sociological science

Equalization through Deterioration: The Shrinking Gender Gap in Swedish School Grades

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Abstract: This article documents a surprising reversal in the long-standing gender gap in academic achievement: between 2021 and 2024, Swedish girls' school grades declined sharply, whereas boys' grades remained stable, narrowing the gender gap by over a third. Using full-population data on official school grades and national test scores, the analysis shows that the decline is broad based, affecting nearly all subjects and concentrated among previously high-performing girls. Changes in grading policy or long-term mental health trends are unlikely to account for the sudden downturn. Instead, the evidence points to behavioral changes in girls' school engagement, possibly triggered by external shocks. Among the most plausible shocks are the rise of TikTok, which increased in popularity among girls just before the grade decline, and Covid-19 disruptions, which may have acted as a catalyst. Although the causes remain uncertain, the pattern signals a sociologically significant disruption, challenging assumptions of stable female academic advantage and inviting international replication.

Keywords: educational achievement; school grades; gender equality; gender gap

Reproducibility Package: A reproducibility package is available at https://osf.io/y8vmk/files/osfstorage. Parts of the article are based on publicly available aggregate data. These data, links to sources, and code to reproduce the analyses are provided in the reproducibility package. Parts of the article are based on analyses of microdata accessed through Statistics Sweden's secure MONA server within the framework of the Inequality project with ethical approval from the Swedish Ethical Review Authority (Dnr 2019-02761). Data can be accessed only after ethical approval from the Swedish Ethical Review Authority (see https://etikprovningsmyndigheten.se/en/) and after secrecy assessment of Statistics Sweden (see https://www.scb.se/en/services/ordering-data-and-statistics/). A list of necessary registers and variables and code to reproduce the analyses are provided in the reproducibility package.

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THE female academic advantage has emerged as one of the most striking educational transformations of the past half-century. Since the 1980s, girls and women have systematically overtaken boys and men in school achievement and educational attainment across virtually all Western countries (OECD 2024; Pekkarinen 2012)—a trend so widespread that it suggests deep-rooted social, cultural, and institutional causes. Although these gains were initially celebrated as progress toward gender equality, they have increasingly been reframed as an imbalance, giving rise to debates about a "boy crisis" in education and the need for targeted support for male students.

In the sociology of education, it has become widely accepted that gender gaps in academic achievement are expanding in the favor of girls. These trends are typically assumed to be persistent products of long-run shifts in gender norms, behaviors,

and institutional practices. However, what if this seemingly stable pattern is now starting to reverse?

Using new full-population data from Sweden, a country that has long been a forerunner in gender-related trends, this article documents a narrowing gender gap in school grades—not because boys are improving but because girls are doing worse. I examine the magnitude and contours of this reversal and evaluate candidate explanations by comparing their implications to the observed patterns. Although I cannot isolate definitive causal mechanisms, I can assess the plausibility of competing accounts and rule out some.

The decline has occurred over three years (2021–2024), so it is yet too early to say whether this is a temporary decline or whether it may signal the early stages of a broader reversal of gender gaps in education. The abrupt downturn in girls' grades marks a break in a long upward trajectory of female educational performance. Even in the absence of a definitive causal explanation, such a reversal has sociological significance: disruptions to stable patterns may signal deeper structural or cultural transformations not yet visible in official discourse.

The Swedish case is worth watching and replicating in other countries. Declining performance is concerning in itself, but Sweden may also offer early evidence of a new trend. Just as the rise of the female academic advantage reflected large-scale shifts in gender roles, aspirations, and institutional arrangements, its potential erosion may speak to equally consequential, but as yet poorly understood, societal changes.

The Puzzle: A Sudden Decline among Girls

Sweden's comprehensive school system spans grades 0–9, enrolling students from age 6 to 16 in a unified, non-tracked structure. At the end of grade 9—the final year of compulsory schooling—students receive subject-level grades from F to A, each mapped to a 0–20-point scale. The sum of a student's 16 best subject grades yields a "grade sum," ranging from 0 to 320. This grade sum is reported in official statistics and used for upper secondary school selection. For recent cohorts, the mean is approximately 220 with a standard deviation of about 70.

Figure **??** shows the trend in average grade sums from the 2007 to 2024 finishing cohorts. Until 2020, grades trended steadily upward for both sexes—a pattern widely attributed to grade inflation, as teacher-assigned grades are not tied to external benchmarks. There was no corresponding rise in performance on standardized international assessments, such as Programme for International Student Assessment (PISA). Boys and girls followed parallel grade trajectories, aside from a temporary dip for boys in 2016 and 2017, linked to an influx of unaccompanied young male migrants.

The break in this trend is sharp and recent: after a slight decline in 2021, girls' average grades began to decline markedly in 2022, falling from 235 to 228 in 2024. Boys' grades remained largely unchanged, resulting in a narrowing gender gap by a third, from 26 to 17 grade points—a decline corresponding to around 15 percent of a standard deviation. This is the empirical turning point that motivates this article.

