Authority Figures and the Polarization of Gender Norms*

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Abstract

This paper examines how authority figures in higher education shape long-run gender norms. We exploit the random assignment of first-year students to faculty advisors at an elite university in the Middle East and combine administrative records with an alumni survey measuring gender attitudes up to 24 years later. Women assigned to female advisors adopt more egalitarian views on gender roles in politics and the labor market, while men become more conservative. Effects are strongest among religious students and in male-dominated STEM fields, where female authority is especially counter-stereotypical. A simple framework combining belief updating and identity-based status concerns rationalizes empowerment for women and backlash among men. The effects may persist through reinforcement as women assigned to female advisors subsequently sort toward female instructors. By contrast, randomized exposure to high-achieving female peers has little effect. The largest effects come from high-value-added and senior female advisors, pointing to a distinct role for transmission through salient authority rather than generic exposure to successful women. More broadly, our findings reveal a progress paradox: gains in women's representation in elite authority can expand opportunities for women while intensifying backlash among men, thereby deepening gender polarization.

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1 Introduction

In many societies, young men and young women are moving in opposite political directions. Survey evidence points to a widening gender gap in ideology among recent cohorts, as young women become more liberal while young men shift less or even move rightward, producing a historically large divergence in views on gender, politics, and social change.[1] At the same time, the last few decades have seen an equally striking transformation in who occupies high-status positions. Women have surpassed men in college completion in many countries (Goldin et al., 2006; OECD, 2021), and their presence has grown in elite, traditionally male-dominated occupations and institutions (Baker and Koedel, 2024). These two developments have largely been studied in isolation. Yet they may be closely connected.

A natural hypothesis is that rising female representation in positions of authority reshapes beliefs about gender roles. But what matters may not be exposure to successful women per se, but exposure to women in legitimate institutional authority. Such exposure directly challenges who is seen as entitled to lead, decide, and govern. This need not produce convergence. For women, it may legitimize aspirations and expand perceived opportunities. For men, it can threaten status, triggering defensive reactions and backlash (Rudman et al., 2012). As a result, the expansion of women in authority—often viewed as unambiguously progressive—may also be an underappreciated driver of polarizing gender norms.

This paper provides causal evidence on this mechanism by studying a naturally occurring and high-stakes form of authority exposure in higher education: first-year academic advising. We exploit a unique institutional setting in which first-year students at the American University of Beirut (AUB) are randomly assigned to *faculty advisors* within department and entry cohort. Faculty advisors are not peripheral figures. They approve course registration, guide major academic decisions, and serve as formal institutional gatekeepers throughout students' early university experience.[2] Because advisor assignment is randomized and occurs at the moment students first enter the university, it generates exogenous variation in exposure to female versus male authority at a formative stage of early adulthood.

We combine two data sources that allow us to trace this early exposure shock far into adulthood. First, we use comprehensive administrative records covering the universe of undergraduates entering AUB between 2001 and 2018, including baseline student characteristics, academic outcomes, and the gender and department of students' first-year advisors. Second, we link these records to a new alumni survey fielded in 2025 that measures gender attitudes 7–24 years after enrollment. The survey elicits beliefs about women's roles in politics and the labor market as well as perceptions of women's status in society; we summarize these responses using standardized indices of (i) *gender role attitudes* and (ii) *gender status perceptions*. This design directly addresses two central challenges in the study of role models and norm formation: selection into exposure—students typically choose mentors, supervisors, or

[1] For recent evidence on the widening ideology gap between young men and women, see Nennstiel and Hudde (2025) on 20–29-year-olds in 32 European countries and Saad et al. (2024) on 18–29-year-olds in the United States. See The Economist (May 13, 2024) for discussion using cross-country survey evidence on 18–29-year-olds from 20 countries.

[2] Faculty advising remains a common and consequential part of the first-year experience. At more than half of universities in the U.S., faculty serve as advisors for a large majority of entering freshman (College Board, 2011). In a multi-institution study of 52,546 first-year students at 209 U.S. institutions, Fosnacht et al. (2017) show that advisors guide course selection, degree planning, personal development, and careers, and that the typical freshman met an advisor 1–3 times during first year.

workplaces—and the difficulty of measuring persistent beliefs long after the initial exposure window. It also allows us to study whether the same randomized exposure to female authority pushes women and men in opposite ideological directions over the long run, and whether these effects are specific to authority rather than broader exposure to high-achieving women.

Our setting is informative about broader trends. AUB is an elite pipeline into high-skilled careers and public life across the Middle East, and Lebanon is characterized by sharp gaps between women's educational attainment and their representation in political and economic leadership. In such contexts, female authority remains relatively rare and highly salient, especially in male-dominated fields and among socially conservative groups. At the same time, Lebanon shares key features with many societies undergoing rapid educational expansion: rising female attainment alongside persistent gender hierarchies in labor markets and politics. As a result, the mechanisms we study are not unique to this context and may generalize to other comparable settings undergoing rapid university expansion and modernization.

To guide interpretation, we develop a simple conceptual framework linking exposure to female authority to gender norms through two mechanisms. First, students interpret the gender of an early authority figure as a signal of the legitimacy and prevalence of female authority within elite institutions. Second, attitudes reflect not only learning but also identity and status concerns. Building on identity-based models (Akerlof and Kranton, 2000; Bénabou and Tirole, 2006, 2011) and work on stereotype salience (Bordalo et al., 2016, 2019), the framework shows why the same exposure can generate divergent responses among men and women, especially in settings where gender hierarchy is salient and female authority remains rare.

The results are consistent with this sort of polarizing response to counter-stereotypical authority. Women assigned to female advisors adopt more egalitarian views on women's participation in politics and the labor market, while men move in a more conservative direction. The resulting increase in polarization is large: for gender role attitudes, assignment to a female advisor widens the gender gap by 0.53 standard deviations (s.d.), comparable in magnitude to the raw gender gaps in attitudes among the wider population of educated Lebanese cohorts in the Arab Barometer (2019) survey. These effects persist up to two decades after enrollment, underscoring how brief but salient institutional encounters during early adulthood can durably shape beliefs. They also appear tightly concentrated in the gender domain. We find little evidence of comparable shifts in unrelated social and political attitudes, suggesting that exposure to female authority primarily reshapes beliefs about gender rather than inducing a broader ideological realignment.

We find that the polarization effects are stronger in settings where female authority is rarer and among groups with stronger gender hierarchies. In STEM departments dominated by male faculty, assignment to a female advisor increases polarization in gender role attitudes by 0.74 s.d. and is driven by differential backlash among men. Among religious students, the polarization estimate reaches 0.98 s.d., again reflecting male backlash as well as larger egalitarian shifts for women. These heterogeneity patterns align closely with the model's comparative statics, which imply greater polarization in hierarchical contexts where female authority is more counter-stereotypical.

We present several mechanisms that help sharpen this interpretation. First, we find analogous po-

larizing effects of exposure to female advisors beyond the first year, identified through exogenous advisor turnover. Second, women initially assigned to female advisors subsequently sort into courses with female instructors, consistent with reinforcement through later academic choices. By contrast, randomized exposure to high-performing female peers within advising groups has no effect on long-run gender norms. Moreover, the effects are strongest when the advisor carries greater institutional salience—among advisors with high academic value-added for students and among professorial, especially senior, faculty. Together, these results are most consistent with a distinct role of *oblique* transmission through authority rather than horizontal peer effects or a generic effect of exposure to successful women.

This paper makes four contributions. First, we identify a concrete and policy-relevant driver of gender polarization. A large literature shows that gender norms are both persistent and transmitted across generations (e.g., Alesina et al., 2013; Giuliano and Nunn, 2021), yet also responsive to social and institutional change (see, e.g., Miho et al. (2024), and Giuliano (2018, 2020) for reviews). What remains less well understood is why recent social change has coincided with widening gender divides rather than convergence. We show that expanding female authority helps explain this pattern. More broadly, our results highlight a "progress paradox": institutional advances that elevate women into authority can simultaneously empower women and harden resistance among men. Crucially, we show that polarization is not due to exposure to successful women in general, but to exposure to women in counter-stereotypical, high-status authority roles, where the symbolic meaning of gender change is most pronounced.

Second, we contribute to a growing literature on how exposure to influential women shapes beliefs and behavior. Beaman et al. (2009, 2012) show that female political leadership shifts perceptions and aspirations in India. Dahl et al. (2021) show, in the context of the Norwegian military, that integrating female peers into traditionally male settings can change men's gender attitudes in the short run but that these effects dissipate with time. More recent studies examine workplace channels for norm transmission and adjustment, focusing on labor-market outcomes, work environment, and firm behavior (Aneja et al., forthcoming; Greenberg et al., forthcoming; Minni et al., 2025). Relative to these studies, we separately identify effects of exposure to female versus male authority and trace its effects on *both* women and men—and hence polarization—over a long time horizon.[3] We also add evidence from a foundational but understudied institution: an elite educational setting in which authority relationships are formal, repeated, and consequential at the transition into adulthood. As college access expands globally, such encounters with female authority are likely to become far more common.

Third, we provide new evidence on the mechanisms of cultural transmission by cleanly distinguishing oblique influence via authority figures versus horizontal peer influence. This distinction is central to models of norm persistence (Bisin and Verdier, 2011), but it is especially challenging to identify empirically in naturally occurring settings. In our context, randomized exposure to female authority polarizes

[3]Our findings are closest to Greenberg et al. (forthcoming), who study the introduction of female officers in all-male combat units within the U.S. military. They show that exposure to female officers, who are in positions of authority, does not impact men's job performance and behavior but negatively affects their perception of workplace quality. The latter effect is driven by male officers, who are also in positions of authority, as they become more aware of workplace issues. On the other hand, men report better workplace quality when their unit integrates a female peer. As in that setting, we distinguish exposure to peers from exposure to authority figures and find that backlash is driven primarily by the latter. We also study such exposure at a similarly formative moment of institutional socialization.

long-run beliefs, whereas comparable randomized exposure to high-performing female peers does not. The effect also strengthens with the advisor's rank, consistent with the idea that hierarchical salience is central to how exposure translates into durable belief change. In this sense, our design isolates a mode of transmission that is foundational to many institutions yet difficult to observe directly given confounding peer and family influences.[4]

Finally, we deepen the evidence base on gender role models in education. A large literature studies the effects of same-gender (i) teachers and instructors (Carrell et al., 2010; Muralidharan and Sheth, 2016; Lim and Meer, 2017; Mansour et al., 2022), (ii) advisors (Canaan and Mouganie, 2023), and (iii) external role models (Breda et al., 2023; Porter and Serra, 2020) on student achievement, persistence, and educational choices. Related work also emphasizes that educators' stereotypes and implicit biases can shape students' performance and subsequent trajectories, and that making such biases salient can reduce discriminatory grading (Alesina et al., 2024; Carlana, 2019). We contribute by studying a setting in which students are randomly assigned to faculty advisors in formal institutional roles, by tracing effects on long-run gender norms rather than short-run academic outcomes alone, and by contrasting exposure to female authority with exposure to high-performing female peers.

The paper proceeds as follows. Section 2 describes the institutional setting and advisor assignment. Section 3 details the linked administrative and survey data and our measures of gender norms. Section 4 presents the identification strategy. Section 5 develops the conceptual framework to guide interpretation of the empirical findings. Section 6 reports the main effects and heterogeneity. Section 7 investigates mechanisms for persistence and distinguishes authority from peer channels. Section 8 concludes.

2 Background: Institutional Setting

This section provides relevant contextual background on Lebanon and the American University of Beirut, including the advising system and the academic environment across departments.

2.1 An Elite University in the Middle East

The American University of Beirut (AUB) is a private, secular university in Lebanon that provides a U.S.-style liberal arts education. Its degrees are registered with the New York Board of Regents, and most courses are taught in English. AUB is mid-sized, enrolling 7,338 undergraduates in Fall 2018.[5] It has an 11:1 student–faculty ratio, average class sizes under 25, and a highly credentialed faculty (83% of full-time faculty hold doctoral degrees). The student body is 49% female, while women constitute 40% of full-time faculty (American University of Beirut, 2018)—shares broadly comparable to U.S. institutions.[6] Female representation among AUB faculty has also risen sharply over time: the female-to-male faculty

[4] Olivetti et al. (2020) contrast exposure to one's own working mother with exposure to working mothers among peers, where the latter combines horizontal transmission from classmates and oblique transmission from their mothers.

[5] AUB primarily focuses on undergraduate education, but it also offers master's degrees and a limited number of PhD programs. In Fall 2018, graduate enrollment totaled 1,471 students (American University of Beirut, 2018).

[6] In Fall 2017, women accounted for 57% of undergraduate enrollment and 46% of full-time faculty at U.S. degree-granting post-secondary institutions (National Center for Education Statistics, 2019, 2021).

ratio increased from 0.58 in 2001 to 0.91 in 2021 (Appendix Figure B.1).

AUB is the most selective university in Lebanon. Admission is based on a composite score that equally weighs SAT scores and high school grades. Each major sets its own admissions cutoff, which can vary by cohort, and students enter directly into their chosen major from the first year. Tuition is high by local standards—typically $20,000 to $25,000 per year depending on major—but merit- and need-based financial aid expands access and supports socioeconomic diversity.

AUB's influence extends well beyond the campus. Founded in 1866 by American Protestant missionaries, it evolved into a secular university by the mid-20th century and was among the region's earliest coeducational institutions, admitting women beginning in 1920 (Anderson, 2011). Today it is one of the Middle East's most prestigious universities, with alumni who have played outsized roles in politics and public life across the region. In 2019, AUB graduates made up 18 percent of the Lebanese Parliament (Abou Melhem, 2019). Alumni have served as presidents or prime ministers in Afghanistan, Jordan, Lebanon, Palestine, Sudan, and Syria.[7] Jordan alone has had ten prime ministers who graduated from AUB (Seeni, 2022). AUB's female alumni have also been political pioneers, holding some of the first high-ranking government posts occupied by women in the region.[8]

This setting combines relatively high female educational attainment with persistently unequal political and economic participation. In 2024, women's share of tertiary education in Lebanon was 57%, above the global and Middle East and North Africa (MENA) averages of 53% and 52%, respectively. Yet Lebanon consistently ranks among the lowest countries worldwide on gender gaps in political and economic participation.[9] Female labor force participation is 27.5%—above the MENA average of 20% but far below the global average of 49%—and women hold only 6.3% of parliamentary seats, compared with 18.3% across the MENA (World Bank, 2025).

Lebanon also offers a distinctive context for examining how religiosity shapes the influence of authority figures on gender norms. Religion is a central axis of social identity, and the two dominant groups in Lebanon (and at AUB) are Muslims and Christians. Religious affiliation is embedded in core institutions: the sectarian power-sharing system allocates senior offices across sects,and religious courts govern family affairs including marriage, divorce, child custody, and inheritance. This institutional structure both amplifies religious influence over policymaking and generates cross-religion variation in women's legal rights. Despite these differences, female labor force participation does not differ substantially between Muslim and Christian women (Hajj and Panizza, 2002), consistent with similarly conservative gender norms across both groups.

[7] These include Ismail al-Azhari, Sudan's prime minister (1954–56) and president (1965–1969); Ashraf Ghani, president of Afghanistan (2014–21); Iraq's prime ministers Fadhel al-Jamali (1953–54) and Sa'dun Hammadi (1991); Lebanese prime ministers Salim al-Huss (1998–2000), Fouad Siniora (2005–09), Najib Mikati (2021–25); Syrian president Nazim al-Qudsi (1961–63); Salam Fayyad, the first prime minister of Palestine (2013).

[8] These include, among others, the first female Interior Minister in Lebanon and the Arab world (Raya al-Hassan, 2019), the first female Defense Minister in Lebanon and the Arab world (Zeina Akar, 2020), and a Jordanian minister (Rima Khalaf)

[9] In 2025, Lebanon ranked 136th out of 148 countries on the World Economic Forum's Global Gender Gap Index. This index measures how far women are from parity with men across health, educational attainment, political participation, and economic empowerment. While Lebanon has achieved near parity in education and health, its low levels of political and economic participation drive down its overall ranking (World Economic Forum, 2025).

2.2 The Academic Advising System

Our analysis focuses on students enrolled in AUB's undergraduate programs. Upon admission, students enter directly into their intended major and, at the beginning of each academic year, are randomly assigned an academic advisor from the faculty within their department. This structure closely resembles advising systems at many U.S. universities in which faculty (rather than administrators) serve as students' primary academic advisors.[10]

We leverage this assignment process to identify the causal impact of advisor gender on students' long-run beliefs and attitudes regarding gender norms. Advisor assignment follows a systematic randomization procedure that yields student–advisor matches independent of students' or advisors' gender, beliefs, preferences, or academic ability. Students are sorted alphabetically by surname or numerically by ID (with the sorting method consistent within each year), while advisors are randomly ordered on a separate list. Administrators then sequentially match students to advisors from these ordered lists. While faculty select into advising roles, they have no scope to choose which students they advise.

Faculty advisors play a central role in students' decision-making and are an important determinant of their success. Canaan et al. (2022) show that in this setting, a higher value-added advisor significantly improves students' first-year GPA and on-time graduation, underscoring the critical role that advisors play in shaping student success. Their responsibilities include helping students choose courses and monitoring academic progress. Major academic decisions—such as course withdrawals, changing majors, selecting a minor, applying for exchange programs, taking a semester leave, or applying to graduate school—are typically discussed with advisors. The system is designed to generate repeated interaction: students must meet in person with their advisor at least once per semester to discuss course registration, since the registration PIN required to enroll is provided only by the advisor. Advisors also review and approve academic petitions initiated by students, typically following an in-person meeting.

Importantly, students cannot request or change advisors. The only changes occur when a faculty member exits advising due to sabbatical, retirement, or rotation off advising, in which case the student is re-assigned through the same randomization process. Combined with required semesterly meetings and advisors' control over registration and petitions, this structure makes advisors recurring points of contact—and potential mentors and gatekeepers—whose interactions can shape students' outcomes and perspectives both immediately and over the long term.

Appendix Table B.1 presents summary statistics on academic advisors at the AUB during our study period from 2001–18. Nearly 40% of advisors are women, mirroring their share of faculty over the study period. The majority are professorial faculty, with 47% being Assistant Professors, 10% Associate, and 17% Full.[11] Within departments, female advisors tend to be of lower rank than male advisors, but exhibit no differences in academic value-added for students (Appendix Table B.2). Following Canaan et al.

[10] An estimated 52% of U.S. post-secondary institutions report that full-time faculty advise most first-year students. Faculty advising is more prevalent at colleges focused primarily on undergraduate education, where 84% report that faculty advise most students, compared with 23% of doctoral-granting universities (College Board, 2011). The advising at AUB mirrors that at liberal arts colleges such as Amherst, Middlebury, Swarthmore, Wesleyan, and Williams, where faculty exclusively advise students and carry out the same advising tasks (see Canaan et al., 2022).

[11] The remaining advisors are lecturers/instructors (11%) or other (0.6%)—including research scientists, emeritus faculty, or administrative roles without clear rank—and 15% have missing rank data.

(2022), we leverage the random assignment of students to advisors within department–year to estimate unbiased measures of advisor VA.[12] On average, advisors served for 4.6 years (standard deviation of 3.8). While the majority of advisors mentor fewer than 20 students, some work with many more in any given year: on average advisors have 19 students, but the median is 13 and the 90th percentile is 41.[13] Such variation is largely a function of department size.

2.3 Characterizing the Academic Environment across Departments

Like many universities in the U.S. and elsewhere, there is wide variation in gender representation among students and faculty across departments at AUB. Appendix Table B.3 reports the share of female students and advisors in each department during our study period (2001–2018), with departments listed in descending order by the total number of students.

