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Same but different: Gender, social origin, and university access. Results from a field experiment on guidance counseling

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ABSTRACT

Inequalities based on social origins heavily influence university access, shaping individuals' careers and earning potential. While educational interventions in upper secondary schools have shown promise in supporting students from low social origins, their effects on gender disparities in university access remain less clear. This study investigates how social origins and gender intersect to affect university enrollment and whether counseling programs influence these patterns. Using data from a randomized controlled trial (RCT) in Germany evaluating a counseling program, our analysis reveals two key results. First, students' evaluations of higher education appear to be shaped by their social background and gender before high school graduation. Second, the counseling program altered these evaluations and enrollment rates in distinct ways depending on students' social background and gender. Our findings contribute to research on social stratification by highlighting intersectional patterns in rational choice evaluations and university enrollment. We also demonstrate that counseling in Germany effectively reduces intersectional inequalities in enrollment, which particularly benefits women from low social origins.

1. Introduction

It has been well established that inequalities based on social origins influence university access (Neugebauer & Schindler, 2012; Shavit et al., 2007).¹ These disparities in enrollment have important implications for individuals' careers and lives, as a university degree can provide substantial financial benefits (OECD, 2022, p. 80). Policymakers, practitioners, and researchers have long sought to reduce these inequalities. In recent years, there has been growing interest in educational interventions, which can be an effective means of promoting enrollment. These programs, offered in upper secondary schools, provide information about educational pathways and sometimes even individualized support in navigating the decision-making and enrollment process. According to rational choice theory, such programs can alter students' perceptions of the costs, benefits, and success probabilities of various educational alternatives that influence inequalities in educational decisions (Boudon, 1974; Breen & Goldthorpe, 1997; Erikson & Jonsson, 1996). Numerous studies have demonstrated that guidance counseling,

the most widespread educational intervention, promotes the enrollment of students from low social origins (for an overview, see Herbaut & Geven, 2020). Some research has also shown that these interventions can have negative effects on enrollment for students from high social origins (Renée, 2025, p. 173; Pietrzyk et al., 2025). These findings underscore the potential of educational interventions to reduce educational inequalities based on social origins.

However, sociological research on inequalities in university access has predominantly adopted a unidimensional approach, focusing solely on social origins. This leaves our understanding of educational interventions incomplete. Specifically, inequalities in university access have rarely been investigated through a lens that considers both social origin *and* gender. This is surprising, given the strong influence of gender on educational success (McDaniel & Buchmann, 2015) and the growing recognition and empirical validation of intersectional perspectives in educational research (Autor et al., 2019; Blossfeld et al., 2016; Breen et al., 2010; Ortiz-Gervasi, 2020; Parker et al., 2020; Prix & Kilpi-Jakonen, 2022; Seehuus, 2019). This study addresses this gap by

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¹ We use the term university as a synonym for an institution of higher education and do not intend to differentiate between university and college, as is common in the United States.

adopting a new perspective on the gendered nature of university access.

Furthermore, research on gendered educational decisions has often focused on horizontal inequalities in choosing a field of study, especially in examining their underlying causes (Ochsenfeld, 2016). More recently, research has expanded to include how interventions can influence these horizontal inequalities (Barone et al., 2019; Beckmann & Fervers, 2024; Erdmann, Schneider, et al., 2023; Finger et al., 2020). In contrast, we investigate university access itself and propose a theoretical perspective that emphasizes both intersectional analysis and considering performance. This dual focus enables us to identify at-risk student groups that might otherwise be overlooked. For instance, this approach may highlight risks faced by women from low social origins in specific educational contexts.

Like many others, we acknowledge that women have overtaken men in terms of overall enrollment (OECD, 2019, p. 198), presumably due to their strong performance. However, they may still be disadvantaged compared to men when making enrollment decisions, when considering performance, particularly in their evaluation of the benefits, costs, and success probabilities associated with pursuing a university degree. Even when women's performance equals or surpasses that of men, they may evaluate these factors less favorably. This could be influenced, for example, by perceived gender differences in labor market outcomes and the potential for gender discrimination. Women may also be more sensitive to the costs of higher education and more likely to assess their academic and career prospects more pessimistically than their male counterparts. This disadvantage may be particularly evident in contexts where the educational system provides attractive post-secondary alternative educational tracks for some women-dominated occupations. It may also explain why, in some countries, women with an entrance qualification appear to enroll less often than men in higher education despite their superior performance (e.g., Switzerland, Austria, and Germany; see Erdmann, Helbig, et al., 2023).

Disadvantages faced by women in rational choice evaluations may contribute to patterns of inequality in university access and shape how these patterns change when interventions are implemented, particularly when social origins are also considered. Specifically, unfavorable rational choice evaluations based on both social origins and gender could lead to a cumulative disadvantage, resulting in particularly low enrollment rates for women from low social origins—when accounting for performance. At the same time, this group may benefit the most from enrollment support, as interventions could help mitigate disadvantages in their rational choice evaluations. However, no research has examined how treatment effects on rational choice evaluations or enrollment vary based on social origins and gender. We address this research gap by investigating whether guidance counseling alters rational choice evaluations and higher education enrollment rates for women and men from low and high social origins heterogeneously.

To introduce our specific context, we first present descriptive statistics on differences in rational choice evaluations based on social origins and gender, using baseline data collected prior to the implementation of the treatment and before high school graduation, while considering students' performance during this period. Building on this, we examined treatment heterogeneity by social origin and gender, separately analyzing rational choice evaluations and enrollment rates to determine how these outcomes are influenced by the intervention. We utilized a special dataset from Germany in which young men and women from low and high social origins participated in a randomized controlled trial (RCT) evaluating an intensive counseling program offered in upper secondary schools designed to promote the enrollment of disadvantaged groups. Participants were surveyed multiple times following the program's implementation, allowing us to assess treatment effects on rational choice evaluations measured before high school graduation and on enrollment with high internal validity. Though we could not rigorously test whether the program effect on enrollment rates was mediated by its effect on rational choice evaluations, we could still assess whether the observed pattern of program effects was consistent with mediation.

By using rich longitudinal and experimental data, this study contributes to social stratification research in three key ways. First, we provide a detailed account of how evaluations of higher education are shaped by the intersection of social origin and gender within specific contexts, helping identify groups that may have been overlooked in previous studies. Second, examining heterogeneous treatment effects on enrollment allowed us to assess how well programs address the specific challenges faced by different at-risk groups and whether these programs can help close enrollment gaps. Third, by expanding our focus beyond enrollment to students' rational choice evaluations, we critically engage with and further advance sociological theories regarding how enrollment inequalities are produced.

The following section outlines the theoretical background and presents our hypotheses. We then provide an overview of the German context, describe our research design, and present our results. Finally, we conclude with a discussion emphasizing the importance of investigating the intersection of social origins and gender in research on inequality and interventions aimed at reducing disparities in university access.

2. Background

2.1. Inequalities in University Access Based on Social Origin

Numerous studies have documented inequalities in enrollment based on social origins (Neugebauer & Schindler, 2012; Shavit et al., 2007), with researchers often attributing these disparities to differences in academic performance and rational choice evaluations (Boudon, 1974; Breen & Goldthorpe, 1997; Erikson & Jonsson, 1996). The variance in academic performance between students from low and high social origins is typically attributed to resource differences that reduce the likelihood of enrollment for students from low social origins. Evaluation differences include estimations of cost, benefits, and probability of success associated with educational pathways. Since students from low social origins tend to perceive higher costs, lower benefits, and a lower likelihood of success compared to their peers from high social origins, these evaluations further reduce their likelihood of enrollment.

The relationship between rational choice evaluations of higher education and educational decisions has been examined in various survey studies. While these studies can establish empirical correlations that align with theoretical considerations, they cannot demonstrate a strictly causal effect of rational choice evaluations on enrollment. Moreover, the findings have been mixed, likely reflecting the influence of specific settings. For instance, Becker and Hecken (2009) showed that working-class children in Germany appear to be discouraged from pursuing higher education due to negative evaluations of their prior performance, low perceived success probabilities, and high expected costs. Similarly, Daniel and Watermann (2018) observed that in Germany, perceived benefits and success probabilities positively influence intentions to enroll in higher education, while costs and investment risks negatively impact these decisions. Jakob and Combet (2020) examined a context where the cost of higher education was particularly high, showing that while cost factors may be less significant in high-income countries, they seem to account for 45 % of the social background effect in El Salvador, where financial barriers substantially hinder students from lower-income families despite their strong aspirations for tertiary education.

