their reported result. Most of their comments or arguments rely on anecdotal stories or personal experiences without presenting data-based evidence as a support. Some of them are even misleading or simply wrong. For example, Gong et al. (2020) repeatedly use Shanghai as an example—the most developed region in China that is so unrepresentative of China’s vast rural countryside our analysis focused on. They even cite the example of Shanghai (page 20) to support their claim that the rural areas did not treat SDYs as an important source of teachers. Even if this is true for Shanghai, this case does not imply there was no teacher shortage in much less-developed rural areas during that period (we will show other case studies on rural villages suggesting a shortage of teachers as a real challenge and the villages regarded SDYs as an important source of teachers). In order to emphasize the chaotic situation during the Cultural Revolution and its impact on education, they cited a source to argue for the widespread school closure during 1966–1968, but from the same source, we find out the authors are actually talking about school closure in urban China, not on the countryside. Our evidence shows clearly that the countryside was actually experiencing an expansion of schools during the same period.

In the remainder of this reply, we will make detailed clarifications and provide more evidence to respond to their comments and demonstrate that all the issues raised in Gong et al. (2020) neither invalidate our empirical design nor change our key findings.

2 Coding for Years of Education

2.1 Are our results driven by miscoding of schooling years?

GLLWZ claimed that the miscoding of years of education drove our results and the estimated effects of SDYs on rural education become negative and statistically insignificant if the code error is corrected. By “miscoding” they mean that our paper assigns a value of six/three/three for completing primary/junior high/senior high education (the 6-3-3 system). GLLWZ recoded the schooling years as 5-2-2 during the Cultural Revolution since they argued that there was a thorough shift from previous 6-3-3 to 5-2-2 during the period. However, we acknowledged and discussed this coding issue in a lengthy footnote (footnote
21) in Chen et al. (2020A). Actually, two of our coauthors wrote a separate paper on the shifts between three-year and two-year middle school education during and after the Cultural Revolution (Chen et al., 2020B). GLLWZ’s claims added nothing to this discussion and largely repeated what was acknowledged in footnote 21. Their claims do not threaten our empirical results for at least three reasons. First, our results are fundamentally driven by higher rates of secondary school graduation (or attendance) that are immune to the coding issue. Second, their recoding of school years is all about national-level changes and should be already absorbed in cohort effects controlled in all our regressions. Actually, when we recode years of schooling according to their proposal, we obtain a similar result (see below) and cannot replicate their negative and insignificant result. Third, the shift in the schooling system during the Cultural Revolution was not uniform across regions and overtime, and there were significant cohort-region variations (see Chen et al. (2020B) for more details). We also provide empirical evidence that the implementation of 5-2-2 was far from perfect. The simple replacement of 6-3-3 with 5-2-2 is not founded. Below let us illustrate these reasons in details.

**Our Alternative Education Outcomes Are Immune from the Coding Issue.** In footnote 21 in Chen et al. (2020A), we acknowledged that our way of coding is imperfect and pointed out the positive effect on years of education should be interpreted as “*either a higher education level or a higher probability of graduation.*” This is the reason why we show in Table 3 of our paper using two sets of outcome variables—imputed years of education and primary school and junior high school graduation. To be clear, the results on the primary school and junior high school graduation (columns (3)–(6) of Table 3 in Chen et al. (2020A), or columns (1) and (3) of Table R1 in this reply) are immune to the coding issue pointed out by GLLWZ. People may have a concern that the shorten curriculum mechanically increased the graduation rate because it lowered the difficulty of school completion. We therefore use the attendance dummies in columns (2) and (4) of Table R1 and obtain similar findings.

**Their Recoding Simply Reflects Cohort-Fixed Effects Already Controlled in Our Regressions.** The recoding of the schooling years from 6-3-3 to 5-2-2 proposed in Gong et al. (2020) is no more than cohort fixed effects—cohorts who received education during the Cultural Revolution might receive education of fewer years than older cohorts. We were fully aware of the shifts in the schooling years—this is the reason why we adopted a cohort DID approach and introduced local densities of SDYs in each county, plus controlling for a set of cohort trends and province-cohort fixed effects.