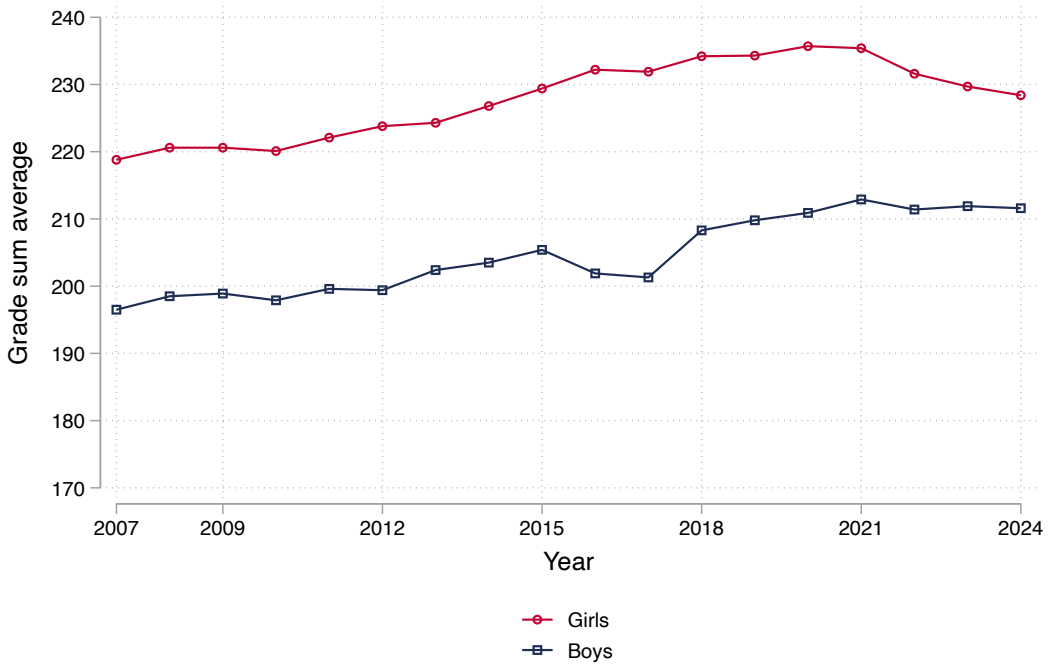

Figure 1: Average grade sum in grade 9 (final grade of compulsory school, age 16) for boys and girls in finishing cohorts 2007–2024 (normally born 1991–2008). Source: National Agency for Education, Official Statistics.

Given the long-term trend in grade inflation, a potential counterfactual is a continuing upward trend for boys as well as girls. In this case, the observed trend after 2021 could suggest a de facto decrease in performance also among boys—but a much smaller one than among girls. Crucially, the decreasing gender gap cannot be readily explained by changes in grading policy. The same A–F scale was used before and after the downturn and nothing changed in 2022. In 2023 (when the decline had already started), a regulatory change (Swedish National Agency of Education 2022b) arguably made grading more lenient by allowing teachers to make holistic judgments rather than requiring students to meet all preset criteria. If anything, this reform should have inflated rather than suppressed grades, meaning that absent this change, grades might have declined even further in 2023 (and for boys as well as girls).

A Shift from High to Middling Performance among Girls

Figure **??** compares grade sum distributions for girls and boys in 2020 (solid lines) and 2023 (dashed lines). For boys, the distribution is nearly unchanged.[1] Among girls, however, the upper tail has thinned: fewer girls now attain very high grade sums, whereas more fall into the middle of the distribution. There is also a slight increase in girls with grade sums around 140–170. In short, the gender gap has narrowed not only at the top of the grade distribution but also at the lower end with

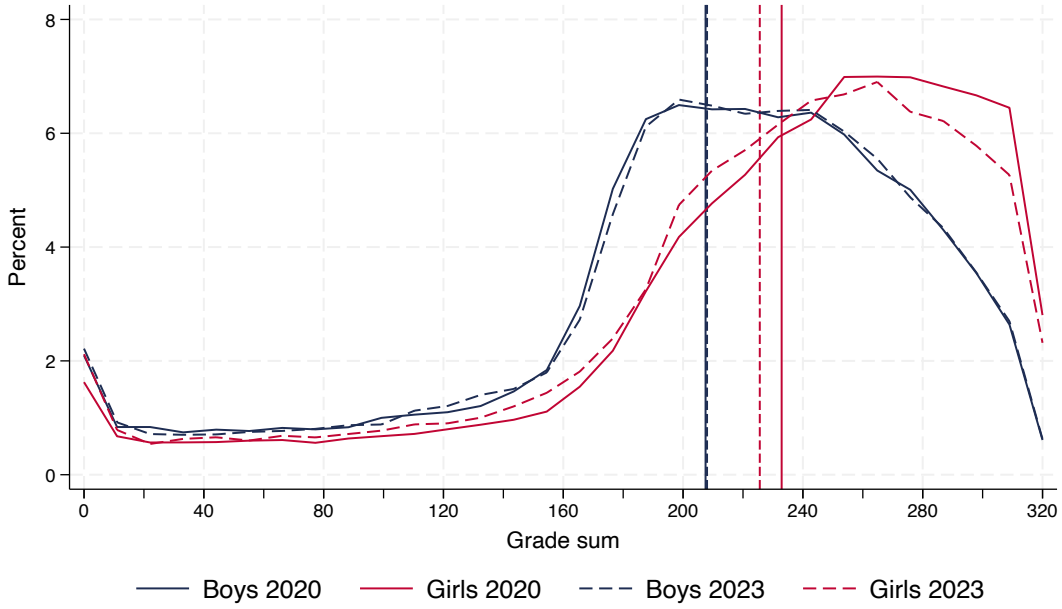

Figure 2: Distribution of grade sums in grade 9 (final grade of compulsory school, age 16) for boys and girls in finishing cohorts 2020 (solid lines) and 2023 (dashed lines). Vertical lines show average grade sums. Source: Microdata from educational registers.

high-performing girls becoming less common and average and low performance more common.