In contrast, other studies suggest that additional factors might play key roles. Barone et al. (2018), for instance, found that in Italy, indirect costs and structural factors, such as high school tracking, were more prominent in perpetuating disparities than rational choice mechanisms. Similarly, Fujihara (2023) concluded that in Japan, subjective factors like cost, success probability, and perceived benefits have limited explanatory power in class origin-related inequalities. While these findings partially align with the rational choice model, they also highlight its limited applicability to understanding educational inequalities

in certain contexts.

Interventions offered during upper secondary school to address inequalities in university access often target rational choice evaluations. Guidance counseling, for example, provides students with individualized information about higher education and supports them in navigating the decision-making and enrollment process. Several studies, primarily from the United States and Canada, indicate that counseling promotes higher education enrollment among students from low social origins (Herbaut & Geven, 2020), whereas the effects of educational interventions can even be negative for students from high social origins (Renée, 2025, p. 173; Pietrzyk et al., 2025). In education systems where viable alternatives to higher education exist, counseling may actually decrease enrollment among students from high social origins. For instance, vocational education and training (VET) offers relatively robust labor market prospects in Germany and Switzerland (Reimer & Pollak, 2010; Scharenberg et al., 2016), making it a more attractive option for some students from high social origins, particularly those struggling with high academic demands. However, despite the extensive research on treatment effects on enrollment, studies exploring the mechanisms underlying these effects remain scarce. It is still unclear whether counseling influences students' rational choice evaluations and, consequently, their enrollment rates.

2.2. Inequality in University Access Based on Gender

In contrast to inequalities in university access based on social origin, gender inequalities may be more complex. While considerable research has examined horizontal gender inequalities in this vein (Barone, 2011; Ochsensfeld, 2016), gender disparities in university access and their relationship to rational choice evaluations have received less attention. In this context, we propose a new perspective on the potential disadvantages faced by women, taking into account their academic performance. It is only when their superior performance is considered that women may appear disadvantaged in terms of enrollment—due, perhaps, to their less favorable rational choice evaluations. As a result, women may not fully realize their academic potential when they choose not to pursue higher education. Educational interventions could help reduce this disadvantage, allowing women to catch up with men, also considering their performance.

It is well established that women perform well academically (OECD, 2015; Voyer & Voyer, 2014), and it seems reasonable to expect that this strong performance would translate into high enrollment rates (Buchmann et al., 2008). Indeed, women are more likely than men to enroll in higher education (OECD, 2019, p. 198), which is consistent with their overall educational advantage (DiPrete & Buchmann, 2013). However, women may still face an enrollment disadvantage due to unfavorable rational choice evaluations, even given their strong academic performance. In recent decades, women have made remarkable progress in terms of enrollment (van Hek et al., 2016; Vincent-Lancrin, 2008). Researchers have partially attributed this to increased demand for labor in the service sector and expanded access to high-status occupations for women. These shifts in labor market opportunities, which have likely influenced women's rational choice evaluations, are believed to have contributed to higher enrollment rates among women (Becker, 2014; Hadjar & Buchmann, 2016). However, this positive trend does not necessarily indicate that women have come to value the benefits of higher education and the probability of success in the same way as men. On the contrary, disadvantages for women in rational choice evaluations may have persisted.

Several factors may explain why women expect fewer benefits from a university degree, all of which relate to gender inequalities in the labor market. Women may anticipate career interruptions due to family responsibilities, as gender divisions between care work and paid work remain prevalent in many families (Edlund & Öun, 2016; Salin et al., 2018). Even with equal pay, the expectation of working fewer hours may lead women to anticipate fewer benefits from a university degree

compared to men. Additionally, women with the same education and qualifications as men continue to face discrimination in the labor market (Combet & Oesch, 2019; Quadlin, 2018), which may lead them to expect comparatively lower returns. Women may also consider the gender segregation of the labor market and its associated wage structures (Leuze & Strauß, 2014; Zheng & Weeden, 2023), leading them to expect lower financial returns from a university degree, especially if they pursue a degree in a gender-segregated field of study.

Gender differences may also affect perceived success probability. Women tend to underestimate their abilities, often viewing them as inferior to men's despite performing at the same level (Fiedler et al., 2024; Huang, 2013). As a result, women may doubt their capacity to complete a degree and rate their probability of success as lower.

Some studies have suggested that women have less favorable rational choice evaluations than men, particularly in terms of success probability (Jackson, 2003; Lörz et al., 2011; Tolsma et al., 2010) and perceptions of higher education benefits (Lörz et al., 2011). Furthermore, these unfavorable rational choice evaluations seem to negatively impact women's enrollment (Lörz et al., 2011). However, no study has examined gender-specific enrollment rates while accounting for performance, nor has research established whether women are discouraged from enrolling due to unfavorable rational choice evaluations when their performance is considered.

Since counseling aims to reduce inequalities in university access, professional advice might influence not only disparities based on social origins but also gendered rational choice evaluations, encouraging women and enabling them to enroll at the same rate as men while achieving comparable performance. Regarding perceived benefits, counselors could encourage young women to develop more optimistic expectations for themselves and inform them about the possibilities of combining an ambitious career with motherhood, ensuring that young women do not necessarily associate starting a family with reduced working hours. Additionally, counselors could promote optimism by assuring women that they may not experience gender discrimination in the labor market—whether due to their personal circumstances or broader reductions in discrimination as awareness of the issue grows.

Concerning the probability of success, counselors could help strengthen women's confidence in their ability to complete a degree. Specifically, they could provide a more realistic picture of the academic requirements of higher education and help women compare these with their past academic performance.

The impact of interventions on gender differences in rational choice evaluations and enrollment, independent of performance, has not yet been comprehensively examined (for studies where gender effects were reported as a minor outcome, see Barone et al., 2017; Castleman & Page, 2015; Kerr et al., 2020; for studies on migration-specific disparities, see Pietrzyk et al., 2023). However, researchers have hypothesized that providing information on the earning potential of certain occupations could influence the choice of major, especially for women, given their horizontal disadvantages (Barone et al., 2019; Finger et al., 2020).

2.3. Intersection in University Access and Intervention Effects

Although the intersection of social origins and gender in university access has not been comprehensively investigated, some studies have identified differences in educational outcomes based on these factors. For example, research has revealed disparities in academic performance (Autor et al., 2019), expectations of university graduation (Ortiz-Gervasi, 2020), and field choices in higher education (Prix & Kilpi-Jakonen, 2022; Seehuus, 2019), with variations depending on national context (Blossfeld et al., 2016; Breen et al., 2010; Lörz & Mühleck, 2019).

Based on these findings, individuals from low social origins and women appear to have less favorable rational choice evaluations. In particular, women from low social origins may be especially negatively biased in their evaluations due to the intersection of their social origin

and gender. Since rational choice evaluations influence enrollment decisions (Becker, 2014; Hadjar & Buchmann, 2016; Stocké, 2007), women from low social origins may have the lowest enrollment rates, given their less favorable evaluations when performance is considered.

As part of educational programs aimed at increasing enrollment among disadvantaged groups, counselors seek to positively influence students' perceptions of higher education. While researchers have generally assumed that such interventions help reduce disparities related to social origins, gendered differences have not been explicitly examined. Moreover, if an intersectional disadvantage exists in rational choice evaluations based on social origins and gender, treatment effects may also be heterogeneous across intersectional groups. Specifically, counseling may have a particularly strong effect on the rational choice evaluations of young women from low social origins, reducing the disadvantages associated with both their social origin and gender.

Thus, we examine whether the effects of guidance counseling on rational choice evaluations vary by social origin and gender, assuming that women from low social origins experience the strongest treatment effect (H1).

Additionally, since rational choice evaluations are assumed to shape enrollment decisions, differences in treatment effects on evaluations may lead to differences in treatment effects on enrollment. Women from low social origins are expected to benefit most from counseling in terms of enrollment, as their unfavorable evaluations are likely most influenced by counseling.

Thus, we examine whether the effects of guidance counseling on enrollment rates vary by social origin and gender, assuming a particularly strong treatment effect on the enrollment rates of women from low social origins (H2).

3. The German Context

We investigated our research questions regarding university access in Germany; therefore, in the following, we describe the specifics of the German education system in terms of social inequalities in obtaining higher education qualifications and in the transition from secondary school to higher education. First, despite the strong stratification in secondary education, which leads to social selectivity in acquiring university entrance qualifications (Haas & Hadjar, 2024), inequality in the transition to higher education remains significant (Hillmert & Jacob, 2010; Reimer & Pollak, 2010). Recent data indicates that only 65 % of students from low social origins with a higher education entrance qualification enroll in university, compared to 82 % of their peers from high social origins (Quast et al., 2023).