Put it in an econometric way, assume there exists a genuine “years of education” \( Y^*_{i,g,c,p} \). The gap between our imputed years of education \( Y_{i,g,c,p} \) and the genuine values effectively creates a missing
Table R1: The Effect of SDYs on the Educational Attainment of Rural Children (1990 Census)

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Primary Education</th>
<th>Junior High Education</th>
<th>Years of Education (Recoded)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Graduate</td>
<td>Attend</td>
<td>Graduate</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Local Density of Received SDYs</td>
<td>0.441</td>
<td>0.373</td>
<td>0.767</td>
</tr>
<tr>
<td>*Affected Cohorts (1956–1969)</td>
<td>(0.0873)</td>
<td>(0.0868)</td>
<td>(0.121)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,775,858</td>
<td>2,775,858</td>
<td>2,775,858</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.258</td>
<td>0.248</td>
<td>0.212</td>
</tr>
<tr>
<td>( \bar{Y} ) of Control Group</td>
<td>0.616</td>
<td>0.631</td>
<td>0.205</td>
</tr>
<tr>
<td>Individual Controls</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>County FE</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Province-cohort FE</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Base Education×cohort FE</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

Note: Only rural sample is used. Standard errors are clustered at the county level. Individual controls include gender and ethnicity. Local density of received SDYs is computed by dividing the number of received SDYs by the county population in 1964. Base education is calculated as the primary and junior high graduation rates of the control group.
variable $\eta_{i,g,c,p} = Y_{i,g,c,p} - Y^*_{i,g,c,p}$. Therefore the main equation becomes

$$Y_{Edu_{i,g,c,p}} = \beta_0 + \beta_1 \%SDY_{c,p} \times I (1956 \leq g \leq 1969) + \beta_2 X_{i,g,c,p} + \lambda_c + \mu_{g,p} + \Lambda_c \times \mu_g + \eta_{i,g,c,p} + \varepsilon_{i,g,c,p}.$$ 

GLLWZ’s claim about measurement error merely shows the existence of a missing variable. But the existence of $\eta_{i,g,c,p}$ does not necessarily bias the estimate of $\beta_1$—for the bias to occur, the measurement error has to be correlated with $\%SDY_{c,p} \times I (1956 \leq g \leq 1969)$ conditional on other covariates including cohort fixed effects ($\mu_{g,p}$). A simple replacement of 6-3-3 with 5-2-2 for the affected cohorts in the Cultural Revolution only reflects the cohort fixed effects which are already controlled for in all our regressions. Actually we try to replicate GLLWZ’s recoding method by treating 1966 and 1978 as the years of policy changes (see Table R2). Compared to our original estimate in the paper, their coding method actually yields a somewhat smaller but still high significant estimate (2.233 versus 3.237) (see columns (1) and (2) in Table R1). This is no surprise since there is no reason to expect a change of coding at the cohort level to alter our main results when the cohort effects are already controlled for. But to our big surprise, their reported result cannot be replicated.

The True Value May Lie Somewhere Between Our Two Estimates. We would like to emphasize that GLLWZ’s claim about a nationwide, uniform shift in the schooling system from 6-3-3 to 5-2-2 is unfounded. As detailed in Chen et al. (2020B), there were significant cohort-regional variations in the enforcement of the schooling reform during the Cultural Revolution. Additionally, the enforcement was far from perfect. In order to support our argument, we exploit the 2010 wave of China Family Panel Studies (CFPS) which provides valuable information about the exact years of schooling at each education level. Figure R1 shows that the enforcement of 5-2-2 scheme was surprisingly weak. Even for the most affected cohorts, only 40%-60% of them actually received two years of junior/senior high education. Although the 5-2-2 system was better enforced in primary education, still more than 20% of the pupils took a six-year primary school. So the real case about years of schooling during our sample period is something between 6-3-3 and 5-2-2, varying at cohort-region levels (unfortunately we do not have such a nationally-representative dataset). To some extent, our estimates based on 6-3-3 and 5-2-2 coding respectively, shown in columns (5) and (6) in Table R1, provide an upper-bound and lower bound estimation of the treatment effect on years of schooling, which both point to a significantly positive effect.

