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The Intergenerational Transmission of Gendered Visibility Gaps in Knowledge Work

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THE INTERGENERATIONAL TRANSMISSION OF GENDERED VISIBILITY GAPS IN KNOWLEDGE WORK

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THE INTERGENERATIONAL TRANSMISSION OF GENDERED VISIBILITY GAPS IN KNOWLEDGE WORK

Research Summary

This study examines whether gendered visibility gaps transmit across professional generations through mentorship. We argue that women mentors may provide developmental support equivalent to men mentors yet connect mentees to communities with more limited reach. Newcomers gain visibility through mentor-linked audiences, and these inherited audiences can shape the visibility of mentees' independent contributions over time. Studying mentor–mentee relationships in science, we find that mentees of women receive fewer citations than mentees of men for comparable work, including for work produced without the mentor. This gap is concentrated in the mentor-linked audience and is stronger when mentees collaborate frequently with mentors and remain close to the mentors' intellectual domain. The findings show how gendered visibility gaps propagate through mentorship via audience inheritance to the next generation.

Managerial Summary

Mentorship does more than provide training and support; it also shapes who sees newcomers' work. This study shows that newcomers may continue to rely on audiences associated with their mentors even after producing work independently, allowing inequalities in audience reach to transmit across professional generations. Using academic science as the empirical setting, we find that mentees of women receive less visibility for comparable work than mentees of men, not because their work appears weaker, but because it travels through narrower mentor-linked audiences. For organizations, the implication is not to avoid assigning women mentors. Rather, firms should complement mentorship with broader sponsorship, cross-unit exposure, and opportunities for newcomers to present high-quality work beyond the mentor's immediate circles.

Keywords: Visibility, Mentorship, Gender, Intergenerational Transmission, Audience Inheritance

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INTRODUCTION

At the intersection of two bodies of research lies an unresolved question. One shows that women's contributions receive less visibility than comparable contributions by men, particularly in knowledge-intensive settings where audiences rely on social cues under uncertainty (Kanter, 1977; Ridgeway, 1991; Correll & Ridgeway, 2006; Joshi, 2014; Sarsons et al., 2021). The other shows that mentors are central to how newcomers gain visibility by introducing them to relevant audiences, involving them in important projects, and vouching for their work before decision-makers (Kram, 1985; Allen et al., 2004; McDonald & Westphal, 2013). Together, these literatures raise a question that neither has addressed: what happens to newcomers' visibility when their mentor is a woman?

The answer is not obvious. Women mentors provide genuine developmental support, including training, guidance, and access to resources, and their mentees may benefit from these inputs regardless of mentor gender. Yet visibility, the process by which contributions enter the consideration set of relevant audiences, depends on social structure as well as quality. If women mentors are less visible in the broader field than comparable men mentors, they may introduce mentees into communities with more limited reach, even when their developmental support is equivalent. The question is whether this limitation travels: whether visibility constraints associated with women mentors carry over to work that mentees later produce on their own.

We argue that they do, through a process we call audience inheritance. Mentors introduce newcomers to relevant audiences from within communities shaped by their own position in the field. Because audiences operate under uncertainty and limited attention, they rely on existing associations to determine which contributions merit notice. These associations, linking a newcomer's work to particular people and communities, can persist after the mentor is no longer directly involved. Gendered visibility differences in one generation may therefore propagate to the next through the very relationships designed to help newcomers succeed.

This argument leads to three empirical questions. First, do contributions produced jointly with a mentor receive less visibility when the mentor is a woman rather than a man? Second, and more consequentially, does this gap persist for work that mentees produce without their mentor, after the direct link to the mentor has been severed? Third, when is this transmission strengthened or weakened?

These questions are consequential for strategy research because organizations depend on social systems that determine which contributions become visible to relevant audiences. Visibility matters for at least two reasons. First, only contributions that become visible can be incorporated into future work, developed further, or used as knowledge building blocks (Ocasio, 1997; Fleming & Sorenson, 2004). Second, when contributions remain unseen or unused, the people who produce them may become frustrated, disengage, or leave, depriving organizations of valuable talent.

Prior work shows that visibility is shaped by social position. Affiliations, network ties, and status influence whether actors and their work are noticed and built upon (Podolny, 1993; Stuart, Hoang, & Hybels, 1999; Washington & Zajac, 2005; Azoulay, Stuart, & Wang, 2014). Other work shows that early affiliations can have enduring consequences for future status trajectories (Milanov & Shepherd, 2013). Yet this research has focused on visibility advantages attached to focal actors, transferred through contemporaneous affiliations, or carried forward through an actor's own status trajectory. We extend this work by examining whether visibility gaps transmit across professional generations through mentorship. Our focus is not only whether an early tie affects a newcomer's subsequent position, but whether the mentor-linked audience itself is inherited and continues to shape which of the mentee's subsequent independent contributions become more or less visible.

We develop this argument by bringing together three literatures. Research on gender explains why visibility may be unequal: women's contributions are often less visible in

technical, scientific, and organizational domains, especially when audiences rely on social cues under uncertainty (Rossiter, 1993; Hoisl & Mariani, 2017; Lerchenmueller & Sorenson, 2018). Research on social relationships explains how visibility can travel across social ties, because associations shape which actors and contributions become salient under uncertainty and limited attention (Podolny, 1993; Reschke et al., 2018). Research on mentorship identifies a central relationship through which newcomers enter visibility structures in the first place (Kram, 1985; Reskin, 1979; Malmgren et al., 2010). Prior work in each literature addresses part of this process. We bring them together to examine whether gendered visibility gaps propagate from one professional generation to the next.

We test our arguments in the academic life sciences. This setting is well suited to studying the intergenerational transmission of visibility gaps because mentor–mentee relationships can be identified through a distinctly competitive early-career fellowship, contributions are observable as publications, and visibility can be traced through citation patterns over time (Merton, 1988; Azoulay et al., 2014; Azoulay et al., 2019). We compare the citation trajectories of mentees of women and men for work produced jointly with the mentor and for work produced without the mentor. The latter provides the critical test of transmission: whether visibility gaps associated with mentor gender persist once the mentor is absent from the contribution itself.

Our findings support the intergenerational transmission mechanism. Mentees of women receive fewer citations than mentees of men for comparable work, both for joint work with the mentor and, critically, for work produced independently. The independent-work gap is approximately 13% after accounting for publication, author-team, and topic-level characteristics, and it applies to both women and men mentees. Additional analyses show that the gap is concentrated in the mentor-linked audience, defined as scholars who previously cited the mentor’s work. The gap is also larger when mentees collaborate more frequently with their

mentors and when their independent research remains closer to the mentor's domain. Together, these patterns suggest that mentor gender shapes the audience structures through which mentees' work becomes visible and that gendered visibility gaps can be transmitted across generations through audience inheritance.

The paper makes three contributions. For strategy research on status, attention allocation, and visibility, we show that visibility advantages and disadvantages can propagate across professional generations through mentor-linked audiences. This extends prior work on affiliations, endorsements, and status spillovers by identifying audience inheritance as a distinct mechanism: mentors do not merely lend status, endorse newcomers, or affect their future position; they connect newcomers to audiences that continue to shape which later independent contributions are noticed and built upon. For research on gender gaps, we show that disadvantage can arise at the visibility stage, before contributions are evaluated, credited, or rewarded, and that it is not limited to women themselves but can also affect those connected to women through audience inheritance. This mechanism helps explain how gender gaps persist despite policies focused on individual women's development (Rossiter, 1993; Hoisl & Mariani, 2017; Sarsons et al., 2021). For the mentorship literature, we highlight the importance of visibility. Mentors not only develop mentees; they also shape the audience structures through which mentees' contributions become known and may transmit the visibility constraints of the communities in which they are embedded (Kram, 1985; Allen et al., 2004). Practically, these findings suggest that mentorship programs should attend not only to who mentors, but also to whether mentors provide access to audiences broad enough to make high-quality work visible.

