Title: "Spurring and Siloing: Identity Navigation in Scientific Writing Among Asian Early-Career Researchers"

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Abstract:
Scientific writing and publication are critical sites where early-career researchers must navigate between their personal identities and the presumed objectivity of scientific discourse. For non-white researchers, this process involves complex negotiations that remain understudied, particularly among those stereotyped as "model minorities." This qualitative study examines how Asian and Asian American early-career scientists navigate their racial and cultural identities within scientific writing and publication processes. Drawing on interviews with 23 participants who engaged with the Journal of Emerging Investigators, we identified two primary approaches to identity navigation: "spurring," wherein racial and cultural backgrounds catalyze research questions and scientific inquiry, and "siloing," wherein these identities are deliberately compartmentalized during formal scientific writing. Using an integrated theoretical framework combining cultural community wealth, narrative identity, and model minority discourse, we analyzed how participants strategically deployed cultural resources while navigating institutional expectations. Our findings reveal that while participants drew upon familial capital to inform research interests and occasionally acknowledged reflexivity, most also practiced disciplinary compartmentalization and adhered to perceived scientific norms of objectivity. This tension demonstrates how early-career scientists negotiate competing cultural scripts while developing professional identities. These findings have significant implications for science education, suggesting the need to help students recognize cultural backgrounds as valuable resources rather than sources of bias, address myths of pure objectivity, and provide models of successful identity integration in scientific work. By documenting these navigation strategies, we contribute to understanding both individual agency and institutional constraints in scientific practice, particularly for students from backgrounds historically underrepresented in STEM fields.

Keywords:
Science writing, model minority, identity navigation, early-career researcher, Asian scientists

Introduction

Scientific writing and publication represent critical sites where early-career researchers develop their professional identities and learn to navigate the cultural norms of their academic disciplines (Cameron et al., 2020; McRell et al., 2021; Richardson, et al., 2021). For non-white researchers, this process involves complex negotiations between their racial and cultural identities and the presumed objectivity of scientific discourse. These negotiations are particularly salient in the natural sciences, where dominant epistemological frameworks emphasize universal knowledge and researcher neutrality. This study examines how early-career Asian and Asian American scientists approach these negotiations as they enter scientific publishing, revealing both the assets they bring to scientific work and the challenges they face in bridging different cultural worlds.

Research Gap and Significance

While substantial research has examined barriers facing minoritized groups in science, less attention has been paid to how early-career scientists actively construct professional identities that integrate or compartmentalize their racial and cultural backgrounds. This gap is particularly significant given growing evidence that cultural resources and perspectives can enhance scientific inquiry (Medin & Bang, 2014) while simultaneously creating tensions with dominant scientific norms (Hsin & Xie, 2014). Understanding how scientists navigate these dynamics is crucial for developing more inclusive scientific institutions that can benefit from diverse perspectives while supporting the development of early-career researchers. Recent work on reflexivity in research highlights the unavoidable influence of researchers' social locations on scientific practice (Oswald, 2024; Reich, 2021). Despite this, the integration of personal identity into scientific work remains contentious, with some scholars arguing that acknowledging positionality violates scientific principles of universalism (Savolainen et al., 2023). This tension may present challenges for early-career scientists from non-white backgrounds as they develop their scientific voices and professional identities.

Asian and Asian American Scientists as Critical Case

The experiences of Asian and Asian American scientists offer particularly rich insight into the dynamics of reconciling personal and professional ways of communicating science. The model minority stereotype frames Asian and Asian Americans as naturally skilled in science and mathematics while simultaneously marking them as perpetual foreigners in scientific institutions (Lee, 1996; Chinn, 2002; Steele, 2011). This creates both unique pressures and opportunities as these early-career scientists navigate cultural expectations, professional norms, and racial stereotypes.

Recent research suggests that Asian American academic achievement stems primarily from cultural values around effort and immigration-related factors rather than innate ability or socioeconomic advantage (Hsin & Xie, 2014). These findings challenge simplistic narratives while highlighting how cultural values persist across generations, shaping how Asian and Asian American scientists approach their work. However, the model minority framework simultaneously masks diversity within Asian and Asian American experiences while creating additional pressures through unrealistic achievement expectations and limited identity expressions (Hsieh & Kim, 2020; Poon et al., 2016).

To understand how early-career scientists navigate identity in scientific writing, we integrate three theoretical perspectives that together illuminate both individual agency and institutional constraints. These theories - cultural community wealth, narrative identity, and

model minority discourse - complement each other by revealing different aspects of how individuals draw upon cultural resources, construct meaningful identities, and navigate institutional pressures in scientific contexts.