A first pattern is the familiar divide between STEM and non-STEM fields. Engineering, computer science, physics, and related quantitative disciplines have relatively low female representation among students, often below one-third (e.g., 13.6% in Mechanical Engineering and 26.8% in Computer Science). In contrast, many non-STEM fields have much higher female enrollment (e.g., in the social sciences, humanities, and health sciences). Psychology, media and communications, and English literature enroll more than 80% women, while programs such as nutrition and elementary education are overwhelmingly female. These patterns mirror those observed in universities globally, where women remain underrepresented in technical fields but constitute a majority in many non-STEM disciplines.

A second feature is the frequent mismatch between the gender composition of students and advisors. In many departments, women represent a substantial share of students but a much smaller share of advisors. For example, women constitute roughly half of students in Economics and Biology but less than one-quarter of advisors, while in Chemistry the share of female advisors is below 10% despite women comprising nearly half of students. Similar gaps appear in several engineering and quantitative fields, where female faculty—and therefore potential advisors—remain particularly scarce.

As a result, female advisors are relatively rare in many departments, especially in STEM. In some cases the share of female advisors is close to zero (e.g., Physics), while in others it is only a few percent. When present in these environments, female advisors are therefore likely to stand out relative to the broader departmental context. This variation in the visibility of female authority figures is an important feature of our conceptual framework in Section 5 and our empirical results throughout the paper.

[12] Specifically, we regress students' standardized first-year GPA on department–year fixed effects. We then collapse the residuals to the advisor–year level and construct VA using a leave-one-year-out estimator, where each advisor's VA in a given year is predicted using their students' from all other years (Chetty et al., 2014). Importantly, we also estimate VA using the universe of students excluding our survey respondents, which, combined with the leave-year-out procedure, removes any mechanical correlation between advisor VA and the long-run outcomes we study.

[13] In Appendix Table B.1, columns 1–2 include all advisors in the data, while columns 3–4 restrict to advisors with at least one respondent from our survey described in Section 3. Because advisors with larger advisee rosters are mechanically more likely to have at least one respondent, the means for advisees per year and years served are higher in columns 3–4 but should not be interpreted as selective participation. By contrast, rank distribution and gender composition—unaffected by this mechanical relationship—are similar across samples.

3 Data: A Linked Alumni Survey

This study combines a novel survey of AUB alumni with administrative student records. Below, we describe the data and student population, and then characterize gender norms among respondents.

3.1 Survey Design and Registrar Record Linkage

The first component of our data is a newly collected online survey capturing demographics, current residence, and a broad set of social, political, religious, and gender attitudes among individuals who first enrolled at AUB between 2001 and 2018. To construct the survey sample, the AUB Registrar provided a comprehensive roster of alumni meeting this criteria, which contained 25,530 former students. We fielded the survey between March and May 2025.The Alumni Office implemented a three-wave contact protocol consisting of an initial invitation followed by two reminder emails sent at three-week intervals.[14] To encourage participation, respondents were offered a $15 gift card upon survey completion, with the option to donate the equivalent amount to one of three designated local medical institutions. The incentive options were disclosed in the initial invitation.

After the initial invitation, 923 emails were reported as undeliverable by the survey platform, leaving 24,607 individuals as the effective sampling frame. However, the Alumni Office indicated that some addresses were likely outdated, including student email accounts that remain technically active but are often no longer monitored after graduation. As a result, the 24,607 contacts should be viewed as an upper bound on the population that could realistically be reached.

In total, we received 1,287 complete survey responses and 170 partial responses. These 1,457 responses correspond to a response rate of nearly 6% relative to the alumni-office sampling frame. Because we cannot identify the exact students in that sampling frame within the de-identified registrar data, Figure 1 instead reports cohort-specific response rates relative to the full population of students who enrolled between 2001 and 2018 (31,572 individuals).[15] These rates are relatively stable across cohorts, ranging between 4 and 5 percent, which may reflect sustained alumni engagement over time.

Finally, we link survey responses to administrative records from the AUB Registrar's Office. The registrar data include students' SAT scores, high school of graduation, year and semester of first enrollment, gender, major or department of study, graduation GPA, and the gender of the student's first-year academic advisor. Using identifiers held by the Alumni Office, 1,396 survey respondents were successfully matched to registrar records, and a fully de-identified dataset was then shared with our research team.

Describing Survey Respondents and Representativeness. Table 1 compares survey respondents and non-respondents among all students enrolled at AUB between 2001 and 2018, both overall and separately by gender. Response rates are similar for men (4.2%) and women (4.6%). Panel A reports charac-

[14] Most participants responded either to the initial invitation or after the first reminder, with an average of 0.95 reminders received. The average completion time for the 46-question survey was approximately 10 minutes.

[15] The survey was sent only to alumni with a valid email address on file (24,607 individuals), but this outreach list was not linked to the de-identified registrar data. As a result, we observe the full registrar population and the subset who responded, but cannot identify which specific students were included in the survey sampling frame.

teristics measured prior to first-year-advisor exposure at AUB, and Panel B reports exposure to female instructors in AUB courses.

Among respondents, men and women are similar on some dimensions but differ on others. Men scored higher on SAT Math than women (660 versus 619), while the gender gap in SAT Verbal is small (549 versus 546). Male and female respondents were equally likely to be legacy students (about 18%). Men were somewhat more likely to have attended elite (41% versus 36%) and religious high schools (40% versus 37%). They were also much more likely to be in STEM fields (68% versus 34%). Consistent with this sorting, and with the disproportionate share of male faculty in STEM, male respondents were less likely than female respondents to take courses taught by women (32% versus 43%).

Columns 1–3 show that respondents and non-respondents are very similar on most predetermined characteristics. Respondents score slightly higher on SAT Math (639 versus 632) and SAT Verbal (547 versus 542), but differences in legacy status, birth year, school background, and STEM enrollment are small. The same pattern holds within gender. In columns 4–6, male respondents have somewhat higher SAT scores than male non-respondents and are modestly more likely to be in STEM fields (68% versus 63%), but otherwise look very similar. In columns 7–9, female respondents also score slightly higher on both SAT sections than female non-respondents, while legacy status, birth year, school background, and STEM enrollment are nearly identical across response status.

Exposure to female instructors is likewise very similar for respondents and non-respondents. In the full sample, respondents took nearly the same share of courses with female instructors as non-respondents (0.378 versus 0.381, columns 1–3). The same pattern holds within gender. Among men, respondents were slightly less likely than non-respondents to take courses taught by women (0.016, columns 4–6). Among women, the corresponding differences are also very small (0.005, columns 7–9).

Overall, Table 1 provides little evidence of meaningful compositional differences between respondents and non-respondents on either baseline characteristics or realized exposure to female faculty. In Section 4.3, we provide more direct evidence against selection bias by showing that advisor gender is orthogonal to survey response.

3.2 Characterizing Gender Norms

Having established the representativeness of our survey, we turn now to our primary measures of gender norms and beliefs. The literature conceptualizes these outcomes as multi-dimensional, encompassing both prescriptive views about appropriate roles for men and women and descriptive beliefs about women's status and position in society. Existing survey-based work typically operationalizes gender norms using questions about political leadership, labor market participation, household roles, and perceptions of gender equality (e.g., the World Values Survey, Arab Barometer, and General Social Survey).

We organize seven gender-related survey questions into two conceptually distinct outcome families. The first captures prescriptive beliefs about gender roles: normative views regarding what men and women should do in politics, work, and the household. The second captures perceptions of gender status: beliefs about whether women's position in society and the economy is adequate or has gone "too far." This distinction is well established in the literature, which emphasizes that beliefs about women's

appropriate roles need not coincide with beliefs about women's current status, and that these dimensions can respond differently to shocks (see, e.g., Alesina et al., 2013; Bursztyn et al., 2020; Giuliano, 2020).

The *Gender Role Attitudes* family consists of four binary indicators capturing deeply held normative beliefs. Respondents are coded as one if they answered "Strongly agree" or "Agree," and zero otherwise, to statements asserting that: (i) men are better political leaders than women; (ii) only men should hold the highest political offices (e.g., president or prime minister); (iii) women should stop working after marriage; and (iv) men should be the sole providers for their families. Panel A of Table 2 summarizes these outcomes: 15.4% agree that men are better political leaders, 6.0% support male-only political leadership, 5.2% believe women should stop working after marriage, and 12.1% endorse exclusive male breadwinning. However, gender gaps emerge for three of the four outcomes, with the largest difference observed for political leadership: 25.4% of male students agree that men are better political leaders, compared to only 6.3% of female students.

The *Gender Status Perceptions* family comprises three questions measuring beliefs about women's current position in Lebanese society and the economy. Specifically, respondents were asked whether women's participation in the Lebanese labor market is already sufficient (21.2% agree, Panel B of Table 2), whether women's role in society does not need further improvement (8.5%), and whether women in Lebanon have become "too progressive" (17.3%). As with gender role attitudes, male students are generally more likely than female students to express conservative views along this dimension.

When turning to causal analysis, we follow Kling et al. (2007) and construct standardized indices for each of the two families of outcomes. Each index is defined as the equally weighted average of the z-scores of its component questions. We construct z-scores by subtracting the mean and dividing by the standard deviation among students initially assigned to male advisors, and the resulting indices are re-standardized relative to this same reference group. Higher index values indicate more conservative gender attitudes. The two indices are positively correlated but may capture somewhat distinct preferences (corr. = 0.38). We therefore allow exposure to female authority to affect each dimension differently, and we also consider a pooled index aggregating all seven outcomes for completeness.

4 Empirical Strategy

This section develops our empirical strategy in three steps. First, we propose an estimating equation to identify the causal effects of advisor gender. Second, we validate the randomization process. Third, we rule out systematic non-response bias in our alumni survey.

4.1 Estimating Equation

To identify the impacts of exposure to female versus male advisors, we estimate the following linear regression model for first-year students enrolled at the university between the years 2001 and 2018:

$$\begin{aligned} y_{idgat} \quad = \quad & \beta_1 \cdot \text{female advisor}_a + \beta_2 \cdot \text{female student}_i + \beta_3 \cdot (\text{female advisor}_a \times \text{female student}_i) \\ & + \gamma_{dgt} + \varepsilon_{idgat}, \end{aligned} \tag{1}$$

where y_{idgat} refers to the outcome of interest for student i of gender g in department d matched to advisor a in academic year t. $female\ advisor_a$ is an indicator equal to 1 if advisor a is female and 0 otherwise. $female\ student_i$ is a binary indicator for whether student i is a woman. All specifications include a department-by-year fixed effect (FE), γ_{dt}, which is essential for identification since randomization occurs within the same department and year. We further interact these FE with student gender g, γ_{dgt}, to account for differential trends in gender norms over time within departments. Our core specification includes only these variables, with ε_{idgat} being the error term. As a baseline, we cluster standard errors at the level of treatment, advisor-by-year, and show robustness to randomization inference.

We focus on three main parameters of interest. First, β_1 identifies the effect of assignment to a female versus male advisor for male students. Second, $(\beta_1 + \beta_3)$ identifies this effect for female students. Finally, $-\beta_3$ is our estimate of the polarization effect, which captures the differential impact on the gender gap in outcomes when students are assigned to male rather than female advisors.[16]

In alternative specifications, we add further controls for predetermined student and advisor characteristics besides gender. For students, these include math SAT scores, verbal SAT scores, legacy status, elite high school, religious high school, and birth year fixed effects. We interact all of these controls with student gender to allow for differential trends in norms across same-gender students with different backgrounds prior to AUB. For advisors, these include rank and academic value-added. We interact these controls with student gender, which helps ensure that the findings are driven by student–advisor gender matches rather than other advisor characteristics.

When exploring mechanisms, we also consider an alternative measure of exposure to female advisors that captures cumulative exposure over a student's entire enrollment at AUB. As discussed in Section 2.2, advisor changes arise from exogenous factors outside students' control (e.g., faculty sabbaticals or exit). Exploiting this variation, we re-estimate equation (1), replacing the indicator for having a female initial advisor, $female\ advisor_a$, with the share of female advisors a student is exposed to during their enrollment, $\left(\frac{female\ advisors_a}{total\ advisors_a}\right)$. This specification provides an intensive-margin, repeated-exposure analogue to our baseline extensive-margin design, allowing us to assess whether exposure beyond the first year generates additional or distinct effects.

4.2 Randomization Checks

Under random assignment of students to advisors, the β coefficients in equation (1) should be unbiased and admit a causal interpretation. We validate that random assignment process in two ways.

We first show that predetermined student characteristics are orthogonal to advisor gender within department–year randomization strata, for both male and female students. We estimate equation (1) using the characteristics in Panel A of Table 1, all measured prior to enrollment at AUB. Appendix Table B.4 reports the results separately for male and female students (rows 1–2) and for the gender gap (row 3). Panel A uses the gender of the first-year advisor, while Panel B uses cumulative exposure to female advisors over all years of enrollment. Across nearly all comparisons, differences are small and statistically indistinguishable from zero. The only significant imbalance is in one of 12 specifications:

[16] Meanwhile, β_2 is the average difference in outcomes between female and male students when matched to male advisors.

male students with greater cumulative exposure to female advisors are somewhat more likely to come from religious high schools. While this could reflect chance due to sampling variation, we show, in robustness checks, that flexibly controlling for all predetermined characteristics leaves the main results on gender norms unchanged.

To further assess consistency with random assignment, we complement the regression-based balance checks with formal randomization tests following Carrell and West (2010). Within each department–year cell, we draw 10,000 random samples without replacement, matching the observed size of each advisor group. For each simulated draw, we compute the total number of female students and the sums of Math and Verbal SAT scores. We then construct empirical p-values as the share of simulations in which the given simulated statistic is smaller than its observed counterpart. Under random assignment, these p-values should be uniformly distributed. We test this using χ^2 goodness-of-fit tests for both the full sample and survey respondents (Appendix Table B.5). Among respondents, we fail to reject random assignment for all characteristics: 0 of 99 tests for female students, 0 of 131 for Math SAT, and 0 of 132 for Verbal SAT.[17] In the full sample, only 3 of 921 tests reject the null. Overall, these results provide no evidence of systematic non-random assignment by gender or academic ability.

4.3 Selection into the Alumni Survey

A second identification concern is whether selection into the alumni survey is orthogonal to advisor gender. Selection would threaten identification if (i) advisor gender affects the likelihood of survey response and (ii) the same factors that influence response also shape gender attitudes. For example, if female students assigned to female advisors were more likely to respond—perhaps due to greater satisfaction with their undergraduate experience—our estimates could overstate the long-run effects of female advisor assignment by disproportionately sampling more egalitarian respondents.

Appendix Table B.6 provides direct evidence against this concern. We estimate equation (1) using an indicator for survey response as the outcome and the full sample of students enrolled at AUB between 2001 and 2018. Across both exposure measures—female advisor in the first year and share of female advisors over all years—advisor gender has little systematic effect on response rates for either male or female students. Point estimates are generally small and statistically indistinguishable from zero. We also find no evidence of differential selection by student gender: the implied polarization in response rates is essentially zero across specifications, with estimates between 0 and 0.4 percentage points (p.p.). To further address any remaining concerns, we reweight our baseline effects on gender norms using inverse probability weights based on predicted survey response from the specifications with controls in columns 2 and 4 of Appendix Table B.6 (see Section 6.1 on robustness checks).

We further assess this concern using variation in the timing of survey submission. If advisor gender affected participation in ways correlated with gender norms, selection might differ across survey-response rounds. Three results go against such concerns: (i) advisor gender has no effect on the timing of survey submission (Panel A, Appendix Table B.7), (ii) the effects of advisor gender on gender attitudes are stable across rounds (Panel B, Appendix Table B.7), and (iii) we find virtually identical baseline re-

[17] The smaller number of tests for female students reflects the absence of variation in some department–year cells in the sample.

sults controlling for survey-round FE (see the discussion in Section 6.1). Together, the results in this section show that selective survey participation is unlikely to bias our main findings.

5 Conceptual Framework: Authority, Learning, and Polarizing Norms

Having established the validity of the randomized advisor assignment and long-run survey data, we introduce a simple conceptual framework to guide interpretation of equation (1). The framework combines two forces: (i) belief updating about the institutional legitimacy of female authority and (ii) identity- and status-motivated choice of gender attitudes. The identity component follows Akerlof and Kranton (2000) and related work emphasizing how social image and identity maintenance can distort learning and information processing (Bénabou and Tirole, 2006, 2011).

The model shows how exposure to counter-stereotypical female authority can produce divergent long-run responses among men and women and clarifies the conditions under which such divergence—and resulting polarization—is most pronounced. Our treatment of counter-stereotypical authority is motivated by work on stereotype formation and salience (Bordalo et al., 2016, 2019). This section presents the model's key ingredients and predictions; additional details and proofs are provided in Appendix A.

5.1 A Latent Institutional Regime and Advisor Gender as a Signal

Individuals enter university with incomplete information about how legitimate and feasible female authority is within elite educational pipelines. Formally, let there be an unobserved institutional regime, $\theta \in \{0, 1\}$, where $\theta = 1$ denotes an *egalitarian regime* in which female authority is legitimate and relatively common, and $\theta = 0$ denotes a *patriarchal regime* in which female authority is viewed as illegitimate or rare. A student begins with a prior belief $\pi_0 \equiv \Pr(\theta = 1)$, which we allow to vary across student types and contexts.[18] For example, students in male-dominated fields or with stronger religious identity may hold more patriarchal priors (lower π_0), consistent with documented heterogeneity in gender attitudes across social groups and contexts (e.g., Jayachandran, 2021; Lundberg, 2025).

Students receive a salient signal about the regime from their initial interaction with a faculty advisor. Let $s \in \{0, 1\}$ denote the gender of the assigned advisor, where $s = 1$ indicates a female advisor. We assume the signal is informative about the regime:

$$\begin{aligned} &\Pr(s = 1 \mid \theta = 1) = q_1, \\ &\Pr(s = 1 \mid \theta = 0) = q_0, \qquad q_1 > q_0. \end{aligned} \tag{2}$$

Although advisor assignment is random within department–year strata, students may not know the broader composition of authority in the institution, nor how accepted female authority is within their immediate environment. A first advisor can therefore serve as a salient cue not simply about the raw prevalence of women in authority, but about the legitimacy, acceptance, and social meaning of female

[18] The binary formulation of θ is without loss of generality for the core implications of the model. Key insights extend to a Gaussian model with closed-form posteriors, where $\theta \sim \mathcal{N}(\mu, \sigma)$ and parameters vary by context.

authority in elite settings. We interpret q_1 and q_0 as capturing these perceived signal probabilities from the student's perspective.

Upon observing s, students update beliefs by Bayes' rule:

$$\pi(s) \equiv \Pr(\theta = 1 \mid s) = \frac{\pi_0 \Pr(s \mid \theta = 1)}{\pi_0 \Pr(s \mid \theta = 1) + (1 - \pi_0) \Pr(s \mid \theta = 0)}. \tag{3}$$

A female advisor shifts beliefs toward an egalitarian regime whenever $q_1 > q_0$. The informativeness of this signal is captured by the likelihood ratio $LR \equiv q_1/q_0$. When female authority is perceived to be especially rare under a patriarchal regime (small q_0), LR is large, and the posterior shift induced by a female advisor is correspondingly stronger. Thus, belief updating is amplified precisely in contexts where female authority is more counter-stereotypical.

