



Missing the Mark: A New Form of Honorary Authorship Motivated by Desires for Inclusion

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Abstract As scientific teams in academia have become increasingly large, interdisciplinary, and diverse, more attention has been paid to honorary authorship (i.e., giving authorship to those not making a significant contribution). Our study examined whether honorary authorship occurs because of the desire to include all or many team members. Interviews with project principal investigators ($n = 6$) and early-career project members ($n = 6$) from 6 interdisciplinary environmental science research teams revealed that

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principal investigators frequently employed inclusion-motivated honorary authorship but that this practice had some negative impacts on early-career team members with less power and status, thereby undermining true inclusion of those from underrepresented groups. We believe our findings are of import not only for environmental scientists, but also for scholars who are interested in issues of authorship decision-making regardless of disciplinary affiliation.

Keywords Honorary authorship · Inclusion · Power and status · Interdisciplinary research · Research teams · Environmental science

Honorary authorship, a term describing what occurs when authorship is given to individuals who do not meet a discipline's established criteria for co-authorship, has become an area of concern in scholarly circles for a number of reasons (Greenland & Fontanarosa, 2012). Publishing scholarship is imperative for disseminating knowledge and advancing fields of study (Conn et al., 2015). It also provides career benefits to those in academia because it plays a central role in building one's reputation and in annual reviews and promotion within the tenure system, particularly in research-focused institutions (Flanagan, 2015). However, power dynamics related to social status (e.g., gender) may determine one's authorship opportunities and authorship credit (Street, Rogers, Israel, & Braunack-Mayer, 2010). Issues of publishing and career progression are also complicated by increasing pressure for engagement in interdisciplinary scholarship as a means of integrating knowledge and capitalizing on the practices of multiple disciplines (Spelt, Biemans, Tobi, Luning, & Mulder, 2009). As publications have become more important and teams have become larger and more interdisciplinary, the number of authors has increased, which has made it more difficult to determine authorship credit and to discern whether honorary authorship is involved (Borenstein & Shamoo, 2015; Greenland & Fontanarosa, 2012).

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Concurrently, universities and colleges have become increasingly diverse in the composition of their students and faculty members (Smith, 2015), and there is a growing interest in social group inclusion. This term is defined as academic and scientific environments in which all feel welcome, valued, and respected and in which all individuals' viewpoints and perspectives are heard (Lirio, Lee, Williams, Haugen, & Kossek, 2008). These changes can bring challenges to scientific team leaders as they seek to be inclusive of team members who vary along a number of dimensions, including race/ethnicity, gender, nationality, sexual orientation, and academic discipline (Leca & Vrâncanu, 2014). However, having a diverse team does not ensure inclusive practices; research suggests that team members with lower power and status are less involved in decision-making and other team processes, thereby impeding the potential benefits of diversity (Bunderson, 2003; Bunderson & Reagans, 2011). In this article we integrate the concerns raised by the literatures on diversity, interdisciplinarity, and honorary authorship. For our study we drew upon 12 interviews with members of six interdisciplinary environmental science teams in order to examine the role of power, status, and desire for inclusion in honorary authorship practices. We believe our findings are of import not only for environmental scientists, but also for scholars who are interested in issues of authorship decision-making regardless of disciplinary affiliation.

The Concept of Honorary Authorship – Power and Practices

Although authorship criteria vary by discipline, most scientific journal policies state that authorship requires drafting the manuscript or revising it critically for important intellectual content (Bošnjak & Marušić, 2012). Similarly, in environmental science, the discipline examined in our study, authorship policies typically require that authors make a “significant” or “substantial” contribution to the research and/or manuscript. Despite these guidelines, honorary authorship appears to be fairly common and is a practice of growing concern across academic disciplines, with reported rates ranging from 20% - 50% of published papers (Kennedy, Barnsteiner, & Daly, 2014; Wislar, Flanagan, Fontanarosa, & DeAngelis, 2011). The literature suggests that honorary authorship is often granted in order to increase an individual's perceived productivity (i.e., gift authorship) or to increase the likelihood that a paper will be published (i.e., guest authorship; da Silva & Dobranszki, 2015; Greenland & Fontanarosa, 2012).