THEORETICAL BACKGROUND

Visibility as a Social Process

Visibility is the process by which contributions enter the consideration set of relevant audiences (Ocasio, 1997; Podolny, 1993). Organizations depend on this process because the value created by individual contributions, such as ideas, discoveries, or solutions, is realized only when relevant audiences notice them and incorporate them into subsequent work and decisions. In knowledge-intensive settings, this process is especially consequential because organizations and knowledge communities, such as research and development (R&D) fields, generate more knowledge than audiences can fully evaluate. Research on organizational attention similarly argues that what decision makers do depends on which issues, actors, and solutions enter their focus in the first place (Ocasio, 1997). A contribution may therefore be valuable yet still have little consequence if it does not become visible to those positioned to use or build on it.

Visibility is related to quality, but distinct from it. Quality refers to the underlying value of a contribution; visibility refers to whether relevant audiences encounter it (e.g., Simcoe & Waguespack, 2011). Work that remains outside the consideration set cannot be evaluated or used, regardless of its quality. Visibility therefore precedes many outcomes through which knowledge work creates value, including resource allocation, collaboration, and recognition.

Visibility is socially structured because audiences operate under uncertainty about quality and limited attention. They rely on social cues to decide which contributions merit consideration. Status is one such cue: when quality is difficult to assess directly, audiences use status to infer which actors and outputs deserve consideration (Podolny, 1993). Affiliations and endorsements similarly direct audiences toward some actors and opportunities rather than others, as research on entrepreneurial ventures and high-status partners shows (Stuart et al., 1999). Early ties and status-conferring events can also have durable consequences for actors' subsequent status, legitimacy, and endorsement from others (Washington & Zajac, 2005;

Milanov & Shepherd, 2013; Azoulay et al., 2014; Reschke, Azoulay, & Stuart, 2018). Because these cues are social rather than intrinsic, visibility is not a property of a contribution alone. It is a relational property, i.e., a function of where the contribution is situated in a social structure, who is associated with it, and which audiences those associations bring within reach. Contributions with weaker associations to visible or high-status actors may therefore remain outside relevant audiences' consideration sets even when their intrinsic quality is comparable.

This social structure is especially important in knowledge work, where audiences routinely face more contributions than they can evaluate in depth. Managers cannot assess every employee idea; investors cannot evaluate every venture with equal care; and scientists cannot read and build on all potentially relevant publications. Across these settings, visibility depends not only on the contribution itself, but also on the social pathways through which it travels. Contributions linked to more visible actors or broader audiences are therefore more likely to enter subsequent knowledge-building and resource-allocation processes (Azoulay et al., 2014; Reschke et al., 2018; Wu, 2024). As a result, visibility can be unequally distributed even when underlying quality is equal.

Gendered Visibility

The social pathways through which contributions travel can be gendered. In organizational and market settings, women's ideas, expertise, and performance are often less likely than comparable contributions by men to be recognized, rewarded, or carried forward (Correll, 2004; Castilla & Benard, 2010; Joshi, 2014; Botelho & Abraham, 2017; Sarsons et al., 2021). The literature identifies a set of related but analytically distinct outcomes: whether expertise is recognized, whether performance is evaluated equivalently, whether credit is attributed, and whether contributions receive attention. This distinction is especially important in collaborative knowledge work, where individual contributions are often difficult to observe directly.

Large-scale archival evidence from science points in the same direction: women's publications receive fewer citations than comparable publications by men, making science a setting in which gendered differences in visibility can be traced systematically over time (Hoisl & Mariani, 2017; Lerchenmueller & Sorenson, 2018; Wu, 2024). Taken together, this literature shows that women's contributions often receive less attention, recognition, credit, or reward. Yet these outcomes are not always clearly distinguished. Visibility is analytically prior to recognition, evaluation, credit allocation, and reward: before a contribution can be assessed or acted upon, it must first enter the consideration set of relevant audiences.

A useful explanation for these gaps comes from research on gender and status. Gender can operate as a diffuse status characteristic: an attribute that shapes expectations about competence and contribution even when it is unrelated to actual ability or performance (Berger, Cohen & Zelditch, 1972; Ridgeway, 1991; Correll & Ridgeway, 2006). In performance settings where quality, expertise, or individual contribution is uncertain, audiences rely on such expectations to allocate attention and interpret evidence. This logic is visible in science and engineering teams, where actual expertise is often difficult to observe and gender can become a cue for identifying whose expertise is relevant (Joshi, 2014). This logic is also documented in market evaluation settings, where gender-based disadvantages are strongest when evaluators face higher search costs or greater uncertainty (Botelho & Abraham, 2017). Because gender carries widely shared cultural associations linking men with competence in many professional domains, women's contributions may be less likely to be noticed, circulated, or treated as worth following (Bian et al., 2017; Rivera & Tilcsik, 2019). This does not require overt bias or conscious discounting. Rather, gender can become one of the social cues through which audiences allocate visibility under uncertainty and limited attention.

This reasoning implies that gendered visibility gaps are embedded in the social structures through which knowledge work becomes known. Women may have less access to

influential networks, high-visibility assignments, and informal sponsorship channels that carry contributions beyond local work settings (Kanter, 1977; Ibarra, 1992; Seibert, Kraimer, & Liden, 2001; Joshi, 2014). Their contributions may also travel through audiences that are narrower, even when the underlying work is comparable. A gendered visibility gap therefore arises when contributions associated with women are less likely than comparable contributions associated with men to enter the consideration set of relevant audiences. Such a gap need not reflect lower quality, explicit rejection, or even a formed negative evaluation. It can emerge earlier, because contributions travel through different positions, relationships, and audiences. The implication is that gendered visibility gaps may shape not only whether women's own contributions are seen, but also the audience structures available to those connected to them.

Mentorship as a Visibility Relationship

The relational nature of visibility is especially consequential for newcomers. Newcomers often lack an independent audience. Their abilities are not yet widely known, their contributions have not accumulated a track record, and relevant audiences have limited information about the quality or relevance of their work. Even valuable contributions may therefore remain local if they do not reach audiences positioned to notice and use them.

Mentorship is one central relationship through which newcomers can address this visibility problem. Prior research has primarily conceptualized mentorship as developmental. Mentors provide advice, training, career guidance, and access to resources that help mentees develop skills and navigate professional systems (Kram, 1985; Scandura, 1992; Higgins & Kram, 2001; Allen et al., 2004). We build on this view by emphasizing mentorship as a visibility relationship. Mentors do not only help newcomers become more capable; they also help make newcomers and their contributions visible to relevant audiences.

More specifically, mentors can broker audience access. They involve mentees in visible projects, connect them to professional communities, and create opportunities for their work to

be seen by audiences that newcomers could not easily reach on their own. Senior managers may bring junior employees into important assignments, advisors may introduce founders to investors, and senior scientists may attach junior researchers' work to audiences that already follow the senior scholar's research. In each case, the mentor helps attach the newcomer's contribution to audiences and opportunity channels beyond the newcomer's independent reach (Reskin, 1979; Seibert, Kraimer, & Liden, 2001; McDonald & Westphal, 2013).

This visibility role is especially clear when mentors and mentees produce work together. Joint work attaches the newcomer's contribution to an established actor and makes the mentor–mentee association visible to relevant audiences. Audiences that follow the mentor may encounter the mentee's contribution because it travels through the mentor's projects, collaborators, outlets, or communities. The mentor thus supplies an audience channel through which the newcomer's work can become visible.

This audience-brokering function is bounded by the mentor's own position. Mentors introduce newcomers into the communities to which they are connected. A mentor embedded in an audience with greater reach can help a mentee become visible to that audience. A mentor embedded in a narrower audience can provide equally valuable developmental support, but the audience reach available to the mentee will be limited. Visibility transfer therefore depends not only on mentoring quality, but also on the reach of the audience the mentee inherits.

This logic connects mentorship to research on affiliations, status, and early relationships, but highlights a distinct mechanism. Prior work shows that affiliations and endorsements shape how actors are noticed and how opportunities unfold (Stuart et al., 1999), and that early relationships can have durable consequences for actors' later status trajectories (Milanov & Shepherd, 2013). Our focus is not only that an early tie affects the newcomer's later position, but that the mentor-linked audience itself can become a durable channel through which subsequent work is more or less likely to be seen.

