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Faculty Public Engagement Attitudes and Practices at the University of Wisconsin-Madison and other Land Grant Institutions

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Holesovsky, Bao, Rose, Brossard, Markowitz

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Table of Contents

Executive Summary ***5***
Select Results 6

Part 1: Faculty in the Sciences ***8***

Section 1: Views of science and the public **9**
Figure 1.1. Views of the public regarding science. 10
Figure 1.2. Views of science in society 11
Figure 1.3. Views of scientific decision-making 12

Section 2: Social media use and attitudes **13**
Figure 2.1. Frequency of social media platforms use 14
Figure 2.2. Frequency of social media use for specific science-related purposes 15
Figure 2.3. Social media attitudes 16

Section 3: Engagement activities and training participation **17**
Figure 3.1. Participation in infrequent public engagement efforts over their careers 18
Figure 3.2. Participation in frequent public engagement efforts over the previous year 19
Figure 3.3. Willingness to participate in future infrequent public engagement efforts 20
Figure 3.4. Willingness to participate in future frequent public engagement efforts 21
Figure 3.5. Participation in science communication trainings 22

Section 4: Defining public engagement **23**
Figure 4.1. Definition of public engagement 24
Figure 4.2. Types of events considered public engagement 25

Section 5: Engagement climate and culture at universities **26**
Figure 5.1. University expectations for public engagement and outreach 27
Figure 5.2. University climate for public engagement 28
Figure 5.3. University barriers related to public engagement 29
Figure 5.4. University barriers related to engagement by participation 30
Figure 5.5. Graduate student support for public engagement 31

Section 6: Perceptions of self-efficacy related to engagement **32**
Figure 6.1. Autonomy to participate in engagement split by position 33
Figure 6.2. Self-efficacy related to public engagement 34
Figure 6.3. Self-efficacy related to public engagement by communication training experience 35
Figure 6.4. Use of social science research for science communication 36

Section 7: Engagement motivations, drawbacks, and barriers **37**
Figure 7.1. Motivations for engagement 39
Figure 7.2. Scientist drawbacks to engagement 40
Figure 7.3. Scientist barriers to engagement 41

Part 2: Faculty in the Arts and Humanities *42*

Section 8: Views of science and the public **43**
Figure 8.1. Views of the public regarding science 44
Figure 8.2. Views of science in society 45
Figure 8.3. Views of scientific decision-making 46

Section 9: Social media use and attitudes **47**
Figure 9.1. Frequency of social media platforms use 48
Figure 9.2. Frequency of social media use for specific work-related purposes 49
Figure 9.3. Social media attitudes 50

Section 10: Engagement activities and participation **51**
Figure 10.1. Participation in infrequent public engagement efforts over their careers 52
Figure 10.2. Participation in frequent public engagement efforts over the previous year 53
Figure 10.3. Willingness to participate in future infrequent public engagement efforts 54
Figure 10.4. Willingness to participate in future frequent public engagement efforts 55

Section 11: Defining public engagement **56**
Figure 11.1. Definition of public engagement 57
Figure 11.2. Types of events considered public engagement 58

Section 12: Engagement climate and culture at universities **59**
Figure 12.1. University climate for public engagement 60
Figure 12.2. University barriers related to public engagement 61
Figure 12.3. Graduate student support for public engagement 62

Section 13: Perceptions of self-efficacy related to engagement **63**
Figure 13.1. Self-efficacy related to public engagement 64
Figure 13.2. Use of social science research for science communication 65

Section 14: Engagement motivations, drawbacks, and barriers **66**
Figure 14.1. Motivations for engagement 67
Figure 14.2. Scholar drawbacks to engagement 68
Figure 14.3. Scholar barriers to engagement 69

Part 3: About the Survey *70*

Section 15: Sampling and Procedures **71**
Figure 15.1. Total Faculty Responses from Land Grant Universities 72

Section 16: Final Sample information **73**
Figure 16.1. Distribution by research designations 74
Figure 16.2. Distribution by U.S. regions 74
Figure 16.3. Respondents' fields of study 74
Figure 16.4. Respondents' primary university position 75
Figure 16.5. Respondents' additional university positions 75
Figure 16.6. Respondents' extension appointments 76

Section 17: Fields of study **77**

Section 18: Respondent demographics **78**
Figure 18.1. Respondents' ages 79
Figure 18.2. Respondents' races 79

Appendix A: Responses across regions of the U.S. 80
Figure A.1. Views of the public regarding science by U.S. regions..... 81
Figure A.2. Views of science in society by U.S. regions..... 82
Figure A.3. Views of scientific decision-making by U.S. regions..... 83
Figure A.4. Participation in infrequent public engagement efforts by U.S. regions..... 84
Figure A.5. Participation in frequent public engagement efforts by U.S. regions 85
Figure A.6. Participation in science communication trainings by U.S. regions..... 86
Figure A.7. University climate for public engagement by U.S. regions 87
Figure A.8. University barriers related to public engagement by U.S. regions..... 88
Figure A.9. Autonomy to participate in engagement by U.S. regions..... 89
Figure A.10. Self-efficacy related to public engagement by U.S. regions 90
Figure A.11. Use of social science research for science communication by U.S. regions .91
Figure A.12. Motivations for engagement by U.S. regions 92
Figure A.13. Drawbacks to engagement by U.S. regions..... 93
Figure A.14. Barriers to engagement by U.S. regions..... 94

Faculty public engagement with science: Attitudes and practices at the University of Wisconsin-Madison and other Land Grant institutions

This report presents the current state of public communication with science efforts and attitudes of faculty at University of Wisconsin-Madison and all Land Grant universities across the United States. Using the results from a census survey, we examine faculty views of public engagement activities and the role of science in society, along with their current participation in a variety of science engagement and science outreach activities. We also explore the institutional climate surrounding public communication and factors that may encourage or discourage involvement in outreach and engagement.

Results presented in this report stem from a large-scale census of all faculty at 46 land-grant universities (within 45 university systems) across the U.S. The survey was conducted from May to July 2018. Our final sample consisted of N=10,706 respondents who were distributed across multiple fields. For UW-Madison specifically, the final sample consisted of N=564 respondents. More details can be found in the "About the survey" section, pg 70.

The following topics are discussed: faculty views of science and the public; social media use and attitudes; participation in engagement activities and training; faculty definitions of public engagement; perceived engagement climate and culture at universities; perceived self-efficacy for engagement; and motivations, drawbacks, and barriers to engagement.

Responses to the survey questions are presented in two groups: faculty in the Sciences (N=432 for UW-Madison and N=8,923 for all Land Grants) includes those who indicated they were in the social sciences, life sciences, or physics and mathematics and faculty in the Arts and Humanities (N=132 for UW-Madison, N=1,783 for all Land Grants) includes those who indicated they were in the arts and humanities or other non-science, profession-based fields.

To explore similarities and differences in attitudes and practices of faculty at UW-Madison compared to all the faculty at Land Grant universities, we highlight UW-Madison faculty's responses in most of the graphs within this report. UW-Madison respondents' views and attitudes tend to not vary too much in comparison with all of the Land Grant faculty, however there are a few notable differences which are depicted in the sections below.

Additionally, we also provide responses to survey questions distributed across the regions of the U.S. Figures showing public engagement-related attitudes attributable to cultural differences associated with the geographical locations of the land-grant universities spread across the United States (see Figure 16.2 for the distribution of responses across geographic location) can be found in Appendix A.

Select results from Faculty at UW-Madison

- Faculty at UW-Madison have mixed views of the public. Faculty agree that members of the public can bring valuable perspectives to discussions about scientific research (82% agreement among Science faculty; 64% agreement among Arts/Humanities faculty), they also view the public as generally uninformed about basic science (69% agreement among Science faculty and 70% agreement among Arts/Humanities faculty).
- Faculty have strong opinions about scientists' involvement in policy decisions about science, with 90% of faculty in the Sciences and 85% of faculty in the Arts/Humanities agreeing that scientists should be actively involved in political debates about science. Faculty in the Sciences are confident in the abilities of the scientific community to guide the responsible development of new technologies (74% agreement), as are faculty in the Arts/Humanities (64% agreement).
- Social media is not heavily used by faculty respondents in either field for work-related purposes, although some platforms are more heavily used than others. Of those on social media, around half (50%) of faculty reported that they never use social media for a variety of work-related purposes, such as sharing announcements about their new studies.
- Majority of UW-Madison faculty think social media should be used as a forum for discussing controversial topics (67% of faculty in the Arts/Humanities and 66% of faculty in the Sciences agree). However, faculty are still ambivalent about how social media use can impact their reputation. Around 15% only of faculty think that it does not.
- Overall, 98% of UW-Madison faculty have participated in at least one outreach or engagement activity. Traditional activities, such as giving public lectures or interviews with journalists, remain more popular.
- Not all faculty who have participated in outreach or engagement activities received training; only half (51%) of faculty in the Sciences at UW-Madison indicate they have had some type of science communication training.
- Institutional climate and culture surrounding public communication is perceived as lacking by faculty at UW-Madison. Only about 23% of faculty in Sciences and 28% of faculty in the Arts/Humanities agree that public engagement is treated as a core component of the work expected of faculty at their university.
- Respondents indicate that the culture towards public engagement is overall positive.
    - About three quarters of Arts/Humanities faculty (72%) and Science faculty (73%) reject the stereotype that faculty at UW-Madison who are active communicators are not very good researchers.
    - A high number of faculty in the Sciences (82%) reject the idea that public engagement is incompatible with the scientific culture.
- Generational changes may affect the culture of support for public engagement.

    - Over half (57%) of respondents indicate they were not encouraged by their advisors to get involved in engagement when they were graduate students.
    - Yet, faculty now support the engagement activities of their graduate students (around 90% agreement).
- There is mixed confidence in respondents' abilities to interact with their audiences.
    - Most respondents are confident they could have discussions with diverse audiences (about 83% agreement).
    - While 69% of faculty from the Arts/Humanities and 65% of faculty from the Sciences at UW-Madison do not think that answering questions from an audience is difficult, the remainders find it difficult or are unsure.
- About 72% of Arts/Humanities faculty and 81% of Science faculty think insights from social science research should inform science communication efforts, but only around half report paying attention to science communication research and around one third of faculty from Arts/Humanities (33%) and Sciences (28%) do not use it.
- Having a sense of duty (around 89% agreement) and personal enjoyment (84% agreement from faculty in the Sciences and 90% agreement from faculty in the Arts/Humanities) are strong motivators for participating in engagement.
- Opinions are more mixed in identifying common drawbacks to engagement. Faculty indicate that they may not get involved because it does not help their career (28% agreement from faculty in the Arts/Humanities and 29% agreement from faculty in the Sciences) or because it makes people a target (41% agreement among faculty in the Sciences and 43% agreement among faculty in the Arts/Humanities).
- Agreement on possible barriers to engagement are also mixed. Faculty are ambivalent about the ideas that most researchers are bad at engagement (around 38% ambivalence) and that they may have had bad experiences (47% of faculty in the Sciences and 52% of faculty in the Arts/Humanities neither disagree nor agree). Notably, faculty agree with the barrier that there are no institutional incentives to do so (55% of faculty in the Sciences and 60% of faculty in the Arts/Humanities at UW-Madison).

Part 1: Faculty in the Sciences

Section 1: Views of science and the public

Science faculty respondents at all Land Grant universities generally hold mixed views of members of the public (Figure 1.1). Most faculty in the Sciences agree that lay audiences can bring valuable perspectives to science discussions, but they also think members of the public lack an understanding of basic scientific principles. Further, many respondents still prescribe to a deficit model of thinking about public attitudes toward controversial science, with almost 41% of UW Science faculty and 43% of all Land Grant Science faculty agreeing with the idea that people would be more supportive of science if they understood it and just about 20% from UW and 18% from all Land Grants disagreeing.

Regarding views of how science is used in society (Figure 1.2) and who should be responsible for making decisions about scientific issues (Figure 1.3). Faculty respondents are mostly ambivalent about the idea that scientists know best what is good for the public (47% neither disagree nor agree at UW and 49% at all Land Grant faculty), however, they do agree that scientists should be actively involved in political debates about science (90% of UW faculty and 83% of all Land Grant faculty agree).

Respondents do think that the scientific community is capable of guiding the responsible development of new technologies (about 74% agree at UW and 75% at all Land Grants). There is also general agreement among Science faculty that scientists should pay attention to the wishes of the public (63% agree at UW and 55% at all Land Grants). Notably, those in the Sciences are highly confident in the abilities of scientists to responsibly guide technology development and generally agree that scientists should pay attention to the wishes of the public.

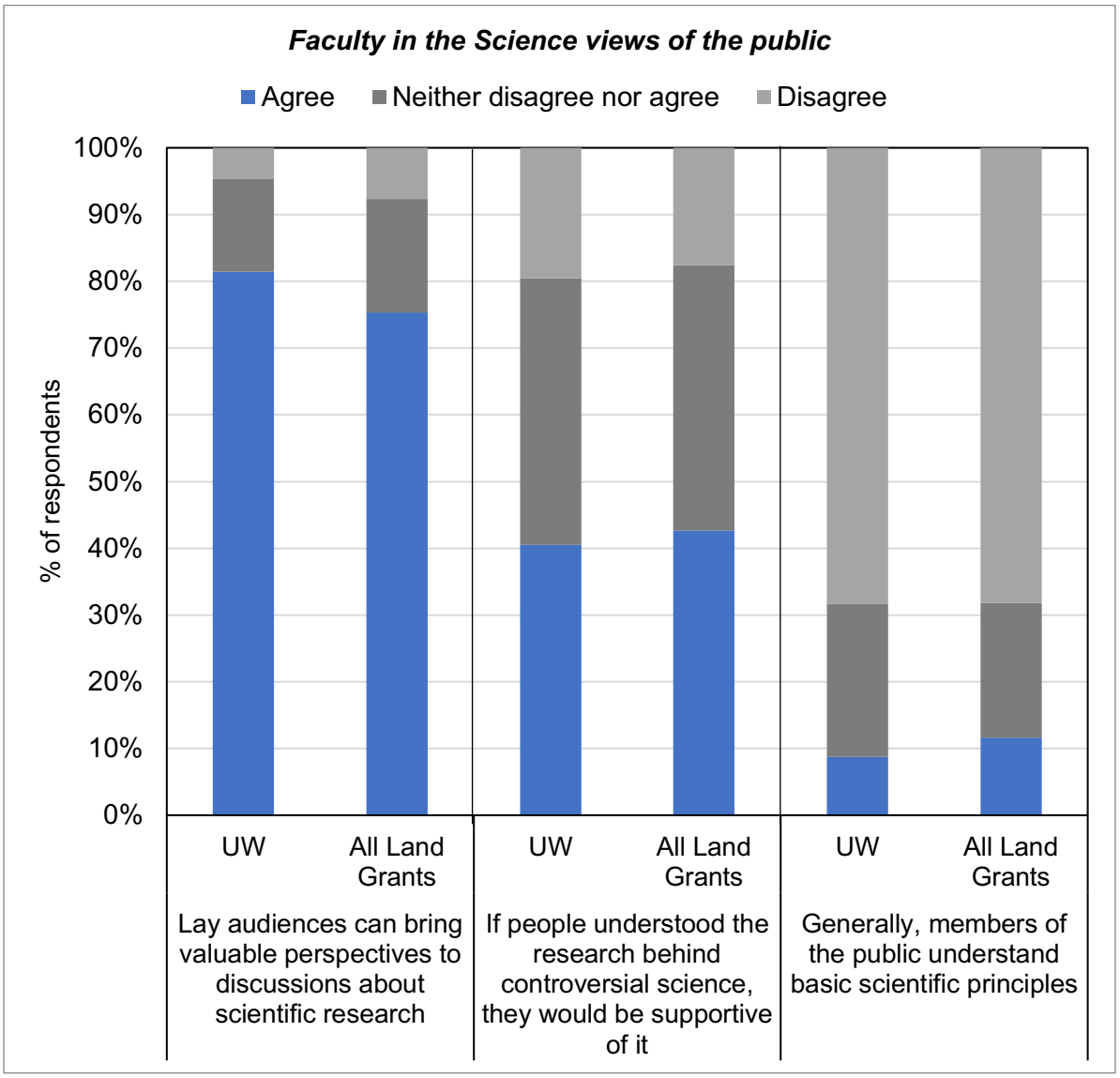


Figure 1.1. Science faculty views of the public regarding science.

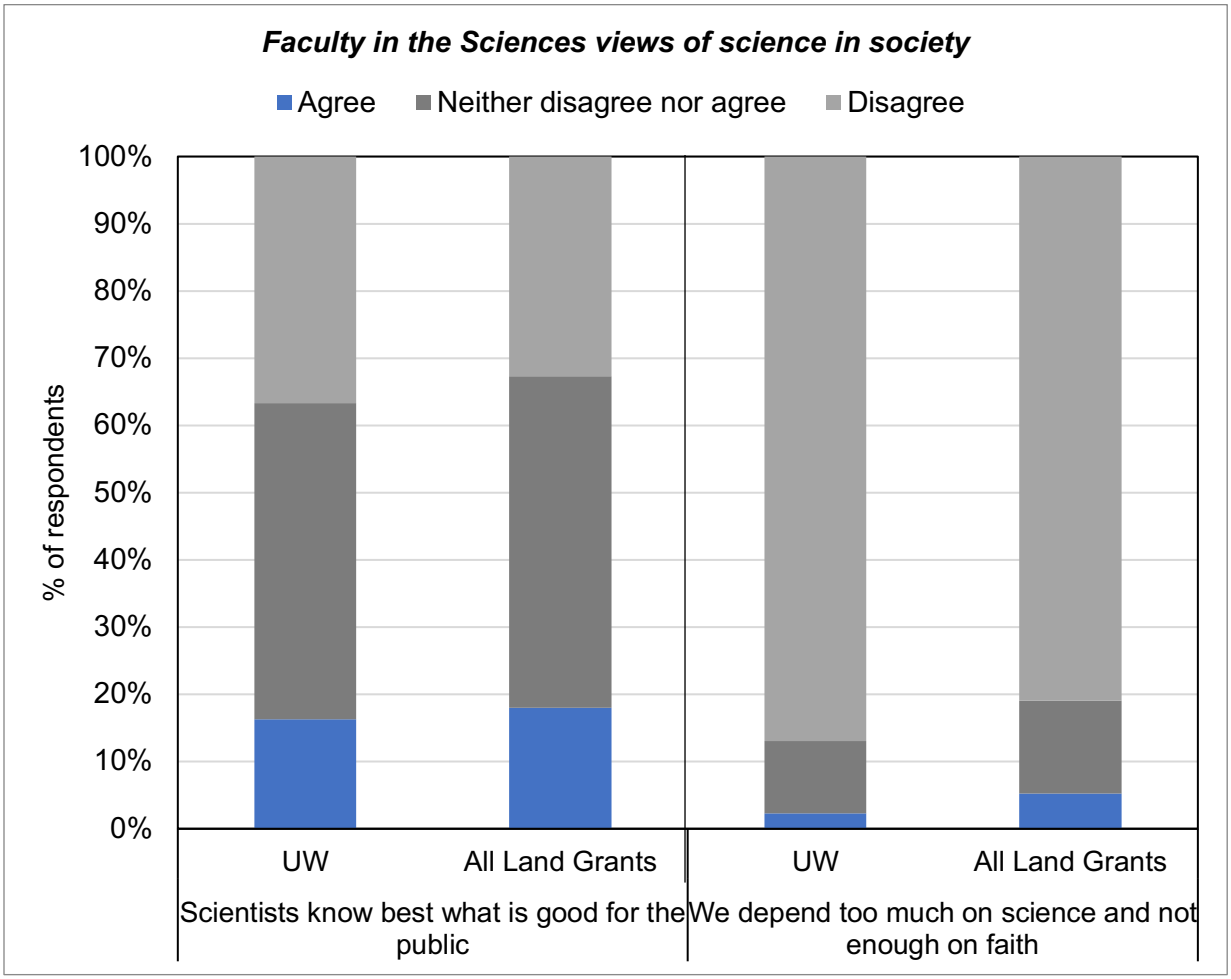


Figure 1.2. Faculty in the Sciences views of science in society

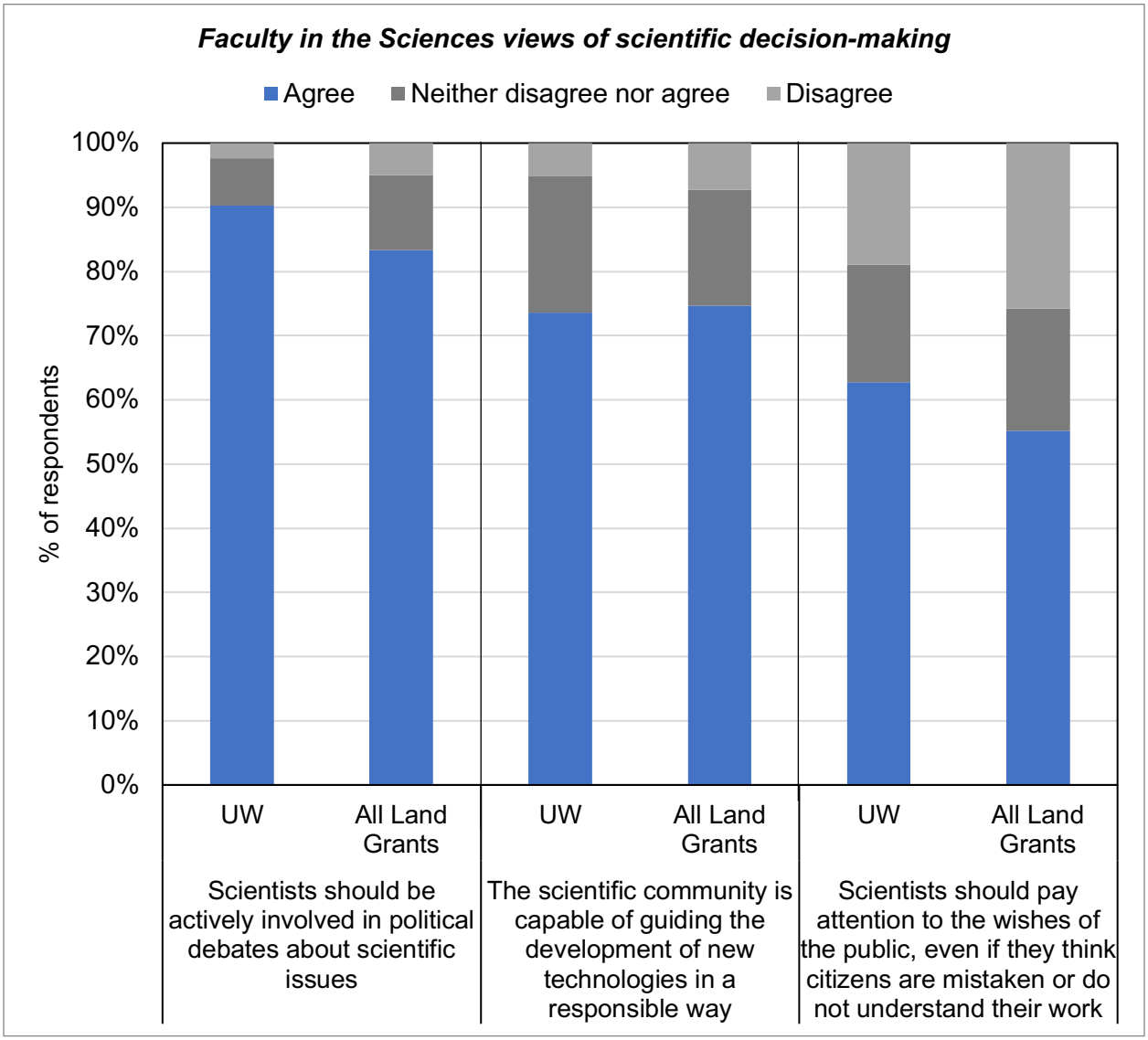


Figure 1.3. Science faculty views of scientific decision-making

Section 2: Social media use and attitudes

Overall, around 86% of UW Science faculty and 84% of all Land Grant Science faculty respondents indicate they used social media. They do not, however, report high social media use for science-related purposes. Of the common social media platforms we ask about, most respondents either do not use the platform or do not do so frequently. The respondents' use of social media do vary by platform (Figure 2.1). Wikipedia, YouTube, and restricted online communities such as ResearchGate or Mendeley are among the more universally used platforms by Science faculty. Platforms such as Twitter appear to be more polarized: Science faculty at UW tend to use the platform more often (25% at least once a week) compared to Science faculty all Land Grants (18%). Additionally, a considerable amount of Science faculty does not use this platform (56% at UW and 59% at all Land Grants).

When asked about their general use of social media for specific work-related purposes, many Science faculty respondents again report that they do not engage in these activities, yet UW faculty report slightly lower numbers (Figure 2.2). Around half of Science faculty report that they never engage with peers on post-publication content about their research (47% of faculty at UW and 53% of faculty at all Land Grants); write about topics related to their research (50% of faculty at UW and 52% of faculty at all Land Grants); share announcements about their new studies (46% of faculty at UW and 51% of faculty at all Land Grants); or participate in discussions about their field of research (44% of faculty at UW and 46% of faculty at all Land Grants). Of the remaining respondents, for each of these activities around a quarter to a third of faculty do indicate they took part around once a month.

Looking at all Science faculty members' attitudes towards social media (Figure 2.3), over six-in-ten respondents (66% at UW and 63% at all Land Grants) disagree that scientists should not discuss potentially controversial topics on social media. Yet, considerably fewer respondents reject the idea that using social media negatively impacts a scientist's reputation (48% disagree at UW and 46% at all Land Grants). Many respondents also find social media to be time-consuming (51% agree at UW and 50% at all Land Grants) and they are ambivalent about whether using social media impacts their academic impact (41% neither disagree nor agree disagree at UW and 44% at all Land Grants). Most Science faculty respondents do, however, believe that there are lay audiences interested in what scientists have to share about science on social media (83% of all faculty).

