Networking Opportunities and Gender Inequality in Science

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Abstract

We study how gender shapes the career advantages academic scientists gain from networking. Specifically, we examine how men and women in this field benefit differentially from temporary service roles at a major scientific funding body in China which provide substantial networking opportunities. We compare the career outcomes of temporary workers to those of unsuccessful finalists for the same positions. For male scientists, temporary service is associated with a 56% increase in high-impact grants, a doubling of promotion likelihood, and a 20% higher chance of becoming an influential gatekeeper within their field. In contrast, female scientists experience no significant gains. This disparity appears to stem primarily from the differential expansion of professional networks, with men benefiting disproportionately. However, when female scientists have greater opportunities to network with senior women, they reap comparable levels of career benefits. Our findings shed light on how the history of gender inequality in academic science can perpetuate career disparities and underscore the importance of fostering inclusive networking opportunities.

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1 Introduction

Despite progress towards gender equality in STEM education over time, women remain underrepresented in most scientific fields, particularly in senior positions (Carrell, Page and West, 2010; Ceci and Williams, 2011; Huang et al., 2020; Kim and Moser, 2023). One key factor contributing to this disparity in white collar roles more generally is the gender gap in networking opportunities (Mengel, 2020; Cullen and Perez-Truglia, 2023). In science, this claim has garnered significant attention but lacks substantial empirical evidence (Vásárhelyi et al., 2021; **?**). This paper explores how gender persistently shapes the career advantages scientists gain from networking opportunities.

We estimate the career impacts of network shocks experienced by mid-career scientists in China. We first document how these shocks generate differential impacts on the networks of male and female scientists. We then show how the gender differences in post-shock professional outcomes such as grant receipt, scholarly productivity, and promotion reflect the expansion of the scientist's professional network, with greater benefits accruing to males. We also examine how these shocks affect the likelihood of male and female scientists becoming gatekeepers with whom other scholars seek to network, documenting a pathway through which the gender gap in senior roles perpetuates itself. Finally, we explore whether the gender disparity attenuates when female scientists have greater opportunities to network with senior women.

The network shocks we study come from the common practice of funding agencies using temporary "rotators" to assist with operations, particularly grant-making. These rotators are mid-career academic scientists who take a two-year leave from their current positions to serve at the National Natural Science Foundation of China (NSFC), the largest funder of basic science research in China.[1] During this period, rotators experience a large positive shock to their network of professional connections. Service offers rotators many privileges, including the opportunity to form close relationships with officials at the funding agency, and their

[1]The US and Japanese national science funding agencies, among others, have rotator programs similar to that which we study (Hoenen and Kolympiris, 2020).

involvement in administrating research funding attracts the attention of many scientists in their fields. Further, rotators are responsible for selecting and organizing the scientific committees that evaluate grant applications, allowing them to work directly with and gain exposure to recognized senior scholars in their fields.

Our data comprise information on scientists who are competing to serve as rotators at the National Natural Science Foundation of China (NSFC). This context offers several unique features. First, the role of networking is explicitly recognized as an important facet of career advancement in China, particularly in academia (Shi and Rao, 2010; Fisman et al., 2018; Bao and Huang, 2023).[2] Second, the NSFC is required to publicly release the list of final-round candidates competing for the same rotator positions in recent years, providing us with a unique opportunity to compare the career trajectories of rotators with those of unsuccessful candidates who reached the final round of consideration.

Our empirical analysis proceeds in four steps. First, we show that rotators and unsuccessful final-round candidates (henceforth, "finalists") are comparable in terms of age, academic rank, the prestige of degree-granting and home institutions. Second, we show that male and female scientists who eventually become rotators have similar networks prior to service, but after service, the networks of males are far larger than those of females. Third, we estimate the impact of rotator service on a range of career outcomes, including receipt of research funding, professional promotion, and the likelihood of becoming an influential gatekeeper sought after for networking by other scholars. We use event study and difference-in-differences approaches to compare changes in these outcomes between rotators and finalists, separately for male and female scientists. Finally, we explore two potential mechanisms – the expansion of the scientist's professional network and any resulting increase in their scientific productivity.

Rotator service appears to significantly expand the professional networks of male rotators, but not those of females. Prior to service, both male and female future rotators have similar levels of connections with senior scholars serving on

[2]Given the prevalence of such practices, the NSFC has recently issued regulations prohibiting explicit network-building activities between panelists, NSFC officials, and grant applicants. Source: `https://www.nsfc.gov.cn/publish/portal0/tab442/info89394.htm`, last accessed September 1, 2023.

NSFC review panels. After service, however, male rotators expand their network size by roughly 50 percent more than female rotators. This gender gap in network expansion is more pronounced for connections with scholars from outside the rotator's home institution – connections likely made possible by the service itself.

The next set of results reveals that the benefits of rotator service accrue almost exclusively to men. After their service, male rotators are much more likely than male finalists to obtain funding from the NSFC. These gains are concentrated in high-stakes NSFC "special" grants, which offer large amounts of funding and academic privileges, and are considered important stepping stones for career advancement. Male rotators win 56 percent more of these high-stakes grants than finalists. In contrast, we find no evidence that female rotators experience similar benefits in terms of grant receipt, whether overall or for special grants specifically, as compared to female finalists.

Male rotators enjoy two additional short-term benefits from their service. First, they are more than twice as likely as male finalists to be promoted to senior positions at their home institutions. Second, colleagues in the same field at a male rotator's home institution win more grants than their counterparts at the institutions of finalists, both during and after the rotator's service period. We, however, find no evidence of these benefits accruing to female rotators or their colleagues.

In terms of long-term benefits, male rotators also experience a notable advantage: service increases the likelihood of their later ascension to senior roles, where they become key figures with whom junior scientists seek to network. After their service, male rotators are steadily more likely to serve as NSFC panelists (i.e., gatekeepers of research funding) than male finalists who were not chosen to serve as rotators. In contrast, we find no such impact on the career trajectories of female rotators. This suggests that rotator service increases men's – but not women's – longer-term centrality within the social networks of academic science.

Next, we investigate the mechanisms underlying these results. First, we argue that potential gains in insider knowledge during rotator service are unlikely to explain the gendered patterns in post-service benefits identified earlier, as both male and female rotators perform the same set of responsibilities at the NSFC, which do not vary by gender (Hoenen and Kolympiris, 2020). We then conduct empirical

analysis investigating the potential role of two distinct mechanisms: first, an expansion of the scientist's professional network; and second, an improvement in their ability to produce high-quality peer-reviewed academic research, possibly gained through interactions with senior scholars during rotator service.

Our findings suggest that the main factor driving the gender gap in benefits is the expansion of professional networks. We find no evidence that serving as a rotator improves the volume or quality of peer-reviewed research produced. There is no increase in the number of publications, first- or last-authored publications, top publiations, or citations for either male or female rotators.

On the networking side, we show two pieces of evidence supporting this explanation. First, we find that, for male rotators only, the benefits of service vary systematically with the intensity of the networking opportunities provided by the role. We compare outcomes for rotators in positions offering more, as opposed to fewer, opportunities to generate new network links. The benefits for males increase when there are more such opportunities, and the gender gap in benefits diminishes in roles with fewer such opportunities.

Second, we investigate how the gender-specificity of networking opportunities affects the benefits that scientists reap from service. Drawing on previous work on affinity groups (Mengel, 2020; Vásárhelyi et al., 2021; Cullen and Perez-Truglia, 2023), we test the hypothesis that female rotators can achieve similar benefits to male rotators when they have more opportunities for female-to-female network formation. We measure these opportunities by the proportion of senior female panelists – i.e., gatekeepers of research funding – in the fields of female rotators. In fields with a higher proportion of senior female panelists, the gender gap in rotator benefits diminishes or disappears. In these fields, male and female rotators establish similar rates of post-service connections with senior scholars. Additionally, the other benefits of service – such as grant receipt, professional promotion, and likelihood of later becoming a senior NSFC panelist – are comparable for both male and female rotators in these fields, while in other fields, the male-female disparity is even greater.

Our study contributes to the growing literature on the role of networking in perpetuating gender inequality in the labor market, with a particular focus on sci-

entists. Previous research has highlighted how networks can provide short-term career benefits that differ by gender, based on studies conducted at two top universities and a large firm (Yang, Chawla and Uzzi, 2019; Goldin, 2021; Hampole, Truffa and Wong, 2021; Cullen and Perez-Truglia, 2023).

We advance this literature in the following ways. First, we extend the analysis to an entire industry – academic science – rather than focusing on a single institution. Second, we estimate the persistence of networking effects on career advancement over a longer time frame. Third, we show how gender inequality in the career impacts of networking can self-reinforce. Specifically, men who benefit from networking opportunities are more likely than women to become future gatekeepers, with whom the next generation of professionals seeks to connect. Finally, we identify the circumstances under which this male advantage disappears, offering insights for future policy interventions to address this issue.

These findings also contribute to the broader understanding of the persistence of group-based inequalities in the labor market. Networks are often shaped by membership in various social groupings, such as hometown, alma mater, or even shared habits like smoking (Fisman et al., 2018; Zimmerman, 2019; Cullen and Perez-Truglia, 2023). Our results suggest that the affinity networks formed through such groupings – especially those historically associated with exclusion, such as gender and race – can perpetuate advantages for their members and facilitate their ascent to senior roles. By increasing the likelihood that members of advantaged networks occupy these senior positions – roles that often entail gatekeeping access to resources critical for career advancement – this dynamic plays a key role in shaping the future composition of leadership within these fields.

Finally, our study relates to the long-standing literature on temporary workers, which has primarily focused on the effects of temporary contracts on workers' labor market outcomes (Booth, Francesconi and Frank, 2002; Goldschmidt and Schmieder, 2017; García-Pérez, Marinescu and Vall Castello, 2019). We contribute to this literature by examining a specific group: scientists temporarily employed at a research funding agency. The closest study to ours is Hoenen and Kolympiris (2020), who investigate how rotators at the US National Science Foundation help early-career colleagues secure scientific grants through mentoring. We build upon

this work by exploring how professional networks shape career advancement in science, with particular attention to how these dynamics differ by gender.

2 Institutional Background

In this section, we provide a brief overview of the NSFC rotator program, followed by a discussion of the perceived benefits of serving as a rotator.

2.1 NSFC Rotator Program

The National Natural Science Foundation of China (NSFC) is China's largest funder of basic science research, which provides funding through a rigorous merit-based review system. To help manage the growing volume of funding applications it receives, the NSFC established its rotator program in 2002. Currently, rotators account for approximately one-third of the NSFC's staff. Similar to rotator programs at the U.S. National Science Foundation and the Japan Science and Technology Agency, NSFC rotators are mostly scholars from universities or research institutions (Zhang et al., 2019; Hoenen and Kolympiris, 2020). Rotators serve for a fixed period, typically two years, before returning to their home institutions. Unlike their counterparts in the U.S. and Japan, NSFC rotators are paid by their home institutions, with the NSFC providing only a small stipend to cover basic living expenses.

NSFC rotator recruitment occurs annually, and researchers holding at least the rank of associate professor are eligible to apply. Applications are first screened by permanent agency staff, and a selected group of candidates -– typically two to three per open position — are then invited to Beijing for in-person interviews. Candidates are evaluated based on their academic qualifications and skills related to organization and management.

From 2002 to 2021, the NSFC employed a total of 587 rotators.[3] Similar to the US National Science Foundation, the main responsibilities of NSFC rotators include screening initial grant applications in their fields, convening expert committees to evaluate these applications, and overseeing the execution of approved grants. Rotators are also tasked with organizing expert teams to write the annual

[3]As of 2023, rotators accounted for one-third36% of the NSFC's total workforce. Source: `https://www.nsfc.gov.cn/publish/portal0/ndbg/2023ndbg/06/info92784.htm`

guidebook for submitting NSFC grant applications and to establish funding priorities across fields.

Rotators serve in either scientific or supportive departments. The NSFC has eight scientific departments, each responsible for sponsoring funding in specific fields.[4] Each scientific department manages the selection of grant proposals and oversees the execution of funded projects. In addition, several supportive offices help coordinate activities across scientific departments and provide administrative and strategic support. When applying to become a rotator, candidates select the department in which they wish to serve.

2.2 Perceived Benefits of Rotator Service

Service as an NSFC rotator offers significant networking opportunities, which can yield both short- and long-term professional benefits. The bottom row of Figure A1 illustrates the stages of the application review process, several of which provide rotators opportunities to build connections with senior scholars. In the first stage, rotators invite senior scholars to help write the application guide, providing them with influence over the prioritization of subfields and research questions in the upcoming funding cycle. In the third and fourth stages, rotators ask senior scholars to evaluate grant applications, giving them significant influence over which projects are funded – an influence that carries reciprocal opportunities. By selecting who receives these invitations, rotators can foster new relationships based on mutual favor and exchange with senior scholars. The networks formed during service may help rotators or their colleagues secure grants after their term at the NSFC.[5]

However, both supply- and demand-side pressures might make it more difficult or costly for women to establish connections with senior scholars during rotator service. On the supply side, senior scholars, who are themselves disproportionately male, may prefer to associate or collaborate with scholars of the same gender (Kuhn and Shen, 2013; Mengel, 2020). On the demand side, the risk of sexual harassment or assault increases the costs women face when engaging in certain networking activities, such as after-dinner socializing in the presence of alcohol or one-on-one

[4]The NSFC established a new interdisciplinary science department in late 2020. We exclude it from this analysis, as it was not operational during the majority of our study period.

[5]Section 5 will discuss the associated networking benefits in detail.

meetings in private offices. These risks are less prevalent for male rotators, who can participate in these activities with fewer concerns (Hersch, 2011; Buckles, 2019; Folke and Rickne, 2022).

In addition to networking benefits, rotators may also gain valuable knowledge during their service at the NSFC. First, a rotator could acquire insider knowledge about the functioning of the NSFC, which could help improve the success of future grant applications, even in the absence of direct personal connections. This might include knowledge of how to better choose a topic or compose a grant proposal. Second, rotators may gain a deeper understanding of the scientific research frontiers, both through interactions with leading experts and by reviewing high-quality research proposals. However, such knowledge gains are unlikely to vary by gender, as both male and female rotators perform the same set of responsibilities at the NSFC.

3 Data

We collect and combine four main data sources that characterize the identity, productivity, professional network, and career advancement of NSFC rotators and finalists. In this section, we describe each source and how they are linked. We provide this information in tabular form in Table A1.

3.1 The Roster of NSFC Rotator Candidates

Our first data source comprises the identities of people who served as NSFC rotators and those who were finalists in the competition for NSFC rotator positions but were not ultimately selected. We refer to this first group as "rotators," the second group as "finalists," and the union of both groups as "rotator candidates."

We draw our data from several sources. We obtained administrative data, covering the period from 2017 to 2021, which list the universe of candidates who made it to the final round of selection for rotator service. These data include information both on those who served, and on those finalists who made it to the final interview round but were ultimately not selected. For rotators who served earlier, we collected information from a variety of sources – the Internet Archive (http://web.archive.org/); author information published in the Bulletin of the Na-

tional Natural Science Foundation of China, the official journal of the NSFC; and from Google and Baidu searches with the keywords "NSFC rotators" (in Chinese, *liudong xiangmu zhuren*). Together, this yielded the names of 454 rotators – comprising 77.3 percent of the total set of 587 rotators who served over the period from 2002 to 2021 – and the names of all 309 finalists who attended a final round of interviews but were not selected to serve as rotators over the period from 2017 to 2021. In our main analysis we use only the 2017-2021 sample, including 267 rotators and 309 finalists.

We link the names of rotator candidates to official data from the NSFC and information posted on each person's web page and personal CV. These data include gender, home institution, year of birth, educational history, work history (including mobility to and from other institutions, promotion, and the NSFC department in which they served), and academic job title at the time of attending the face-to-face interview. This yields matched data for 763 rotator candidates, 94 percent of the names in our sample.

In Table A2 we present summary statistics for these NSFC rotator candidates. About one in four is female, and roughly 90 percent of them obtained their PhDs from either top-tier Chinese universities, overseas universities, or the Chinese Academy of Sciences. Most NSFC rotator candidates are currently affiliated with this set of elite institutions, with only one third coming from lower-ranked universities. We find no evidence of systematic differences between successful rotators and finalists (i.e., failed rotator candidates who made it to the final round) in terms of age, rank, home institution, and degree-granting institution. While we do not observe why a given candidate was or was not selected, rotators and finalists are strikingly similar on these observable characteristics.[6]

3.2 Administrative Data on NSFC Grants

Our second data set records the NSFC grants awarded to scientists in China over this period. We scraped these data from the NSFC's official website, which publishes information annually on the grants approved in that year.[7] This information

[6]We will discuss this issue in detail in Section 4.2.

[7]Source: http://kd.nsfc.gov.cn/; last accessed December 12, 2021

includes grant type, approval year, and the NSFC department that a grant belongs to, along with the awardee's name and institution.