5.2 Attitudes as a Tradeoff between Accuracy and Identity

Let $a \in [0, 1]$ denote a student's long-run *support for gender equality*, where larger a indicates more egalitarianism. Students choose a by balancing (i) an "accuracy" motive, aligning attitudes with beliefs about the institutional environment, and (ii) an identity-and-status motive, aligning with a gender-typed ideal. We capture this using a quadratic loss representation, following (Akerlof and Kranton, 2000):

$$\min_{a \in [0,1]} (a - \pi(s))^2 + \rho_g(s) (a - \iota_g)^2, \tag{4}$$

where $g \in \{F, M\}$ indexes student gender, $\iota_g \in [0, 1]$ is the identity ideal, and $\rho_g(s) \geq 0$ is the weight placed on identity and status concerns relative to accuracy. We interpret a as an expressed normative stance, so beliefs about the institutional environment can shape attitudes about women's appropriate roles. The first term captures the value of holding attitudes consistent with perceived institutional reality. The second captures identity utility and social-image costs: departing from one's gender-typed ideal may generate dissonance, peer sanction, or anticipated status loss. For expositional simplicity, we normalize the gender-typed ideals to the endpoints: $\iota_F = 1$ and $\iota_M = 0$. However, none of the core comparative statics require these extreme values; it is sufficient that $\iota_F > \iota_M$.

A key mechanism is that counter-stereotypical female authority increases the *salience* of gender identity—through empowerment and aspiration for women, and status threat and norm enforcement for men. We model this as an increase in $\rho_g(s)$ when $s = 1$, especially when female authority is perceived to be rare:

$$\rho_g(s) = \rho_{g0} + \alpha_g \cdot s \cdot (1 - p), \qquad \alpha_g \geq 0. \tag{5}$$

Here, ρ_{g0} is the baseline weight on identity concerns, and α_g governs how strongly identity responds to counter-stereotypical exposure, captured by $s \cdot (1 - p)$, where $p \in [0, 1]$ reflects the perceived prevalence of female authority in the relevant environment (e.g., department or field). When p is low, a female advisor is more counter-stereotypical and thus more salient, generating a stronger identity response. This formulation follows stereotype- and salience-based models in which atypical examples are more attention-grabbing and identity-relevant (Bordalo et al., 2016, 2019). We view p as capturing the baseline

salience of female authority in the student's environment, while q_0 and q_1 govern the informativeness of a particular encounter with a female advisor.[19]

5.3 Closed-form Solution and Core Predictions

The objective in equation (4) is strictly convex, and yields a unique interior optimum:

$$a_g^*(s) = \frac{\pi(s) + \rho_g(s)\,\iota_g}{1 + \rho_g(s)}. \tag{6}$$

Thus, attitudes are a weighted average of (i) the belief-driven component, $\pi(s)$, and (ii) the identity ideal ι_g, with weights governed by $\rho_g(s)$.

Prediction 1 (Women move toward egalitarianism). For women ($\iota_F = 1$),

$$a_F^*(s) = \frac{\pi(s) + \rho_F(s)}{1 + \rho_F(s)} = 1 - \frac{1 - \pi(s)}{1 + \rho_F(s)}.$$

A female advisor increases $\pi(s)$ through belief updating and increases $\rho_F(s)$ through empowerment and role-model salience. Both effects raise $a_F^*(s)$, implying $a_F^*(1) > a_F^*(0)$ whenever $q_1 > q_0$ and $\alpha_F \geq 0$.[20]

Prediction 2 (Male response is ambiguous; conditional backlash). For men ($\iota_M = 0$),

$$a_M^*(s) = \frac{\pi(s)}{1 + \rho_M(s)}.$$

A female advisor increases $\pi(s)$, pushing attitudes toward egalitarianism, but also increases $\rho_M(s)$, strengthening identity- and status-based resistance. Backlash occurs when the latter effect dominates:

$$a_M^*(1) < a_M^*(0) \quad \Longleftrightarrow \quad \frac{\pi(1)}{\pi(0)} < \frac{1 + \rho_M(1)}{1 + \rho_M(0)}. \tag{7}$$

Thus, equation (7) reflects a tradeoff between (i) learning, which pushes men toward more egalitarian views, and (ii) identity- and status-based responses, which can push in the opposite direction. Backlash arises when the latter dominates. This is consistent with identity maintenance overriding learning in the Bénabou and Tirole (2006) framework. In practice, the same factors that make female authority more counter-stereotypical—such as low perceived prevalence of female authority, p—can both heighten its salience and affect how informative it is, so these forces need not vary independently. As a result, stronger backlash in hierarchical settings is not automatic: it arises when the exposure-induced increase in identity and status concerns is sufficiently large relative to the accompanying belief update.

[19] Of course, settings where female authority is less prevalent may both increase salience and make a female advisor more informative. One interpretation is that p corresponds to the prior probability of encountering female authority, for example, $p = \pi_0 q_1 + (1 - \pi_0) q_0$. None of the qualitative results require p to vary independently of these primitives.

[20] Note that the comparison is across exposures rather than relative to each student's own prior. Thus, the model does not imply that women assigned to male advisors become conservative in levels; with sufficiently egalitarian priors they may remain highly egalitarian, even though $a_F^*(0) < a_F^*(1)$.

In a learning-only benchmark where the identity weight does not respond to exposure ($\alpha_F = \alpha_M = 0$), observing a female advisor shifts beliefs toward an egalitarian regime ($\pi(1) > \pi(0)$) and therefore moves both men and women toward more egalitarian attitudes. Polarization is therefore not built into the model. It arises only when counter-stereotypical female authority also raises identity salience sufficiently to overturn learning for men, as in inequality (7). The framework therefore does not assume backlash; it identifies the conditions under which it emerges and predicts it should be strongest precisely where female authority is rare and gender hierarchy is salient (low p, high ρ_{M0}, high α_M).

Corollary (Polarization under male backlash). Define polarization as the gender gap in attitudes:

$$\Delta(s) \equiv a_F^*(s) - a_M^*(s).$$

When women become more egalitarian and men exhibit backlash, the gender gap widens: $\Delta(1) - \Delta(0) > 0$. Thus, under these conditions, exposure to female authority can polarize gender attitudes.

The framework also suggests a pathway to persistence. A brief early encounter can have durable effects if it changes the sequence of later encounters: initial exposure may shift subsequent course-taking, instructor choice, or willingness to engage with female authority, so that later signals reinforce rather than undo the first one. Appendix A.6 formalizes this repeated-exposure logic.

6 Long-Run Effects of Advisors on Gender Norms

We now turn to estimates of the effects of advisors on gender norms, guided by three key insights from the conceptual framework. First, exposure to a female authority figure should shift women toward more egalitarian gender-role attitudes through learning and identity channels. Second, similar exposure may generate backlash among men when the identity- and status-salience induced by counter-stereotypical female authority dominates informational updating. Third, polarization should be strongest in contexts where female authority is most counter-stereotypical or norms are most rigid—in our setting, male-dominated STEM fields and among more religious students.

6.1 Baseline Results: Empowerment and Backlash

We begin with baseline estimates for men, women, and the implied gender gap (polarization) from equation (1). The coefficients in Table 3 capture the effect of being assigned a female rather than a male advisor in the first year of university, measured 7–24 years after enrollment. All outcomes are oriented with higher values being more conservative gender attitudes (i.e., lower a in the model of Section 5).

The results reveal stark and asymmetric long-run responses to early exposure to female authority. Panel A reports estimates for *Conservative Gender Role Attitudes*, beginning in column 1 with the overall index. Male students assigned to a female advisor exhibit more conservative attitudes, with a point estimate of 0.22 standard deviations (s.d.), though this effect is imprecisely estimated (s.e. 0.18). In contrast, female students assigned to a female advisor display a large and statistically significant shift

toward more egalitarian views, with an estimated effect of –0.31 s.d. The resulting increase in gender polarization is substantial and precisely estimated at 0.53 s.d. We find qualitatively similar, though less precisely estimated, patterns for the *Gender Status Perceptions* index in Panel B, column 6: 0.22 s.d. for men, -0.14 for women, and 0.37 for polarization. Appendix Table B.8 (column 1) reports results for an omnibus index combining all seven gender-related survey questions, with the point estimates mirroring those for the *Gender Role Attitudes* index in Table 3: 0.27 (s.e.=0.19) for men, -0.28 (0.13)** for women, and 0.55 (0.22)** for polarization.

Columns 2–5 of Panel A in Table 3 explore heterogeneity across component beliefs of the *Gender Role Attitudes* index. Nearly all outcomes are directionally consistent with the aggregate index, but the magnitudes and precision are largest for attitudes related to women's participation in politics and the labor market. Women with female advisors are 7 p.p. less likely to agree that men are better suited for politics (column 3) and 5.9 p.p. less likely to believe that women should stop working when they get married (column 4). Among male students, the corresponding estimates are noisier but similarly sized: exposure to a female advisor increases agreement with these statements by 7.1 p.p. and 5.0 p.p., respectively. These are large effects relative to the counterfactual of being assigned to male advisors (means at the bottom of the table), and they imply sizable increases in polarization of 14.1 p.p. and 10.8 p.p., respectively. Comparable patterns emerge for beliefs about political leadership more broadly (column 2), while for the statement that "men should be the sole providers for their families," the male response reverses sign but remains small and statistically insignificant (column 5). We observe analogous, though less precisely estimated, effects for components of the *Gender Status Perceptions* index in Panel B (columns 7–9).

To benchmark magnitudes, we compare our estimates to gender norm gaps observed in the Arab Barometer for Lebanon, which includes related questions on women's roles in politics, work, and society. In those data, differences between men and women are typically on the order of 15–24 p.p.[21] The polarization effects we estimate—10–14 p.p. on individual outcomes and over 0.5 s.d. on the composite index—are comparable to, and in some cases exceed, these population-level differences. Importantly, this comparison is conservative: Arab Barometer gaps reflect attitudes shaped by decades of cumulative socialization, whereas our estimates are driven by a single, plausibly exogenous exposure to female authority in the first year of university. That such a short-lived institutional shock generates effects of comparable magnitude underscores both the salience of early adult experiences and the capacity of authority figures to durably shape gender norms.

Interpreted through the model in Section 5, the baseline patterns point to distinct mechanisms for women and men. For women, female advisors increase both the perceived legitimacy of female authority and the salience of aspirational identity, generating durable shifts toward more egalitarian gender attitudes. For men, the estimates suggest that any learning about female competence is offset—or even dominated—by identity and status concerns, consistent with the backlash condition in equation (7). In

[21] We use the 2018–19 wave of the Arab Barometer as it contains questions about women in politics that are identical to those in our survey. We restrict the sample to individuals with at least a bachelor's degree who fall within the same age cohort as our main sample (i.e., aged 21–37 in 2018–19). The gender gaps in the Arab Barometer are close in magnitude to those we document. Women are 14.6 and 23.9 p.p. less likely than men to agree that men make better political leaders and that only men can serve as President or prime minister, respectively. The gender gap in the standardized index of these two questions is on the order of 0.399 s.d.

Section 6.2, we provide further evidence supporting these mechanisms, showing that polarization is amplified in male-dominated STEM fields and among religious students. First, however, we bolster the interpretation of our baseline findings as causal effects of advisor gender on students' gender norms.

Robustness and Placebo Checks. Three results reinforce the consistency of our point estimates and inference. First, Appendix Table B.9 shows that the baseline estimates in Table 3 are robust to including a host of controls for student and advisor characteristics fully interacted with student gender (see Section 4.1). While precision varies, the magnitudes are comparable to baseline estimates, and the key qualitative insights are unchanged. Second, to account for differential survey response rates, we reweight our baseline estimates by the inverse predicted probability of survey response as a function of these controls (see Section 4.3 and Appendix Table B.6). The estimates in Appendix Table B.10 are qualitatively and quantitatively similar to the baseline Table 3. Third, Appendix Table B.11 shows that our clustering on the level of randomization, advisor×year, is robust to a randomization inference procedure.

A growing concern in the political economy literature is that changes in a focal trait may reflect a broader shift in a bundled set of cultural attributes, rather than movement in the targeted or hypothesized mechanism itself.[22] To assess this concern, we re-estimate our baseline specification (1) across a wide set of non-gender outcomes spanning religiosity, sectarian tolerance, trust, political identity, and incentivized behaviors. Appendix Table B.12 reports treatment effects for men (column 1), women (column 2), and the implied polarization gap (column 3), alongside each outcome's raw correlation with our two gender indices (columns 4–5). Outcomes are oriented so that higher values indicate greater support, and are ordered by the strength of their raw correlation with the *Gender Role Attitudes* index.

Across outcomes that are empirically distant from gender norms—including trust measures, political engagement, and donation and prize-claiming behaviors—estimated effects in Table B.12 are uniformly small and statistically indistinguishable from zero. By contrast, the few statistically significant estimates are concentrated among outcomes that are most strongly correlated with our gender attitude indices, such as support for civil and interreligious marriage. This pattern argues against a diffuse "bundled culture" interpretation in which exposure to female authority figures induces broad shifts across social, political, and behavioral domains. Instead, it points to changes that are tightly concentrated in the domain of gender norms, consistent with limited spillovers rather than generalized cultural change.

6.2 Heterogeneity: Male-Dominated Fields and Conservative Backgrounds

The baseline results above suggest that female advisors cause polarization of gender norms driven by a strong shift towards egalitarian norms among women and a somewhat weaker backlash response among men. While these results pool across heterogeneous student populations and contexts within the university, the model in Section 5 delivers clear comparative statics for when polarization should be strongest. This section explores two key dimensions of heterogeneity that shape female empowerment and male backlash. First, we compare fields of study where female authority is more versus less

[22] See Acemoglu and Robinson (2025) for a framework in which culture and institutions are jointly sustained as social equilibria, implying that cultural traits may move together. For related discussions of multidimensional culture and correlated norms, see, e.g., Alesina and Giuliano (2015), Bisin and Verdier (2011), Fernández (2011), Guiso et al. (2006), and Tabellini (2008).

counter-stereotypical based on prevailing gender representation. Second, we distinguish more versus less religious students to capture variation in patriarchal norms and the strength of identity concerns.

STEM versus non-STEM Departments. The model highlights two reasons why effects should be amplified in male-dominated STEM fields. First, female authority is more counter-stereotypical, so a female advisor generates a larger salience shock and thus a larger identity-based response (equation 5). Second, encountering a female advisor may convey more information about the institutional regime (a larger likelihood ratio q_1/q_0), yielding greater belief updating. Both channels strengthen women's egalitarian response and increase the likelihood of backlash among men (equation 7), resulting in greater polarization. We test this implication by splitting the sample into STEM and non-STEM fields, which differ sharply in the scope for counter-stereotypical exposure (see Section 2.3 and Appendix Table B.3).

Consistent with these insights, Table 4 shows larger effects on polarization in departments where women are traditionally underrepresented. While women exhibit similarly sized progressive egalitarian shifts in both non-STEM and STEM fields (columns 1 and 3), male backlash is entirely driven by STEM majors: men assigned to female advisors in STEM exhibit a 0.48 s.d. increase in conservative *Gender Role Attitudes* relative to those assigned to male advisors (column 3). In contrast, there is no evidence of backlash in non-STEM fields; if anything, men display a weak and imprecise progressive shift ($\widehat{\beta}_1 = -0.19$, s.e. 0.27; column 1). As a result, polarization effects are concentrated in STEM: assignment to a female advisor increases the gender gap in *Gender Role Attitudes* by 0.74 s.d. in STEM fields, compared to a small and statistically insignificant 0.13 s.d. in non-STEM fields. As in the baseline results, effects on *Gender Status Perceptions* are weaker, though generally signed in the same direction (columns 2 and 4). Appendix Table B.13 reports results for individual outcomes, and Appendix Table B.14 demonstrates robustness to the additional controls described above.

Taken together, these findings suggest that the consequences of female authority depend critically on the surrounding gender composition. In male-dominated academic environments, female advisors generate polarizing responses, consistent with defensive reactions by men to challenges to traditional gender hierarchies—particularly in relatively conservative and patriarchal settings like Lebanon. In more gender-balanced fields, by contrast, female authority primarily shapes women's attitudes without triggering systematic backlash among men. We next examine whether similar patterns arise along a cultural dimension that also shapes the salience of gender hierarchies.

Religiosity. Religious individuals tend to hold more conservative gender attitudes in many societies. In the model, religious students may enter university with more patriarchal priors, lower perceived prevalence of female authority, stronger baseline identity concerns, and greater sensitivity to norm violations. Each force amplifies polarization: women respond more strongly in an egalitarian direction, while men are more likely to react defensively through backlash.

We test these implications in Table 5 by splitting the sample between students who identify as religious and those who do not. Two features of the data support this exercise. First, while religiosity is strongly correlated with gender attitudes, it is orthogonal to advisor assignment (see row 4 of Appendix

Table B.12). Second, religious students are distributed across departments at AUB rather than being concentrated in a small subset of fields, limiting concerns that these patterns simply proxy for academic environment (see Section 2.3). For example, in our survey sample 61.5% of students in STEM fields identify as religious compared to 63.1% of students in non-STEM fields.[23]

Table 5 shows that female advisors cause relatively stronger norm changes among religious students. Male backlash is entirely driven by this group: religious men assigned to female advisors exhibit a 0.55 s.d. increase in conservative *Gender Role Attitudes* (column 3) and a 0.53 s.d. increase in conservative *Gender Status Perceptions* (column 4). By contrast, there is no evidence of backlash among non-religious men, who, if anything, display weak and imprecise progressive shifts (columns 1 and 2). Among women, we also observe larger egalitarian shifts in prescriptive beliefs for those who identify as religious, though the differences relative to non-religious women are more modest than for men (columns 1 and 3). Combined, these responses generate strong polarization: assignment to a female advisor increases the gender gap in *Gender Role Attitudes* by 0.98 s.d. among religious students, compared to a small and statistically insignificant 0.10 s.d. among the non-religious. Appendix Table B.17 reports results for individual outcomes, and Appendix Table B.18 shows robustness to the additional controls described above.

These findings highlight the role of religious identity in shaping how exposure to female authority translates into long-run gender attitudes. Among students with more traditional priors, university exposure may not narrow gender divides but instead intensify them. Female advisors provide a salient signal of legitimate female authority for religious women, fostering belief updating and identity formation, while posing a sharper challenge to entrenched hierarchies for religious men, triggering defensive responses. The result is greater polarization within an otherwise shared institutional environment.

7 A Counter-Stereotypical Authority Mechanism

The results thus far show that exposure to female advisors in the first year of university fosters persistent polarization in gender norms. The patterns align with a model in which counter-stereotypical authority both (i) signals the legitimacy of women in elite roles and (ii) triggers asymmetric identity-based responses among men and women. The stronger effects in male-dominated STEM fields and among more religious students reinforce this interpretation.

This section provides additional evidence on the channels behind the counter-stereotypical authority mechanism. First, we examine pathways through which initial advisor exposure effects can be reinforced

[23] We also examine alternative measures of religious heterogeneity, including students' reported religious affiliation (Muslim, Christian, Druze) and the religious affiliation of their high schools. Appendix Table B.15 shows that while both capture meaningful cultural variation, differences in gender norms are substantially larger within religious groups than between them, and measures of religiosity explain a significant share of this within-group variation. Consistent with these patterns, Appendix Table B.16 shows that the backlash effects are similar among male students from Christian and Muslim backgrounds, while there is some evidence that female advisors induce a stronger egalitarian shift among Muslim female students. Meanwhile, students from Muslim religious high schools are more conservative on average (0.56 and 0.40 s.d. above the mean on the *Gender Role Attitudes* and *Gender Status Perceptions* indices, respectively), compared to near-zero means among students from Christian schools (-0.10 and -0.02) and secular or non-affiliated schools (-0.03 and -0.03). This is consistent with Anderson (2025), who finds that a higher Muslim population share is significantly correlated with more gender-biased norms. However, the sample of 76 Muslim high-school students is too small to support meaningful heterogeneity analyses.

over time. Second, we distinguish the influence of female authority figures from that of successful female peers, testing whether norm transmission operates primarily through oblique (authority) rather than horizontal (peer) channels. Finally, we use variation in instructor stature to identify heterogeneity in the strength of the counter-stereotypical shock.