Cultural Community Wealth in Scientific Practice

Yosso's (2005) cultural community wealth framework illuminates how non-white scientists draw upon interconnected forms of community-nurtured resources to enhance scientific inquiry and create pathways for innovation. Rather than viewing cultural background as a deficit to overcome, this framework reveals how different forms of capital work together to shape how scientists approach research questions, develop methodologies, and contribute to scientific knowledge. The process often begins with scientists drawing upon familial and community knowledge to identify research questions that mainstream science might overlook. Kimmerer (2013) documented how Indigenous scientists integrate traditional ecological knowledge passed down through generations into their research, leading to innovative approaches in environmental research that challenge and enrich "Western" scientific paradigms. In fact, Elshakry (2010) critiqued the historical framing of "Western science," which subsumed knowledge produced in Asia and reinterpreted it as European in origin. This integration demonstrates how familial capital not only informs initial research questions but also provides alternative frameworks for data interpretation and analysis.

Community connections extend beyond knowledge systems to create practical pathways for research impact. Zambrana et al. (2015) described how scientists from minoritized groups leverage social capital through community networks to develop research partnerships and access study populations, while simultaneously building trust between scientific institutions and communities. The trust-building process is crucial for conducting more comprehensive research while ensuring its relevance to community needs.

Language plays a crucial role in this knowledge integration process, though not without complexity. As Bowker (2021) demonstrated, while multilingual abilities could theoretically enhance scientific communication and enable broader knowledge exchange, institutional pressures to publish in English often constrain scientists' ability to fully leverage their linguistic resources. While multilingual scientists possess valuable capabilities for bridging different knowledge systems, they face structural barriers to deploying these capabilities effectively (di Bitetti et al., 2017).

The deployment of these cultural resources requires significant navigational skill, particularly in institutional contexts that may not readily recognize their value. Chinn's (2002) work with Asian and Pacific Islander women scientists reveals how they draw on cultural traditions of adaptability and strategic relationship-building to successfully maneuver through male-dominated scientific spaces. Navigation is supported by aspirational capital, which may enable scientists to maintain their research vision despite institutional skepticism that has been notably documented towards women (Bird & Rhoton, 2021).

Perhaps most significantly, cultural community wealth enables scientists to develop resistant capital - the ability to question dominant paradigms and propose alternative perspectives. Other scholars have demonstrated how Black women scientists leverage their critical awareness of power dynamics to identify gaps in scientific knowledge and develop new methodological approaches (Prescod-Weinstein, 2020; Rankin et al., 2021). Their resistance to limiting assumptions, supported by deep community knowledge and robust social networks, often leads to theoretical innovations that benefit the broader scientific enterprise.

Together, these forms of capital form a rich foundation for scientific practice that extends

beyond individual research capabilities to encompass community relationships, knowledge systems, and pathways for innovation. Understanding how early-career scientists draw upon these resources - or face constraints in doing so - is crucial for developing more inclusive scientific institutions that can benefit from diverse perspectives and approaches.

Narrative Identity and Cultural Scripts in Science

While cultural community wealth identifies available resources, narrative identity theory illuminates how scientists make meaning of their experiences through stories that are mediated by cultural symbolic systems (Ricoeur, 1991). For early-career scientists from non-white backgrounds, these narratives must bridge multiple cultural worlds: their home cultures, academic science culture, and broader societal narratives about race and achievement. Cultural scripts powerfully shape both how individuals see themselves and how institutions treat them (Chinn, 2002). In science, professional norms emphasize objectivity, detachment, universal knowledge, and individual achievement. These norms often conflict with cultural scripts that emphasize community obligations, cultural knowledge transmission, collective achievement, and specific forms of identity expression. For instance, Medin and Bang (2014) documented how Indigenous scientists must reconcile Western scientific emphasis on researcher neutrality with cultural traditions that acknowledge intimate connections between researchers and the phenomena they study.

Model Minority Myth Framework and Scientific Achievement

The model minority myth framework provides crucial context for understanding how institutional pressures shape identity navigation, particularly for Asian and Asian American scientists (Poon et al., 2016). This stereotype creates a complex web of expectations and constraints that influences how scientists construct their professional identities. Lee (1996) demonstrated how the model minority narrative simultaneously provides advantages through positive expectations about scientific ability while limiting acceptable forms of identity expression. This dynamic often forces Asian and Asian American scientists to carefully manage their self-presentation, potentially constraining their ability to bring cultural resources into their work (e.g., Nguyen et al., 2022).