1Note that this decline is mechanical because junior high graduation previously implies an increase of three years of education—now the increase becomes two.

2Chen et al. (2020B) contained information for about 160 counties in the sample of CFPS, which only accounts for about 6 percent of China’s counties.
Table R2: The *Supposed* Schooling Years by Education Level and Cohorts (GLLWZ’s approach)

<table>
<thead>
<tr>
<th>Cohorts</th>
<th>Primary School</th>
<th></th>
<th>Junior High School</th>
<th></th>
<th>Senior High School</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year in 5th grade</td>
<td>Years of Education</td>
<td>Year in 2nd grade</td>
<td>Years of Education</td>
<td>Year in 2nd grade</td>
<td>Years of Education</td>
</tr>
<tr>
<td>1946</td>
<td>1957</td>
<td>6</td>
<td>1960</td>
<td>3</td>
<td>1963</td>
<td>3</td>
</tr>
<tr>
<td>1947</td>
<td>1958</td>
<td>6</td>
<td>1961</td>
<td>3</td>
<td>1964</td>
<td>3</td>
</tr>
<tr>
<td>1948</td>
<td>1959</td>
<td>6</td>
<td>1962</td>
<td>3</td>
<td>1965</td>
<td>3</td>
</tr>
<tr>
<td>1949</td>
<td>1960</td>
<td>6</td>
<td>1963</td>
<td>3</td>
<td>1966</td>
<td>2</td>
</tr>
<tr>
<td>1950</td>
<td>1961</td>
<td>6</td>
<td>1964</td>
<td>3</td>
<td>1967</td>
<td>2</td>
</tr>
<tr>
<td>1951</td>
<td>1962</td>
<td>6</td>
<td>1965</td>
<td>3</td>
<td>1968</td>
<td>2</td>
</tr>
<tr>
<td>1952</td>
<td>1963</td>
<td>6</td>
<td>1966</td>
<td>2</td>
<td>1968</td>
<td>2</td>
</tr>
<tr>
<td>1953</td>
<td>1964</td>
<td>6</td>
<td>1967</td>
<td>2</td>
<td>1969</td>
<td>2</td>
</tr>
<tr>
<td>1956</td>
<td>1967</td>
<td>5</td>
<td>1969</td>
<td>2</td>
<td>1971</td>
<td>2</td>
</tr>
<tr>
<td>1957</td>
<td>1968</td>
<td>5</td>
<td>1970</td>
<td>2</td>
<td>1972</td>
<td>2</td>
</tr>
<tr>
<td>1960</td>
<td>1971</td>
<td>5</td>
<td>1973</td>
<td>2</td>
<td>1975</td>
<td>2</td>
</tr>
<tr>
<td>1964</td>
<td>1975</td>
<td>5</td>
<td>1977</td>
<td>2</td>
<td>1979</td>
<td>3</td>
</tr>
<tr>
<td>1968</td>
<td>1979</td>
<td>6</td>
<td>1982</td>
<td>3</td>
<td>1985</td>
<td>3</td>
</tr>
</tbody>
</table>
Note: Authors’ calculation from the 2010 wave of CFPS. We only keep the standard schools and exclude special school types such as adult schools.