Second, gender patterns of enrollment in Germany differ slightly from those in other Western countries. In many countries, women enroll in university more often than men without consideration of additional background characteristics (OECD, 2019), often due to their strong performance. This is not the case in Germany. Without accounting for background characteristics, women with an entrance qualification (*Abitur*) in Germany enroll less often than men (Statistisches Bundesamt, 2024). This German specificity in gendered enrollment can be explained by the strong VET sector, which offers an alternative to higher education for some female-dominated occupations. For example, training for supportive and caring occupations typically held by women, such as nursing, occur within the VET system in Germany, whereas in other countries it is usually provided through university programs. As a result, rational choice evaluations regarding the benefits of higher education may be somewhat lower for women in Germany than in other countries, leading to women's low enrollment rates.

Third, the strong VET sector in Germany may also play a role in how counseling affects educational decisions. VET has often been discussed as a way to "divert" students from low social origins (Shavit & Muller, 2000). It is less academically demanding than higher education, promotes lower and middle management-level careers, and offers good earnings prospects, despite being relatively disadvantaged compared to higher education. Guidance counseling that provides targeted support to

disadvantaged students might encourage them to pursue higher education rather than VET to reach their full potential. Conversely, as VET can be a valuable alternative, professional advice might also motivate some advantaged students to choose VET over higher education if it better suits their potential, interests, and career goals.

4. Research Design

4.1. The Counseling Program

We explored the research questions in the context of a guidance counseling program operated by universities in North Rhine-Westphalia, Germany. This program emphasized intensive one-on-one counseling sessions with students in upper secondary school, provided by counselors who typically hold a university degree and are certified in counseling. The program's main goal was to promote enrollment among students from low social origins. During these sessions, the counselors provided tailored advice based on the students' needs, such as choosing between VET and higher education, selecting a higher education institution, deciding on a major, or understanding the requirements for university admission and financial aid. The program was designed to provide long-term support that could continue after students graduated from high school.

Students controlled the frequency and duration of their participation in the program. On average, students participated in five sessions, and about a fourth continued participating in the program after graduation. These figures suggest that the program was generally well received and, in some cases, a stable collaboration between counselors and students was established.²

4.2. The Randomized Controlled Trial

The study "Future and Career Plans Before High School Graduation" was an RCT conducted in upper-secondary schools in North Rhine-Westphalia to evaluate the counseling program (for an overview, see Pietrzyk et al., 2019). On average, these upper secondary schools serve socioeconomically disadvantaged students. Thirty schools participated in the RCT.³ These schools offer the highest general certificate of education (*Abitur*), a prerequisite for enrolling in higher education (*Gymnasien* and comprehensive schools, *Gesamtschulen*, with an academic track). The RCT and panel surveys were conducted in several stages (Fig. 1).

The first stage involved a baseline survey of all students in the selected schools in their penultimate year before graduation. This survey collected information through a paper-and-pencil questionnaire on students' career aspirations, post-school plans, social environment, interests, and psychosocial competencies.

Not all students who participated in the baseline survey were

² This and the other information refer to the analysis sample (for wave 4) for individuals who were assigned to the treatment condition and actually participated in the program. Descriptively, we looked at differences by sociodemographic characteristics: women seemed to attend the program slightly more often than men (5.3 vs 4.4 sessions). Regarding the duration, men from low social origins tended to end their participation earlier; only 17 % continued in the program after graduation while, among the other three groups based on gender and social origin, the percentage ranged from 25 to 28.

³ For more information on school recruitment and participation, see Pietrzyk et al. (2019). The study included schools identified as socially disadvantaged based on an index used by the Ministry of Education in North Rhine-Westphalia (referred to as the location type concept; Isaac, 2011). This index considers factors such as the proportion of unemployed and welfare recipients in the area surrounding the school. It also considers the proportion of individuals with a migration background, which is closely linked to socioeconomic status in Germany. Specifically, schools where these percentages were comparatively low were excluded from the study.

Time	Feb. 2018	May 2018	Feb. 2019	Nov. 2019	Nov. 2020
Educational phase	before graduation			after graduation	
	1.5 years before	1 year before	0.5 years before	0.5 years after	1.5 years after
Program	Start of counseling program				
	Wave 1 Baseline measurement	Wave 2		Wave 3	Wave 4

Fig. 1. Study schedule.

included in the RCT due to limited counselor capacity. In the second stage, we randomly and individually selected 1344 students to participate in the RCT, prioritizing those from low social origins in line with the program's target group. Students with no social origins information or from high social origins were included in the RCT only if slots were available. However, due to the underrepresentation of students from low social origins in the highly stratified German secondary school system, the number of participants from low social origins was slightly higher than those from high social origins (703 vs 615).

In the third stage of the RCT, participants were randomly and individually assigned to either a treatment group, which took part in the program, or a control group, which did not. This assignment was conducted equally, using school and social origins as blocking variables. To ensure scientific rigor, an independent researcher from GESIS (Leibniz Institute for the Social Sciences) conducted the randomization. Assignment to the treatment was found to be independent of key predictors of enrollment, including academic performance (GPA), intentions to pursue higher education, and baseline rational choice evaluations (see Fig. A1 in the Appendix). Students in the control group were not expected to receive individual counseling on post-secondary education, as such student-intensive counseling does not exist in German schools outside of the investigated program.

In the fourth stage, the program began immediately after the baseline measurement and random assignment of students to the experimental conditions. Thus, counseling started approximately 1 year before the students' high school graduation. The compliance rate for the experimental conditions was over 80 % (see Table A1 in the Appendix).

In subsequent phases, we conducted three additional surveys to collect information on participants' educational pathways, future and career plans, and other relevant characteristics.

To test our hypotheses, we used data from waves 1, 2, and 4. Data from the penultimate year of schooling, collected before the treatment began, were used to describe rational choice evaluations of the baseline measurement. We tested treatment effects on rational choice evaluations (H1) using data collected at the end of schooling. To test the hypotheses on the treatment effect on enrollment (H2), we used data collected 1.5 years after school completion.

The sample sizes used to test the hypotheses varied due to differences in attrition across waves (wave 2: 13.5 %, wave 4: 20.8 %, relative to wave 1). However, there is no evidence that panel attrition affected our estimates. For both wave 2 and 4 attrition, we observed no systematic differences in dropout rates between treatment conditions. Additionally, key predictors of enrollment remained similar between the control and treatment groups, regardless of participation (see Table A2 in the Appendix).

Due to low item nonresponse (see Table A1 in the Appendix), we did not impute missing data. To balance the analysis samples across all waves to a certain extent, we used the analysis sample from wave 4 as a reference point and adjusted the samples for analyses using data from waves 1 and 2. Thus, for descriptive analyses and those using data from waves 1 and 2, we included only individuals who also participated in wave 4. It is important to note, however, that the samples used in the analyses of waves 2 and 4 still differ slightly, as some individuals did not

participate in wave 2 despite having participated in wave 4. Information on the samples for each analysis can be found in Table A1 in the Appendix.

4.3. Analytical Procedure

We conducted our analyses in two steps, focusing on treatment heterogeneity by social origin and gender. In the first step, we examined the intervention's effect on rational choice evaluations preceding the actual enrollment decision (H1). For this analysis, we used data from wave 2, which was collected 6 months before high school graduation. In the second step, we assessed the intervention's effect on enrollment based on social origin and gender. To test the second hypothesis (H2), we used data from wave 4, collected 1.5 years after graduation. For both steps, we applied the intention-to-treat (ITT) approach, in which only assignment to the control or treatment group was considered the main independent variable. This approach estimates the program's actual effect under real-world conditions (Hollis & Campbell, 1999) by considering participants' random assignment to experimental conditions rather than their participation in the program. We estimated the ITT using ordinary least squares (OLS) regression. Since some aspects of rational choice evaluations are influenced by academic performance, we controlled for the GPA reported in wave 1 in these models. Additionally, we used z-standardized values for all metric variables. In the models assessing the treatment effect on enrollment in higher education, we again controlled for the z-standardized GPA.

For all analyses, we applied robust standard errors and school fixed effects to account for variation between schools.

To ensure the robustness of our results regarding sample selection and the chosen statistical analysis method, we conducted additional analyses using alternative sample selections and logistic regression. The findings remained consistent across these variations.

4.4. Operationalization

Our dependent variables were rational choice evaluations and enrollment. For rational choice evaluations, we measured the *perceived success probability*, *costs*, and *benefits*, which we operationalized mainly in line with rational choice considerations on educational decisions. *Perceived success probability* is reflected by two constructs: probability of success and self-efficacy. To measure the perceived probability of success we asked students to indicate on a single item their perception of how likely they are to successfully complete a higher education degree. Furthermore, we included four variables to measure self-efficacy, a construct that captures how students perceive their own effectiveness (Bandura, 1997). To ensure alignment with the research question, we examined the strength of self-efficacy expectations in relation to higher education studies. These expectations were measured through four questions (e.g., "How likely are you to rely on your abilities during your postsecondary education if you decide to take up higher education?"). The answers to the four questions were combined into one self-efficacy scale. We used two different operationalizations of perceived success probability because the constructs we targeted measured slightly

different aspects of the anticipated ability to master higher education. While the students' evaluation of success probability may also consider external aspects, self-efficacy clearly focuses on the individual.