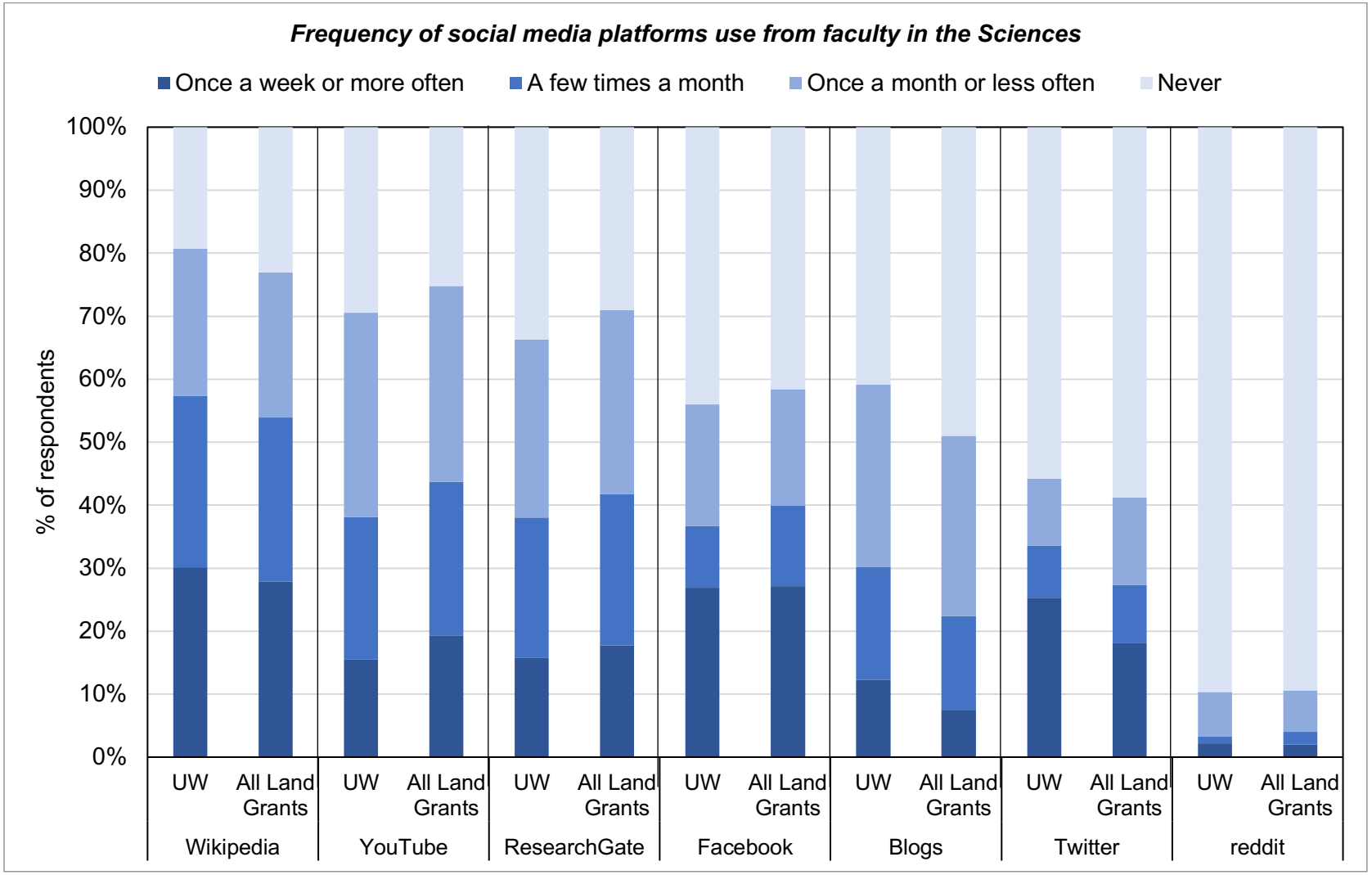


Figure 2.1. Frequency of social media platforms use by faculty in the Sciences

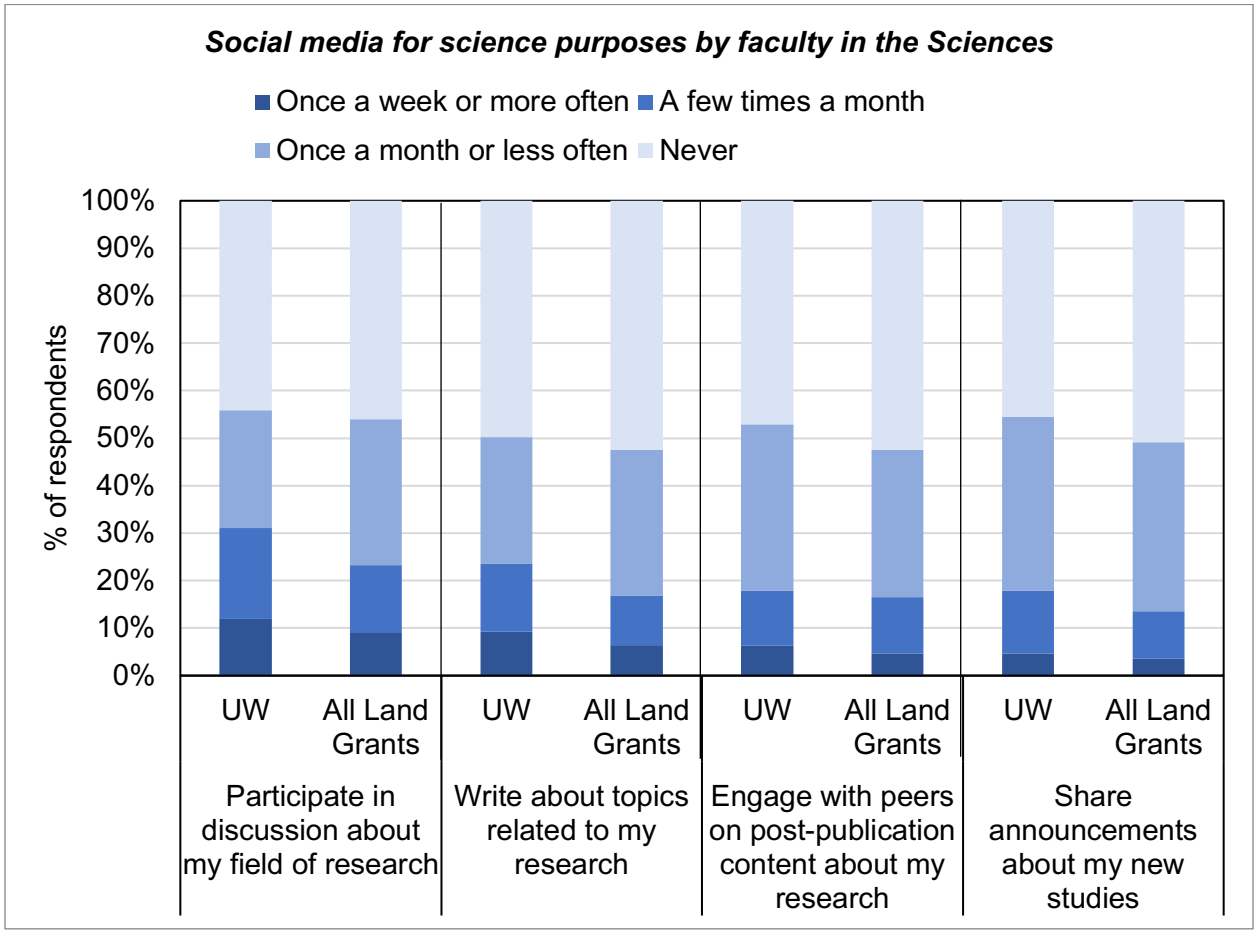


Figure 2.2. Frequency of social media use for specific science-related purposes from faculty in the Sciences

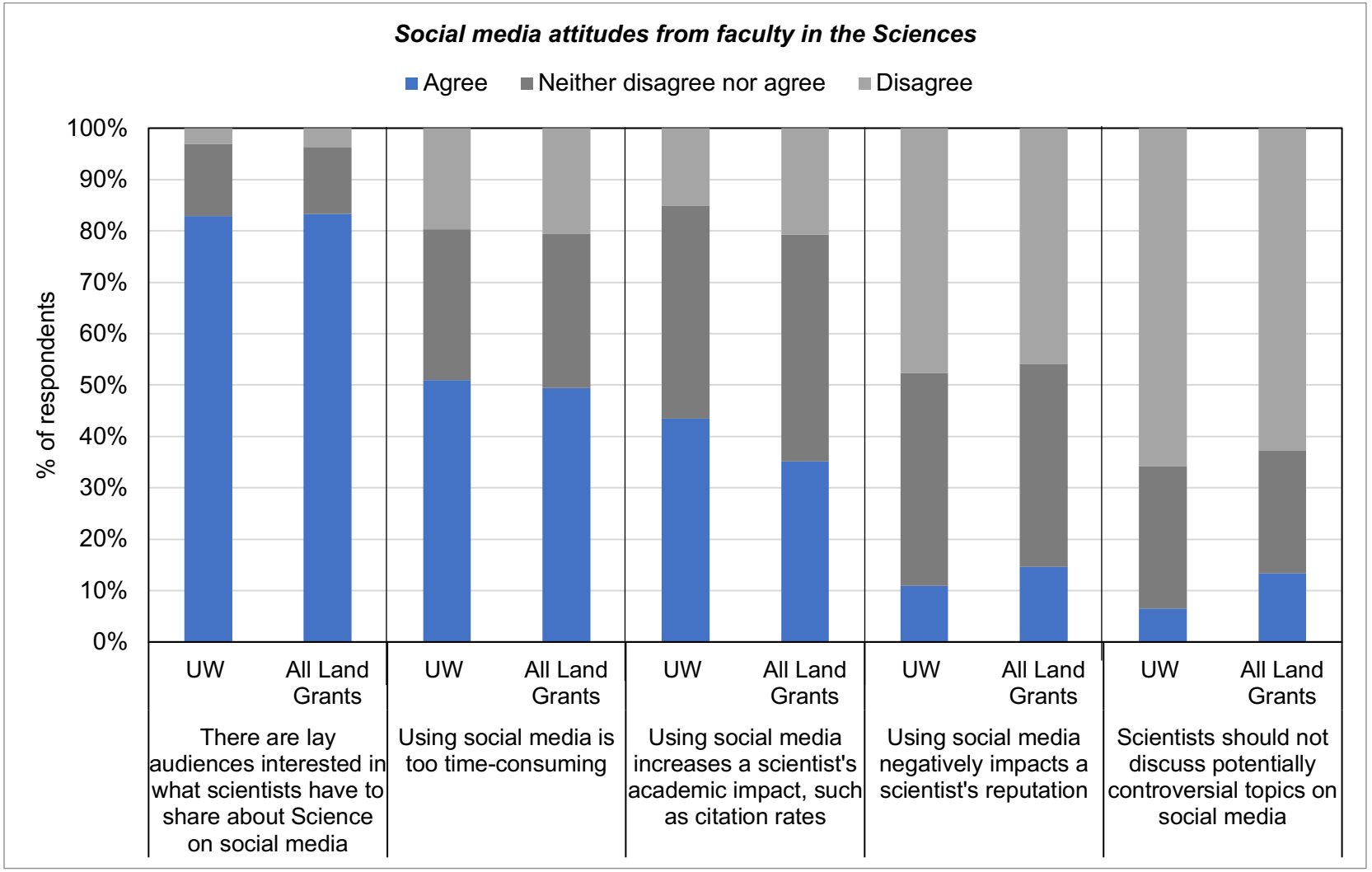


Figure 2.3. Social media attitudes from faculty in the Sciences

Section 3: Engagement activities and training participation

All respondents in the Sciences report participating in a variety of public engagement and outreach activities (Figures 3.1 and 3.2), although participation is more common for some activities than others. Over half of the Science faculty have worked at open house events (77% at UW and 81% at all Land Grants) or science festivals (66%-68% of all faculty), participated in public meetings (78%-79% of all faculty), met with policymakers (66%-68% of all faculty), given public lectures (77% at UW and 71% at all Land Grants), given interviews to journalists (79% at UW and 70% at all Land Grants), worked with K-12 youth (57% at UW and 64% at all Land Grants), or writing news articles (53% at UW and 50% at all Land Grants) at least once in their careers. Faculty more frequently (i.e., more than once in the past year) participate in activities such as giving public lectures, giving interviews, and working with K-12 youth. Activities such as working with K-12 youth, meeting with policymakers and participating in science festivals occur less often. About three-quarters of Science faculty respondents never give talks at science pubs and cafés or blogged, although some in the Sciences participate in these activities multiple times.

When asked about their willingness to participate in public engagement and outreach in the future, the vast majority of Science faculty respondents are willing to take part in a variety of activities (Figures 3.3 and 3.4). The most popular choices (over 85% of respondents are at least somewhat willing to participate) are more traditional activities that many are already actively involved in: giving public lectures, giving interviews, meeting with policymakers, participating in public meetings, working at open houses, and working with K-12 youth. Respondents at both UW and all Land Grants are relatively less open to and enthusiastic about writing blogs and giving talks in science pubs or cafés. Notably, writing a blog is one of the least frequently performed activities and has the most resistance in terms of future willingness to participate.

In complement to their past engagement involvement, a total of 51% of respondents from UW and 58% of respondents from all Land Grants in the Sciences indicated that they have received some science communication training, with 24% of UW Science faculty and 33% of Science faculty from all Land Grants participating in more than one type of training. Generally, faculty from UW report less training in science communication than faculty at all Land Grants, except for NSF CIRTL courses and MOOCs (Figure 3.5). The most commonly attended type of training was short, single day workshops or seminars (49% of all Land Grant faculty and 42% of UW faculty), followed by webinars (23% of all Land Grant faculty and 15% of UW faculty) and multi-day workshops or seminars (22% from All Land Grants and 15% of UW faculty).

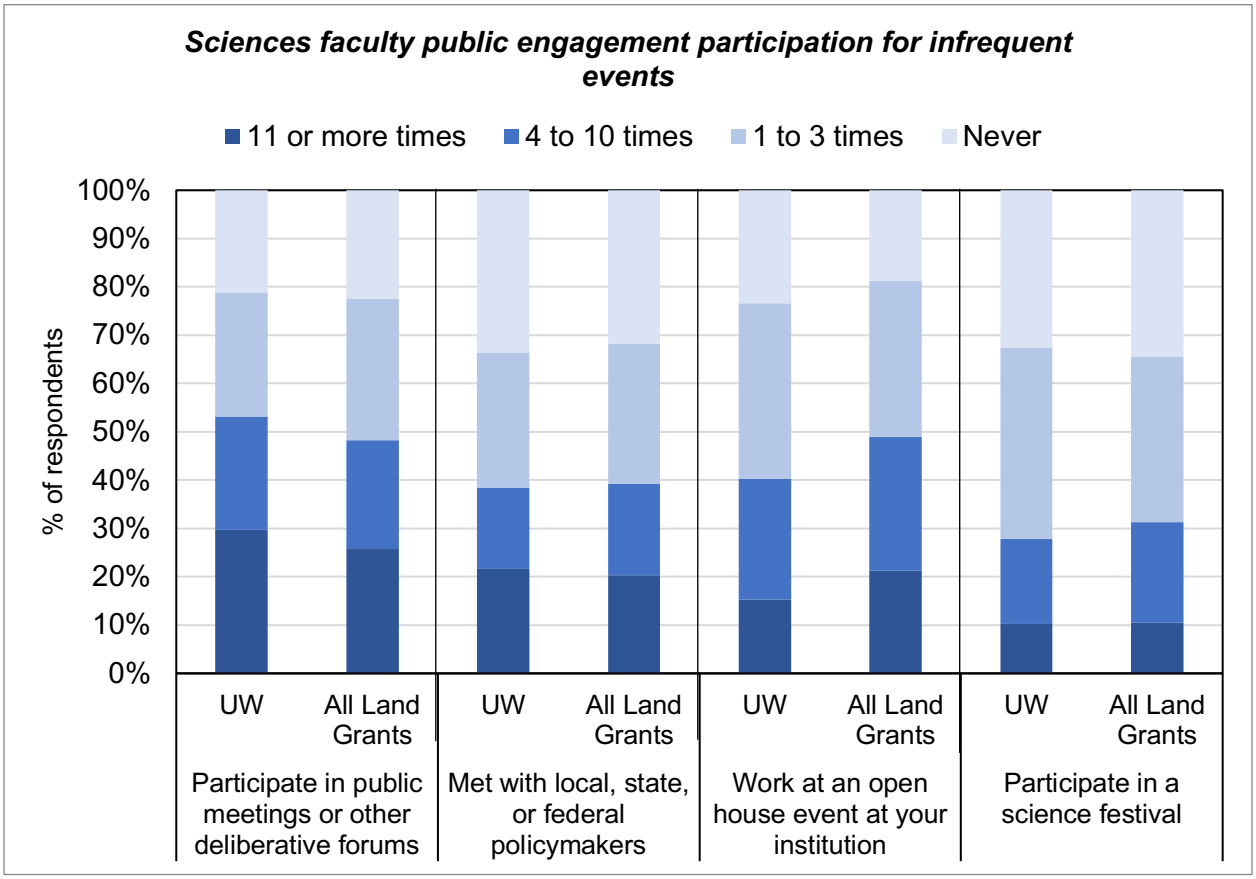


Figure 3.1. Science faculty participation in infrequent public engagement efforts over their careers

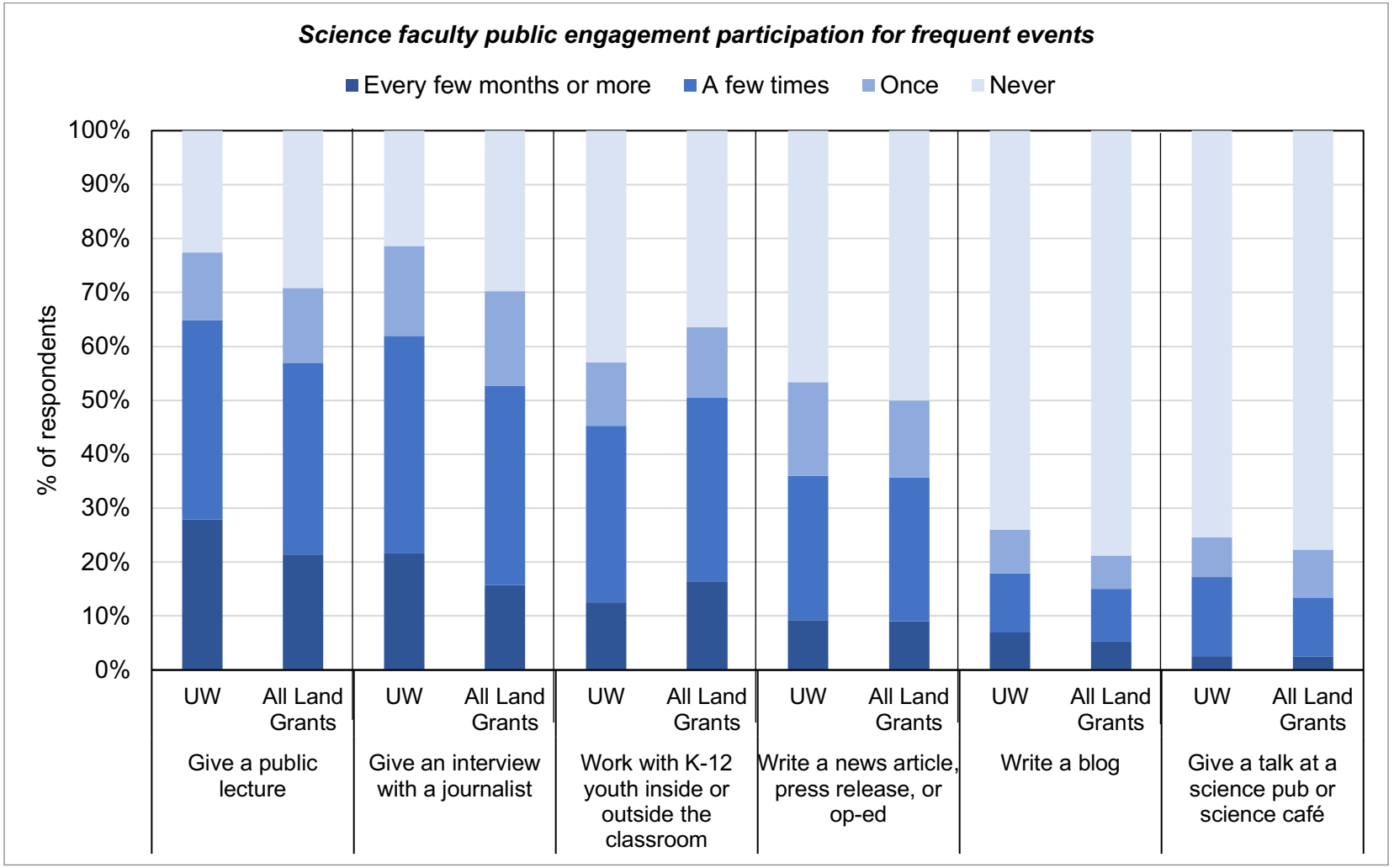


Figure 3.2. Science faculty participation in frequent public engagement efforts over the previous year

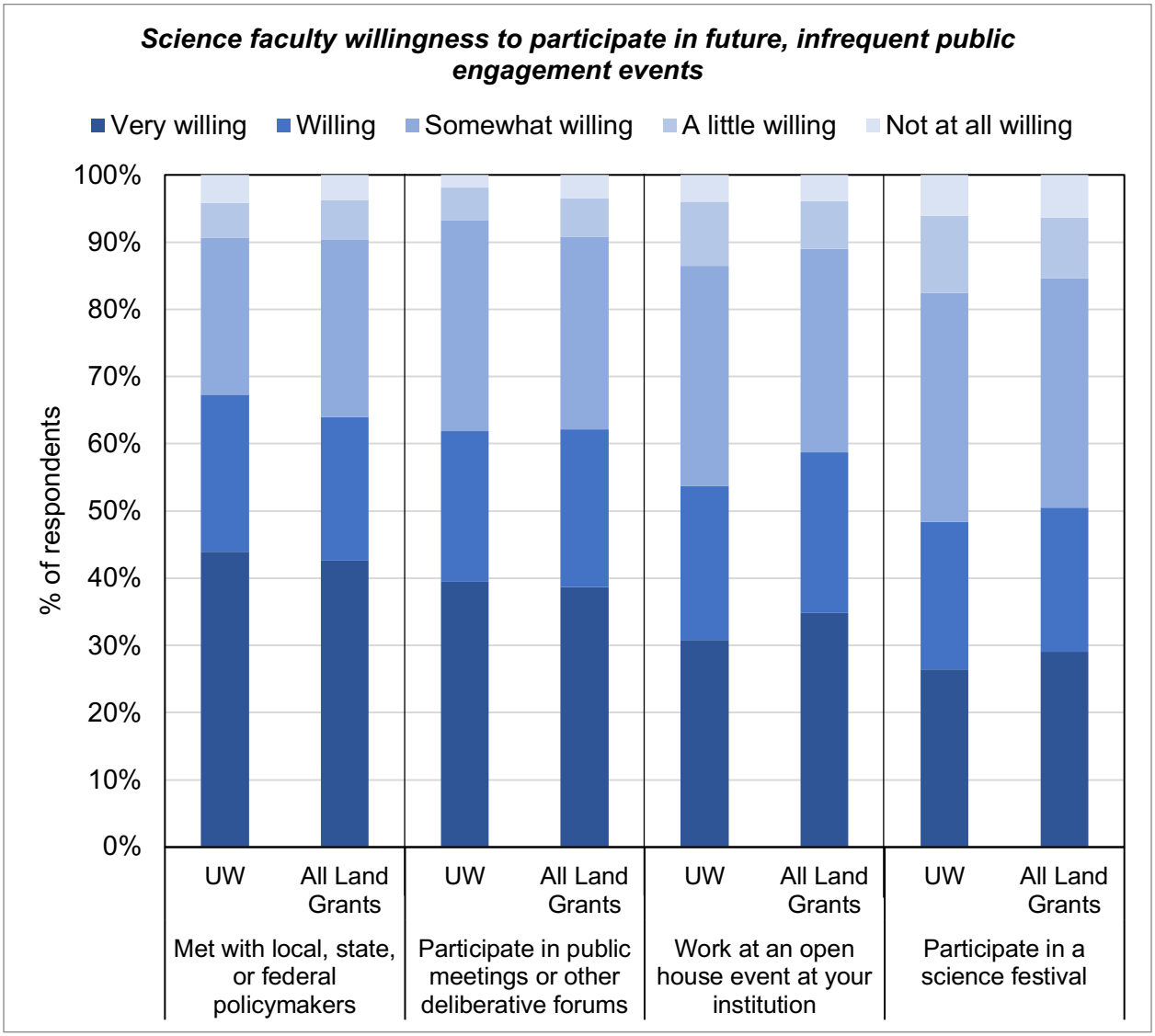


Figure 3.3. Science faculty willingness to participate in infrequent public engagement efforts in the future