2.2 Is deterioration in the quality of education a major issue?

Gong et al. (2020) also raised the concern about the quality of education during the Cultural Revolution. This is the very concern of our analysis as well—our paper devoted almost an entire section (Section V. Lasting Effects of SDYs) to address whether the effects of SDYs on educational attainment represented certain improvement in educational quality, and we found evidence for the increased educational quality brought by SDYs (Table 8 in Chen et al. (2020A)).

Gong et al. (2020) did not present any concrete criticism on what we analyzed in Section V but described in details how educational quality deteriorated during the Cultural Revolution. Pointing to the negative effects of the Cultural Revolution on educational quality per se does not threaten our empirical analysis at all: In an econometric sense, these effects will be absorbed by cohort fixed effects, and our cohort-DID identification incorporating local variations in densities of SDYs yields estimates of the SDY effect on educational quality independent of the general effects of the Cultural Revolution. Actually in our paper (column (4) in Table 6), we took account of the effects of the Cultural Revolution in an explicit way, which is much more sophisticated than their general descriptions since we introduced interactions between the Cultural Revolution cohorts and county-level severity of the campaign captured
by the the number of victims in each county as the share of the county’s population in 1964 using data from the “China Political Events Dataset, 1966–1971” (see Section IV.D of Chen et al. (2020A) for more details). Our key results remain robust to the inclusion of the effects of the Cultural Revolution.

While there is a consensus that education quality deteriorated in elite urban schools, whether the education before the Cultural Revolution was good in rural villages to start with was debatable. Hannum (1999) described the basic education system in China since 1949 as vacillating between a socialist egalitarian model (that emphasized popularization) and a liberal competitive model (that emphasized quality). Before 1966, education policies emphasized expertise, creating a system called “little pagoda” (xiaobaota). The system encouraged developing a small number of talented students for the college exams (Andreas, 2004). This implies that the educational content was not designed for the more populous rural children. During the Cultural Revolution, curriculum began to stress knowledge and skills that could be used in real life. For example, standard scientific courses (physics, chemistry, or biology) were combined into more practical courses such as basic industrial knowledge and basic agricultural knowledge (Han, 2001). We agree with Gong et al. (2020) that working in farms and factories are not a good form of education for the elite urban youths. However, this form of education could be more useful in the less-developed rural areas. Andreas (2004, pp.21) nicely described the usefulness of such vocational education in rural China:

*Lai Shui No.1 Middle School provided all senior middle school students with a common general education program for one and a half years and then divided them into small groups for 6 months of specialized training in tractor operation and repair, bookkeeping, orchard care, medicine (to train “barefoot doctors” to serve in village clinics), and veterinary medicine. The senior middle school run by Wang Cun Commune organized a successful school-run chemical fertilizer factory, and the most important part of its vocational program revolved around the factory.*

Gong et al. (2020) also treated school closures during the early period of the Cultural Revolution as another source of deteriorated education quality. They repeatedly cited Meng and Gregory (2002). For example, they wrote in page 7 that “To measure the impacts of these events, Meng and Gregory (2002) count the number of schooling years interrupted by the shut-down of all schools in 1966–1968.” They assumed all schools were shut down throughout China, which is not true. They did not notice that the study of Meng and Gregory (2002) focus on urban China. “At the beginning of the Cultural Revolution, all schools in urban China were closed for about 2–3 years. No teaching was carried out, and no new students were recruited” (Meng and Gregory, 2002, pp.936). Additionally, most primary
schools remained functioning during the period.\textsuperscript{3} We have several reasons to believe rural schools were much less affected. First, the initial purpose of the Cultural Revolution was to undercut differences between the peasantry and the remainder of the population (Hannum, 1999, pp.199), not to destroy education. This logic is consistent with school closure in the urban areas and simultaneous education expansion in the rural areas. Second, during 1966–1968, secondary education was still in limited scope in rural China, and it became increasingly important afterwards. Primary education was the main body of rural education in the early years of the Cultural Revolution. Lastly, even if we take GLLWZ’s claim about school closure as true (which is unlikely to be the case), it is still effectively a background variable and should be absorbed by cohort effects. Figure 3 in Chen et al. (2020A) (Figure R2 here) presents the effect of SDYs by each cohort. We observe statistically positive effect for cohorts born after 1963, who were supposed to enter primary school in 1970 and would not be affected by school closure anyway.