7.1 Persistence and Reinforcement Pathways

Our conceptual framework highlights a reinforcement channel that can sustain long-run effects. Initial exposure may shift beliefs and identity directly. It may also influence subsequent choices that shape later encounters with female authority. Such exposure could lead students to select into environments that generate repeated signals, reinforcing earlier updating and identity salience. This feedback can strengthen women's egalitarian shifts and sustain or even amplify men's resistance.[24]

This reinforcement logic motivates three empirical tests. First, we ask whether effects are stronger for advisors who are more academically consequential for students. Second, we test whether cumulative exposure to female advisors beyond the first year amplifies long-run norm changes. Third, we examine whether first-year exposure shifts subsequent course choices toward (or away from) female instructors, providing a behavioral pathway for reinforcement. Together, these tests clarify how a brief early encounter with female authority can generate durable norm changes.

Cohort Variation and an Evolving University Environment. Before turning to these tests, we present suggestive evidence that the baseline effects vary by cohort. Appendix Table B.19 splits the sample at the 2010 entry-year midpoint. Women's egalitarian shift in *Gender Role Attitudes* is similar across cohorts, while polarization is concentrated among more recent cohorts because the male backlash response only materializes after 2010. Patterns for *Gender Status Perceptions* are qualitatively similar.

This cohort pattern admits multiple interpretations, and each points to time-varying scope for reinforcement. One possibility is attenuation: earlier cohorts are observed farther from enrollment, so any backlash response may dissipate as students accumulate additional experiences and exposures. Another is composition: alumni survey coverage, and the mix of students and majors may differ across cohorts. A third is a changing environment. The early-to-mid 2010s saw a marked rise in female faculty representation at AUB (see Section 2.1), and with heightened salience of gender norms as the #MeToo movement and related cultural currents reached Lebanon. These shifts may have affected both the informativeness of exposure to female authority and the identity stakes it triggered. Regardless of the interpretation, these results are striking given recent evidence suggesting that young men are more likely than older men to hold patriarchal values and oppose progress in women's rights, breaking the trend of each generation becoming more liberal than the last (The Economist, May 13, 2024; Kamarck and Muchnick, 2024). Given these distinct but perhaps complementary explanations, we treat the cohort split as suggestive, and use the reinforcement tests below to probe whether and how an initial exposure shock compounds through subsequent encounters.

[24] Appendix Section A.6 illustrates these reinforcement dynamics through a simple extension of the baseline model in Section 5.

High-Academic-Value-Added Advisors Amplify Gender Polarization. If advising shapes students' trajectories, exposure to female authority may matter more when the advisor is especially influential in promoting academic success. We test this in Table 6 by examining whether exposure effects on gender norms are larger for advisors with higher academic value-added. As discussed in Section 2.2, our measure of VA reliably captures how effective an advisor is at promoting student success.

Table 6 shows that polarization in *Gender Role Attitudes* is concentrated among students assigned to high-VA advisors. We split the sample into students randomly assigned to advisors with positive and negative VA. Since VA is mean zero by construction, this corresponds to students assigned to above and below average advisors.[25] For men, assignment to a female advisor increases conservative *Gender Role Attitudes* by 0.47 s.d. (s.e. 0.27) when the advisor has positive VA, compared to a small and imprecise 0.13 s.d. (s.e. 0.41) for negative-VA advisors. For women, the egalitarian shift is likewise concentrated among positive-VA advisors: -0.39 s.d. (s.e. 0.13) versus 0.05 s.d. (s.e. 0.29) for negative VA. The implied polarization effect is large and precisely estimated in the positive-VA sample (0.86 s.d., s.e. 0.29), but close to zero and statistically insignificant for negative-VA advisors (0.08 s.d., s.e. 0.48). And as with other tests, effects on *Gender Status Perceptions* are qualitatively similar albeit smaller and less precise.

These patterns are consistent with an interaction between authority and reinforcement and help interpret the male backlash response through the lens of the model. The fact that backlash is concentrated among high-VA advisors also aligns with evidence from social psychology showing that successful and competent women are often perceived as less likable than comparable men and may face economic penalties (Heilman et al., 2004; Rudman, 1998).

High-VA advisors are likely to be more visible and consequential authority figures, increasing both the informational content of early exposure and the identity stakes of accepting a counter-stereotypical signal. For women, a highly effective female advisor may strengthen belief updating about the legitimacy of female authority and trigger reinforcing academic engagement. For men, the same salience may sharpen perceived challenges to traditional hierarchies, making backlash more likely. These mechanisms are complementary, even if they cannot be fully separated empirically in our setting.

Cumulative Advisor Exposure Beyond First Year. While a majority of students keep the same advisor throughout their time at AUB, 28% of survey respondents experience advisor changes for exogenous reasons such as sabbaticals, retirement, or rotation off advising (see Section 2.2). We use these changes to re-estimate equation (1) based on the cumulative exposure measure: $\left(\frac{female\ advisors_a}{total\ advisors_a}\right)$. This specification tests whether additional exposure beyond the initial randomized encounter appears to reinforce, rather than unwind, the first-year shock. Table 7 reports the results.

While the qualitative patterns closely mirror our baseline initial-advisor estimates, the magnitudes are informative. Moving from zero exposure to female advisors to full exposure across all enrollment years implies a 0.27 s.d. increase in conservative *Gender Role Attitudes* for men (s.e. 0.21) and a 0.48 s.d. decrease for women (s.e. 0.15), yielding a polarization effect of 0.75 s.d. (s.e. 0.26). These estimates are comparable to, and if anything slightly larger than, the baseline effects of first-year exposure in Table 3:

[25] Recall that our baseline results are robust to the inclusion of VA as an additional control (see Appendix Table B.9).

0.22 s.d. (s.e. 0.18) for men and -0.31 s.d. (s.e. 0.13) for women, with implied polarization of 0.53 s.d. (s.e. 0.22). As in the baseline analysis, effects on *Gender Status Perceptions* are similarly signed but less precisely estimated. Appendix results further show that this comparability extends to the robustness checks in Section 6.1 and heterogeneity patterns in Section 6.2.[26]

Together, these results suggest two conclusions. First, the effects of initial advisor assignment are not driven by advisor switching. Second, additional—and, for some, distinct—exposure beyond the first year does not undo the initial shock. If anything, the slightly larger polarization estimates are consistent with reinforcement: later encounters with female authority may compound earlier belief updating for women while sustaining identity-based resistance among men. We turn now to another mechanism for reinforcement inside the classroom.

Course Choices as a Reinforcement Channel. Course-taking provides a natural channel through which a brief first-year advising shock can persist and compound. An advisor may shape beliefs directly, but may also redirect students into academic environments that generate repeated exposure to female authority, different peers, and different course content. These downstream choices can reinforce early updating among women and sustain, or even intensify, resistance among men if repeated encounters raise the identity stakes of counter-stereotypical authority. Identifying such a course-based mechanism for norm change is challenging. We therefore take a reduced-form approach and ask whether first-year exposure to female authority shifts students' subsequent course-taking in systematic ways. Specifically, we estimate equation (1) using measures of course choice as outcomes.

We begin by examining whether first-year advisor assignment changes the gender composition of instructors students encounter over the remainder of their time at AUB.[27] Table 8 provides suggestive evidence of divergence in subsequent instructor exposure. Among women, assignment to a female advisor increases the share of courses taught by female faculty by 2.6 p.p., a 6.2% effect relative to the counterfactual mean among those with male advisors (column 1). Among men, assignment to a female advisor reduces subsequent exposure to female instructors by 0.8 p.p. (2.7% relative to the mean), which is consistent with avoidance, though imprecisely estimated.

The divergence is more pronounced in the environments where we find the strongest polarization in gender norms. In STEM departments, female advisors lead women to take more courses taught by female instructors (-0.038, s.e. 0.022) and men to take fewer (-0.024, s.e. 0.021), implying a statistically significant 6.2 p.p. polarization effect (column 2). In non-STEM fields, both estimates are positive but small and statistically insignificant (column 3). A similar pattern appears by student religiosity. Among more religious students, female advisors substantially increase women's subsequent exposure to female instructors (0.049, s.e. 0.022), while men again move in the opposite direction, though less precisely estimated (-0.009, s.e. 0.030; column 4). Effects for less religious students are qualitatively similar but

[26] Appendix Table B.20 reports robustness to additional student- and advisor-level controls potentially correlated with switching. Appendix Table B.21 reports heterogeneity by STEM field with robustness to controls in Table B.22, and Appendix Table B.23 reports heterogeneity by religiosity with robustness to controls in Table B.24.

[27] We restrict the analysis here to survey respondents entering AUB in 2014 or earlier to ensure that we observe the full sequence of coursework, as our administrative data end in 2018.

smaller and noisier (column 5). These heterogeneous responses closely mirror the groups in which we observe the largest polarization in long-run gender norms (see Tables 4 and 5).

Overall, these patterns point to course-taking as a plausible reinforcement channel. The initial advising assignment may not simply affect beliefs at one moment in time; it appears to shift the stream of authority figures students subsequently encounter inside the classroom. Women assigned to female advisors are more likely to continue encountering female instructors, while men are less responsive and may move in the opposite direction. This endogenous sorting provides a concrete pathway through which an initially brief exposure to female authority can leave durable effects on gender norms.

7.2 Authority vs. Peers: Oblique vs. Horizontal Transmission

A key remaining question is whether our effects are specific to exposure to *authority*, or whether they instead reflect broader exposure to high-achieving women in students' immediate environment. The course-sorting evidence above is consistent with reinforcement through additional contact with female instructors, but it does not by itself distinguish between oblique transmission from authority figures and horizontal transmission through peers. We address this distinction by testing whether exposure to high-performing female *peers* generates similar long-run polarization effects as exposure to female *advisors*.

We focus on high-performing peers to create the closest possible analogue to our main setting. Advisors are high-status figures with formal authority and institutional legitimacy. If our results simply reflect exposure to high-achieving women—rather than authority per se—then being assigned to advising group cohorts with more top-performing women should produce comparable shifts in gender norms. In addition, although advisor groups are designed for advising, they also form a natural peer environment: 9% of survey respondents recalled forming friendships within their advisor group 7–24 years prior (with 5% being unsure).

To implement this test, we exploit the same random assignment to advisor cohorts, but shift the focus from advisor gender to peer composition. Within each department–entry-year, students are randomly assigned to advisor groups that differ in the share and performance distribution of female peers. We estimate two complementary specifications following Mouganie and Wang (2020).

The first specification identifies, for student i, the effects of exposure defined as the share of high-performing women in one's peer group, relative to all students in the group:

$$\begin{aligned} y_{idgtc} \;=\; & \beta_1 \cdot \text{top women}_{-i,c} + \beta_2 \cdot \text{top men}_{-i,c} + \beta_3 \cdot \text{share female}_{-i,c} \\ & + \beta_4 \cdot (\text{top women}_{-i,c} \times \text{female student}_i) + \beta_5 \cdot (\text{top men}_{-i,c} \times \text{female student}_i) \\ & + \beta_6 \cdot (\text{share female}_{-i,t} \times \text{female student}_i) + \eta \cdot \text{SAT}_i + \gamma_{dgt} + \varepsilon_{idgc}, \end{aligned} \tag{8}$$

where $top\ women_{-i,c}$ is the leave-one-out share of advising-group cohort c that is high-performing women, defined using department–year-specific SAT Math percentile p thresholds. We also control for overall gender composition ($share\ female_{-i,c}$) and the share of high-performing men ($top\ men_{-i,c}$). All peer composition measures are standardized to mean zero and standard deviation one. There are three parameters of interest: β_1 captures the effect of a one-s.d. increase in high-performing female peers on

male students, $\beta_1 + \beta_4$ captures the same effect on female students, and $-\beta_4$ captures polarization.

A second specification considers the share of women among all high-performing students:

$$y_{idgt} = \beta_1 \cdot \text{share women top}_{-i,t} + \beta_2 \cdot (\text{share women top}_{-i,t} \times \text{female}_i) + \eta \cdot \text{SAT}_i + \gamma_{dgt} + \varepsilon_{idgt} \quad (9)$$

where $share\ women\ top_{-i,c} = \frac{top\ women_{-i,t}}{top\ women_{-i,c} + top\ men_{-i,c}}$, also standardized to mean zero and unit standard deviation. Both specifications control for own SAT Math score (SAT_i) and are otherwise identical to the baseline equation (1).

Across both specifications, both gender norms indices, and all percentile p thresholds (top 5%, 10%, and 15%), we find null effects. The point estimates in Table 9 are uniformly small—typically below 0.1 s.d.—and statistically indistinguishable from zero. Most importantly, we find no evidence of polarization. Whereas female advisors generate 0.53 s.d. greater polarization in *Gender Role Attitudes* (Table 3), exposure to high-performing female peers yields polarization estimates ranging from -0.07 to -0.12 s.d., depending on the specification and p-threshold used to define high performance.

The contrast between strong advisor effects and null peer effects is difficult to reconcile with a purely "exposure to successful women" story. Instead, it points to an authority-based mechanism: counter-stereotypical examples matter most when they occupy positions of formal authority. Female advisors are not only high-achieving; they represent legitimate institutional power. That combination appears to generate empowerment for women and backlash for men. High-performing female peers, despite being visible and accomplished, do not carry the same hierarchical meaning and thus do not trigger the same belief updating among women and identity-based responses among men.

7.3 Unbundling Authority and Counter-Stereotypes

The previous findings suggest that long-run polarization is triggered by exposure to female *authority* rather than high-achieving female peers. This raises the question of which dimension of authority matters. Our framework in Section 5 implies that the counter-stereotypical shock should be strongest when the woman holds greater institutional stature. Professorial rank is the clearest marker of high status in the university hierarchy, and in our setting women are less represented at higher ranks, making female authority most counter-stereotypical precisely where status is greatest (see Appendix Table B.2). We test this implication by estimating our baseline specification 1 separately by advisor rank.

Table 10 reveals a clear gradient. In panel A, polarization effects are concentrated among *professorial* advisors (columns 1–2): assignment to a female professor produces sizable and statistically significant widening of the gender gap in both *Gender Role Attitudes* (0.88 s.d.) and *Gender Status Perceptions* (0.81 s.d.). By contrast, when the assigned advisor is *non-professorial* (lecturers/instructors), the corresponding polarization estimates are smaller and less consistently signed (columns 3–4). Panel B points in the same direction within the professorial subsample: polarization is somewhat more pronounced for *senior* professors (columns 3–4) relative to more *junior* ones (columns 1–2).

These rank gradients sharpen the interpretation of the advisor effects we identify. Female advisors do not simply provide exposure to successful women; they provide exposure to women occupying the

top of the institutional hierarchy. When status is highest and female representation is lowest, a female advisor may carry greater symbolic weight—both as a stronger signal about women's place in elite roles and as a sharper identity-relevant cue (i.e., a role model for women and a status threat for men). This is precisely the combination that our framework predicts should amplify divergence and thus polarization.

Together with the null peer results in Section 7.2, Table 10 suggests that it is not "successful women" per se that drive polarization, but the social meaning of *counter-stereotypical authority*. The strongest effects emerge where female authority is simultaneously most institutionalized and most exceptional.

8 Conclusion

This paper asks whether exposure to women in authority durably reshapes gender norms—and whether it ultimately narrows or widens gender divides. Exploiting the random assignment of first-year undergraduates to faculty advisors at an elite university in the Middle East and measuring beliefs up to 24 years later, we find that female authority shifts attitudes in opposite directions. Women assigned to female advisors adopt more egalitarian views about women's roles in politics and the labor market. Male students exposed to the same counter-stereotypical authority become more conservative on closely related beliefs. The net effect is a large and persistent increase in polarization.

Our findings highlight a broader lesson about the social meaning of authority exposure. First, divergence is greatest in settings where female authority is both rare and hierarchically salient: in male-dominated STEM departments and among religious students. In these environments, exposure appears to amplify empowerment for women while intensifying identity- and status-based resistance among men. Second, the effects persist through reinforcement rather than dissipating with time. Women assigned to female advisors subsequently sort into courses taught by women, while randomized exposure to high-performing female peers produces little change in long-run norms. Consistent with an authority-based mechanism, the largest effects arise when the initial exposure carries greater institutional weight: among students with more senior advisors and with advisors with higher academic value-added. Together, these patterns point to the distinct normative force of legitimate, hierarchical authority.

The implications extend beyond the university. As women's representation rises in leadership across the economy and public life, societies may experience simultaneous progress and backlash—faster movement toward gender equality for some groups alongside hardening resistance for others. This dynamic is especially likely when integration is rapid, historically male-dominated institutions are disrupted, and exposure occurs during formative years. Expanding women's authority is essential for equality, but our findings suggest it can also reallocate beliefs in ways that undermine consensus and complicate the politics of gender-related reform. Understanding these nonlinear dynamics of cultural change is an important direction for future research on gender norms.

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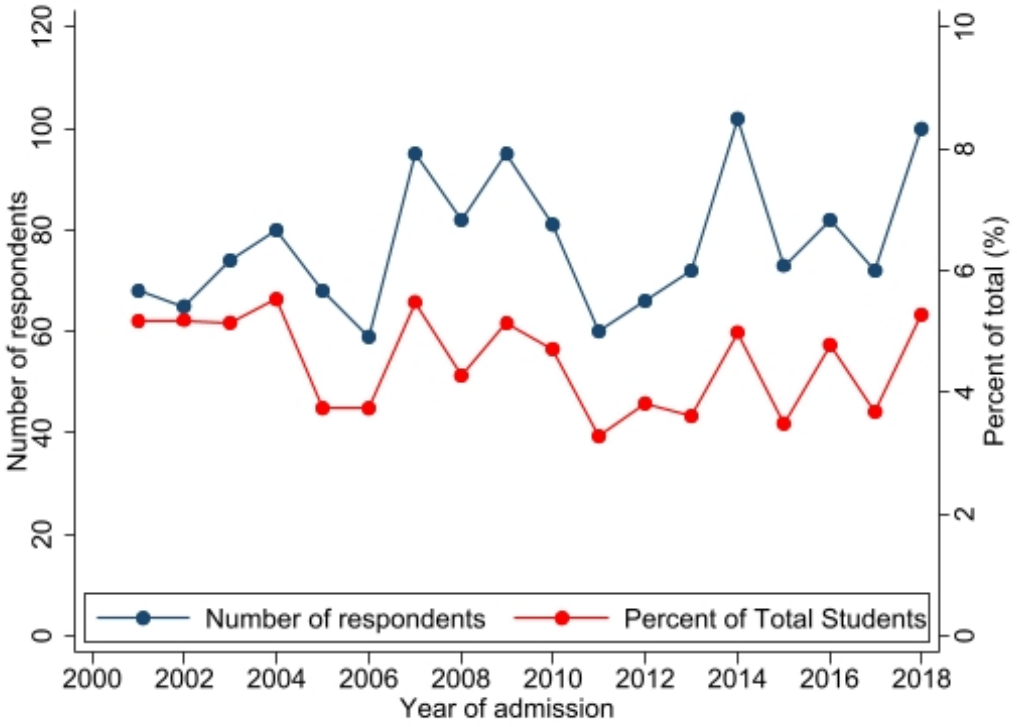
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Figures

Figure 1: Number and Percentage of Respondents by Year of Admission



Notes: The sample includes all students who responded to our survey and who were enrolled at the American University of Beirut between the years 2001 and 2018.