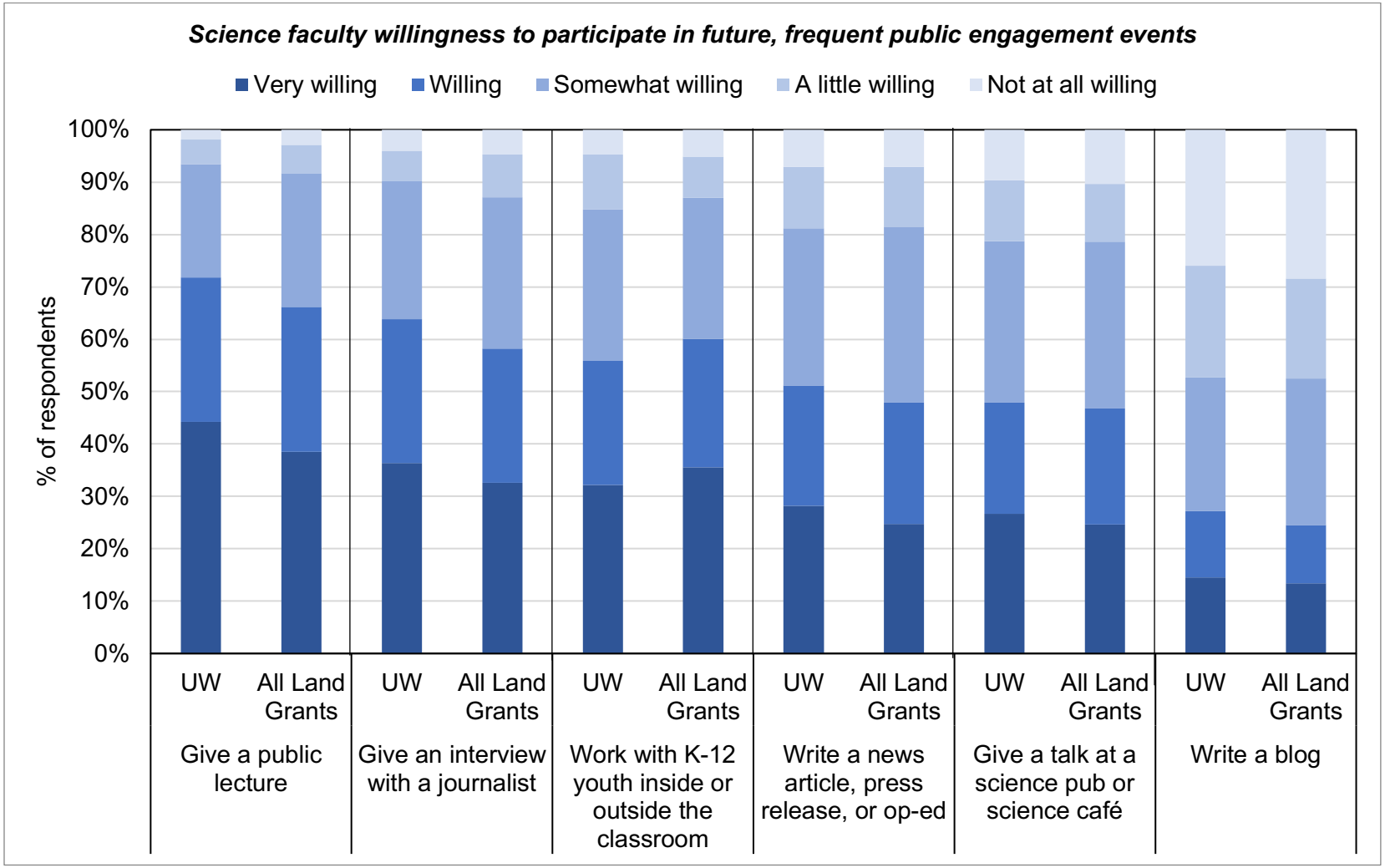


Figure 3.4. Science faculty willingness to participate in frequent public engagement efforts in the future

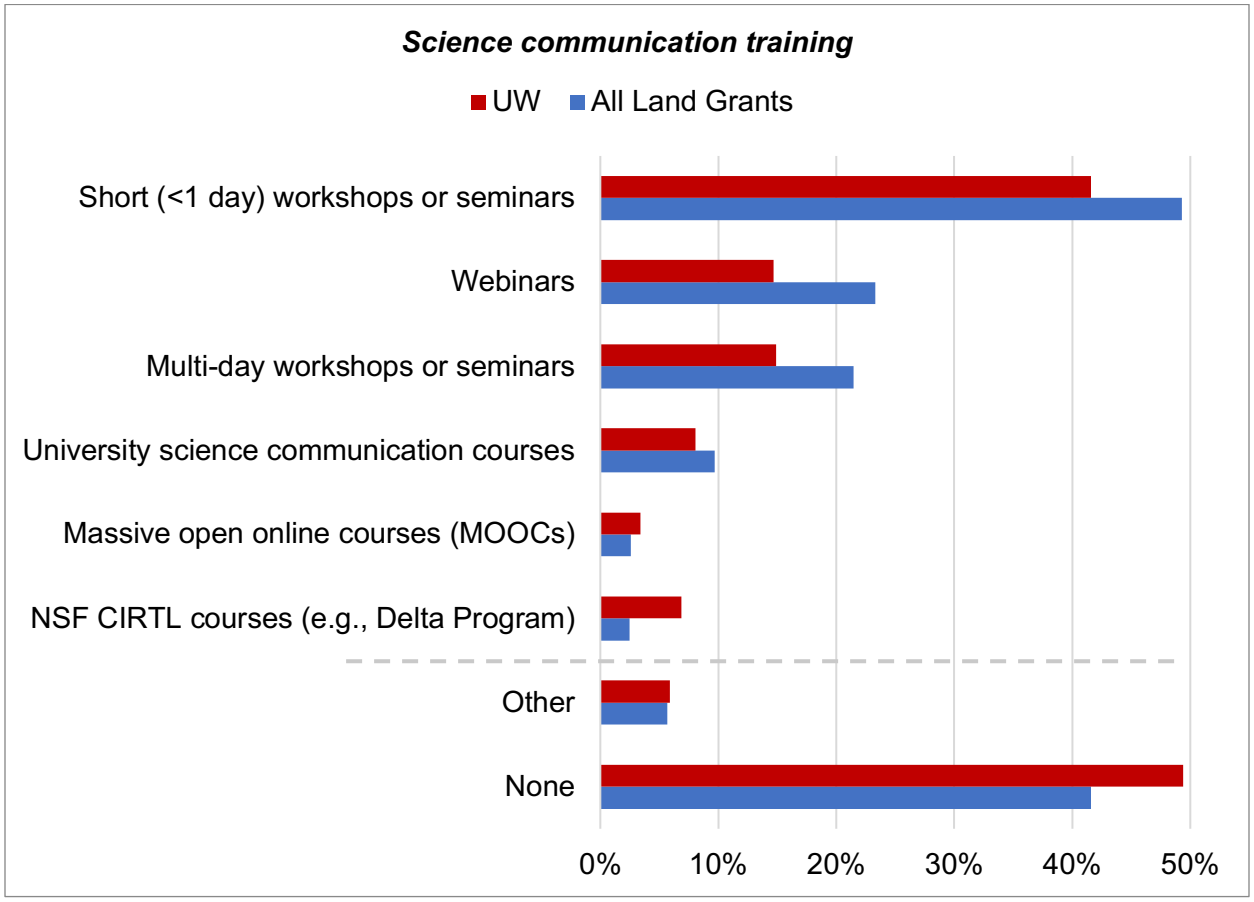


Figure 3.5. Participation in science communication trainings by faculty in the Sciences

Section 4: Defining public engagement

In the science communication field, activities categorized as public engagement differ from those under the broader umbrella of public outreach. Specifically, public engagement activities involve two-way forms of communication which emphasize discussion and mutual learning. Using this definition, we assess Science faculty respondents' understanding of public engagement (Figure 4.1). Most respondents from the Sciences understand that public engagement emphasizes two-way communication (about 86% agree) and discussion (75% of all Land Grant and 71% of UW faculty), but over half of the respondents also align engagement activities with elements of traditional outreach, such as one-way forms of communication (about 54%-55% agree). Moreover, there is less consensus among respondents as to what role, if any, direct policy recommendations or other tangible outcomes play for engagement. Around four-in-ten respondents are ambivalent (about 40% neither disagree nor agree) as to whether a tangible outcome is necessary for an activity to be considered engagement.

When asked about specific types or characteristics of activities that fall into the category of public engagement (Figure 4.2), all Science faculty respondents identify informal science education (about 91%-92% agree) and community service (81%-82% agree) as public engagement, as well as any communication efforts more broadly (86-89% agree). Interestingly, respondents are less sure of the inclusion of social media: around 40% of respondents either disagree (17% from all Land Grants and 13% from UW) or are unsure (24% neither disagree nor agree), as to whether communicating on social media is a public engagement activity.

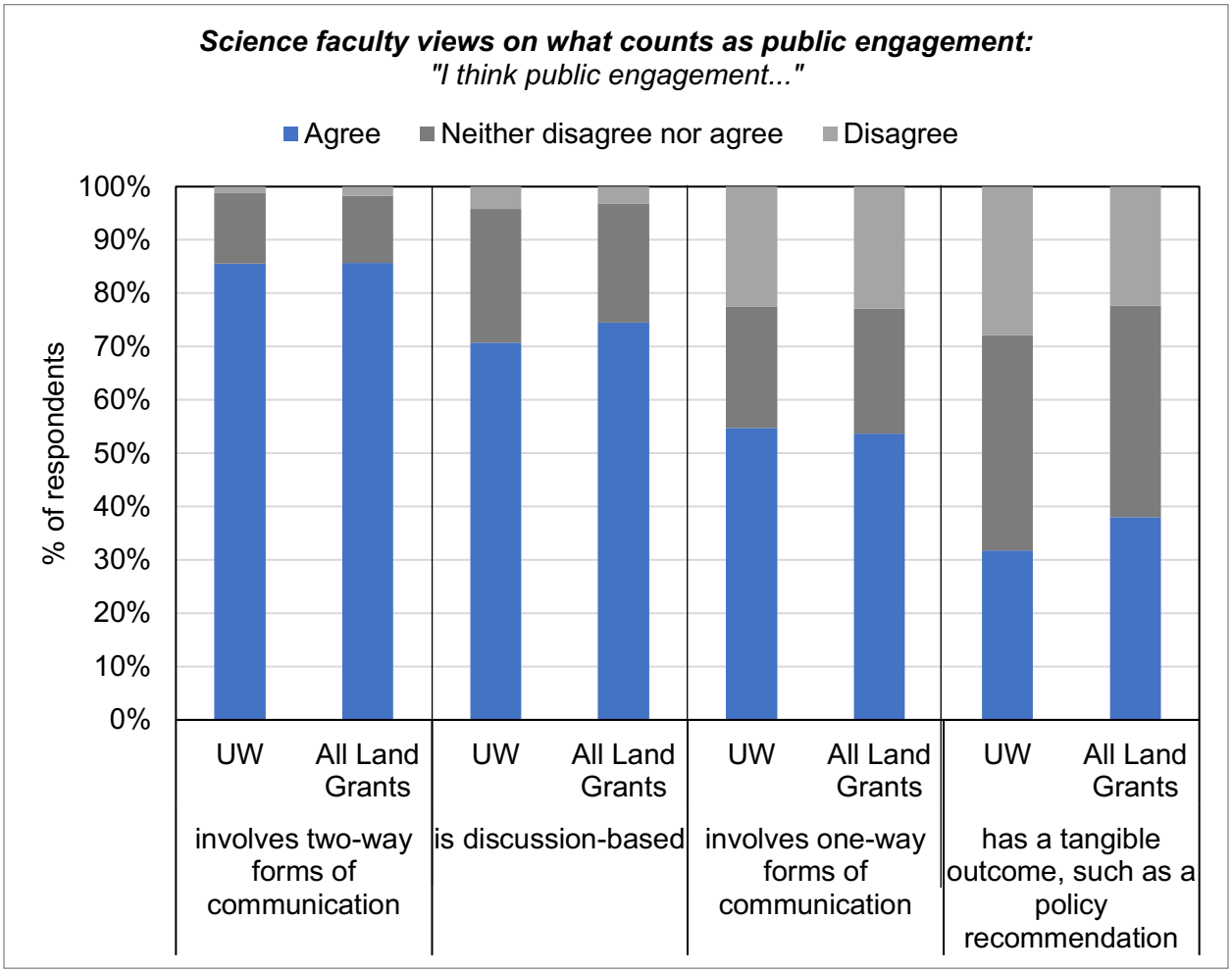


Figure 4.1. Definition of public engagement from faculty in the Sciences

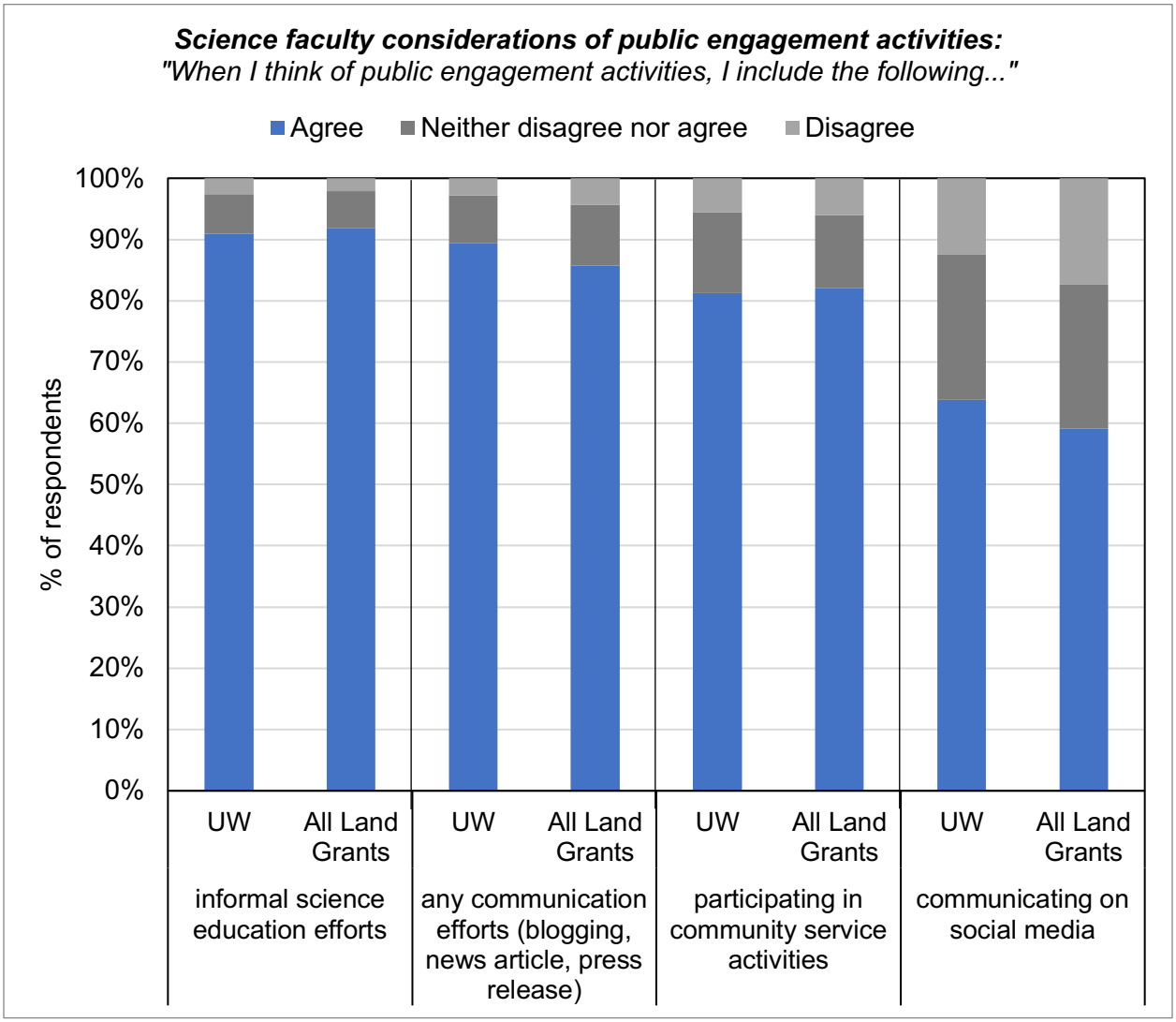


Figure 4.2. Types of events considered public engagement from faculty in the Sciences

Section 5: Engagement climate and culture at universities

Next, we turn to Science faculty respondents' perceptions of the university climate regarding public engagement and outreach efforts. In terms of official university expectations for public engagement and outreach (Figure 5.1), many Science faculty respondents indicate that public engagement and outreach activities are considered as at least a small part of their annual or performance review process (83%), tenure dossier (82%), hiring contract (56%). Faculty in the Sciences at UW report similar, but smaller percentages (annual or performance review process: 79%, tenure dossier: 79%, and hiring contract: 46%). This leaves a considerable portion of respondents in the Sciences for which public communication efforts are not part of their official university expectations. In line with this, Science respondents are mixed in their views of the importance assigned to public engagement by their universities, with just under half disagreeing (47% of faculty at all Land Grants and 55% of faculty at UW) with the statement that public engagement is treated as a core component of the work expected of faculty at their university, as important as research and/or teaching (Figure 5.2).

Science faculty respondents are mostly supportive of their active communicator peers, with 73% of faculty at UW and 66% of faculty at all Land Grants rejecting with the idea that people at their university who are active communicators are not very good researchers (Figure 5.2). Further, most respondents in the Sciences do not think (81-82% of all faculty disagree) that public engagement is incompatible with the scientific culture (Figure 5.3).

As additional indicators of university's engagement climate, Science faculty give mixed responses as to whether they stopped participating in engagement based on how overwhelmed they felt by other responsibilities or with whether they've seen their colleagues get burned out from participating in engagement (Figure 5.3). Just over a third of respondents in the Sciences (40% of faculty at UW and 36% of faculty at all Land Grants agree) indicate that they sacrifice engagement when they are overwhelmed with other responsibilities, while another third (about 33%-34% of all faculty disagree) reject this strategy. Almost a quarter of respondents (22% of all faculty) also indicate they have seen colleague burnout attributable to outreach and engagement, with more disagreement with this statement occurring among those who are more willing to participate in the future (Figure 5.4).

Lastly, responses from the Science faculty indicate there may be a change occurring over time regarding the culture of public engagement support (Figure 5.5). When asked about support for engagement from their advisors during their time as graduate students, most respondents indicate they were not encouraged to get involved in engagement (57% of faculty from UW and 50% of faculty from all Land Grants disagree). Despite the lack of encouragement from their advisors, most Science faculty respondents indicate they support their own graduate students' participation in engagement activities (about 88-90% of all faculty agree).

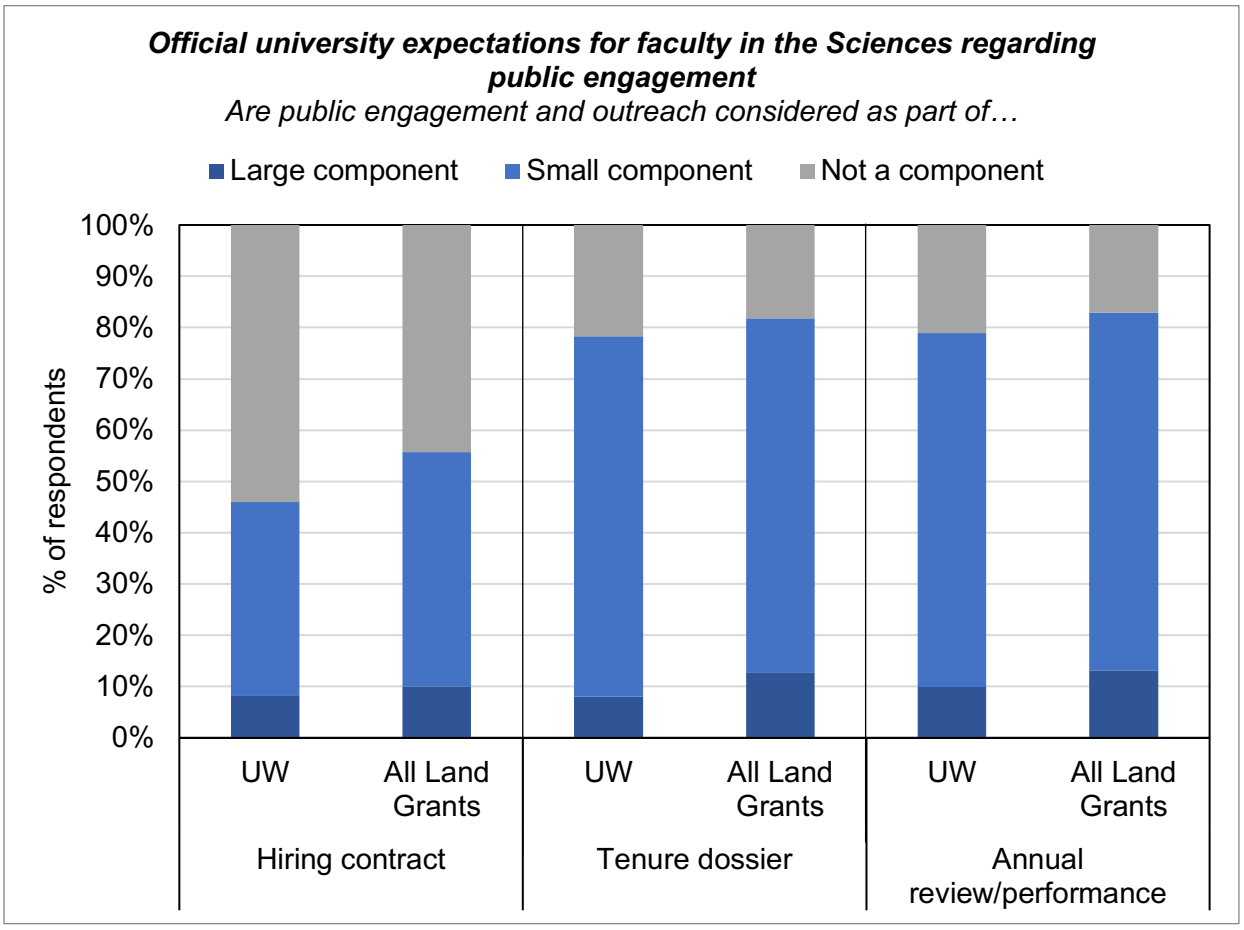


Figure 5.1. University expectations for public engagement and outreach for Science faculty

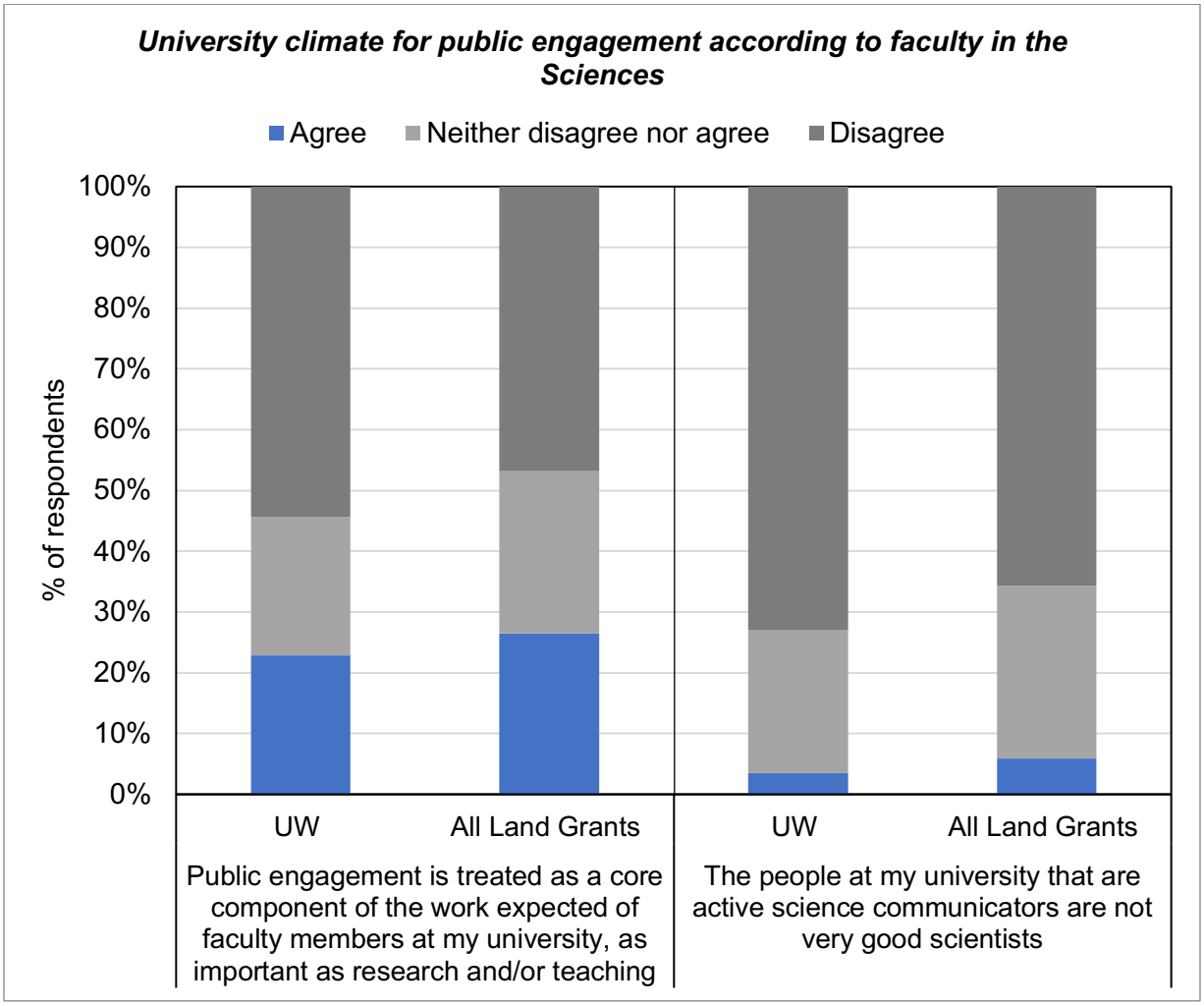


Figure 5.2. University climate for public engagement according to Science faculty