2.3 Are our results driven by a “great-leap forward” in basic education?

Gong et al. (2020) wrote on page 7 that “Meanwhile, China’s basic education experienced a “great leap forward” in quantity expansion, especially in rural areas…. This great leap forward alone would result in an increase in educational attainment of rural children even without SDYs, if attainment was simply measured by schooling years.” We are surprised that GLLWZ raised this point because we spent an entire subsection (Section IV.C. Rural Education Expansion Program) discussing the tremendous expansion in rural secondary education from the mid-1960s to the late-1970s. All GLLWZ’s discussion about the expansion campaign (both the drastic increase during the campaign and radical decline afterward) were already documented in Chen et al. (2020A). We stated on page 3416 that “According to the NBS, the number of secondary schools increased tenfold from 19,367 in 1965 to 198,963 in 1977” and “After Mao’s death, the expansion was partially reversed between 1978 and 1983. Many schools attached to production brigades were shut down, and at most one junior high school was retained in each commune (Pepper, 1990).” We also presented this trend in online Appendix Figure A2 in Chen et al. (2020A) (Figure R3 here).

To formally differentiate the effects of SDYs and rural education expansion, we collected county-year-level information on the number of primary and secondary schools from local gazetteers. Our analysis shows that the radical educational expansion during the Cultural Revolution indeed played an

\textsuperscript{3}Deng and Treiman (1997, pp.400) wrote that “Although most primary schools continued to operate as usual, almost all secondary and tertiary level institutions were shut down completely from 1966–68 and most tertiary level institutions remained closed until 1972.”
Figure R2: Effect of SDYs on the Educational Attainment of Different Cohorts

Panel A - Census 1982

Panel B - Census 1990

Panel C - Census 2000

Panel D - Three Censuses in One Graph

Note: Replication from Figure 3 in Chen et al. (2020A).
Figure R3: The Process of China’s Secondary Education Expansion since the Late 1960s

Panel A - Summary Statistics from Local Gazeteers

Panel B - National-level Statistics

Note: Replication from online Appendix Figure A2 in Chen et al. (2020A).
important role in boosting education in rural China. The magnitude is comparable to the estimated effect of SDYs. However, the quantitatively important effect of the educational expansion does not invalidate the importance of SDYs. A missing variable issue would bias our estimation only under the circumstance that conditional on other covariates, the missing variable is strongly correlated with the key independent variable \(\%SDY_{c,p} \times I(1956 \leq g \leq 1969)\). Column (2) of Table 6 in Chen et al. (2020A) presents the estimates when controlling for the process of education expansion and finds that our key estimate barely changes. This is not surprising because the improvement in rural education brought about by the SDYs was an unintended consequence of the send-down movement, while the rural education expansion was an intended campaign of the government. To shed some light on this point, the left panel of Figure R4 shows the correlation between the local densities of SDYs and the annual increase in secondary schools during the Cultural Revolution—we find no such correlation (correlation=0.008). In contrast, we find a strong correlation between the densities of SDYs and the increase of teachers (the right panel of Figure R4, correlation=0.29), which supports the mechanism that some SDYs became teachers. We will elaborate more on the mechanism issue in Section 4.