Integration: A Multi-Level Framework

These three theoretical perspectives work together to illuminate different aspects of identity navigation in science. Cultural resources provide raw material for identity construction, while narrative processes transform these resources into coherent professional identities. Institutional contexts, and frameworks shaped by model minority myth condition individuals in how these resources can be deployed and how identities can be expressed.

This integrated framework allows us to examine both individual agency in drawing upon cultural resources, and institutional constraints on identity expression. It suggests that successful navigation requires both strategic deployment of cultural resources and careful attention to institutional demands. Moreover, it helps explain why scientists might simultaneously draw upon and distance themselves from cultural resources as they navigate different demands and expectations in scientific contexts.

Research Questions

Building on this conceptual foundation, our study examines:

1. In what ways do Asian and Asian American early career scientists draw upon different forms of cultural capital in their scientific research and writing processes?

2. How do Asian and Asian American early career scientists view scientific writing as a space for identity integration?
3. How do Asian and Asian American early career scientists interpret and respond to dominant scientific professional norms?

Using the critical case of Asian and Asian American early career scientists to answer these questions, we aim to understand both individual strategies for identity navigation and broader implications for institutional change. Our findings reveal two primary approaches- which we term "spurring" and "siloing" - through which early-career scientists manage the relationship between their cultural identities and scientific work.

Methodology

Study Context and Significance

This study focuses on early-career scientists publishing through the Journal of Emerging Investigators (JEI), a platform that supports high school students in developing research and scientific writing skills. The journal's peer review process mirrors professional scientific publishing while providing supportive feedback from graduate student and postdoctoral reviewers. This context provides unique insight into how scientists begin to navigate identity issues as they enter scientific publishing, before they are fully socialized into disciplinary norms. The findings contribute to understanding both individual identity navigation strategies and institutional factors that support or hinder identity integration in science.

Participants and Recruitment

To examine how early-career scientists incorporate their racial and cultural identities into scientific writing and publication, we conducted a comprehensive recruitment process through the Journal of Emerging Investigators (JEI), a peer-reviewed journal that publishes research by high school students. We sent email invitations to 1,904 individuals who had previously participated in JEI as authors, editors, or reviewers. From the pool of respondents, we selected potential participants based on several criteria: self-identification as a person of color, current involvement in scientific research or writing, either as a student or early-career scientist, and willingness to discuss their experiences with identity and scientific work in detail.

Of the initial respondents meeting our criteria, we contacted 45 individuals for interviews. In this paper, we analyze the interviews we conducted with twenty-three participants who completed interviews and self-reported their background to be of Asian or Asian American. These participants represent a range of ethnic and national backgrounds, scientific disciplines, and career stages (Table 1). Most participants (87%) were based in the United States, while 13% were international participants. This sample size aligns with recommendations for qualitative interview studies seeking to achieve theoretical saturation while maintaining depth of analysis (Charmaz, 2006). The study was approved by the Emory University Institutional Review Board (STUDY00000797). All participants provided their informed consent or assent prior to completing the interview.

Table 1: Participant Demographics

Self-Reported Demographic Information	Frequency	Percentage
Self-Identified Racial Identity		

East Asian	12	52.2%
South Asian or Indian	6	26.1%
Southeast Asian	3	13.0%
Central Asian	1	4.3%
Pacific Islander	1	4.3%
Gender		
Male	11	47.8%
Female	12	52.2%
Country of Residence		
USA	20	87.0%
India	1	4.3%
China	1	4.3%
Vietnam	1	4.3%
Highest Education Level Completed		
Less than High School	1	4.3%
High School	6	26.1%
Undergraduate School	10	43.5%
Graduate School	5	21.7%
Not in School	1	4.3%
Science Discipline (Authors Only)		
Natural Sciences	10	55.5%
A.I. & Data Sciences	3	16.7%
Social Sciences	3	16.7%
Environmental Sciences	2	11.1%

Note: *N*=23 participants

Interview Protocol and Process

We developed a semi-structured interview protocol following Charmaz's (2006) constructivist grounding theory approach. The protocol was designed to explore participants' experiences based on our research questions, examining their personal and cultural background, early experiences with science and writing, current scientific writing practices, perceptions of identity in scientific contexts, experiences with peer review and publication, and navigation of cultural identity in scientific settings.

Interviews were conducted virtually and lasted between 45-60 minutes each, generating approximately 1000 minutes total minutes of recorded conversation. All interviews were audio-recorded with participant consent and professionally transcribed. Transcripts were subsequently de-identified and cleaned for clarity while preserving the original meaning and context of participants' responses.