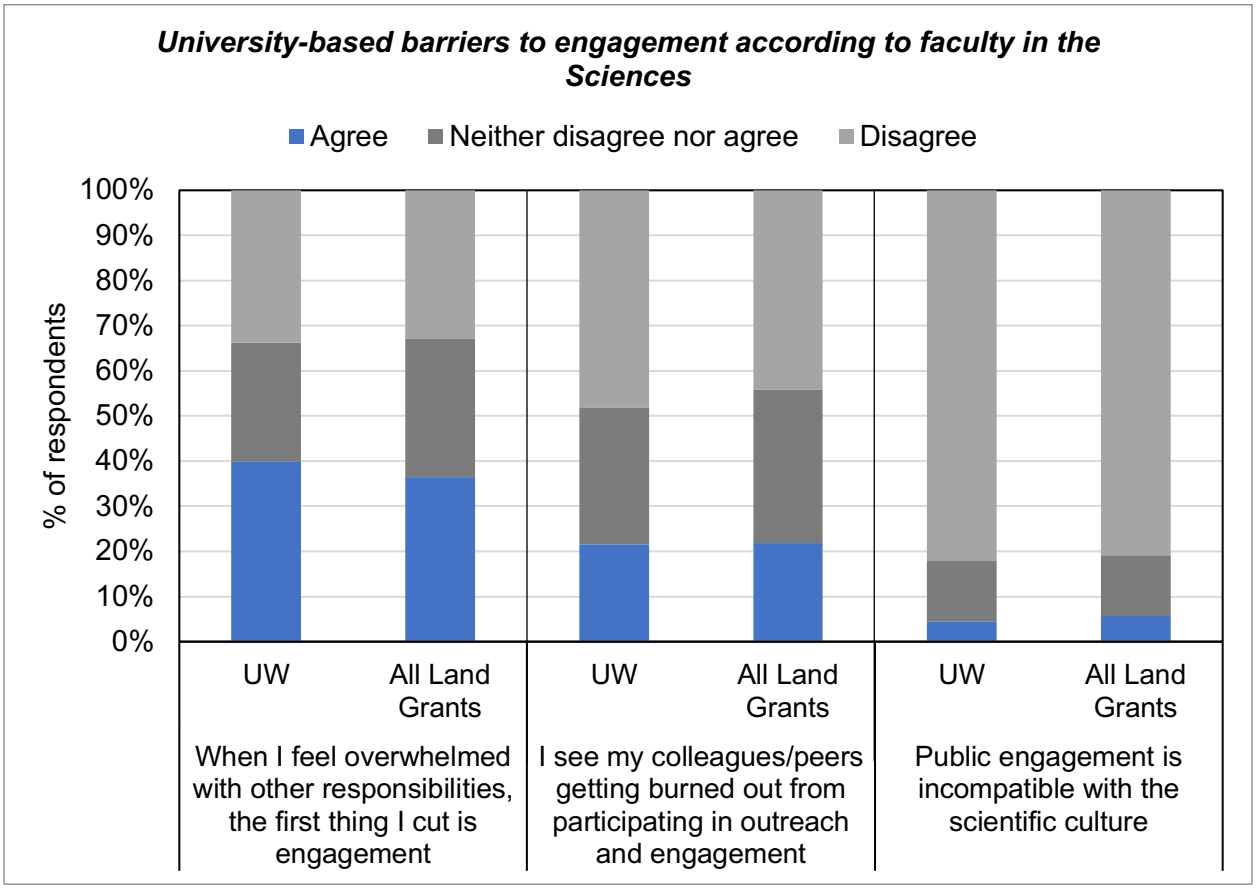


Figure 5.3. University barriers related to public engagement from Science faculty

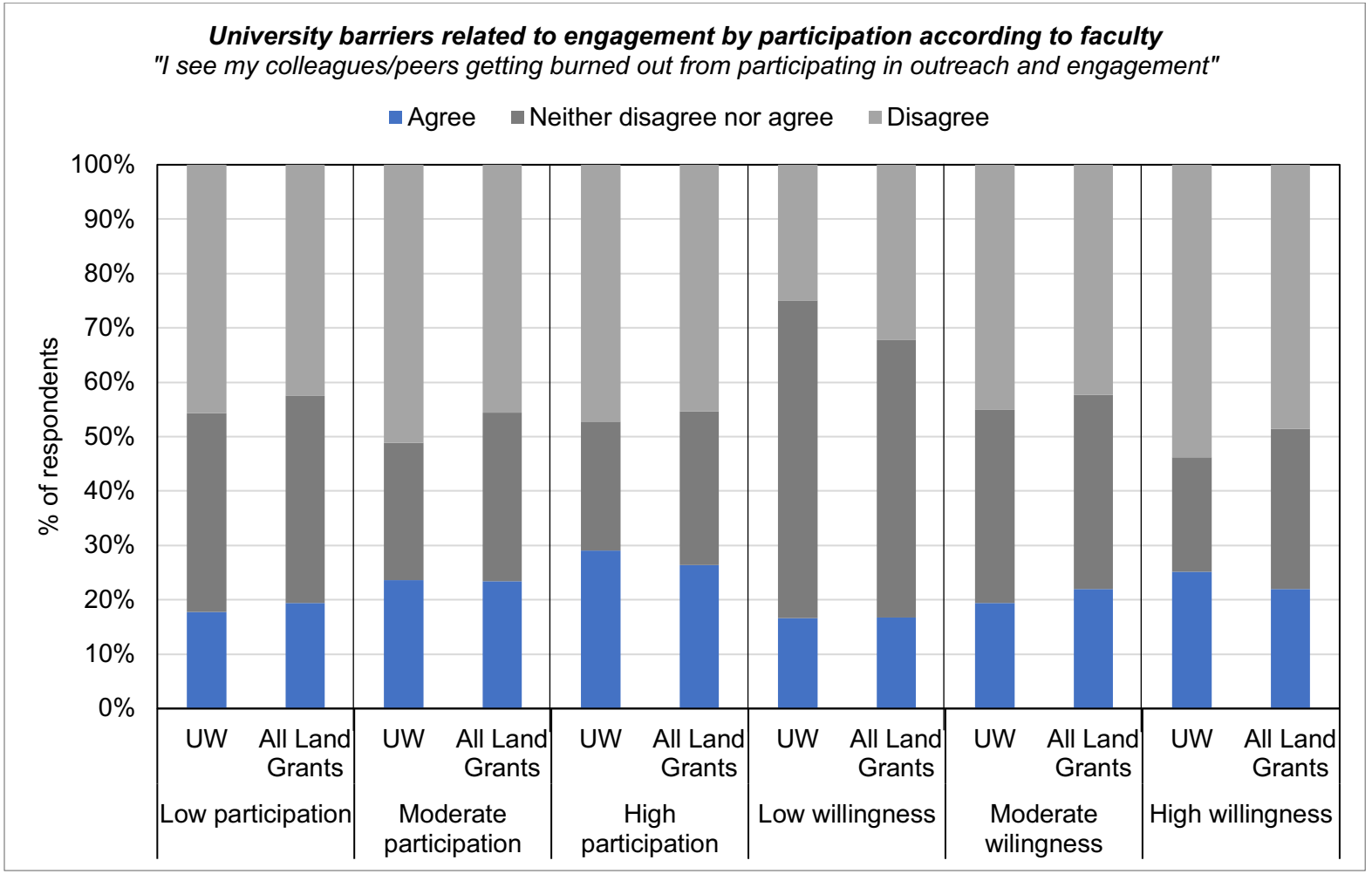


Figure 5.4. University barriers related to engagement by participation from Science faculty

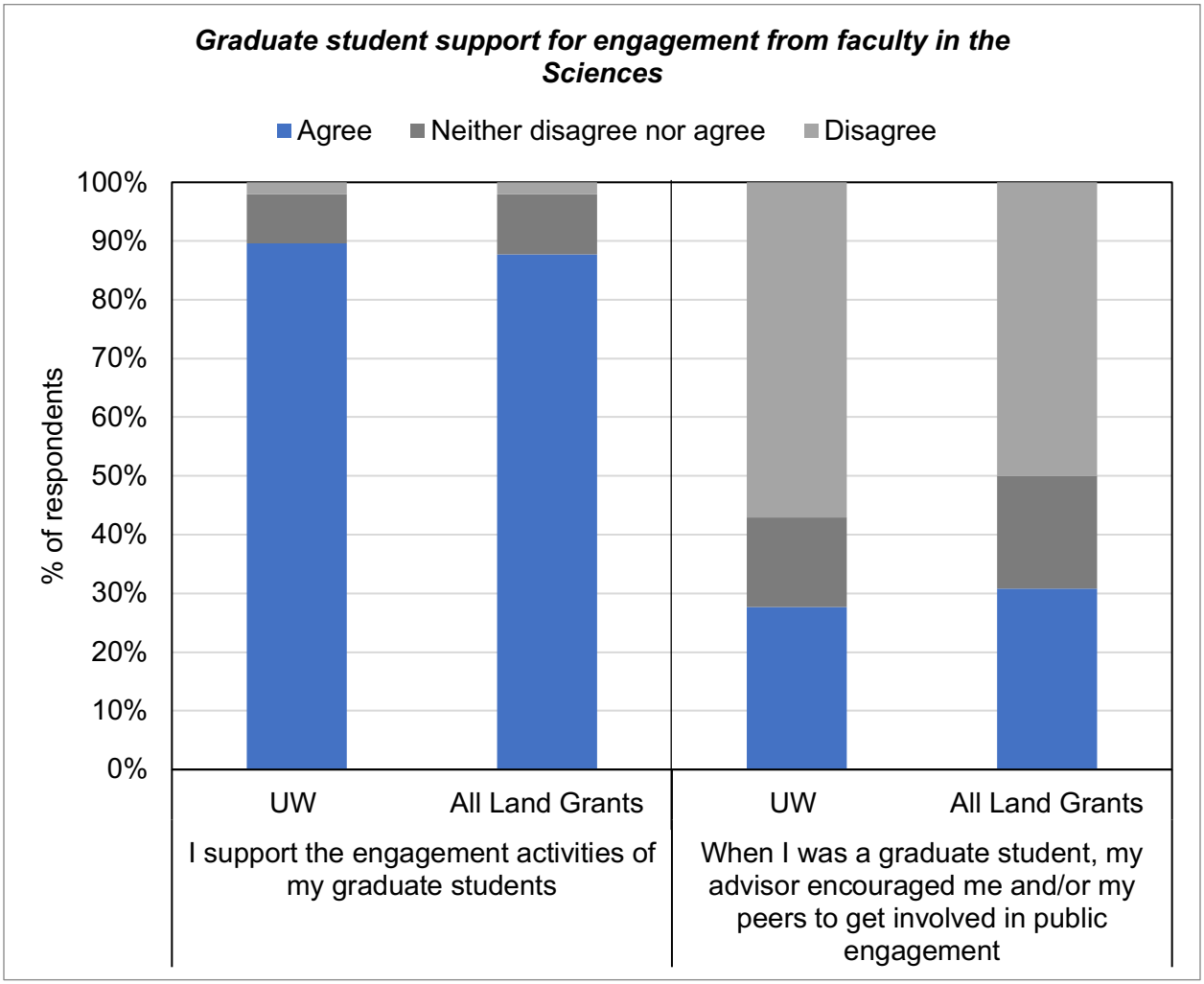


Figure 5.5. Graduate student support for public engagement for faculty in the Sciences

Section 6: Perceptions of self-efficacy related to engagement

In addition to the cultural climate surrounding engagement at universities, faculty members' perceptions of their own self-efficacy or abilities to participate in public engagement can influence their involvement. Overall, 89% of Science faculty at UW and 87% of that at all Land Grant respondents feel they have autonomy over the decision to participate in engagement activities, with only around 4% indicating otherwise. The primary university position held by all Land Grant respondents in the Sciences does appear to influence how much autonomy they feel they have over this decision, with tenured faculty members (89%, N=4,699) reporting the greatest autonomy compared to their non-tenure track position (83%, N=1,914) and tenure-track, non-tenured (84%, N=1,460) colleagues (Figure 6.1). However, there are no such statistically significant differences in decision autonomy among tenured faculty (91%, N=270), non-tenure track position (90%, N=51) and tenure-track, non-tenured (84%, N=67) faculty in the Sciences at UW.

Regarding their abilities to effectively participate in engagement and outreach (Figure 6.2), the majority of respondents in the Sciences feel capable of having discussions with diverse audiences (83% of all faculty agree) and most respondents reject the assertion that answering questions from the audience is difficult (65% of faculty from UW and 59% of all Land Grant faculty disagree). A notable number of Science faculty respondents are ambivalent about being able to find opportunities for science communication training (31% of UW faculty and 28% of all Land Grant faculty neither disagree nor agree). Looking at the effects of science communication training on scientists' self-efficacy (Figure 6.3), UW faculty who have received training (27% one training type; 24% 2+ training types) are, unsurprisingly, more knowledgeable about how to find opportunities to improve their communication skills compared to those with no training (49% of Science faculty from UW). Faculty at all Land Grants also report similar findings (25% one training type; 33% 2+ training types; 42% no training). Those with training are also more confident in their abilities to hold discussions with diverse audiences and, to a lesser extent, handle audience questions.

The growing body of social science research on science communication provides insights for effective science communication outreach and engagement efforts. Science faculty respondents indicate mixed use of this research when asked about whether they pay attention to social science research on the topic (Figure 6.4). Around half of respondents (52% of all Land Grant faculty and 49% of UW faculty agree) report paying attention to science communication research while a close to a quarter of respondents indicate they do not (29% of faculty from UW and 24% of all Land Grant faculty disagree). Yet, the majority of respondents (81% of UW faculty and 78% of faculty at all Land Grants) agree that insights from social science research should be used to inform science communication efforts.

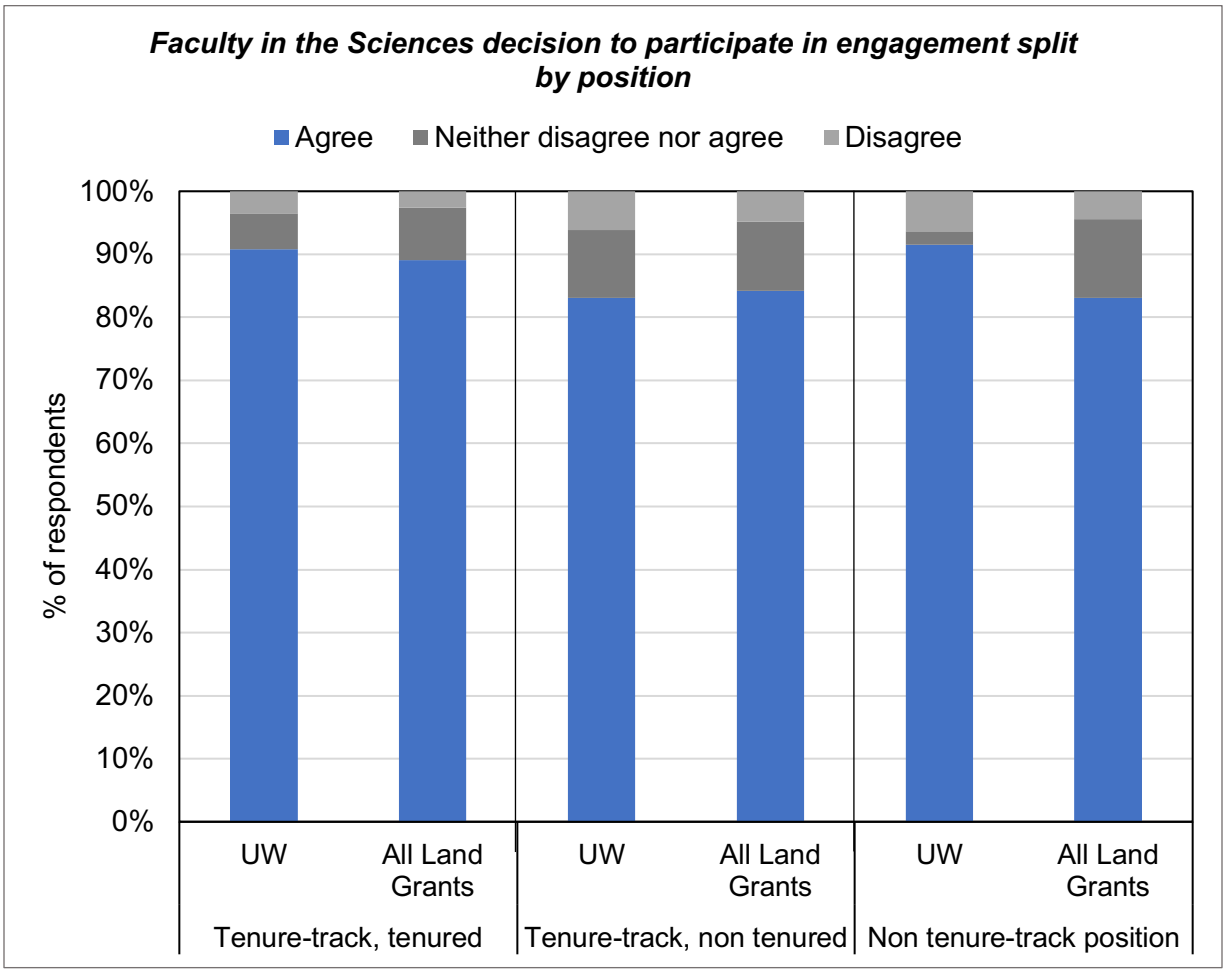


Figure 6.1. Science faculty members' autonomy to participate in engagement split by position

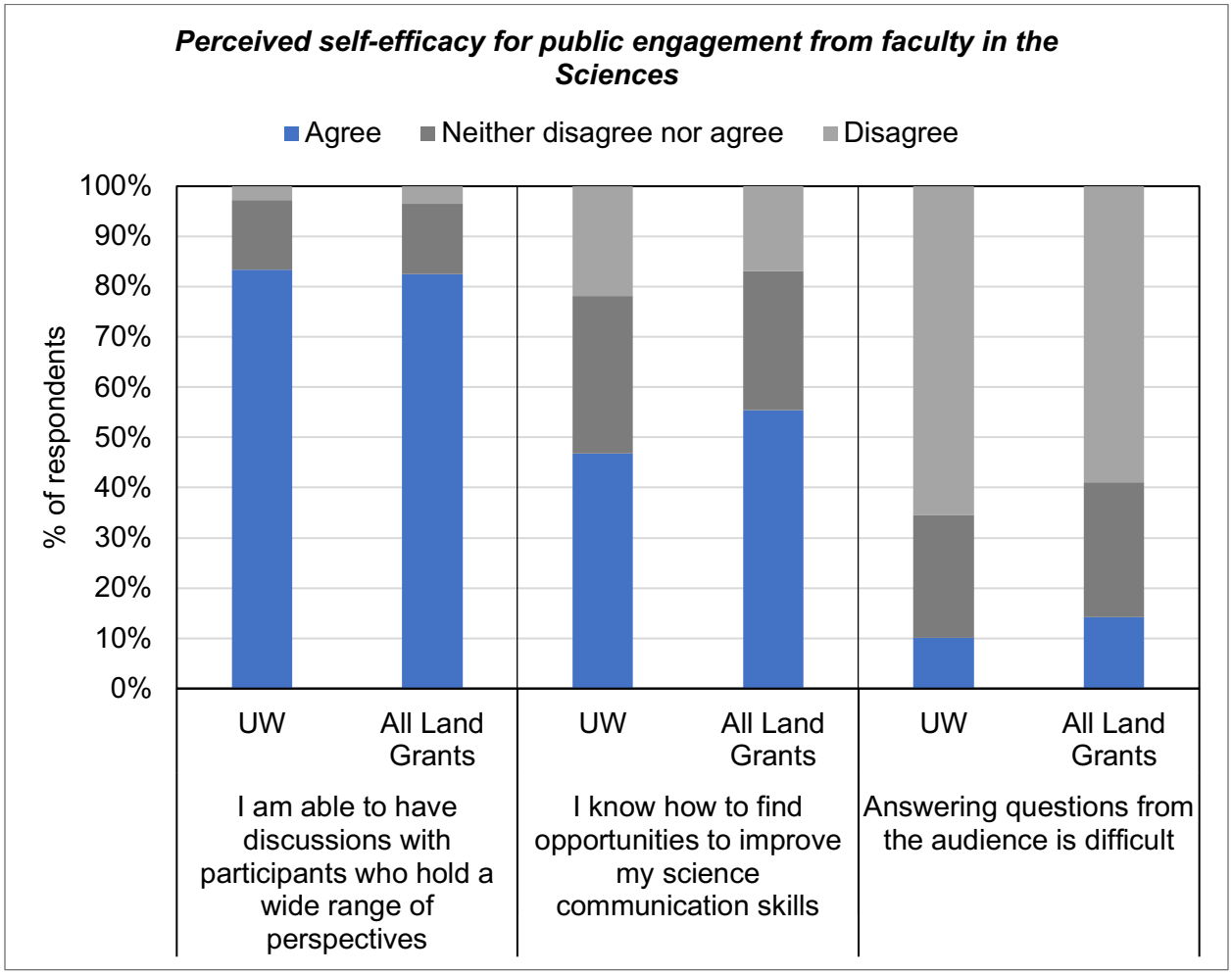


Figure 6.2. Self-efficacy related to public engagement from Science faculty

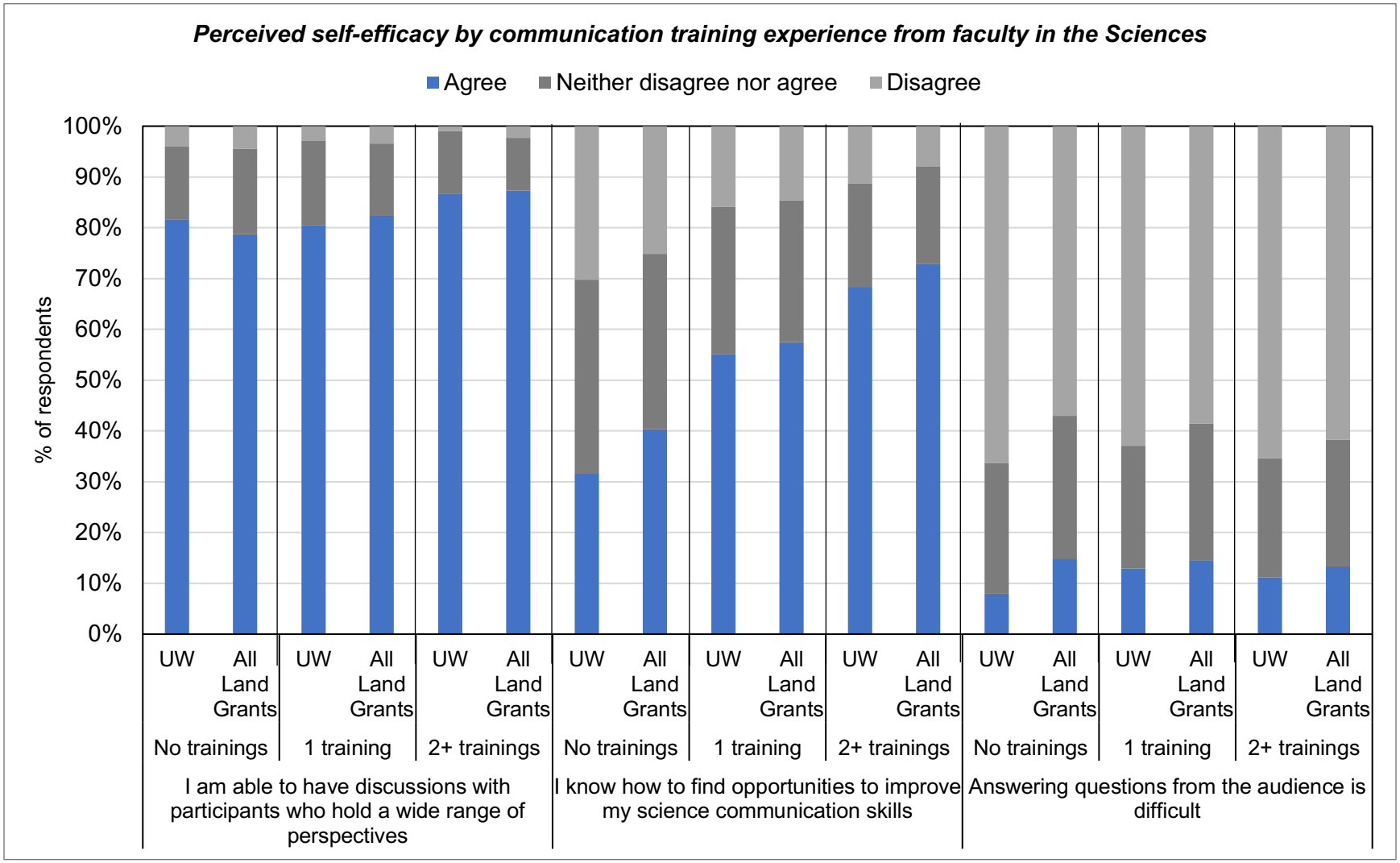


Figure 6.3. Self-efficacy related to public engagement by communication training experience from faculty in the Sciences