Figure R4: The Correlation between SDYs and School Construction during the Cultural Revolution

3 Failed Identification?

GLLWZ claimed our identification is “failed” because “this treatment variable bears features of endogeneity, accompanied by factors that invalidate the parallel-trend assumption” (Gong et al., 2020, pp.14). Again, this is a well-acknowledged issue in our paper. We emphasized multiple times that our
identification (cohort DID) does not require the densities of SDYs to be random or exogenous. We wrote on page 3394 that “Our identification strategy does not require the number of SDYs received in each county to be exogenous. The central requirement for identification in our cohort DID strategy is the parallel-trend assumption: . . .” and on page 3399 that “While our identification strategy does not require those numbers to be exogenous, it is important to understand the factors that affected the flow of SDYs.” We devoted an entire subsection (Section I.B. Flows of SDYs) to discussing about this issue. Almost all GLLWZ’s descriptions about the endogeneity of the density of SDYs coincided with our discussion and failed to offer any new insight. We already highlighted the fact that 92.1% of SDYs were reallocated within the province (page 3396), which contrasts previous studies that mainly focus on the inter-province flow of SDYs (Kinnan et al., 2018; Xing and Zhou, 2018). We also pointed out important factors that influenced the number of SDYs a county would receive, including the distance from cities and local condition of the destination counties.

The parallel-trend assumption is not testable because it requires the knowledge of counter-factual scenario if the send-down movement did not take place. That is why we took lots of efforts in presenting supportive evidence, including (1) a comprehensive control of heterogeneous trends (Section II.C), (2) no pre-existing trend prior to the movement (Figure 3), and (3) controlling for a wide range of confounding factors (Section IV). GLLWZ claimed the inter-regional collaboration as “a crucial confounding factor or contemporaneous event neglected in the paper” (Gong et al., 2020, pp.15). They wrote that “to persuade rural counties to willingly take in SDYs, major cities (especially provincial capital cities) where SDY originated had a policy to establish a long-term collaboration between city districts and the rural prefectures/counties.” Even if we assume the inter-regional collaboration is important (they failed to provide any evidence), the collaboration is more of a channel of the send-down movement than a confounding factor. The rural-urban collaboration was unlikely to happen without the occurrence of the movement and the arrival of SDYs. More importantly, this social connection hypothesis has nothing to do with our key results on the positive effects of SDYs on rural education and thus does not constitute a valid challenge to our identification about this part of estimation.

4 Fake Mechanism?

We provide evidence that better-educated SDYs contributed to the local pool of teachers and regard this as one specific channel of how SDYs improved education in rural China (Section III.B). Gong et al. (2020) believe this channel does not work because they argued (1) SDYs were not well-educated, (2) not many of them became teachers, and (3) they did not live with farmers. None of those claims are
relevant for our studies. First, we don’t need SDYs to be well educated although all of them came from urban areas with better educational facilities and teachers than rural areas, and a significant number of them came from big cities with much better educational resources. As long as a certain proportion of reasonably educated SDYs became teachers, this would significantly increase the pool of better-educated youths who were natural candidates of rural teachers. Second, we don’t require many SDYs to become teachers. According to NBS, there were only 0.66 million secondary school teachers in 1966 (NBS, 2010). Even a very small proportion of 17.7 million SDYs becoming teachers would be a meaningful increase in the supply of teacher. Note the fact about the economy of scale of educating process: A rural teacher can teach a class of 30-50 students at one time and multiple classes per week. Chen et al. (2020A) did some interesting calculation to illustrate this point: “the arrival of the SDYs significantly increased the supply of local teachers (by 0.75 for primary school teachers and 0.38 secondary school teachers per thousand inhabitants)” (page 3413). Out of the 22.0 SDYs per thousand inhabitants, only 1.13 became teachers (about 5 percent). This small share does not change the fact the the increased supply in teachers is important because the initial densities of teachers were so low in 1965. According to our data, the number of primary (secondary) school teachers per thousand inhabitants was only 4.9 (0.55) in 1965. Third, SDYs don’t need to live with peasants for the mechanism to work, although many of them did reside in villages interacting closely with peasants and their children on daily basis. Bear in mind that we mainly focused on the sample of SDYs sent to the villages rather than those working in state farms. We even don’t need the assumption that the SDYs were warmly welcomed in the locality—which is certainly debatable. Some interactions inside or outside the classrooms are enough for the SDYs to exert some influences on rural kids.