We captured the costs by asking respondents to estimate how much of a financial burden enrollment would be for them and their families. We also measured *benefits* using four variables reflecting different aspects of labor market benefits for higher education graduates. Specifically, respondents assessed their prospects of obtaining a well-paying, prestigious, and interesting job after graduating from higher education. Furthermore, we measured students' perceived risk of unemployment with a higher education degree. We considered all four aspects of benefits separately in the analyses to avoid losing any information. All variables reflecting rational choice evaluations were measured on a 5-point Likert scale, with 1 being the lowest and 5 the highest. The questions and descriptives for each variable can be found in [Table A3](#) in the Appendix.

The enrollment in higher education was measured binarily, with 1 being enrolled in higher education and 0 not enrolled in higher education.

To identify the intersection between different social groups, we measured social origins and gender as binary variables. Social origins were defined by parents' highest educational degree. Students with a parent who graduated from higher education were classified as high (1), and those without were classified as low (0). For gender, we coded women with 0 and men with 1.

According to the ITT approach as the main independent variable for the analyses regarding the treatment effect, we coded the treatment group with 1 and the control group with 0.

To study the intersection of social origins and gender in higher education evaluations and enrollment rates, net of performance, we considered in some analyses the initial academic performance, measured as GPA in wave 1 on a 15-point scale (0: low, 15: high) that was calculated based on grades in German, Mathematics, English, Biology, Physics, History, and Social Sciences.

5. Results

5.1. Descriptive Results: Intersection in Rational Choice Evaluation at Baseline

[Table 1](#) presents the predicted margins of evaluations of higher education at baseline (wave 1), broken down by social origin and gender for descriptive purposes.⁴ These analyses enabled the examination of potential differences in rational choice evaluations among the various groups at baseline prior to high school students' final enrollment decisions. Additionally, they help contextualize the results presented later.

The results in [Table 1](#) align with some of the previously mentioned findings ([Fiedler et al., 2024; Lörz et al., 2011](#)) on differences in rational choice evaluations by social origin and gender. Looking at the overall picture reveals that students from low social origins tended to give the least favorable evaluations of the rational choice components (framed values), with some exceptions and gender-based differences. Conversely, students from high social origins, particularly men, provided the highest number of favorable evaluations (indicated by a gray background).

Significant differences between social groups can be assessed through the interaction terms of the linear regression models used to calculate the predicted margins (for further details, see [Table A4](#) in the Appendix). Significant interaction terms were found for success probability, self-efficacy, costs, and prestigious jobs. The magnitude of the

differences observed between the four social groups varied, with differences of 0.3 standard deviations considered small but still meaningful. For example, there was a substantial difference in how women from low social origins and men from high social origins evaluated the costs of higher education, exceeding one-third of a standard deviation (0.379). While this difference might be categorized as small, it remains notable, particularly in the context of understanding how social origins and gender intersect in shaping perceptions of higher education costs.

The differences between genders within and across the social origin groups underscore the complex interplay between social origin, gender, and rational choice evaluations, suggesting that both sociodemographic factors should be considered to understand disparities in educational decision-making.

5.2. Intersection in Intervention Effects on Rational Choice Evaluations

Based on the linear regression models and employing an ITT approach, we estimated the treatment effects on each variable of the rational choice evaluations 6 months prior to high school graduation. [Fig. 2](#) illustrates the differences between the control and treatment groups across social origins and gender for each variable, allowing us to explore the nuanced impacts of the intervention (for further details, see [Table A5a](#) in the Appendix).

Our findings reveal that the treatment significantly influenced a limited subset of rational choice evaluations, with these effects confined to specific social groups. As illustrated in [Fig. 2](#), the treatment primarily benefited men from high social origins, particularly in terms of their self-efficacy and perceived likelihood of securing a well-paid job through higher education. For this group, the self-efficacy score in the treatment group was 0.36 standard deviations higher than in the control group (see also [Table A5b](#) in the Appendix). Similarly, their perception of the likelihood of obtaining a well-paid job through higher education was 0.24 standard deviations higher compared to their counterparts in the control group. For all other groups, we did not find significant or notable effects on rational choice evaluations. While the treatment did not produce pronounced effects on rational choice evaluations overall, our results suggest that the treatment effect is heterogeneous by social origin and gender for specific aspects, as two of the seven models reveal a significant interaction term (see [Table A5a](#) in the Appendix).

These findings contrast with our initial hypotheses, which posited that the intervention would have the most pronounced impact on groups with the least favorable evaluations of higher education—namely, women from low social origins. While the patterns of average marginal effects in [Fig. 2](#) suggest some degree of intersectionality in the treatment effects by social origin and gender, most of these were not statistically significant. Moreover, the group we expected to benefit the most from the treatment did not exhibit notable improvements in their rational choice evaluations.

Instead, men from high social origins, who initially exhibited the most favorable rational choice evaluations (see [Section 5.1](#)), derived the greatest benefit from the counseling intervention. This unexpected result raises important questions about its implications. If rational choice evaluations are indeed linked to higher education enrollment decisions, our findings suggest that men from high social origins are likely to show the largest treatment effects on actual enrollment outcomes. The results in the following section will reveal whether the effects observed in rational choice evaluations align with those on actual enrollment outcomes.

5.3. Intersection in Intervention Effects on Enrollment

The next step was to analyze the treatment effects on enrollment. We present the main results graphically by visualizing the treatment effects on higher education enrollment 1.5 years after high school graduation for the intersectional groups, based on the ITT regression analysis and controlling for performance (for more details, see [Table A6](#) in the

⁴ Since we focused on rational choice evaluations while controlling for prior performance, we decided to provide predicted margins by accounting for GPA and applying school fixed effects rather than displaying simple group means for our descriptives.

Table 1

Predicted margins of evaluations by social origin and gender in wave 1 (baseline).

	Women from low social origins	Men from low social origins	Women from high social origins	Men from high social origins
Success probability ^a	-0.079	-0.008	-0.056	0.215
Self-efficacy ^a	-0.043	-0.020	-0.067	0.185
Costs	0.113	0.098	-0.017	-0.266
Well-paid job ^a	-0.069	0.093	-0.043	0.071
Prestigious job ^a	0.074	-0.147	0.010	0.026
Interesting job	-0.072	-0.139	0.116	0.109
Unemployment risk	0.111	-0.010	0.001	-0.170

Note: Predicted margins based on linear regression models with school fixed effects ($n = 30$) and ^acontrolled for z-standardized GPA in wave 1; rational choice evaluations are z-standardized; detailed values for the coefficients of the underlying analytic models are reported in Table A4 in the Appendix.

Appendix). Our findings indicate that the treatment effect was heterogeneous by both social origins and gender. Although none of the coefficients reached statistical significance—perhaps due to the small sample size (see Table A7 in the Appendix)—the results provide exploratory insights into intersectional patterns of treatment effects on enrollment (against the backdrop of treatment effects on rational choice evaluations) rather than definitive evidence.

Our results, illustrated in Fig. 3, corroborate the findings of Pietrzyk et al. (2025), who reported that the intervention increases enrollment among individuals from low social origins, irrespective of gender. While the effects were not statistically significant, we observed meaningful increases in enrollment: 5.9 percentage points for women and 4.1 percentage points for men from low social origins. However, our analysis further shows that the negative impact on enrollment for those from high social origins, as noted by Pietrzyk et al. (2025), was primarily driven by its adverse effect on women from high social origins, with a decrease of 7.8 percentage points in enrollment. In contrast, no remarkable treatment effect was observed for men from high social origins. These findings underscore the critical importance of incorporating an intersectional framework when analyzing the effects of interventions on educational inequalities.

When comparing the group-specific treatment effects on rational choice evaluations and enrollment in higher education, we found no correspondence between the effects observed for these two outcomes. Although both rational choice evaluations and enrollment were heterogeneously affected by the treatment across social origins and gender, the groups most affected differed. Men from high social origins benefited most in terms of rational choice evaluations, whereas women from low social origins were most positively impacted in terms of enrollment in higher education. While our experimental design did not allow for a direct test of the link between rational choice evaluations and enrollment, the lack of alignment between these effects raises the question of whether rational choice evaluations indeed influence enrollment decisions.