Girls Saw Declining Advantages in All School Subjects

The decline in girls' performance is not limited to one academic domain. Between 2020 and 2024, girls' average grades fell across nearly all school subjects. The largest drops occurred in Swedish (–0.9 points), Mathematics (–0.8), and Geography (–0.8). English was the sole exception, where girls improved slightly but boys improved more, reducing the gender gap even there.

Figure **??** shows the gender gap (female minus male average grades) for all subjects from 2020 to 2024. In 2020, girls outperformed boys in all subjects except sports, where grades were equal. In 2024, the female advantage had shrunk in every subject, and their parity in sports had turned into a marked disadvantage. In sum, the decline is systematic and wide ranging. It affects core academic subjects (Maths and Swedish), other subjects (social sciences as well as natural sciences and languages), and even practical subjects.

Why Might Girls' Grades Be Declining?

To understand why girls' grades have recently deteriorated, it is useful to revisit the established explanations for their long-standing academic advantage. One well-documented source of girls' advantage lies in so-called **non-cognitive traits**

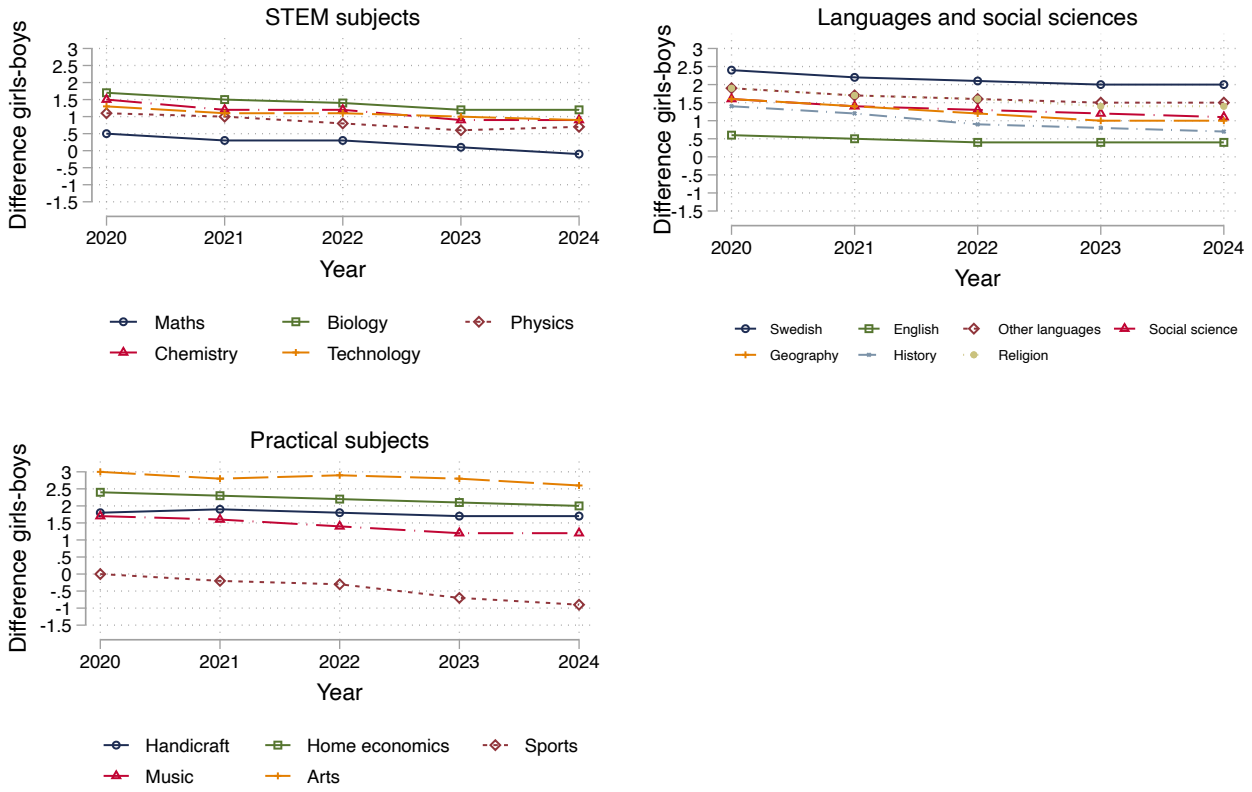

Figure 3: Gender grade gaps (female average grade minus male average grade) for different subjects 2020–2024. Downward sloping lines mean that the female advantage declined (or turned to a disadvantage). Source: National Agency for Education, Official Statistics.

(Buchmann et al. 2008; Cornwell, Mustard, and Van Parys 2013; DiPrete and Jennings 2012). The definition of non-cognitive traits is not fixed, but they are often measured in terms of behaviors such as effort, classroom engagement, and compliance with school norms. Effects of such behaviors may have two channels. First, although teachers should not reward behavior in and of itself, it is possible that they do this unconsciously (a "good behavior bias"). Second, non-cognitive traits such as school engagement can boost performance, especially in aspects of achievement that are hard to test with standardized instruments, such as active participation in group projects, oral presentation, or delivery of homework. Hence, a decline in grades could happen due to a deterioration in girls' non-cognitive traits.