Our findings suggest that honorary authorship can also be motivated by a desire for broad inclusion, that is, to include as authors as many team members as possible. Specifically, we have uncovered a phenomenon that we refer to as *over-inclusive authorship*, wherein authorship was granted in the name of inclusion to team members who did not meet disciplinary criteria for authorship. Although motivated by positive intentions, this practice in fact undermined social group inclusion (i.e., supporting those from underrepresented or low status groups) by negatively affecting those on the team with low power. We use “inclusion” to refer to the incorporation of a wide number of team members, “over-inclusive authorship” to refer to the practice of listing a wide number of team members as authors when not warranted, and “social group inclusion” to refer to including individuals from underrepresented or low status social groups.

Even though over-inclusive authorship might seem more benign than gift or guest authorship, all three types of honorary authorship are problematic. Those who are

inappropriately given authorship cannot confirm the validity of scientific results, and such practices may exploit early-career and student colleagues by creating a culture that rewards unfair practices (Street et al., 2010) and may minimize the primary authors' contributions (Borenstein & Shamoo, 2015; Hagen, 2008). Furthermore, the negative impact may be particularly felt by early career and underrepresented scholars; to the extent that these team members have relatively low power and status, they may experience more of the negative consequences but feel they cannot protest such practices.

Power

Power refers to an individual's ability to control or influence decisions, outcomes, and other people (Fiske, 2010). Power dynamics among team members play a crucial role in the development, implementation, and impact of any collaboration. In particular, the actions and decisions of powerful team members (e.g., team leaders, principal investigators) can strongly influence team practices, such as authorship norms (Janss, Rispen, Segers, & Jehn, 2012). Team leaders are also key agents in setting a culture of social group inclusion through their policies and interactions with team members (Salazar, Lant, Fiore, & Salas, 2012; Shore et al., 2011).

In contrast, low power individuals may lack voice, which is an agentic, constructive behavior that involves speaking up about important issues in organizational settings with a goal of making improvements to the status quo (Morrison, 2011). Research shows that people are less likely to use agentic voice when they do not feel efficacious, perceive costs to their careers for doing so, are newer within an organization, and believe that leaders do not support upward communication (Morrison, 2011). Additional factors may also dampen the use of voice: through the phenomenon of *groupthink*, in which consensus is the primary goal, individuals may be "induced to consent to organizational practices, despite the possible disadvantages for the people involved" (Doorewaard & Brouns, 2003, p.107). Thus, team members, especially those lacking power, may experience psychological pressure that results in a willingness to accept decisions made by powerful team leaders even when those decisions do not benefit them.

Practices

This lack of power extends to team authorship practices and may result in certain authorship practices leading to harmful outcomes for low power co-authors (e.g., students, early-career scholars, women, and racial/ethnic minorities). For example, students vs. faculty members, and untenured faculty members vs. tenured faculty members, perceive themselves as having less power in authorship decision-making (Geelhoed, Phillips, Fischer, Shpungin, & Gong, 2007). Further, Street et al. (2010) found that some early-career scholars (e.g., graduate students, early-career faculty) reported discomfort or an inability to raise concerns regarding authorship within collaborations with senior researchers or supervisors, perhaps because of the "unbalanced dependence" of early-career team members on more senior team members (Zucker, 2012, p. 781). Moreover, studies have found that both male and female team members commonly attribute more value to the expertise of male team members (Joshi, 2014) and that women frequently undervalue their own contributions to collaborative work (Haynes & Heilman, 2013). Implicit biases, miscommunication, and a perceived lack of voice may contribute to low power individuals' relative inability to challenge authorship decisions

(Doorewaard & Brouns, 2003; Joshi, 2014; Zucker, 2012). Thus, over-inclusive authorship, by which the desire for inclusion leads to honorary authorship, may actually undermine social group inclusion because inflating a manuscript's authorship list may disproportionately harm early-career scholars by diluting the professional recognition of and credit given to their contributions. To the extent that early-career scholars lack power and voice on their team, they may feel unable to protest such practice.

Theoretical Framework

One prominent framework for understanding how teams effectively work together is the Input-Process-Output (IPO) model of teamwork originally developed by McGrath (1964). The IPO model articulates the dynamic interplay between input (e.g., resources available to the team and characteristics of team members), processes (e.g., the dynamic practices by which team members meet task demands), and output (e.g., team performance) in the pursuit of team goals. Further, the IPO model frames team practices as part of a system rather than simply a series of individual interactions. Kozlowski and Ilgen (2006) expanded upon McGrath's (1964) model to focus on team decision-making related to resolving task-driven problems, such as coordinating team members' efforts to meet task demands and satisfying team members' needs.