Mentorship therefore provides a mechanism through which visibility can travel across professional generations: *audience inheritance*. Earlier mentor associations can continue to shape which audiences encounter a mentee's later contributions, even after the mentor is no longer directly involved. Because this visibility function depends on the mentor's own audience reach, mentorship can transmit not only visibility advantages but also visibility constraints.

Intergenerational Transmission of Gendered Visibility Gaps

The preceding arguments suggest that mentorship can transmit visibility gaps across professional generations. Visibility depends on the audiences through which contributions travel, and mentorship is one central relationship through which newcomers enter such audiences. If women and men mentors are embedded in audiences that differ in reach, then the visibility available to their mentees may differ as well. This logic does not imply that women mentors provide weaker training or that their mentees produce lower-quality work. The developmental support mentors provide may be equivalent across mentor gender. The difference lies in the audience structures through which mentees' contributions become visible. When mentors introduce newcomers to audiences, they do so from within their own communities. If women mentors are connected to narrower audiences than comparable men mentors, then their mentees may enter visibility structures with less reach.

The most immediate implication concerns work produced jointly by mentors and mentees. In joint work, the mentor is directly attached to the contribution, and the mentor–mentee association is visible to audiences. The contribution is therefore likely to travel through audiences that already follow, cite, or otherwise attend to the mentor's work. If women mentors are embedded in narrower audience structures than comparable men mentors, then contributions produced with women mentors should receive less visibility than comparable contributions produced with men mentors. This leads us to our baseline hypothesis:

Hypothesis 1. *Contributions produced jointly by mentees and women mentors receive less visibility than comparable contributions produced jointly by mentees and men mentors.*

This baseline gap is necessary but not sufficient to establish intergenerational transmission. If the gap appeared only in joint work, it could reflect the mentor's direct attachment to the focal contribution or the circulation of that contribution through the mentor's immediate community. Such a pattern would not yet show that visibility gaps travel across professional generations.

The critical test is whether the gap persists when mentees produce work without their mentors. If mentor gender mattered only because of this direct attachment, the gap should disappear once the mentor is no longer directly attached to the contribution. If, however, mentorship shapes where newcomers first become visible, which audiences begin to follow their work, and which communities later encounter their independent contributions, then independent work may continue to travel through audience structures initially formed around the mentor. Persistence of the gap in independent work would therefore distinguish the intergenerational transmission argument from a simpler collaboration effect. This leads to our second hypothesis:

Hypothesis 2. *Independent contributions by mentees of women mentors receive less visibility than comparable independent contributions by mentees of men mentors.*

The strength of this transmission should depend on how closely mentees remain connected to their mentors' communities. Such closeness can be relational or intellectual. Relational closeness arises through repeated collaboration (e.g., Li et al., 2019), which reinforces the mentor–mentee association and makes it more likely that the mentee's later work continues to reach mentor-linked audiences. Intellectual closeness arises when mentees

continue to work within the mentor's domain of expertise, making even independent contributions relevant to audiences familiar with the mentor's work (e.g., Stuart et al., 1999).

When mentees collaborate less frequently with their mentors or move into more distant domains, their work is more likely to reach audiences that are less tied to the mentor. Under these conditions, mentor-linked visibility should matter less. The gendered visibility gap should therefore be strongest when mentees remain close to their mentors, because the mentor's community constitutes a larger share of the audience the mentee can realistically reach:

Hypothesis 3. *The negative relationship between having a woman mentor and the visibility of mentees' independent contributions is stronger when mentees remain more closely connected to their mentors, either relationally through more frequent collaboration or intellectually through independent work that is closer to the mentor's area of expertise.*

EMPIRICAL STUDY

Empirical Setting

We test our arguments in the context of formal mentorship relationships in the academic life sciences. This setting is well suited to studying the intergenerational transmission of visibility gaps because it allows us to observe three elements that are difficult to observe jointly in many organizational settings: mentor–mentee relationships, the contributions mentees produce, and the audiences that later engage with these contributions.

More specifically, we leverage the F32 program funded by the U.S. National Institutes of Health (NIH). F32 fellowships are nationally competitive awards from the world's largest public funder of biomedical research and provide up to three years of mentored support for early-career scientists. The program requires a mentor who helps define the research agenda and provides resources, scientific training, and access to relevant intellectual communities. This setting maps closely onto our theoretical argument. F32 fellows are newcomers who have

not yet accumulated independent visibility, and their early work is shaped by mentors who also connect them to audiences in which their work can become visible.

The nature of the F32 program further shifts the empirical comparison away from differences in mentee and mentor quality. The highly competitive selection process reduces, though does not eliminate, concerns that mentor gender mainly captures differences in mentee quality or developmental support provided by mentors[1]. The F32 setting thus allows us to study whether, among high-quality mentees working with capable mentors, visibility differs through the audience structures their mentors make available.

A strength of the science setting more generally is that visibility can be observed through citations. We use citations as a measure of visibility because a later author can cite a focal publication only if that publication has entered the author's consideration set (Sorenson & Fleming, 2004; Ross et al., 2022). Citations are not, however, a pure measure of visibility. They also reflect a decision to acknowledge a contribution as relevant, useful, or appropriate to cite (Merton, 1988; Tekles, Auspurg, & Bornmann, 2022). We therefore interpret citations as lying on a continuum: at one end, they are observable traces that a contribution became visible to a later audience; at the other, they may reflect stronger forms of valuation, recognition, or knowledge diffusion. Our empirical use of citations relies on the more conservative interpretation that requires fewer assumptions: that a cited contribution had become visible enough to be considered.

Our detailed forward-citation data allow us to move empirically along this continuum. We observe not only how often a focal publication is cited, but also who cites it and whether each citer has cited the focal publication before. First-time citations sit closer to the visibility end of the continuum because they mark the point at which the contribution enters a new audience's consideration set. Repeated citations sit closer to the valuation end because

[1] Our matching procedure and selection analyses support this comparability (see Appendices B and C1).

awareness has already been established and the citer decides whether to cite the contribution again. If the mentor-gender gap is concentrated among first-time citers and weakens among repeated citers, the pattern is more consistent with unequal visibility than with unequal valuation. A valuation interpretation would instead require the gap to persist among audiences that have already demonstrated awareness of the focal contribution.

The citation-level data also allow us to test audience inheritance directly. We identify whether citers previously cited the mentor and use this information to construct time-varying mentor-linked audiences. This allows us to compare citations from audiences connected to the mentor with citations from audiences outside the mentor-linked audience. If mentorship transmits visibility through inherited audiences, the gap should be concentrated among audiences connected to the mentor rather than appearing uniformly across all citers.

Sample Construction

To construct the sample, we combine data from PubMed, Clarivate's Journal Citation Reports, Scopus, iCite, genderize.io, Author-ity, and NIH ExPORTER. These sources allow us to identify F32 fellows, link them to mentors, collect publication records, assign author gender (see Appendix A), disambiguate authors, measure citations, and follow F32 recipients' publications over time. Figure 1 summarizes the research design, sample construction and main data sources.

Insert Figure 1 about here

The F32 fellowship requires a sponsoring mentor, and NIH grant acknowledgments link F32 awards to resulting publications. Following life-science authorship norms, we identify the mentor as the last author on the first publication acknowledging the F32 grant. We begin with F32 recipients who published at least one article acknowledging the grant and reconstruct their publication histories. We focus on original research articles, excluding reviews, editorials,

and other publication types for which visibility may reflect different selection and audience processes. To focus on early-career mentorship and comparable observation windows, we also exclude fellows with unusually long pre-grant publication histories; papers published before the grant; papers with unusually large author teams; papers published more than ten years after the grant; and papers on which the mentor appears as a coauthor but not in the senior last-author position. The resulting sample comprises 24,438 articles by 2,975 F32 recipients, including 666 recipients mentored by women and 2,309 mentored by men.