With all that said, we would like to emphasize several additional points to help understanding our paper. First, we make clear in our paper that the teacher-channel is not exclusive. We stated on page 3413 that “Note that we are not claiming that serving as teachers was the only channel of the SDYs’ effects in the send-down movement. In addition to teaching the standard courses, the urban youth also shared their knowledge, ideology, technology, and stories based on their urban experiences. Such communications could happen outside the classroom.” We are open to new channels. For example, if GLLWZ can provide solid and statistical evidence (in addition to narratives) on their inter-regional collaboration story, it would be a very nice complement to our study that help to better understand the contribution of SDYs in the countryside.

Second, GLLWZ used a case study (Shanghai) that is not representative to our study. To support their claim that “locale in the countryside did not regard SDYs as an important source of teachers,” they used the case of Shanghai—“Had SDYs been qualified as teachers, local governments would have
recruited them, as was indeed the case in Shanghai only for the better educated graduates of Classes 1966–67” (Gong et al., 2020, pp.20). We read this sentence for multiple times and realize the authors’ own experience actually provided direct evidence to our paper! Even for the well-educated cities like Shanghai, the government still recruited some SDYs to become teachers (even though the number could be very small). It is natural to expect the demand for teachers would be much stronger in less-developed rural countryside. Note that we purposefully excluded Beijing, Tianjin, Shanghai, and city-governed districts that were more-developed urban areas and focused on less-developed rural counties. In those poorer areas, there are many pieces of anecdotal evidence suggesting that (1) a shortage of teachers was a real issue in rural setting and (2) SDYs were important candidates for rural teachers. We list a few here:

- Gu (2009, pp.230): “Working as teachers in non-state-funded schools was an important experience of many educated youths. They dedicated themselves to the cause of education in rural China, especially in the remote areas.”

- Han (2001, pp.64): “these locally built schools were not as good as government-financed middle schools in towns cities (poor buildings, a serious lack of equipment, fewer and less competent teachers, and the inability to offer certain courses due to a shortage of teachers were frequent problems in rural settings). . . .”

- Han (2001, pp.67): “883 educated urban youth were sent to Jimo County in 1968, a number larger than the total number of county high school graduates (775) for the previous seventeen...show how the number of rural primary and middle school teachers increased in response to the policy of sending educated youth to the countryside.”

- Andreas (2004, pp.17): “The principal practical obstacle to expanding village education had always been a shortage of qualified teachers, and this problem became acute during the ambitious expansion of the Cultural Revolution decade.”

- Andreas (2004, pp.19): “The rural teacher shortage was addressed in two ways...Second, Village leaders selected young villagers who had finished middle school to serve as minban teachers, that is, teachers in community-run schools. The number of educated villagers who qualified to serve as minban teachers increased steadily during the early 1970s, as educated youth (zhishi qingnian) entered the village.”

Figure R4 shows that the densities of SDYs were not correlated with new schools but correlated with
new teachers, providing additional evidence that serving as teachers was an important channel that
SDYs improved rural education.