In our study, the input consisted of individuals' power and status within the team and their desire for inclusion. The output we examined consisted of whether over-inclusive authorship occurred and, if so, what individuals' perceptions were of the consequences of this practice. The processes that connected input and output were team members' attitudes about over-inclusive authorship and the power dynamics within the team. This framework helped us to focus on these processes as contributing to over-inclusive, honorary authorship. Accordingly, it provides an appropriate structure for examining the process of assigning authorship within environmental science teams, and we suggest that this model may be useful to others examining authorship practices.

The Study

Research Question

Our research question was how team power dynamics and the desire for team inclusion affect authorship practices and how individual perceptions of these factors differ between senior and early-career team members. Our examination of this question contributes to the literatures on diversity and inclusion, team science, and organizational power as they relate to the important area of authorship practices in research teams. We received IRB approval prior to the start of the study, conducted interviews in 2015, and engaged in data cleaning and analysis between 2015 and 2016.

Participants

Our sample ($n = 12$) was comprised of one project principal investigator (PI; $n = 6$) and one early-career (EC) project member (i.e., graduate student, post-doc, or assistant

professor; $n = 6$) from six project teams who received NSF-funded, interdisciplinary grants in environmental science. Potential participants were identified from the NSF database of awards for three interdisciplinary and often collaborative funding programs in environmental science. Thus, our study involved twelve people, two each from six project teams, representing nine institutions. To reduce the potential for participant identifiability, we do not provide the names of the specific programs. We opted to study teams in environmental science because research in this area is often interdisciplinary; however, to our knowledge authorship issues in this discipline have not yet been studied. For a team to be eligible for inclusion, it had to have a minimum of three co-PIs (to increase the likelihood of team interdisciplinarity and diversity); and the project needed to have been active for at least two years. We randomly selected teams from among those eligible until we had interviewed two individuals (one PI and one EC team member) from six teams. For each team, we requested that the project PI provide us with the contact information for an appropriate EC individual.

All six PIs were White men who were senior scholars (e.g., tenured professor, senior research associate) with an average age of 54.1 years ($SD = 8.7$ years). Five of them were U.S. citizens, and all identified as heterosexual. Of the EC participants, there were 3 White women, 1 woman of color, 1 White man, and 1 man of color. The six EC team members were either graduate students ($n = 2$), post-docs ($n = 2$), or untenured assistant professors ($n = 2$) at the start of their NSF-funded project. EC team members had an average age of 35.3 years ($SD = 8.1$ years), four of the six were U.S. citizens, and all but one identified as heterosexual.

Procedure

We conducted all interviews virtually and recorded them using Zoom virtual meeting software. The first author, a faculty member in Psychology, interviewed all of the PIs; a graduate student in Education interviewed all of the EC participants. Interviews lasted from 1 to 1.5 hours. We included authorship questions, such as the following. “Does your team have any formal policies (or informal guidelines) regarding how you assign authorship?” “Do you think that formal policies about authorship are/would be helpful?” “Has your team experienced any tensions or difficult decisions related to authorship practices?” “What are your experiences with honorary authorship on this team?” “Have you given honorary authorship or received it?” We defined honorary authorship to participants as including someone as an author who did not make a significant contribution to the work.

We transcribed each interview, removed identifying information, and analyzed the data using inductive thematic analysis, which allows categories and concepts to emerge that are rooted in participants’ narratives rather than imposed upon the data by researchers’ preconceived theories (Braun & Clarke, 2006). Two graduate research assistants coded the interviews until they reached interrater reliability (Cohen’s kappa) of .80, indicating strong agreement (McHugh, 2012). We began with open coding of participant responses in which meaning was assigned to phrases and sentences. From these open codes we created categories of related or similar codes and organized them into higher-order themes, which we present in the results. In order to protect the confidentiality of individual participants and reduce the possibility of identifying members of the same team, we assigned PIs identification numbers 1–6 and assigned EC participants identification numbers 7–12. When providing illustrative quotations, we report participants’ PI or EC status and identification number (e.g., PI-2 or EC-12).

Results

Our results revealed that honorary authorship appeared to be fairly common in these research teams, but not for the two most commonly cited reasons (gift or guest authorship); rather, it was motivated in part by a desire to be “inclusive.” In all of the teams, the project PIs determined the rules and expectations around who would be included as an author on a paper and in what author position. Thus, it was the team PIs who encouraged the practice we refer to as over-inclusive authorship, or including individuals as authors who do not meet established disciplinary criteria (i.e., writing or making a substantial intellectual contribution to a manuscript), in the name of inclusion. Although the PIs appeared to be well-intentioned in their tendency towards over-inclusive authorship, some EC team members perceived costs to this practice. These ideas are described further below in relation to the three themes that emerged in response to our research question of how team power dynamics and desires for team inclusion influence authorship practices, and whether perceptions of authorship practices differ by career status. These themes are (1) the relationship between inclusion and authorship practices, (2) motivations for over-inclusive authorship, and (3) consequences of over-inclusive authorship. In our presentation of the results, we also note where power and status may influence perceptions of inclusion and authorship practices.