Our empirical design compares mentees of women and men mentors whose mentors are similar in training capacity, scientific track record, and research resources, while allowing their audience structures to differ. Because mentors and mentees are not randomly paired, we match on mentor characteristics measured at the time of the grant: prior productivity, the share of publications in high-impact journals, and prior NIH R01 grants. We also match on F32 recipient gender and grant-year period. These variables align with the evaluation criteria used to score F32 applications. Appendix B provides further details on the F32 setting, mentor identification, manual validation of mentor–mentee ties, and matching variables. After matching, neither mentor characteristics, F32 characteristics, nor their combination jointly predict mentor gender (Appendix C1). Appendix C2 examines predictors of inclusion in the final matched sample. Together, the post-matching balance tests support comparability by mentor gender, and the inclusion analysis reduces concerns that selection into the final matched sample is driven by quality-related differences. One remaining difference is that F32 recipients mentored by women had published more papers before the grant, which we control for in all analyses. The matched sample contains 22,222 articles by 2,738 F32 recipients, including 663 recipients mentored by women and 2,075 mentored by men.

Variables and Descriptive Statistics

The analysis is at the publication level, the contributions through which mentees' work becomes visible. Table 1 reports definitions and descriptive statistics for the key variables in the full sample. We also report a correlation matrix in Appendix D. Pairwise correlations and variance inflation factors indicate that multicollinearity is not a concern.

Insert Table 1 about here

The dependent variable is the number of forward citations a publication receives. Citation counts are measured as of 2021, and all models include publication-year fixed effects to account for differences in citation windows. On average, publications in our sample receive 81 citations, with substantial variation across publications.

Our main independent variable is woman mentor, an indicator equal to one if the focal F32 recipient was mentored by a woman and zero otherwise. Approximately one fifth of the publications in our dataset are produced by mentees of women.

To examine whether mentor-linked visibility gaps vary with the closeness of the mentor –mentee relationship, we use two moderator variables. The first is collaboration frequency, measured as the number of publications coauthored by the mentor and mentee within the first five years after receipt of the F32 grant. In models with this variable, we also control for the mentee's total number of publications during the same period to separate collaboration with the mentor from overall productivity.

The second moderator is research proximity, which captures how closely a focal mentee publication relates to the mentor's prior research. We measure proximity using Medical Subject Headings (MeSH), externally assigned keywords that describe the content of publications indexed in PubMed (see Appendix E). Specifically, research proximity is the share of MeSH terms on the focal mentee publication that also appeared on the mentor's prior publications.

We include controls for characteristics of the F32 recipient, the mentor, and the focal publication. At the F32-recipient level, we control for the F32 recipient's gender, pre-grant

publication record, pre-grant share of publications in high-impact journals, number of publications after the grant, publications in the year prior to the focal publication, the research infrastructure of the host institution, whether the F32 grant was extended, and grant cohort. These variables account for observable differences in mentee background, productivity, institutional context, and career timing. At the mentor level, we control for the same characteristics used for matching. These variables capture differences in mentors' research experience, seniority, and resource base that may shape how they train mentees, support their projects, and provide research skills and infrastructure. They therefore help account for alternative pathways through which mentor characteristics could influence the quality or production conditions of mentees' work.

At the publication level, we control for author team size, the share of women coauthors, journal impact factor, and publication year. In analyses of mentees' independent publications, we also control for last author gender. These controls allow us to account for differences in the focal publication's author team, outlet, and timing, and to distinguish visibility differences associated with mentor gender from those associated with article and coauthor characteristics.

We further include two controls that capture the content and potential topic-level audience of each publication. First, we construct an expected citations percentile based on the MeSH terms assigned to each article. This variable captures how many citations publications with similar content and publication year typically receive. Second, we construct a risk set of citers, which captures the size of the audience working on similar content in the years following publication. Together, these variables account for topic-based differences in citation potential and audience size. They help ensure that estimated visibility differences are not driven by mentees of women and men working on systematically different topics. Appendix E provides further details on the construction of these variables.

Together, these controls provide a conservative test of visibility transmission. Some of them may partly absorb the process we theorize: highly visible mentors may have better access to high-impact journals or resources that help mentees publish stronger and more visible work. We nevertheless include these controls to rule out the alternative explanation that citation differences reflect differences in mentees' research quality, resources, or production conditions rather than mentor-linked visibility inheritance. In robustness checks, we also estimate models with fewer controls to assess the sensitivity of our results to these controls.

RESULTS

To formally test our hypotheses, we estimate negative binomial regression models since the dependent variable, forward citations, is an overdispersed count variable. Appendix F compares negative binomial and Poisson specifications and confirms that the negative binomial model better fits the data. For transparency, we report results for both the full and matched samples. We present incidence rate ratios, where values below one indicate negative effects. Standard errors are clustered at the mentor level.

Hypothesis 1 predicts that contributions produced jointly by mentees and women mentors receive less visibility than comparable contributions produced jointly by mentees and men mentors. We test this prediction on publications where the mentor appears as the last author. These publications capture the setting in which the mentor is directly attached to the focal contribution and the relationship between mentor and mentee is directly observable.

The results presented in Models 1 and 2 of Table 2 support Hypothesis 1. Publications produced with women mentors as last author receive fewer citations than comparable publications produced with men mentors. The estimated visibility gap is 7.2 percent in the full sample and 8.4 percent in the matched sample. The persistence of the discount in the matched sample suggests that it is not explained by observable differences in mentor or mentee capacity.

This finding indicates that when the mentor is directly part of the focal contribution, work produced with women mentors becomes less visible than comparable work produced with men mentors.

Insert Table 2 about here

Hypothesis 2 predicts that this visibility gap extends to work mentees produce without their mentors. We test this prediction on independent publications, where the mentor does not appear as a coauthor. Appendix G shows the timing of these publications. By five years after grant receipt, most publications are produced without the mentor, indicating that independent work becomes the dominant form of output relatively early in mentees' careers. This makes independent publications the key test of intergenerational transmission.

The results reported in Models 3 and 4 of Table 2 support Hypothesis 2. Independent publications by mentees of women receive fewer citations than independent publications by mentees of men. The estimated gap is 12.7 percent in the full sample and 12.9 percent in the matched sample. This effect is estimated after accounting for characteristics of the publication, the mentee, the mentor, and the author team, including the gender of the last author on independent publications. The persistence of the gap for independent work suggests that mentor gender continues to shape the visibility of mentees' work beyond direct collaboration. Although the point estimate is larger for independent than for co-authored publications, post-estimation tests indicate that these effect sizes are not statistically distinguishable and should therefore not be overinterpreted.

Hypothesis 3 predicts that this visibility gap for independent work is stronger when the mentee remains more closely connected to the mentor. We examine two forms of closeness: collaboration frequency and research proximity. Collaboration frequency captures how often the mentor and mentee coauthored in the first five years after the F32 grant. Research proximity captures how closely the focal publication overlaps with the mentor's prior research domain.

The interaction models (reported in Appendix H and depicted as marginal effects in Figure 2) support both moderation effects. The visibility gap between mentees of women and mentees of men increases with the frequency of prior collaboration. It is also larger when the mentee's independent work remains closer to the mentor's research domain. Both patterns point to conditions under which the mentee's work is more likely to remain relevant to the audience inherited from the mentor.

Insert Figure 2 about here

Taken together, the hypothesis tests show a consistent pattern. Mentees of women receive less visibility than comparable mentees of men, both when producing work with the mentor and when producing work independently. The gap is stronger when mentees remain closely tied to their mentors through repeated collaboration or related research content. These findings are consistent with the argument that visibility gaps can transmit through mentorship.

Visibility Transmission through Audience Inheritance

We next examine the audience inheritance mechanism. If mentorship transmits visibility gaps through inherited audiences, the citation gap should be concentrated among scholars connected to the mentor rather than appearing uniformly across all citers.

We begin by examining mentors' own visibility, measured by the size of their audience: the number of unique authors who cite their work. Figure 3A shows that women mentors have smaller audiences than men mentors. After controlling for publication year, grant year, and the length of the mentor's publishing career, women mentors' audiences are roughly 20% smaller. This difference establishes a key condition for transmission: women mentors are connected to more limited audiences through which their mentees' work can later become visible.