We focus on grants awarded to NSFC rotator candidates and to others at their home institution. To do so, we match each grant to the institution receiving the grant and, where relevant, the individuals identified in our roster of rotator candidates. These comprise information on 344,002 grants, accounting for 62.6 percent of all NSFC grants approved over the period from 2000 to 2021. Grants awarded to scholars at institutions with no rotator candidates do not appear in our data. Importantly, most grants from the NSFC typically have only a single Principal Investigator (PI) and other investigators, rather than a PI, co-PIs, and investigators, as is more common for funding from agencies in North America and Europe. As a result, the vast majority of credit from a given grant can be associated with one person, though other investigators may benefit from subcontracts.[8]

3.3 Annual Data on Scientific Publications

Our third dataset comprises information on a person's publications, the authorship order for each publication, and its record of citations. We use these to measure productivity of the scientists in our data. We gather these records from the website www.scopus.com, which we match to rotator candidates in our sample.[9] We use the site's application programming interface (API) to extract publication information for our list of rotator candidates. We successfully obtain information on publications for 83.1 percent of our sample. We use these data to create several variables: the annual number of academic papers published, which we use to measure the quantity of rotator candidates' scientific output; the annual average number of citations per paper, which we use to measure the quality of their output. We also measure rotator candidates' performance based on the annual number of first-

[8]One exception to this is the small set of "special" grants which are not talent grants. We conduct and report relevant sensitivity analyses separating these from other special grants

[9]We chose Scopus for three advantages it has over its competitors, such as Web of Science. First, Scopus has greater coverage than its competitors, particularly among Chinese-language journals (Mongeon and Paul-Hus, 2016; Vera-Baceta, Thelwall and Kousha, 2019; Baas et al., 2020). Second, it identifies authors by their full names, as opposed to first initial and last name, which is particularly useful in our setting. Finally, author IDs are assigned by Scopus staff rather than by self-registration, minimizing risk of non-classical error coming from strategic registration behavior.

authored and last-authored papers, which may be more appropriate for measuring "true" productivity.

3.4 Data on Panelists and Scientific Connections

Our final data set collects a record of network links between rotator candidates and the senior panelists who evaluate grant applications each year. We gather these data from several sources.

Our first source consists of data on the collaboration history of scientists, which we obtained via web-scraping an NSFC site (`https://kd.nsfc.cn/`) in 2021. Within these data, a link is made if two scientists have ever participated as investigators on the same NSFC grant. These data cover links from 1998 up to the year 2020.

We link these to a second data source containing the identities of panelists who have served on NSFC grant awarding committees over the period from 2014 to 2020, also obtained from the official NSFC website (www.nsfc.gov.cn). In cases where the information has expired or been taken down, we gather data from other official sources, such as Sciencenet (a major science website supervised by the Chinese Academy of Science, http://fund.sciencenet.cn/) and Qingta (a leading education and science information provider in China, https://www.cingta.com/). This yields 9,023 names, comprising the list of senior scientists who served as panelists on 89.2% of the roughly 600 NSFC review committees publicized during the 2014-2020 period. These data also contain information on each person's official NSFC ID number (which we use for matching), their field of research (and thus NSFC department), the type of grant committee on which they served, and the years in which they served. Using these data, we hand-collect other relevant information – such as institution and gender - from each panelist's personal website and curriculum vitae.

We use this merged dataset to generate two connection variables. The first measures the number of panelists to whom a rotator candidate is connected. The second measures the number of NSFC grants on which a given rotator candidate and a given panelist are both listed as investigators.

We further separate each measure into two distinct types of connection: links to panelists who are affiliated with the person's home institution and, separately,

links to panelists from other institutions. The incidence of collaboration between rotators and those panelists from outside of their institution is of particular interest because rotator service is more likely to increase the likelihood of such connections – as compared to scientists in the rotator's home institution, with whom the rotator is already likely to have some contact.

Finally, we link our data on rotator candidates to data on the identity of panelists, identifying which candidates go on to become senior panelists, the gatekeepers with whom future rotators choose to network. This provides an outcome variable that is a natural endpoint of our analysis, capturing the extent to which rotator service enables scholars to become the senior scholars with whom others hope to network. Since we are following rotators' trajectories, we extend these data into 2023.

4 Research Design

In this section, we present the implementation of our research design, first explaining our estimating equations, and then presenting an empirical test of their identifying assumptions.

4.1 Econometric Model and Estimation

Our empirical analyses estimate how being selected to serve as a rotator affects various aspects of a scientist's career trajectory. Intuitively, we compare the outcomes of rotators before, during, and after service to those of rotator finalists who make it to the final interview but are not ultimately selected for service. We estimate this rotator-finalist difference overall, and then separately for male and female rotator candidates.

We employ two main approaches to estimation: an event study and a difference-in-differences approach. First, we estimate the following event study specification:

$$Y_{it} = \alpha_o + \sum_{p=-P}^{P} \alpha_{1\#p} * Rotator_i * p_{it} + \rho_i + \lambda_t + \varepsilon_{it} \tag{1}$$

Y_{it} is the outcome variable for rotator candidate i in year t. The outcome variables

we use include number of grants received, amount of grant funding received, number of publications, and professional promotion. $Rotator_i$ is an indicator variable capturing whether a rotator candidate served as a rotator. The distance in years between the year in which data was observed to the year of the person's interview for rotator service are captured by period variables p_{it}, with $p = -1$ set to the year of the interview, meaning that $p = 0$ is the person's first year of (potential) service, should they be selected. The terms ρ_i and λ_t capture person and year fixed effects, respectively.

Our main coefficients of interest are the set $\alpha_{1\#p}$ estimated over the periods p_{it}, which estimate how the outcome variable for those selected to serve as a rotator varies over time. These are measured relative to the person's year of starting service and capture three periods: pre-service ($p \leq -1$), during the two years of service as a rotator ($p = 0$ and $p = 1$), and post-service ($p \geq 2$). This estimates whether and how outcome variables from before, during, and after the period of service vary relative to the comparison group in question. In our main analysis, we restrict our data for analysis to contain only observations for each rotator candidate within a 5-year window around the date of their final interview for service at the NSFC (i.e., $P = 5$). We present sensitivity analyses for key results using $P = 8$ and $P = 10$. Standard errors are clustered at the rotator candidate level. To show how these patterns vary for male rotators versus finalists, as compared to female rotators versus finalists, we also estimate these coefficients separately by gender.[10]

Our second approach uses a differences-in-differences (DD) design to estimate the overall effect of serving as a rotator. We compare the outcomes of rotators with those of finalists (i.e., failed rotator candidates) before and after the interview date; we also estimate this effect separately by gender. Our specification is:

$$Y_{it} = \beta_0 + \beta_1 Rotator_i * AfterInterview_{it} + \rho_i + \lambda_t + \varepsilon_{it} \tag{2}$$

Y_{it} is again the outcome of rotator candidate i in year t.[11] $AfterInterview_t$ is an

[10] This could also be achieved using a single estimation with additional interaction terms. Our approach is equivalent to estimating one equation with fully interacted gender x rotator x post-service and gender x year fixed effects.

[11] The person-level fixed effect absorbs the stand-alone $Rotator_i$ variable.

indicator variable that takes the value 1 if the year t is after the date in which the person completed their final, in-person interview for rotator service (i.e., $P \geq 0$). As in Equation (1), ρ_i and λ_t capture person- and year-level fixed effects, respectively. Here we again cluster our standard errors at the rotator candidate level.

Our main coefficient of interest here is β_1, loading on the interaction term between $Rotator_i$ and $AfterInterview$. This parameter estimates the overall benefit accruing to the rotator after being selected for service, relative to finalists. As a result, it is more immediately policy-relevant than $\alpha_{1\#p}$. We generate three sets of estimates of this parameter as well: first overall, then separately by gender. Importantly, however, this estimate of β_1 from Equation (2) combines any penalty that might exist during service – for example, as a result of the NSFC's prohibition of rotators from earning grants during service – and any premium that accrues afterwards.

We can also estimate an alternative to this approach, in which we generate separate estimates for the period of service, over which time we expect a penalty, as service normally prohibits rotators from winning more grants, and that after service, during which time any premium from service would appear.

$$(3) \quad Y_{it} = \gamma_0 + \gamma_1 Rotator_i * DuringServ_{it} + \gamma_2 Rotator_i * AfterServ_{it} + \rho_i + \lambda_t + \varepsilon_{it}$$

In this specification, γ_1 gives the during-service estimate, and γ_2 gives the after-service estimate.

We complement these with a cross-sectional analysis of the scientific connections that rotators have with NSFC panelists, as described in Section 3.4. We compare connections for two groups: one is the set of female and male rotators (not finalists) who began their service in 2017 or later; and the second is the set of female and male rotators who began their service prior to 2016. Because of the structure of our data, the connections of the first group are only those created *prior* to their period of rotator service, while those in the second group include connections made after service as well as before. We refer to the first group as "before service" and the second group as "after service." We regress the connections variable in question on the person's gender, conditional on group, yielding the difference in connections

between female and male rotators in each of these two groups, before and after service, respectively.

We use this comparison to measure two important differences. First, we use it to show the extent to which such rotator–panelist connections vary before and after service, and to estimate whether this differs by gender. Second, we use it to estimate how any gender difference in post-service connections varies with the gender specificity of the networking opportunities provided to female and male rotators in different service roles.

4.2 Balancing Test

To show that the treatment group ("rotators") and the control group ("finalists") are comparable, we do the balancing test in terms of individuals' pre-treatment characteristics including gender, age at interview, academic rank at interview, educational background, and prestige of home institutions.

Figure 1 plots raw differences in treatment and control group means. As expected, the treatment group ("rotators") and the control group ("finalists") are comparable, except that rotators are slightly younger and more likely to come from elite universities than finalists. We obtain a p-value of 0.33 in a joint test that all the differences are zero.[12] We also conduct similar regression exercises for females and males separately. As shown in Figure A2 and the final two columns of Table A3, rotators and finalists are comparable even for females and males separately. This is reassuring because our main specification is also estimated separately by gender.

To summarize, the balancing test results suggest that our analysis sample forms the basis for a credible comparison and the DID estimaotrs are likely to recover the casual effect of rotator service on individuals' career outcomes.

5 Gendered Networking Opportunities Due to Rotator Service

In this section, we characterize how rotators' professional networks vary before and after the rotator's period of service. Our analysis studies the connections between

[12]The first two columns of Table A3 show that the rotator status is almost uncorrelated with all pre-treatment characteristics.

Figure 1. Balancing Test: Rotators vs. Finalists

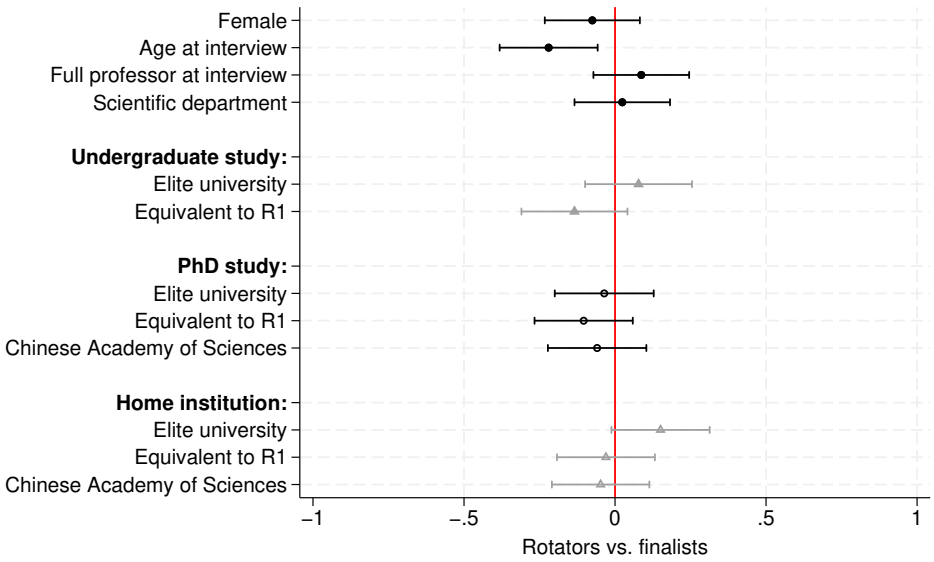


Figure 1 notes: this figure presents estimates from regressions of pre-treatment characteristics on the dummy variable for rotator experience without controls. These characteristics include gender, age at interview, academic rank at interview, educational background, and prestige of home institutions. "Elite universities" are the 39 universities recognized as the most prestigious in China, officially so by China's "Project 985." This group includes both Peking and Tsinghua Universities. "Equivalent to R1" refers to the group of 77 Chinese universities, recognized by the Chinese government's 211-Project but not by (the slightly more prestigious) Project 985. The Chinese Academy of Sciences (CAS) is China's premier national research institution with more than 100 affiliated institutes and laboratories.

the mid-career scientists who become rotators and the senior scientists who serve as NSFC panelists. Since a key benefit of rotator service is contact with these senior scientists, we first estimate how this opportunity changes the size and structure of rotators' professional networks. As described in Section 3.4, we measure network size and structure with the person's likelihood of being on subsequent NSFC grants with these senior scientists. We use two measures - whether or not there was ever such a connection between a rotator and a panelist, and the number of such connections between each pair. We further separate this by whether or not the panelist is at the same institution as the rotator.

We show our results in Figure 2. Panel (a) shows connections prior to service, and Panel (b) shows connections after service. In Panel (a), we find no evidence of pre-service gender differences in the number of NSFC panelists, nor in the number of grants won with a panelist. In Panel (b), however, we see clear evidence of gender differences in connections with NSFC panelists after rotator service: after their period of service concludes, we estimate that male rotators have a greater number of connections with NSFC panelists and a greater number of NSFC grants held with panelists than do females, both of which are statistically significant. Furthermore, the largest difference is among the post-service connections male rotators have with NSFC panelists from other institutions, rather than from their home institution.

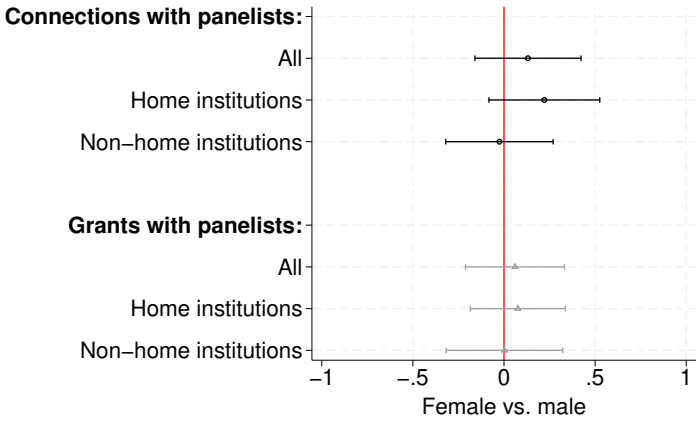
To sum up, female rotators are less likely than males to be tasked with jobs that offer networking opportunities during their service at the NSFC. Further, they are also less likely to develop connections with NSFC panelists after leaving the NSFC. This suggests that female rotators reap fewer networking benefits from their temporary service at the NSFC.

6 Rotator Service and Gender Gaps in Grant Receipt

In this section, we estimate the impact of rotator service on the grant receipt of scientists and their colleagues. We first examine how rotator service influences the likelihood of scientists securing subsequent research funding from the National Natural Science Foundation of China (NSFC). We distinguish between ordinary and special grants, with the latter being of particular importance due to their higher stakes in terms of award size and career advancement. Second, we explore whether

Figure 2. Connections Between Rotators and Panelists Before and After Service

(a) Before Service



(b) After Service

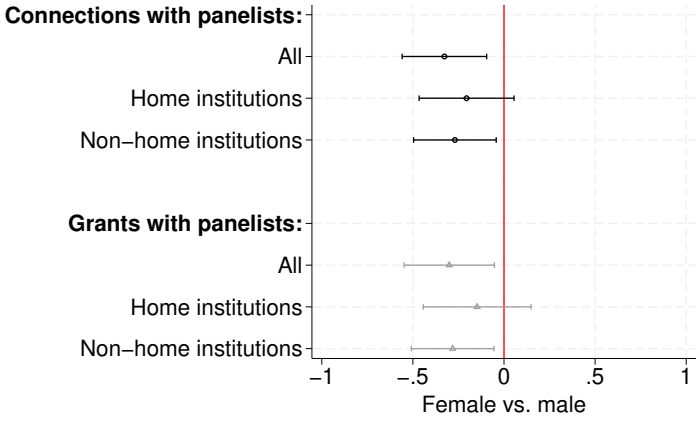


Figure 2 notes: this figure shows our estimate, and its 95 percent confidence interval, of gender differences in connections with NSFC panelists by regressing the outcome variable on the person's gender. Positive values mean that females have higher levels of the variable than males, and negative values mean that males have higher levels of the variable than females. In Panel (a), these variables are measured for only those rotators who participate in the finalist interview for NSFC service in 2017 or after and whose data, as a result, represents only connections formed prior to their start of NSFC service. In Panel (b), these variables are measured for only those who participate in the finalist interview for NSFC service in 2016 or before and whose data, as a result, also contains connections formed after their start of NSFC service. We report estimates overall, and then separately for panelists from home institutions and for outside panelists, as indicated in the labels on the left side of each panel.

rotator service affects the volume of scientific funding awarded to other scientists in the rotator's field at their home institution.

6.1 Grants Awarded to Rotator Candidates

In this subsection we first estimate how rotator service affects the number of awarded scientific grants over time using the entire sample. We then explore the rotator service effect by gender, followed by the difference-in-differences estimates.

The rotator service effect using the entire sample. We present event-study results in Figure 3, plotting our estimates of $\alpha_{1\#p}$ and their confidence intervals from Equation 1. Panel (a) displays the estimates of the rotator service effect on the number of awarded NSFC grants. Panel (b) displays the estimates separately for the receipt of low-stakes ordinary grants and of high-stakes special grants.