The Relationship Between Inclusion and Authorship Practices

Our first theme identified how participants linked the desire for inclusion to their team’s authorship practices (i.e., input to output; see Elliott et al., 2016, for further details on the content of specific authorship policies for each team). All PIs viewed inclusive authorship as a team norm and a goal. For example, PI-5 said, “I’m trying personally to be as inclusive as possible, which means, when it’s my papers, I tend to involve more people than others would.” Noting the challenges associated with authorship decisions, PI-4 said, “I’m always inclusive, not exclusive, and sometimes deciding what is enough contribution ...can be tricky.” Similarly, PI-6 said, “Whether it’s considered ethically appropriate or not, we err on the side of generosity.” Thus, inclusion and generosity were spontaneously used as justification for over-inclusive authorship, without interviewers using these terms. Participants also described over-inclusive practice when they described including technicians or data collectors as authors even when that was their only role, including project funders as authors, and granting authorship to all of the PIs on the grant even if a manuscript described a segment of the work in which they had not been involved. Yet, when directly asked, each of the PIs denied engaging in honorary authorship, which we had defined as including someone as an author who did not meet the disciplinary criteria for authorship.

All of the EC team members shared the PIs’ perceptions that team papers tended to be inclusive, and they often used that term. They all described inclusivity as a key principle in authorship decisions. For example, in response to a question of whether anyone on the team had withheld authorship, EC-11 said, “I think it’s more inclusive than exclusive.” EC-9 described her attitudes regarding her team’s authorship practices, saying, “...it resonates with me, the inclusiveness and letting- you know putting people on there.” She later added, “I think we’ve always erred on the side of (laughs) over-inclusion. No, I don’t think anyone has been excluded.” Four of these six EC participants (the graduate

students and post-docs) denied that honorary authorship had occurred on their team, and they expressed favorable perceptions of their team's authorship practices.

However, the two ECs who were assistant professors during the early years of their team's projects expressed the perception that they believed honorary authorship may have occurred on their team; and they were more ambivalent about the practice. For example, EC-8 indicated her uncertainty about inclusive authorship in both her words and her hesitant communication style:

I guess I just – yeah, I'm a little bit two-minded. I feel like I've given a lot to the project, and I kind of am expecting to be rewarded by being included as – I've included people who have hardly done anything on papers as authors... on papers that I've written, and I guess I would kind of expect the same, but I don't know if that's gonna [sic] happen...I am also a lead author on a paper with 20, 25 authors, and it's a real pain. So, I also realize it's really difficult to be very inclusive.

Similarly, EC-10, also an assistant professor, describes her concerns with over-inclusive authorship based on her experience as lead author on one of the team's papers.

There was only me and one other person that [sic] I would say wrote the paper., and then I think there were one or two people who never even commented on the paper, but most people at least responded and was [sic] like “looks great” or gave some minimal sort of input.

Later, EC-10 noted her concerns with such a practice:

My *personal* philosophy is, if I'm on a paper, I'm gonna [sic] *at minimum*, give it a good review. ...But, you know, I would never be on the paper and not read it without comment, and a lot of people do do that, and so... there's an element of frustration there that I think skews my “let's include everyone approach” (with sing-song voice).

Thus, all participants viewed inclusion as important and desirable and justified what we would define as honorary authorship as a means of promoting inclusion. That is, teams were engaging in the practice of over-inclusive authorship. Whereas all of the PIs viewed this practice positively, there was some variability in the EC's perceptions. These perceptions differed by career stage, and possible reasons for them also emerged in the two remaining themes.

Motivations for Over-Inclusive Authorship

Within our second theme, we identified teams' motivation (i.e., team processes) for engaging in over-inclusive authorship as stemming from (a) a moral view of inclusion as a valued behavior and (b) a research-focused view of inclusion as promoting project goals.

The *moral motivation* viewed inclusion as a valued behavior, especially in contrast to exclusionary practices, as described by PI-2:

There's [sic] two kinds of authorship mistakes that I think you could make. One, you could have someone included in the paper that didn't really do that much....The other type of error is, “You know, I should've been on that paper.” That's a much more divisive kind of error, and I think people are very keen to avoid that one.