Insert Figure 3 about here

We then examine whether this audience difference carries over to mentees' independent work. We define the mentor's audience as scholars who cited the mentor before citing a focal publication by the mentee and distinguish citations to the mentee's work from this inherited audience from citations by scholars outside it. The results in Figure 3B show that the citation gap is concentrated in the inherited audience. Mentees of women receive about 16.5% fewer citations from their mentors' prior audiences than comparable mentees of men, whereas citations from outside mentors' audiences accrue at roughly the same rate.

This contrast is important because citers outside the mentor's audience have no observed prior citation link to the mentor and are therefore less likely to encounter the mentee's work through the mentor-linked visibility structure. Their similar citation behavior suggests that the underlying work by mentees of women is not generally less likely to attract citations. If the gap were driven by differences in the quality, relevance, or citation potential of the work itself, we would expect it to appear among these outside citers as well. Instead, the discount appears only where the mentor-linked audience structure should matter. Table 3, Models 1 and 2 report the corresponding regression results.

Insert Table 3 about here

Model 3 provides a complementary test by interacting mentor gender with the share of citations a mentee publication receives from the mentor's audience. The overall citation discount for mentees of women increases as their work depends more heavily on the inherited mentor audience. Figure 4 further links this audience dependence to the closeness of the mentor –mentee relationship. Mentees draw a larger share of citations from the mentor's audience when they have collaborated more frequently with the mentor and when their work remains closer to the mentor's research domain. These are also the conditions under which the visibility gap associated with mentor gender becomes stronger.

Insert Figure 4 about here

Together, these patterns support the proposed audience inheritance mechanism. The transmitted visibility gap is not a general penalty attached to mentees of women or their work. It arises through the audience structures that mentorship creates and sustains: women mentors are connected to smaller audiences, mentees continue to rely on these inherited audiences, and the citation discount grows when mentees' work remains more closely tied to them.

Transmission of Visibility or Valuation?

The preceding analyses support a visibility mechanism: mentees of women receive fewer citations because their work travels through more limited mentor-linked audiences. However, citations are not a pure measure of visibility. They may also reflect valuation. An alternative explanation is therefore that the work of mentees of women is equally visible but evaluated less favorably once seen. In this account, potential citers may be aware of the focal work but consciously decide not to cite it because they associate lower quality with work linked to women mentors, or because they hold broader biases against women and their affiliates. Such a mechanism would imply a valuation problem rather than a visibility problem.

We examine this possibility by asking whether the gap persists among audiences that have already shown awareness of the focal publication. We distinguish between first-time and repeated citers of a focal mentee publication. First-time citations are not pure visibility: they also reflect a citer's decision that the work is worth citing. But they sit closer to the visibility end of the continuum because they mark the first observed point at which the focal publication enters a citer's attention set. Repeated citers, by contrast, are author teams in which at least one author has previously cited the focal paper. These authors have already demonstrated awareness of the work. If the citation gap reflected persistent lower valuation conditional on awareness, we would expect the gap to remain among repeated citers.

Table 4 reports this analysis. Model 1 shows an 11.1% citation discount for independent work by mentees of women relative to comparable work by mentees of men among first-time citers. Model 2, by contrast, shows no gap among repeated citers once we control for the number of first-time citers. This pattern suggests that the gap is not driven by continued discounting among audiences that have already shown awareness of the work. Instead, the gap is concentrated where papers first enter new citers' attention sets.

Insert Table 4 about here

This does not imply that gender bias in valuation is irrelevant. Gendered valuation may contribute to women mentors having narrower audiences to begin with. Our claim is more specific: valuation differences do not appear to explain the transmission of visibility to mentees' independent work. Once audiences have already revealed awareness of a focal paper, they do not cite work by mentees of women at lower rates.

Additional Alternative Explanations and Robustness Checks

We conduct several additional analyses to rule out other alternative explanations. First, we examine whether the results are driven by self-citations, since mentees of women may receive fewer citations if they cite their own work less often. Re-estimating our main models after excluding self-citations, we find that the visibility gap remains, indicating that differences in self-citation behavior do not explain our results (Appendix I1).

Second, we assess whether the gap is explained by the visibility of later author teams. Mentees of women may collaborate with different types of coauthors, including senior coauthors who themselves attract fewer citations. Our main analyses already account for author team size and gender composition as well as last author gender. In additional analyses, we also control for other characteristics of the last author on independent publications. The results

remain consistent, suggesting that the visibility gap is not simply due to mentees of women publishing with less visible senior coauthors (see Appendices I2 and I3).

Third, we examine whether the effect differs by mentee gender. If the citation gap reflected a direct penalty against women mentees, it should be concentrated among women F32 recipients. Instead, the gap applies to both women and men mentees. This pattern is consistent with our argument that transmission operates through the mentor-linked audience rather than through the mentee's own gender (see Appendix I4).

Fourth, we implement a placebo mentor test. We identify senior coauthors early in the mentee's career who are not the formal F32 mentor and repeat the analysis using the gender of this placebo mentor. If the results reflected association with senior coauthors in general, the placebo mentor should produce a similar pattern. It does not (see Appendix I5).

We also conduct several robustness checks. First, to address unequal citation accrual periods, we re-estimate the main models using citations accumulated within ten years after publication; the results remain consistent, indicating that the visibility gap is not driven by differences in citation windows (Appendix J1). Second, to assess sensitivity to gender-classification error, we report the share of unclassified and low-confidence name-based gender assignments and re-estimate the models after excluding these observations; the results remain substantively unchanged (Appendix J2). Finally, we re-estimate the main models without journal impact factor, expected citations, and risk-set controls, which may partly absorb the broader visibility process but provide conservative comparisons across publications with similar outlet visibility, topic-level citation potential, and audience size. The estimates remain similar, suggesting that the main finding is not driven by these controls (Appendix J3).

Together, these analyses indicate that the visibility gap is not explained by self-citations, later coauthor structures, mentee gender, generic senior-coauthor associations, gender-classification error, citation-window choices, or the conservative analytical structure.

DISCUSSION

This study examines whether gendered visibility gaps in knowledge work can transmit across professional generations through mentorship. We argue that newcomers become visible through audiences associated with their mentors and that these audience structures can shape which later contributions enter subsequent knowledge-building activity. We refer to this mechanism as audience inheritance. Our findings are consistent with this mechanism. Mentees of women receive fewer citations than comparable mentees of men, including for work produced without the mentor. The gap is stronger when mentees collaborate more frequently with their mentors and when their work remains closer to the mentor's research domain. Most importantly, the gap is concentrated in the mentor-linked audience: mentees of women receive fewer citations from scholars connected to their mentors, while we find no comparable gap outside that audience. Additional analyses distinguishing first-time from repeated citers further suggest that the gap arises at the point of visibility, rather than from persistent valuation differences among audiences already aware of the work.

The central implication is that gendered visibility gaps are not only disadvantages attached to focal women. They can travel through mentorship relationships. This matters because knowledge-intensive work is organized around social systems that determine which contributions become visible to relevant audiences. Contributions become consequential only when they reach audiences that can notice, use, cite, promote, or otherwise build on them. Mentorship is one of the earliest and most important ways through which newcomers enter these systems. Our findings show that this pathway can transmit unequal visibility even when mentees produce comparable work. The mechanism is not that women mentors train weaker mentees or that their mentees produce lower-quality contributions. Rather, mentor gender is associated with differences in the audiences through which mentees' work becomes visible.

Our study contributes to strategy research on visibility, status, and social position. Prior work shows that audiences use status, affiliations, network positions, and early ties to decide which actors and contributions merit attention under uncertainty and limited attention (Podolny, 1993; Stuart et al., 1999; Washington & Zajac, 2005; Milanov & Shepherd, 2013; Azoulay et al., 2014; Reschke et al., 2018). This work has primarily examined status-related advantages attached to focal actors, spillovers among contemporaneous actors, or early relationships that shape the focal actor's subsequent trajectory. We extend this literature by identifying audience inheritance as a mechanism. Developmental ties do not merely affect where newcomers begin or how their own status evolves; they can transmit audience structures across professional generations, shaping which later independent contributions become visible.