This figure shows four key patterns. First, prior to service, estimates are centered around and not statistically different from zero. This supports the parallel trends assumption needed for our difference-in-differences analysis. Second, during the period of service, rotators experience a penalty in the number of grants they receive, relative to finalists. This is as expected, given that rotators are prohibited from applying to new grants while serving at the NSFC. Third, after service, rotators experience a statistically significant increase in the number of grants they win. Finally, after service, rotators are much more likely than finalists to obtain high-stakes special grants, which are very important for individuals' career progress and are much more linked to networking activities (Shi and Rao, 2010).[13]

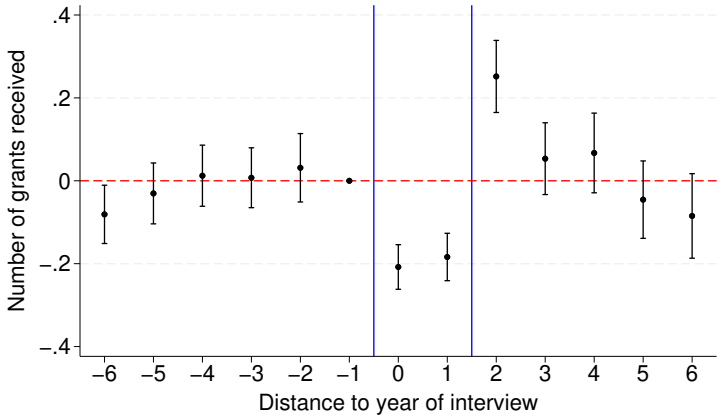
The rotator service effect by gender. As illustrated in Panel (a) of Figure 4, male rotators enjoy an overall post-service benefit that, while decreasing over time, remains both substantial and statistically significant even in the third year after their service. In contrast, the benefits for female rotators dissipate, returning to zero by the second year post-service.

When examining the results for ordinary grants (Panel (b)) and high-stakes

[13]The NSFC has issued several official announcements regarding the importance of special grants (e.g. `https://www.nsfc.gov.cn/publish/portal0/tab442/info73839.htm`) and the campaign to alleviate networking activities in funding evaluations (e.g. `https://www.nsfc.gov.cn/publish/portal0/tab440/info75026.htm`).

Figure 3. Rotator Service and Grant Receipt: The Entire Sample

(a) All grants



(b) Ordinary vs. high-stakes special grants

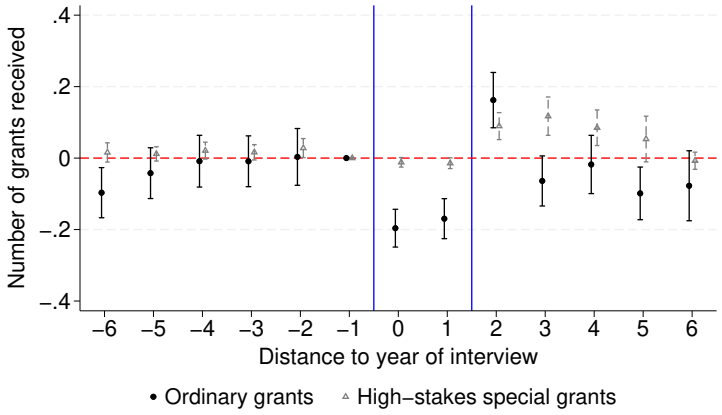


Figure 3 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the number of all grants the person wins in a given year in Panel (a) and the number of ordinary or special grants in Panel (b). These figures present a "stacked" event study, with the year zero assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. We show the tabular analogue to these results in Table 1.

special grants (Panel (c)) separately, we find that both female and male rotators benefit similarly from their temporary service in terms of low-stakes ordinary grants. However, male rotators are much more likely to secure high-stakes special grants, with this advantage persisting for up to four years after their service. Female rotators, on the other hand, do not enjoy such benefits.

We also test the robustness of our estimates to a few sets of alternative samples: (1) excluding those who later become permanent NSFC employees and thus are no longer permitted to apply for NSFC grants,[14] (2) excluding those who attended the interview more than once,[15] and (3) limiting the sample to those job positions with complete candidate lists.[16] As shown in Figures A3, A4, and A5, our main estimates are robust across these samples.

Difference-in-Differences estimates. To complement the event study, we present difference-in-differences estimates of the effect of service on grant receipt. We present estimates of the parameters γ_1 and γ_2 in Table 1 (estimated using Equation 3). Recall that γ_1 is an estimate of the penalty that rotators experience during service, and γ_2 is an estimate of any premium that accrues post-service once they leave the NSFC and are again able to compete for grants. The estimates corresponding to Figure 3 appear in column 1. In Panel A, we present estimates for the entire sample, and in Panels B and C we present the gender-specific estimates of this parameter, as indicated in the panel titles.

Consistent with our event study results shown in Figures 3 and 4, we find that during service, rotators experience a statistically significant penalty in terms of grant receipt relative to finalists. This holds both overall and separately for males and for females. After service, we estimate a large and statistically significant benefit for male rotators that almost offsets the during-service penalty. For females, our estimate of γ_2 is less than half the magnitude of that for males and is not statistically significant.[17]

[14] Nineteen rotators and two finalists became permanent NSFC employees later.

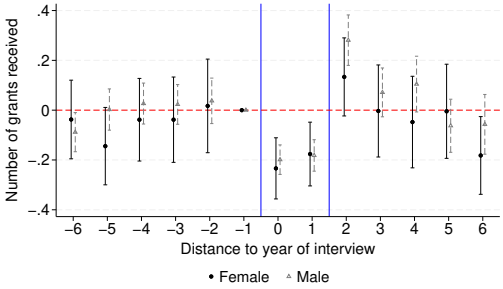
[15] Twenty people attended the face interview organized by the NSFC more than once.

[16] Thirty-six candidates competed for job positions without complete candidate lists due to missing position information on candidates.

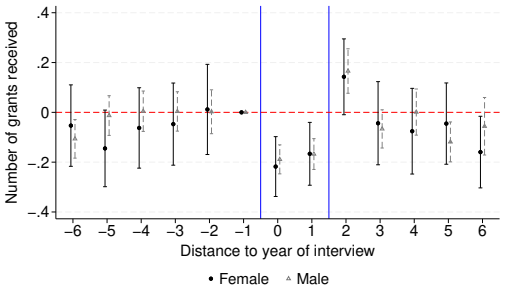
[17] We can use Equation 2 to estimate the total benefit (or penalty) a rotator experiences six years after their interview for service. We show these estimates in Table A4. Our estimate of the overall

Figure 4. Rotator Service and Grant Receipt: Male vs. Female

(a) All grants



(b) Ordinary grants



(c) High-stakes special grants

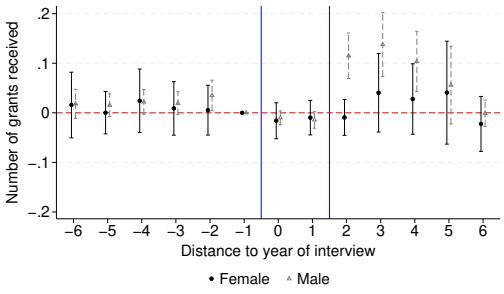


Figure 4 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the number of all grants the person wins in a given year in Panel (a), the number of ordinary grants in Panel (b), and the number of special grants in Panel (c). These figures present a "stacked" event study, with the year zero assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. We show the tabular analogue to these results in Table 1.

Table 1. How Rotator Experience Affects Grant Receipt During and After Service

	(1) All grants	(2) Ordinary grants	(3) Special grants
Panel A: All Observations			
During service (γ_1)	-0.190***	-0.162***	-0.028***
	(0.014)	(0.013)	(0.005)
After service (γ_2)	0.134***	0.059***	0.076***
	(0.022)	(0.019)	(0.013)
Pre-interview outcome mean	0.206	0.185	0.020
N	6,180	6,180	6,180
Panel B: Females			
During service (γ_1)	-0.174***	-0.153***	-0.022**
	(0.032)	(0.030)	(0.010)
After service (γ_2)	0.071	0.064	0.007
	(0.045)	(0.040)	(0.015)
Pre-interview outcome mean	0.198	0.180	0.019
N	1,362	1,362	1,362
Panel C: Males			
During service (γ_1)	-0.193***	-0.164***	-0.029***
	(0.015)	(0.014)	(0.006)
After service (γ_2)	0.151***	0.056***	0.094***
	(0.026)	(0.022)	(0.015)
Pre-interview outcome mean	0.208	0.187	0.021
N	4,818	4,818	4,818

Table 1 notes: this table presents estimates of two separate parameters - γ_1, the penalty in the outcome variable experienced by those selected for rotator service during their period of service, during which time they are ineligible to receive grants, and γ_2, the (potential) premium they experience after they complete service and are once again eligible. The outcome variable is the number of NSFC grants the person won in a given year. We present estimates separately for all grants, and for two distinct types of grants (respectively), as listed in the column heading. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1. Estimates of β_1 from Equation 2 are given in Table A4.

The gender differences in benefits associated with rotator service come mainly from the receipt of special grants. We uncover a large benefit for male rotators and no evidence of a benefit for female rotators after leaving the NSFC. We estimate a positive and statistically significant coefficient for male rotators' receipt of special grants, which is more than four times higher than their baseline likelihood.[18] In contrast, we find no such effects for females.

We also evaluate whether temporary rotator service affects the amount of grant money awarded in a given year. As shown in Figure A6 and Table A5, both the event study and the difference-in-difference estimates show a similar pattern to the estimates with number of grants as the outcome (Figure 3 and Table A4), except that the rotator service effect on the overall amount of funding is positive for males but negative for females.

7 Rotator Service and Other Career Outcomes

In this section we explore whether rotator service affects two key later-career outcomes: the person's likelihood of professional promotion in their institution, and their likelihood of becoming a gatekeeper of research funds with whom more junior scholars choose to network.

7.1 Administrative Promotion

We next estimate how rotator experience affects the likelihood of male and female rotator candidates' professional advancement. We focus on the chance of being promoted as our main outcome. We study promotion to senior positions such as dean or vice dean of a school, or director or deputy director of an administrative office at the university level. Despite the common connotation of such titles in the US system of more service and less research, in China these positions confer *greater* allocation of research resources to the scientist, such as funding and support positions, as well as greater power and influence in the scientific field in which the person works (Jia, Nie and Xiao, 2019; Acemoglu, Yang and Zhou, 2024). Indeed,

effect of the rotator experience is negative: compared with finalists, a rotator's likelihood of being awarded an NSFC grant during or after their period of service decreases by 20 percent.

[18] As shown in Column (3) of Table A4, a male rotator's overall likelihood of being awarded a special NSFC grant during or after their service more than doubles compared with the baseline likelihood.

they are commonly seen as stepping stones to elite positions in the Chinese scientific establishment.[19]

Our event study results appear in Figure 5, again broken down into estimates for the entire sample in Panel (a) and those by gender in Panel (b).

These estimates show that male rotators enjoy an increase in their likelihood of being promoted after service, relative to male finalists. For females, we see little evidence of an effect. Analog difference-in-differences results appear in Table A6; the overall estimate for men is a significant 0.044 increase in the annual likelihood, and a non-significant estimate of 0.010 for women. We reject equality of the estimates at $p < 0.05$. In Appendix Figure A7, we report results estimated after dropping those who change institutions after their period of (potential) service. The patterns shown in that figure track closely with those in Figure 5.

Our estimates of the overall effect of rotator experience on likelihood of being promoted to an administrative position appear in Table A6. These, too, show that promotion benefits coming from rotator experience are concentrated among male rotators. While small in absolute terms, they are very large in relative terms: we estimate that rotator experience more than doubles male rotators' annual likelihood of being promoted. We find no evidence of such an effect among female rotators.[20]

7.2 Becoming An Influential Gatekeeper

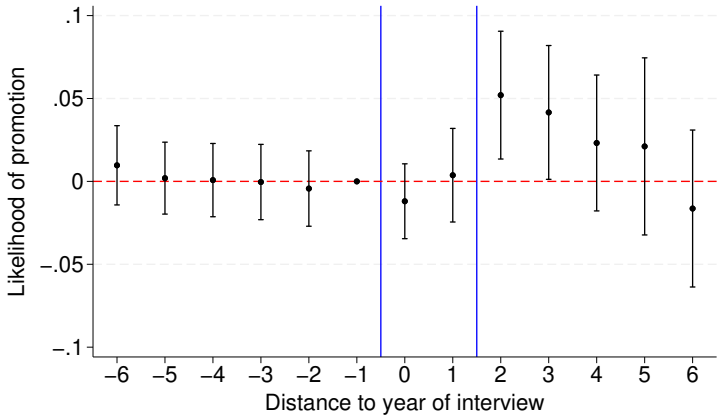
Next, we use our research design to estimate how rotator service affects the likelihood of a scientist to later be chosen to serve as a panelist in an NSFC-convened review panel. Recall that these panelists are senior scientists invited by the NSFC to evaluate the quality of that year's grant submissions. As a result, scientists in these roles are gatekeepers of research funding, deciding which proposals will be funded

[19] A possible explanation for the gendered career impact of the rotator service is that male rotators are more likely to obtain talent NSFC grants, whose awardees often turn to administrative positions afterwards. This phenomenon has been documented in NSFC's annual performance evaluation reports. Source: `https://www.nsfc.gov.cn/Portals/0/fj/fj20210525_01.pdf`.

[20] These results may beg the question: given how little apparent benefit women reap from rotator service, why do they continue to apply and serve? We argue that a key reason for this is the information available to these researchers when they decide whether to apply to serve as rotators. On average, we estimate a benefit to service; furthermore there are three male rotators to every one female rotator, and male rotators enjoy a clear benefit. As a result, the evidence available to female scientists considering rotator service is likely to suggest a benefit for them.

Figure 5. Likelihood of Promotion

(a) Full sample



(b) Female vs. male

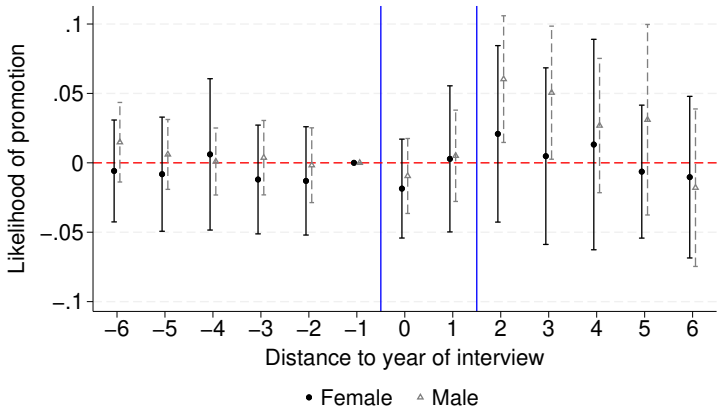


Figure 5 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the likelihood the person is promoted to a senior academic position in a given year. As indicated in the panel titles, the estimates in Panel (a) were generated using the entire sample, and those in Panel (b) were generated using female and male subsamples separately. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. In Table A6, we show the tabular analog to these results. Our results there show similar patterns, and we can reject equality between estimates for males and for females at $p < 0.05$.

and which will not be.

We show these results in Figure 6. For males, selection to rotator service leads to an increase in the probability of later being selected to serve as a panelist. This probability increases over time for each scientist, suggesting a change in their career trajectory. We observe the largest estimates six years after service, when male rotators are 25 percent more likely to serve as panelists than are male finalists. For females, we see no evidence that rotator service leads to an increase in the likelihood of serving as an NSFC panelist, as compared to female finalists.

8 Networking

In this section, we present an investigation of the possibility that the effects seen in Sections 6 and 7 stem through the networking channel.

8.1 How Benefits of Service Vary with the Intensity of the Network Shock

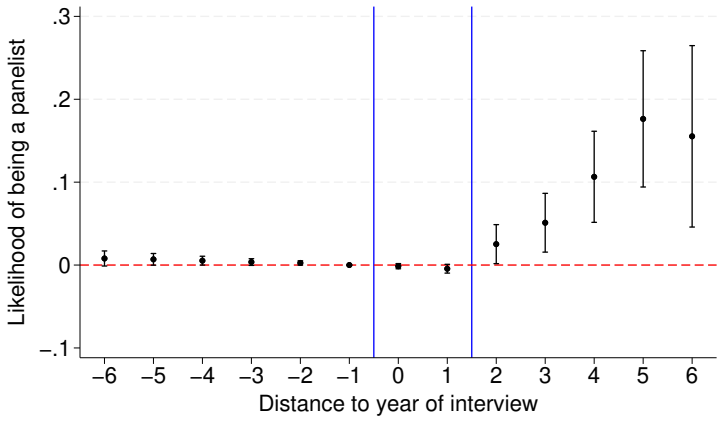
In this subsection, we study how the benefits we estimate in Subsection 6.1 vary with the intensity of the positive network shock provided by service.

We implement this by comparing benefits between rotators who come from home institutions who are closer to versus further away from Beijing, the home of the NSFC. Scientists who serve as rotators must live and work in Beijing during their period of service. For scientists who are based at institutions in or near Beijing, we hypothesize that the positive shock to the person's network coming from rotator service is smaller than it is for those who work further afield. The logic behind this hypothesis is that those based in or near Beijing can easily attend – and thus benefit from – many of the informal networking opportunities at the NSFC and other related institutions, even absent an opportunity for rotator service.[21] Those further away cannot easily access these networks without the service opportunity. We split rotators into two groups: those from institutions who are "far away" from

[21] This follows Giroud (2013), which documents that geographic proximity increases the flow of information and levels of investment from firm headquarters to plants. It is also very similar to the structure of conferences held by the National Bureau of Economic Research in Cambridge, MA, where those from nearby universities incur far lower costs from attending major conferences held there than incurred by those from further away.