Third, GLLWZ’s description about SDYs’ living arrangement in the countryside was misleading.
In order to support their argument that SDYs were segregated from farmers, they wrote in page 21
that “They, however, typically lived by themselves in their own compound (so-called “jiti hu (collective
households)” or “zhiqing dian (SDY residence)” in a group of 3-10 persons (Bonnin, 2013, p. 242).”
However, the group resettlement (both jiti hu and zhiqing dian) was a major form of resettlement only
before 1968. Because the initial purpose of the send-down movement to re-educate the SDYs by the
poor farmers, the central government discouraged SDYs from living in its own group. A December
issue of People’s Daily criticized that SDY residence (zhiqing dian) drove SDYs away from politics
and poor farmers (Liu, 2009, pp.121). Although collective households (jiti hu) still existed, the groups
of SDYs became smaller and more scattered. Liu (2009, pp.123) wrote that “From the late 1960s
to the early 1970s when the re-reducation theory was dominating, jiti hu of SDYs started to transit
into production teams from people’s commune and production brigade. The size of zhiqing dian became
smaller. Meanwhile, the distribution of SDYs in the villages became more scattered. Going down on
one’s own (or 3–4 SDYs) was quite common.” They also did not acknowledge the fact that our county-
level data did not include those SDYs working in state farms to start with.\footnote{They wrote in page 21 that “…of all SDYs sent down during 1967–1979, about 27.4 percent were “nong chang zhi qing
(farm-worker youth)” (Table 3B in Liu, 2009), working as farm workers in state or collective farms, living a semi-military
life physically isolated from rural villagers.”} We conducted a comparison
between the county-aggregated number of SDYs and the number from the national report in the online
Appendix Table C1. The aggregated number from local gazetteers sums up to 10.6 million—about 60%
of the 17.7 millions SDYs. We explained in details in Appendix C about the possible reasons driving the
gap. One reason is that local gazetteers did not record SDYs sent to state farms—they were separately
recorded in the farm chronicles (nongchangzhi).

5 Lack of Welfare Analysis?

Gong et al. (2020) blamed us for not providing a systematic welfare analysis that take into account the
negative consequences of the send-down movement. They totally misread our whole paper. First, we
never deny the cost side of the movement. We reviewed a large literature focusing on the consequences
of the movement on the SDYs themselves, most of which were negative and even tragic. In our paper,
we actually reviewed most papers appearing in their comments to highlight the profoundly negative
social and economic consequences (Gong et al., 2020, pp.22). On page 3396 of Chen et al. (2020A), we
wrote that “The consequences include almost every aspect of one’s life course (Zhou and Hou, 1999), such as marriage (Song and Zheng, 2016), education and income (Xie et al., 2008), inter vivos transfer (Li et al., 2010), subjective wellbeing (Wang and Zhou, 2017), political attitudes (Harmel and Yeh, 2016), beliefs and values (Gong et al., 2015), and financial behavior (Fan, 2020).” Given such a huge pileup of previous studies examining the (negative) consequences of the send-down movement on SDYs themselves, we claim our unique contribution to this line of literature by focusing on the effects of the SDYs on the education attainment of rural children in the receiving regions.

Second, we made a clear statement at the end of our paper: “To the best of our knowledge, this paper is among the first to assess the benefits of the send-down movement on rural children. Since it was a mandatory and uncompensated migration from the SDYs’ perspective, this movement also caused many negative consequences for the SDYs (such as deprivation of further educational opportunities). How to evaluate the cost side of the movement is an important topic and we would leave it for future research” (Chen et al., 2020A, pp.3427).

Last but not the least, the contribution of our paper, namely highlighting an unintended, positive effects of the movement on a different population (rural children), does not depend upon a welfare evaluation of the entire send-down movement. The presence of huge social costs itself cannot refute the positive effects of the movement on educational attainment of millions of rural people, which are so real and persistent as to deepen our understanding of the formation of a large human capital stock in rural China in pre-reform era and its long-term impact on the reform era.

We would like to end our discussion here with a concluding paragraph from Liu (2009, pp.533)—a book that GLLWZ cited frequently to highlight the social costs of the send-down movement.

“Illustrating the historical lessons from the send-down movement is not equivalent to erasing SDYs’s contribution in developing rural villages and borderland under harsh conditions. SDYs and the send-down movement are two concepts that are conceptually related but differ in implications. People would not forget the achievement of SDYs in spreading agricultural knowledge, popularizing education, providing healthcare services, and changing the under-development status of poor regions. We should cherish the shining of youth forever, especially during the decade that tortured millions of people.”
References