EC-11 (a graduate student) similarly described inclusive authorship as preferable to exclusive. She said, “The thing is, to get a paper out, so many people are involved and

included, so why not. If they made it possible for you to get this, why not include them? It's not gonna [sic] hurt you." EC-8 (assistant professor) described the practice in terms of being "nice" and rewarding team members for their work on the broader project, if not the specific paper:

In leading a subproject, I feel like there's [sic] some people who really contributed a lot even though they didn't contribute conceptually or write the paper, but they contributed a lot by doing data collection, and I feel like it's nice – I feel like I should recognize those people at least by giving them an authorship on one of the papers.

Thus, many team members in our study saw inclusive authorship practice as morally right—it was a good and "nice" thing. In many ways, pitting exclusion against inclusion serves to validate over-inclusive authorship practice, but perhaps a more appropriate dichotomy is between true inclusion and over-inclusion. Authorship was often used to reward individuals for their work on projects; and many viewed the practice as without harm, with only benefits for the team as a whole and for individual team members – an assumption which, as outlined in the third theme, was not always accurate.

Our participants also described *research-focused motivations* for engaging in inclusive practice in which inclusion served project goals by promoting team cohesion and positive relationships. One way in which this subtheme was described was that including everyone was a way of preventing conflict regarding authorship decisions:

I've always taken a very inclusive view towards publications, and ... so I would say it's kind of reinforced the idea that [excluding individuals that should have been authors] is a source of great unhappiness that it would be good to avoid. (PI-2)

This PI continued to make a clear link between inclusive authorship and avoidance of conflict when he said, "I can't think that there's any kind of simmering resentments out there because the papers that we publish have had a really long lists of authors. I don't think people have been left off." EC-9 echoed this sentiment when she said, "I think there've been times where we disagreed, where I don't think someone has contributed at all, but just for the [sake of] keeping everyone happy (laughs), they've been included." She later added, "...I'm probably still learning about the...nuances and realities of working with a group where sometimes it's worth keeping people happy and things moving more than being right." Thus, part of achieving project goals was accomplished by managing the emotions of team members – "keeping people happy," avoiding "simmering resentments," and "great unhappiness," which might occur if team members feel wronged in not being included as authors on a paper. Over-inclusion acts to counter this possibility and was perceived as keeping the project moving positively forward.

These moral and research-focused motivations for over-inclusive authorship superseded the ethical standards around the expected contributions that confer authorship. Many participants clearly articulated that what they were doing was outside the norm for ethical authorship decision-making, often in a grey area between ethical and unethical behavior. Yet, they justified the behavior as having positive benefits for the team and the scholarship and as not causing harm. However, the third theme (Consequences) highlights some ways in which over-inclusive authorship practice may cause harm, particularly for EC team members.

Consequences of Over-Inclusive Authorship

Our results revealed that the consequences of over-inclusive authorship (i.e., the output) varied by career stage, with differences observed (1) for PIs; (2) for untenured, assistant professor ECs; (3) for post-doctoral ECs; and (4) for graduate student ECs. One of the greatest concerns about over-inclusive authorship was that the large number of co-authors would diminish the credit received by those who made the most significant contributions to the paper. However, concerns about dilution of credit varied between PIs and EC team members, as well as among EC team members, depending on their career stage.

For PIs, the consequences of engaging in an over-inclusive practice were minimal because of their seniority and career stage (e.g. tenured faculty, senior research associate). PI-4 explained his position as follows: “I say it’s the career stage, too. ...I have published enough, people can recognize the work I’m doing in the paper even if I’m not the corresponding author.” PI-6 similarly remarked, “You get to a certain stage in your career where you can be a little more generous with certain aspects of where you fall into authorship....” Such statements indicate that the PIs, who were all senior scholars and White males, expected that they would be acknowledged as contributing to publications, regardless of their authorship position, as a function of their expertise and more privileged status in their fields. Furthermore, senior scholars may even benefit from ceding primary authorship roles, since, as outlined by EC-10 (an assistant professor), this practice may be perceived as good mentoring: “There’s the shift post-tenure ...where, especially if it’s your students that [sic] are first authors, that’s showing your mentoring capabilities.”