Fig. 3 does not fully capture the overall effect of the treatment on enrollment inequality. To gain a more comprehensive understanding of how the treatment may influence intersectional inequality in enrollment rates, we computed predicted margins based on the ITT regression results (see Table A6 in the Appendix). Fig. 4 presents the predicted enrollment rates for the control and treatment groups, stratified by social origins and gender. It illustrates the treatment effects by displaying the differences in enrollment rates between these groups (represented by gaps between squares and dots), as previously detailed in Fig. 3.

The results depicted in Fig. 4 allow for a comparison of enrollment inequality with and without the treatment (treatment group vs. control group). A comparison of the patterns between the two groups reveals

that gaps in enrollment rates by social origin and gender were significantly wider in the control group (squares) than in the treatment group (dots). Without treatment, women from high social origins had the highest enrollment rate (76 %), while women from low social origins had the lowest rate (59 %). Enrollment rates for men, regardless of social origin, were similar to those of women from low social origins, ranging from 62 % to 65 %.

In the control group, a distinct pattern of intersectional inequality in higher education enrollment emerged. Without treatment and when controlling for academic performance, women from high social origins had a clear advantage over women from low social origins and men, regardless of their social origin. With treatment, the differences disappeared almost completely. Enrollment for women from high social origins decreased to 69 %, while enrollment for women from low social origins increased to 66 %. The enrollment rates for men, regardless of social origin, were similar to those of women, ranging from 68 % for men from high social origins to 66 % for men from low social origins.

This reduction in inequality can be attributed to heterogeneous treatment effects influenced by the dynamics of social origin and gender. Specifically, positive treatment effects for groups with lower enrollment rates were counterbalanced by negative effects for the group with the highest enrollment rates, leading to a convergence of enrollment rates among social groups within the treatment group. These findings indicate that the treatment effectively reduced enrollment gaps across diverse social groups, highlighting its potential to mitigate educational inequalities when considering the intersecting dynamics of social origin and gender.

Overall, our findings did not confirm heterogeneous treatment effects on rational choice evaluations and enrollment by social origins and gender as we had expected. Specifically, we hypothesized a particularly strong treatment effect on the evaluations of women from low social origins (H1). However, pronounced treatment effects were observed exclusively for individuals with initial favorable evaluations—namely, for men from high social origins. Similarly, we hypothesized a strong treatment effect on the enrollment rates of women from low social origins (H2). While our findings suggest a promising trend toward increased enrollment in higher education for this group, the effect did not reach the threshold for statistical significance.

Nevertheless, our results revealed two important insights. First, the intersectional pattern of treatment effects on rational choice evaluations observed 6 months before high school graduation did not correspond to the pattern observed in enrollment rates 1.5 years after graduation. Although men from high social origins exhibited the greatest responsiveness in some rational choice evaluations, their enrollment rates were unaffected by the treatment. Thus, the impact of rational choice evaluations on enrollment remains questionable.

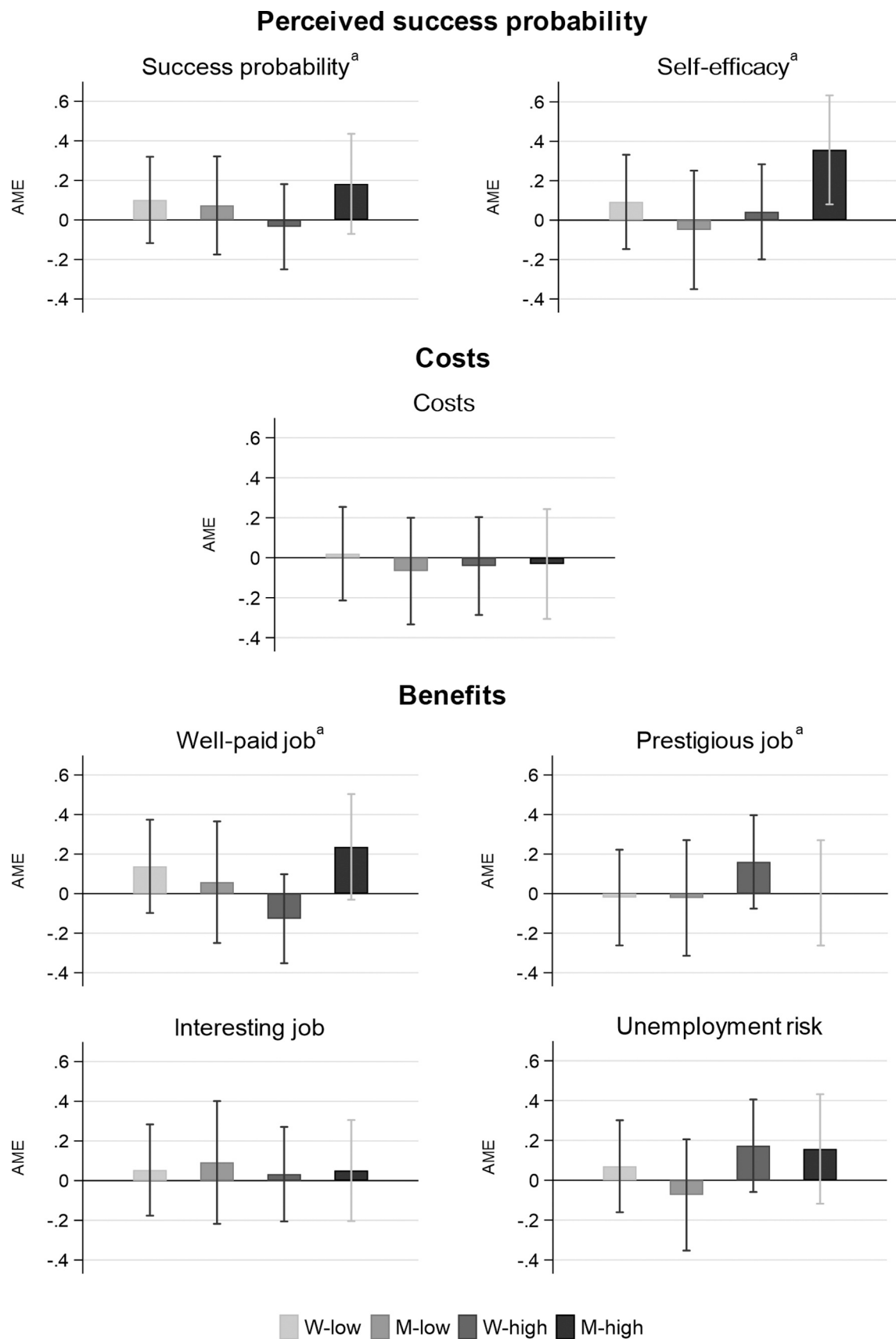


Fig. 2. Average marginal effects on rational choice evaluations by social origin and gender. Note: Predictions with 95 % confidence intervals; W-low: Women from low social origins; M-low: Men from low social origins; W-high: Women from high social origins; M-high: Men from high social origins. ^acontrolled for z-standardized GPA in wave 1. The exact values can be found in [Table A5b](#) in the Appendix.

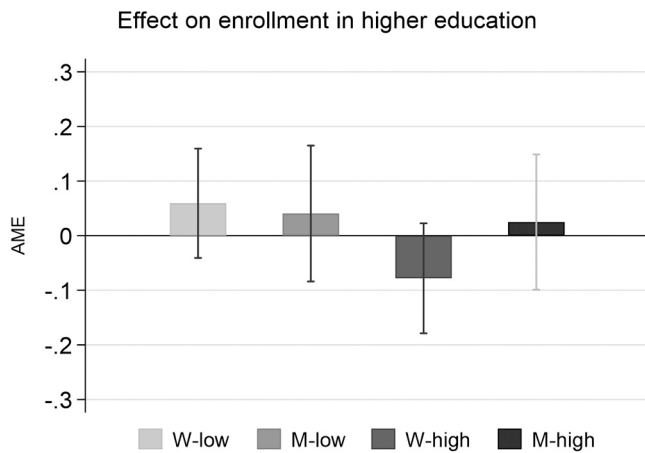


Fig. 3. Average marginal effects on enrollment in higher education by social origins and gender. Note: Predictions with 95 % confidence intervals; W-low: Women from low social origins; M-low: Men from low social origins; W-high: Women from high social origins; M-high: Men from high social origins; Figure based on Table A6 in the Appendix.