Figure 6. Effects on Becoming an NSFC Panelist

(a) Full Sample



(b) Female vs. male

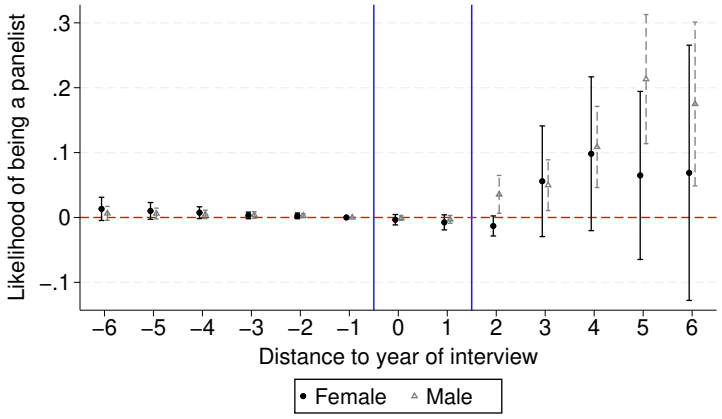


Figure 6 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is whether the person has been chosen to serve as an NSFC panelist (the senior role in grant review and selection discussed in Section 2). As indicated in the panel titles, the estimates in Panel (a) were generated using the entire sample, and those in Panel (b) were generated using female and male subsamples separately. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. Our results are robust to dropping those who became permanent NSFC employees. We show analog tabular results in Table A7.

the capital, which we deinfe to be at least 500 km from Beijing, and those who are closer. Here we highlight results for receipt of special grants because – as described in Section C.1 – these grants are the most likely to respond to changes in the person's professional network. We present these results in Figure A8, and in Table A9.[22]

Rotators whose institutions are far from Beijing benefit far more from service than those from nearby. Difference-in-differences estimates in Table A9 show that male rotators hailing further from Beijing experience a 0.157 annual increase in their likelihood of winning a special grant, more than twice that of males from nearer by, and roughly six times that of females from far away (we estimate an imprecise negative effect for females from nearby). The differences between the male, far away estimates and all other estimates are statistically signifcant at $p < 0.01$. Robustness checks show that our main finding is sensitive to multiple alternative definitions of far away – including more than three hours distance by train, or just being outside (as opposed to within) the Beijing city limits.[23,24]

We observe similar patterns of heterogeneity in the effect on selection to be an NSFC panelist appear. These results appear in Figure A9. Here again, for male rotators from institutions far away from Beijing, there is a year-on-year increase in the likelihood of the rotator being selected to be a panelist that is nearly twice as large as for those from institutions close by. Once again, we see no evidence of a benefit for female rotators in either group. The tabular analog to these results appears in Table A12, in which we estimate a significant benefit for males far away from Beijing that is statistically distinguishable from the negative and insignificant estimate for males from closer-by, and no significant effects for females.

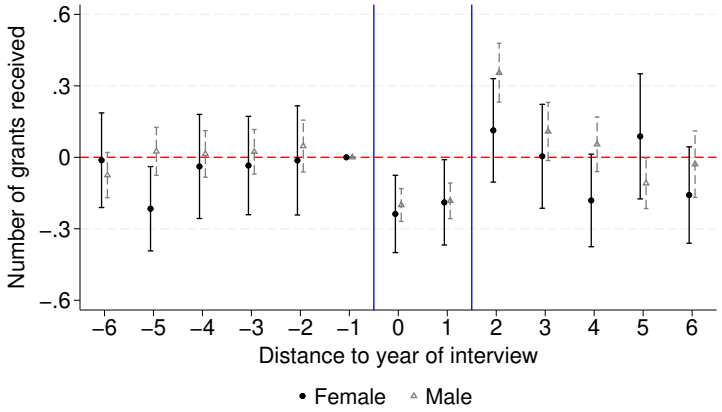
[22] We present results for all grants in Appendix Figure A8.

[23] For length not these are not reported here, but are available on request.

[24] These findings also argue against a separate alternative explanation for our findings in Section 6: that male rotators are more ambitious than female rotators. Were gender differences in ambition to explain our results, we would expect to see smaller gender differences in the benefits from rotator service among rotators who come from a place far away from Beijing. This is because of selection: women normally bear the majority of childcare and household duties in China (Luo and Chui, 2018). As a result, women who are able to leave their homes and travel far away to serve as a rotator are likely positively selected on ambition. The fact that we see greater male benefit among rotators from far away suggests this potential explanation is unlikely.

Figure 7. How Effects Vary with Distance to Beijing

(a) Rotator's Home Institution is 500km or More Away from Beijing



(b) Rotator's Home Institution is Within 500km of Beijing

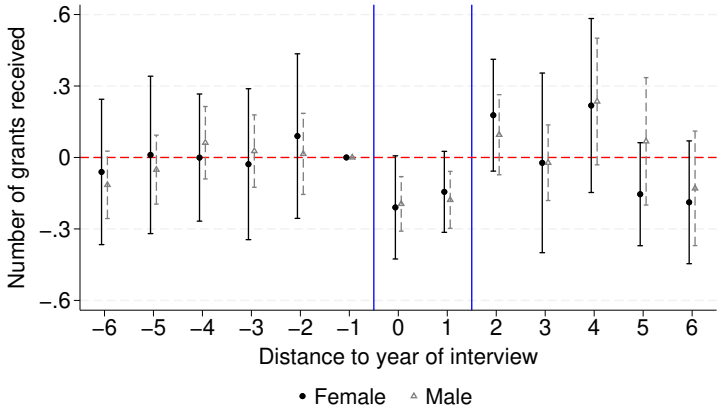


Figure A8 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the number of grants the person receives in a given year. As indicated in the panel titles, the estimates in Panel (a) were generated using rotator candidates whose home institutions are located within 500 kilometers of Beijing, and those in Panel (b) were generated using rotator candidates whose home institutions are located more than 500 kilometers from Beijing. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. We present tabular results in Table A10.

8.2 Gender-specificity of Networking Opportunities

We next estimate whether this greater incidence of female-to-female networking changes the other benefits that male and female rotators reap from service. We begin again with grant receipt – first overall and then by grant type – as our dependent variable. Figure 8 shows these results for all grants.

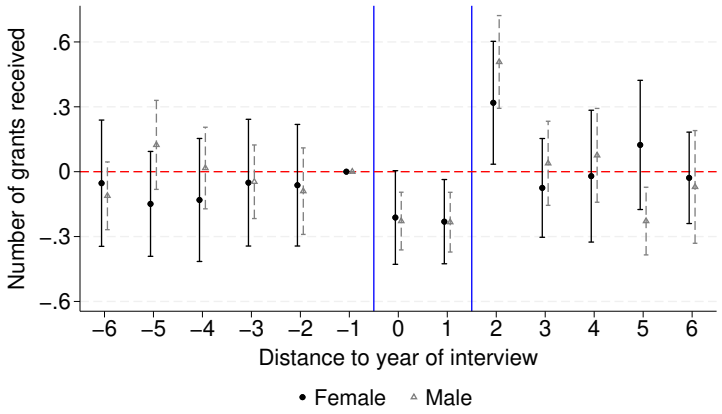
We find that in fields with a higher proportion of senior females, the gendered benefit of service, in terms of grant receipt, decreases dramatically. We show analogue difference-in-difference results in Table A14. In Appendix Figures A10 and A11, we show similar results separately for special grants and ordinary grants, respectively. For the higher-stakes special grants, in group 1 we see an attenuation of the outsize benefit for males we observe in Figure 3, but still some visual evidence of males reaping larger benefit than females for lower stakes grants; in group 2, this imbalance is far more stark either than in group 1, or in the results overall. For ordinary grants, the group 1 estimates suggest that the benefits of service approach gender parity, while for group two there are no benefits for females and small ones for males. Tabular equivalents appear in Table A14, and the point estimates presented there bear out the patterns shown in the event study.

Studying differences in the effects of service on promotion instead of grant receipt, we find a similar pattern of results. We present these estimates in Table A15. We estimate more than a doubling in the annual likelihood of promotion for females in group 1 which is similar in magnitude (and not statistically distinguishable from) that for males in either group. It is also more than four times as large as that for females in group 2. While the estimates for females in group 1 are not precisely estimated, the large difference in magnitude in the estimates for group 1 and group 2 females is consistent with our other estimates showing a much larger career benefit for female rotators in fields with a larger proportion of senior female scientists serving as NSFC panelists.

A slightly different pattern manifests in our estimates of heterogeneity by department for the impact on becoming an NSFC panelist. In Figure A12, we show estimates separately by field (group 1 and group 2, as above). We find that in fields with more opportunities for female rotators to network with senior female scien-

Figure 8. How Effects on Grant Receipt Vary by Gender Composition of Field

(a) Group 1: More Female Panelists



(b) Group 2: Fewer Female Panelists

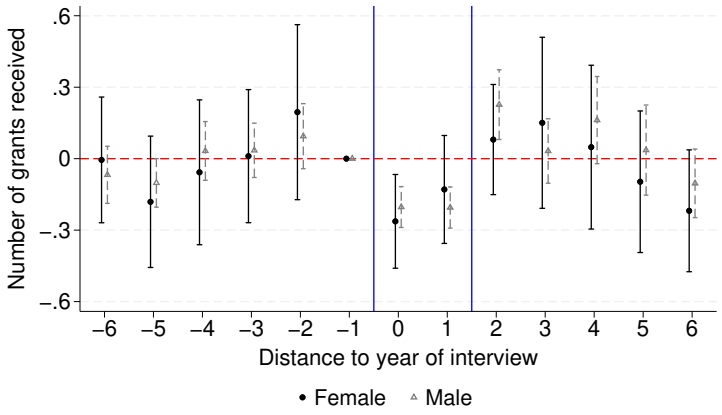


Figure 8 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the number of grants the person receives in a given year. As indicated in the panel titles, the estimates in Panel (a) were generated using rotators from group 1 fields – the life and medical sciences – which have a greater proportion of senior panelists who are female. Those in Panel (b) were generated using rotator candidates from group 2 fields, which have a lower proportion of senior female panelists. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. We show the tabular analog to these results in Tables A13. These results reject that the rotator-finalist difference is equal between females in group 1 and in group 2 at a high level of precision. We show analog results in figure form for special grants in Figure A10.

tists, there is no evidence that rotator service increases the likelihood of becoming an NSFC panelist for either female or male rotators. In fields with a greater gender imbalance of senior panelists, conversely, we observe large gains for male rotators, with point estimates for the final year in the event study exceeding a 40 percent increase in the likelihood of being selected to be a panelist. We see smaller gains for women. We show the tabular analogue to these results in Table A16, which reflect the patterns we see in the figure.

We implement this analysis by dividing the eight NSFC fields into those with a greater or lesser proportion of senior panelists who are female. The first group is comprised of two fields with a relatively higher proportion of females: the life sciences and health sciences, respectively. In this group, 19.3 percent of NSFC panelists are female. In the second group, comprised of the remaining six fields – chemical sciences, management sciences, information sciences, earth sciences, engineering and material sciences, and mathematical and physical sciences – the average proportion of panelists who are female is only 8.6 percent. Connections also vary by field: in group 1, the group comprised of fields with a higher proportion of females, 8.9 percent of the rotators are connected to at least one female NSFC panelist. In group 2, that share is only 4.6 percent.[25] This grouping is also supported by other studies have shown similar gender distributions in these fields, both in the US and globally.[26] We plot the pre- and post-service connections of male and female rotators in the two sets of fields in Figure 9.

We find that the impact of service on rotators' networks varies systematically with the opportunities for same-sex networking between rotators and panelists. Prior to service, in both groups, males and females are similarly likely to be connected to senior panelists (Panels A and C). After service, male and female rotators experience different changes to their networks depending on the gender composition of panelists in their field (Panels B and D). In group 1 fields, there

[25] In Table A11 we provide these summary statistics of the gender composition of these fields, and of the two groups into which we divide them.

[26] See Sheltzer and Smith (2014), Huang et al. (2020), "The State of U.S. Science and Engineering 2022" (source: https://ncses.nsf.gov/pubs/nsb20221/u-s-and-global-stemeducation-and-labor-force#demographic-composition-of-the-stem-workforce, accessed January 13, 2023), and the U.S. 2014 NCES report (source: https://nces.ed.gov/programs/digest/2014menu_tables.asp, accessed February 1, 2023).

is no evidence of a post-service difference in connectedness by gender. By contrast, in group 2 fields – those with a lower proportion of senior scientists serving as panelists who are female – male rotators have roughly 0.75 more post-service connections with NSFC panelists, and participate in roughly one more NSFC grant with these panelists than do female rotators. For reference, this is roughly a 50 percent increase in the ratio of male rotators' connections with senior scholars to female rotators' connections with these scholars.

9 Scientific Productivity

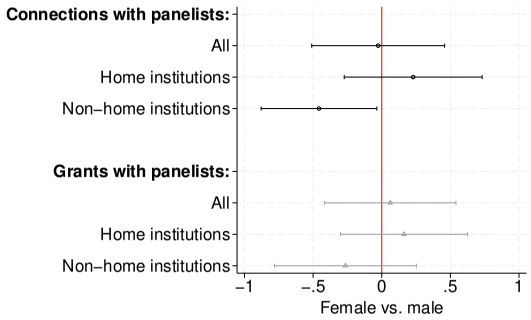
In this section, we investigate another potential contributor to the effects we measure in Sections 6 and 7 -– that rotators become more able to produce peer-reviewed research during their period of service, and that gendered differences in this type of productivity gain explain the gender differences in the career benefits from service we estimate in that section.

Such productivity differences could come from a number of sources. First, a rotator could obtain information on the functioning of the NSFC that they could use for the success of grant applications, absent any benefit from personal connections made while on the job per se (Hoenen and Kolympiris, 2020). This could include knowledge of how to better choose a topic or better frame and compose a grant proposal. It could also include knowledge gained during service about where the various scientific research frontiers lie. This might come either from interacting with leading experts, from processing high-quality research proposals, or both. We argue that, were this productivity channel to be a major driver of the effects we measure in Section 6, then we would not expect to observe the gender gaps we record. Male and female rotators do similar work at the NSFC, and are likely to acquire similar amounts of knowledge about proper grant composition, research frontiers, and NSFC functioning regardless of gender.

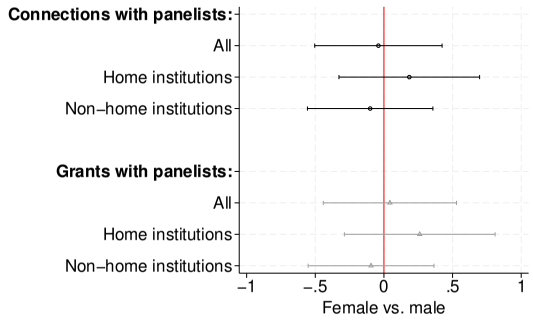
Second, we investigate another potential explanation – that male rotators simply become more productive than females as a result of their temporary work period at the NSFC. Many potential factors could influence this; perhaps, as shown by Niederle and Vesterlund (2007), men have more competitive urges, which might drive them to produce more scientific output. We test for this using our research

Figure 9. Connections Between Rotators and Panelists Before and After Service, by Gender Concentration of Senior Panelists

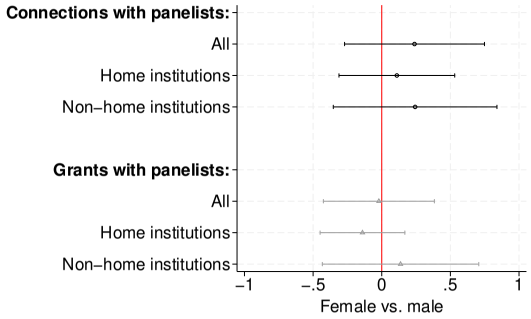
(a) Group 1: More Female Panelists, Before Service



(b) Group 1: More Female Panelists, After Service



(c) Group 2: Fewer Female Panelists, Before Service



(d) Group 2: Fewer Female Panelists, After Service

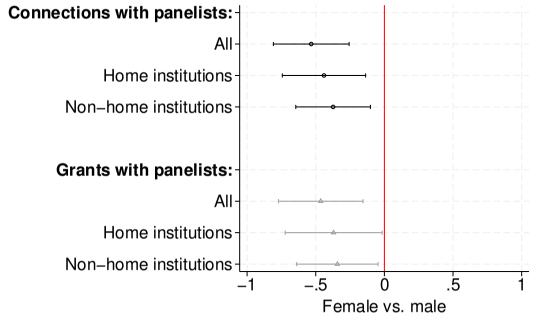


Figure 9 notes: this figure shows our estimate, and its 95 percent confidence interval, of the conditional difference between female and male values of the variable listed, implemented by restricting the sample according to the panel description, and regressing the outcome variable on the person's gender. Positive values mean that females have higher levels of the variable than males, and negative values mean that males have higher levels of the variable than females. Estimates in Panels (a) and (b) were generating using only rotators from group 1 fields – the life and medical sciences – which have a greater proportion of senior panelists who are female. Those in Panels (c) and (d) were generated using rotator candidates from group 2 fields, which have a lower proportion of senior female panelists. We report estimates overall, and then separately for panelists from home institutions and for outside panelists.