Another explanation for girls' advantages focuses on **time allocation** and distractions. Boys spend more time than girls on leisure activities that take a lot of their time, such as video games and sports. The rise of social media may have changed girls' time allocation to become more similar to boys'—the explosive rise of TikTok is especially interesting as it is temporally well aligned with the downturn in girls' grades. TikTok will be addressed further below.

Mental health problems may adversely affect school performance. According to the Swedish Health Behavior in School-Aged Children (HBSC) survey, problems such as feeling low or irritated, as well as psychosomatic problems, have increased

between 2005 and 2022 in all studied age groups (11, 13, and 15). In all study cohorts, problems increase between ages 11, 13, and 15, and girls have markedly more problems than boys (Public Health Agency of Sweden 2023). Could mental health issues lie behind girls' decline? This is unlikely. The gender gap in mental health has been large for several decades, and until 2021 girls did better than boys in school in spite of their worse mental health. If mental health is the explanation behind the decline of girls' grades, something more must explain why it suddenly has this effect when this was not previously the case. If mental health plays a role, it is likely as an amplifier of other stressors rather than a standalone explanation of the sudden change.

Another mechanism that may amplify other factors is **peer effects**. High-school students' friend networks are highly segregated by gender, meaning that behaviors, norms, and expectations may spread in gender-specific ways. For example, boys have been found to be more exposed and more responsive to peers who exhibit school-resistant behavior (Geven, Jonsson, and van Tubergen, 2017) and girls could in a similar vein be vulnerable to changing norms among peers about homework and positive school behavior.

Could **grading practices** have become stricter? This is improbable. No official changes occurred until the 2023 cohort, and the reform introduced then actually encouraged more generous grading by allowing teachers to make holistic rather than criterion-based judgments. There is also no reason to believe that any tightening in practice would disproportionately affect girls.

The abrupt decline in girls' grades in 2022 points to a sudden external shock that disproportionally affected girls. Two candidates stand out: the rise of TikTok and the Covid-19 pandemic. International evidence shows that Covid had negative effects on student learning, especially among those from lower socioeconomic backgrounds (Betthäuser, Bach-Mortensen, and Engzell 2023). This is plausible: families with fewer resources may have struggled to provide effective learning environments during school closures. However, it is not obvious why such disruptions would disproportionately harm girls, especially in a context like Sweden, where compulsory schools remained largely open.

Girls' advantage in non-cognitive traits, such as complying with demands and putting more effort in school work, is likely to have been helpful during the Covid disruptions. Because boys had more school difficulties to begin with, they were potentially more likely to lose out when schooling was disrupted and more responsibility put on the individual student. One possibility is that Covid shifted the weight teachers placed on observable classroom behavior when schooling was disrupted. At the same time, standardized tests were cancelled in 2020 and 2021, so teachers also had worse indicators of testable achievement, which would likely have opposite effects. Another possibility is that girls' greater vulnerability to mental health struggles may have interacted with the stress and social isolation of the pandemic to suppress engagement.

The existing literature offers limited guidance about gender differences in Covid effects. A recent review documented a lack of studies of gender differences in pandemic effects (Betthäuser et al. 2023), but one high-quality study in the Netherlands detected similar-sized learning losses among boys and girls (Engzell, Frey, and

Verhagen 2021). In short, while Covid is temporally adjacent to the observed trend, it does not offer an obvious gendered mechanism.

Are Test Scores Telling the Same Story?

National Test Scores

A comparison with trends in achievement tests can suggest which kind of performance that drives the decline among girls. Sweden's national tests, taken in grade 9 a couple of months before final grades are assigned, offer a useful comparison point. These are the same for all students and cover the same domains every year but have different contents. Hence, they may vary in difficulty. All students take tests in Maths, Swedish, and English, one social science subject, and one natural science subject, and all students in a given school take the same natural science and social science subject. Hence, while around 100,000 students (a full cohort) take the core tests, around 20–40,000 students take each of the other tests. Tests are teacher graded following a standardized template, and they impact but are not decisive for grades. Test scores have the same scale as grades.

Figure **??** shows the gender gap in average test scores (female minus male) for cohorts in 2019 and 2022–2024 (due to the Covid pandemic, no tests were carried out in 2020 and 2021). The results confirm a declining female advantage in all subjects between 2019 and 2024, with strong declines in Swedish, Mathematics, Biology, Physics, Chemistry, Geography, Religion and History, and small declines in English and Social Science. The timeline of the decline in test scores is not perfectly synchronized with the decline in grades: while grades fell most steeply between 2021 and 2022 and continued to decline in 2023 and 2024, test scores declined more between 2022 and 2023, and stabilized somewhat thereafter. Overall, the results for test scores are jumpier. For the non-core subjects, this may be partly due to variation in the samples (they are not necessarily based on the same schools over time), but it may also be due to random variation in the type of test items.

These patterns suggest that part of the grade decline reflects genuine deterioration in achievement, but that this is not the full explanation. The more consistent drop in grades points to an additional role for factors that the national tests do not capture. Notably, the Swedish national test scores are not a pure yardstick of achievements. First, some achievements are hard to measure with standardized tests (such as oral performance, performance in creative projects, or in group work), and these achievements may be legitimately reflected in grades. Second, just as grades, tests are graded by teachers who know the students, meaning that non-achievement factors such as effort or good behavior may affect the assessment—at least in some subjects—albeit not as much as for grades.