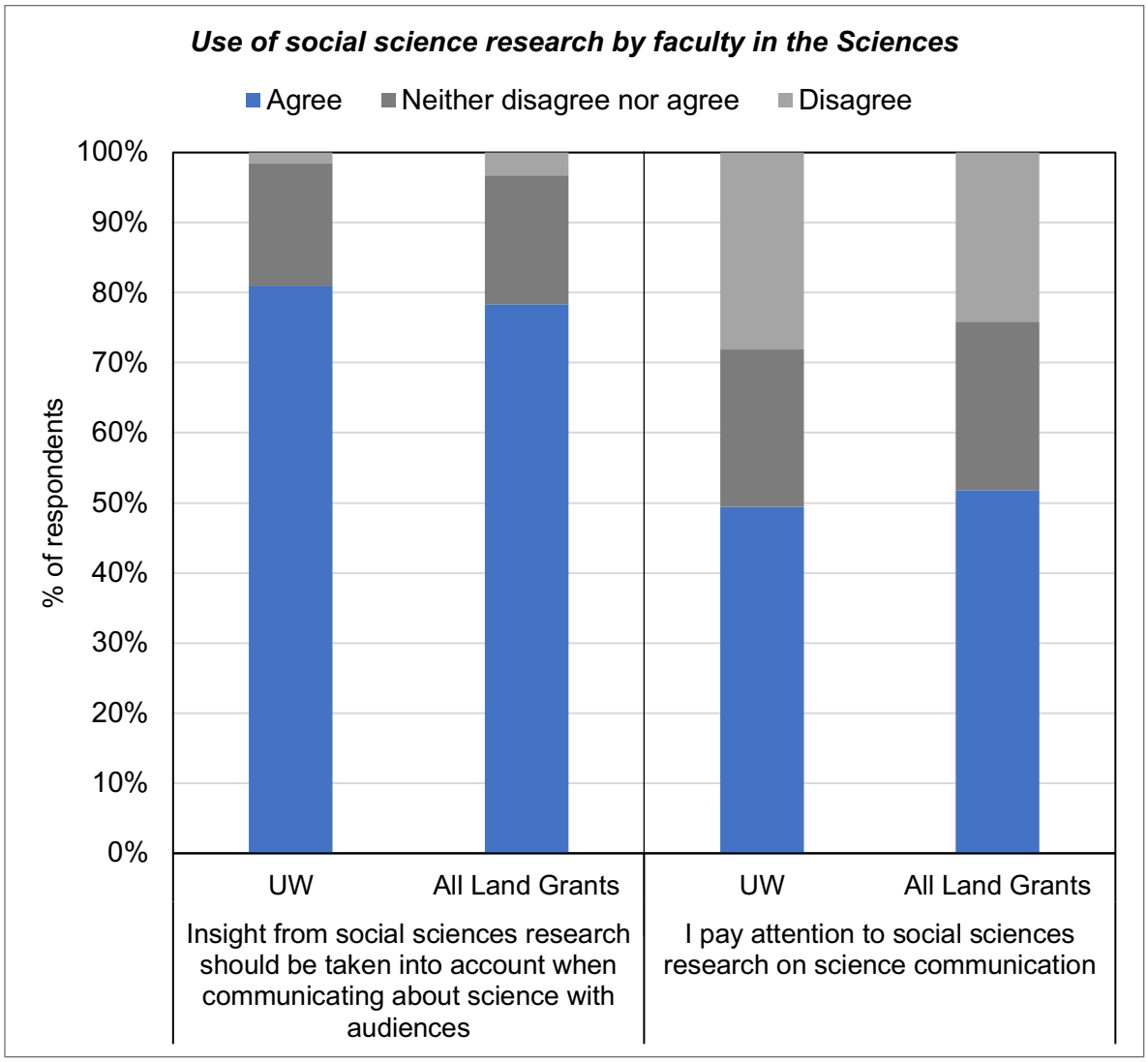


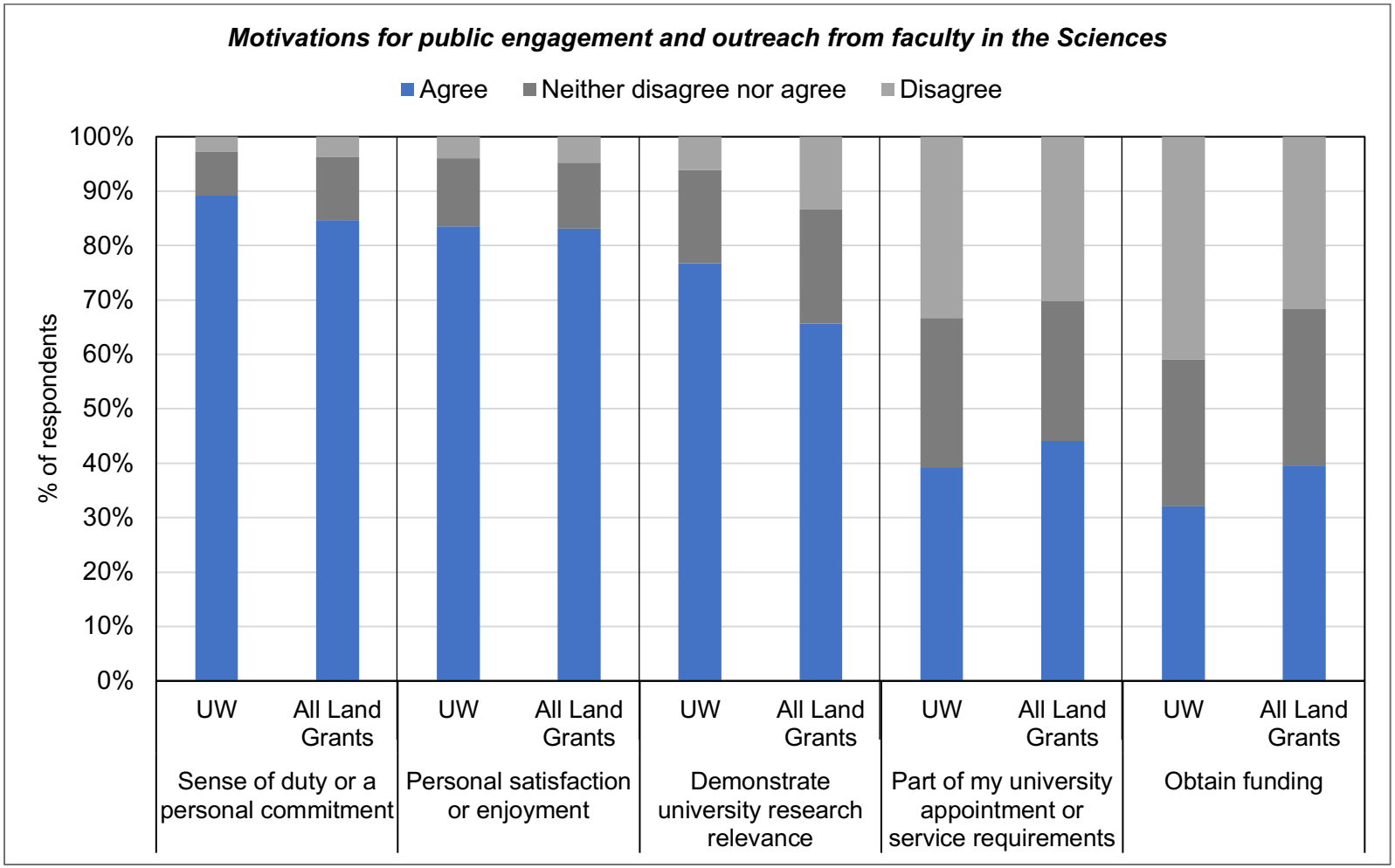
Figure 6.4. Use of social science research for science communication by faculty in the Sciences

Section 7: Engagement motivations, drawbacks, and barriers

Numerous motivations, drawbacks, and barriers to public engagement and outreach have been suggested by science communication researchers and practitioners. For personal motivations (Figure 7.1), faculty respondents in the Sciences indicate that a sense of duty (90% of UW and 85% of all Land Grant agree) and personal enjoyment (83%-84% of all faculty agree) are strong motivators for participating in engagement. Respondents also believe that demonstrating their university's research relevance is a motivating factor (77% of UW faculty and 66% of all Land Grant faculty agree). Opinions are more mixed about motivations related to obtaining funding and fulfilling university appointment requirements.

Science faculty respondents mostly reject the drawbacks commonly associated with public engagement (Figure 7.2). Respondents reject the assertions that engagement is not their job (83% of UW faculty and 80% of all Land Grant faculty disagree), it distracts from research (63% of UW faculty and 60% of all Land Grant faculty disagree), and it diverts money from other activities (62% of UW faculty and 57% of all Land Grant faculty disagree). Opinions are more mixed about the potential drawbacks that engagement does not help their careers (29% of UW faculty and 27% of all Land Grant faculty agree; 44%-45% of all faculty disagree) and makes them a target (41% of UW faculty and 38% of all Land Grant faculty agree; about 33% of all faculty disagree).

Finally, faculty respondents in the Sciences are more ambivalent about some of the common potential barriers to public engagement (Figures 7.3). Respondents are ambivalent about the reasons preventing their colleagues from participating in public engagement being that most researchers are bad at engagement (39%-40% of all faculty neither disagree nor agree) and that they may have had bad experiences in the past (47% of UW faculty and 45% of all Land Grant faculty neither disagree nor agree). There is more consensus around the barrier that there is a lack of institutional incentives to engage (55% of UW faculty and 53% of all Land Grant faculty agree).


Motivations for public engagement and outreach from faculty in the Sciences
Agree
Neither disagree nor agree
Disagree
% of respondents
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
UW
All Land Grants
Sense of duty or a personal commitment
Personal satisfaction or enjoyment
Demonstrate university research relevance
Part of my university appointment or service requirements
Obtain funding

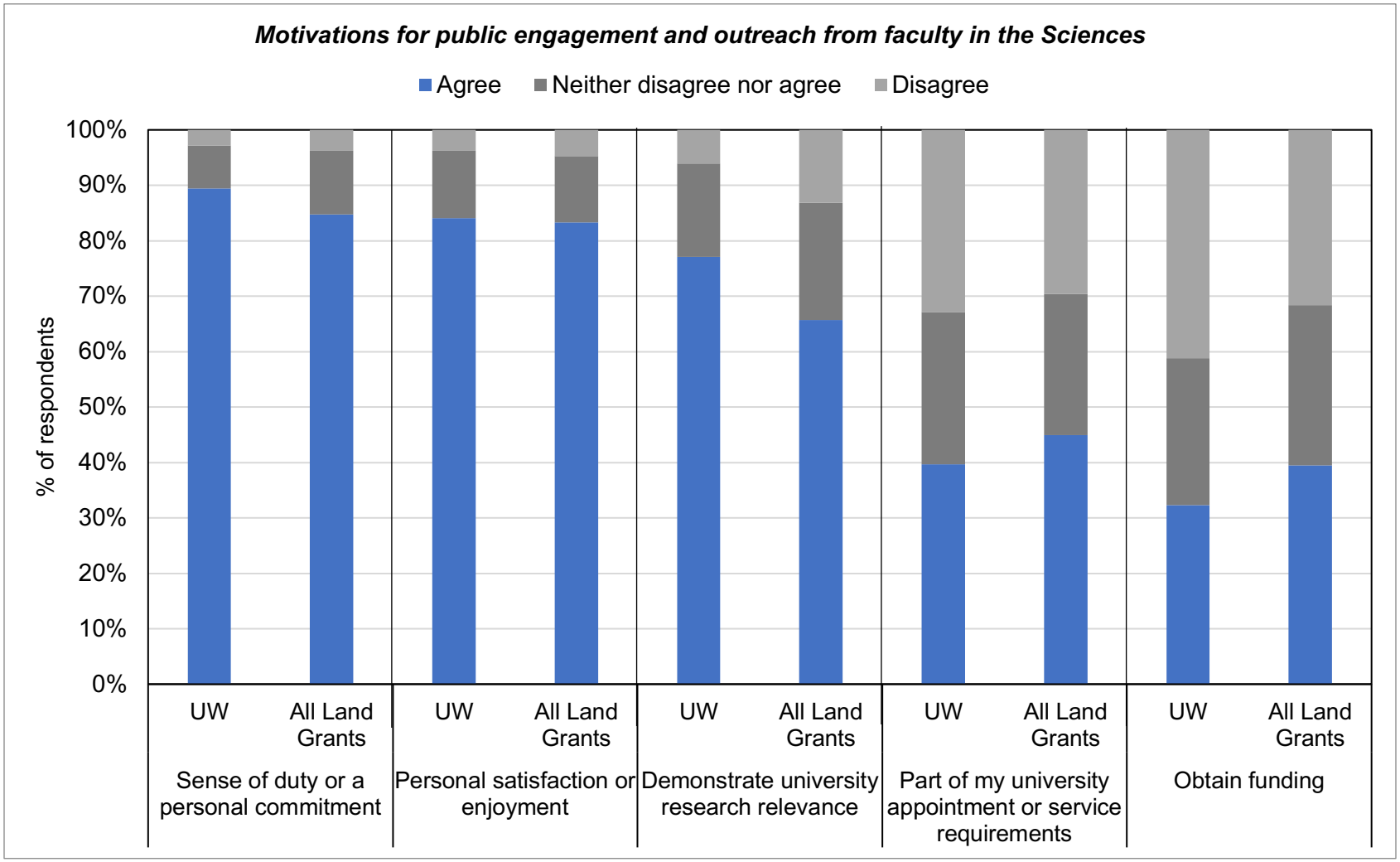


Figure 7.1. Motivations for engagement, according to respondents in the Sciences

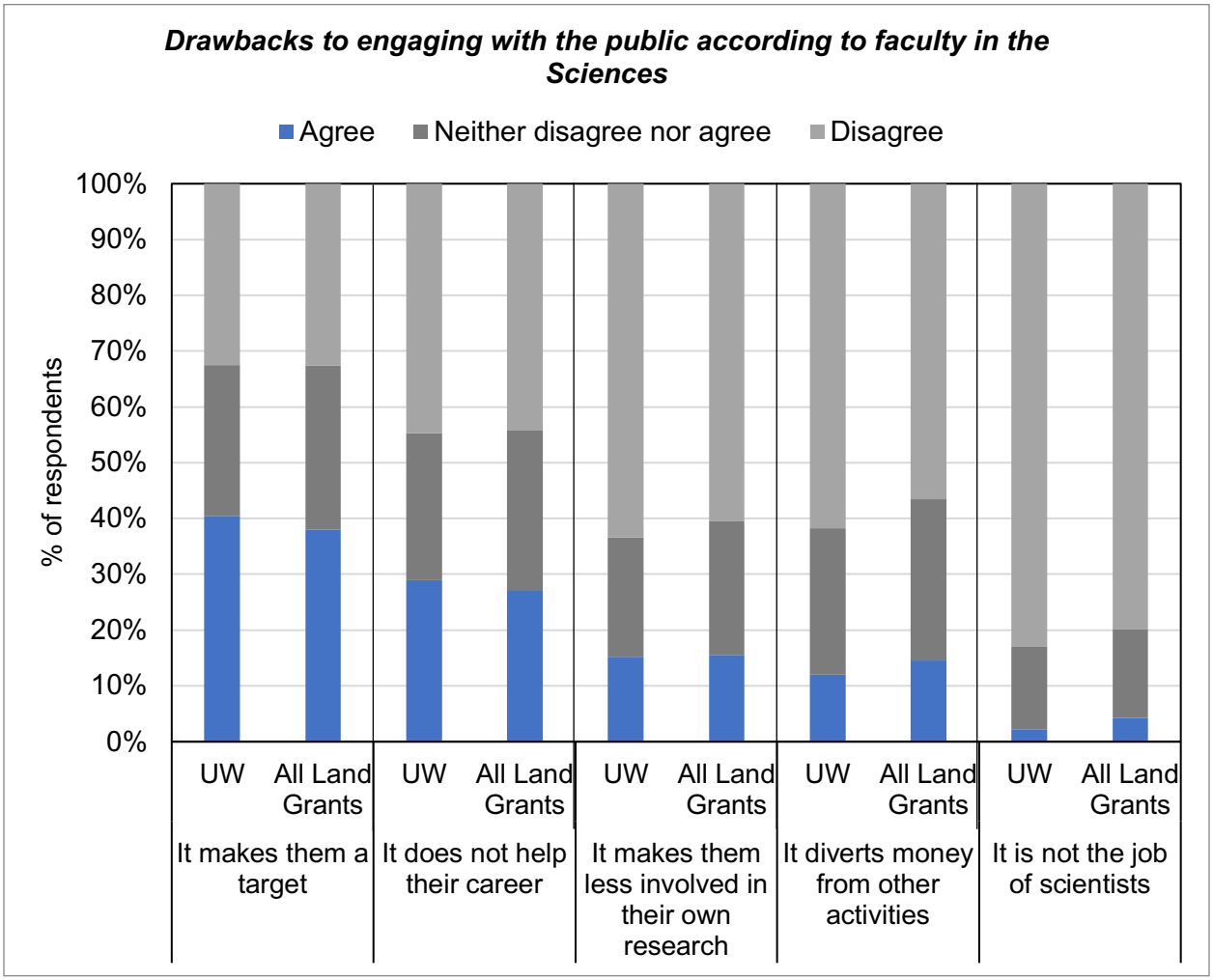


Figure 7.2. Scientist drawbacks to engagement, according to respondents in the Sciences

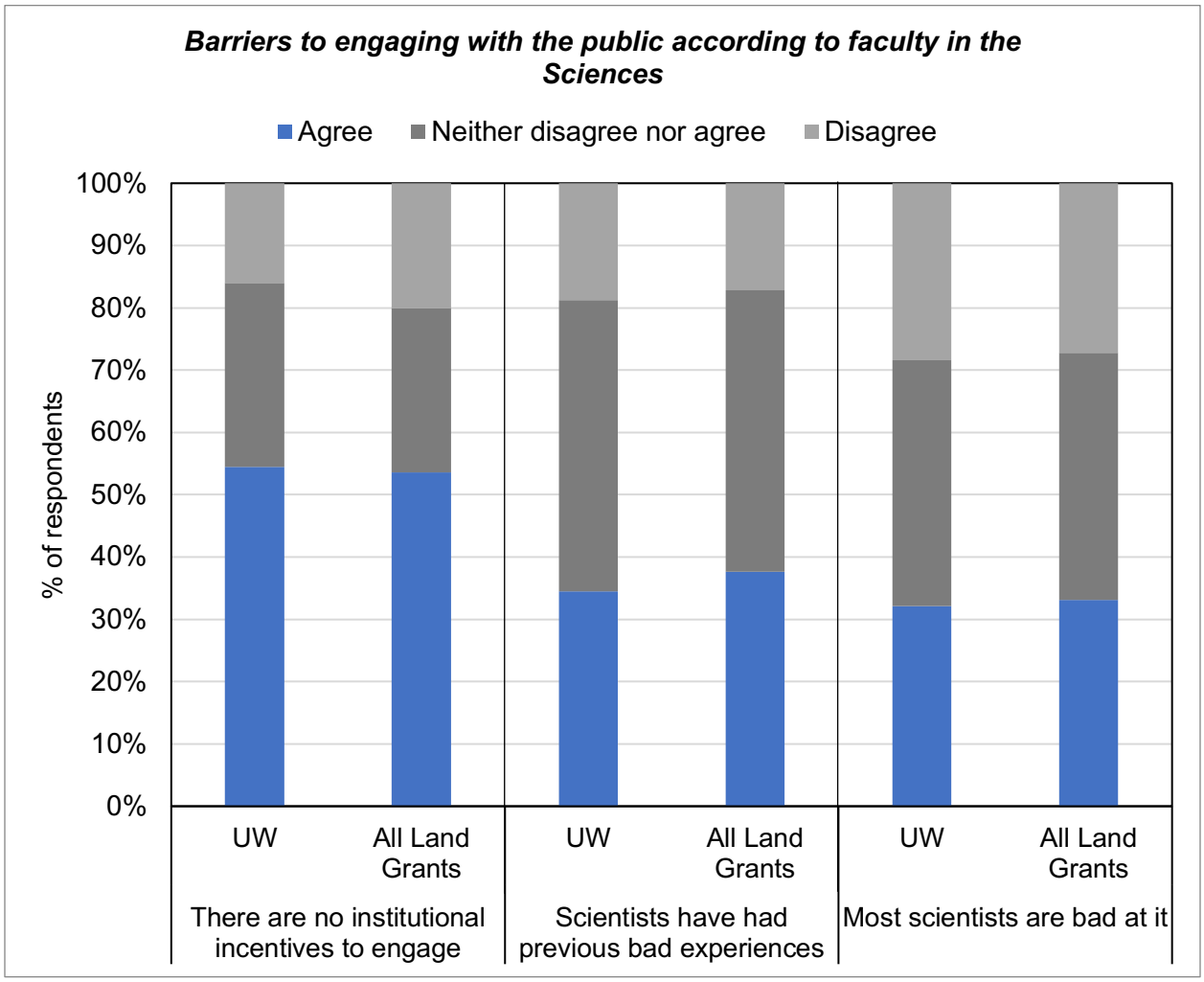


Figure 7.3. Scientist barriers to engagement, according to respondents in the Sciences

Part 2: Faculty in the Arts and Humanities

Section 8: Views of science and the public

Similar to their colleagues in the Sciences, faculty respondents in the Arts and Humanities hold mixed views of members of the public (Figure 8.1). In line with those in the Sciences, most Arts and Humanities respondents do not think that members of the public understand basic scientific principles (about 70% disagree at UW and 67% at all Land Grants). They do, however, believe that lay audiences can bring valuable perspectives to science discussions (about 64% of all faculty agree), although they are not as confident in lay audiences as respondents in the Sciences. While still a considerable proportion, fewer faculty respondents in the Arts and Humanities at all Land Grants prescribe to a deficit model of thinking about public attitudes toward controversial science, with about 41% agreeing that people would be more supportive of science if they understood it and only 17% disagreeing. Additionally, about 49% of faculty at UW agree that people would be more supportive of science if they understood it and only 14% disagree.

Faculty respondents in the Arts and Humanities hold similar views to those in the Sciences regarding science in society (Figure 8.2) and who they think should be responsible for scientific issue decision-making (Figure 8.3). Respondents are mostly ambivalent about the idea that scientists know best what is good for the public (49%-50% of all faculty neither disagree nor agree), however, they do agree that scientists should be actively involved in political debates about science (85% agree). Interestingly, Arts and Humanities faculty respondents are less confident in the abilities of both the public and the scientific community to make decisions about science compared to Science respondents. Most Arts and Humanities respondents still do agree that the scientific community is capable of guiding the responsible development of new technologies (64%-65% of all faculty agree). Faculty in the Arts and Humanities are disputed about whether scientists have a responsibility to pay attention to the wishes of the public, with over four-in-ten agreement about the statement (40% of all faculty) and over one-third disagreement (46% of UW and 39% of all Land Grants).