Data Analysis

Our analysis combined deductive and inductive coding approaches to capture both theoretically derived themes and emergent patterns in the data. The coding process proceeded in three phases. In the initial collaborative coding phase, all five members of the research team collectively analyzed one interview transcript to establish consistent coding practices and develop preliminary coding categories. This process helped ensure reliability and allowed us to

identify both anticipated themes from our research questions and unexpected patterns in the data. Through this collaborative process, we developed a codebook that included a priori codes derived from research questions and theoretical framework, emergent codes identified through initial transcript analysis, clear definitions and examples for each code, and guidelines for code application.

Three members of the research team then led the systematic coding of all transcripts. These researchers met weekly to compare coding decisions, discuss ambiguous cases, resolve disagreements through consensus, refine code definitions as needed, and document coding decisions. The first author continued to refine the codebook and ultimately reapply it across the transcripts. The codebook was treated as a living document, updated iteratively as new insights emerged while maintaining consistency in core coding categories.

Research Team

The research team varies in terms of their career stage and racial identities, which is helpful for gaining multiple perspectives on the study topic. Four of the authors are mid-career stage researchers. One of the authors identifies as a White American who serves as a reviewer and editor for a science journal and who only speaks English. One of the authors identifies as a white American who speaks only English. One of the authors identifies as a Black American who speaks only English. One of the authors identifies as South Asian American and familiar with three South Asian languages. She also studies how people make meaning of science through reading, writing, and drawing tasks. Two of the authors are early-career researchers. One of the authors identifies as South Asian American and is bilingual in English and Spanish. One of the authors identifies as East Asian American and is bilingual in English and Korean.

Results

Our analysis revealed complex dynamics in how Asian and Asian American early-career scientists navigate racial identity in scientific writing. Two primary approaches emerged: *spurring*, wherein racial backgrounds served as catalysts for scientific inquiry, and *siloing*, wherein racial identity was deliberately separated from scientific work. These strategies reflect different ways of deploying cultural capital and navigating institutional expectations within scientific contexts.

When faced with questions about how their Asian identities were incorporated into their process of writing and publishing a scientific article, the early career scientists that we spoke with demonstrated the conflicting ways in which they approach integrating their race into their academic work. We explore two narratives that Asian and Asian American early career scholars used to explain how race affected their experiences within the scientific publishing process: spurring, wherein they cited their racial backgrounds and racialized experiences as important stimulation for their initial research question and writing process; and siloing, wherein they stressed the fundamental need to separate racial identity from the scientific writing and publishing process (Table 2).

Table 2: Coding Schema for Interviews

General and Specific Codes	Frequency	Percentage
Spurring		
Curiosity	9	39.1%
Reflexivity	3	13.0%

Siloing		
Racial Invisibility	6	26.1%
Disciplinary Practices	18	78.3%
Scientific Norms	17	73.9%

Note: *N*=23 participants

Spurring

When initially asked about the role that their race had played within their writing process, many of the Asian student authors that we interviewed indicated that they had not previously considered the role of their racial identity within their research process. However, upon further reflection, many of these Asian early career scholars interviewed indicated that they indeed felt that their racial identities had influenced their experiences in academic publishing.

Specifically, 39.1% viewed their Asian racial identity as spurring the curiosity and framework for the project that led to their article publication. In so doing, these Asian student authors showcase the ways in which racial identity can be used as a bridge between differing community values. For example, Chloe Gao, 18-year-old woman who identified as East Asian, explained,

> I think I actually did mention [my race] a little bit with my project, because mine was about tea. So, I kinda talked a little bit about like Asian, like traditional medicine, and like how tea is like has been used for a long time, in like maybe like 2 sentences. But it was still like a nice touch, and I felt connected.

And Evan Li, a 17-year-old man who identified as East Asian, reported why he felt motivated to ask questions about environmental issues in a Chinese context, stating,

> If I weren't Chinese, maybe I wouldn't have chosen the topic specifically, and maybe I wouldn't have been so like concerned about an environmental injustice that might be happening. So I think, being from this background, it kind of inspired me to choose this topic, and really like, resonate with the topic, and be more like, involved in research, and not do it for the sake of, you know, for the sake of doing it. It kind of made me more like passionate about like what I'm doing and made the process honestly a lot more easier, a lot easier because it gave me like motivation.

As Chloe's and Evan's remarks demonstrate, their racial contexts and backgrounds served as exposure for several initial research questions that they brought into the academic setting. Using their racial backgrounds, Chloe and Evan were able to construct scientific questions that legitimate concerns in their ethnic communities.