However, for the EC team members, such credit would not be automatically granted. It is noteworthy that the two interviewees who were the most circumspect about over-inclusive authorship were the two individuals who were (or who had recently been) untenured assistant professors. Both of them were aware of the ways in which this authorship practice could dilute the credit given to those who contributed most heavily to the papers. EC-8, when describing her experience as lead author on a paper with 25 co-authors, remarked on what she had heard about another discipline: “The more authors you have, the less credit you are able to take for getting something published even if you’re lead author.”

Similarly, EC-10 described an experience as lead author of a paper with a large number of co-authors, many of whom had provided little feedback on the paper. Although she said that she valued the collaborative nature of the team’s approach, she also expressed misgivings: “I have mixed feelings about it. I don’t mind it with this team in particular, but... just having that many authors – it makes my CV really bulky (laughs), all those names.” When asked whether she agrees with her team’s authorship norms, she expressed ambivalence: “You know, if I were leading the team, I don’t know if I would follow them exactly.”

The post-doctoral and graduate student EC team members we interviewed did not share these concerns regarding the dilution of their credit. Instead, the post-doctoral EC team members expressed uncertainty about whether they would be authors on particular papers and how their names would be ordered. This was especially pronounced on teams without written authorship policies, apparently the consequence of having policies that were very inclusive but not very explicit regarding when individuals would be authors

and their authorship position. For example, when asked about his opinion of his team's authorship practices, EC-7, a post-doc, said:

You know, the problem is, is we don't know how it's going to shake out. Like you said, there's no official policy, so I would be pleasantly surprised if I'm on the big synthesis papers, and I expect to be on local ones, and you know hopefully it works out that way.

Similarly, EC-9, another post-doc, expressed concerns about whether she would be the first author on papers related to a model she was building:

One thing that I would do differently for myself is negotiate for this huge model I'm building and ...negotiate who will be first author because I didn't pick the model, and I didn't get to do a lot of the planning work, but I've done all the *actual* work (laughs). And I don't know that there's gonna [sic] be a problem. I'm hoping that there won't be, but it's...something I wish I had thought of to do right from the onset.

In contrast to the credit dilution concerns expressed by the assistant professors and the uncertainty regarding authorship felt by the post-doctoral scholars, the graduate student EC members were pleased with their teams' authorship practices. EC-12, a graduate student, expressed agreement with his team's clear, written authorship policies, which he noted aligned well with his own attitudes toward authorship: "I'd say my personal policies for authorship have been similar to what [the PI] is using as policies within the lab...I've tried to stick to similar policies myself ...even before joining the lab." EC-11, another graduate student, noted, "I'm grateful that I learned it this way as opposed to a more cut-throat way of doing authorships [sic]." She later elaborated on her perspectives about "cut-throat" conventions that exclude those who make contributions through data collection and analysis:

People are so concerned with getting their name out there and...kind of screwing other people over in the process. I've been lucky to be on this project where we didn't do that. It was just like if you contributed, even if you just did something that you felt was trivial, you contributed to the greater scientific good.

This student expressed a strong agreement with her team's over-inclusive authorship practice and felt that this approach to authorship should be adopted by the greater research community.

The positive, accepting attitudes of both graduate students may be due to their very early career stage. Graduate student team members may be engaging in tasks, such as data collection, that might not typically earn them authorship. For these individuals, like the PIs, the advantages of over-inclusive authorship may be more salient than any possible costs. Further, their greater distance to tenure may mean that they are less likely to see the dilution of credit as a career advancement concern. Thus, the consequences of over-inclusive authorship clearly varied by career stage, with the most positive impact felt by the most senior, PIs, and the most junior, graduate students, team members we interviewed. In contrast, the more senior EC team members (i.e., assistant professors and post-docs) perceived less clear outcomes for this practice, feeling either uncertainty about their authorship on team papers or concern that their career advancement would be negatively affected if their contribution as first-author was not recognized by colleagues during promotion and tenure decisions.

Our results suggest that PIs, who made the authorship rules, were teaching their EC team members a way of assigning authorship that is, by their own admission, in an

ethical grey area. Their comments suggest that EC team members perceive themselves as learning and adopting this specific way of collaborating. Thus, socialization into authorship norms and practices was clearly taking place within the teams we studied. Problematically, the PIs were unaware of the potentially adverse outcomes of over-inclusive authorship on EC team members. Their privilege and status meant that they were not concerned about their contribution being diluted because they were known in the field and had elevated career status, and they did not experience uncertainty about authorship because they were the ones making authorship decisions. Conversely, although the impact of over-inclusive authorship on EC team members was not uniform, some perceived negative outcomes with significant career implications.