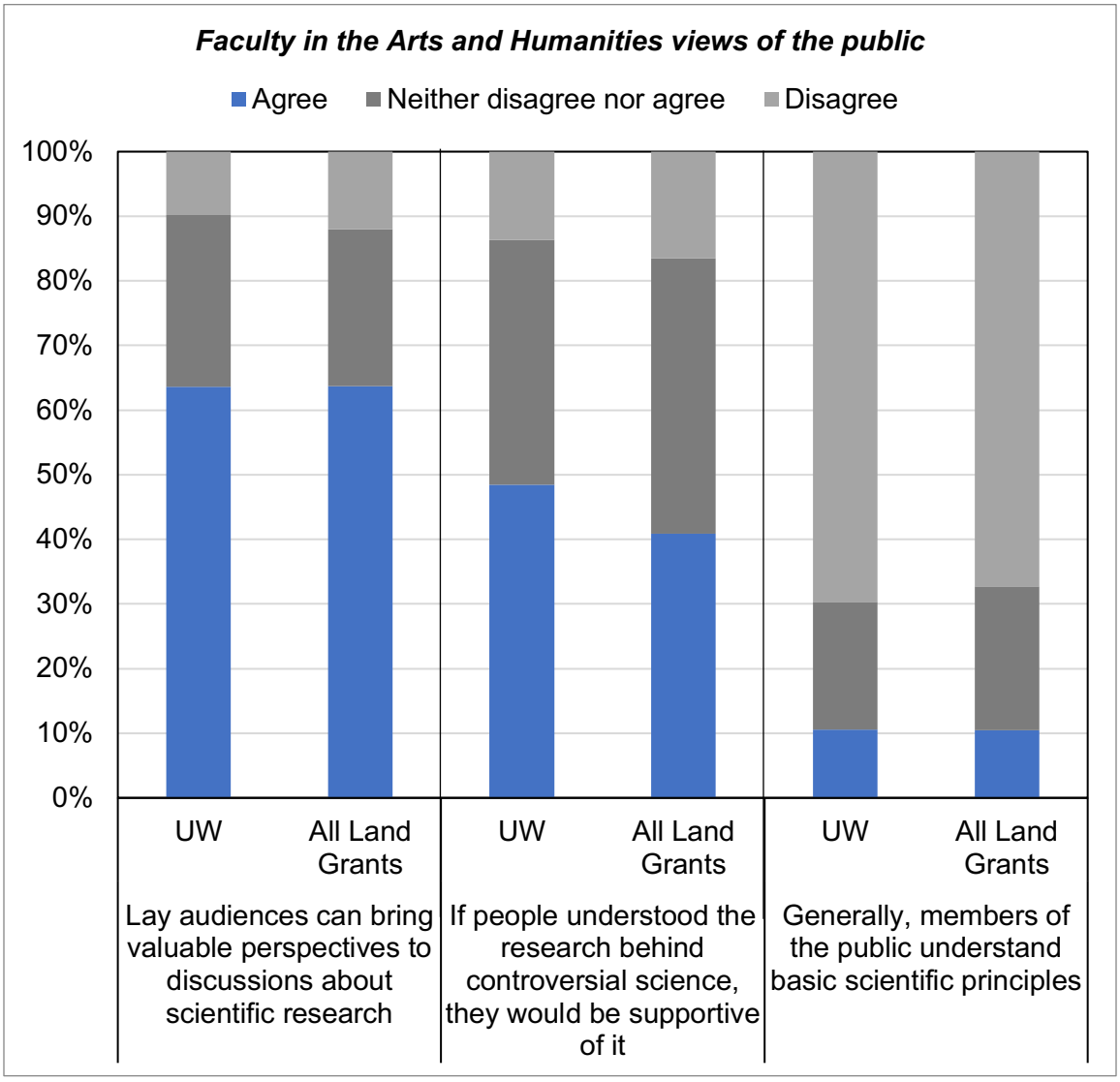


Figure 8.1. Arts and Humanities faculty views of the public regarding science

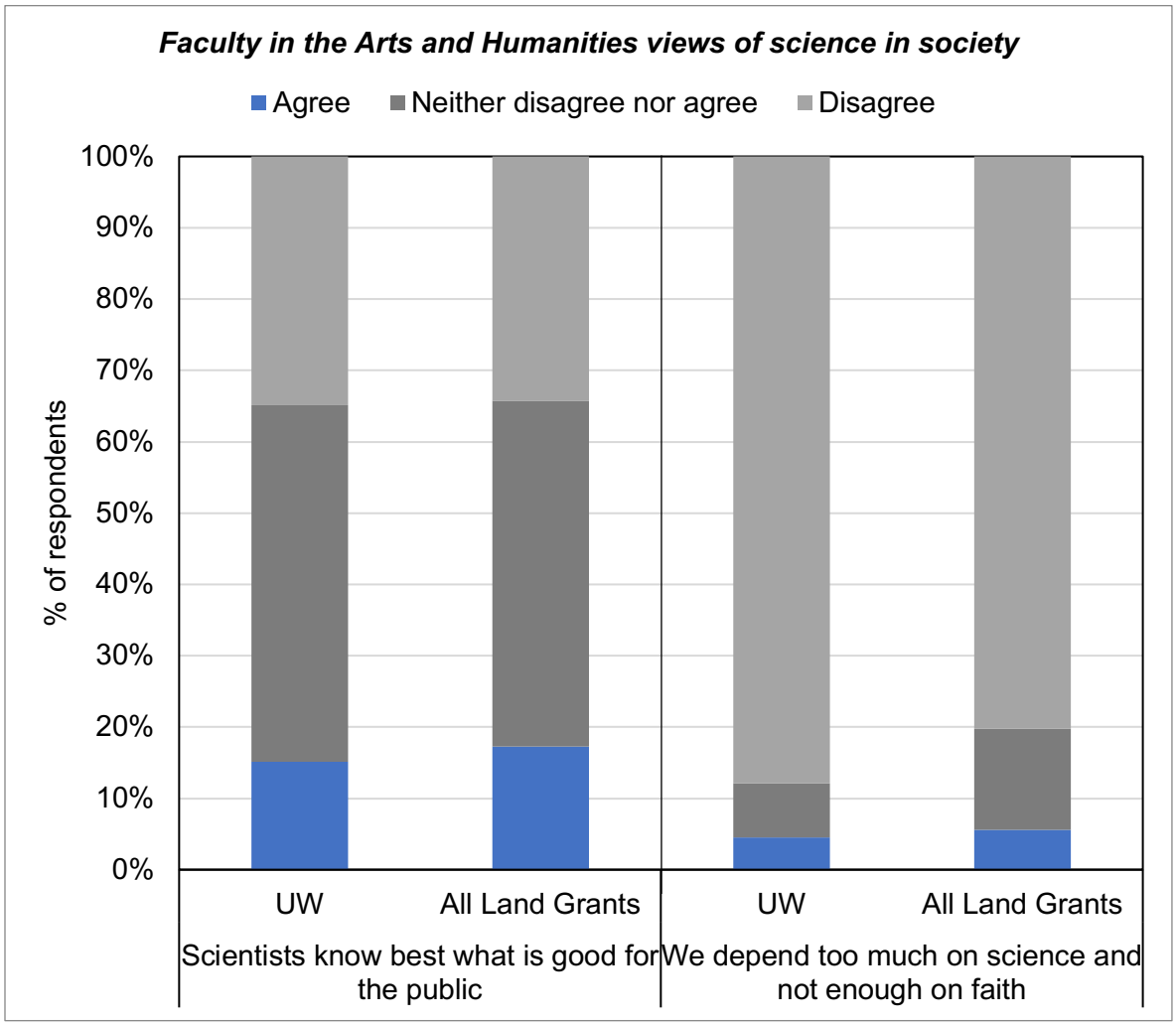


Figure 8.2. Arts and Humanities faculty views of science in society

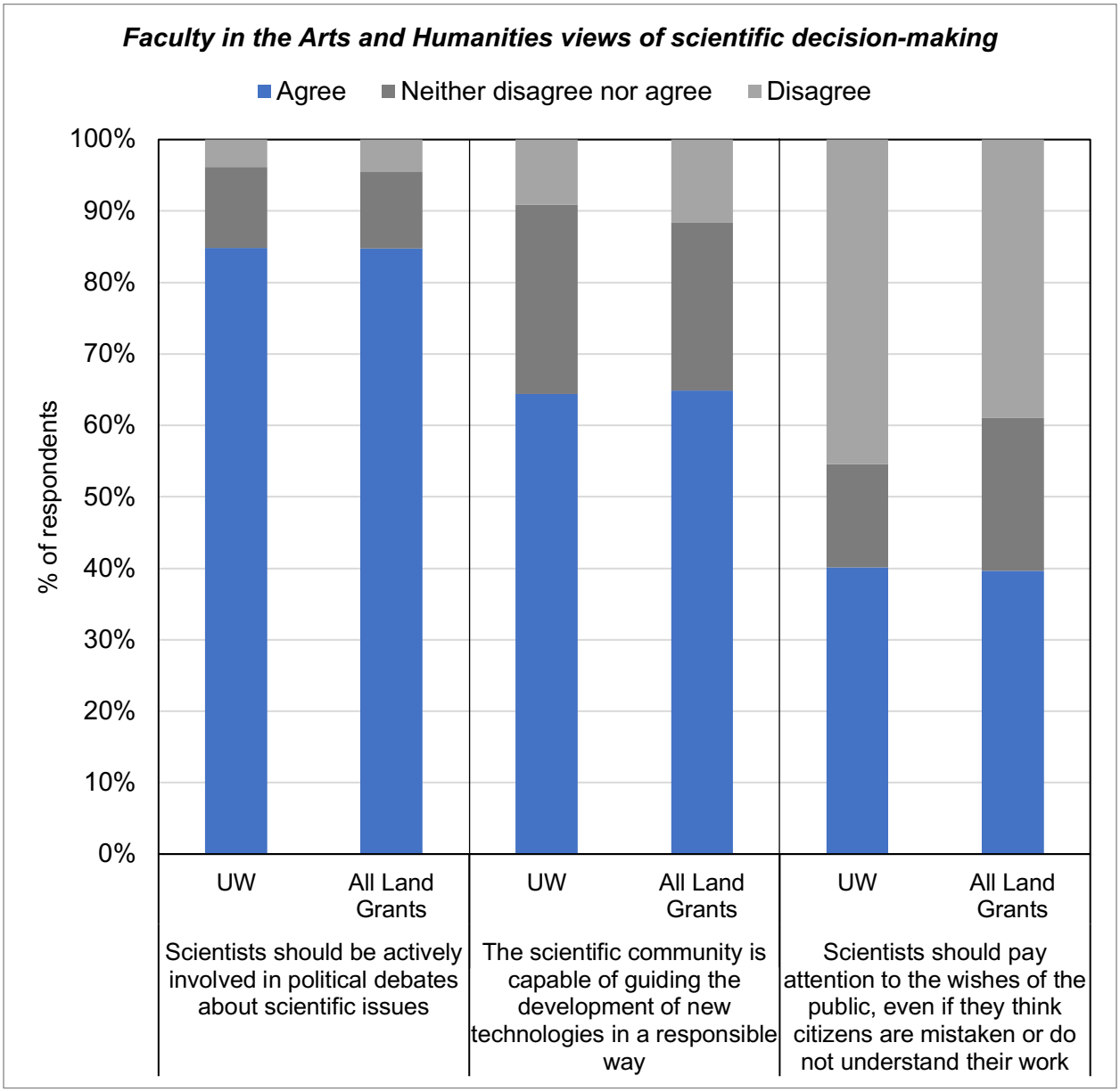


Figure 8.3. Arts and Humanities faculty views of scientific decision-making

Section 9: Social media use and attitudes

Of the faculty respondents in the Arts and Humanities, 83% at UW and 87% at all Land Grants report using social media. Along with their Science colleagues, those in the Arts and Humanities do not report high frequency social media use for work-related purposes, although they do use most social media platforms slightly more frequently. The Arts and Humanities respondents' use varies by social media platform (Figure 9.1), with the most universally used platforms including Wikipedia, YouTube, and Facebook. Perhaps unsurprisingly, the largest difference in platform use between respondents in the Arts and Humanities and those in the Sciences is for restricted online communities (e.g., ResearchGate), with those in the Sciences using the platforms considerably more frequently.

Faculty in the Arts and Humanities report a similar lack of engagement when asked about their general use of social media for specific work-related purposes (Figure 9.2). Around half of Arts and Humanities respondents report that they never engage with peers on post-publication content about their research (47% of UW faculty and 49% of all Land Grant faculty), write about topics related to their research (40% of UW faculty and 46% of all Land Grant faculty), share announcements about their new studies (46% of UW faculty and 44% of all Land Grant faculty), or participate in discussions about their research (34% of UW faculty and 36%of all Land Grant faculty). There is still a sizeable number of faculty who report that they engage on social media, but they participate only once a month or less frequently in the listed activities (around a third for each activity). Once again, faculty in the Arts and Humanities report slightly higher levels of engagement.

The social media attitudes of Arts and Humanities faculty members (Figure 9.3) indicate similar concerns and support as those in the Sciences. Just over six-in-ten Arts and Humanities respondents (67% of UW faculty and 64% of all Land Grant faculty) disagree that scholars should not discuss potentially controversial topics on social media. Yet, they also express a disconnect where considerably fewer respondents reject the idea that using social media negatively impacts a scholar's reputation (37% of UW faculty and 41% of all Land Grant faculty disagree). Many respondents find social media to be time-consuming (55% of UW faculty and 47% or all Land Grant faculty agree) and they are ambivalent about whether using social media positively affects their academic impact (46%-47% of all faculty neither disagree nor agree). Most Arts and Humanities faculty respondents do, however, believe that there are lay audiences interested in what scholars share about the arts and humanities on social media (about 80% of all faculty agree).

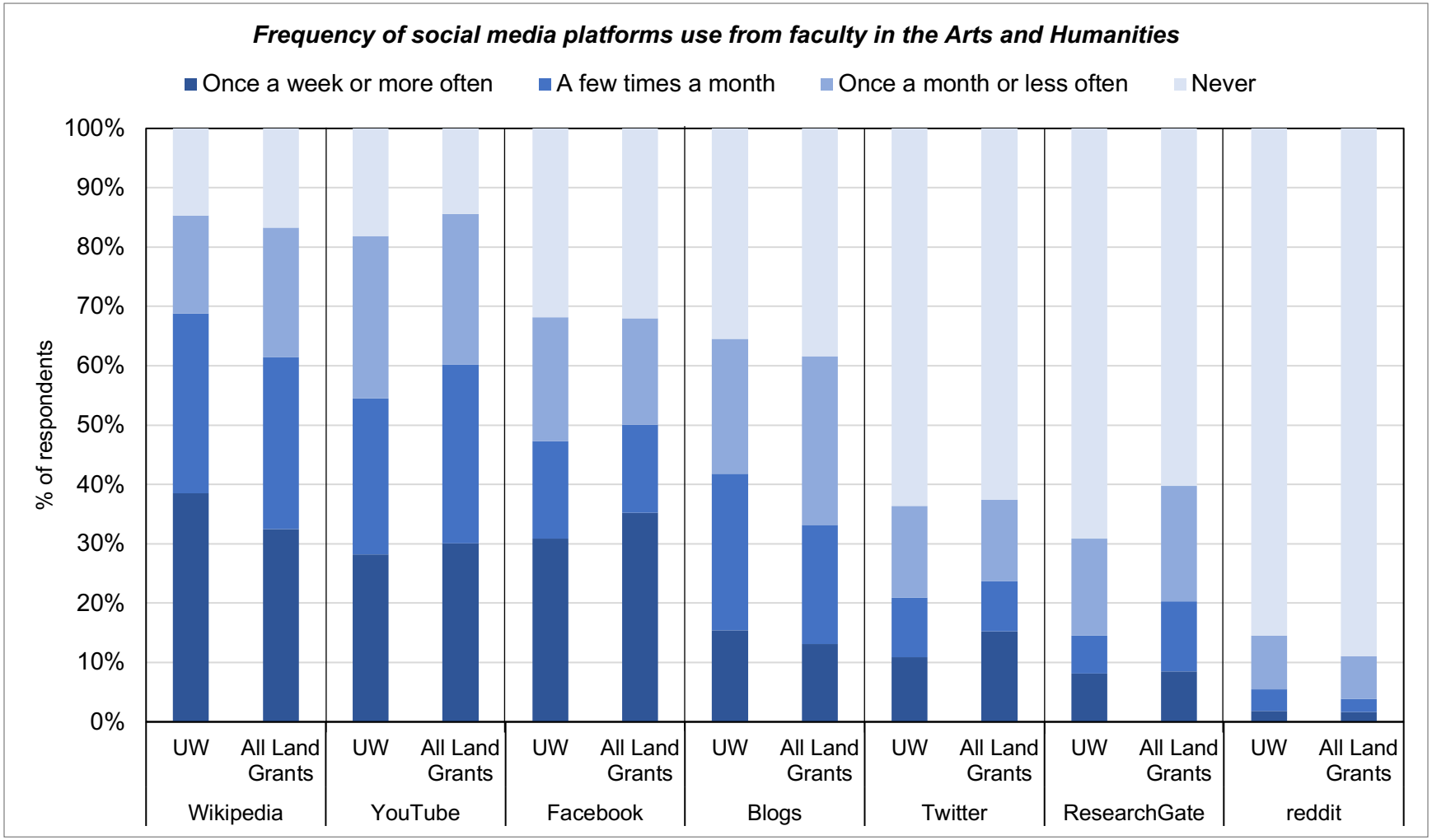


Figure 9.1. Frequency of social media platforms use by faculty in the Arts and Humanities

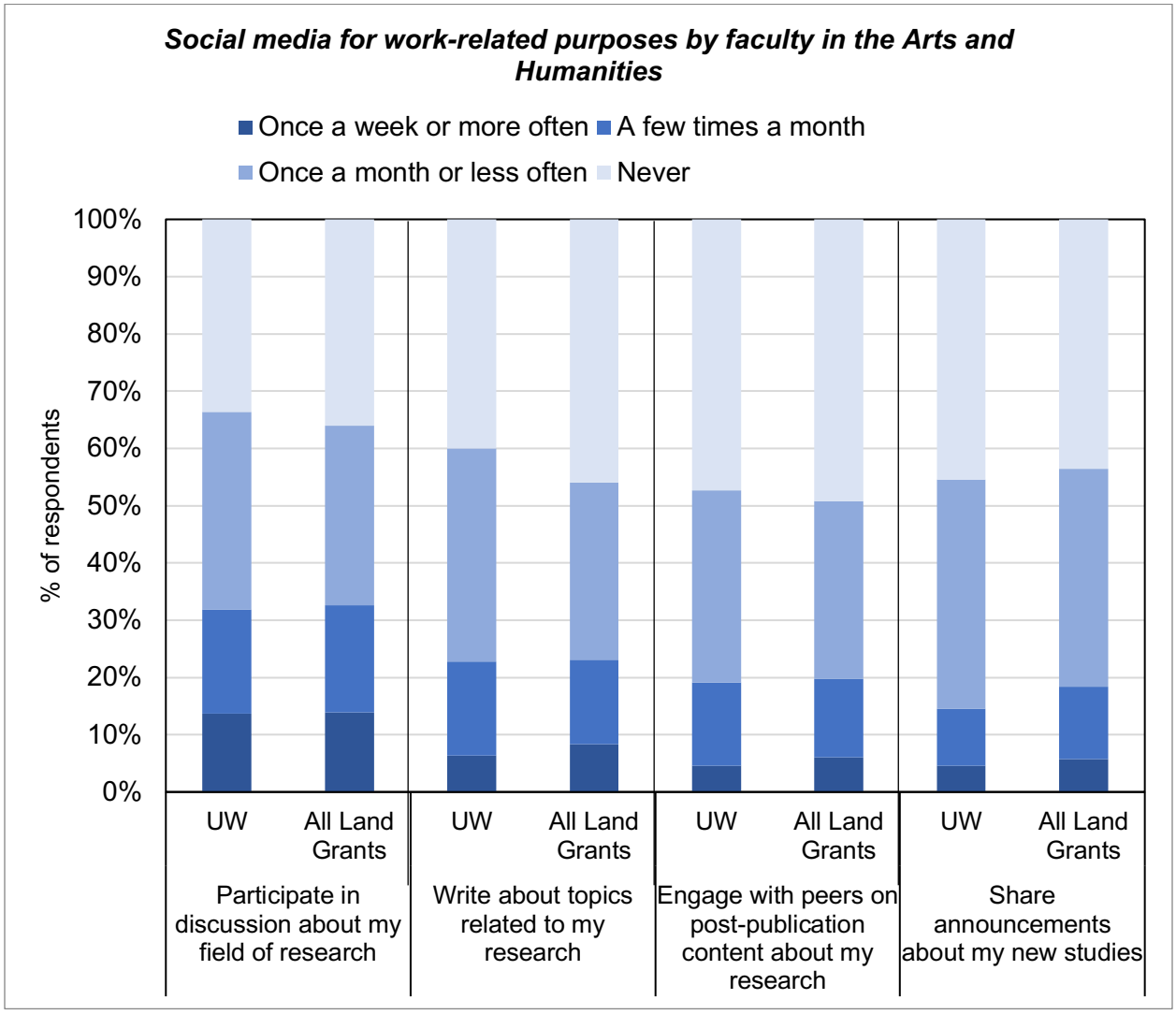


Figure 9.2. Frequency of social media use for specific work-related purposes from faculty in the Arts and Humanities

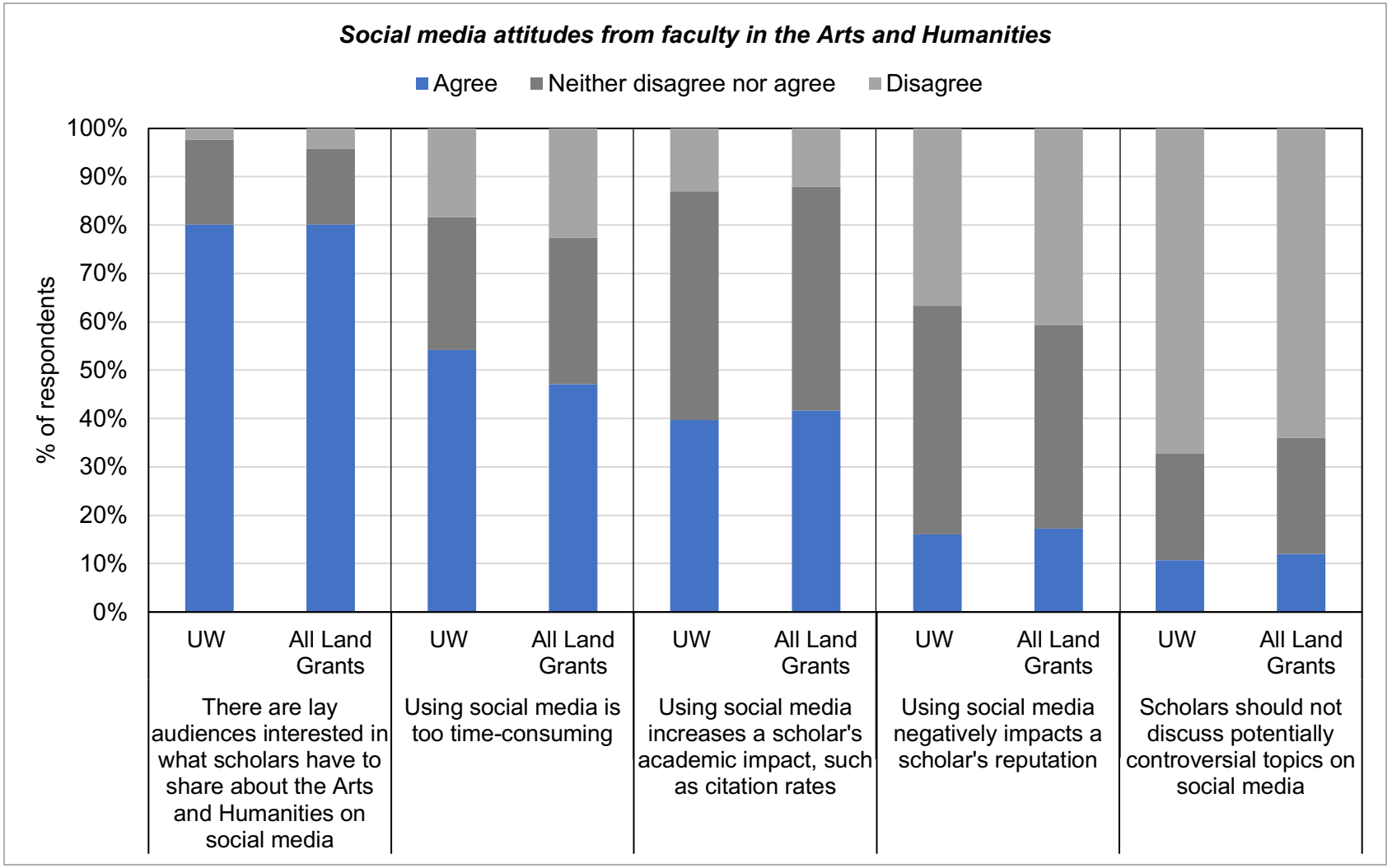


Figure 9.3. Social media attitudes from faculty in the Arts and Humanities

Section 10: Engagement activities and participation

Faculty in the Arts and Humanities report participating in a variety of public engagement and outreach activities (Figures 10.1 and 10.2), although their level of involvement varies by activity.

Over half of the Arts and Humanities faculty have worked at open house events (73% at UW and 82% at all Land Grants), participated in public meetings (81%-82% of all faculty), met with policymakers (48% at UW and 55% at all Land Grants), given public lectures (84% at UW and 78% at all Land Grants), given interviews to journalists (74% at UW and 68% at all Land Grants), or worked with K-12 youth (55% at UW and 57% at all Land Grants) at least once in their careers. Along with their Science colleagues, Arts and Humanities faculty most frequently (i.e., more than once in the past year) participate in activities such as giving public lectures, giving interviews, and working with K-12 youth. Activities such as meeting with policymakers occurred less often. Given their specific focus, those in the Arts and Humanities unsurprisingly participate less often in science festivals and science pubs or cafés than their Science colleagues, although some Arts and Humanities faculty do regularly participate in these activities.

When asked about their participation in public engagement and outreach in the future, Arts and Humanities faculty respondents are willing to take part in a variety of activities (Figures 10.3 and 10.4). The most popular choices (over 85% of respondents were at least somewhat willing to participate) are more traditional activities that many are already actively involved in: giving public lectures, giving interviews, meeting with policymakers, participating in public meetings, working at open houses, and working with K-12 youth. Respondents are relatively less open to and enthusiastic about writing blogs, giving talks in science pubs or cafés, and participating in science festivals.

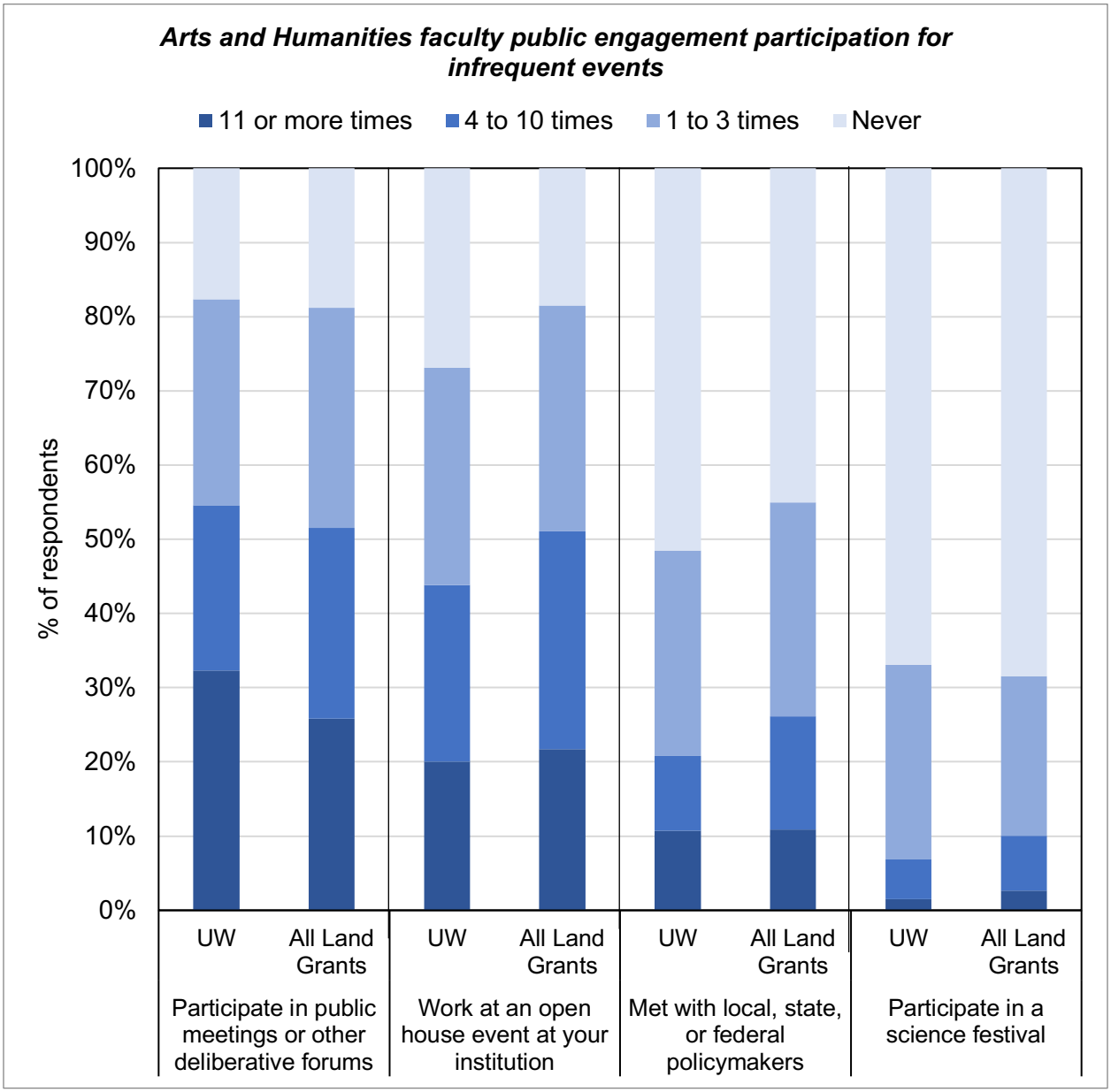


Figure 10.1. Arts and Humanities faculty participation in infrequent public engagement efforts over their careers