For some participants, this use of racial identities and experiences as a jumping off point for a research question was also reported to be widespread among their peers in scientific spaces. Amithi Nanda, 18-year-old woman who identified as South Asian, stated,

> From what I've experienced at school like in my AP research class, when everyone was sharing their research ideas and like their topics like, I feel like everyone was connected to their topic in one way. Either, it was usually their race…or, like other people brought their cultures into it….so I do see, like a lot of people bringing in their personal identity into their research.

Although not initially driven by questions involving race, other Asian student researchers encountered race within the research process that were shaped by their own racial identities. Aaron Baker, a 17-year old man who identified as both East Asian and white, started their

project with a more general research question, but explained “From my literature review, I did see a lot about how minorities are affected by Alzheimer's, and they have, like a 3 times higher mortality rate from Alzheimer's, and that really affected me...So I think that if that was my initial inspiration for doing Alzheimer's research, then.”

Very few of the early career scholars that we spoke with saw their research as being fundamentally shaped by their standpoint as an Asian individual as theories of reflexivity would indicate. However, 13% did express the ways in which racial identity influences how scientists approach their research and writing process. Won Jun Paik, a 29-year-old man who identified as East Asian, for example, stated, “I don't know, I think there are times when I can voice my opinion, and I guess in that sense, my opinions draw from my racial cultural background. I guess there's that, so maybe like in a little in some ways.” And Chloe, the 18-year-old East Asian woman, expanded on this idea, saying that one’s racial background impacts “how they do data analysis, how they see a certain problem, um, how they interpret certain results.”

This spurring approach reveals the narrative work that Asian and Asian American early career scientists use to legitimize cultural knowledge within scientific frameworks. Through careful narrative framing, these scholars can maintain their scientific credibility while still bringing their racial identities into their academic work. In this way, they are able to navigate between different epistemological traditions.

Siloing

In general, however, the further that the early career scholars got into their research and publishing process, the less that early career scholars felt that their Asian racial identities influenced their scholarship. For 26.1% of participants, they had never considered the possibility of their racial identities shaping their participation in the scientific writing process. Aaron, who had before discussed how his East Asian and white identity had influenced his decision to study health inequalities in Alzheimer’s in the previous section, responded to a question about how he incorporated his racial identity into his writing by stating, “I mean it's my writing, I guess, but that's never really been something that I've thought about.” Similarly, Evan, who had expressed how his East Asian identity had spurred his interest in studying environmental justice issues in a Chinese community, said “Like, for me, those things of background of race and identity, they were never like a topic much really present in my life.”

Aaron and Evan internalized dominant scientific scripts which imply that scientific inquiry must be kept separate from racial identity. Moreover, their experiences also highlight the consideration that Asian and Asian American academics have with being seen as a representative of their race, hinting at the influence of the model minority discourse on their academic experiences.

This contradiction between racial issues spurring research questions but being siloed within the rest of the research process was made sense by 78.3% of participant’s expression that this type of racial identity incorporation was not allowed in the research norms of the biological sciences. Nathaniel Fang, an 18-year-old East Asian man, explained,

> I do data analysis, so I don't really think it's applicable...That would go into one of the bias categories for writing. I think if you're doing a meta-analysis on your own culture or something like that, or your doctorate is something culture related, I think it's fine to know your biases and stuff.

For Nathaniel, racial identities bias the scientific process and thus should be relegated to other disciplines.

Evelyn Yang, an 18-year-old East Asian woman, also siloed racial identity from her type of "basic science" research, stating,

> In my opinion it wasn't necessary, at our point of study to kind of bring in more cultural or racial viewpoints. But I do definitely think, especially with like clinical studies or, you know, when you actually talk about like, how is this treatment going to be used, that viewpoint should definitely be considered. I just think with, like, since you're doing more like drug discovery, and just on the more like basic science aspect, I didn't express any, and I didn't think it was kind of necessarily appropriate to do so.

Similarly, Abigail Takahashi, a 17-year-old East Asian woman, quipped, "I mean, I don't see myself bringing in my racial or cultural points in my research because I'm more into like biological sciences." And Tanusha Singh, a 18-year-old woman who identified as Southeast Asian, explained, "I don't see the necessity of bringing that aspect into my writing, because it is primarily scientific...But I don't think there's like a need for me to like insert my own identity into like my project, because it is solely focused on like very molecular biology." For these Asian and Asian American early career scientists, then, their experience researching and publishing in the biological sciences was rendered as incompatible as being shaped by their racial identities, even if that type of connection might be allowed in other disciplines.