Discussion

Previous research has shown that honorary authorship may take place in order to increase an author's perceived productivity (gift authorship) or to increase the likelihood of publication (guest authorship; da Silva & Dobranszki, 2015; Greenland & Fontanarosa, 2012). The results of this study suggest that honorary authorship might also take place because of a well-intentioned, yet misdirected desire for the inclusion of as many team members as possible. We refer to the practice of listing individuals as authors who do not merit authorship based on established disciplinary criteria in the name of inclusion as *over-inclusive authorship*. Within the IPO model framework, the desire for inclusion was an important input that led to over-inclusive authorship and a perception that this practice was beneficial for the team. The two assistant professors' perceptions of positive aspects of this practice were in conflict with their views that over-inclusive authorship might harm their individual careers. Team power dynamics and perceptions of over-inclusive authorship as both morally valuable and important for the success of the research were the processes that appeared to mediate these relationships.

Referring to over-inclusive authorship as "inclusive" and "generous" masks the ways in which it may reflect an unethical practice. Further, we suggest that, because of inclusion's multiple meanings, claims of authorship practice to foster inclusion may falsely, but perhaps unintentionally, capitalize on the positive connotation of "inclusion" as it refers to the participation and support of all social groups (i.e., social group inclusion). However, over-inclusive authorship and social group inclusion are different phenomena; the moral good attached to the term "inclusion" (and its connection to positive values around diversity) may stifle dissent from over-inclusive authorship. As a result of its negative consequences, especially for early-career team members, the practice of over-inclusivity may run counter to meaningful social group inclusion. This is an unfortunate reality, as research suggests that having a diverse team can accrue benefits because team members from different backgrounds bring complementary knowledge (e.g., skills, perspectives; Bunderson, 2003; Bunderson & Reagans, 2011). For example, teams with cultural or ethnic diversity tend to be more creative, flexible, and innovative; further, teams with gender diversity operate more effectively than homogeneous teams (Bear & Woolley, 2011; McLeod, Lobel, & Cox, 1996). However, if underrepresented team members lack voice or are harmed by their teams' practices, the benefits of this diversity may not be realized.

We also found that the power and status of individual team members played a significant role in authorship practice through the process of team power dynamics.

Specifically, PIs had the greatest power and status, established general rules for authorship, and viewed over-inclusive authorship as without costs. At the other end of the spectrum, assistant professors worried that their contribution on the paper would be diminished by large numbers of co-authors. As the assistant professors were women, these concerns may be warranted; Sarsons (2015) found that in the field of economics, where authorship is customarily listed alphabetically, women with male co-authors are less likely to receive tenure than men with male or female co-authors, suggesting that they receive less credit and recognition for their contribution to the manuscript. Notably, it seemed that both post-docs and assistant professors were unwilling or unable to express their authorship concerns, likely because they lacked power and voice.

All EC participants described experiences that suggest that socialization, or an understanding of the team's values, goals, and norms (Chao, O'Leary-Kelly, Wolf, Klein, & Gardner, 1994), is taking place within teams. Specifically, ECs were learning the norm of over-inclusive authorship, which we suggest is a form of honorary authorship. This form of socialization is an additional process that we had not theorized, but it was also influenced by power and status. Because this practice was couched in the language of inclusion and generosity, there was a lack of critical discussion of the ethics of the practice; and EC team members were more likely to adopt it unquestioningly.

In our randomly selected sample, all six of the PIs were men and four of the six ECs were women. Thus, there is a confounding of status and gender within our sample that makes it difficult to know whether some of the effects we identified are due to power, gender, or both. However, the imbalance in our sample represents the way that women decrease in numbers as they move up the career ladder in science (National Science Foundation, 2015); and thus our results may reflect the experiences of many environmental scientists. Further, the ECs in our study were not only more likely to be female than the PIs, they also represented diversity in terms of race/ethnicity, sexual orientation, and place of origin. In contrast, all the PIs were White and heterosexual; only one was a non-U.S. citizen (although two were born outside the U.S.). Thus, the ECs' lower power and status based on their career stage intersected with other marginalized social group memberships. Demographic similarity affects who is granted power within teams because individuals trust and like others who are similar to themselves (McPherson, Smith-Lovin, & Cook, 2001). We believe that the dissimilarity between the ECs and PIs in our study was rather significant and may have contributed to the ECs' lack of voice, that is, their perceived inability to dispute the practice of over-inclusive authorship (Doorewaard & Brouns, 2003).