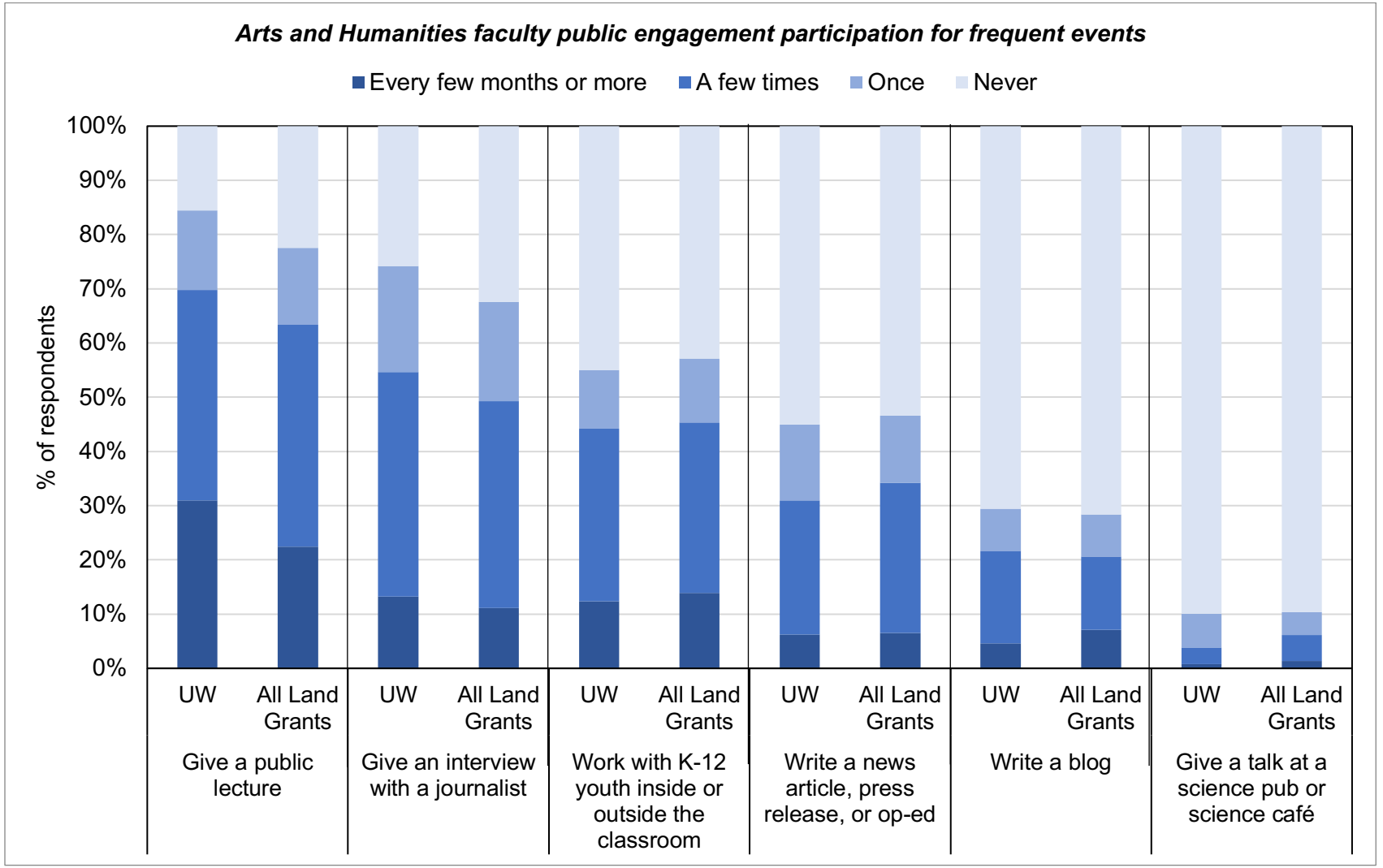


Figure 10.2. Arts and Humanities faculty participation in frequent public engagement efforts over the previous year

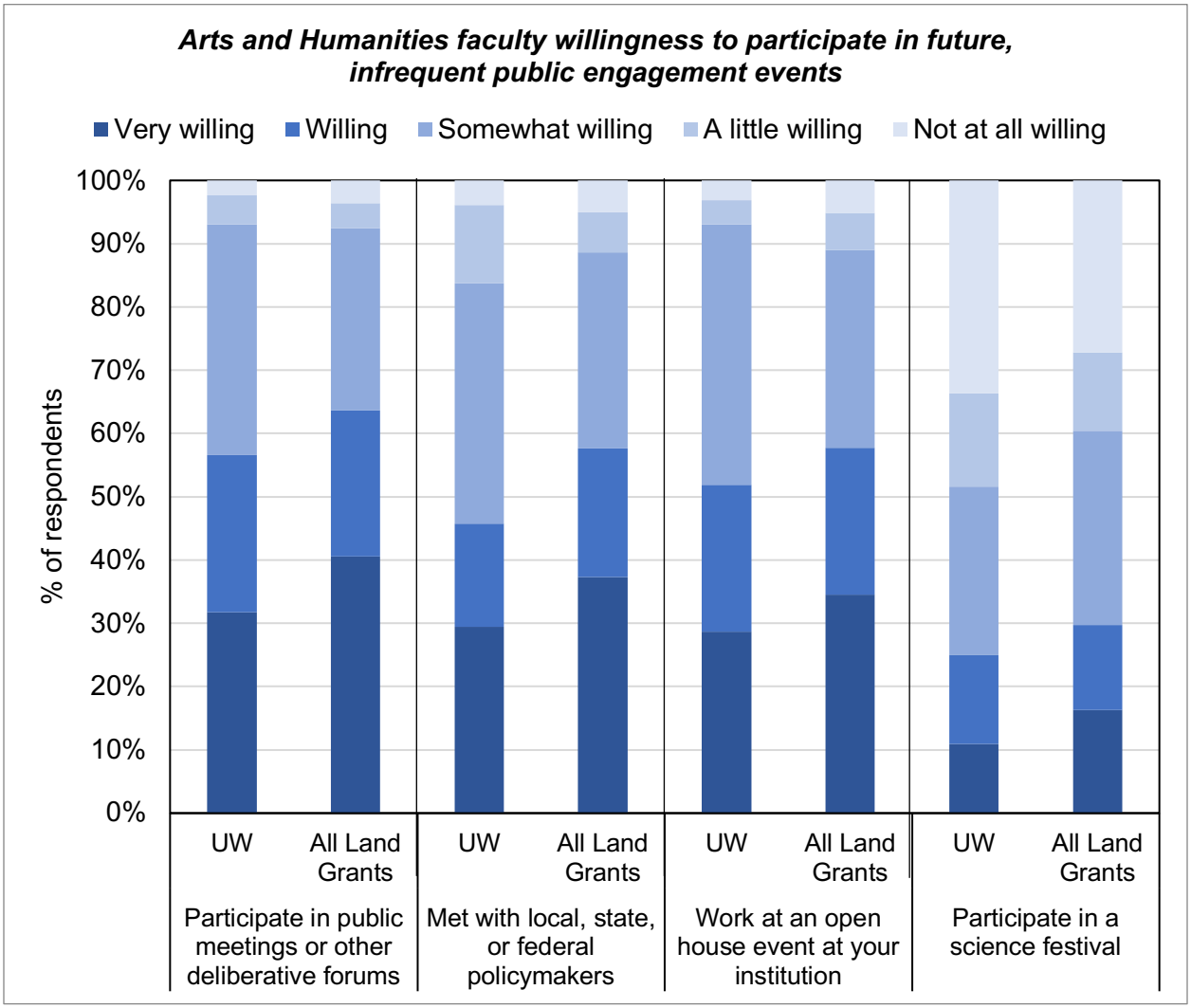


Figure 10.3. Arts and Humanities faculty willingness to participate in infrequent public engagement efforts in the future

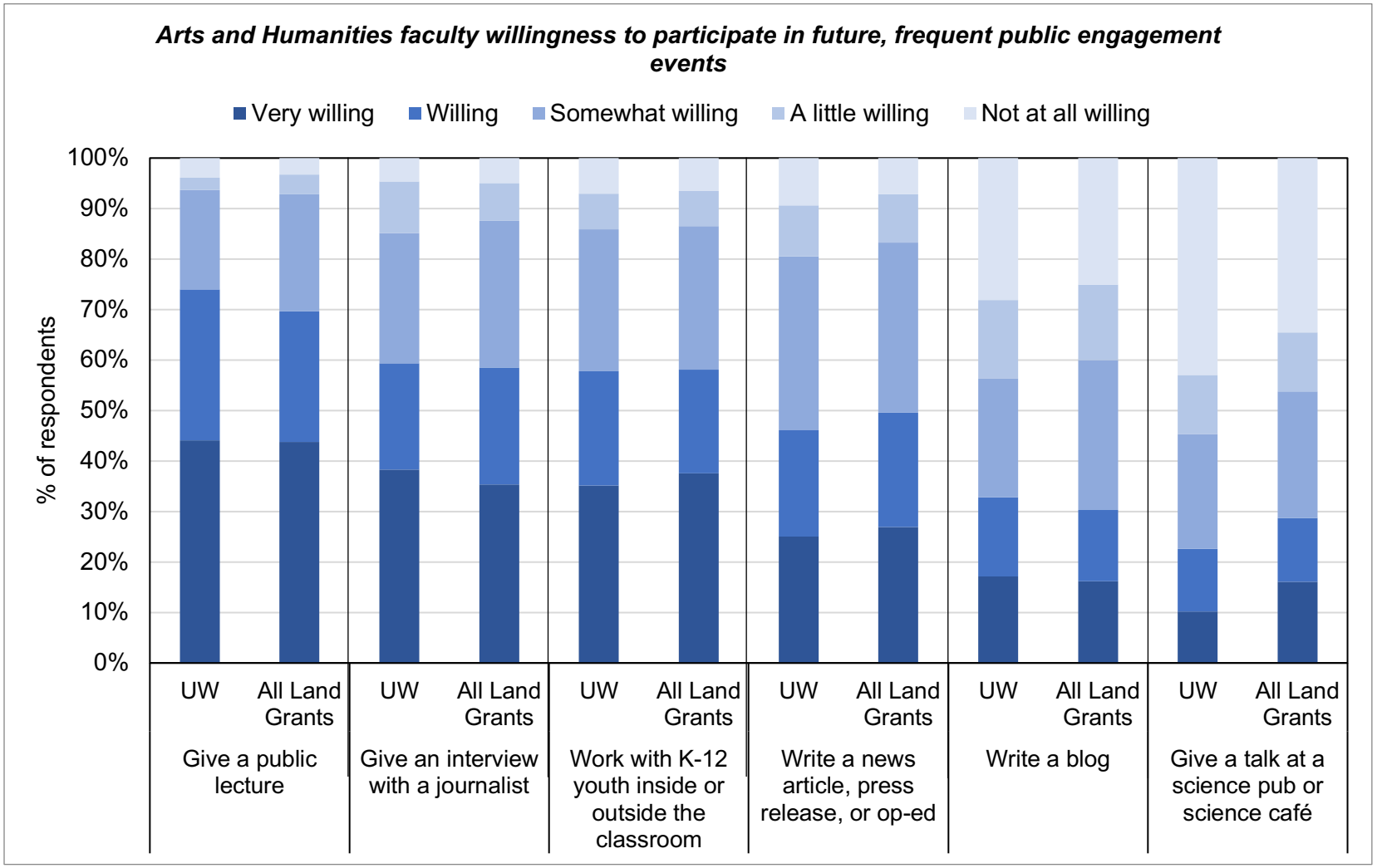


Figure 10.4. Arts and Humanities faculty willingness to participate in frequent public engagement efforts in the future

Section 11: Defining public engagement

Using a definition of public engagement focused on activities involving two-way forms of communication which emphasize discussion and mutual learning, we assess Arts and Humanities faculty respondents' understanding of public engagement (Figures 11.1 and 11.2). While there is general alignment among all faculty respondents based on the characteristics of activities considered to be public engagement, respondents in the Arts and Humanities are more selective than Sciences respondents about the specific events. For general characteristics (Figure 11.1), most respondents from the Arts and Humanities understand that public engagement emphasizes two-way communication (about 85% of all faculty agree) and discussion (71% of UW faculty and 76% of all Land Grant faculty agree), but over half of the respondents also align engagement activities with elements of traditional outreach, such as one-way forms of communication (57% of UW faculty and 53% of all Land Grant faculty agree). Moreover, there is less consensus around what role, if any, direct policy recommendations or other tangible outcomes play for engagement. Around four-in-ten respondents are ambivalent (46% of UW faculty and 41% of all Land Grant faculty neither disagree nor agree) about the necessity of a tangible outcome for public engagement.

For specific types of activities that fall into the category of public engagement (Figure 11.2), Arts and Humanities faculty respondents identify community service (85% of UW faculty and 87% of all Land Grant faculty agree) and informal science education (88% of all faculty agree) as public engagement, as well as any communication efforts more broadly (92% of UW faculty and 83% of all Land Grant faculty agree). Along with those in the Sciences, Arts and Humanities respondents are also less sure about whether social media could be included: almost 50% of respondents either disagree (20% of all faculty) or are unsure (18% of UW faculty and 27% of all Land Grant faculty neither disagree nor agree) as to whether communicating on social media was a public engagement activity. Although, more UW faculty (62%) agree with communicating on social media as a public engagement activity compared with all Land Grant faculty (54%).

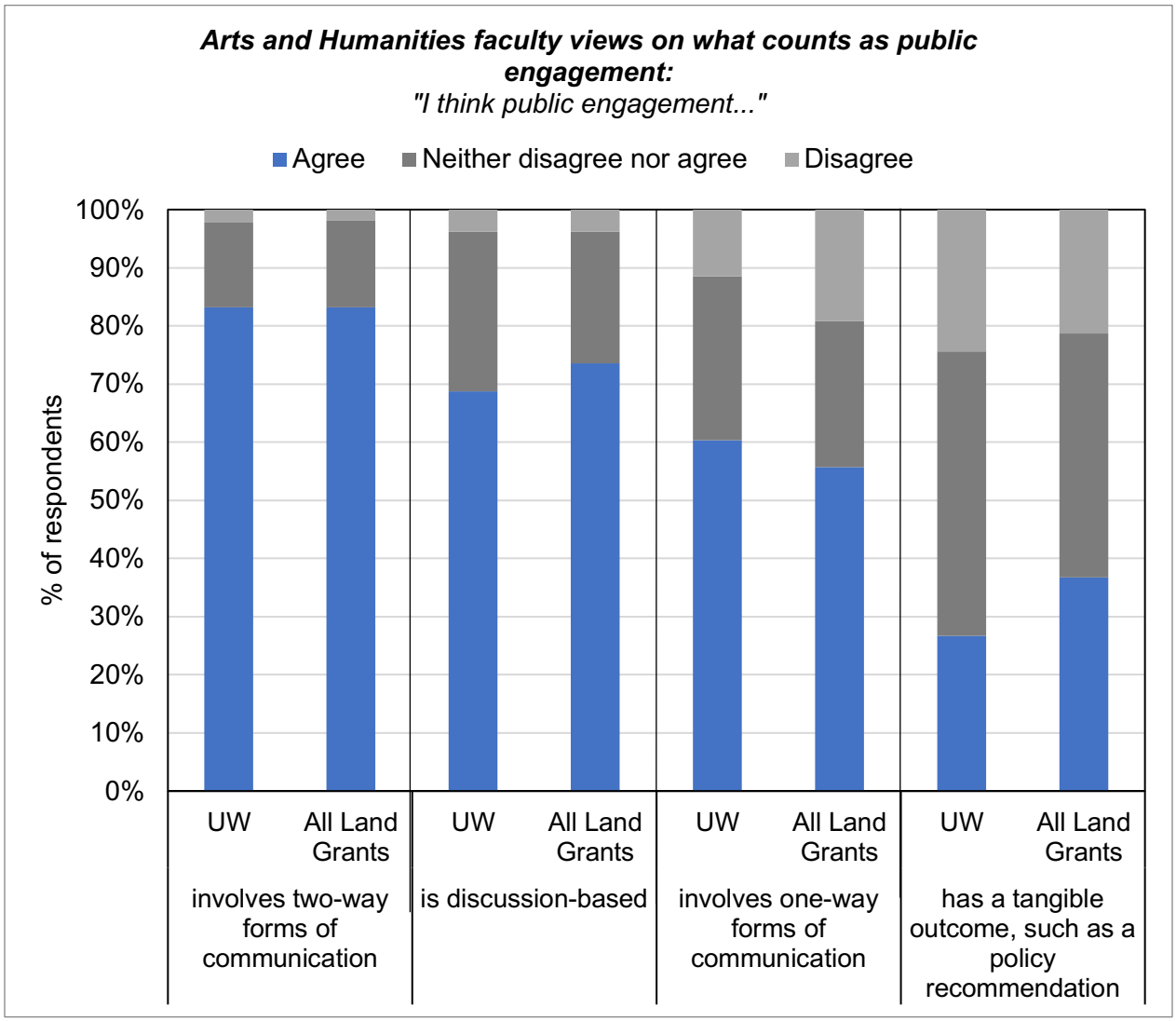


Figure 11.1. Definition of public engagement from faculty in the Arts and Humanities

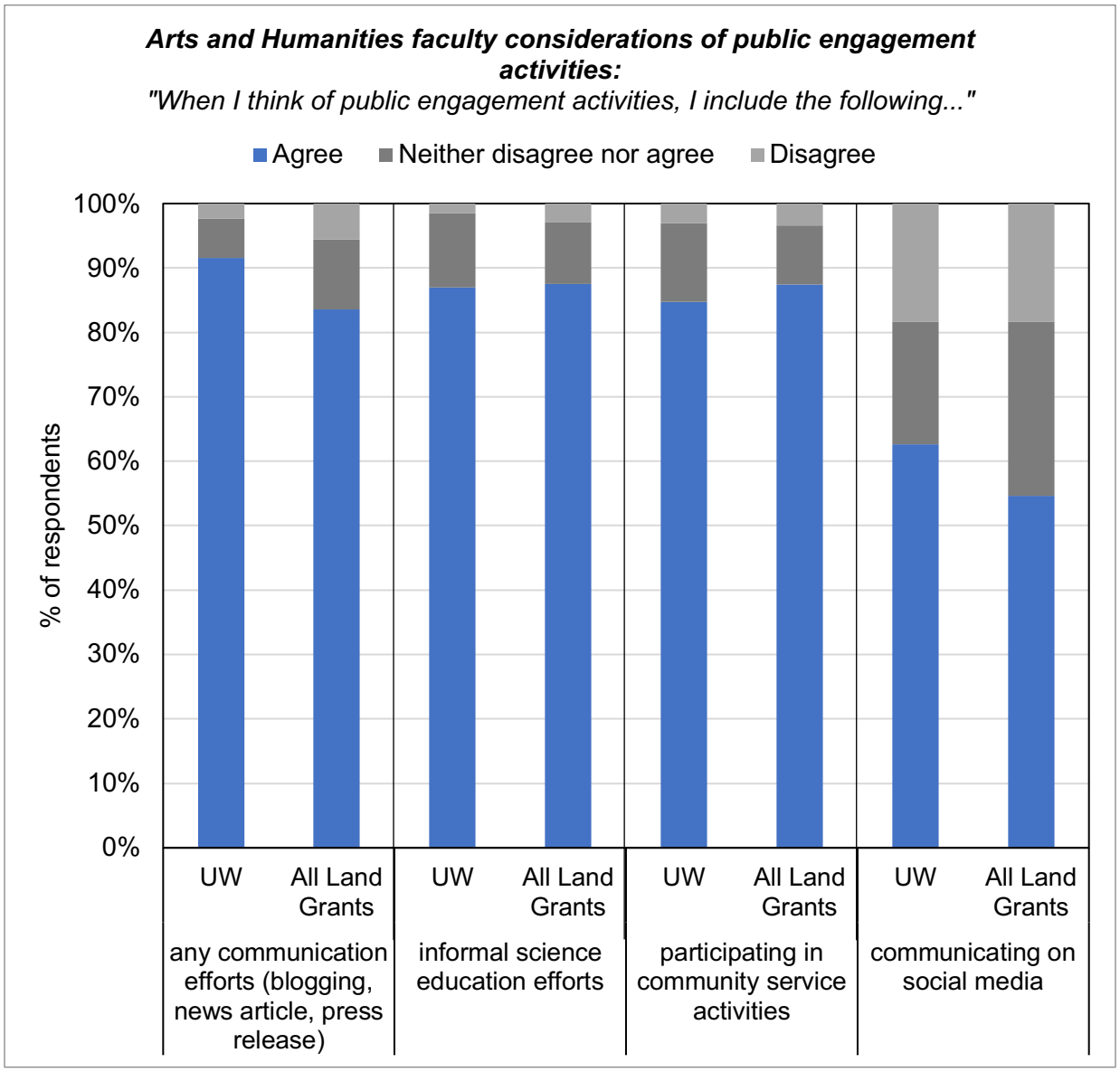


Figure 11.2. Types of events considered public engagement by Arts and Humanities faculty

Section 12: Engagement climate and culture at universities

Next, we address Arts and Humanities faculty respondents' perceptions of the university climate regarding public engagement and outreach efforts.

As with Science faculty, Arts and Humanities respondents have mixed views of how public engagement is viewed at their universities and by their colleagues (Figure 12.1): about 25% of faculty at all Land Grants and 28% at UW agree that public engagement is treated as a core component of the work expected of faculty at their university compared to the 47% who disagree at all Land Grant universities and 54% at UW. Arts and Humanities faculty respondents also reject (66% of faculty at all Land Grants and 72% of faculty at UW disagree) the idea that people at their university who are active communicators are not very good researchers.

As additional indicators of university's engagement climate, Arts and Humanities faculty were asked whether they stopped participating in engagement based on how overwhelmed they felt by other responsibilities or whether they've seen their colleagues getting burned out from participating in engagement (Figure 12.2). Respondents indicate that they give up engagement when overwhelmed with other responsibilities (35% of UW faculty and 30% of all Land Grant faculty agree), while over a third (36-38% disagree) reject this strategy. Almost a quarter of respondents (25% of all Land Grant faculty and 21% of UW faculty) also indicate they have seen colleagues burning out from outreach and engagement.

Lastly, responses from the Arts and Humanities faculty supplement the potential change in the culture of public engagement indicated by those in the Sciences (Figure 12.3). When asked about support for engagement from their advisors when they were graduate students, most respondents indicate they were not encouraged to get involved in engagement (57% of UW faculty and 55% of all Land Grant faculty disagree). In contrast to the lack of encouragement from their advisors, most Arts and Humanities faculty respondents indicate they support their own graduate students' participation in engagement activities (91% of UW faculty and 86% of all Land Grant faculty agree).

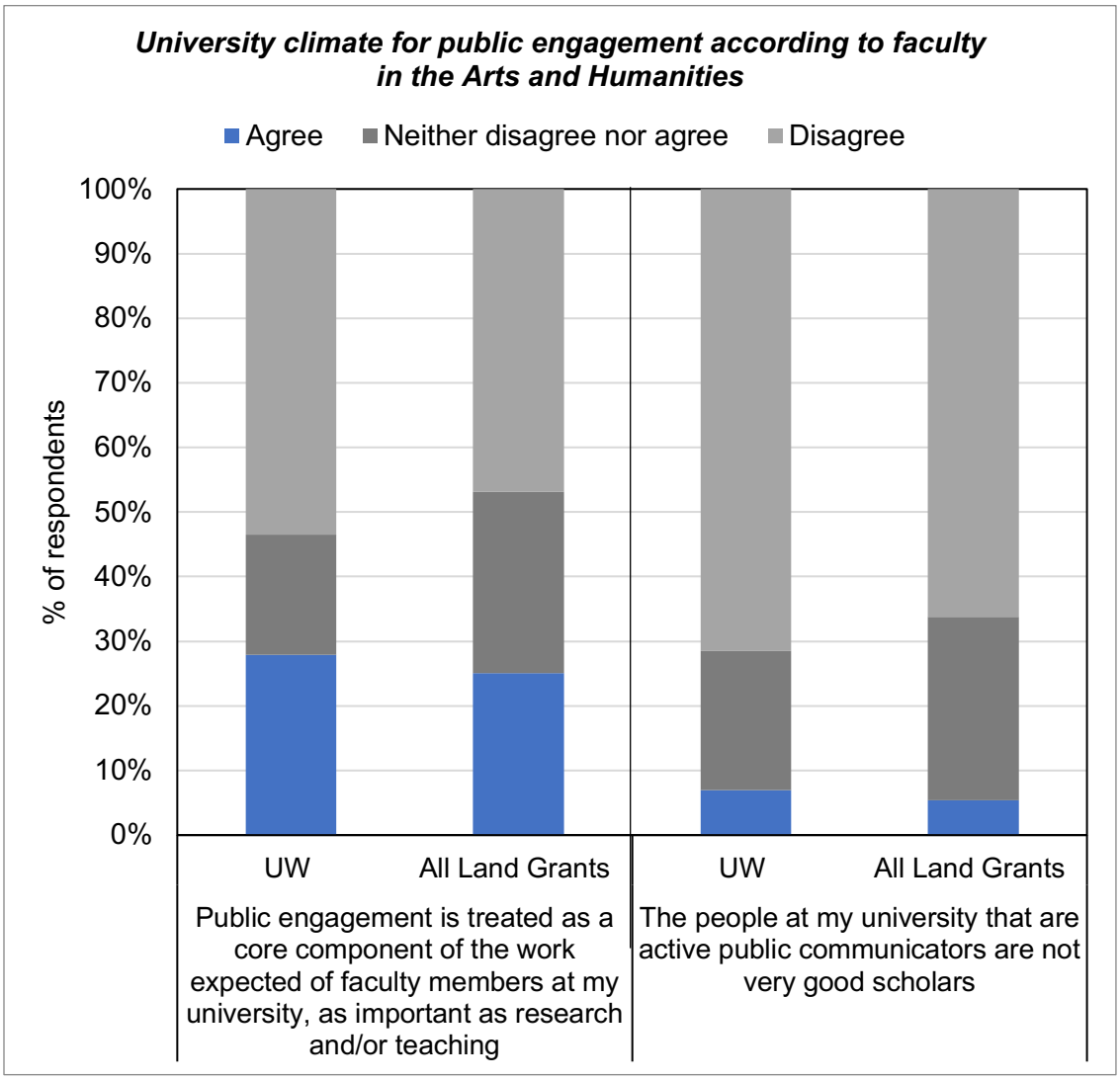


Figure 12.1. University climate for public engagement according to Arts and Humanities faculty