PISA Test Scores

PISA 2022, which assesses a sample of Swedish 15-year-olds, paints a different picture. Between 2018 and 2022, both girls and boys saw a decline in Maths and reading, consistent with international trends attributed to Covid-related learning disruptions. However, the gender gaps in PISA remained unchanged across all

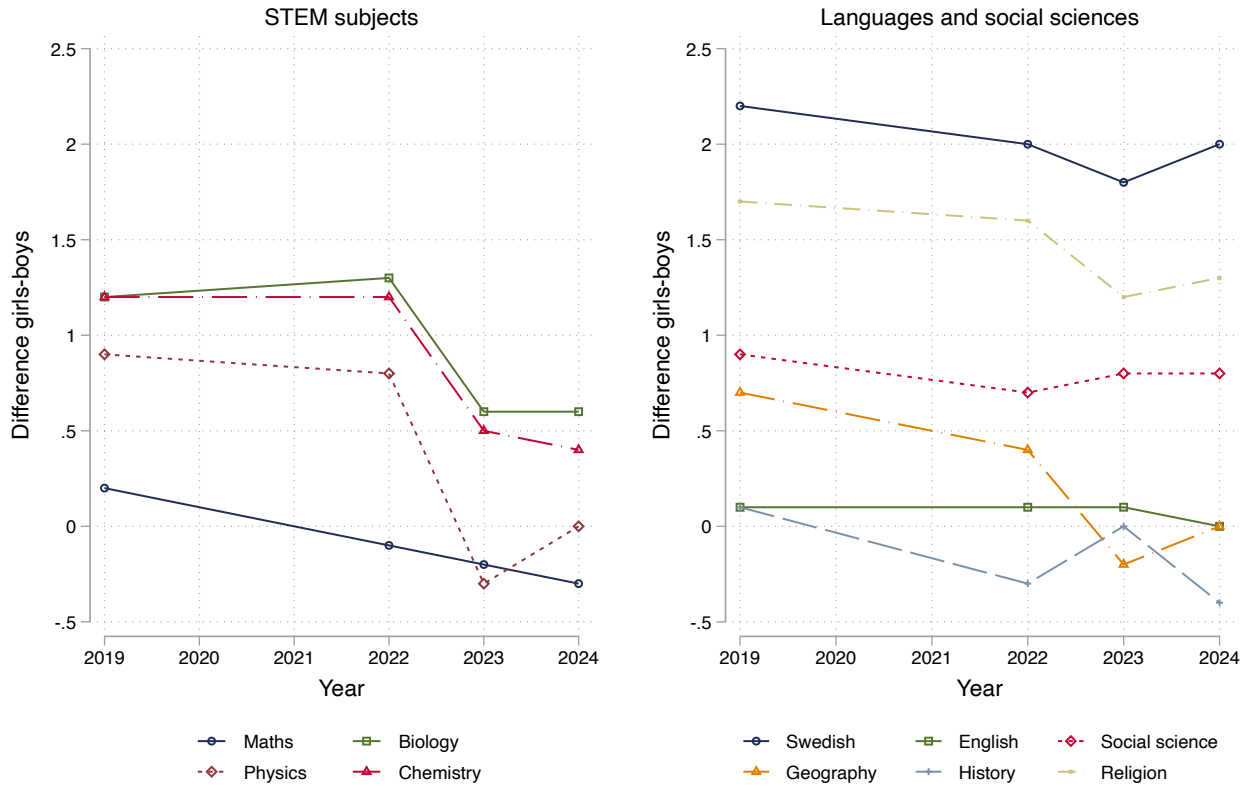

Figure 4: Gender test score gaps (female average score minus male average score) in tests for different subjects, grade 9 cohorts 2019 and 2022–2024. Source: National Agency for Education, Official Statistics.

subjects, including reading (where girls outperform boys), Maths (no gap), and natural sciences (small female advantage) (Swedish National Agency of Education, 2023).

Why do Swedish grades and national test scores show shrinking gender gaps, while PISA does not? One reason may be content mismatch: PISA evaluates achievement against international benchmarks rather than the Swedish curriculum,[2] and unlike grades or national tests, PISA leaves little room for teacher discretion. A further possibility is sample bias. PISA assesses around 5,000–6,000 students, and research suggests that the sample overrepresents high-performing students. In 2018, for example, the average grade sum among PISA participants was 233, compared to 218 in the full population (Borger, Johansson, and Strietholt 2024). PISA also underestimates variation in achievement. Although these biases may not distort gender comparisons directly, they likely reduce the sensitivity of PISA to subtle population-level trends.

Given the long-term inflationary trend in grades in Sweden, the recent changes may best be compared with a counterfactual of a continuation of the upward trend. In this perspective, the changes in grades in 2022 can reflect deteriorating achievement for boys as well as girls, in line with the PISA results. However, the decreasing advantage for girls over boys—not seen in PISA—would suggest that