Tables

Table 1: Comparison of Survey Respondents and Non-Respondents

	Full Sample			Men			Women		
	Resp. (1)	Non-Resp. (2)	Diff. (3)	Resp. (4)	Non-Resp. (5)	Diff. (6)	Resp. (7)	Non-Resp. (8)	Diff. (9)
Panel A: Baseline Characteristics									
SAT - Math	639.0	631.5	7.5	659.9	652.6	7.4	619.3	609.5	9.7
	(78.2)	(78.9)		(71.5)	(75.1)		(79.1)	(76.7)	
SAT - Verbal	547.3	542.1	5.3	548.8	542.4	6.5	545.9	541.8	4.2
	(105.6)	(101.0)		(113.9)	(108.7)		(96.8)	(92.3)	
Legacy student	0.185	0.188	-0.003	0.187	0.189	-0.002	0.183	0.187	-0.004
	(0.388)	(0.390)		(0.390)	(0.391)		(0.387)	(0.390)	
Birth year	1990.3	1990.4	-0.07	1990.5	1990.4	0.13	1990.3	1990.5	-0.27
	(5.8)	(5.6)		(5.96)	(5.5)		(5.6)	(5.74)	
Elite high school	0.386	0.406	-0.020	0.410	0.420	-0.010	0.364	0.391	-0.027
	(0.487)	(0.491)		(0.492)	(0.494)		(0.481)	(0.488)	
Religious high school	0.385	0.349	0.036	0.400	0.369	0.031	0.372	0.327	0.045
	(0.487)	(0.477)		(0.490)	(0.483)		(0.484)	(0.469)	
Secular high school	0.615	0.651	-0.036	0.600	0.631	-0.031	0.628	0.673	-0.045
	(0.487)	(0.477)		(0.490)	(0.483)		(0.484)	(0.469)	
Entered STEM Department	0.507	0.489	0.018	0.684	0.629	0.055	0.344	0.347	-0.003
	(0.500)	(0.500)		(0.465)	(0.483)		(0.475)	(0.476)	
Panel B: Outcomes at AUB									
Share courses female taught	0.378	0.381	-0.003	0.322	0.338	-0.016	0.431	0.426	0.005
	(0.162)	(0.172)		(0.143)	(0.159)		(0.162)	(0.174)	
Observations	1,396	30,176		670	15,251		726	14,923	

Notes: This table compares pre-determined characteristics of survey respondents (*Resp.*) and non-respondents (*Non-Resp.*) among all students enrolled at AUB between 2001 and 2018, for the full sample and separately by gender. Non-respondents include students not targeted by the survey as well as targeted students who did not respond; we are unable to separately identify these two groups in our anonymized administrative data. Standard deviations are in parentheses. *Legacy student* is an indicator equal to one if the student has a close relative (parent or sibling) who previously graduated from AUB. *Elite high school* is an indicator equal to one if the student attended a high school classified as elite or progressive based on curriculum and institutional characteristics. This includes: (i) international and American-curriculum schools (e.g., IC Ras Beirut, American Community School, Choueifat branches); (ii) elite French and European schools (e.g., Grand Lyceé Franco-Libanais, Lycée Verdun, German School); (iii) top Lebanese private co-educational schools (e.g., Jamhour, Champville, Evangelical schools); and (iv) other quality private Beirut schools. *Share courses female taught* is the proportion of all courses taken at AUB that were taught by a female instructor.

Table 2: Summary Statistics for Survey Outcomes, By Gender

	All Students (1)	Female Students (2)	Male Students (3)
Panel A: Gender Role Attitudes			
Only men can be President/Prime Minister	0.059	0.042	0.078
Men are better at political leadership	0.154	0.063	0.254
Women should stop working after marriage	0.052	0.036	0.069
Men should be sole provider	0.121	0.125	0.117
Panel B: Gender Status Perceptions			
Women's labor participation is high enough	0.212	0.202	0.222
Women's role does not need improving	0.085	0.066	0.105
Women in Lebanon are too progressive	0.173	0.138	0.211
Observations	1,396	726	670

Notes: The sample includes all students who responded to our survey and who were enrolled at the American University of Beirut (AUB) between 2001 and 2018.

Table 3: Effects of Female Advisors on Gender Norms

	Panel A: Conservative Gender Role Attitudes				
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide
	(1)	(2)	(3)	(4)	(5)
Effects on male students	0.220	0.057	0.071	0.050	-0.023
	(0.181)	(0.054)	(0.067)	(0.044)	(0.058)
Effects on female students	-0.307**	-0.021	-0.070*	-0.059**	-0.088**
	(0.125)	(0.037)	(0.042)	(0.029)	(0.039)
Effects on gender polarization	0.527**	0.078	0.141*	0.108**	0.064
	(0.215)	(0.065)	(0.076)	(0.053)	(0.069)
Observations	1,238	1,238	1,238	1,238	1,238
Mean (Male students, Male advisor)	0.060	0.049	0.233	0.060	0.125
Mean (Female students, Male advisor)	-0.005	0.059	0.103	0.067	0.158

	Panel B: Conservative Gender Status Perceptions			
	Index	Women Work High	Women Role Society	Women Too Progressive
	(6)	(7)	(8)	(9)
Effects on male students	0.224	0.035	0.063	0.076
	(0.186)	(0.074)	(0.056)	(0.062)
Effects on female students	-0.143	-0.027	-0.026	-0.064
	(0.169)	(0.070)	(0.044)	(0.058)
Effects on gender polarization	0.367	0.062	0.089	0.140
	(0.249)	(0.096)	(0.070)	(0.086)
Observations	1,239	1,238	1,238	1,239
Mean (Male students, Male advisor)	0.041	0.210	0.094	0.181
Mean (Female students, Male advisor)	0.048	0.238	0.086	0.172

Notes: This table shows the effects of being assigned a female advisor during first year at university. The sample includes all students enrolled between the years 2001 and 2018. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). The *Effects on gender polarization* effect is equal to the *Effect on male students* minus the *Effect on female students*. In Panel A, column (1) presents the standardized *Gender Role Attitudes* index, and columns (2)–(5) present the individual questions comprising this index. In Panel B, column (6) presents the standardized *Gender Status Perceptions* index, and columns (7)–(9) present the individual questions comprising this index. Individual outcomes are binary indicators equal to one if the respondent agreed or strongly agreed with the statement. All regressions include department-by-year fixed effects as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table 4: Heterogeneous Effects of Female Advisors, by Department Type

	STEM		Non-STEM	
	Gender Role Attitudes (1)	Gender Status Perceptions (2)	Gender Role Attitudes (3)	Gender Status Perceptions (4)
Effects on male students	0.476**	0.329	-0.194	0.055
	(0.225)	(0.246)	(0.267)	(0.278)
Effects on female students	-0.265*	0.017	-0.327*	-0.217
	(0.136)	(0.200)	(0.171)	(0.228)
Effects on gender polarization	0.741***	0.312	0.133	0.271
	(0.260)	(0.301)	(0.307)	(0.364)
Observations	617	618	621	621

Notes: This table shows the effects of being assigned a female advisor during first year at university by the type of department that they entered prior to being assigned their advisor. Columns (1)–(2) report results for students in STEM departments, and columns (3)–(4) report results for students in non-STEM. See Appendix Table B.3 for a breakdown of STEM and non-STEM departments. The specification is otherwise identical to the baseline in Table 3. The sample includes all students enrolled between the years 2001 and 2018. Both index outcomes are standardized. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 5: Heterogeneous Effects of Female Advisors, by Student Religiosity

	Religious		Non-Religious	
	Gender Role Attitudes (1)	Gender Status Perceptions (2)	Gender Role Attitudes (3)	Gender Status Perceptions (4)
Effects on male students	0.552*	0.526*	-0.097	-0.207
	(0.309)	(0.281)	(0.134)	(0.344)
Effects on female students	-0.431***	-0.004	-0.196	-0.444
	(0.156)	(0.249)	(0.199)	(0.316)
Effects on gender polarization	0.983***	0.530	0.099	0.237
	(0.339)	(0.375)	(0.240)	(0.467)
Observations	770	771	468	468

Notes: This table shows the effects of being assigned a female advisor during first year at university by student religiosity. Columns (1)–(2) report results for students who self-identify as religious, and columns (3)–(4) report results for students who self-identify as not religious. The specification is otherwise identical to the baseline in Table 3. The sample includes all students enrolled between the years 2001 and 2018. Both index outcomes are standardized. All regressions are run with the inclusion of department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 6: Heterogeneous Effects of Female Advisors, by Advisor Value Added (VA)

	Gender Role Attitudes		Gender Status Perceptions	
	Positive VA (1)	Negative VA (2)	Positive VA (3)	Negative VA (4)
Effects on male students	0.467*	0.127	0.285	-0.050
	(0.266)	(0.413)	(0.265)	(0.346)
Effects on female students	-0.388**	0.050	-0.093	0.160
	(0.128)	(0.294)	(0.284)	(0.257)
Effects on gender polarization	0.855***	0.078	0.378	-0.209
	(0.294)	(0.477)	(0.391)	(0.413)
Observations	665	573	665	574

Notes: This table shows the effects of being assigned a female advisor during first year for students by advisor value added (VA). Columns (1)–(2) report results for students who were assigned to advisors with above-average VA (positive because VA is standardized), and columns (3)–(4) report results for students who were assigned to advisors with below-average VA (negative because VA is standardized). Advisor VA is estimated exploiting the random assignment of students to advisors within department–year cells. We regress students' standardized first-year GPA on department–year fixed effects, collapse residuals to the advisor–year level, and construct VA using a leave-one-year-out estimator based on students in other years (Chetty et al., 2014). VA is estimated using the universe of students excluding survey respondents, ensuring no mechanical correlation with the outcomes here. See Canaan et al. (2022) for further details. The specification is otherwise identical to the baseline in Table 3. The sample includes all students enrolled between the years 2001 and 2018. Both index outcomes are standardized. All regressions are run with the inclusion of department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 7: Effects of Cumulative Female Advisor Exposure on Gender Norms

	Panel A: Conservative Gender Role Attitudes				
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide
	(1)	(2)	(3)	(4)	(5)
Effects on male students	0.270	0.084	0.143*	0.018	-0.035
	(0.212)	(0.064)	(0.081)	(0.050)	(0.054)
Effects on female students	-0.475***	-0.066*	-0.106**	-0.074*	-0.116**
	(0.145)	(0.038)	(0.043)	(0.039)	(0.049)
Effects on gender polarization	0.745***	0.150**	0.249***	0.092	0.081
	(0.256)	(0.074)	(0.090)	(0.063)	(0.073)
Observations	1,240	1,240	1,240	1,240	1,240
Mean (Male students, No female advisors)	0.049	0.044	0.218	0.066	0.128
Mean (Female students, No female advisors)	0.089	0.083	0.124	0.076	0.174

	Panel B: Conservative Gender Status Perceptions			
	Index	Women Work High	Women Role Society	Women Too Progressive
	(6)	(7)	(8)	(9)
Effects on male students	0.324	0.093	0.066	0.106
	(0.216)	(0.079)	(0.062)	(0.073)
Effects on female students	-0.006	-0.019	-0.032	0.056
	(0.178)	(0.078)	(0.049)	(0.070)
Effects on gender polarization	0.330	0.112	0.098	0.050
	(0.279)	(0.108)	(0.079)	(0.103)
Observations	1,241	1,240	1,240	1,241
Mean (Male students, No female advisors)	0.020	0.197	0.094	0.174
Mean (Female students, No female advisors)	-0.014	0.236	0.089	0.115

Notes: This table shows the effects of the proportion of female advisors (continuous) students are exposed to throughout their university career, as distinct from the initial first year female advisor (binary) exposure in the baseline Table 3. The sample includes all students enrolled between the years 2001 and 2018. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). The *Effects on gender polarization* effect is equal to the *Effect on male students* minus the *Effect on female students*. In Panel A, column (1) presents the standardized *Gender Role Attitudes* index, and columns (2)–(5) present the individual questions comprising this index. In Panel B, column (6) presents the standardized *Gender Status Perceptions* index, and columns (7)–(9) present the individual questions comprising this index. Individual outcomes are binary indicators equal to one if the respondent agreed or strongly agreed with the statement. All regressions include department-by-year fixed effects as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 8: Effects of Female Advisors on Proportion of Female Instructors

	Dep. Var.: Share of Courses Taught by Women				
	All Students (1)	STEM Dept. (2)	Non-STEM Dept. (3)	Religious Students (4)	Non-Religious Students (5)
Effects on male students	-0.008	-0.024	0.012	-0.009	-0.014
	(0.018)	(0.021)	(0.029)	(0.030)	(0.028)
Effects on female students	0.026*	0.038*	0.021	0.049**	0.011
	(0.015)	(0.022)	(0.019)	(0.022)	(0.036)
Effects on gender polarization	-0.033	-0.062**	-0.008	-0.058	-0.025
	(0.023)	(0.029)	(0.034)	(0.038)	(0.046)
Observations	1,044	512	532	571	356
Mean (Male students, No female advisors)	0.295	0.266	0.369	0.305	0.280
Mean (Female students, No female advisors)	0.421	0.311	0.475	0.412	0.425

Notes: This table shows the effects of having a female advisor on the proportion of female instructors in all courses taken by students during their enrollment at the AUB. The sample includes students entering AUB in 2014 or prior as we do not observe completed course histories for students entering from 2015–2018 due to administrative data coverage. This explains the somewhat smaller sample sizes relative to the baseline survey population in prior tables. Column (1) reports results for the full survey population. Columns (2) and (3) split by STEM and non-STEM majors as in Table 4. Columns (4) and (5) split by self-reported religiosity as in Table 5. The sample includes students entering in 2014 or prior. The specification is identical to the baseline Table 3. All regressions include department-by-year interacted with student gender fixed effects. Standard errors clustered by advisor–year are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table 9: Effects of High-Performing Female Peers on Gender Norms

	Gender Role Attitudes			Gender Status Perceptions		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Share of Top Women in Cohort					
	Top 5%	Top 10%	Top 15%	Top 5%	Top 10%	Top 15%
Effects on male students	-0.076	-0.061	-0.058	0.047	0.025	0.130
	(0.105)	(0.112)	(0.100)	(0.089)	(0.129)	(0.119)
Effects on female students	-0.018	-0.024	0.022	-0.045	-0.013	-0.006
	(0.056)	(0.047)	(0.047)	(0.045)	(0.047)	(0.046)
Effects on polarization	-0.058	-0.037	-0.081	0.092	0.038	0.136
	(0.119)	(0.122)	(0.111)	(0.100)	(0.137)	(0.128)
Observations	906	906	906	906	906	906
	Panel B: Share of Women among Top Performers in Cohort					
	Top 5%	Top 10%	Top 15%	Top 5%	Top 10%	Top 15%
Effects on male students	-0.033	-0.092	-0.109	-0.121	-0.183	-0.114
	(0.098)	(0.090)	(0.079)	(0.108)	(0.109)	(0.133)
Effects on female students	-0.026	-0.034	0.016	-0.014	-0.076	-0.031
	(0.064)	(0.065)	(0.068)	(0.102)	(0.091)	(0.083)
Effects on polarization	-0.007	-0.058	-0.124	-0.107	-0.107	-0.083
	(0.117)	(0.112)	(0.104)	(0.148)	(0.142)	(0.157)
Observations	952	1,044	1,104	952	1,044	1,104

Notes: This table shows the effects of exposure to high-performing female peers on gender norms where peers are all of those other first-year students randomly assigned to one's advising group. As in equation (8), Panel A measures exposure as the share of the advising-group-peer cohort that is top women (controlling for the proportion of female peers as well as the proportion of top male peers). As in equation (9), Panel B measures exposure as share of women among top performers. Top performers are defined as those in the top 5% (columns 1 and 4), top 10% (columns 2 and 5), and top 15% (columns 3 and 6) of the department–year-specific Math SAT distribution. Sample sizes fall relative to the baseline in Table 3 as we lose observations across panels and columns where there are no male or female in the relative top X% in an advisor group. All regressions control for own SAT Math score. The specification is otherwise identical to the baseline in Table 3. The sample includes all students enrolled between the years 2001 and 2018. Both index outcomes are standardized. All regressions are run with the inclusion of department-by-year fixed effects interacted with student gender. Standard errors clustered by advisor–year are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table 10: Heterogeneous Effects of Female Advisors, by Professorial Status and Rank

	Panel A: Professorial vs. Non-Professorial Faculty			
	Professorial		Non-Professorial	
	Gender Role Attitudes (1)	Gender Status Perceptions (2)	Gender Role Attitudes (3)	Gender Status Perceptions (4)
Effects on male students	0.418	0.393	-0.045	0.034
	(0.290)	(0.296)	(0.346)	(0.222)
Effects on female students	-0.462**	-0.420*	-0.196	0.399*
	(0.206)	(0.233)	(0.328)	(0.224)
Effects on gender polarization	0.880**	0.813**	0.151	-0.365
	(0.354)	(0.366)	(0.479)	(0.339)
Observations	883	884	355	355

	Panel B: Junior vs. Senior Professorial Faculty			
	Junior Professors		Senior Professors	
	Gender Role Attitudes (1)	Gender Status Perceptions (2)	Gender Role Attitudes (3)	Gender Status Perceptions (4)
Effects on male students	0.584	-0.074	0.190	0.695
	(0.436)	(0.367)	(0.425)	(0.573)
Effects on female students	0.044	-0.570*	-0.903**	0.270
	(0.240)	(0.328)	(0.429)	(0.340)
Effects on gender polarization	0.540	0.496	1.093*	0.425
	(0.494)	(0.482)	(0.578)	(0.672)
Observations	363	363	520	521

Notes: This table shows heterogeneity in the effects of being assigned a female advisor by advisor professorial status and rank. In Panel A, columns (1) and (2) report results for students assigned to advisors who are professorial faculty (assistant, associate, and full professors), and columns (3) and (4) report results for students assigned to advisors who are non-professorial faculty (lecturers, instructors). In Panel B, we restrict to professorial faculty only and compare junior professors (assistant professors) in columns (1)–(2) to senior professors (associate and full professors) in columns (3)–(4). See Appendix Table B.1 for a full breakdown of advisors across rank and status. Because some advisors have missing rank information in the administrative data, in Panel A, columns 3–4, we include an indicator for missing rank and its interaction with student gender as controls. Results are similar when including these missing-rank advisor observations in the other columns instead. The specification is otherwise identical to the baseline in Table 3. The sample includes all students enrolled between the years 2001 and 2018. Both index outcomes are standardized. All regressions are run with the inclusion of department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Appendix (For Online Publication)

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A Model Appendix: Details and Derivations

This appendix provides full derivations for the conceptual framework in Section 5. We (i) derive belief updating from advisor gender, (ii) solve the attitude choice problem, (iii) establish conditions for egalitarian shifts and backlash, (iv) provide comparative statics mapping to our heterogeneity patterns, and extend the model to allow for repeated interactions and reinforcement effects.

A.1 Belief updating from advisor gender

Let the latent regime be $\theta \in \{0, 1\}$ with $\theta = 1$ denoting an egalitarian regime. Students hold prior $\pi_0 = \Pr(\theta = 1) \in (0, 1)$. The advisor gender signal is $s \in \{0, 1\}$, where $s = 1$ indicates a female advisor. The signal structure is

$$\Pr(s = 1 \mid \theta = 1) = q_1, \qquad \Pr(s = 1 \mid \theta = 0) = q_0, \qquad q_1 > q_0.$$

Posterior Beliefs. Bayes' rule yields

$$\pi(1) \equiv \Pr(\theta = 1 \mid s = 1) = \frac{\pi_0 q_1}{\pi_0 q_1 + (1 - \pi_0) q_0}, \tag{A.1}$$

$$\pi(0) \equiv \Pr(\theta = 1 \mid s = 0) = \frac{\pi_0 (1 - q_1)}{\pi_0 (1 - q_1) + (1 - \pi_0)(1 - q_0)}. \tag{A.2}$$

Monotonicity: Female Advisor Shifts Beliefs toward the Egalitarian Regime. Define the prior odds $O_0 = \pi_0/(1 - \pi_0)$. Posterior odds after observing $s = 1$ satisfy

$$\frac{\pi(1)}{1 - \pi(1)} = O_0 \cdot \frac{q_1}{q_0}.$$

Because $q_1/q_0 > 1$, we have $\pi(1) > \pi_0$. Similarly, after observing $s = 0$,

$$\frac{\pi(0)}{1 - \pi(0)} = O_0 \cdot \frac{1 - q_1}{1 - q_0},$$

and since $q_1 > q_0$ implies $(1 - q_1)/(1 - q_0) < 1$, we have $\pi(0) < \pi_0$. Hence

$$\pi(1) > \pi_0 > \pi(0). \tag{A.3}$$

Posterior Gap and Informativeness. A direct expression for the posterior gap is

$$\pi(1) - \pi(0) = \frac{\pi_0 (1 - \pi_0)(q_1 - q_0)}{\Big(\pi_0 q_1 + (1 - \pi_0) q_0\Big)\Big(\pi_0 (1 - q_1) + (1 - \pi_0)(1 - q_0)\Big)} > 0. \tag{A.4}$$

The gap is increasing in $(q_1 - q_0)$ and, more generally, in the likelihood ratio $LR = q_1/q_0$.