Figure 10. Effects of Rotator Service on Productivity

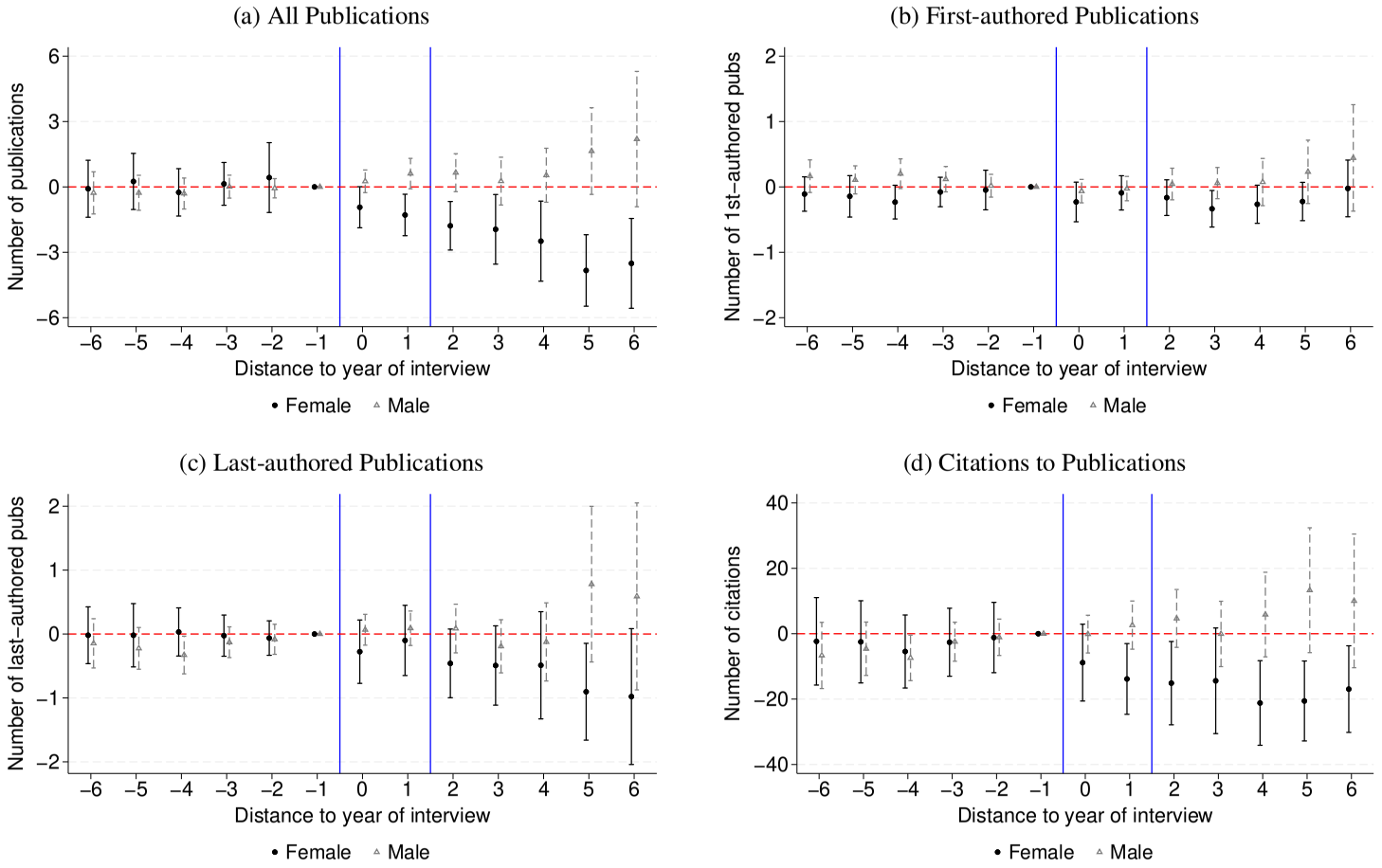


Figure 10 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the academic productivity of the person, measured at the person-year level. We show this for four dependent variables, as indicated in the panel title. We superimpose two vertical lines on the figure to delimit the period of two years in which a rotator candidate would serve at the NSFC were they to be selected. Standardard errors are clustered at the rotator candidate level. We show the relevant difference-in-differences results in Table A17, which show no evidence of any difference in productivity between rotators and finalists on all of these outcomes, except for overall number of papers published by female rotators, which shows a marginally significant penalty for rotator service.

design, estimating the impact of service on scientific productivity. We use four dependent variables in this analysis: a person's total annual number of scientific publications; a person's annual number of first-authored and, separately, last-authored scientific publications; and their publication quality, as proxied for by the annual number of citations to a person's publications.

In Figure 10, we show our event study estimates for the four measures of productivity. In Panel (a) we show estimates for total number of publications, and see no evidence that, after service, either female or male rotators produce more output than finalists on this measure. In Panel (b) we show estimates for first-authored publications. Here too we see that male productivity stays relatively constant; female productivity may decline somewhat, but we cannot reject that our estimates of $\alpha_{1\#p}$ are equal to zero. In Panels C and D, we show results for last-authored publications and the annual volume of citations to the scientist's publications; here, too, we see no evidence of an increase in productivity for either group. Table A17 shows the related regression results, which reflect the patterns seen in the event studies: we fail to reject the null of no impact on publications of any type or citations. We estimate a marginally significant drop in total number of publications for females that does not appear to be driven by either first-authored or last-authored publications.

Another potential explanation, related to productivity, is that rotators get to know panelists and, as a result, are more productive with panelists in particular. We can test for this by merging several of our datasets – the datasets on rotator candidates and panelists, respectively, along with our data on publications. Using the same event study and difference-in-differences approaches, we estimate whether the incidence of coauthorship between candidates and panelists changes after the interview for those selected to serve as rotators. In Appendix Figure A13, we present these results. We find no evidence that rotator service has an impact on the incidence of coauthorship with NSFC panelists or that this differs by gender.

10 Conclusion

Despite great progress towards gender equality in many spheres of society, there remain far more men than women in senior roles in many parts of the labor market, including politics, business, and academic science. This is a bad outcome for

society on multiple fronts. Least controversially, it implies great inefficiencies in economic production, both because of the large amount of overlooked female talent and because of the ignorance of important perspectives in which it results. It is also not a forgone conclusion – similar number of males and females enter many of these fields, but there is a far more "leaky pipeline" for women in terms of who persists to the highest ranks.

To understand the root causes of this phenomenon, we study the role of professional networks, an often crucial means for professional advancement to such positions. We estimate how gender persistently shapes the labor market benefits of positive network shocks to mid-career academic scientists. We show that males are more likely to benefit from these shocks, seemingly through the social ties they form with senior scientists. These benefits persist far into their career trajectories – so far, in tact, that these men are more likely to move into a senior position where they themselves are the target of networking activities from more junior scientists. Women, in contrast, enjoy no short- or long-term benefits from the same network shocks.

We then investigate potential mechanisms for this disparity. We present a robust set of patterns consistent with the explanation that these effects are driven by the gendered nature of the way shocks expand professional networks. The benefits we measure increase or attenuate with changes in the intensity of networking opportunities offered by the service role. These benefits also become more gender-equal when the service opportunity provides more opportunities for female-to-female networking. We find no evidence that increased productivity is a likely driver of these patterns.

Most strikingly, we see that these patterns shape who becomes the next generation of influential scientists. Males who are chosen for rotator service are not only more likely to be promoted in their jobs, but are also more likely to later inhabit roles where they serve as gatekeepers for scientific research funding. These gatekeeper roles are on the opposite side of the dyadic relationship of favor exchange through which rotators advance their careers. The fact that, overall, rotator service helps men but not women to ascend to these roles illustrates how these networks entrench and perpetuate gender inequality in career trajectories. As a whole, our

findings highlight how the benefits reaped from important career opportunities in science depend crucially on gender, and illustrate how these processes can help explain the persistent inequality at the most senior levels of science, and possibly in other white-collar careers as well.

In industries and other parts of society characterized by high levels of interpersonal contact, personal and professional advancement often depends on the discretionary allocation of resources by senior figures. When the benefits of a given interpersonal interaction depend on personal traits or other advantages that historically have conferred privileges – such as gender, race, socioeconomic status, or able-bodiedness – then past inequality may reproduce itself far into the future, even despite demographic or social changes which might otherwise suggest a trend toward greater equality.

A common societal goal is to make sure that past privileges given to specific groups do not determine future opportunities for career advancement. To this effect, many organizations in a wide range of industries strive to provide professional development opportunities to junior members of historically marginalized groups. Our study suggests that, in order to be successful, such efforts should also include complementary interventions targeting the allocation of power – and the ability to confer favor – at the senior level. More specifically, efforts to diversify the gender composition of the gatekeepers in senior positions may help reduce the large imbalance in the benefit younger male and female scientists reap from major career opportunities, and thus promote greater equity in the career development of male and female professionals in science and beyond.

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Appendices

For Online Publication

A Appendix Tables

Table A1. Description of Data Sources

Description of data	Source of data	Years covered	Variables
Roster of candidates	Main NSFC website; internet archive; Bulletin of the National Natural Science Foundation of China; Google and Baidu searches with the keywords "NSFC rotators" (in Chinese, liudong xiangmu zhuren)	Rotators: 2002-2021; Finalists: 2017-2021	Age, gender, rank, home institution, promotion record
Administrative data on NSFC grants	Main NSFC website	2000-2021	Type of grant; amount of grant
Data on scientific publications	Scopus.com	1997-2021	Author list; journal; annual citations
Data on panelists and scientifict connections	Main NSFC website; Sciencenet.com; Cingta.com	2014-2020	Incidence of grants between scientists

Table A1 notes: this table summarizes the data sources we describe in Section 3.

Table A2. Summary Statistics for Rotator Candidates

	All	Rotators	Finalists
Female	0.222	0.204	0.236
Age at interview	38.415	37.966	38.801
Full prof. at interview	0.421	0.445	0.402
Scientific dep.	0.746	0.752	0.741
Undergraduate study			
Elite univ.	0.400	0.420	0.382
Key univ.	0.193	0.165	0.218
Other univ.	0.408	0.416	0.401
PhD study			
Elite univ.	0.472	0.463	0.481
Key univ.	0.170	0.149	0.188
CAS	0.115	0.104	0.123
Other institutions	0.243	0.284	0.208
Home institution			
Elite univ.	0.312	0.349	0.279
Key univ.	0.239	0.232	0.244
CAS	0.077	0.070	0.083
Other institutions	0.373	0.349	0.394
N	622	274	348

Table A2 notes: This table presents summary statistics for the individuals in our sample of rotator candidates. We provide the mean of each variable in our sample (column 1) as well as the group-specific mean for rotators and finalists separately (columns 2 and 3, respectively). "Elite universities" are the 39 universities recognized as the most prestigious in China, officially so by China's "Project 985." This group includes both Peking and Tsinghua Universities. "Equivalent to R1" refers to the group of 77 Chinese universities, recognized by the Chinese government's 211-Project but not by (the slightly more prestigious) Project 985. The Chinese Academy of Sciences (CAS) is China's premier national research institution with more than 100 affiliated institutes and laboratories.

Table A3. Balancing Tests of the Rotator Status

	(1) Full sample	(2) Full sample	(3) Female	(4) Male
Female	-0.022	-0.062		
	(0.057)	(0.109)		
Age at interview	-0.012*	-0.014	-0.020	-0.007
	(0.006)	(0.013)	(0.013)	(0.008)
Full professor at interview	0.047	0.089	0.080	0.038
	(0.049)	(0.096)	(0.124)	(0.055)
Scientific department	-0.056		-0.025	-0.077
	(0.057)		(0.127)	(0.065)
Undergraduate study:				
Elite university	0.000	0.036	-0.170	0.046
	(0.057)	(0.104)	(0.133)	(0.064)
Equivalent to R1	-0.101	-0.106	-0.262	-0.054
	(0.065)	(0.123)	(0.164)	(0.074)
PhD study:				
Elite university	-0.101*	-0.118	0.021	-0.117*
	(0.060)	(0.107)	(0.141)	(0.067)
Equivalent to R1	-0.080	-0.237	-0.007	-0.084
	(0.078)	(0.146)	(0.199)	(0.086)
Chinese Academy of Sciences	-0.121	-0.094	-0.031	-0.130
	(0.093)	(0.166)	(0.188)	(0.114)
Home institution:				
Elite university	0.071	0.130	-0.008	0.094
	(0.062)	(0.115)	(0.154)	(0.070)
Equivalent to R1	0.050	0.094	-0.034	0.069
	(0.065)	(0.125)	(0.143)	(0.073)
Chinese Academy of Sciences	0.126	0.323	0.191	0.071
	(0.111)	(0.209)	(0.202)	(0.142)
Position FEs	No	Yes	No	No
p-value for joint F test	0.334	0.413	0.334	0.569
R^2	0.026	0.126	0.100	0.024
N	486	412	98	388

Table A3 notes: this table presents estimates of regressing the rotator dummy on individual characteristics. In column (2) we control for position fixed effects in the regression. In columns (3) and (4) we repeat the analysis for females and males separately. *** < 0.01, ** < 0.05, * < 0.1.

Table A4. How Rotator Service Affects Grant Receipt: Overall Effect Estimates

	(1) All grants	(2) Ordinary grants	(3) Special grants
Panel A: All Observations			
Overall effect (β_1)	-0.042***	-0.061***	0.020***
	(0.015)	(0.013)	(0.007)
Pre-interview outcome mean	0.206	0.185	0.020
N	6,180	6,180	6,180
Panel B: Females			
Overall effect (β_1)	-0.057*	-0.049*	-0.008
	(0.032)	(0.030)	(0.011)
Pre-interview outcome mean	0.198	0.180	0.019
N	1,362	1,362	1,362
Panel C: Males			
Overall effect (β_1)	-0.038**	-0.064***	0.026***
	(0.017)	(0.015)	(0.009)
Pre-interview outcome mean	0.208	0.187	0.021
N	4,818	4,818	4,818

Table A4 notes: this table presents estimates of β_1 from Equation 2. The outcome variable is the number of NSFC grants the person has won in a given year. We present estimates separately for all grants, and for two distinct types of grants (respectively), as listed in the column heading. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1.

Table A5. Amount of Grant Money Received, in Thousands of Yuan

	(1) Full sample	(2) Female	(3) Male
Overall effect (β_1)	6.538	-53.996*	21.744
	(17.431)	(27.674)	(20.501)
During service (γ_1)	-138.949***	-120.929***	-142.845***
	(12.373)	(23.206)	(14.370)
After service (γ_2)	179.470***	19.390	221.448***
	(34.564)	(42.509)	(41.902)
Pre-interview outcome mean	115.855	105.814	118.654
N	6,180	1,362	4,818

Table A5 notes: this table presents estimates of β_1 from Equation 2 and, from a separate estimation, of γ_1 and γ_2 from Equation 3. The dependent variable is the amount of grant money the person was awarded in a given year. We present estimates for the entire sample, then for females and males separately, as indicated in the column headings. Observations occur at the individual-year level. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1.

Table A6. Likelihood of Promotion

	(1) Full sample	(2) Female	(3) Male
After service (γ_2)	0.039***	0.016	0.045***
	(0.011)	(0.015)	(0.013)
During service (γ_1)	-0.004	-0.002	-0.005
	(0.007)	(0.010)	(0.009)
Pre-interview outcome mean	0.010	0.004	0.011
N	6,180	1,362	4,818

Table A6 notes: this table presents estimates of β_1 from Equation 2 and, from a separate estimation, of γ_1 and γ_2 from Equation 3. Our outcome variable of interest is the person's likelihood of being promoted to an administrative position in a given year. We present estimates for the entire sample, then for females and males separately, as indicated in the column headings. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1.

Table A7. Effects on Becoming an NSFC Panelist

	(1) Full sample	(2) Female	(3) Male
After service (γ_2)	0.058***	0.030	0.066***
	(0.014)	(0.028)	(0.016)
During service (γ_1)	-0.008***	-0.011	-0.007*
	(0.003)	(0.007)	(0.004)
Pre-interview outcome mean	0.000	0.000	0.000
N	6,180	1,362	4,818

Table A7 notes: this table presents estimates of β_1 from Equation 2. Our outcome variable of interest is the person's likelihood of being selected to serve as a panelist in a given year. We present estimates for the entire sample, then for females and males separately, as indicated in the column headings. We restrict our attention to five years prior to the interview and six years after the interview because we do not have observations for rotator finalists beyond this window. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1.

Table A8. How Effects on Grant Receipt Vary by Department of Service: Overall Estimates

	All grants		*Special grants*	
	(1) Scientific departments	(2) Supportive departments	(3) Scientific departments	(4) Supportive departments
	Panel A: All Observations			
Overall estimate (β_1)	-0.045	-0.060	0.016	-0.010
	(0.022)	(0.037)	(0.012)	(0.015)
Mean of outcome variable	0.197	0.197	0.024	0.024
Number of observations	3,838	818	3,838	818
	Panel B: Females Only			
Overall estimate (β_1)	-0.099	-0.060	-0.038	-0.010
	(0.047)	(0.037)	(0.029)	(0.015)
Mean of outcome variable	0.197	0.197	0.024	0.024
Number of observations	991	818	991	818
	Panel C: Males Only			
Overall estimate (β_1)	-0.027	-0.056	0.034	-0.009
	(0.025)	(0.041)	(0.013)	(0.019)
Mean of outcome variable	0.197	0.197	0.024	0.024
Number of observations	2,847	626	2,847	626

Table A8 notes: this table presents estimates of β_1 from Equation 2. Our outcome variable of interest is the number of grants a person receives in a given year. We present estimates separately for the type of department in which a person is considered for service, and separately for all grants, and for the higher-stakes special grants which are more important for professional advancement. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1.