Whereas some Asian and Asian American early-career scientists made room for the incorporation of racial identities within the scientific process within non-STEM disciplines, others (73.9%) also explained that they didn't feel that racial identities should ever make their way into scientific writing. For example, Nhan Do, a 20-year-old Southeast Asian man, said

> So I could see why people might want to write and say, when you're writing, uh, uh, an acknowledgement section, you could talk about yourself a little bit, I guess. But I don't think it's designed necessarily to accommodate a lot of story sharing, right? If you want to know more about somebody, you can go and read a biography. But if you want to know what scientific contributions they've made, you go and read their papers, right? You don't go to science paper expecting, you know, gossip or anything like that.

And Peihua Lei, a 18-year-old woman who identified as Pacific Islander and East Asian, expanded on this "I don't think that there's ever really much of an opportunity in this type of scientific writing, like in papers, um, to talk about your own identities, because like, It seems like you're not supposed to talk about it."

For these early career academic writers, then, publishing a scientific paper necessitated a kind of bifurcation between who they were as an Asian researcher and the process of science. These narratives show the recognition of implicit cultural scripts in science and reveal strategic identity management on the part of our interviewees. Moreover, these narratives also demonstrate how Asian early career scientists must navigate institutional power dynamics and racial stereotypes to be perceived as legitimate scientists.

Discussion

Overview of Key Findings

Our analysis revealed complex dynamics in how Asian and Asian American early-career scientists navigate racial identity in scientific writing. Two primary approaches emerged: *spurring*, wherein racial backgrounds served as catalysts for scientific inquiry, and *siloing*, wherein racial identity was deliberately separated from scientific work. These complementary

strategies reflect different ways of deploying cultural capital and navigating institutional expectations within scientific contexts.

The tension between these approaches directly addresses our research questions regarding how Asian and Asian American early-career scientists draw upon cultural capital, view scientific writing as a space for identity integration, and respond to dominant scientific norms. Our findings suggest that these scientists strategically manage their cultural identities, drawing upon them for motivation and research direction while often compartmentalizing them during the formal writing process. This dynamic reveal both the potential contributions of diverse cultural perspectives and the persistent constraints of scientific norms that emphasize objectivity and universality.

Familial Capital: Strong Evidence for Strategic Use

Our findings provide substantial evidence for how familial capital - knowledge cultivated through family and community - informs research choices among Asian early-career scientists. This was particularly evident in Evan Li's decision to study environmental issues in Chinese communities, where he explicitly connected his ethnic background to his research interests: "If I weren't Chinese, maybe I wouldn't have chosen the topic specifically, and maybe I wouldn't have been so like concerned about an environmental injustice that might be happening." His statement reveals how cultural knowledge transmitted through community connections shaped not just his topic selection but his sensitivity to environmental concerns.

Similarly, Chloe Gao's integration of "Asian traditional medicine" knowledge into her tea research demonstrates how cultural knowledge passed through generations can inform scientific inquiry; for her, there was a sense of personal connection to her work, stating she “felt connected" to her research through this cultural linkage.

Amithi Nanda's observation that many students in her AP research class drew upon racial and cultural backgrounds for research ideas suggests a broader pattern of leveraging familial capital. She noted, "everyone was connected to their topic in one way. Either it was usually their race...or, like other people brought their cultures into it." This observation indicates a recognition, at least among students, that cultural knowledge can serve as a legitimate foundation for scientific inquiry. However, our data also reveals limitations in how explicitly this capital can be acknowledged in scientific writing. Chloe's characterization of her cultural references as just "2 sentences" and "a nice touch" suggests a careful calibration of how much cultural context is appropriate to include. This measured approach reflects the constraints of scientific writing formats that may not readily accommodate extensive cultural contextualization.

Navigational Capital: Strategic Compartmentalization

Our findings suggest that navigational capital—the skills to maneuver through institutions not created with communities of color in mind—manifests in the "siloing" approach adopted by many participants. When Nathaniel Fang distinguishes between contexts where acknowledging cultural background is "fine" versus where it represents "bias categories for writing," he demonstrates sophisticated institutional navigation. Similarly, Evelyn Yang's careful distinction between basic science research where cultural perspectives seemed inappropriate versus clinical studies where "that viewpoint should definitely be considered" reveals a nuanced ability to read and respond to different perceived institutional contexts.

This strategic compartmentalization represents more than simple assimilation; it demonstrates how Asian early-career scientists have developed nuanced understandings of when and how cultural identity can be acknowledged within scientific institutions. The high percentage

of participants who believed racial identity incorporation was not allowed in scientific norms suggests that developing this form of navigational capital is essential for early-career scientists from minoritized backgrounds.