Comparative Statics for Posterior Beliefs. Differentiating (A.1) gives

$$\frac{\partial \pi(1)}{\partial q_1} = \frac{\pi_0(1-\pi_0)q_0}{\big(\pi_0 q_1 + (1-\pi_0)q_0\big)^2} > 0, \tag{A.5}$$

$$\frac{\partial \pi(1)}{\partial q_0} = -\frac{\pi_0(1-\pi_0)q_1}{\big(\pi_0 q_1 + (1-\pi_0)q_0\big)^2} < 0, \tag{A.6}$$

$$\frac{\partial \pi(1)}{\partial \pi_0} = \frac{q_0 q_1}{\big(\pi_0(q_1-q_0)+q_0\big)^2} > 0. \tag{A.7}$$

Thus, holding fixed q_1, a smaller q_0 (female authority rarer under the patriarchal regime) increases the informativeness of observing a female advisor.

A.2 Attitude Choice Problem

Let $a \in [0,1]$ denote support for gender equality (higher a is more egalitarian). After observing s, a student of gender $g \in \{F, M\}$ chooses a to minimize

$$L(a; g, s) = (a - \pi(s))^2 + \rho_g(s)\,(a - \iota_g)^2, \tag{A.8}$$

where ι_g is the identity ideal and $\rho_g(s) \geq 0$ is the weight on identity/status relative to accuracy.

Solution. The first-order condition is

$$2(a - \pi(s)) + 2\rho_g(s)(a - \iota_g) = 0.$$

Solving yields

$$a_g^*(s) = \frac{\pi(s) + \rho_g(s)\iota_g}{1 + \rho_g(s)}. \tag{A.9}$$

Derivatives. From (A.9),

$$\frac{\partial a_g^*}{\partial \pi(s)} = \frac{1}{1+\rho_g(s)} > 0, \tag{A.10}$$

$$\frac{\partial a_g^*}{\partial \rho_g(s)} = \frac{\iota_g - \pi(s)}{(1+\rho_g(s))^2}. \tag{A.11}$$

Hence, increases in identity weight raise expressed egalitarianism whenever $\iota_g > \pi(s)$ and lower it whenever $\iota_g < \pi(s)$. The signs used in the main comparative statics in the paper therefore do not require extreme endpoint ideals; it is sufficient that $\iota_F > \iota_M$.

A.3 Salience and Counter-stereotypical Authority

We model identity salience as

$$\rho_g(s) = \rho_{g0} + \alpha_g \cdot s \cdot (1-p), \qquad \alpha_g \geq 0, \tag{A.12}$$

where $p \in [0,1]$ is the perceived prevalence of female authority and $(1-p)$ captures counter-stereotypicality. Then, for $s=1$,

$$\frac{\partial \rho_g(1)}{\partial p} = -\alpha_g.$$

Combining with (A.11), we obtain

$$\frac{\partial a_g^*(1)}{\partial p} = \frac{\partial a_g^*}{\partial \rho_g(1)} \cdot \frac{\partial \rho_g(1)}{\partial p} = -\alpha_g \cdot \frac{\iota_g - \pi(1)}{(1+\rho_g(1))^2}. \tag{A.13}$$

For women (with $\iota_F = 1$), $\iota_F - \pi(1) > 0$ and thus $\partial a_F^*(1)/\partial p < 0$: women's egalitarian shift is larger when female authority is rarer (smaller p). For men (with $\iota_M = 0$), $\iota_M - \pi(1) < 0$ and thus $\partial a_M^*(1)/\partial p > 0$: men's egalitarianism declines when female authority is more counter-stereotypical (smaller p), consistent with stronger backlash in those contexts.

Note that π_0 and q_0 play distinct roles. A lower π_0 means the student begins with a more patriarchal prior; a lower q_0 means observing a female advisor is less likely under a patriarchal regime and hence more informative. These objects need not move together.

A.4 Exposure Effects: Women, Men, and the Backlash Condition

Women. For women, set $\iota_F = 1$:

$$a_F^*(s) = \frac{\pi(s) + \rho_F(s)}{1 + \rho_F(s)} = 1 - \frac{1 - \pi(s)}{1 + \rho_F(s)}.$$

Because $\pi(1) > \pi(0)$ by (A.3) and $\rho_F(1) \geq \rho_F(0)$ by (A.12), both the numerator and denominator of the last expression move in a direction that increases a_F^*, implying

$$a_F^*(1) > a_F^*(0). \tag{A.14}$$

Men. For men, set $\iota_M = 0$:

$$a_M^*(s) = \frac{\pi(s)}{1 + \rho_M(s)}.$$

Then

$$a_M^*(1) - a_M^*(0) = \frac{\pi(1)}{1 + \rho_M(1)} - \frac{\pi(0)}{1 + \rho_M(0)}. \tag{A.15}$$

The sign is ambiguous.

Backlash. Men exhibit backlash ($a_M^*(1) < a_M^*(0)$) iff

$$\frac{\pi(1)}{\pi(0)} < \frac{1 + \rho_M(1)}{1 + \rho_M(0)}. \tag{A.16}$$

Using $\rho_M(1) = \rho_{M0} + \alpha_M(1-p)$ and $\rho_M(0) = \rho_{M0}$, backlash is more likely when α_M is larger and/or p is smaller (female authority more counter-stereotypical).

Local Approximation. For intuition, consider a small-change approximation around (π, ρ):

$$da_M^* \approx \frac{1}{1+\rho}\, d\pi - \frac{\pi}{(1+\rho)^2}\, d\rho.$$

Thus backlash is more likely when the identity-salience effect $d\rho$ is large relative to the informational update $d\pi$, especially when π is not too small and ρ is large.

Learning-only benchmark. If $\alpha_F = \alpha_M = 0$, then $\rho_g(1) = \rho_g(0)$ for both genders. Since $\pi(1) > \pi(0)$, it follows immediately that $a_F^*(1) > a_F^*(0)$ and $a_M^*(1) > a_M^*(0)$. Hence male backlash, and any resulting increase in polarization, requires the exposure-induced identity channel.

A.5 Polarization

Define the gender gap in egalitarian attitudes as

$$\Delta(s) = a_F^*(s) - a_M^*(s).$$

Then the exposure-induced change in polarization is

$$\Delta(1) - \Delta(0) = \big[a_F^*(1) - a_F^*(0)\big] - \big[a_M^*(1) - a_M^*(0)\big]. \tag{A.17}$$

Whenever women become more egalitarian (A.14) and men exhibit backlash ($a_M^*(1) - a_M^*(0) < 0$), polarization must increase: $\Delta(1) - \Delta(0) > 0$.

A.6 Repeated Exposure and Reinforcement

Suppose students face N authority encounters indexed by $t = 1, \ldots, N$, each generating an independent signal $s_t \in \{0, 1\}$ with the same likelihoods as above. Let $K = \sum_{t=1}^{N} s_t$ denote the number of female authority encounters. Standard Bayesian updating implies the posterior log-odds after N encounters satisfy:

$$\log \frac{\pi_N}{1 - \pi_N} = \log \frac{\pi_0}{1 - \pi_0} + K \log \frac{q_1}{q_0} + (N - K) \log \frac{1 - q_1}{1 - q_0}. \tag{A.18}$$

Hence, holding N fixed, more female encounters (K larger) increase π_N whenever $q_1 > q_0$.

Identity salience may also accumulate with repeated counter-stereotypical exposure:

$$\rho_{g,N} = \rho_{g0} + \alpha_g(1 - p)\, K. \tag{A.19}$$

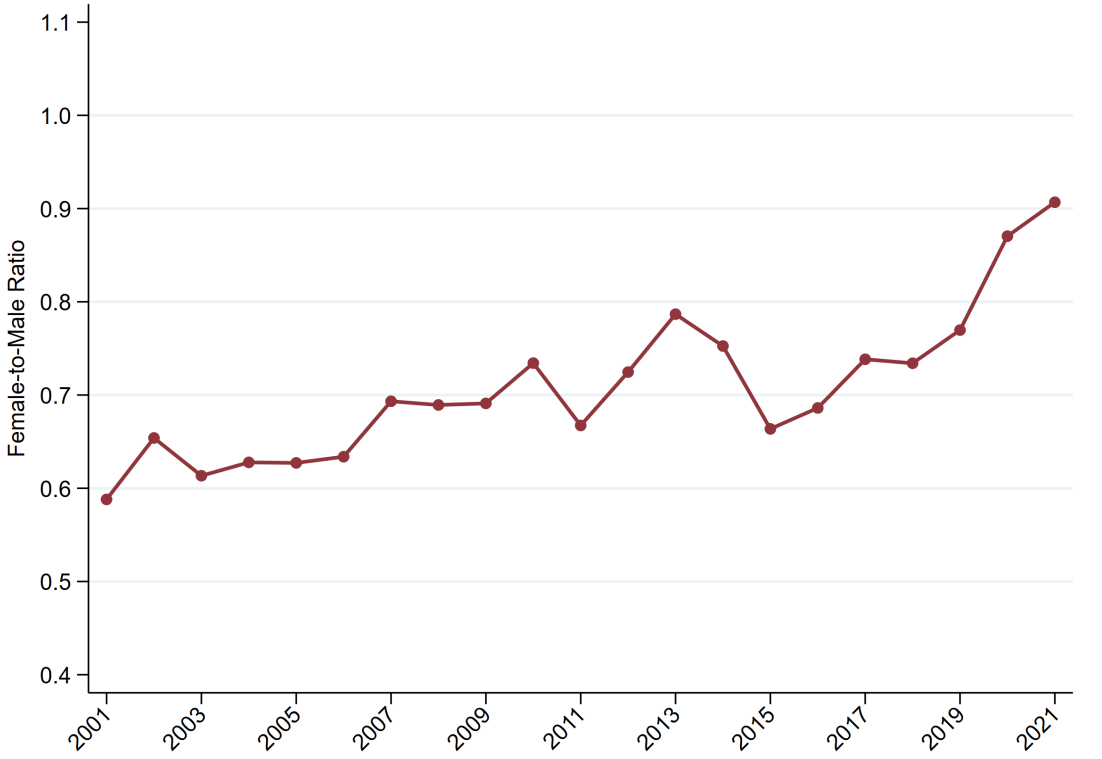
Long-run attitudes after N encounters are

$$a_{g,N}^* = \frac{\pi_N + \rho_{g,N}\iota_g}{1 + \rho_{g,N}}. \tag{A.20}$$

For women ($\iota_F = 1$), both π_N and $\rho_{F,N}$ rising in K push toward more egalitarian attitudes. For men ($\iota_M = 0$), π_N pushes toward egalitarian attitudes while $\rho_{M,N}$ pushes toward backlash, so the net effect of repeated exposure is ambiguous and governed by the analog of condition (A.16).

B Appendix Figures and Tables

Figure B.1: AUB Faculty: Female-to-Male Ratio, 2001–2021



Notes: The figure displays the ratio of female to male instructional faculty at the American University of Beirut from 2001 to 2021. A ratio of 1.0 indicates gender parity. Data are drawn from the AUB Common Data Sets (Section I: Instructional Faculty), published annually by the AUB Office of Institutional Effectiveness and Decision Support.

Table B.1: Advisor Characteristics

	All Advisors		Respondents' Advisors	
	Mean	Std. Dev.	Mean	Std. Dev.
	(1)	(2)	(3)	(4)
Female advisor	0.391		0.371	
Rank Distribution				
Full professor	0.233		0.199	
Associate professor	0.195		0.190	
Assistant professor	0.326		0.306	
Lecturer/Instructor	0.094		0.110	
Other	0.008		0.009	
Missing rank	0.145		0.187	
Years served	4.56	(3.83)	5.83	(4.00)
Advisees/year	19.1	(22.4)	25.0	(24.9)
Number of unique advisors	519		337	

Notes: This table presents characteristics of academic advisors. Columns 1–2 include all advisors observed in the data. Columns 3–4 restrict to advisors whose advisees include at least one survey respondent. Standard deviations are in parentheses. *Other* includes advisors whose rank is recorded in the data but does not match any of the four standard academic ranks (e.g., research scientists, emeritus faculty, or administrative titles without a clear professorial rank). *Missing rank* includes advisors for whom no rank information is available in any year of the data. Advisors with larger advisee rosters are mechanically more likely to appear in columns 3–4, since the probability of having at least one respondent increases with the number of advisees. As a result, mean values of advisees per year and years served are expected to be somewhat higher among respondents' advisors than in the full sample, and should not be interpreted as evidence of selective participation by advisor type. Rank distribution and gender composition—which are not subject to this mechanical relationship—are similar across both samples.

Table B.2: Female vs. Male Advisor Characteristics

	Value-Added	Professorial
	(1)	(2)
Female Advisor	0.001	-0.259^{***}
	(0.009)	(0.029)
Male Advisor Mean	-0.009	0.878
Observations	2,075	2,340
Department–Year FE	Yes	Yes

Notes: This table compares characteristics of female and male advisors within department–year cells. The unit of observation is advisor–year. Column (1) reports differences in advisor value-added, estimated using first-year GPA. Column (2) reports differences in professorial status (1 = Assistant, Associate, or Full Professor; 0 = Lecturer, Instructor, or other non-professorial). All specifications include department-by-year fixed effects and report robust standard errors in parentheses. $^{*} < 0.10$, $^{**} < 0.05$, $^{***} < 0.01$.

Table B.3: Share of Female Students and Female Advisors by Department

Department	Faculty	Type	Share Female Students	Share Female Advisors	Year Range	In Survey
Business Administration	OSB	Non-STEM	0.549	0.446	2001–2018	Yes
Biology	FAS	STEM	0.520	0.217	2001–2018	Yes
Nursing	FHS	Non-STEM	0.636	0.669	2002–2018	Yes
Computer Science	FAS	STEM	0.268	0.158	2001–2018	Yes
Computer & Comm. Engineering	FEA	STEM	0.306	0.023	2001–2018	Yes
Civil Engineering	FEA	STEM	0.249	0.116	2001–2018	Yes
Economics	FAS	STEM	0.513	0.190	2001–2018	Yes
Mechanical Engineering	FEA	STEM	0.136	0.061	2001–2018	Yes
Electrical & Computer Eng.	FEA	STEM	0.210	0.068	2001–2018	Yes
Chemistry	FAS	STEM	0.454	0.079	2001–2018	Yes
Agriculture	FAFS	Non-STEM	0.412	0.082	2001–2018	Yes
Physics	FAS	STEM	0.246	0.000	2001–2018	Yes
Mathematics (BS)	FAS	STEM	0.394	0.165	2002–2018	Yes
Nutrition & Dietetics	FHS	Non-STEM	0.975	0.600	2001–2018	Yes
Psychology	FAS	Non-STEM	0.830	0.652	2001–2018	Yes
Environmental Health	FHS	Non-STEM	0.673	0.871	2001–2018	Yes
Architecture	FEA	Non-STEM	0.723	0.607	2001–2018	Yes
Graphic Design	FEA	Non-STEM	0.844	0.589	2001–2018	Yes
Political Science	FAS	Non-STEM	0.592	0.239	2001–2018	Yes
Food Science & Management	FAFS	Non-STEM	0.784	0.370	2004–2018	Yes
Public Administration	FAS	Non-STEM	0.585	0.545	2001–2018	Yes
Middle Eastern Lang. & Translation	FAS	Non-STEM	0.609	0.930	2001–2009	Yes
Landscape Design & Ecosys. Mgmt.	FAFS	Non-STEM	0.769	0.740	2002–2015	Yes
Chemical Engineering	FEA	STEM	0.545	0.054	2011–2018	Yes
Medical Laboratory Sciences	FHS	Non-STEM	0.703	0.957	2011–2018	Yes
Elementary Education	FAS	Non-STEM	0.918	0.498	2002–2018	Yes
Media & Communications	FAS	Non-STEM	0.865	0.457	2012–2018	Yes
Agricultural Business	FAFS	Non-STEM	0.374	0.237	2010–2018	Yes

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Table B.3 continued

Department	Faculty	Type	Share Female Students	Share Female Advisors	Year Range	In Survey
Physical Therapy	FHS	STEM	0.245	0.075	2002–2018	Yes
Visual Arts	FEA	Non-STEM	0.577	0.122	2003–2018	Yes
English Literature	FAS	Non-STEM	0.843	0.477	2002–2018	Yes
Education	FAS	Non-STEM	0.862	0.293	2002–2018	Yes
Industrial Engineering	FEA	STEM	0.520	0.172	2016–2018	Yes
Health Sciences - Medical Journ.	FHS	Non-STEM	0.424	0.949	2005–2018	Yes
Sociology & Anthropology	FAS	Non-STEM	0.827	0.291	2001–2018	Yes
Studio Art	FEA	Non-STEM	0.847	0.490	2007–2018	Yes
Construction Engineering	FEA	STEM	0.289	0.536	2011–2018	Yes
Landscape Architecture	FEA	Non-STEM	0.812	0.388	2015–2018	Yes
Applied Mathematics	FAS	STEM	0.329	0.037	2013–2018	Yes
Mathematics (BA)	FAS	STEM	0.300	0.129	2002–2018	Yes
English Language	FAS	Non-STEM	0.895	0.561	2001–2018	Yes
Geology	FAS	STEM	0.449	0.082	2003–2018	Yes
Education - Modern Languages	FAS	Non-STEM	0.889	0.600	2002–2018	Yes
Urban Design	FEA	Non-STEM	0.864	1.000	2016–2018	Yes
History	FAS	Non-STEM	0.476	0.000	2001–2018	Yes
Fine Arts & Art History	FEA	Non-STEM	0.514	0.108	2003–2016	Yes
Visual Arts - Science	FEA	Non-STEM	0.389	0.139	2003–2018	Yes
Medical Imaging	FHS	Non-STEM	0.657	0.971	2016–2018	Yes
Arabic & Near Eastern Languages	FAS	Non-STEM	0.593	0.444	2002–2018	Yes
Food Technology	FAFS	Non-STEM	0.882	0.353	2002–2017	Yes
Sociology	FAS	Non-STEM	0.733	0.400	2004–2018	Yes
Arabic Language & Literature	FAS	Non-STEM	0.786	0.143	2003–2018	Yes
Statistics	FAS	STEM	0.444	0.056	2001–2018	No
Philosophy	FAS	Non-STEM	0.611	0.028	2005–2018	No
Special Education	FAS	Non-STEM	0.971	0.735	2002–2018	No
Veterinary Science	FAFS	Non-STEM	0.706	0.000	2010–2012	No
Visual Arts - Business	FEA	Non-STEM	0.563	0.000	2004–2018	No
Radiologic Technology	FHS	Non-STEM	0.538	0.692	2001–2010	No

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Table B.3 continued

Department	Faculty	Type	Share Female Students	Share Female Advisors	Year Range	In Survey
Overall			0.595	0.360		

Notes: This table shows department-level shares of female students and female advisors for all departments with more than 10 student observations. Type indicates whether the department is classified as STEM or Non-STEM. All nursing entry tracks are grouped under Nursing. Electrical Engineering (EELE) and Electrical & Computer Engineering (EECE) are merged. Year Range indicates the first and last year the department appears in the data. In Survey indicates whether at least one survey respondent was enrolled in that department. Departments are sorted by survey participation and then by number of students (descending) within each group. *Faculty abbreviations:* FAS = Faculty of Arts & Sciences; FAFS = Faculty of Agriculture & Food Sciences; FEA = Maroun Semaan Faculty of Engineering & Architecture; FHS = Faculty of Health Sciences; OSB = Suliman S. Olayan School of Business.