Table A9. How Effects on Receipt of Special Grants Vary by Home Institution's Distance to Beijing

	(1) All rotator candidates	(2) Females only	(3) Males only
Panel A: Home Institution is 500km or More Away from Beijing			
Overall estimate (β_1)	0.033	0.012	0.040
	(0.011)	(0.025)	(0.013)
After service (γ_2)	0.131	0.025	0.157
	(0.021)	(0.033)	(0.026)
During service (γ_1)	-0.004	0.008	-0.006
	(0.011)	(0.025)	(0.012)
Mean of outcome variable	0.024	0.029	0.022
Number of observations	3,082	612	2,466
Panel B: Home Institution is Within 500km of Beijing			
Overall estimate (β_1)	-0.036	-0.088	-0.015
	(0.021)	(0.043)	(0.022)
After service (γ_2)	0.026	-0.067	0.072
	(0.033)	(0.051)	(0.041)
During service (γ_1)	-0.054	-0.096	-0.038
	(0.020)	(0.043)	(0.020)
Mean of outcome variable	0.024	0.029	0.022
Number of observations	1,578	565	1,012

Table A9 notes: this table presents estimates of β_1 from Equation 2 and of γ_1 and γ_2 from Equation 3. Our outcome variable of interest is the number of special grants a person receives in a given year. We present estimates separately for rotator candidates from institutions which are within 500 kilometers, as opposed to further away, from Beijing, the home of the NSFC (indicated in the panel title). We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1. We present estimates for all grants in Table A10.

Table A10. How Effects on Receipt of All Grants Vary by Home Institution's Distance to Beijing

	(1) Full sample	(2) Female	(3) Male
Panel A: Home institution > 500 km Away from Beijing			
During service (γ_1)	-0.193***	-0.173***	-0.197***
	(0.016)	(0.041)	(0.017)
After service (γ_2)	0.156***	0.062	0.178***
	(0.026)	(0.051)	(0.030)
Pre-interview outcome mean	0.206	0.181	0.211
N	4,385	844	3,541
Panel B: Home institution <= 500 km Away from Beijing			
During service (γ_1)	-0.182***	-0.183***	-0.188***
	(0.027)	(0.050)	(0.032)
After service (γ_2)	0.082*	0.075	0.074
	(0.042)	(0.084)	(0.049)
Pre-interview outcome mean	0.206	0.227	0.197
N	1,795	518	1,277

Table A10 notes: this table presents estimates of β_1 from Equation 2 and of γ_1 and γ_2 from Equation 3. Our outcome variable of interest is the number of grants a person receives in a given year. We present estimates separately for rotator candidates from institutions which are within 500 kilometers, as opposed to further away, from Beijing, the home of the NSFC (indicated in the panel title). We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1. We present estimates for special grants only in Table A9.

Table A11. Summary Statistics for NSFC Panelists

NSFC department	(1) Proportion female	(2) Observations
Group 1: More Female Panelists		
Health Sciences	0.223	1,910
Life Sciences	0.146	1,230
Group 2: Fewer Female Panelists		
Chemical Sciences	0.111	1,095
Management Sciences	0.098	287
Information Sciences	0.095	1,162
Earth Sciences	0.086	1,145
Engineering and Material Sciences	0.070	1,149
Mathematical and Physical Sciences	0.060	848
Group 1 overall	0.193	3,140
Group 2 overall	0.086	5,686
Total	0.124	8,826

Table A11 notes: this table shows the gender of senior NSFC panelists who are convened to evaluate grant applications and award grants in each cycle. We list the proportion in each field who are female, separated into two groups as defined in the text and labeled in the panel headings, along with the total number of observations.

Table A12. How Effects on Becoming a Panelist Vary by Distance to Beijing

	(1) All rotator candidates	(2) Females only	(3) Males only
Panel A: Home Institution is 500km or More from Beijing			
Overall estimate (β_1)	0.017	0.002	0.020
	(0.007)	(0.011)	(0.008)
Mean of outcome variable	0.004	0.004	0.004
Observations	4,398	873	3,525
Panel B: Home Institution is Less than 500km from Beijing			
Overall estimate (β_1)	0.001	0.017	-0.007
	(0.012)	(0.025)	(0.015)
Mean of outcome variable	0.011	0.014	0.010
Observations	1,914	590	1,324

Table A12 notes: this table presents estimates of β_1 from Equation 2. Our outcome variable of interest is the person's likelihood of being selected to serve as a panelist in a given year. We present estimates for the entire sample, then for females and males separately, as indicated in the column headings. We present estimates separately by a binarized transformation of the distance from the rotator candidate's home institution to Beijing, where NSFC service takes place, as indicated in the panel title. We restrict our attention to five years prior to the interview and six years after the interview because we do not have observations for rotator finalists beyond this window. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1. We show the relevant event-study results in Figure A9.

Table A13. How Effects on Receipt of All Grants Vary by Gender Composition of Field

	(1) Full sample	(2) Female	(3) Male
Group 1: More Female Panelists			
During service (γ_1)	-0.186***	-0.153***	-0.195***
	(0.027)	(0.047)	(0.033)
After service (γ_2)	0.233***	0.197***	0.249***
	(0.042)	(0.077)	(0.051)
Pre-interview outcome mean	0.225	0.197	0.238
N	1,463	480	983
Group 2: Fewer Female Panelists			
During service (γ_1)	-0.210***	-0.212***	-0.213***
	(0.019)	(0.057)	(0.021)
After service (γ_2)	0.110***	0.042	0.127***
	(0.033)	(0.065)	(0.037)
Pre-interview outcome mean	0.232	0.252	0.228
N	3,023	523	2,500

Table A13 notes: this table presents estimates of γ_1 and γ_2 from Equation 3. Our outcome variable of interest is the number of grants a person receives in a given year. We present estimates separately by the gender composition of senior panelists in the person's field, as indicated in the panel title. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1. We show results for special grants only in Table A14.

Table A14. How Effects on Receipt of Special Grants Vary by Gender Composition of Field

	(1) All rotator candidates	(2) Females only	(3) Males only
Group 1: More Female Panelists			
After service (γ_2)	0.047	0.030	0.063
	(0.025)	(0.036)	(0.034)
During service (γ_1)	0.025	-0.008	0.050
	(0.017)	(0.029)	(0.022)
Mean of outcome variable	0.024	0.029	0.022
Number of observations	1,331	509	818
Group 2: Fewer Female Panelists			
After service (γ_2)	0.148	-0.053	0.199
	(0.028)	(0.058)	(0.030)
During service (γ_1)	-0.029	-0.058	-0.022
	(0.015)	(0.044)	(0.015)
Mean of outcome variable	0.024	0.029	0.022
Number of observations	2,506	478	2,028

Table A14 notes: this table presents estimates of γ_1 and γ_2 from Equation 3. Our outcome variable of interest is the number of special grants a person receives in a given year. We present estimates separately by the gender composition of senior panelists in the person's field, as indicated in the panel title. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1.

Table A15. How Effects on Promotion Vary by Gender Composition of Field

	(1) All rotator candidates	(2) Females only	(3) Males only
Group 1: More Female Panelists			
Overall estimate (β_1)	0.027	0.014	0.035
	(0.011)	(0.016)	(0.016)
After service (γ_2)	0.052	0.049	0.053
	(0.018)	(0.030)	(0.023)
During service (γ_1)	0.020	0.004	0.030
	(0.012)	(0.014)	(0.018)
Mean of outcome variable	0.011	0.007	0.013
Number of observations	1,331	509	818
Group 2: Fewer Female Panelists			
Overall estimate (β_1)	0.003	-0.006	0.006
	(0.009)	(0.016)	(0.011)
After service (γ_2)	0.029	0.012	0.035
	(0.014)	(0.023)	(0.017)
During service (γ_1)	-0.006	-0.013	-0.004
	(0.009)	(0.015)	(0.010)
Mean of outcome variable	0.011	0.007	0.013
Number of observations	2,506	478	2,028

Table A15 notes: this table presents estimates of β_1 from Equation 2 and, from a separate estimation, of γ_1 and γ_2 from Equation 3. Our outcome variable of interest is the likelihood the person is promoted in a given year. We present estimates separately by the gender composition of senior panelists in the person's field, as indicated in the panel title. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1.

Table A16. How Effects on Becoming a Panelist Vary by Gender Composition of Senior Panelists

	(1) All rotator candidates	(2) Females only	(3) Males only
Panel A: Group 1, More Female Panelists			
Overall estimate (β_1)	-0.007	-0.003	-0.010
	(0.011)	(0.020)	(0.014)
Mean of outcome variable	0.011	0.013	0.009
Observations	1,605	544	1,061
Panel B: Group 2, Fewer Female Panelists			
Overall estimate (β_1)	0.019	0.014	0.020
	(0.007)	(0.015)	(0.008)
Mean of outcome variable	0.004	0.005	0.004
Observations	4,707	919	3,788

Table A16 notes: this table presents estimates of β_1 from Equation 2. Our outcome variable of interest is the person's likelihood of being selected to serve as a panelist in a given year. We present estimates for the entire sample, then for females and males separately, as indicated in the column headings. We present estimates separately by the gender composition of senior panelists in the person's field, as indicated in the panel title. We restrict our attention to five years prior to the interview and six years after the interview because we do not have observations for rotator finalists beyond this window. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1.

Table A17. Effects on Volume of Peer-reviewed Publications

	(1) Papers published	(2) First author	(3) Last author	(4) Times cited
Panel A: All Observations				
Overall estimate (β_1)	0.038	-0.057	0.013	-0.393
	(0.259)	(0.065)	(0.102)	(1.955)
Mean of outcome variable	3.299	0.639	0.662	12.059
Number of observations	4,661	4,661	4,661	4,661
Panel B: Females Only				
Overall estimate (β_1)	-0.919	-0.051	-0.200	-5.882
	(0.512)	(0.098)	(0.163)	(4.596)
Mean of outcome variable	2.792	0.401	0.441	9.918
Number of observations	1,182	1,182	1,182	1,182
Panel C: Males Only				
Overall estimate (β_1)	0.351	-0.059	0.083	1.470
	(0.298)	(0.079)	(0.125)	(2.097)
Mean of outcome variable	3.469	0.718	0.736	12.776
Number of observations	3,479	3,479	3,479	3,479

Table A17 notes: this table presents estimates of β_1 from Equation 2, studying the impact of service on the production of peer-reviewed journal articles in a given year. We use four outcome variables, one per column of results, as labeled in the top row of the table. We control for both individual and year fixed effects in all regressions. Standard errors are clustered at the rotator candidate level. *** < 0.01, ** < 0.05, * < 0.1. Analog event study results are given in Figure 10.

B Appendix Figures

Figure A1. Rotators' Roles in NSFC Grant Review

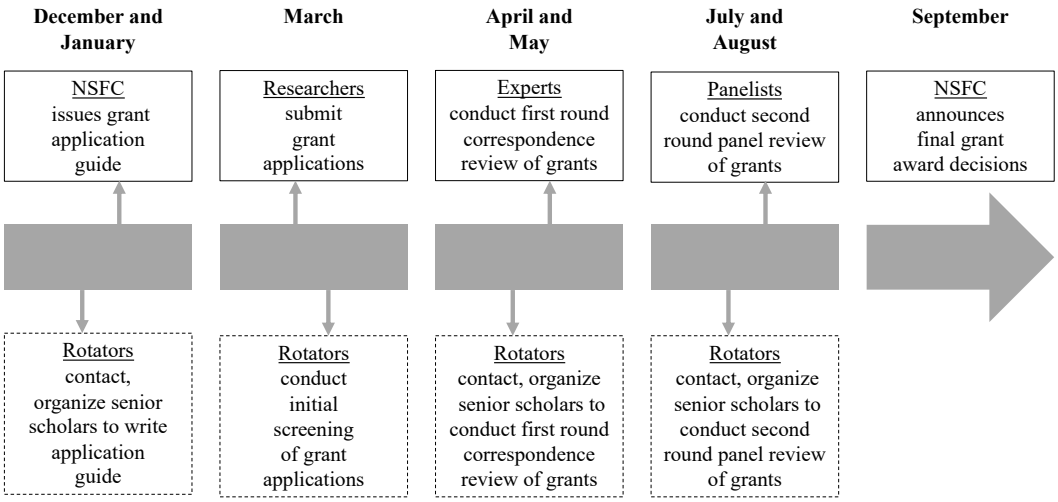
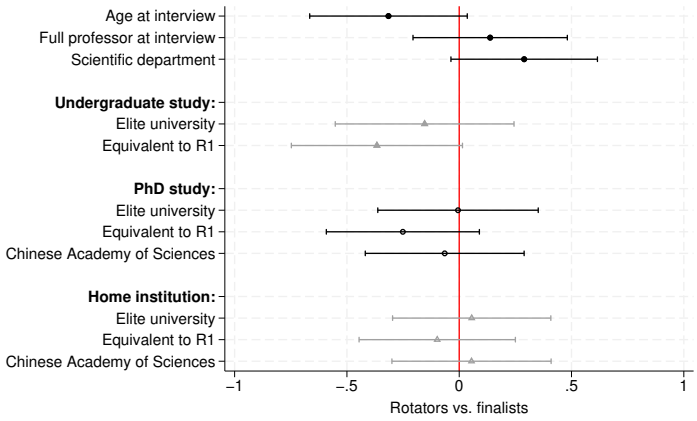


Figure A1 notes: this figure displays a visual representation of the timeline for the NSFC's annual grant review. Each node represents a time period. The sequence of the up and down arrows pointing to the actors indicate the sequence of actions in that period. The top set of boxes describes the activities of three sets of actors: the NSFC, scholars who apply for grants, and the experts who participate in grant review. The bottom set of boxes describes the activities of rotators, highlighting their opportunities for interaction with senior scholars, from which the benefits of networking are most likely to accrue.

Figure A2. Balancing Tests by Gender

(a) Females



(b) Males

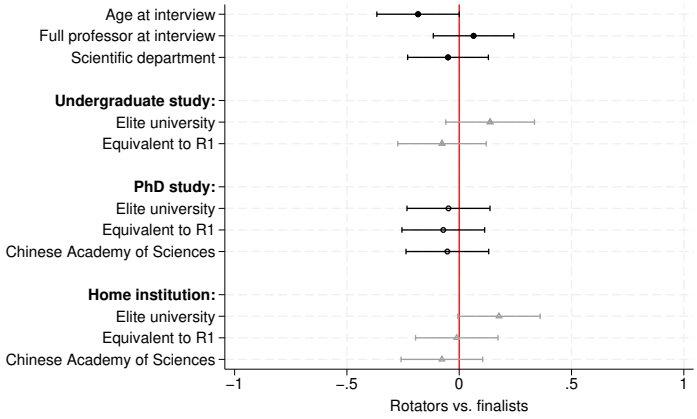
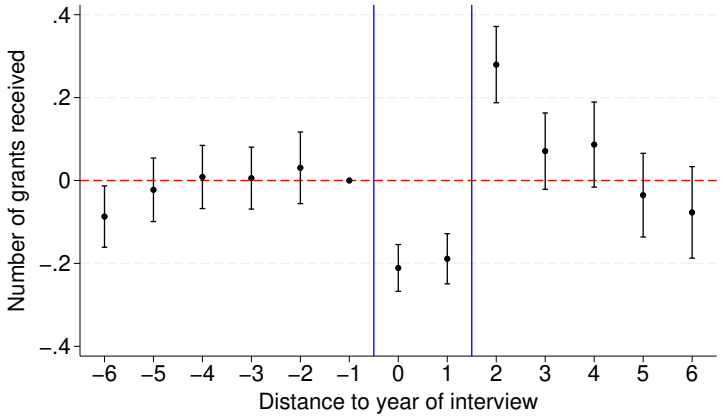


Figure A2 notes: this figure presents separate gender-specific estimates from regressions of pre-treatment characteristics on the dummy variable for rotator experience without controls. These characteristics include gender, age at interview, academic rank at interview, educational background, and prestige of home institutions. "Elite universities" are the 39 universities recognized as the most prestigious in China, officially so by China's "Project 985." This group includes both Peking and Tsinghua Universities. "Equivalent to R1" refers to the group of 77 Chinese universities, recognized by the Chinese government's 211-Project but not by (the slightly more prestigious) Project 985. The Chinese Academy of Sciences (CAS) is China's premier national research institution with more than 100 affiliated institutes and laboratories.