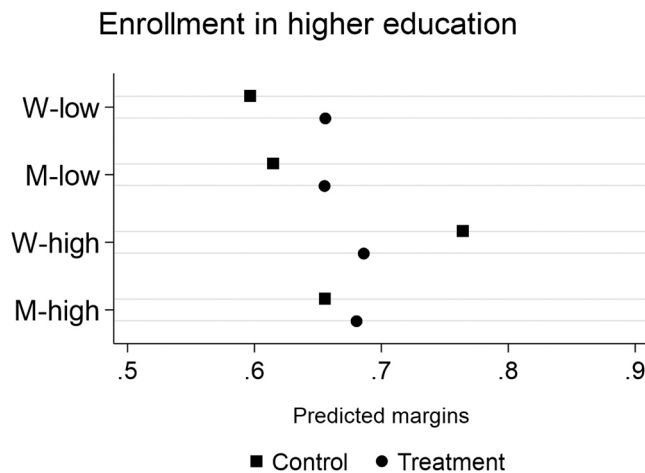


Fig. 4. Predicted margins on enrollment in higher education by social origins, gender, and treatment. Note: W-low: Women from low social origins; M-low: Men from low social origins; W-high: Women from high social origins; M-high: Men from high social origins; Figure based on Table A6 in the Appendix.

Second, inequalities in enrollment rates based on social origin were most evident among women, and the treatment effects on enrollment were most notable within this group. While our first analysis did not show a notable effect on women's rational choice evaluations, the second analysis indicated that the support provided by the program was more targeted. Specifically, the program appears to have helped narrow the enrollment gap driven by social origins, particularly where the intervention was most needed. This is particularly true for the social origins gap driven by factors other than academic performance, as we controlled for this variable in our analyses.

6. Robustness

To ensure the robustness of our results across different models and sample specifications, we conducted supplementary analyses using alternative sample selections and logistic regression. Our primary analysis employed a backward sampling method, anchored on the last wave for our analytical sample. To validate these findings, we recalculated all models using a listwise deletion sample, which included only participants with valid responses for all variables in both wave 2 and

wave 4. The results from this alternative specification remained consistent, showing no notable variation (see Tables A8 and A9 in the Appendix).

To further assess the stability of our findings, we examined the predicted margins of the treatment effect on enrollment using a logistic regression model. Once again, the results proved robust, reinforcing the reliability of our initial conclusions (see Fig. A2 based on Table A10 in the Appendix). These supplementary analyses provide no indication of instability in our findings, suggesting that our results remain consistent across various sample selections and analytical approaches.

7. Summary and Discussion

Interventions aimed at reducing inequalities in university access have rarely been examined from a perspective that simultaneously considers social origins and gender. Our study focused on this intersection by analyzing disparities in rational choice evaluations and higher education enrollment and assessing the impact of an intensive counseling program on these inequalities. Building on existing research concerning social and gender-based inequalities, we adopted a new perspective on the gendered nature of university access, positing that intersectional disparities place women from low social origins at a particular disadvantage despite their strong academic performance. Thus, we examined how social origins and gender intersect with respect to higher education evaluations and enrollment rates, independent of performance, and whether guidance counseling differentially influences these outcomes.

Our findings indicate that the impact of counseling on rational choice evaluations varies across social origins and gender. Specifically, the program demonstrated heterogeneous effects, with significant impacts observed only for two rational choice components among men from high social origins. These socioeconomically privileged men reported an increased self-efficacy and improved expectations for securing well-paid employment after graduating from higher education. Our results diverge from the first hypothesis (H1), which posited that women from low social origins would experience the greatest impact on their rational choice evaluations. Instead, men from high social origins—who already displayed the most favorable rational choice evaluations according to our descriptive analyses—benefited the most from counseling. Although these findings run counter to our expectations, they underscore the partially differential responsiveness to the intervention based on social origins and gender in shaping rational choice evaluations of higher education.

Regarding enrollment rates, our descriptive findings suggest that the counseling program increased enrollment among individuals from low social origins, with women benefiting the most. This aligns with our second hypothesis (H2), although the effects did not reach statistical significance. In contrast, the intervention (descriptively) reduced enrollment among women from high social origins by 7.8 percentage points, a decline that is clearly meaningful in magnitude. Notably, this pattern of the program's impact on enrollment rates contributed to a reduction in intersectional inequalities in enrollment, as women from high social origins had particularly high enrollment rates in the control group.

Although our results did not fully align with our expectations, they offer important insights for social stratification research. For instance, our descriptive findings reveal an intersectional pattern in rational choice evaluations, with men from high social origins displaying favorable evaluations and women from low social origins exhibiting unfavorable evaluations. As intersectional patterns are not typically considered in research on rational choice evaluations, future studies could build on these findings by clarifying whether and how the highly positive evaluations of men from high social origins influence their educational trajectories. Additionally, the less favorable evaluations observed among women from low social origins—a group often overlooked in previous research on educational inequalities—highlight their

increased risk of not fulfilling their academic potential.

Another important contribution of our study is demonstrating that counseling in Germany is an effective means of reducing *intersectional* inequalities in enrollment, thereby extending previous research in this vein. Our earlier work has shown that counseling closes the enrollment gap between social origin groups in Germany (Pietrzyk et al., 2025). We expand on this by showing that counseling *increases* enrollment rates among women from low social origins while *reducing* enrollment among women from high social origins. Conversely, counseling had little to no effect on men's enrollment, regardless of their social origins. Gender-specific responsiveness to counseling is a novel finding in treatment research and may stimulate further studies in this area.

Our study also contributes to theoretical considerations. Surprisingly, we did not observe a correspondence between treatment effects on rational choice evaluations and enrollment. Theoretically, we assumed that enrollment would depend on rational choice evaluations, but our observations suggest that there may be limits to a universally applicable rational choice theory.

Among the many aspects that warrant further discussion, we would like to highlight two in particular. First, as already mentioned, the intersectional pattern of counseling effects on rational choice evaluations observed before high school graduation did not align with the pattern of treatment effects on enrollment rates after graduation. Specifically, the social groups influenced by counseling in their rational choice evaluations did not exhibit corresponding effects in their enrollment decisions. While rational choice theory suggests a link between rational choice evaluations and enrollment decisions, empirical research has yielded ambiguous findings regarding this link (see Section 2.1). Several factors may explain this lack of correspondence. First, while the rational choice approach is a commonly employed framework for explaining educational inequalities, robust empirical evidence verifying the link between rational evaluations and enrollment remains scarce. In the specific context of the transition from school to higher education, findings remain inconclusive, suggesting that rational choice evaluations may have limited explanatory power (see Section 2.1). Consequently, the existence of such a link remains questionable, raising the possibility that other factors beyond rational choice evaluations may play a more significant role in predicting enrollment decisions, such as institutional factors related to educational tracking or mechanisms identified by cultural reproduction theory (Bourdieu & Passeron, 1971). Second, even if a causal link between rational choice evaluations and enrollment exists in the absence of treatment, the intervention itself may alter the underlying mechanism. For example, the intervention may influence enrollment decisions through mechanisms other than changes in rational choice evaluations, suggesting that it may modify the mechanism of decision-making rather than simply altering individual perceptions. Third, the link between rational choice evaluations and enrollment may only emerge as a cumulative effect across multiple rational choice components. While we did not observe notable effects on individual components of rational choice evaluation for women from low social origins, it is possible that changes may influence enrollment only cumulatively. Thus, only when all the small changes in rational choice evaluation are considered together might they account for the observed effect on enrollment. Finally, it is important to note that our approach was not designed to test the link between rational choice evaluations and enrollment decisions in its full causal complexity. Even advanced methods, such as principal stratification for analyzing mediation processes in experimental settings (as applied by Page, 2012), do not meet the requirements of classical causal analysis and should be interpreted with caution (see Page, 2012, p. 237). Taken together, however, our findings cast doubt on the assumption that rational choice evaluations universally determine enrollment. If such a link existed across the board, we would have expected to observe increased enrollment among men from high social origins, which we did not.

The second noteworthy aspect is that inequalities in enrollment rates by social origins were most evident among women, and the treatment

effects on enrollment were strongest within this group. Therefore, the counseling program appeared to target intersectional enrollment gaps, addressing disparities where intervention was most needed. The inequality-reducing effect was achieved through an increase in enrollment among women from low social origins and decreased enrollment among women from high social origins.

When interpreting the results for women with high social origins, it is essential to consider the specific context of Germany. The observed reduction in their enrollment should not necessarily be viewed as an entirely negative outcome. Unlike in other countries, where forgoing higher education might severely limit future opportunities, Germany offers alternative vocational pathways that may provide equally viable career prospects. The counseling program may have helped women from high social origins identify educational options more aligned with their interests, which might otherwise have been inaccessible due to lower academic performance. Our findings indicate that women from high social origins exhibited the highest enrollment rates regardless of their academic performance, suggesting that even those with lower grades may opt for higher education. Additionally, counseling may have informed these students about alternative post-secondary opportunities that they were previously unaware of due to their social origin.