Table B.4: Balance Test: Effects of Female Advisors on Pre-Determined Characteristics

	Math SAT (1)	Verbal SAT (2)	Legacy (3)	Elite School (4)	Religious School (5)	Birth Year (6)
Panel A: Binary Treatment						
Effects on male students	1.163	-7.104	0.096	-0.010	0.110	0.117
	(8.390)	(12.122)	(0.064)	(0.092)	(0.082)	(0.264)
Effects on female students	8.172	0.116	0.025	-0.002	0.033	0.024
	(8.108)	(7.927)	(0.060)	(0.071)	(0.076)	(0.093)
Gender gap	-7.009	-7.220	0.072	-0.008	0.077	0.093
	(11.470)	(13.924)	(0.088)	(0.119)	(0.111)	(0.279)
Observations	1,396	1,396	1,396	1,396	1,396	1,396
Panel B: Continuous Treatment						
Effects on male students	0.158	-15.403	0.067	-0.118	0.215**	-0.216
	(9.509)	(14.582)	(0.075)	(0.099)	(0.094)	(0.224)
Effects on female students	12.436	5.541	-0.006	-0.033	-0.013	-0.151
	(8.689)	(8.997)	(0.067)	(0.081)	(0.092)	(0.139)
Gender gap	-12.278	-20.944	0.073	-0.085	0.228*	-0.065
	(12.913)	(17.024)	(0.104)	(0.132)	(0.131)	(0.266)
Observations	1,398	1,398	1,398	1,398	1,294	1,398

Notes: Panel A shows results using binary treatment (having a female advisor during first year). Panel B shows results using continuous treatment (proportion of female advisors). Standard errors clustered by advisor–year are shown in parentheses. All regressions include department-by-year fixed effects interacted with student gender. *** p<0.01, ** p<0.05, * p<0.10.

Table B.5: Random Assignment Test

	Female student Empirical P-Value (1)	Math SAT Empirical P-Value (2)	Verbal SAT Empirical P-Value (3)
Test for Student Characteristics in Survey Sample			
χ^2 goodness of fit test (no. failed/total tests)	0/99	0/131	0/132
Test for Student Characteristics in Full Sample			
χ^2 goodness of fit test (no. failed/total tests)	0/295	2/314	1/312

Notes: The empirical p-value of each advisor represents the proportion of the 10,000 simulated groups of students with a summed value less than that of the observed group. Sample includes students entering from academic years 2001 till 2018. The χ^2 goodness of fit test results indicate the number of tests of the uniformity of the distribution of p-values that failed at the 5% level. The reduced number of tests for Female student is due to the fact some departments do not have any variation in Female students in certain years.

Table B.6: Effects of Female Advisors on Likelihood of Survey Response

	Advisor Exposure Measure			
Ap	Initial		Cumulative	
	(1)	(2)	(3)	(4)
Effects on male students	0.002	0.006	0.003	0.006
	(0.005)	(0.005)	(0.006)	(0.006)
Effects on female students	0.001	0.008	0.005	0.010*
	(0.005)	(0.006)	(0.006)	(0.006)
Effects on gender polarization	0.000	-0.003	-0.002	-0.004
	(0.007)	(0.008)	(0.008)	(0.008)
Controls	No	Yes	No	Yes
Observations	31,570	31,568	31,636	31,634
Mean with male advisor (Men)	0.042	0.042	0.042	0.042
Mean with male advisor (Women)	0.043	0.043	0.041	0.041

Note: This table summarizes both the effects of being assigned a female advisor during first year at university and the proportion of female advisors across all years at university on the likelihood of responding to the survey. The sample includes all students enrolled between the years 2001 and 2018. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. Columns (1) and (2) present binary treatment results without and with controls, respectively. Columns (3) and (4) present continuous treatment results without and with controls. All controls and fixed effects are interacted with student gender. Student controls include math SAT scores, verbal SAT scores, legacy status, elite school, religious school, birth year. Advisor Controls include advisor Value-Added (VA), and advisor academic rank. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table B.7: Survey Timing and Response Behavior

Panel A: Does Advisor Gender Predict Survey Submission Timing?

	Reminders Received (0/1/2) (1)	Received ≥1 Reminder (Binary) (2)
Effects on male students	0.096	0.066
	(0.110)	(0.078)
Effects on female students	0.033	0.059
	(0.097)	(0.057)
Effects on gender polarization	0.063	0.007
	(0.154)	(0.099)
Observations	1,396	1,396

Panel B: Are Gender Attitudes Stable Across Survey Rounds?

	Gender Role Attitudes			Gender Status Perceptions		
	Round 1 (rem. = 0) (1)	Round 2 (rem. = 1) (2)	Round 3 (rem. = 2) (3)	Round 1 (rem. = 0) (4)	Round 2 (rem. = 1) (5)	Round 3 (rem. = 2) (6)
Effects on male students	0.235	0.492	0.171	0.289	0.372	0.770
	(0.358)	(0.377)	(0.442)	(0.604)	(0.331)	(0.600)
Effects on female students	-0.163	-0.181	-0.245	-0.527	0.018	-0.140
	(0.146)	(0.157)	(0.364)	(0.646)	(0.222)	(0.309)
Effects on gender polarization	0.397	0.673*	0.416	0.815	0.354	0.910
	(0.387)	(0.391)	(0.570)	(0.884)	(0.411)	(0.672)
Observations	376	558	304	377	558	304

Notes: Panel A tests whether assignment to a female advisor predicts the timing of survey submission. The outcome in column (1) is the number of reminder emails received before responding (0, 1, or 2). The outcome in column (2) is a binary indicator equal to one if the respondent required at least one reminder. Panel B examines whether estimated effects of female advisor assignment on the Gender Role Attitudes and Gender Status Perceptions indices vary across survey rounds. Round 1 includes respondents who replied before any reminder, Round 2 those who responded after the first reminder, and Round 3 those who responded after the second reminder. Stability of point estimates across rounds supports the view that selective survey participation is not driving the main results. The sample includes all students enrolled between the years 2001 and 2018. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). The specification is otherwise identical to the baseline Table 3. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.8: Effects of Female Advisors on Combined Gender Norms Index

	Full Sample (1)	Non-STEM Departments (2)	STEM Departments (3)	Non-Religious Students (4)	Religious Students (5)
Effects on male students	0.269	-0.093	0.494**	-0.181	0.655**
	(0.186)	(0.245)	(0.250)	(0.212)	(0.316)
Effects on female students	-0.279**	-0.334*	-0.160	-0.380	-0.279
	(0.131)	(0.179)	(0.145)	(0.249)	(0.172)
Effects on gender polarization	0.548**	0.240	0.654**	0.199	0.934***
	(0.223)	(0.293)	(0.282)	(0.327)	(0.356)
Observations	1239	621	618	468	771

Notes: This table shows the effects of being assigned a female advisor during first year at university using one combined gender index. The combined gender attitudes index is constructed using the KKL method Kling et al. (2007) by averaging all seven standardized individual gender attitude outcomes. Column (1) shows results for the full sample. Columns (2)-(3) split by department type (Non-STEM vs STEM) as in Table 4. Columns (4)-(5) split by student religiosity as in Table 5. The sample includes all students enrolled between the years 2001 and 2018. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). The specification is otherwise identical to the baseline Table 3. *** p<0.01, ** p<0.05, * p<0.10.

Table B.9: Effects of Female Advisors on Gender Norms, Student and Advisor Controls

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index (1)	Men President (2)	Men Better Politics (3)	Women Stop Working (4)	Men Provide (5)	Index (6)	Women Work High (7)	Women Role Society (8)	Women Too Progressive (9)
Effects on male students	0.296	0.067	0.068	0.065	0.010	0.337*	0.087	0.088	0.093
	(0.182)	(0.053)	(0.078)	(0.046)	(0.062)	(0.196)	(0.077)	(0.059)	(0.070)
Effects on female students	-0.301**	-0.055	-0.085*	-0.039	-0.051	-0.051	-0.032	0.042	-0.072
	(0.152)	(0.045)	(0.052)	(0.028)	(0.043)	(0.158)	(0.072)	(0.042)	(0.054)
Effects on gender polarization	0.598**	0.122*	0.153	0.104*	0.061	0.388	0.119	0.046	0.165*
	(0.233)	(0.069)	(0.094)	(0.054)	(0.075)	(0.248)	(0.100)	(0.072)	(0.088)
Observations	1,238	1,238	1,238	1,238	1,238	1,239	1,238	1,238	1,239
Mean with male advisor (Men)		0.049	0.233	0.060	0.125		0.210	0.094	0.181
Mean with male advisor (Women)		0.059	0.103	0.067	0.158		0.238	0.086	0.172

Notes: This table shows the effects of being assigned a female advisor during first year at university. The sample includes all students enrolled between the years 2001 and 2018. Column (1) presents the standardized Gender Role Attitudes index; columns (2)–(5) present the individual questions comprising this index. Column (6) presents the standardized Gender Status Perceptions index; columns (7)–(9) present the individual questions comprising this index. Individual outcomes are binary indicators equal to one if the respondent agreed or strongly agreed with the statement. All regressions include department-by-year fixed effects as in equation (1), and all controls and fixed effects are interacted with student gender. Student controls include math SAT scores, verbal SAT scores, legacy status, elite school, religious school, birth year. Advisor Controls include advisor Value-Added (VA), and advisor academic rank. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.10: Effects of Female Advisor on Gender Norms, Inverse Probability Weighting

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Effects on male students	0.300*	0.107**	0.067	0.032	0.003	0.213	0.042	0.065	0.057
	(0.179)	(0.051)	(0.070)	(0.045)	(0.060)	(0.197)	(0.074)	(0.051)	(0.068)
Effects on female students	-0.305**	-0.022	-0.072	-0.055**	-0.088**	-0.133	-0.024	-0.023	-0.062
	(0.126)	(0.038)	(0.044)	(0.027)	(0.038)	(0.168)	(0.071)	(0.043)	(0.058)
Polarization of views	0.604***	0.130**	0.138*	0.087	0.091	0.346	0.066	0.088	0.120
	(0.213)	(0.063)	(0.081)	(0.053)	(0.071)	(0.254)	(0.095)	(0.066)	(0.091)
Observations	1,233	1,233	1,233	1,233	1,233	1,234	1,233	1,233	1,234

Notes: This table shows the effects of being assigned a female advisor during first year at university. Regressions are weighted by the inverse predicted probability of responding to the survey, with probabilities constructed based on the specification in column 2 of Appendix Table B.6. The specification is otherwise identical to the baseline Table 3. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses.*** p<0.01, ** p<0.05, * p<0.10.

Table B.11: Effects of Female Advisors on Gender Norms, Randomization Inference

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Effects on male students	0.220	0.057	0.071	0.050	-0.023	0.224	0.035	0.063	0.076
	[0.156]	[0.146]	[0.309]	[0.224]	[0.701]	[0.276]	[0.696]	[0.220]	[0.332]
Effects on female students	-0.307**	-0.021	-0.070	-0.059**	-0.088**	-0.143	-0.027	-0.026	-0.064
	[0.019]	[0.539]	[0.121]	[0.037]	[0.049]	[0.572]	[0.841]	[0.716]	[0.428]
Effects on gender polarization	0.527***	0.078	0.141*	0.108**	0.064	0.367	0.062	0.089	0.140
	[0.006]	[0.103]	[0.091]	[0.020]	[0.413]	[0.214]	[0.654]	[0.210]	[0.202]
Observations	1,238	1,238	1,238	1,238	1,238	1,239	1,238	1,238	1,239
Mean with male advisor (Men)		0.049	0.233	0.060	0.125		0.210	0.094	0.181
Mean with male advisor (Women)		0.059	0.103	0.067	0.158		0.238	0.086	0.172

Notes: The sample includes all students enrolled between the years 2001 and 2018. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). Randomization inference p-values (1,000 permutations) are shown in brackets. The specification is otherwise identical to the baseline Table 3. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.12: Placebo Test: Effects on Non-Gender Outcomes (Sorted by Correlation)

	Advisor Gender Effects			Correlation with Conservative	
	Men	Women	Polarization	Gender Role Attitudes	Gender Status Perceptions
	(1)	(2)	(3)	(4)	(5)
Favors civil marriage	0.115	0.153*	-0.038	-0.276	-0.182
	(0.082)	(0.081)	(0.116)		
Favors interreligious marriage	0.097	0.176**	-0.079	-0.214	-0.179
	(0.091)	(0.087)	(0.129)		
Feels more Lebanese than own sect	-0.027	0.115**	-0.142	-0.210	-0.149
	(0.073)	(0.057)	(0.097)		
Self-identifies as not religious	0.055	0.042	0.013	-0.205	-0.164
	(0.086)	(0.069)	(0.110)		
Has friends from different religions	-0.071	-0.002	-0.068	-0.154	-0.089
	(0.060)	(0.059)	(0.086)		
Trusts people from different sects	-0.050	-0.019	-0.032	-0.139	-0.037
	(0.064)	(0.034)	(0.072)		
Trusts people from different religions	0.034	-0.040	0.074	-0.124	-0.026
	(0.051)	(0.033)	(0.059)		
Generally trusts others	-0.080	0.073	-0.154	-0.124	-0.054
	(0.104)	(0.085)	(0.134)		
Comfortable with neighbors of different sect	-0.052	-0.029	-0.023	-0.114	-0.107
	(0.047)	(0.024)	(0.053)		
Claimed survey gift card	-0.004	-0.047	0.042	0.099	0.013
	(0.070)	(0.077)	(0.105)		
Donated prize to AUB Medical Center	-0.009	0.001	-0.011	-0.096	-0.021
	(0.064)	(0.078)	(0.101)		
Religion plays no role in hiring	-0.077	0.048	-0.125**	-0.095	-0.057
	(0.051)	(0.030)	(0.060)		
Married to spouse of different religion	0.042	0.058	-0.016	-0.093	-0.040
	(0.052)	(0.044)	(0.068)		
Supports secular parties or abstains	0.069	-0.032	0.101	-0.092	-0.059
	(0.078)	(0.045)	(0.091)		
Identifies primarily as Lebanese	0.028	0.012	0.016	-0.088	-0.075
	(0.074)	(0.064)	(0.100)		
Has voted in Lebanese elections	0.096	-0.005	0.101	-0.083	-0.105
	(0.082)	(0.065)	(0.104)		
Supports Syrian/Palestinian refugees	-0.071	0.061	-0.131	-0.079	-0.096
	(0.077)	(0.072)	(0.103)		
Comfortable with neighbors of different religion	-0.025	-0.002	-0.022	-0.078	-0.107
	(0.028)	(0.019)	(0.034)		
Still supports same political party	-0.041	0.016	-0.057	0.075	0.052
	(0.061)	(0.034)	(0.070)		
Attributes corruption to sectarianism	0.114	0.038	0.076	-0.074	-0.052
	(0.071)	(0.072)	(0.099)		
Donated prize to Hotel Dieu de France	0.005	-0.010	0.015	-0.043	-0.012
	(0.017)	(0.026)	(0.031)		
Views sectarianism as obstacle	0.096	-0.050	0.146	-0.040	-0.127
	(0.073)	(0.067)	(0.101)		
Holds unfavorable views of the West	0.077	0.005	0.072	0.032	-0.027
	(0.062)	(0.071)	(0.096)		
Medium/high political engagement	-0.007	-0.003	-0.004	-0.027	-0.029
	(0.081)	(0.075)	(0.111)		
Feels treated equally regardless of sect	-0.023	-0.101	0.078	0.020	0.043
	(0.083)	(0.065)	(0.106)		
Donated prize to Al Makassed Hospital	0.009	0.055	-0.046	0.017	0.022
	(0.030)	(0.042)	(0.054)		
Attributes corruption to colonialism	-0.056	0.024	-0.080	-0.011	-0.007
	(0.052)	(0.050)	(0.072)		
Observations		1,188			

Notes: This table presents placebo tests using outcomes that should not be systematically affected by advisor gender. Outcomes are sorted by absolute correlation with Gender Role Attitudes (descending). Higher absolute correlations suggest the placebo outcome may be related to gender attitudes. Columns (1)-(3) show the effects of being assigned a female advisor on male students, female students, and polarization. Columns (4)-(5) show correlations between each placebo outcome and the two main gender attitude indices. The sample includes all students enrolled between the years 2001 and 2018. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). The specification is otherwise identical to the baseline Table 3. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.13: Heterogeneous Effects of Female Advisors on Individual Gender Norms, by Department Type

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel A: STEM Departments								
Effects on male students	0.476**	0.173**	0.050	0.081	0.008	0.329	0.014	0.104	0.132*
	(0.225)	(0.068)	(0.083)	(0.060)	(0.078)	(0.246)	(0.087)	(0.070)	(0.079)
Effects on female students	-0.265*	-0.051	-0.095*	0.000	-0.071	0.017	-0.025	0.017	0.015
	(0.136)	(0.045)	(0.055)	(0.000)	(0.056)	(0.200)	(0.107)	(0.044)	(0.077)
Effects on gender polarization	0.741***	0.225***	0.145	0.081	0.079	0.312	0.038	0.087	0.117
	(0.260)	(0.081)	(0.101)	(0.060)	(0.096)	(0.301)	(0.123)	(0.081)	(0.111)
Observations	617	617	617	617	617	618	617	617	618
	Panel B: Non-STEM Departments								
Effects on male students	-0.194	-0.130*	0.105	-0.000	-0.074	0.055	0.070	-0.003	-0.014
	(0.267)	(0.072)	(0.112)	(0.058)	(0.082)	(0.278)	(0.132)	(0.092)	(0.095)
Effects on female students	-0.327*	-0.007	-0.059	-0.086**	-0.096*	-0.217	-0.028	-0.046	-0.100
	(0.171)	(0.049)	(0.056)	(0.042)	(0.051)	(0.228)	(0.090)	(0.061)	(0.077)
Effects on gender polarization	0.133	-0.123	0.164	0.086	0.022	0.271	0.098	0.043	0.086
	(0.307)	(0.088)	(0.118)	(0.071)	(0.095)	(0.364)	(0.155)	(0.110)	(0.124)
Observations	621	621	621	621	621	621	621	621	621

Notes: This table estimates the heterogeneous effects specification in Table 4 for all of the individual questions comprising the two indices. All individual outcomes are binary indicators equal to one if the respondent agreed or strongly agreed with the statement. All regressions are run with the inclusion of department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.14: Heterogeneous Effects of Female Advisors on Individual Gender Norms, by Department Type, with Student and Advisor Controls

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel A: STEM Departments								
Effects on male students	0.453*	0.181***	0.040	0.070	0.002	0.298	0.048	0.093	0.088
	(0.244)	(0.070)	(0.096)	(0.068)	(0.090)	(0.279)	(0.099)	(0.073)	(0.097)
Effects on female students	-0.249	-0.064	-0.098	0.008	-0.049	0.303	0.027	0.094	0.110*
	(0.152)	(0.048)	(0.064)	(0.018)	(0.060)	(0.195)	(0.111)	(0.060)	(0.066)
Effects on gender polarization	0.702**	0.245***	0.138	0.062	0.051	-0.004	0.021	-0.002	-0.022
	(0.286)	(0.084)	(0.118)	(0.070)	(0.107)	(0.330)	(0.142)	(0.089)	(0.124)
Observations	617	617	617	617	617	618	617	617	618
	Panel B: Non-STEM Departments								
Effects on male students	0.245	-0.079	0.112	0.100	0.080	0.788	0.357**	0.082	0.240*
	(0.397)	(0.132)	(0.148)	(0.088)	(0.087)	(0.508)	(0.179)	(0.184)	(0.137)
Effects on female students	-0.191	-0.043	-0.040	-0.040	-0.012	0.041	0.059	0.072	-0.117
	(0.267)	(0.069)	(0.082)	(0.054)	(0.070)	(0.256)	(0.109)	(0.072)	(0.088)
Effects on gender polarization	0.436	-0.036	0.152	0.140	0.092	0.747	0.299	0.010	0.357**
	(0.468)	(0.148)	(0.166)	(0.103)	(0.107)	(0.572)	(0.206)	(0.198)	(0.166)
Observations	621	621	621	621	621	621	621	621	621

Notes: This table estimates the heterogeneous effects specification in Table 4 for all of the individual questions comprising the two indices, inclusive of additional controls for predetermined student and advisor characteristics. All regressions include department-by-year fixed effects as in equation (1) and all controls and fixed effects are interacted with student gender. Student controls include math SAT scores, verbal SAT scores, legacy status, elite school, religious school, birth year. Advisor Controls include advisor Value-Added (VA), and advisor academic rank. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.15: Gender Norms by Religion and Religiosity

Religion	Religiosity	Gender Role Attitudes	Gender Status Perceptions	Observations
Muslim	Religious	0.295	0.238	447
		(1.195)	(1.131)	
	Non-Religious	-0.228	-0.144	174
		(0.690)	(0.931)	
	Overall	0.149	0.131	621
		(1.103)	(1.092)	
Christian	Religious	-0.132	-0.011	265
		(0.917)	(0.952)	
	Non-Religious	-0.200	-0.234	139
		(0.707)	(0.752)	
	Overall	-0.155	-0.088	404
		(0.850)	(0.894)	
Muslim+Druze	Religious	0.272	0.228	468
		(1.179)	(1.124)	
	Non-Religious	-0.225	-0.108	220
		(0.701)	(0.966)	
	Overall	0.113	0.120	688
		(1.075)	(1.087)	

Note: This table reports group-specific means and standard deviations in parentheses for the two standardized gender norms indices, which are constructed following Kling et al. (2007), where higher values indicate more conservative attitudes. The groups are combinations of self-reported religion and religiosity.