Figure A3. Robustness of the Results for Grant Receipt to Dropping Those Who Became NSFC Permanent Employees

(a) Entire Sample



(b) By Gender

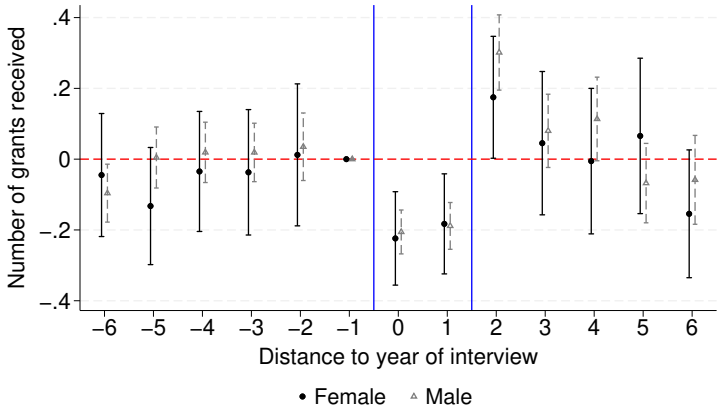
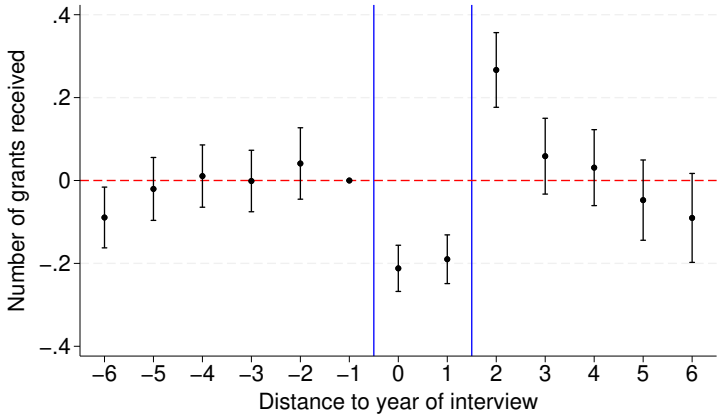


Figure A3 notes: in this figure we present a version of Figure 3 in which we show robustness of our results to excluding those who became NSFC permanent employees later. We show the estimates using the entire sample in Panel (a) and the estimates for male and female scientists in Panel (b). As in Figure 3, these show estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. We superimpose two vertical lines on the figure to delimit the period of two years in which a rotator candidate would serve at the NSFC were they to be selected. Standard errors are clustered at the rotator candidate level.

Figure A4. Robustness of the Results for Grant Receipt to Dropping Those Who Attended the Interview More Than Once

(a) Entire Sample



(b) By Gender

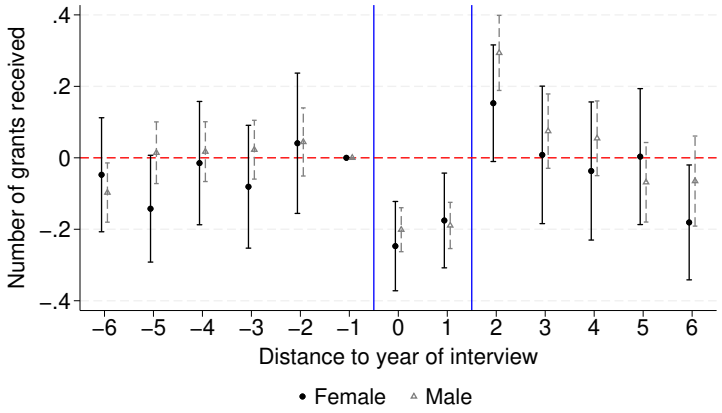
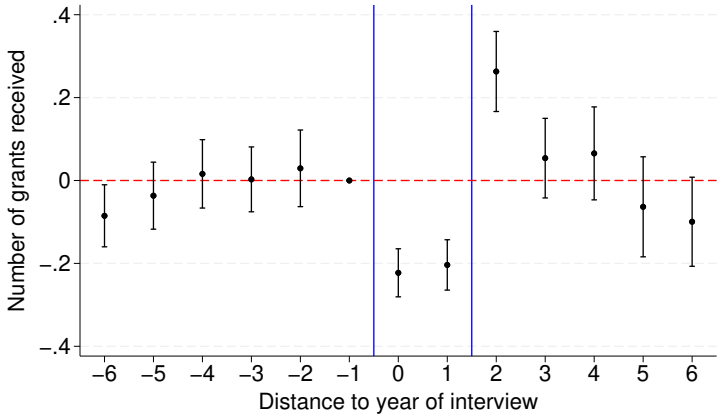


Figure A4 notes: in this figure we present a version of Figure 3 in which we show robustness of our results to excluding those who attended the interview more than once. We show the estimates using the entire sample in Panel (a) and the estimates for male and female scientists in Panel (b). As in Figure 3, these show estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. We superimpose two vertical lines on the figure to delimit the period of two years in which a rotator candidate would serve at the NSFC were they to be selected. Standard errors are clustered at the rotator candidate level.

Figure A5. Robustness of the Results for Grant Receipt to Dropping Job Positions Without Complete Candidate Lists

(a) Entire Sample



(b) By Gender

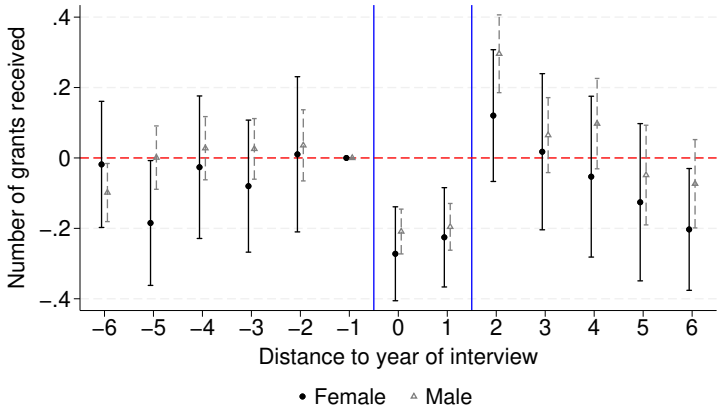
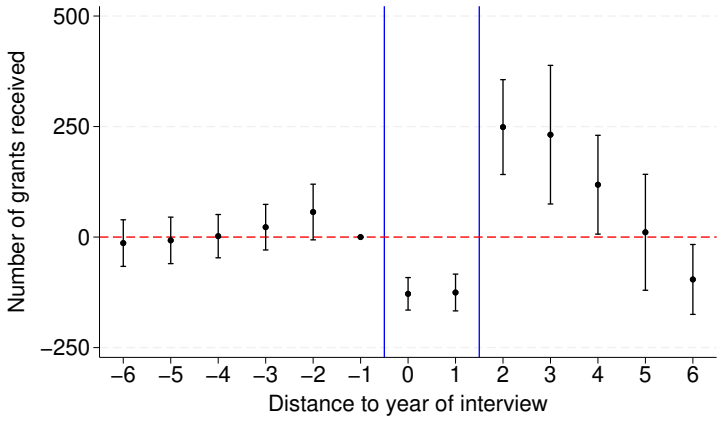


Figure A5 notes: in this figure we present a version of Figure 3 in which we show robustness of our results to excluding candidates from the job positions without complete candidate lists. We show the estimates using the entire sample in Panel (a) and the estimates for male and female scientists in Panel (b). As in Figure 3, these show estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. We superimpose two vertical lines on the figure to delimit the period of two years in which a rotator candidate would serve at the NSFC were they to be selected. Standard errors are clustered at the rotator candidate level.

Figure A6. Rotator Service and the Amount of Grant Funding Received

(a) Entire Sample



(b) By Gender

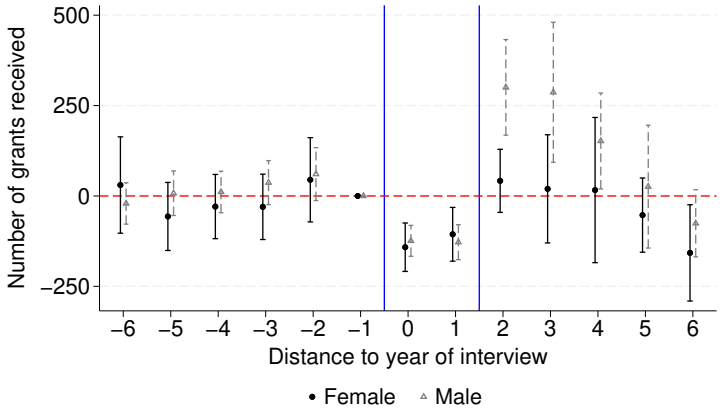


Figure A6 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the amount (unit: 1,000 yuan) of grant money the person wins in a given year. We show the estimates using the entire sample in Panel (a) and the estimates for male and female scientists in Panel (b). This figure presents a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level.

Figure A7. Effects on Promotion, Excluding Those who Changed Institution

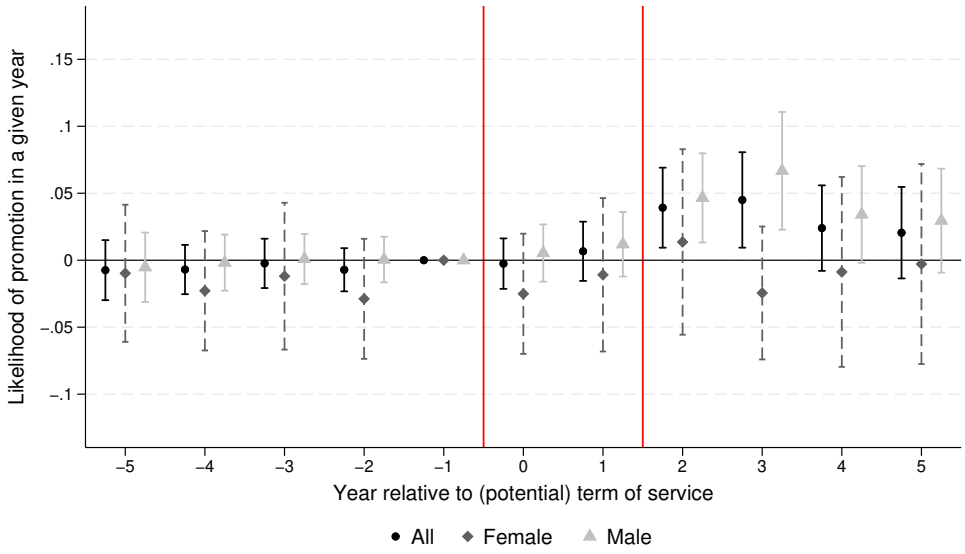


Figure A7 notes: this presents results analog to those in Figure 5, but generated with a sample that excluded those who changed institution after their period of (potential) service. We superimpose two vertical lines on the figure to delimit the period of two years in which a rotator candidate would serve at the NSFC were they to be selected. Standard errors are clustered at the rotator candidate level.

Figure A8. How Benefits Vary with Distance to Beijing: All Grants

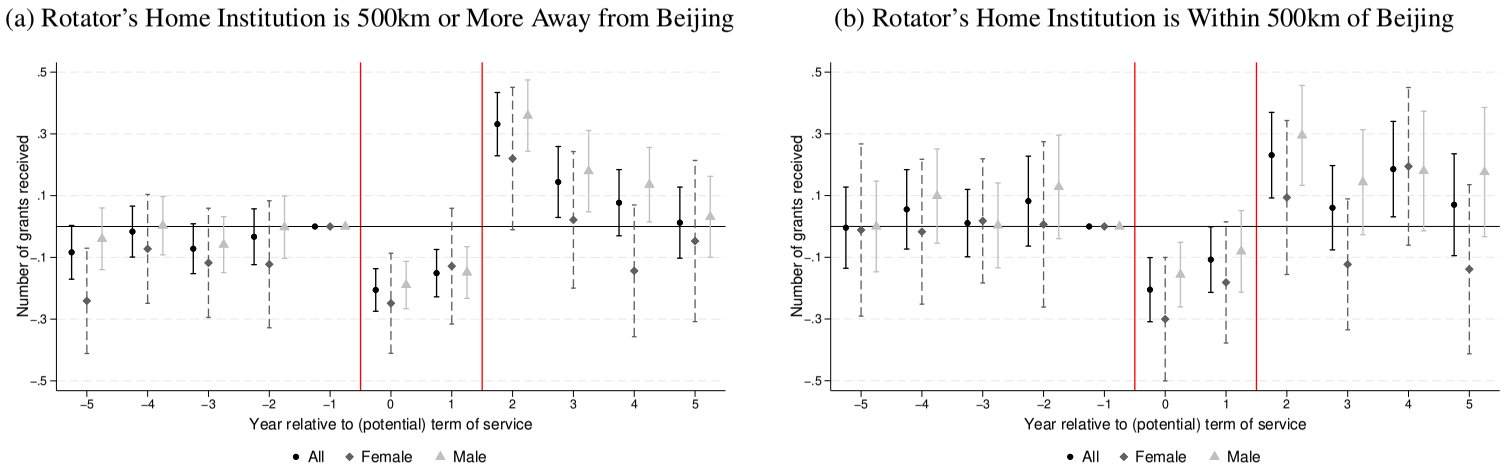


Figure A8 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the total number of grants the person receives in a given year. As indicated in the panel titles, the estimates in Panel (a) were generated using rotator candidates whose home institutions are located within 500 kilometers of Beijing, and those in Panel (b) were generated using rotator candidates whose home institutions are located more than 500 kilometers from Beijing. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. Our results are robust to dropping those candidates who later moved to other institutions, including those who became permanent NSFC employees.

Figure A9. Effects on Becoming an NSFC Panelist: Heterogeneity by Distance to Beijing

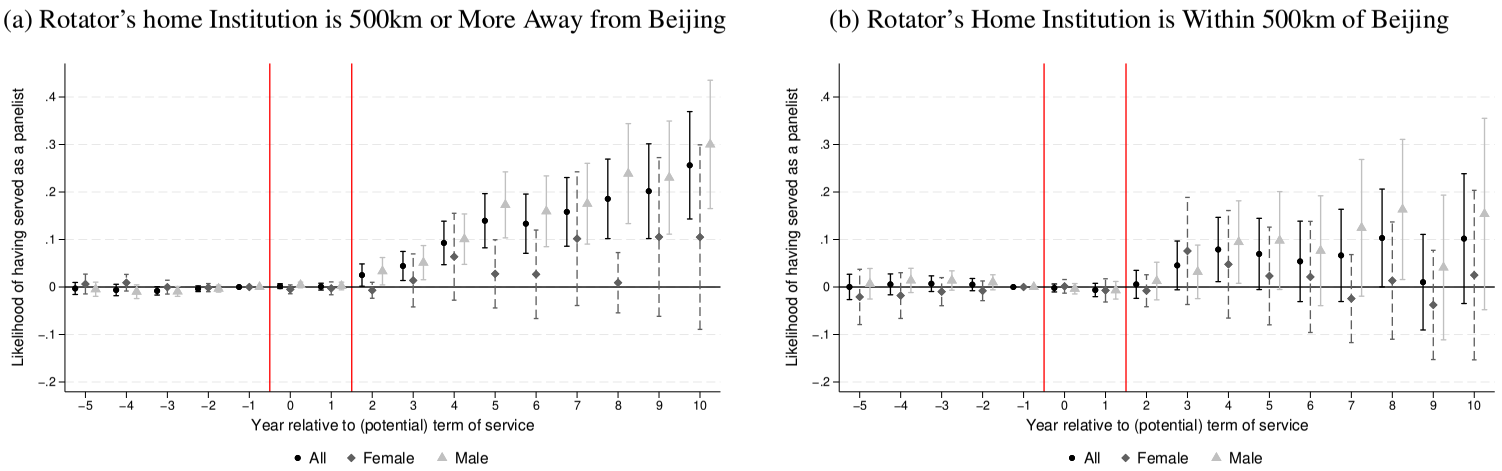


Figure A9 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is whether the person has been chosen to serve as an NSFC panelist (the senior role in grant assessment discussed in Section 2). As indicated in the panel titles, the estimates in Panel (a) were generated using rotator candidates whose home institutions are located 500 kilometers or more away from Beijing, and those in Panel (b) were generated using rotator candidates whose home institutions are located less than 500 kilometers from Beijing. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. Our results are robust to dropping those candidates who later moved to other institutions, including those who became permanent NSFC employees. We show a tabular analog to these results in Table A12, in which we estimate a significant benefit for males far away from Beijing that is statistically distinguishable from the (negative, insignificant estimate) for males from closer-by, and no significant effects for females.

Figure A10. Gender Composition of Field and Effects of Service on Special Grants

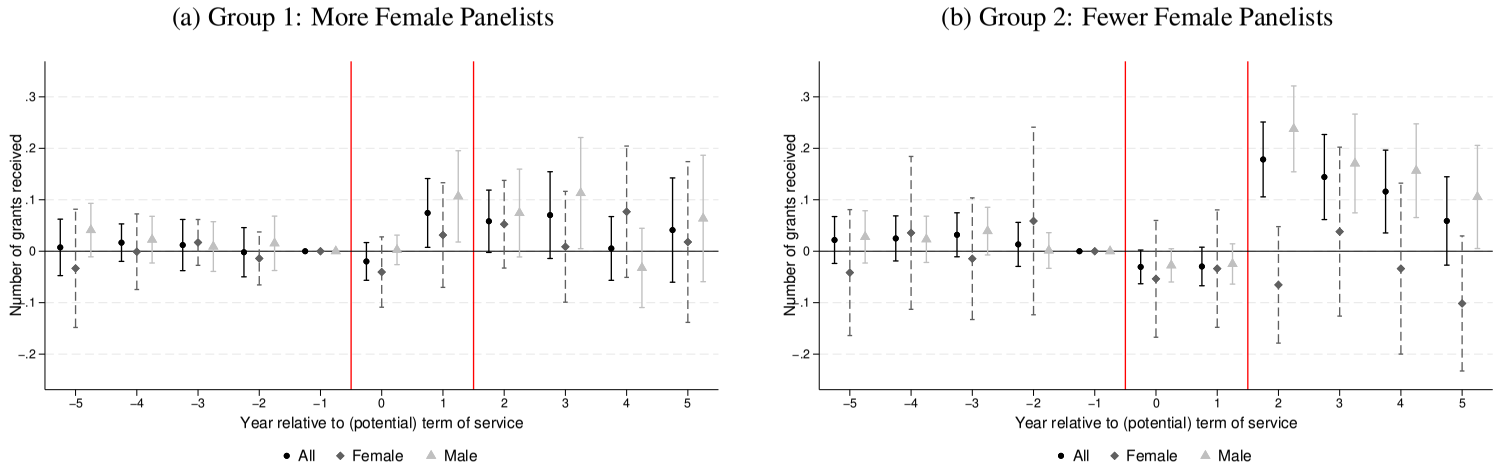


Figure A10 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the number of ordinary grants received by a person in a year. As indicated in the panel titles, the estimates in Panel (a) were generated using rotators from group 1 fields – the life and medical sciences – which have a greater proportion of senior panelists who are female. Those in Panel (b) were generated using rotator candidates from group 2 fields, which have a lower proportion of senior female panelists. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level.