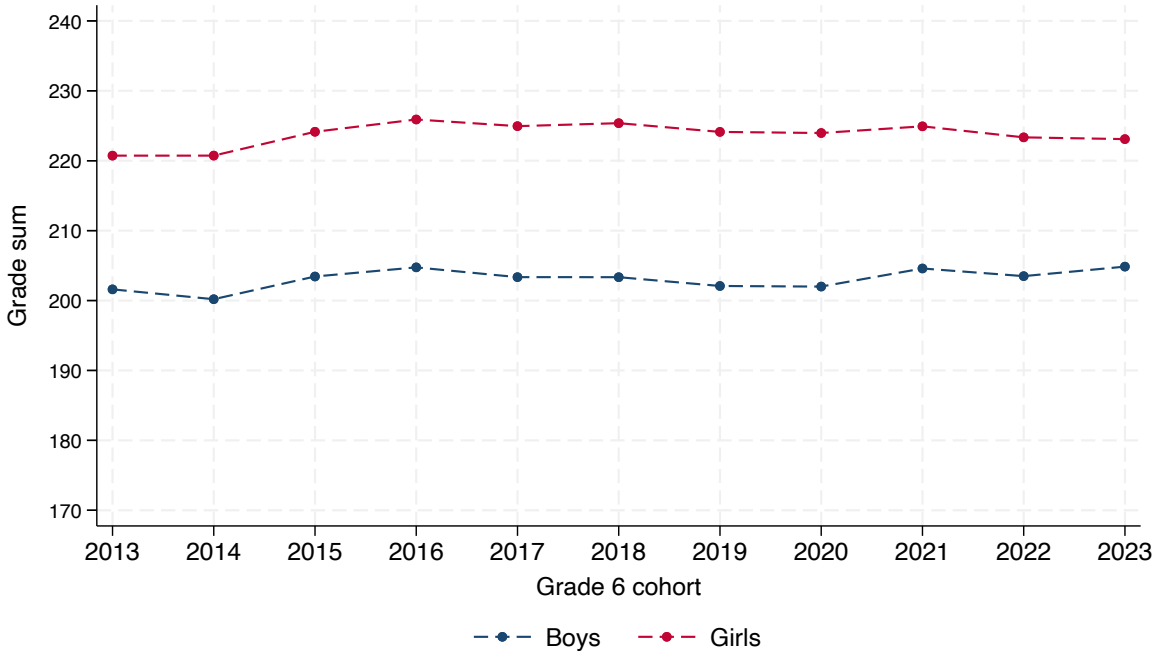

Figure 5: Average grade sums in grade 6 (age 13) for boys and girls 2013–2023. Source: Microdata from educational registers.

girls' grades suffer also from some additional factor. However, given the differences in sampling and test content, this remains speculative.

Taken together, the evidence suggests that girls' test performance has declined, but that their steeper drop in grades likely reflects additional factors, such as declining classroom engagement or shifting behaviors not captured by standardized assessments.

Age, Period, and Cohort?

To clarify the nature of the decline in girls' grades, it is useful to ask: Is this a cohort effect (a lasting feature of a given birth cohort), a period effect (something affecting students in different cohorts at a point in time), or an age-specific response to a shared shock?

Since 2013, Swedish students have received official grades not only in grade 9 (end of compulsory schooling) but also in grade 6 (end of middle school). This allows for comparison of performance across two key ages within the same cohort. Although grade 6 grade sums are not published in official statistics, they can be calculated from microdata. Similar to grade 9 grades, the scale goes from 0 to 320, with a 2023 average of 214 (SD = 55). Figure **??** shows no systematic trend in grade 6 grades across recent cohorts, for either girls or boys.

Figure **??** shows grades for the same students across both points in time, including only those present in both grade 6 and grade 9. Girls who later showed a decline in grade 9 grades had no such drop in grade 6, suggesting that the affected cohorts

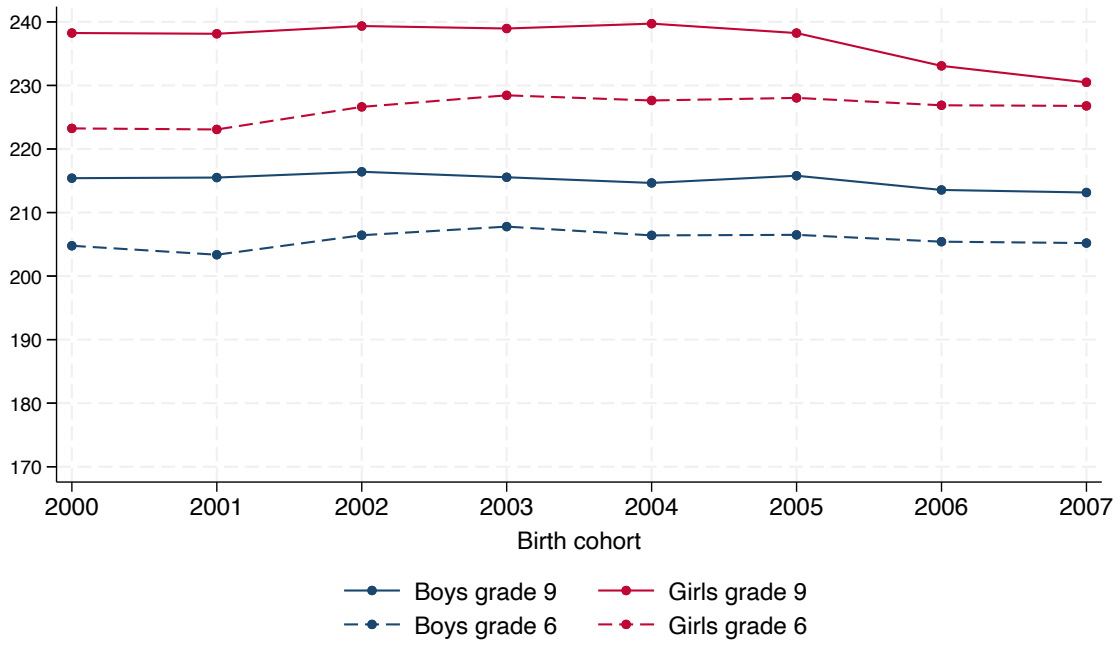

Figure 6: Average grade sums in grade 6 and grade 9 for boys and girls in grade 9 finishing cohorts 2016–2023. Source: Microdata from educational registers.

were not intrinsically lower performing. Instead, the decline appears to stem from something that occurred after grade 6 (around 2019 and 2020) but before or in grade 9 (2022 and 2023). Additional analyses (not shown) confirm the expectation from Figure **??** that the largest declines occurred among girls who had previously been high performers.