Table B.16: Heterogeneous Effects of Female Advisors, by Student Religion

	Christian		Muslim		Muslim + Druze	
	Gender Role Attitudes (1)	Gender Status Perceptions (2)	Gender Role Attitudes (3)	Gender Status Perceptions (4)	Gender Role Attitudes (5)	Gender Status Perceptions (6)
Effects on male students	0.312	0.312	0.378	0.568	0.424	0.567*
	(0.280)	(0.273)	(0.366)	(0.363)	(0.354)	(0.340)
Effects on female students	0.018	-0.006	-0.384**	-0.228	-0.256	-0.212
	(0.120)	(0.186)	(0.181)	(0.332)	(0.185)	(0.281)
Effects on gender polarization	0.294	0.318	0.762*	0.796	0.680*	0.779*
	(0.304)	(0.331)	(0.390)	(0.495)	(0.382)	(0.443)
Observations	402	402	619	619	685	685

Notes: This table estimates the baseline specification in Table 3 separately for different self-reported religious groups. Columns (5)-(6) include Druze students with Muslims. The sample includes all students enrolled between the years 2001 and 2018. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.17: Heterogeneous Effects of Female Advisors on Individual Gender Norms, by Religiosity

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index (1)	Men President (2)	Men Better Politics (3)	Women Stop Working (4)	Men Provide (5)	Index (6)	Women Work High (7)	Women Role Society (8)	Women Too Progressive (9)
	Panel A: Religious Students								
Effects on male students	0.552*	0.113	0.263**	0.081	-0.027	0.526*	0.134	0.119	0.172*
	(0.309)	(0.096)	(0.107)	(0.076)	(0.093)	(0.281)	(0.103)	(0.077)	(0.100)
Effects on female students	-0.431***	-0.056	-0.099	-0.085**	-0.082	-0.004	0.023	-0.005	-0.019
	(0.156)	(0.049)	(0.066)	(0.040)	(0.053)	(0.249)	(0.095)	(0.065)	(0.085)
Effects on gender polarization	0.983***	0.169	0.362***	0.166*	0.055	0.530	0.111	0.123	0.190
	(0.339)	(0.109)	(0.122)	(0.085)	(0.104)	(0.375)	(0.132)	(0.100)	(0.132)
Observations	770	770	770	770	770	771	770	770	771
	Panel B: Non-Religious Students								
Effects on male students	-0.097	0.053	-0.243**	0.000	0.053	-0.207	-0.060	-0.086	-0.007
	(0.134)	(0.048)	(0.102)	(0.000)	(0.048)	(0.344)	(0.132)	(0.113)	(0.078)
Effects on female students	-0.196	0.000	-0.057	-0.029	-0.076	-0.444	-0.105	-0.114	-0.133
	(0.199)	(0.083)	(0.052)	(0.000)	(0.067)	(0.316)	(0.151)	(0.071)	(0.102)
Effects on gender polarization	0.099	0.053	-0.186	0.029	0.129	0.237	0.045	0.028	0.126
	(0.240)	(0.096)	(0.115)	(0.000)	(0.083)	(0.467)	(0.201)	(0.134)	(0.128)
Observations	468	468	468	468	468	468	468	468	468

Notes: This table estimates the heterogeneous effects specification in Table 5 for all of the individual questions comprising the two indices. All individual outcomes are binary indicators equal to one if the respondent agreed or strongly agreed with the statement. All regressions are run with the inclusion of department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.18: Heterogeneous Effects of Female Advisors on Individual Gender Norms, by Religiosity, with Student and Advisor Controls

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel A: Religious Students								
Effects on male students	1.125***	0.195**	0.320**	0.164*	0.177	0.653**	0.244*	0.159*	0.108
	(0.306)	(0.098)	(0.123)	(0.098)	(0.107)	(0.321)	(0.134)	(0.081)	(0.121)
Effects on female students	-0.519**	-0.142*	-0.158	-0.080**	0.004	0.167	0.052	0.092	-0.027
	(0.239)	(0.081)	(0.096)	(0.035)	(0.055)	(0.250)	(0.103)	(0.076)	(0.093)
Effects on gender polarization	1.644***	0.337**	0.478***	0.244**	0.172	0.485	0.193	0.067	0.135
	(0.390)	(0.132)	(0.157)	(0.104)	(0.119)	(0.405)	(0.164)	(0.108)	(0.150)
Observations	770	770	770	770	770	771	770	770	771
	Panel B: Non-Religious Students								
Effects on male students	0.061	0.100	-0.246	-0.007	0.133*	0.333	0.046	0.089	0.126
	(0.292)	(0.097)	(0.160)	(0.054)	(0.069)	(0.358)	(0.123)	(0.121)	(0.113)
Effects on female students	-0.353*	-0.025	0.000	-0.075	-0.159*	-0.489	-0.032	-0.128*	-0.221*
	(0.193)	(0.065)	(0.000)	(0.067)	(0.085)	(0.409)	(0.222)	(0.065)	(0.113)
Effects on gender polarization	0.414	0.125	-0.246	0.068	0.291***	0.822	0.078	0.218	0.346**
	(0.349)	(0.117)	(0.160)	(0.087)	(0.110)	(0.542)	(0.254)	(0.137)	(0.159)
Observations	468	468	468	468	468	468	468	468	468

Notes: This table estimates the heterogeneous effects specification in Table 5 for all of the individual questions comprising the two indices, inclusive of additional controls for predetermined student and advisor characteristics. All regressions include department-by-year fixed effects as in equation (1) and all controls and fixed effects are interacted with student gender. Student controls include math SAT scores, verbal SAT scores, legacy status, elite school, religious school, birth year. Advisor Controls include advisor Value-Added (VA), and advisor academic rank. Standard errors clustered by advisor–year are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table B.19: Heterogeneous Effects of Female Advisors, by Cohort Entry Period

	Year of Enrollment at AUB			
	< 2010		≥ 2010	
	Gender Role Attitudes (1)	Gender Status Perceptions (2)	Gender Role Attitudes (3)	Gender Status Perceptions (4)
Effects on male students	-0.167	0.111	0.492*	0.304
	(0.165)	(0.250)	(0.277)	(0.265)
Effects on female students	-0.312*	-0.025	-0.304*	-0.251
	(0.179)	(0.268)	(0.175)	(0.211)
Effects on gender polarization	0.145	0.135	0.795**	0.555*
	(0.250)	(0.372)	(0.315)	(0.329)
Observations	604	605	634	634

Notes: This table shows the effects of being assigned a female advisor during first year at university, split by admission year. The sample includes all students enrolled between the years 2001 and 2018. Both index outcomes are standardized. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). The specification is otherwise identical to the baseline Table 3. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10. *** p<0.01, ** p<0.05, * p<0.10.

Table B.20: Effects of Cumulative Female Advisor Exposure on Gender Norms, with Student and Advisor Controls

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index (1)	Men President (2)	Men Better Politics (3)	Women Stop Working (4)	Men Provide (5)	Index (6)	Women Work High (7)	Women Role Society (8)	Women Too Progressive (9)
Effects on male students	0.225	0.088	0.125	0.016	-0.060	0.355	0.081	0.092	0.108
	(0.223)	(0.067)	(0.091)	(0.055)	(0.066)	(0.220)	(0.083)	(0.062)	(0.082)
Effects on female students	-0.487***	-0.091**	-0.108**	-0.064*	-0.102*	0.060	-0.021	0.019	0.046
	(0.163)	(0.044)	(0.048)	(0.038)	(0.053)	(0.178)	(0.085)	(0.046)	(0.070)
Effects on gender polarization	0.712**	0.179**	0.233**	0.080	0.042	0.295	0.102	0.073	0.062
	(0.276)	(0.079)	(0.104)	(0.066)	(0.084)	(0.281)	(0.115)	(0.077)	(0.111)
Observations	1240	1240	1240	1240	1240	1241	1240	1240	1241

Notes: This table re-estimates the specification in Table 7, inclusive of additional controls for predetermined student and advisor characteristics. All regressions include department-by-year fixed effects as in equation (1) and all controls and fixed effects are interacted with student gender. Student controls include math SAT scores, verbal SAT scores, legacy status, elite school, religious school, birth year. Advisor Controls include advisor Value-Added (VA), and advisor academic rank. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.21: Heterogeneous Effects of Cumulative Female Advisor Exposure on Gender Norms, by Department Type

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel A: STEM Departments								
Effects on male students	0.445	0.193**	0.125	0.042	-0.057	0.347	0.006	0.121*	0.132
	(0.273)	(0.086)	(0.088)	(0.067)	(0.070)	(0.263)	(0.096)	(0.069)	(0.091)
Effects on female students	-0.357**	-0.078	-0.089	-0.025	-0.082	-0.029	0.006	-0.035	0.017
	(0.154)	(0.052)	(0.062)	(0.029)	(0.062)	(0.203)	(0.114)	(0.033)	(0.080)
Effects on gender polarization	0.801***	0.272***	0.214**	0.067	0.025	0.376	-0.000	0.156**	0.115
	(0.306)	(0.099)	(0.108)	(0.073)	(0.093)	(0.322)	(0.136)	(0.077)	(0.123)
Observations	618	618	618	618	618	619	618	618	619
	Panel B: Non-STEM Departments								
Effects on male students	-0.036	-0.107	0.173	-0.023	0.003	0.284	0.245*	-0.031	0.060
	(0.303)	(0.073)	(0.163)	(0.071)	(0.085)	(0.374)	(0.139)	(0.118)	(0.122)
Effects on female students	-0.548**	-0.058	-0.116**	-0.104*	-0.137*	0.008	-0.034	-0.031	0.080
	(0.214)	(0.053)	(0.058)	(0.059)	(0.070)	(0.260)	(0.105)	(0.077)	(0.101)
Effects on gender polarization	0.513	-0.049	0.290*	0.080	0.140	0.276	0.279	-0.000	-0.019
	(0.377)	(0.091)	(0.170)	(0.092)	(0.109)	(0.461)	(0.172)	(0.141)	(0.161)
Observations	622	622	622	622	622	622	622	622	622

Notes: This table re-estimates the specification in Table 7, split by the student's department type (STEM vs. non-STEM). All regressions include department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.22: Heterogeneous Effects of Cumulative Female Advisor Exposure on Gender Norms, by Department Type, with Student and Advisor Controls

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel A: STEM Departments								
Effects on male students	0.334	0.199**	0.099	0.021	-0.106	0.218	-0.026	0.092	0.086
	(0.270)	(0.085)	(0.103)	(0.072)	(0.084)	(0.284)	(0.108)	(0.073)	(0.108)
Effects on female students	-0.331**	-0.073	-0.104	0.008	-0.099*	-0.006	-0.080	0.022	0.040
	(0.150)	(0.051)	(0.066)	(0.011)	(0.058)	(0.205)	(0.117)	(0.036)	(0.073)
Effects on gender polarization	0.665**	0.272***	0.203	0.014	-0.006	0.224	0.054	0.071	0.045
	(0.311)	(0.099)	(0.127)	(0.073)	(0.100)	(0.337)	(0.148)	(0.078)	(0.135)
Observations	618	618	618	618	618	619	618	618	619
	Panel B: Non-STEM Departments								
Effects on male students	-0.087	-0.086	0.030	0.024	-0.014	1.059**	0.335*	0.197	0.341**
	(0.566)	(0.139)	(0.183)	(0.179)	(0.174)	(0.534)	(0.177)	(0.182)	(0.172)
Effects on female students	-0.505*	-0.085	-0.100	-0.089	-0.098	0.117	-0.005	0.042	0.049
	(0.264)	(0.063)	(0.071)	(0.065)	(0.084)	(0.294)	(0.127)	(0.085)	(0.117)
Effects on gender polarization	0.418	-0.001	0.130	0.114	0.085	0.942	0.340	0.155	0.291
	(0.623)	(0.152)	(0.196)	(0.190)	(0.191)	(0.608)	(0.213)	(0.200)	(0.213)
Observations	622	622	622	622	622	622	622	622	622

Notes: This table re-estimates the specification in Table 7, split by the student's department type (STEM vs. non-STEM) and inclusive of additional controls for predetermined student and advisor characteristics. All regressions include department-by-year fixed effects as in equation (1) and all controls and fixed effects are interacted with student gender. Student controls include math SAT scores, verbal SAT scores, legacy status, elite school, religious school, birth year. Advisor Controls include advisor Value-Added (VA), and advisor academic rank. Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.23: Heterogeneous Effects of Cumulative Female Advisor Exposure on Gender Norms, by Student Religiosity

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel A: Religious Students								
Effects on male students	0.505	0.144	0.252**	0.056	-0.066	0.487	0.141	0.090	0.170
	(0.344)	(0.110)	(0.119)	(0.084)	(0.088)	(0.316)	(0.121)	(0.088)	(0.116)
Effects on female students	-0.661***	-0.104**	-0.147**	-0.103*	-0.144**	0.214	0.016	0.021	0.142
	(0.198)	(0.050)	(0.069)	(0.057)	(0.068)	(0.238)	(0.105)	(0.073)	(0.100)
Effects on gender polarization	1.166***	0.248**	0.399***	0.160	0.078	0.273	0.124	0.069	0.028
	(0.402)	(0.123)	(0.138)	(0.102)	(0.109)	(0.405)	(0.159)	(0.113)	(0.158)
Observations	772	772	772	772	772	773	772	772	773
	Panel B: Non-Religious Students								
Effects on male students	-0.167	0.074	-0.145	-0.059	-0.037	0.174	0.035	0.010	0.104
	(0.280)	(0.066)	(0.143)	(0.075)	(0.080)	(0.367)	(0.143)	(0.121)	(0.096)
Effects on female students	-0.322	-0.085	-0.074	-0.023	-0.058	-0.183	0.019	-0.098	-0.044
	(0.221)	(0.082)	(0.066)	(0.057)	(0.075)	(0.388)	(0.168)	(0.080)	(0.138)
Effects on gender polarization	0.154	0.159	-0.071	-0.036	0.022	0.357	0.016	0.108	0.148
	(0.358)	(0.105)	(0.158)	(0.094)	(0.110)	(0.530)	(0.221)	(0.145)	(0.165)
Observations	468	468	468	468	468	468	468	468	468

Notes: This table re-estimates the specification in Table 7, split by the student's religiosity. All regressions include department-by-year fixed effects interacted with student gender as in equation (1). Standard errors clustered by advisor–year are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table B.24: Heterogeneous Effects of Cumulative Female Advisor Exposure on Gender Norms, by Student Religiosity, with Student and Advisor Controls

	Conservative Gender Role Attitudes					Conservative Gender Status Perceptions			
	Index	Men President	Men Better Politics	Women Stop Working	Men Provide	Index	Women Work High	Women Role Society	Women Too Progressive
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Panel A: Religious Students								
Effects on male students	0.627*	0.162	0.210	0.061	0.042	0.341	0.191	0.071	0.006
	(0.343)	(0.128)	(0.135)	(0.102)	(0.120)	(0.342)	(0.149)	(0.081)	(0.135)
Effects on female students	-0.791***	-0.170**	-0.170*	-0.122**	-0.117	0.445	0.055	0.113	0.182
	(0.290)	(0.083)	(0.100)	(0.057)	(0.084)	(0.280)	(0.134)	(0.084)	(0.120)
Effects on gender polarization	1.418***	0.332**	0.380**	0.182	0.159	-0.104	0.136	-0.042	-0.176
	(0.459)	(0.154)	(0.174)	(0.118)	(0.147)	(0.443)	(0.198)	(0.115)	(0.181)
Observations	772	772	772	772	772	773	772	772	773
	Panel B: Non-Religious Students								
Effects on male students	-0.140	0.128	-0.187	-0.084	-0.017	0.613	0.067	0.178	0.228*
	(0.549)	(0.112)	(0.189)	(0.159)	(0.173)	(0.395)	(0.151)	(0.127)	(0.118)
Effects on female students	-0.617**	-0.132	0.000	-0.159	-0.116	-0.310	0.053	-0.097	-0.187
	(0.263)	(0.104)	(.)	(0.107)	(0.070)	(0.401)	(0.232)	(0.062)	(0.124)
Effects on gender polarization	0.477	0.260*	-0.187	0.075	0.099	0.923	0.014	0.276*	0.415**
	(0.608)	(0.154)	(0.189)	(0.191)	(0.187)	(0.564)	(0.278)	(0.142)	(0.171)
Observations	468	468	468	468	468	468	468	468	468

Notes: This table re-estimates the specification in Table 7, split by the student's religiosity and inclusive of additional controls for predetermined student and advisor characteristics. All regressions include department-by-year fixed effects as in equation (1) and all controls and fixed effects are interacted with student gender. Student controls include math SAT scores, verbal SAT scores, legacy status, elite school, religious school, birth year. Advisor Controls include advisor Value-Added (VA), and advisor academic rank. Standard errors clustered by advisor–year are shown in parentheses. In Panel B, column (3), the effect on female students is not separately identified because the outcome variable for non-religious female students lacks sufficient variation after absorbing the full set of fixed effects and controls in this subsample. *** p<0.01, ** p<0.05, * p<0.10.