Figure A11. Gender Composition of Field and Effects of Service on Ordinary Grants

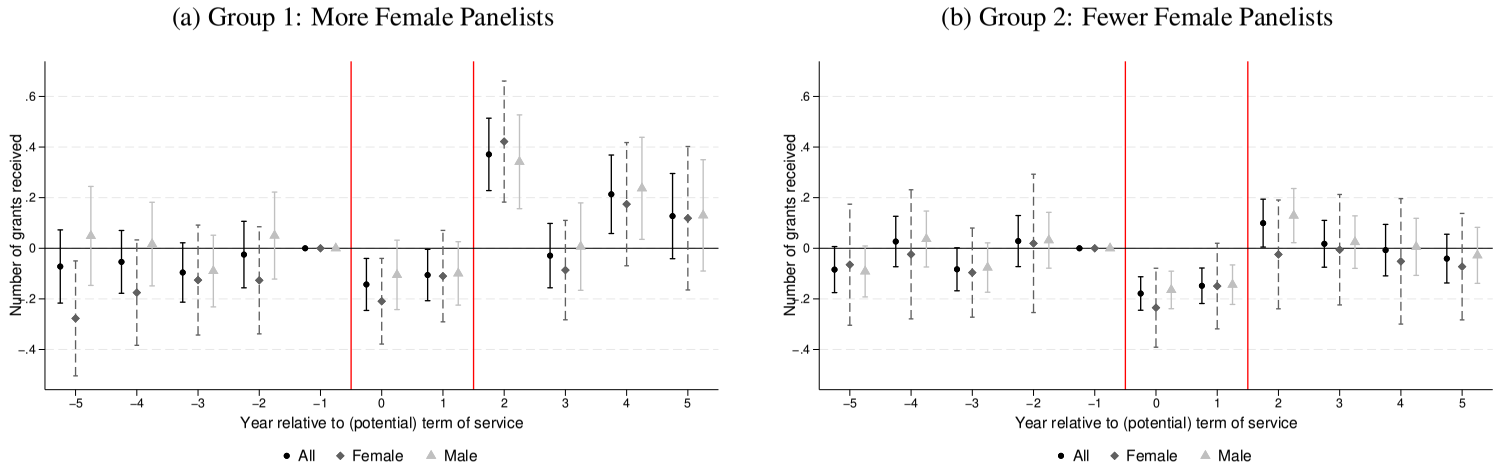


Figure A11 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the number of ordinary grants received by a person in a year. As indicated in the panel titles, the estimates in Panel (a) were generated using rotators from group 1 fields – the life and medical sciences – which have a greater proportion of senior panelists who are female. Those in Panel (b) were generated using rotator candidates from group 2 fields, which have a lower proportion of senior female panelists. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level.

Figure A12. Effects on Becoming an NSFC panelist: Heterogeneity by Gender Composition of Senior Panelists

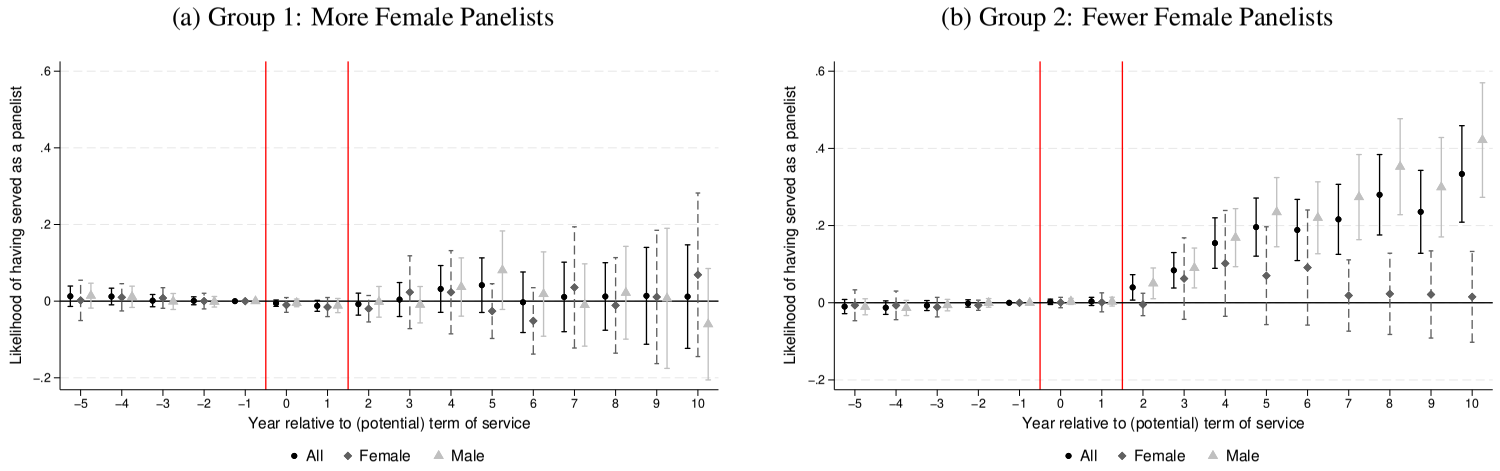
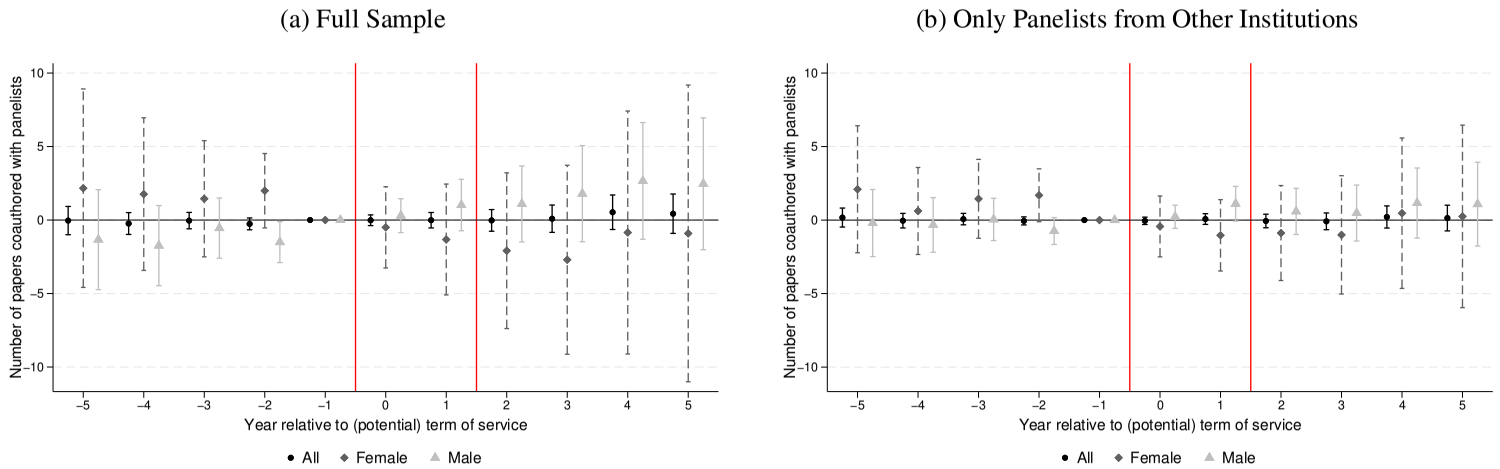


Figure A12 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is whether the person has been chosen to serve as an NSFC panelist (the senior role in grant assessment discussed in Section 2). As indicated in the panel titles, the estimates in Panel (a) were generated using rotators from group 1 fields – the life and medical sciences – which have a greater proportion of senior panelists who are female. Those in Panel (b) were generated using rotator candidates from group 2 fields, which have a lower proportion of senior female panelists. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level. Our results are robust to dropping those candidates who later moved to other institutions, including those who became permanent NSFC employees. We show the tabular analogue to these results in Table A16.

Figure A13. Coauthoring with Panelists



XXX

Figure A13 notes: this figure presents estimates of $\alpha_{1\#p}$ from Equation 1, along with 95 percent confidence intervals. The dependent variable is the number of papers published in a given year on which the person has coauthored with an NSFC panelist. In Panel (a) we show this for all panelists; in Panel (b) we restrict the variable to papers coauthored with panelists from institutions other than the person's own. These figures present a "stacked" event study, with the year negative one assigned to the year in which a given candidate attended their finalist interview for rotator service. We superimpose two vertical lines on the figure to delimit the two year period in which a rotator candidate would serve at the NSFC, were they to be selected. Standard errors are clustered at the rotator candidate level.

C Appendix Background

C.1 NSFC Funding

The National Natural Science Foundation of China (NSFC) was established in 1986 with the mission of supporting basic research and cultivating talented scientists in China. As China's largest funder of basic science research, it provides funding through a rigorous merit-based review system. Since its founding, the NSFC's budget has grown significantly, from approximately 10 million US dollars in 1986 to $5.47 billion in 2022. In recent years, it has become the world's largest producer of scientific research and also the world's largest funding agency in terms of applications received. For instance, in 2022, the NSFC received nearly 300,000 applications, more than three times that of the US National Science Foundation or National Institutes of Health (Yang, 2017; Cyranoski, 2019).

The NSFC's grant making activities can be divided into two broad categories. The first category, referred to as "ordinary" grants, comprises a general grant open to all scientists, an early career grant with an age limit, and a grant specifically for scientists from less-developed regions of China. The second category comprises higher-stakes "special" grants. These include the *excellent young scientist grant*, the *distinguished young scientist grant*, the *international (regional) joint research grant*, and other large grants such as the *key* and *major* grants. While ordinary grants account for the majority of approved NSFC grants, they confer a much smaller amount of funding and are less competitive than special grants, which play an important role in scientists' career advancement. Special grants are also widely perceived as requiring more extensive networking, in addition to scientific merit, to secure than ordinary grants (Shi and Rao, 2010). [27]

The NSFC solicits grant applications annually, following a set schedule each year, as illustrated in Figure A1 (see also Yao and Xiong 2017). The process begins with the NSFC issuing a call for proposals early in the year, with submissions due in March. After submission, NSFC officers conduct an initial screening of applications for completeness. Proposals that pass this initial screening are then evaluated through a correspondence review, which occurs in April and May. Those that successfully pass the correspondence review are further evaluated by expert panels. These experts, who are senior and influential scholars in the relevant fields, are invited by NSFC staff – many of whom are rotators. The panel review occurs in person during a series of agency-wide meetings, typically held in July or August, to make final decisions on grant approvals.

[27] In light of this, examining the impact of service on the likelihood of winning special grants – versus ordinary grants – can offer insights into the role of network shocks generated by rotator service.

C.2 Evidence on Rotators' Networking Benefits

We present two pieces of empirical evidence on how rotators may benefit from the networks established during their service.

First, we scrape and analyze text from two large online discussion forums frequently visited by Chinese scientists.[28] Using the key phrase "NSFC rotators" (*liudong xiangmu zhuren* in Chinese), we identified 107 relevant discussion threads. About half (56) of these threads mention that serving as an NSFC rotator allows individuals to form networks that benefit themselves or their colleagues. These discussions often suggest that rotators use their networks to acquire high-stakes special grants, such as the *excellent young scientist* grant or the *distinguished young scientist* grant, and to help colleagues at home institutions secure NSFC funding. Tables A18 and A19 provide examples of comments that illustrate these perceived links between networking opportunities and professional advancement.

Second, we analyze data on NSFC-sanctioned conferences aimed at facilitating communication among NSFC grant awardees. Many panelists and NSFC officers attend these conferences, making them key networking events. The data, collected from the NSFC's official website (`https://www.nsfc.gov.cn/`), include details on the sponsoring NSFC department, conference date, and host institution. We match this data to the identities of rotators from the host institution who were serving at or around the time of the conference. We focus on 37 conferences held outside Beijing from 2017 to 2021.[29] We find that 14 of the 37 conferences were hosted by rotators' home institutions, suggesting that rotators leverage their service to build connections with senior scientists. Notably, all but one of the rotator-hosted conferences was organized by a male rotator, even though women make up about one-quarter of rotators. This highlights that male rotators disproportionately benefit from the networking opportunities provided by their service.

[28] Xiaomuchong (`http://muchong.com/bbs/`) and the Shuimu community (`https://www.mysmth.net/nForum`).

[29] We focus on conferences outside Beijing because the NSFC, the Chinese Academy of Sciences, and many important universities are all based in Beijing. For rotators based in Beijing, traveling to another Beijing-based institution hosting a conference is relatively easy, reducing the networking opportunities these events provide. In contrast, conferences held outside Beijing are more likely to offer new networking opportunities for attendees from different institutions.

Table A18. Anecdotes from Online Discussion Fora: Set 1

Number	English	Chinese	Source
1	The funding committees are like emperors, whomever serves on them brings the favor of the emperor to their university, bringing lots of benefits, for example help in the grant assessment committee. After finishing, applying for grants becomes much more convenient, the person can contact those whom they served with regardless of the program in which they served. I know someone with a very mediocre publication record who won the outstanding young scholar award after three years of service – with more resources you can get more PhD students and post-docs, and the publications stack up fast – now this person has several hundred publications.	基金委就像皇帝，翻牌子来决定借调哪个学校的人，能被借调的学校倍感皇恩浩荡。到了皇帝身边，可以为婆家说好话，谋利益，比如各种本子函评会评都会有好处。皇帝宠幸结束会婆家，自己申请项目也方便，给基金委的前同事打个招呼，什么项目大差不差都能中。我知道一个三本毕业没什么干货甚至没几篇论文的给基金委宠幸三年回头上了杰青。资源多了以后多找博士博士后，很快论文就摞起来了，现在论文几百篇。	https://exp.newsmth.net/topic/1cdea01ba1768f8221c5eebaa5a1422c/1
2	If your friend goes to serve as a rotator, give him a ring and have him help you fix [your grant application's status].	你的本子要能上会，他打个招呼就给你搞定了。	https://www.mysmth.net/nForum/#!article/QingJiao/599679
3	We had two people who served as rotators, after which one of them won three big grants in the following four years, the other won grants three years in a row, for a total of four grants in five years. If you think there isn't something fishy in here, then you're fooling yourself.	我们这里两个人去基金委借调后，一个 4 年之内拿三个项目（分别是 2015、2016、2018），一个连续三年中奖，五年拿四个（分别是是 2014、2016、2017、2018）。你要说这里面没猫腻，那就见鬼了。	https://www.mysmth.net/nForum/#!article/QingJiao/599679

Table A18 notes: these anecdotes were collected from two large discussion forums for scientists in China: Xiaomuchong (http://muchong.com/bbs/) and Shuimu community (https://www.mysmth.net/nForum) as described in Section 3.

Table A19. Anecdotes from Online Discussion Fora: Set 2

Number	English	Chinese	Source
4	Yourself, your colleagues, and your friends – everyone gets some benefit [from your service].	自己和单位或熟人，在不同程度上都可受益吧。	http://muchong.com/t-3551062-1
5	This year there was someone who had served as a rotator and then won the outstanding early career scholar grant. You tell me whether there's a relationship?	今年有一个担任项目主任，上了杰青的。你说有没有意义？	http://muchong.com/t-3551062-1
6	Every year there are rotators from universities at the NSFC, this is really a great business and everyone knows it. After the two years of service, whichever school had it, their amount of grants is going to go up. These rotators also get tons of invitations to give talks and participate in scholarly exchanges, and everyone knows what the goal is.	基金委每年都在高校公开招聘"流动编制项目主任"，这确是好差事，大家心知肚明。此流动部主任一般任期 2 年，哪个学校有的话，据说当年申请基金数目上涨。他们也经常被很多学校邀请去作报告、进行交流。目的大家是懂的。	http://muchong.com/t-3444071-1-authorid-1073943
7	Service for the NSFC as rotators or on grant selection committees is extremely unfair. I think everyone knows what these people can do. Can't the NSFC just hire more employees? Do they really need to use rotators? Who are the rotators really serving? Is it everyone at their home institution? Is it the people in their field? Their institution's leaders? Everyone knows someone who's like this.	坚决避免从下面高校借调人员参与基金委送审、打包等工作。这是明显的不公平的地方，借调去的人能做什么我想大家心里都会有个预期。难道基金委就不能多招些工作人员吗？非得用这种方式？借调过去的人能为谁谋福利？是他所在的学校的人？是和他有竞争关系的同学科的人？是他的本单位的领导？等等，大家都会有自己认识的。	http://muchong.com/html/201505/8975199.html

Table A19 notes: these anecdotes were collected from two large discussion forums for scientists in China: Xiaomuchong (http://muchong.com/bbs/) and Shuimu community (https://www.mysmth.net/nForum) as described in Section 3.