Other Forms of Cultural Capital: Limited Evidence and Future Directions

While our data provide evidence for familial and navigational capital, we found limited direct evidence for other forms of cultural capital described by Yosso (2005), such as aspirational, linguistic, and resistant capital. For example, aspirational capital—the ability to maintain hopes and dreams despite barriers—might be implied in Evan Li's statement that his background "made me more like passionate about like what I'm doing," but our data do not explicitly capture participants overcoming significant obstacles through cultural resilience. Similarly, while many participants likely possess linguistic capital as multilingual individuals, our interviews didn't specifically address how this might enhance their scientific communication. Resistant capital—knowledge and skills fostered through challenging inequality—was also not prominently featured in our data, possibly reflecting the early career stage of our participants or the constraints of scientific contexts that may discourage explicit resistance to dominant paradigms.

These limitations in our evidence suggest important directions for future research. Studies could more deliberately explore how early-career scientists draw upon aspirational capital to persist through challenges, leverage multilingual abilities in scientific communication, or develop ways to respectfully challenge dominant paradigms. Additionally, educational interventions could help students recognize these forms of capital as potential resources rather than viewing cultural backgrounds as irrelevant or potentially biasing in scientific contexts.

Scientific Writing as a Site of Identity Navigation

Our findings reveal scientific writing as a complex site where early-career Asian and Asian American scientists strategically manage their identities in response to perceived norms and expectations. The "siloing" approach demonstrates sophisticated identity management, where participants consciously separate their cultural identities from their scientific work. Nathaniel Fang's concern that acknowledging cultural influences "would go into one of the bias categories for writing" reveals an internalization of scientific norms that privilege detached objectivity.

This strategic compartmentalization appears particularly pronounced in certain disciplines. As Tanusha Singh explained, "I don't see the necessity of bringing that aspect into my writing, because it is primarily scientific... it is solely focused on like very molecular biology." This statement reflects both an understanding of disciplinary norms and a strategic decision to conform to them. Similarly, Evelyn Yang's distinction between "basic science" research, where cultural viewpoints seemed inappropriate, and "clinical studies," where they might be more relevant, shows nuanced navigation of disciplinary boundaries.

These findings align with Chinn's (2002) work on Asian and Pacific Islander women scientists, which revealed similar tensions in identity navigation. However, while Chinn's participants often wished they "were males" to better fit scientific contexts, our participants instead chose to compartmentalize their cultural identities while maintaining them outside scientific contexts. This difference may reflect generational changes in how minoritized scientists manage identity tensions.

The model minority stereotype likely influences these identity navigation strategies. As Lee (1996) documented, this stereotype creates expectations that Asian Americans will succeed

academically while remaining culturally "other." Our participants' careful management of cultural identity may represent a response to these contradictory expectations—demonstrating scientific competence while selectively controlling when and how cultural background becomes visible.

Response to Scientific Professional Norms: The Objectivity Myth

A striking finding from our study is participants' strong belief in scientific objectivity and the corresponding view that incorporating cultural perspectives constitutes "bias." Most participants expressed that racial identities should not enter scientific writing, reflecting a deeply internalized norm of objectivity in science. Nhan Do's statement that scientific papers aren't "designed necessarily to accommodate a lot of story sharing" and his contrast between biographies and scientific papers reflects this sharp division between personal identity and scientific knowledge.

This perception varied somewhat by discipline, with participants in fields like molecular biology (Tanusha Singh) and "basic science" (Evelyn Yang) expressing the strongest commitment to separating identity from scientific work. This disciplinary variation aligns with Savolainen et al.'s (2023) observation that some fields view acknowledging positionality as violating scientific principles of universalism.

The characterization of cultural perspectives as potential sources of "bias" rather than as valuable epistemological resources reveals a limited understanding of how all knowledge is situated. As feminist philosophers of science like Harding (1991) have argued, pretensions to pure objectivity often mask the ways that dominant perspectives shape scientific inquiry. Our participants' concern with avoiding "bias" reflects what Medin and Bang (2014) describe as the myth of cultural neutrality in science—the mistaken belief that scientific knowledge exists independent of cultural frameworks.

This commitment to an objectivity ideal creates a tension for early-career scientists from non-white backgrounds. While they may draw upon cultural knowledge to identify research questions (as in our "spurring" findings), they also feel compelled to excise traces of this influence in their formal scientific writing. This points to a contradiction that Asian and Asian American early-career scientists must negotiate: Through the erasure of their racialized perspective and the epistemological contributions their cultural perspectives might offer to scientific knowledge, they are able to reach normative scientific audiences with the questions and concerns spurred from cultural influences.