This pattern rules out simple cohort or period explanations. Instead, it points to a period effect that interacted with age and gender: Something in the post-2020 environment selectively undermined school performance among adolescent girls, while leaving boys and younger girls largely unaffected.

Is Covid the Explanation?

Covid-19 was a major and sudden disruption to schooling. In Sweden, the first wave began in March 2020 and continued to affect schools through early 2022. Although Sweden, unlike many other countries, kept its compulsory schools formally open, individual schools had discretion to shift to remote learning, and many did so, especially in 2021. High rates of staff and student absenteeism further disrupted regular instruction (Swedish National Agency of Education 2022a).

Table **??** summarizes pandemic exposure by school cohort. The 2020 cohort was affected at the very end of grade 9, including the cancellation of the national tests. The 2021 cohort suffered disruptions also during the full grade 9 school year and cancellation of national tests. The 2022 cohort experienced disruptions during much of grades 7–9, including the most frequent use of distance education. Later cohorts encountered the pandemic earlier in their schooling.

Table 1: Exposure to Covid restrictions by grade 9 cohort.

Grade 9 Cohort	Exposure to Covid Restrictions
2020	Last months of grade 9. No national tests in grade 9.
2021	Last months of grade 8, all of grade 9. No national tests in grade 9.
2022	Last months of grade 7, all of grade 8, first months of grade 9.
2023	Last months of grade 6, all of grade 7, first months of grade 8. No national tests in grade 6.
2024	Last months of grade 5, all of grade 6, first months of grade 7. No national tests in grade 6.

If the decline in girls' grades is primarily a Covid effect, we would expect the steepest declines among students most exposed to the pandemic. Areas where many foreign-born people live were more adversely affected by Covid, and teachers in schools with many students of foreign background reported that students' learning suffered to a higher extent than did teachers in other schools (Swedish National Agency of Education 2022a). Foreign background students also have fewer socioeconomic resources, which—in line with international findings—would suggest that they suffered more from Covid than Swedish-background students. If Covid is the mechanism behind girls' decreasing grades, we would expect a larger drop among girls of immigrant background.

Figure **??** compares average grades by gender and parental origin (SwB = Swedish-born parents; G2 = generation 2, foreign-born parents). Here, we exclude those who have immigrated, as the composition in terms of age of immigration varies across the cohorts and makes them difficult to compare. Curves fluctuate

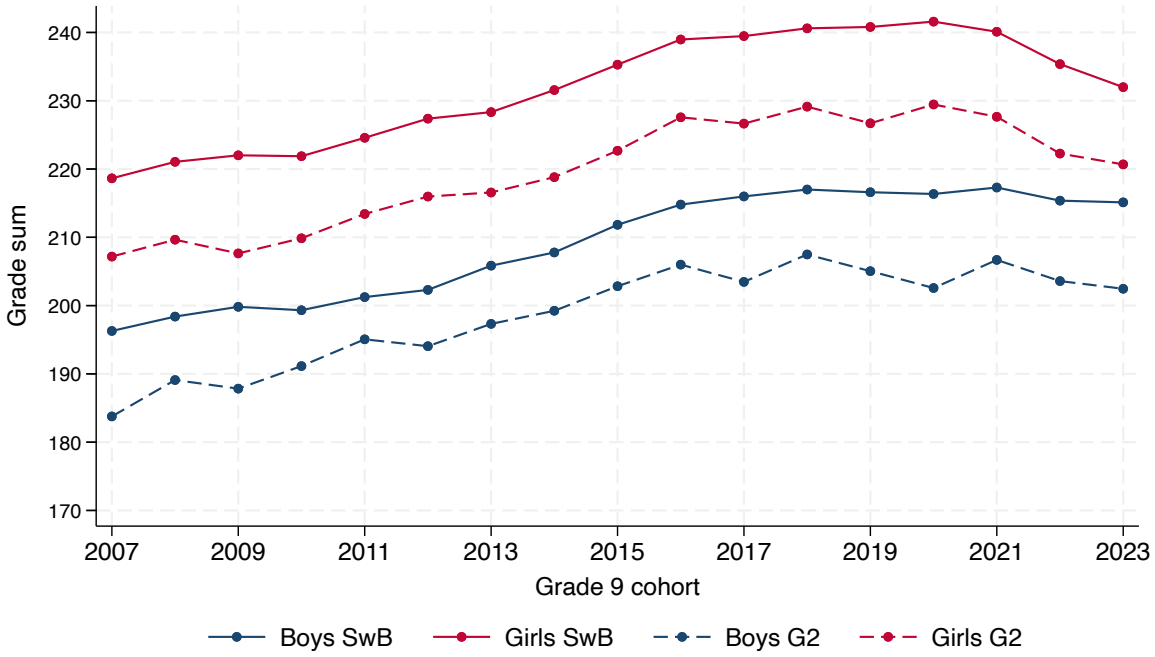

Figure 7: Girls' and boys' average grades for students with Swedish-born parents (SwB) and for students born in Sweden to two foreign-born parents (G2). Source: Microdata from educational registers.

more for generation 2 children due to smaller group size. Strikingly, however, the decline among girls is equally steep among those with Swedish-born parents and those with two foreign-born parents. This is only an indirect test, but it does not support the case for Covid as the driver of girls' declining grades.