This audience-inheritance perspective is related to, but distinct from, classic status and valuation arguments. Much of the literature on evaluation under uncertainty emphasizes that audiences use status cues to infer quality when direct assessment is difficult (Podolny, 1993; Rao, 1994; Simcoe & Waguespack, 2011). In this view, lower-status actors or their work may be evaluated less favorably. Our argument begins one step earlier. Before audiences can value a contribution, the contribution must enter their consideration set. This distinction matters because visibility and valuation are often bundled in outcomes such as citations, awards, promotions, and market uptake. A citation can reflect awareness, usefulness, judgment, social signaling, field norms, or strategic referencing. Recent work in bibliometrics and science studies similarly cautions that citations combine several processes, including visibility, reading, influence, and evaluation (Aksnes et al., 2019; Teplitskiy et al., 2022). We locate the mentor-gender gap on this continuum and show that the pattern is most consistent with visibility and the intergenerational transmission of audience reach.

This does not imply that valuation is unimportant. A large body of research shows that gender can shape how work is judged once it is seen. Studies of hiring, promotions, credit

allocation, peer evaluation, and scientific recognition document gendered double standards and biased assessments under uncertainty (Correll, 2004; Botelho & Abraham, 2017; Lerchenmueller & Sorenson, 2018; Sarsons et al., 2021). Related work on the Matilda effect and the downstream use of scientific ideas shows that women's contributions may receive less recognition or be translated less readily into subsequent technological and scientific impact (Rossiter, 1993; Lincoln et al., 2012; Larivière et al., 2013; Hofstra et al., 2020; Bikard et al., 2025). We see our work as complementary to this literature rather than as a competing account. Gendered valuation may help explain why women mentors have narrower audiences to begin with and may operate at other stages of knowledge production, including publication, hiring, funding, award allocation, authorship attribution, or technology transfer. Our more specific claim is that the transmission of lower visibility to mentees' independent work is not primarily explained by a direct discount applied to the mentees' work once it is seen. The absence of a comparable gap among repeated citers suggests that, in our setting, the key transmission mechanism lies closer to visibility.

Our study further contributes to mentorship research by conceptualizing mentorship as an audience relationship. Prior work has emphasized the developmental benefits of mentorship: training, advice, psychosocial support, resources, sponsorship, career guidance, and access to developmental networks (Kram, 1985; Higgins & Kram, 2001; Allen et al., 2004; Eby et al., 2008). Research further shows that mentors, advisors, sponsors, and senior collaborators shape placement, productivity, career advancement, and access to opportunities (Reskin, 1979; Waldinger, 2010; McDonald & Westphal, 2013; Li et al., 2019; Rocha & van Praag, 2020). We do not challenge this view. Instead, we add that mentors also shape where newcomers are seen. This role is especially important early in a career, when newcomers have limited independent visibility and audiences rely on social ties to decide what to consider. The benefits of

mentorship may therefore depend not only on mentor quality, effort, or support, but also on the reach of the communities in which mentors are embedded.

The practical implications follow directly from this audience perspective. Mentorship programs are often designed under the assumption that assigning a capable mentor gives newcomers the support they need. Our findings suggest that this is incomplete. If mentors differ in the audiences they can access and mobilize, mentorship may distribute visibility unevenly even when mentors are equally capable and committed. In firms, junior employees attached to less visible managers may receive fewer opportunities to present their work to decision makers or have their ideas considered beyond their immediate unit. In professional service firms, consulting, law, R&D organizations, creative industries, and entrepreneurial ecosystems, early association with some senior actors may open broader visibility channels than association with others. The implication is not to avoid assigning newcomers to women mentors or to other mentors who may face visibility constraints. That interpretation would be wrong and harmful. The problem is not women mentors; the problem is that organizations often rely on visibility structures that are already unequal. A better response is to complement mentorship with broader audience access: multiple developmental ties, sponsorship beyond the immediate mentor, cross-unit exposure, formal opportunities to present work, and evaluation systems that track whether high-quality contributions become visible outside local circles.

Our findings also caution against treating visibility-based outcomes as straightforward indicators of individual merit. Citations, project invitations, speaking opportunities, promotions, client exposure, and other visibility-based outcomes are often interpreted as evidence that some individuals or ideas are more valuable than others. Yet such outcomes may partly reflect inherited audience structures. A contribution may receive less visibility not because it is less useful, but because it travels through a narrower audience. This matters for strategy because organizations depend on accurate signals of where valuable knowledge

resides. If visibility is unevenly distributed, organizations may underuse ideas and talent located in less visible parts of their social structure. Visibility gaps are therefore not only an equity concern; they can distort knowledge allocation, search, and learning.

Several limitations qualify our conclusions and point to future research. First, our empirical setting is academic science. This setting provides unusually rich data on mentors, publications, citations, and audience histories, but it differs from many organizational contexts. At the same time, academic science is a conservative setting for our argument. Scientific contributions are formally public, standardized, and evaluated through institutionalized systems of publication and citation. If mentor-linked visibility gaps transmit even in this relatively transparent setting, similar processes may be at least as consequential in organizations where contribution quality is harder to observe and audience access is more informal. Future research should examine whether similar processes operate in firms, entrepreneurial ecosystems, creative industries, or platform-based labor markets. The mechanism should be especially relevant where newcomers depend on senior actors for audience access, where contributions are difficult to evaluate directly, and where new generations are poised to introduce the ideas on which future value creation depends.

Second, citations are an imperfect but useful measure of visibility. They allow us to observe whether later audiences build on focal contributions at scale, but they do not capture all forms of visibility, nor do they fully separate visibility from valuation. We acknowledge this limitation by treating citations as lying on a continuum. Visibility requires the less demanding assumption that a contribution entered a later audience's consideration set; valuation requires the stronger assumption that the observed citation pattern reflects how already-aware audiences judged the contribution. By surfacing a likely distinction between visibility and valuation, our study points to a useful direction for future research. Smaller-scale settings could observe visibility more directly, such as who attends a seminar, sees a pitch, or receives a project

presentation, and then trace subsequent choices to cite the work, invest in the venture, or support the project. Such designs would complement large-scale citation evidence by more cleanly separating whether a contribution was seen from how it was evaluated once seen, and by identifying the conditions under which visibility and valuation diverge.

Third, our design identifies formal F32 mentors and shows that this relationship has a distinctive audience role relative to placebo senior coauthors. However, we do not claim that only formal mentors transmit visibility. Other senior collaborators, supervisors, investors, or project leaders may also connect newcomers to audiences. Our design isolates one especially observable and institutionally defined mentorship episode. Future research could compare different senior ties across settings to identify when and how strongly they transmit visibility.

Fourth, our archival design cannot fully rule out unobserved differences between mentor–mentee pairs. We reduce this concern through the F32 setting, matching on mentor characteristics, controls for mentee productivity and publication characteristics, and audience-level tests, but the design remains observational. Mentor–mentee relationships can in principle be randomized in some settings, such as short-term advisory or accelerator programs. Such designs are more difficult to apply to long-term scientific training relationships, where mentors provide resources, intellectual direction, collaboration opportunities, and access to professional audiences over several years. Future work could use randomized mentorship interventions to examine whether expanding audience access changes the visibility trajectories of newcomers.

Fifth, our study focuses on mentor gender, but visibility gaps likely operate along multiple dimensions. Race, ethnicity, institutional prestige, or organizational unit may all shape the audiences to which mentors and mentees have access. Future work could examine how these visibility structures intersect. Some mentees may inherit especially narrow audiences when mentors face multiple forms of marginalization; others may benefit from compensating visibility channels when organizations deliberately broaden exposure.

Finally, our study does not focus on why women mentors have narrower audiences in the first place. These differences may reflect earlier valuation bias, exclusion from central networks, unequal access to resources, cumulative disadvantage, or institutional gatekeeping. Our contribution begins from the observation that such audience differences exist and asks whether they transmit to mentees. Future research should study how these audience structures form, how visibility and valuation reinforce one another over time, and which interventions can expand audience reach without placing the burden on newcomers or marginalized mentors.

In conclusion, this study shows that gendered visibility gaps can transmit across professional generations through mentorship. Mentors help newcomers become visible, but they are also embedded in audiences that differ in reach. When those audience structures are gendered, comparable work can receive different levels of visibility even after direct collaboration ends. This insight reframes mentorship as more than a developmental relationship. It is also an audience relationship. Understanding who becomes visible, whose ideas are built upon, and whose careers advance requires looking beyond individual ability and effort to the social structures through which visibility is inherited.