Our results should be interpreted in light of several limitations. One of the principal limitations was the specificity of our sample, which was both country-specific and restrictive, with small group sizes when stratified by social origin, gender, and treatment assignment. Consequently, our findings primarily identify broad trends—particularly concerning treatment effects—as the coefficients related to enrollment did not achieve statistical significance and should not be generalized to other national contexts without further examination. Additionally, due to our research design and analytical strategy, we cannot draw causal conclusions about the relationship between the treatment effect on rational choice evaluations and enrollment rates (see discussion above). Moreover, while the individualized nature of the counseling is a strength in the field, it was impossible to identify specific aspects of the program that yielded particular effects. Testing this would require systematically isolating specific counseling tools (e.g., visiting universities, providing information, and conducting assessment tests) and employing a design with multiple treatment arms. As a result, our conclusions are limited to the overall impact of the counseling program, which remains a “black box” in terms of its detailed components.

Overall, our study demonstrates the value of adopting an intersectional perspective when examining educational interventions. It shows that counseling influences both rational choice components and enrollment differently based on social origins and gender. Furthermore, the lack of correspondence between treatment effects on rational choice evaluations and enrollment highlights how intervention studies can provide valuable theoretical insights, complementing survey-based studies that cannot draw causal conclusions. Our findings reinforce the need to consider alternative theoretical frameworks beyond rational choice theory when studying educational inequalities, such as insights from cultural reproduction theory (e.g., Bourdieu & Passeron, 1971). Just as the mechanisms driving educational inequalities remain an open question, so too do the mechanisms by which counseling reduces intersectional disparities in university access. Addressing these questions will likely remain a central focus for sociologists of education in the future.

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Ethical Statement

The project was approved by the Research Ethics Committee of the Berlin Social Science Center (WZB). In accordance with national legislation and institutional requirements, written informed consent from the legal guardian/next of kin of the participants was not required for participation in this study.

CRediT authorship contribution statement

Melinda Erdmann: Writing – review & editing, Writing – original

draft, Methodology, Formal analysis, Data curation, Conceptualization. **Irena Pietrzyk:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Juliana Schneider:** Writing – review & editing, Visualization, Validation, Conceptualization. **Marcel Helbig:** Conceptualization. **Marita Jacob:** Conceptualization.

Declaration of Competing Interest

We have no known conflicts of interest to disclose.

Appendix

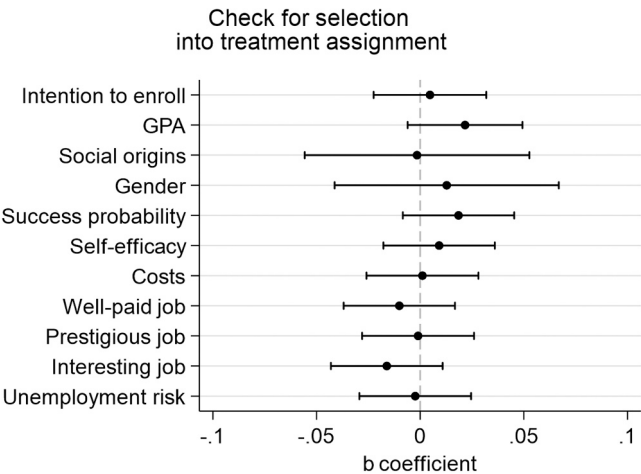


Fig. A1. Check for selection into treatment assignment

Note: Predictions with 95 % confidence intervals; based on linear regression models with z-standardized values for metric variables and robust standard errors. For operationalization see Table A3.

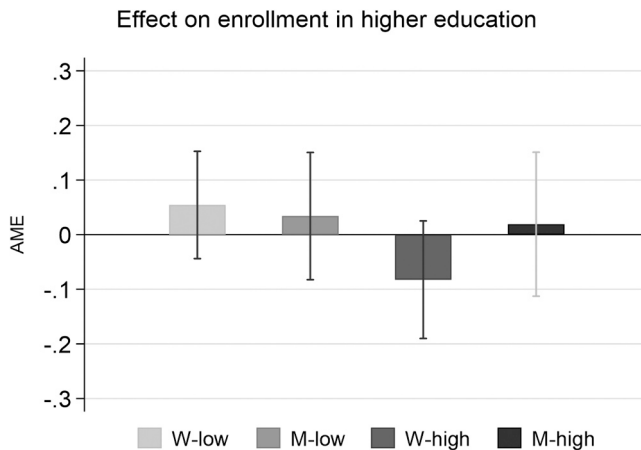


Fig. A2. Average marginal effects on enrollment in higher education by social origin and gender. Results of an ITT logistic regression

Note: Predictions with 95 % confidence intervals; W-low: Women from low social origins; M-low: Men from low social origins; W-high: Women from high social origins; M-high: Men from high social origins. Figure based on Table A10.

Table A1
Compliance to experimental conditions and sample size of analytic samples

<i>Sample in the model of</i>	<i>Complier</i>	<i>N</i>	<i>% item non-response in full sample</i>
Wave 1 (N = 1.344)			
Success probability		1000	0.74
Self-efficacy		1000	0.82
Costs		998	1.49
Well-paid job		998	1.34
Prestigious job		994	1.64
Interesting job		995	1.49
Unemployment risk		999	1.19
Wave 2 (N = 1.162)			
Success probability	83.4 %	942	0.52
Self-efficacy	84.5 %	845	10.24
Costs	83.4 %	941	0.69
Well-paid job	83.4 %	941	0.60
Prestigious job	83.4 %	940	0.77
Interesting job	83.4 %	942	0.52
Unemployment risk	83.4 %	940	0.69
Wave 4 (N = 1.064)			
Enrollment	82.1 %	1004	0.00

Note: Information on the samples that were used for the main results.

Table A2
Panel attrition between experimental conditions

	No further participation in W2			Participation in W2		
	CC	TC	Diff.	CC	TC	Diff.
Social origin	0.41	0.57	−0.15	0.48	0.45	0.02
n	92	74		567	585	
Gender	0.49	0.48	0.01	0.41	0.43	−0.02
n	100	81		572	590	
GPA	8.17	8.08	0.09	8.99	9.19	−0.20
n	94	69		540	556	
Intention to enroll	3.36	3.33	0.03	3.65	3.67	−0.02
n	96	78		562	568	
N	100	82		572	590	

	No further participation in W4			Participation in W4		
	CC	TC	Diff.	CC	TC	Diff.
Social origin	0.45	0.48	−0.02	0.47	0.46	0.01
n	130	132		529	527	
Gender	0.49	0.53	−0.04	0.41	0.41	−0.01
n	140	139		532	532	
GPA	8.47	8.81	−0.34	8.97	9.13	−0.16
n	125	125		509	500	
Intention to enroll	3.44	3.45	−0.01	3.65	3.68	−0.03
n	133	134		525	512	
N	140	140		532	532	

Note: CC: control condition; TC: treatment condition; Diff.: CC – TC. Differences are provided in percentage points (social origin and gender) or in units of the original scale (intention to enroll). For operationalization see Table A3. Only individuals with valid information on social origin are included.

Table A3
Descriptive information on variables

Variable	Wave 1		Wave 2	
	Percentage	n	Percentage	n
Assignment to experiment condition 1 = treatment group; 0 = control group	50	1004	50	945
Social origin (at least one parent with HE degree) 1 = at least one parent with HE degree; 0 = no parent with HE degree	47	1004	47	945
Gender (men) 1 = men; 0 = women	41	1004	41	945
	Mean	n	Mean	n
Perceived self-efficacy in HE	3.54	1000	3.66	845
Scale of four items: How likely is it ... if you decide to take up higher education? that you can rely on your abilities during your post-secondary education ... that you can successfully cope with difficult tasks during your post-secondary education ... that you can successfully solve problems yourself ... that you can still perform well after a long illness ... Scale: 1 = very unlikely – 5 = very likely	3.90	1000	3.96	942
Expected probability of success in HE				
How likely is it in your opinion that you could successfully complete higher education? Scale: 1 = very unlikely – 5 = very likely				
Direct costs of HE	3.06	998	3.00	941
During a vocational training program or higher education, certain things have to be paid for, e.g. travel costs, books, rent, or even fees. Irrespective of your actual educational goals: How difficult would it be for you and your family to cover these costs if you embarked on higher education? Scale: 1 = not difficult at all – 5 = very difficult				
Prospects for a well-paid job with HE	4.26	998	4.18	941
How favorably would you judge your prospects for getting a well-paid job if you completed a higher education program? Scale: 1 = very poor – 5 = very good				
Prospects for a prestigious job with HE	4.32	994	4.31	940
And how good would be your prospects for getting a socially prestigious job if you completed a higher education program? Scale: 1 = very poor – 5 = very good				
Prospects for an interesting job with HE	4.26	995	4.20	942
How favorable would you judge your prospects for getting an interesting job if you completed a higher education program? Scale: 1 = very poor – 5 = very good				
Unemployment risk with HE	2.25	999	2.55	940
What would be your risk of becoming unemployed if you completed a higher education program? Scale: 1 = very low – 5 = very high				
Initial academic performance (GPA)	9.05	1004		
GPA of seven school subjects on a 15-point Scale: 0 low - 15 high				
Intention to enroll in HE	3.67	978		
How likely is it that you will enroll at university? Scale: 1 = very low – 5 = very high				
Variable	Wave 4 Percentage	n		
Enrollment in higher education 1 = enrolled in HE; 0 = not enrolled in HE	66	1004		
Assignment to experiment condition 1 = treatment group; 0 = control group	50	1004		

Note: HE: higher education.