Further, our results reinforce the importance of team leaders in setting the team culture and practice norms (Shore et al., 2011). Studies have noted the importance of team leaders in promoting trust among team members, as well as their role in effective conflict management (Salazar et al., 2012). In our study, authorship decisions were made by PIs and were motivated by morality and/or research productivity. The PIs were also attempting to avoid conflict, and these decisions may have led to non-optimal choices that stifled true inclusion. Based on our results we suggest three ways in which team leaders could change their practices to support authorship decision-making that is truly inclusive.

First, team leaders who want to practice inclusive authorship should provide team members with opportunities to engage in activities that earn them authorship, rather than providing honorary authorship. Importantly, early in the project timeline, team leaders should discuss with the entire team what activities warrant authorship so that team members can make informed decisions about their involvement in the research. The activities that are

considered a “contribution to the research” should be informed by disciplinary guidelines; however, because of the interdisciplinary nature of the teams, leaders should not assume that all team members are aware of or agree with these guidelines.

Second, team leaders could develop formal authorship policies that are co-created by the team rather than determined solely by team leaders (for an example, see Cheruvilil et al., 2014). This practice introduces clarity and transparency in authorship decisions and may promote EC team members feeling that they have a voice. Universities and research institutes could assist in this process by providing training (e.g., through Collaborative Institutional Training Initiative modules, workshops, or webinars) to project leaders on general issues that may affect authorship practices, such as power dynamics, team management, and dealing with conflict, as well as training that focuses more specifically on authorship and other ethical concerns.

Third, teams can create an authorship committee comprised of team members at all career levels with a periodically rotating membership. This committee would be charged with ensuring the implementation of the team’s authorship policy and would mediate any authorship conflicts that may arise. We suggest that such changes in authorship practices will foster a culture that promotes voice and true inclusion in team practices and outcomes (Elliott et al., 2016).

Limitations and Future Research

Our study included only 12 individuals who were not evenly distributed across gender, race, and other dimensions. Thus, future research, both qualitative and quantitative, is needed to determine the extent to which our finding, that honorary authorship occurs in the name of inclusion, might transfer to the larger community of environmental scientists or to those in other interdisciplinary research teams. Nevertheless, by interviewing a PI and EC member from each team, we were able to identify some ways in which power and status influence the perceptions and consequences of over-inclusive honorary authorship and some of the underlying reasons for this practice. In addition, because we identified EC team members by soliciting names from the PIs, our EC participants may have been those who had positive relationships with the PI or were perceived by PIs as productive or satisfied with their involvement on the project. The fact that negative consequences still emerged given this sampling limitation speaks to the potential harm that over-inclusive authorship may have on EC individuals.

We also note that a challenge involved in defining over-inclusive authorship is that it is sometimes unclear whether specific tasks (e.g., data collection or data analysis) are sufficient by themselves to warrant authorship unless they are done in conjunction with other tasks, such as conceptualizing the project or drafting the manuscript. To the extent that the norms of environmental science and other disciplines focus on making a “significant” or “substantial” contribution in order to warrant authorship, they provide limited guidance about this issue. For the purposes of this study, we classified the practice of the teams we studied as over-inclusive based on the acknowledgment of the interviewees that some team members were included as authors even though they did not make significant contributions to the publications. However, it would be helpful for professional societies and scholarly journals to provide greater clarity about what counts as a significant contribution so as to address the ethical dilemma. For example,

as datasets become increasingly large and data analyses more complex, it may make more sense to count these tasks as significant contributions that warrant authorship, especially if they come to involve decision-making that shapes the framing or interpretation of the research.

Conclusion

Our study examined whether honorary authorship might occur in the name of inclusion and the role of power and status in authorship decisions. The results indicated that inclusion was often invoked by our participants to justify a practice (i.e., honorary authorship) that may fail to promote the interests of all EC team members, and thus fail to be truly inclusive. Rather than seeking the creation of meaningful inclusion, at both the level of authorship and at the broader level of the team, we found that so-called inclusive authorship norms are frequently created and implemented because of both moral and research-focused reasons. Because of team power dynamics, over-inclusive authorship practice contributed to hindering social group inclusion. True authorship inclusion occurs when a wide range of team members are invited to do work that earns them authorship on a manuscript and when the team culture provides a safe space for discussion and dissent concerning authorship practices and power dynamics. Given the importance of authorship for individuals' academic career outcomes, scholarship that addresses true inclusion, both in terms of fair authorship practices and the participation of underrepresented groups, is critical.

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