AI USE STATEMENT

The authors used ChatGPT and Claude for improving the clarity of written text. All AI-generated content was reviewed, verified for accuracy, and edited by the authors. The authors take full responsibility for the accuracy and integrity of all material in the manuscript.

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TABLES AND FIGURES

Table 1: Descriptive Statistics

variable name	description	mean	sd	min	max
dependent variables					
citations	forward citations for a given paper	81.40	139.02	0	5142
independent variable					
woman mentor	dummy variable indicating gender of mentor: 1 if woman; 0 otherwise	0.20	-	0	1
F32 characteristics (recipient and grant)					
woman F32 recipient	dummy variable indicating gender of F32 grant recipient: 1 if woman; 0 otherwise	0.37	-	0	1
host institution's research infrastructure	percentile rank of hosting institution in terms of NIH research funding (0 lowest rank, 100 highest rank)	96.41	8.47	0	100
F32 grant extension	dummy variable indicating F32 grant extension: 1 if grant extended; 0 otherwise	0.09	-	0	1
number of papers before F32 grant	number of papers published by F32 grant recipient before F32 grant receipt	2.78	2.53	0	10
share high JIF pubs before F32 grant	share F32 recipient publications in high impact journals (JIF > 10) before F32 grant receipt	0.07	0.19	0	1
paper count since grant receipt	count variable indicating the number of publications since F32 grant receipt	9.00	10.75	1	137
papers in last year	number of papers published by F32 recipient in previous year	1.81	2.49	0	26
number of papers 5 years after F32 grant	number of papers published within the first five years after grant receipt (excluding the endowment paper)	9.47	8.84	0	91
academic cohort'	fiscal year of the F32 grant award	2000	-	1995	2005
mentor characteristics					
number of papers 10 years before F32 grant (mentor)	number of papers mentor published within 10 years before F32 grant receipt	41.57	35.73	0	338
share high JIF pubs 10 years before F32 grant (mentor)	share of mentor publications in high impact journals (JIF > 10) 10 years before F32 grant receipt	0.15	0.15	0	1
number of prior R01 grants (mentor)	number of R01 grants issued to the mentor before F32 grant receipt	4.85	4.88	0	39
size of mentor network of citers	natural logarithm of the number of unique authors who have previously cited the mentor	7.66	1.37	0	11.53
share of women in mentor network of citers	share of women authors in the mentor's network of citers (in %)	20.86	5.41	0	52.34
research characteristics					
number of authors	number of authors on a given paper	4.97	2.19	1	10
share of women coauthors	share of women authors (w/o mentor and F32 recipient) on a given paper	0.33	0.33	0	1
woman last author	dummy variable indicating gender of last author on a given paper: 1 if last author is a woman; 0 otherwise	0.22	0.41	0	1
journal impact factor	journal impact factor of a given paper	5.71	6.51	0	1
expected citations percentile	percentile rank based on average citations associated with assigned MeSH terms of a given paper in the same year (0 lowest rank, 100 highest rank)	74.59	22.88	1	100
number of publications in risk set of citers (log)	natural logarithm of median number of articles with same MeSH terms as focal paper within 5 years of its publication	9.29	0.94	4.74	13.79
publication year'	publication year of a given paper	2005	-	1995	2009
observations					24,438

'median instead of mean reported

Table 2: Formal Tests of Hypotheses 1 and 2

	H1: Mentor last author		H2: Mentor not coauthor	
dependent variable: forward citations	NBREG	NBREG	NBREG	NBREG
	(1)	(2)	(3)	(4)
independent variables:				
woman mentor	0.928	0.916	0.873	0.871
	(0.037)	(0.037)	(0.034)	(0.035)
F32 characteristics (recipient and grant)				
woman F32 recipient	1.046	1.049	0.987	0.983
	(0.038)	(0.040)	(0.035)	(0.036)
host institution's research infrastructure	1.001	1.002	0.997	0.997
	(0.002)	(0.002)	(0.001)	(0.001)
F32 grant extension	0.996	1.016	0.924	0.915
	(0.054)	(0.058)	(0.045)	(0.047)
number of publications before F32 grant	1.020	1.027	1.007	1.011
	(0.007)	(0.008)	(0.007)	(0.007)
share high JIF pubs before F32 grant	1.038	1.004	1.224	1.167
	(0.085)	(0.092)	(0.110)	(0.117)
publication count since grant receipt	0.999	1.000	0.997	0.996
	(0.004)	(0.004)	(0.002)	(0.002)
publications in last year	1.012	1.008	1.021	1.024
	(0.011)	(0.012)	(0.007)	(0.008)
mentor characteristics				
number of publications 10 years before F32 grant (mentor)	1.001	1.001	0.999	0.999
	(0.001)	(0.001)	(0.001)	(0.001)
share high JIF pubs 10 years before F32 grant (mentor)	1.534	1.438	0.868	0.866
	(0.183)	(0.184)	(0.115)	(0.121)
number of prior R01 grants (mentor)	1.001	1.003	0.995	0.995
	(0.005)	(0.005)	(0.004)	(0.005)
research characteristics				
number of authors	1.044	1.042	1.049	1.048
	(0.007)	(0.007)	(0.006)	(0.007)
share of women coauthors	1.084	1.075	0.975	0.995
	(0.050)	(0.052)	(0.042)	(0.044)
journal impact factor	1.053	1.053	1.070	1.071
	(0.002)	(0.002)	(0.003)	(0.003)
woman last author			0.946	0.931
			(0.029)	(0.030)
1st quartile of expected citations (percentile 1-25)	base	base	base	base
2nd quartile of expected citations (percentile 26-50)	1.394	1.406	1.331	1.340
	(0.148)	(0.165)	(0.090)	(0.093)
3rd quartile of expected citations (percentile 51-75)	1.643	1.603	1.635	1.637
	(0.179)	(0.189)	(0.121)	(0.125)
4th quartile of expected citations (percentile 76-100)	2.100	2.052	1.887	1.870
	(0.221)	(0.234)	(0.137)	(0.140)
number of publications in risk set (log)	1.092	1.090	1.121	1.122
	(0.020)	(0.022)	(0.015)	(0.016)
publication year dummies	included	included	included	included
academic cohort dummies	included	included	included	included
CEM matching		included		included
constant	9.667	10.23	9.698	10.49
	(2.839)	(3.252)	(2.339)	(2.606)
observations	10,220	9,274	14,218	12,948

note: standard errors clustered by mentors in parentheses; exponentiated coefficients (IRRs) reported.

Table 3: Test of Audience Inheritance Mechanism

dependent variable: forward citations	**citations from inherited audience**	**citations not from inherited audience**	**all citations**
	NBREG	NBREG	NBREG
	(1)	(2)	(3)
woman mentor	0.835	0.945	0.957
	(0.051)	(0.048)	(0.061)
woman mentor x share citations from inherited audience			0.824
			(0.095)
share citations from inherited audience			1.303
			(0.104)
F32 characteristics (recipient and grant)	included	included	included
mentor characteristics	included	included	included
research characteristics	included	included	included
CEM matching	included	included	included
constant	3.002	6.305	9.665
	(1.019)	(2.130)	(2.486)
observations	12,948	12,948	12,948

standard errors clustered by mentors in parentheses; exponentiated coefficients (IRRs) reported

Table 4: Transmission of Visibility Gap among First-time Citers versus Repeated Citers

dependent variable: forward citations	**citations from first-time citers**	**citations from repeated citers**
	NBREG	NBREG
	(1)	(2)
woman mentor	0.889	0.993
	(0.036)	(0.027)
citations from first-time citers (log)		4.027
		(0.043)
F32 characteristics (recipient and grant)	included	included
mentor characteristics	included	included
research characteristics	included	included
CEM matching	included	included
constant	9.416	0.210
	(2.245)	(0.033)
observations	12,948	12,948

standard errors clustered by F32 recipients in parentheses; exponentiated coefficients (IRRs) reported