Table A4
Differences in rational choice evaluations in wave 1 (baseline)

Variable	origin	p-value	gender	p-value	interaction	p-value	n
Success probability ^a	0.023	0.764	0.071	0.401	0.200	0.080	1000
Self-efficacy ^a	−0.024	0.755	0.023	0.791	0.229	0.051	1000
Costs	−0.130	0.123	−0.015	0.872	−0.235	0.065	998
Well-paid job ^a	0.026	0.760	0.162	0.067	−0.048	0.710	998
Prestigious job ^a	−0.065	0.434	−0.221	0.018	0.238	0.070	994
Interesting job	0.187	0.023	−0.068	0.460	0.061	0.638	995
Unemployment risk	−0.110	0.186	−0.121	0.195	−0.050	0.699	999

Note: Results of linear regressions with school fixed effects (n = 30) and ^acontrolled for z-standardized GPA in wave 1. Rational choice evaluations are z-standardized. B coefficients and p-values are reported. Significant coefficients are in bold (p < 0.10, two-tailed). For operationalization see Table A3.

Table A5a

Treatment effect on rational choice evaluations in wave 2

	Treatment	p	Social origin	p	Gender	p	Social origin # treatment	p	Gender# treatment	p	Gender# social origin	p	Social origin# treatment	gender#	p	n
Success probability ^a	0.101	0.364	0.027	0.811	0.081	0.529	-0.136	0.386	-0.028	0.871	0.050	0.772	0.245		0.312	942
Self-efficacy ^a	0.092	0.449	-0.015	0.912	0.175	0.256	-0.050	0.770	-0.142	0.473	0.034	0.869	0.456		0.093	845
Costs	0.020	0.867	-0.324	0.008	-0.107	0.435	-0.061	0.722	-0.087	0.635	0.030	0.871	0.097		0.713	941
Well-paid job ^a	0.138	0.251	0.156	0.198	0.056	0.708	-0.265	0.111	-0.080	0.688	-0.098	0.624	0.443		0.100	941
Prestigious job ^a	-0.020	0.871	-0.078	0.527	-0.061	0.658	0.180	0.296	-0.002	0.992	0.251	0.197	-0.155		0.564	940
Interesting job	0.054	0.648	-0.037	0.771	-0.140	0.345	-0.021	0.901	0.038	0.847	0.374	0.062	-0.020		0.941	942
Unemployment risk	0.070	0.551	-0.214	0.082	-0.156	0.239	0.103	0.538	-0.144	0.436	-0.031	0.866	0.128		0.623	940

Note: Results of ITT OLS regressions with robust standard errors, school fixed effects (n = 30) and ^acontrolled for z-standardized GPA in wave 1. Rational choice evaluations are z-standardized. B coefficients and p-values are reported. Significant coefficients are in bold (p < 0.10, two-tailed). For operationalization see Table A3.

Table A5b

Average marginal effects on rational choice evaluations in wave 2 by gender and social origin

	Women from low origins		Men from low origins		Women from high origins		Men from high origins	
	AME	p	AME	p	AME	p	AME	p
Success probability ^a	0.101	0.364	0.073	0.563	-0.035	0.753	0.182	0.158
Self-efficacy ^a	0.092	0.449	-0.050	0.746	0.042	0.732	0.356	0.012
Costs	0.020	0.867	-0.067	0.623	-0.041	0.740	-0.032	0.822
Well-paid job ^a	0.138	0.251	0.058	0.712	-0.127	0.269	0.236	0.083
Prestigious job ^a	-0.020	0.871	-0.022	0.883	0.160	0.183	0.004	0.978
Interesting job	0.054	0.648	0.092	0.561	0.033	0.788	0.051	0.696
Unemployment risk	0.070	0.551	-0.074	0.605	0.173	0.144	0.157	0.262

Note: Results based on ITT OLS regressions from Table A5a. Significant coefficients are in bold (p < 0.10, two-tailed).

Table A6

Treatment effect on enrollment in HE

	ITT
Assignment, 1 = assigned	0.059
Gender, 1 = men	0.018
Social origin, 1 = high	0.168 ***
Assignment # gender	-0.019
Assignment # social origin	-0.137 *
Gender # social origin	-0.127
Assignment # gender # social origin	0.122
GPA	0.149 ***
Constant	0.566 ***
Observations	1004
Adjusted R-squared	0.131

Note: Results of an ITT OLS regression with robust standard errors, school fixed effects (n = 30), and controlled for z-standardized GPA in wave 1, *p < 0.10, **p < 0.05, ***p < 0.01 (two-tailed). See also Table A3 for operationalization.

Table A7

Subgroups by social origin, gender, assignment to treatment of wave 4 (N = 1004)

		Women		Man	
		CC	TC	CC	TC
Social origin	low	159	162	110	105
	high	140	132	98	98
	total	299	294	208	203

Note: CC: control group; TC: treatment group.

Table A8
Treatment effect on rational choice evaluations in wave 2 with listwise deletion sample

	Treatment	p	Social origin	p	Gender	p	Social origin # treatment	p	Gender# treatment	p	Gender# social origin	p	Social origin# gender# treatment	p	n
Success probability ^a	0.115	0.328	0.053	0.647	0.167	0.210	−0.167	0.300	−0.087	0.622	−0.030	0.863	0.414	0.094	842
Self-efficacy ^a	0.094	0.445	−0.007	0.955	0.175	0.256	−0.058	0.736	−0.143	0.472	0.027	0.893	0.472	0.083	842
Costs	0.060	0.639	− 0.294	0.022	−0.111	0.444	−0.135	0.452	−0.115	0.555	0.016	0.931	0.153	0.579	842
Well-paid job ^a	0.166	0.197	0.198	0.122	0.136	0.383	− 0.314	0.071	−0.176	0.404	−0.185	0.373	0.513	0.069	842
Prestigious job ^a	−0.016	0.902	−0.042	0.747	0.079	0.553	0.148	0.416	−0.135	0.498	0.125	0.520	−0.025	0.927	842
Interesting job	0.055	0.657	−0.064	0.630	−0.128	0.434	−0.008	0.964	0.062	0.773	0.383	0.074	0.016	0.955	842
Unemployment risk	0.061	0.623	−0.186	0.150	−0.197	0.162	0.118	0.496	−0.076	0.697	−0.018	0.923	0.100	0.713	842

Note: Results of ITT OLS regressions with robust standard errors, school fixed effects (n = 30), ^acontrolled for z-standardized GPA in wave 1. Rational choice evaluations are z-standardized. B coefficients and p-values are reported. Significant coefficients are in bold (p < 0.10, two-tailed). For operationalization see Table A3.

Table A9
Treatment effect on enrollment in HE with listwise deletion sample

	ITT
Assignment, 1 = assigned	0.089
Gender, 1 = men	0.035
Social origin, 1 = high	0.178 ***
Assignment # gender	−0.037
Assignment # social origin	− 0.128 *
Gender # social origin	−0.125
Assignment # gender # social origin	0.125
GPA	0.136 ***
Constant	0.598 ***
Observations	842
Adjusted R-squared	0.119

Note: Results of an ITT OLS regression with robust standard errors, school fixed effects (n = 30) and controlled for z-standardized GPA in wave 1; *p < 0.10, **p < 0.05, ***p < 0.01 (two-tailed). See also Table A3 for operationalization.

Table A10
Treatment effect on enrollment in HE (logistic regression)

	ITT log odds
Assignment, 1 = assigned	0.270
Gender, 1 = men	0.101
Social origin, 1 = high	0.936 ***
Assignment # gender	−0.099
Assignment # social origin	−0.747 *
Gender # social origin	−0.745 *
Assignment # gender # social origin	0.676
GPA	0.788 ***
Constant	0.304
Observations	984

Note: Results of a logistic regression with robust standard errors, school fixed effects (n = 30) and controlled for z-standardized GPA in wave 1; *p < 0.10, **p < 0.05, ***p < 0.01 (two-tailed). See also Table A3 for operationalization.

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