Theoretical Implications

Our findings extend cultural community wealth theory by demonstrating how cultural capital operates in scientific contexts that may not readily acknowledge its value. While Yosso (2005) developed this framework primarily for educational settings, our research shows how it applies to professional scientific practice, particularly scientific writing and publication. Importantly, our findings reveal that cultural capital can operate even when not explicitly acknowledged—driving research questions and motivation even when compartmentalized in formal scientific writing.

The complementary "spurring" and "siloing" strategies we identified contribute to understanding identity navigation in STEM fields. Unlike binary models that position scientists as either assimilating to or resisting dominant norms, our findings suggest a more nuanced process where cultural identity is selectively deployed at different stages of the research process.

This selective deployment allows early-career scientists to both benefit from cultural resources and conform to institutional expectations.

Our research also contributes to literature on model minority discourse by showing how this framework shapes scientific achievement. The perception that acknowledging cultural influence constitutes "bias" reflects the model minority expectation that Asian Americans will succeed by adopting dominant norms rather than challenging them. However, our participants' strategic navigation of when and how to incorporate cultural perspectives demonstrates agency within these constraints.

Practical Implications: Science Education

Our findings suggest several important implications for science education. First, educators should help students recognize how cultural backgrounds can serve as valuable resources rather than irrelevant or biasing factors in scientific inquiry. By explicitly acknowledging the role of cultural perspectives in shaping research questions and approaches, educators can help students leverage their cultural capital more effectively. Second, science education should address the myth of pure objectivity, helping students understand that all knowledge is situated in cultural contexts. Teaching about the history and philosophy of science could help students develop more nuanced understandings of objectivity that recognize the value of diverse perspectives rather than attempting to erase them (Reid and Fankhauser, 2024). Finally, science educators should provide models of successful identity integration in scientific work. Exposing students to scientists who effectively bridge cultural knowledge with scientific practice could help them envision possibilities beyond the binary choice between cultural authenticity and scientific legitimacy.

Practical Implications: Scientific Communication Practices

Scientific publication venues might consider how their formats and expectations could evolve to better accommodate diverse backgrounds. While maintaining rigor, journals could explore alternative formats that allow for more explicit acknowledgment of researchers' positionality and the cultural contexts that inform their work. Additionally, peer review processes could be developed to recognize the value of diverse cultural perspectives rather than treating them as potential sources of bias. Reviewers might be trained to distinguish between methodological rigor and cultural neutrality, acknowledging that good science can emerge from culturally situated perspectives.

Limitations and Future Research

Our study has several limitations that suggest directions for future research. Our sample primarily included Asian and Asian American participants at early career stages, limiting generalizability to other racial/ethnic groups and career stages. Future studies could explore how scientists from other minoritized groups navigate identity in scientific writing, as well as how these navigation strategies evolve throughout scientific careers.

While our interview protocol tried to specifically target certain forms of cultural capital such as resistant and linguistic capital, participants seemed reluctant to share or did not see these questions as relevant to their science research and writing. Future research could more deliberately explore these aspects through targeted questions about institutional navigation and multilingual communication strategies. Future work can also explore whether such navigational capital, as we observed as outsiders, is intentional or perceived as necessary on the part of the early-career scientists themselves. Longitudinal studies would be particularly valuable for

understanding how identity navigation strategies develop over time. Following scientists from training through career advancement could reveal how institutional contexts and career pressures shape identity expression in scientific writing over time and professional experience.

Conclusion

This study reveals both the potential contributions of diverse cultural perspectives to scientific knowledge and the persistent constraints that limit their full expression. By documenting how early-career Asian scientists strategically navigate between cultural identities and scientific norms, we contribute to understanding both individual agency and institutional constraints in scientific practice. The complementary strategies of "spurring" and "siloing" demonstrate sophisticated identity management that allows scientists to draw upon cultural resources while meeting institutional expectations. These strategies represent not just personal choices but responses to broader scientific norms and racial dynamics.

In the political climate of 2025, Asian and Asian American scientists may be uniquely positioned to advance in scientific fields precisely because of their ability to strategically leverage cultural capital while conforming to scientific norms when necessary. Their experience navigating between different cultural scripts provides valuable skills for scientific innovation that bridges diverse knowledge traditions while maintaining legitimacy within established institutions. As science increasingly recognizes the value of diverse perspectives, while political institutions do not, these navigation skills may become increasingly valuable for addressing complex global challenges that require multiple ways of knowing.

Ethics Statement: The study was approved by the Emory University Institutional Review Board (STUDY00000797). All participants provided their informed consent or assent prior to completing the interview.

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