Figure 1: Research Design, Sample Construction and Main Data Sources

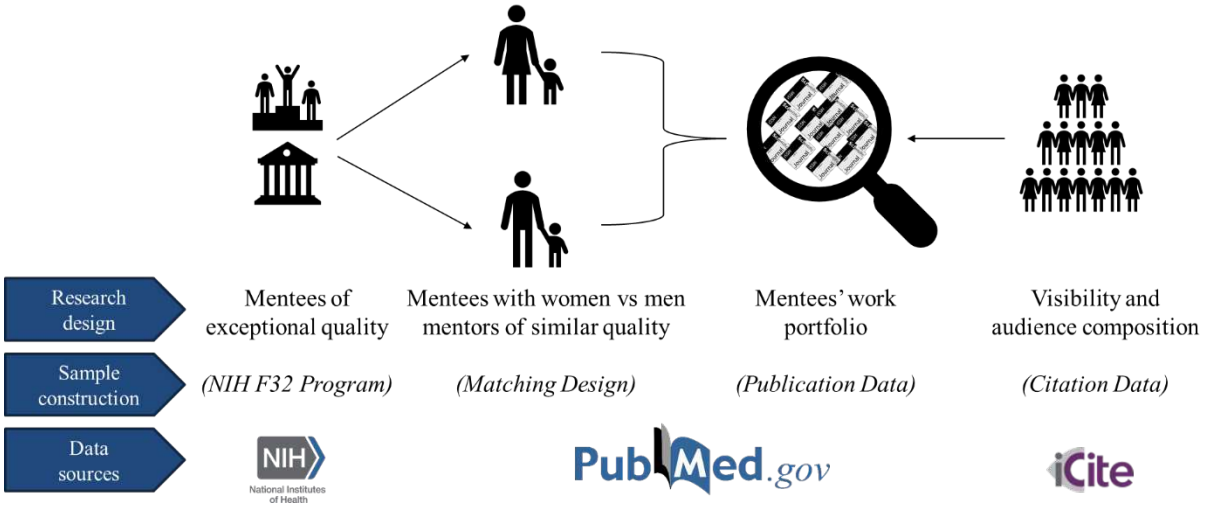


Figure 2: Transmission of Visibility Gap Stratified by Research Proximity and Collaboration Frequency

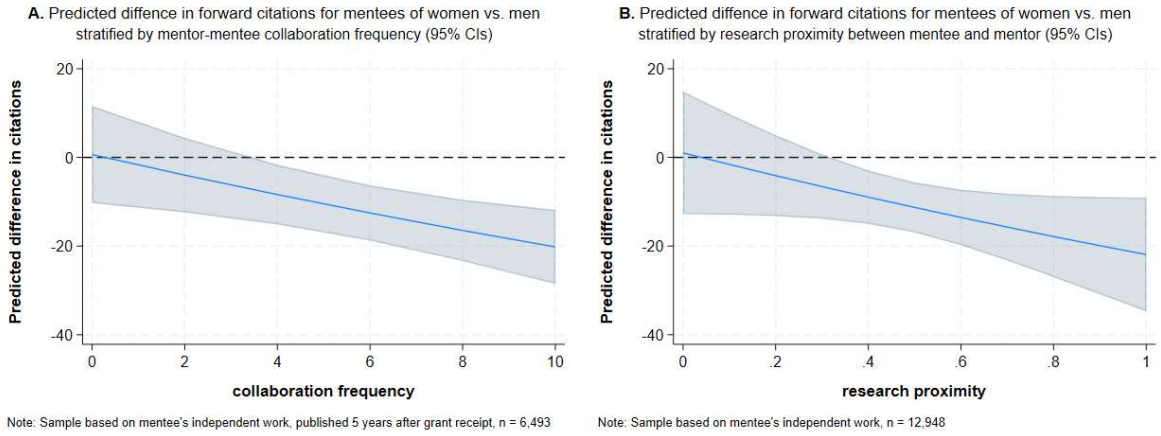
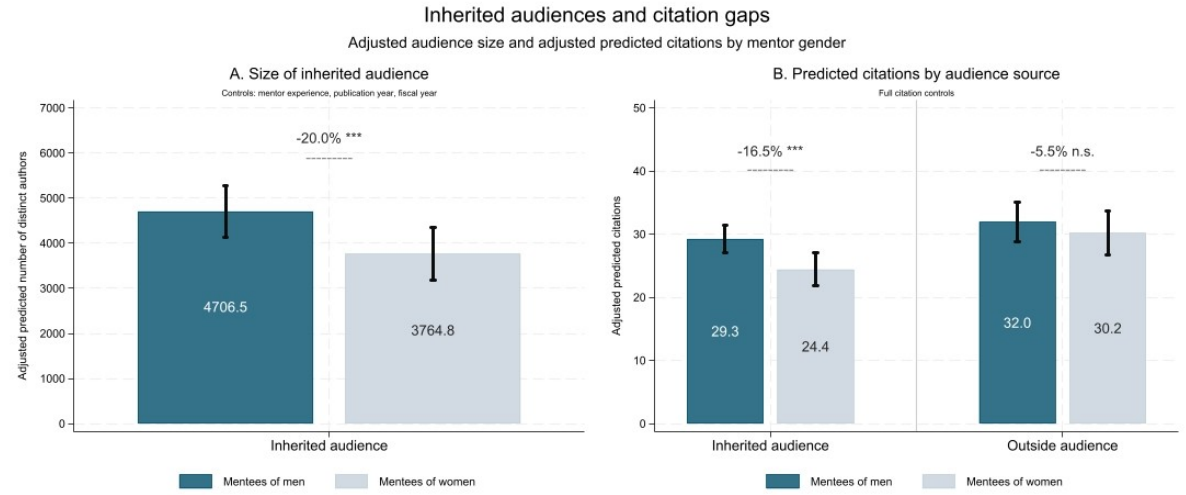
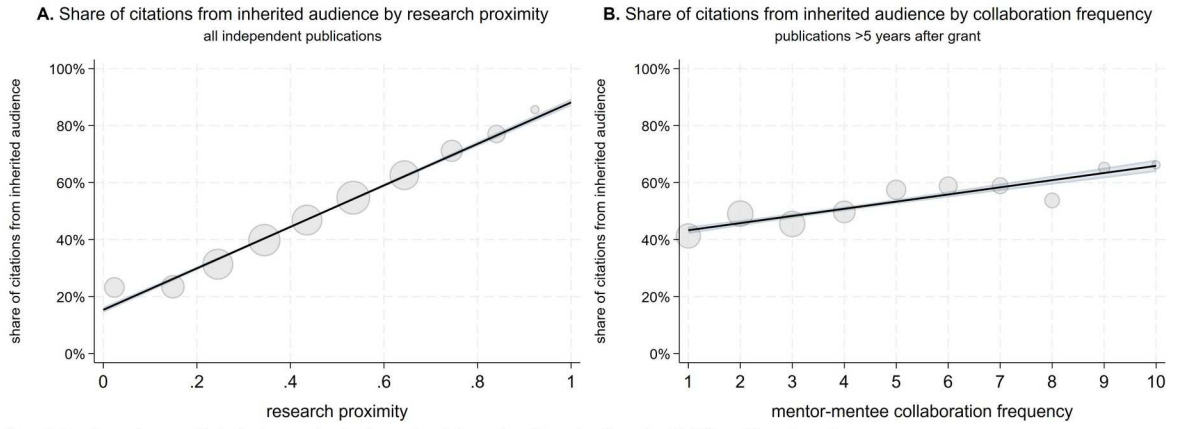


Figure 3: Size of Inherited Audience and Transmission of Visibility Gap through Inherited and Outside Audience



Sample: independent papers by F32 recipients; mentor not listed as coauthor. Whiskers show 95% confidence intervals. Percentages show relative differences for mentees of women. *** p<0.01, ** p<0.05, * p<0.10; n.s. not significant.

Figure 4: Share of Citations from Inherited Audience Stratified by Research Proximity and Collaboration Frequency



Notes: Points show cell means. Circle size is proportional to the number of observations. Lines show linear fits with 95% confidence intervals.