Is TikTok the Culprit?

TikTok is a video-sharing app that was launched in 2017 and became extremely popular in Sweden around late 2019 (Airnow 2020; The Swedish Internet Foundation 2020). In 2021, around 50–60 percent of Swedish high-school students reported using TikTok daily, and in 2022 and 2023 that figure had risen to around 70 percent (Swedish Agency for the Media 2023; The Swedish Internet Foundation 2020–2024). Although both boys and girls use the platform, usage data consistently show that girls are more frequent users. In 2020, 71 percent of girls and 47 percent of boys reported using TikTok daily, and in 2022 the corresponding numbers were 79 percent versus 61 percent (Swedish Agency for the Media 2021, 2023).

TikTok has a short-form, captivating format and has gained a reputation for being highly immersive. It is possible that it steals time from homework, reading, and other activities that support academic performance. In this respect, TikTok may be to girls what video games have long been to boys: a time-intensive distraction. The timing aligns well: TikTok surged in popularity just prior to the downturn in girls' grades, and its usage has remained high even as pandemic disruptions have faded.

Unfortunately, little public data exist on individual-level TikTok usage linked to academic outcomes, making this explanation hard to test directly. Still, the gendered, time aligned, and behaviorally plausible profile of TikTok makes it a stronger candidate than Covid for explaining the selective decline in girls' grades.

Conclusion

This study documents a surprising reversal in a long-standing educational pattern: the gender gap in academic achievement (final comprehensive school grades at age 16) in Sweden is narrowing. This is not due to boys' improvement but to a marked and systematic decline among girls over three consecutive years from 2021 to 2024. Equalization is often seen as a sign of progress, but this case reminds us that convergence can result not only from improvement for the worse-off but also through deterioration for the better-off.

Despite the sudden and substantial change, there is no obvious explanation, and this article is an initial exploration of this puzzle. By means of a cumulative argument, I have discussed how compatible the observed patterns are with different possible individual factors behind the trend, such as a decline in non-cognitive traits, a change in time allocation, or worsening mental health. To account for the sudden decline in grades, any such changes must interact with or be triggered by some sudden external event. I reach some conclusions:

First, the fact that data are for the full population and the grades are the officially reported ones rule out explanations such as sampling error or related methodolog-

ical artifacts. Second, because there is no reason why a harsher grading practice would apply disproportionally to girls, it is likely that something actually happened with the students and not with their teachers. Third, the declining gender gap is not seen in the PISA survey and is less systematic in national test scores than in teacher-assigned grades. This gives tentative support for the decline in non-cognitive traits mechanism, as such traits are likely more reflected in grades than in test scores.

Thus, the results point to a change in behavioral aspects such as effort and school engagement rather than in cognitive skills. This is also in line with the fact that there were no gender gaps in the affected cohorts at younger ages. Therefore, what can possibly have occurred in the period 2021–2024 that had a disproportionate negative effect for 13–16-year-old girls?

Among potential explanations, Covid-19 and TikTok emerge as temporally aligned candidates. It is not obvious why girls' school results would suffer more from Covid, and I find that girls with immigrant parents see no stronger decline despite immigrant families being more adversely affected by Covid.

TikTok fits more closely as it gained popularity particularly among girls just prior to the decline. If TikTok is the trigger, it may have operated through changes in time allocation and effort and school engagement. Of course, Covid and TikTok are not mutually exclusive. Covid may have acted as a catalyst, creating more unstructured time and fewer in-person leisure activities, which in turn provided fertile ground for a highly engaging platform like TikTok to take hold. Although mental health is unlikely as a standalone mechanism, it is possible that young girls' mental health vulnerabilities were part of a "cocktail effect," merging with Covid and TikTok to produce an unprecedented downturn in grades.

Whether this trend will persist remains uncertain. It may prove temporary, which would still make it a puzzle but a less consequential one. Alternatively, it may signal the beginning of a broader change in school engagement among adolescent girls. It is also possible that Sweden—long a forerunner in gender and education patterns—is simply the first to register a shift that may surface elsewhere. The degree to which this will be reflected in school performance likely depends on the structure of grading systems across countries, and on how well they capture dimensions beyond testable achievement. If the decline is specific to Sweden, it would add another part to the puzzle. The sudden events that occurred in Sweden—Covid and the rise of TikTok—applied to other countries as well. Why would Swedish youth see a different impact?

Even without a confirmed cause, the pattern itself carries sociological weight. When stable inequalities begin to shift, they often signal deeper changes in norms, behavior, or institutional dynamics. Descriptive reversals are not merely empirical curiosities but may be early warning signs that long-held assumptions or secular trends may no longer hold. As such, this finding invites attention to the topic not only from education researchers but also from anyone concerned with changing gender stratification and gender norms.

Notes

1 Figure **??** is based on aggregate data from the Swedish National Agency for Education. Microlevel data, necessary for Figure **??**, are so far only available until 2023.

2 PISA results do however correlate rather strongly with grade 9 grades and grade 9 national tests (correlations in 2022: Maths 0.73–0.74; natural science 0.63–0.64; and reading 0.59–0.63) (Swedish National Agency of Education 2025).

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