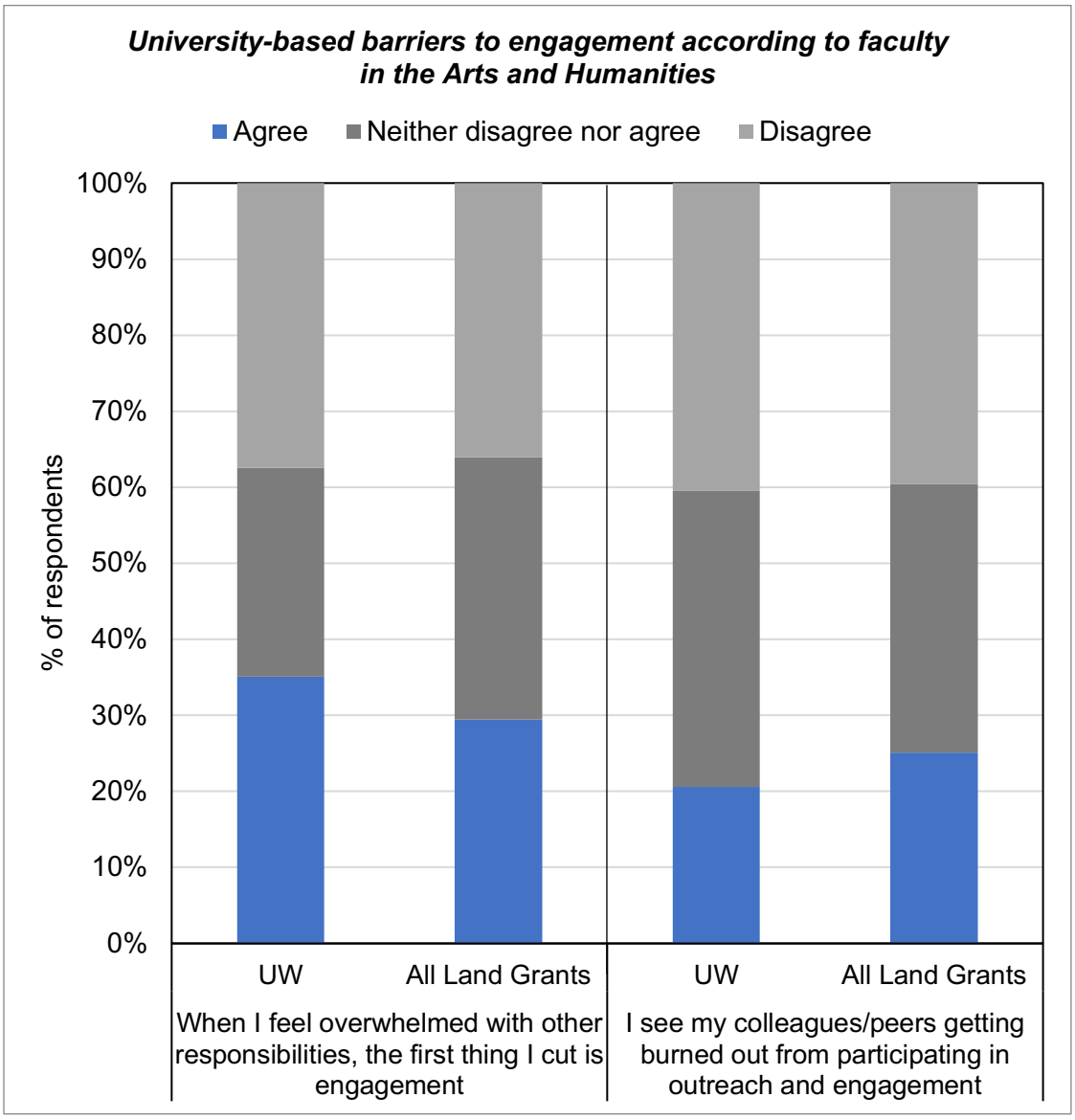


Figure 12.2. University barriers related to public engagement according to Arts and Humanities faculty

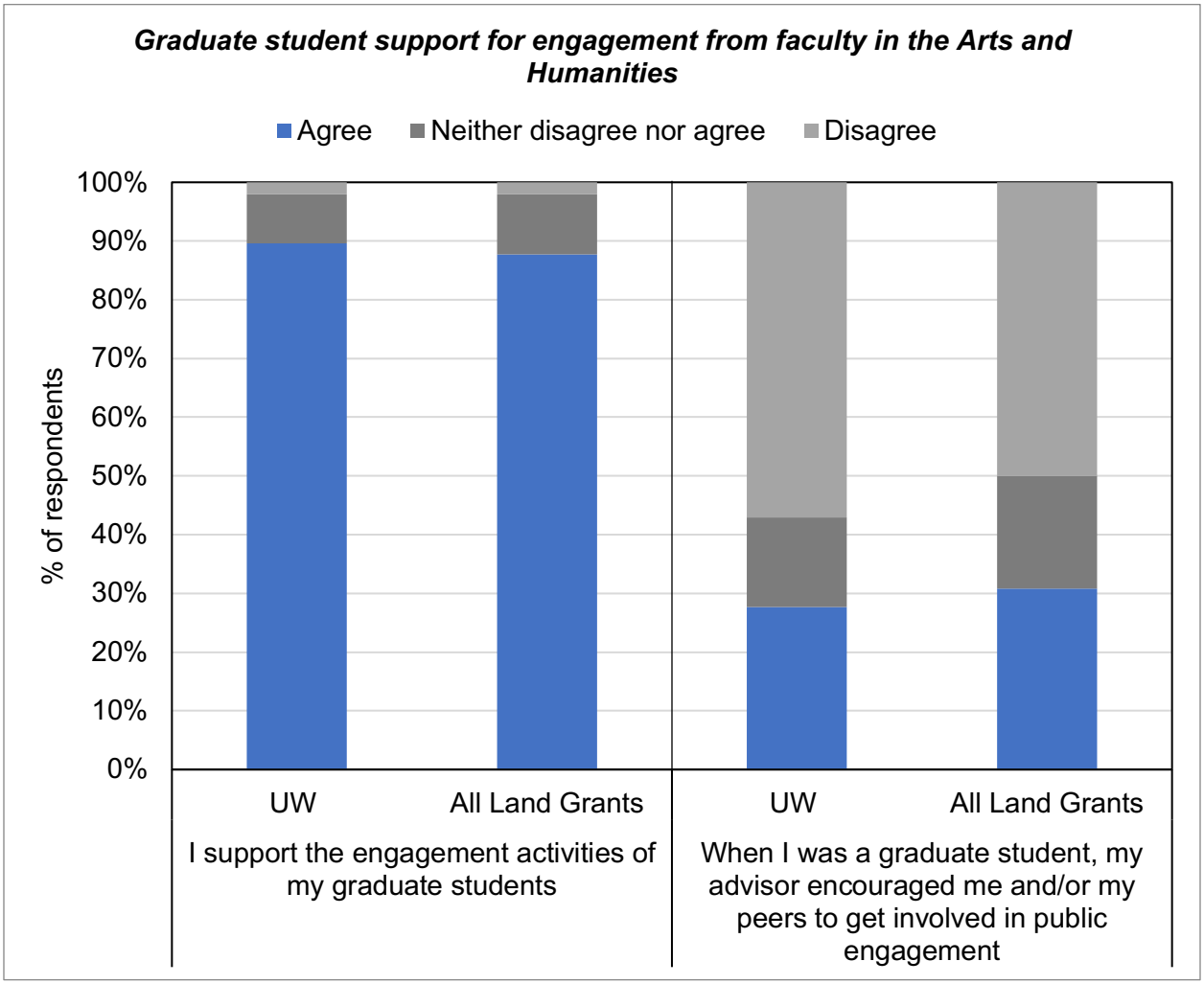


Figure 12.3. Arts and Humanities faculty graduate student support for public engagement

Section 13: Perceptions of self-efficacy related to engagement

Faculty members' perceptions of their own self-efficacy or abilities to participate in public engagement can also influence their involvement. Overall, around 88% of Arts and Humanities faculty respondents at all Land Grant universities and 90% of that at UW feel they have autonomy over the decision to participate in engagement activities. Regarding their abilities to effectively participate in engagement and outreach (Figure 13.1), respondents in the Arts and Humanities feel capable of having discussions with diverse audiences (82% at UW and 85% at all Land Grants agree) and do not think that answering questions from the audience is difficult (69 % of UW faculty and 62% of all Land Grant faculty disagree).

Compared to Science faculty, those in the Arts and Humanities are more hesitant of using social science research to inform science communication efforts (Figure 13.2). Fewer than half of Arts and Humanities respondents (42% of faculty at all Land Grants and 39% of faculty at UW agree) report paying attention to science communication research while over a quarter of respondents indicate they do not (33% of faculty from UW and 27% of faculty from all Land Grants disagree). Considerably more respondents (72% of UW faculty and 70% from all Land Grants) agree that insights from social science research should be used to inform science communication efforts.

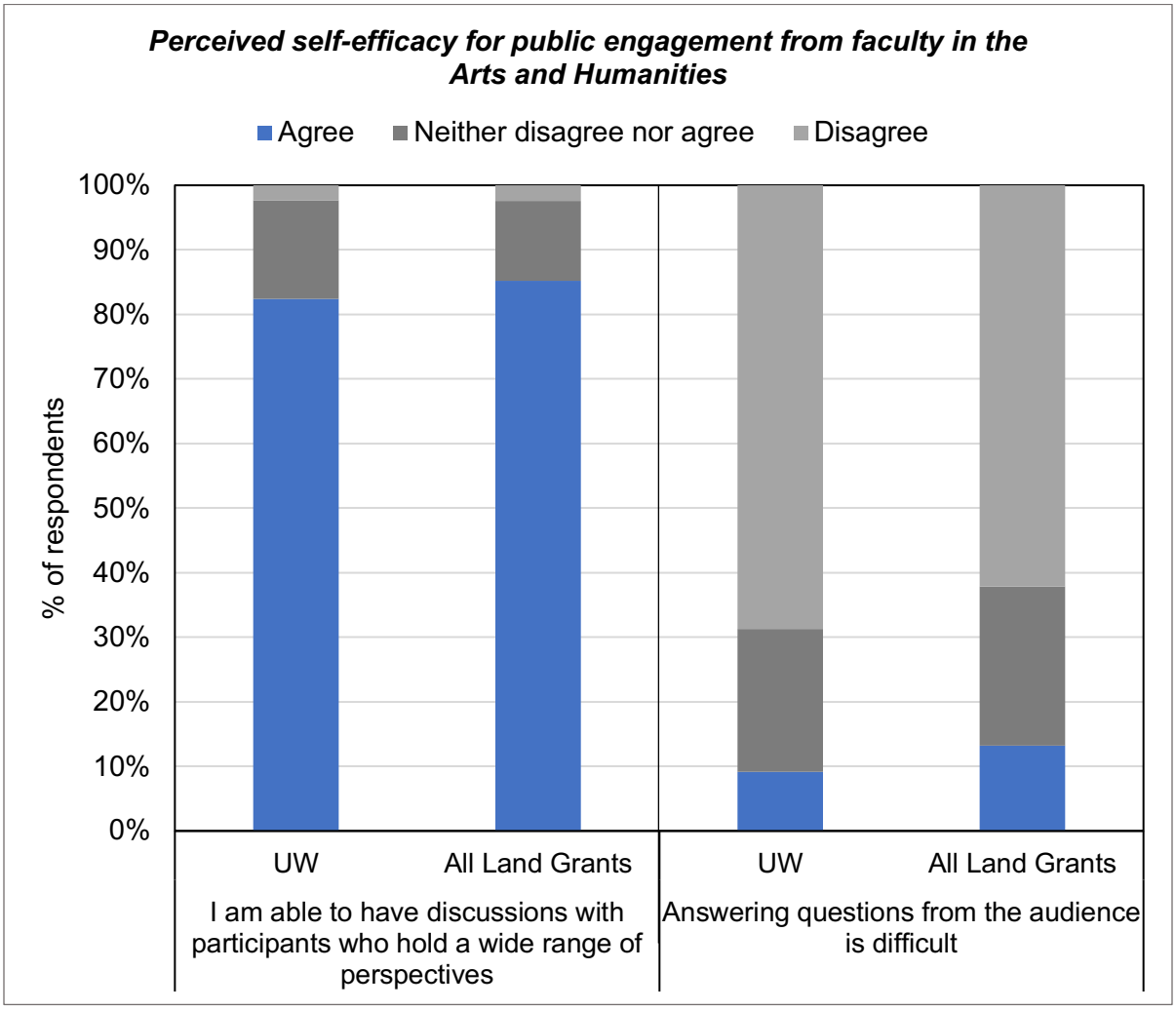


Figure 13.1. Self-efficacy related to public engagement from Arts and Humanities faculty

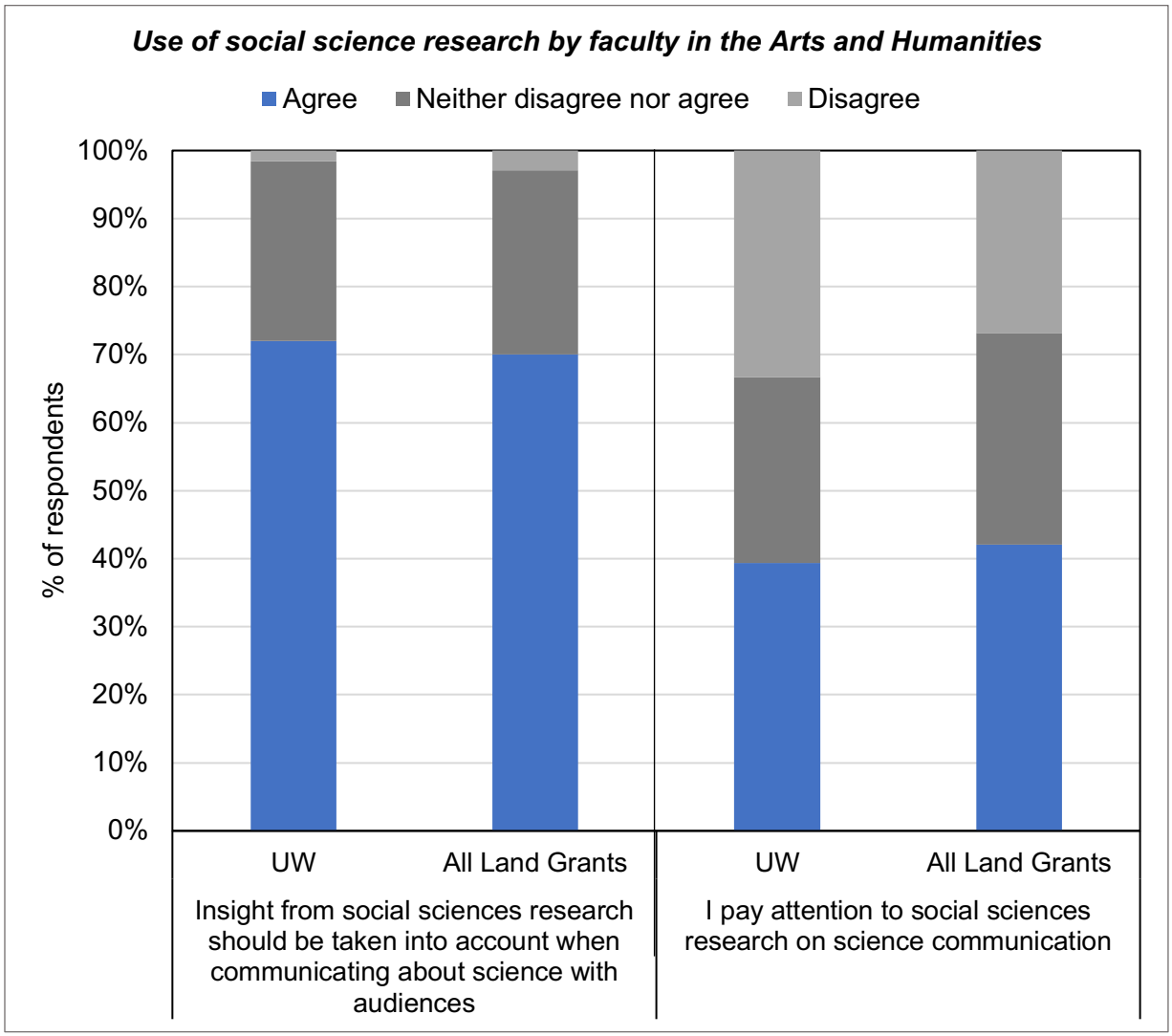


Figure 13.2. Use of social science research for science communication by Arts and Humanities faculty

Section 14: Engagement motivations, drawbacks, and barriers

Faculty in the Arts and Humanities were also asked about the potential motivations, drawbacks, and barriers to public engagement and outreach. For personal motivations (Figure 14.1), faculty respondents in the Arts and Humanities indicate that a sense of duty (90% of UW faculty and 85% of all Land Grant faculty agree) and personal enjoyment (89% of UW faculty and 85% of all Land Grant faculty agree) are strong motivators for participating in engagement. Many respondents are also driven by demonstrating their university's research relevance (67% of UW faculty and 60% all Land Grant faculty agree). Opinions are more mixed about motivations attributable to obtaining funding and fulfilling university appointment requirements. Compared to their Scientist colleagues, those in the Arts and Humanities focus more on personal enjoyment as a motivator and less on demonstrating their university's research relevance or obtaining funding.

As with the Science faculty, Arts and Humanities respondents mostly reject the drawbacks commonly associated with public engagement (Figure 14.2). Art and Humanities faculty do not endorse the assertions that engagement is not their job (83% of UW faculty and 79% of all Land Grant faculty disagree), it distracts from research (59%-61% disagree), and it diverts money from other activities (68% at UW and 62% at all Land Grants disagree). Respondents are less certain about the drawbacks that engagement does not help their careers (29% at UW and 26% at all Land Grants agree, 44%-45% of all faculty disagree) and makes them a target (43% at UW and 36% at all Land Grants agree; 28% at UW and 32% at all Land Grants disagree). Those in the Arts and Humanities are less worried about engagement diverting resources than Science respondents.

Finally, faculty respondents in the Arts and Humanities are less cynical (lower agreement) about the common potential barriers to public engagement compared to those in the Sciences (Figures 14.3). Arts and Humanities respondents are mostly ambivalent about researchers being bad at engagement (40% of all Land Grant faculty and 37% of UW faculty neither disagree nor agree) and having bad experiences in the past (50% of all Land Grant faculty and 52% of UW faculty neither disagree nor agree) as reasons that prevent their colleagues from participating in public engagement. Almost half (60% of all UW faculty and 49% of all Land Grant faculty agree) of respondents think that the lack of institutional incentives to engage was a barrier.

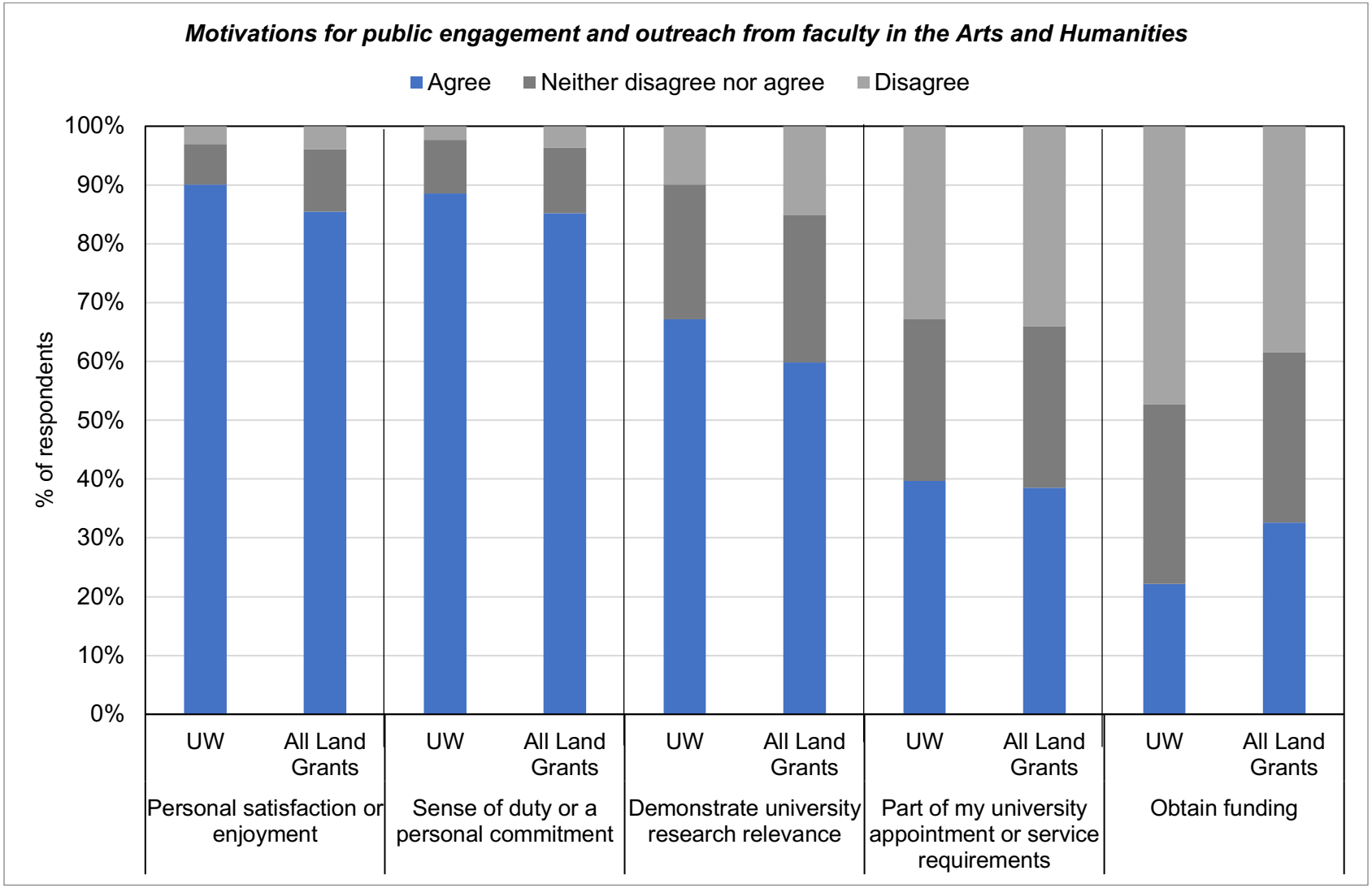


Figure 14.1. Motivations for engagement according to Arts and Humanities faculty

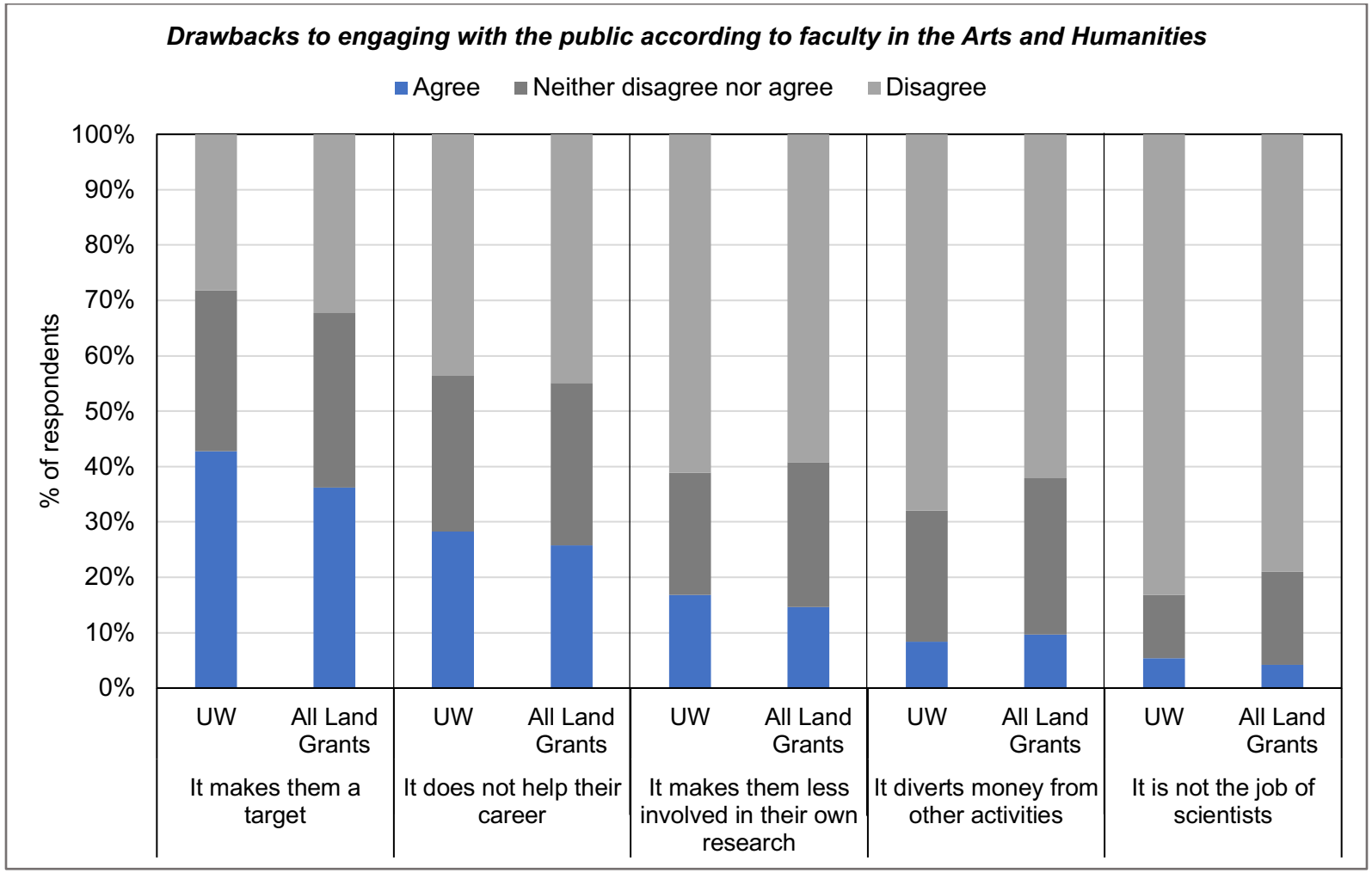


Figure 14.2. Scholar drawbacks to engagement, according to Arts and Humanities faculty

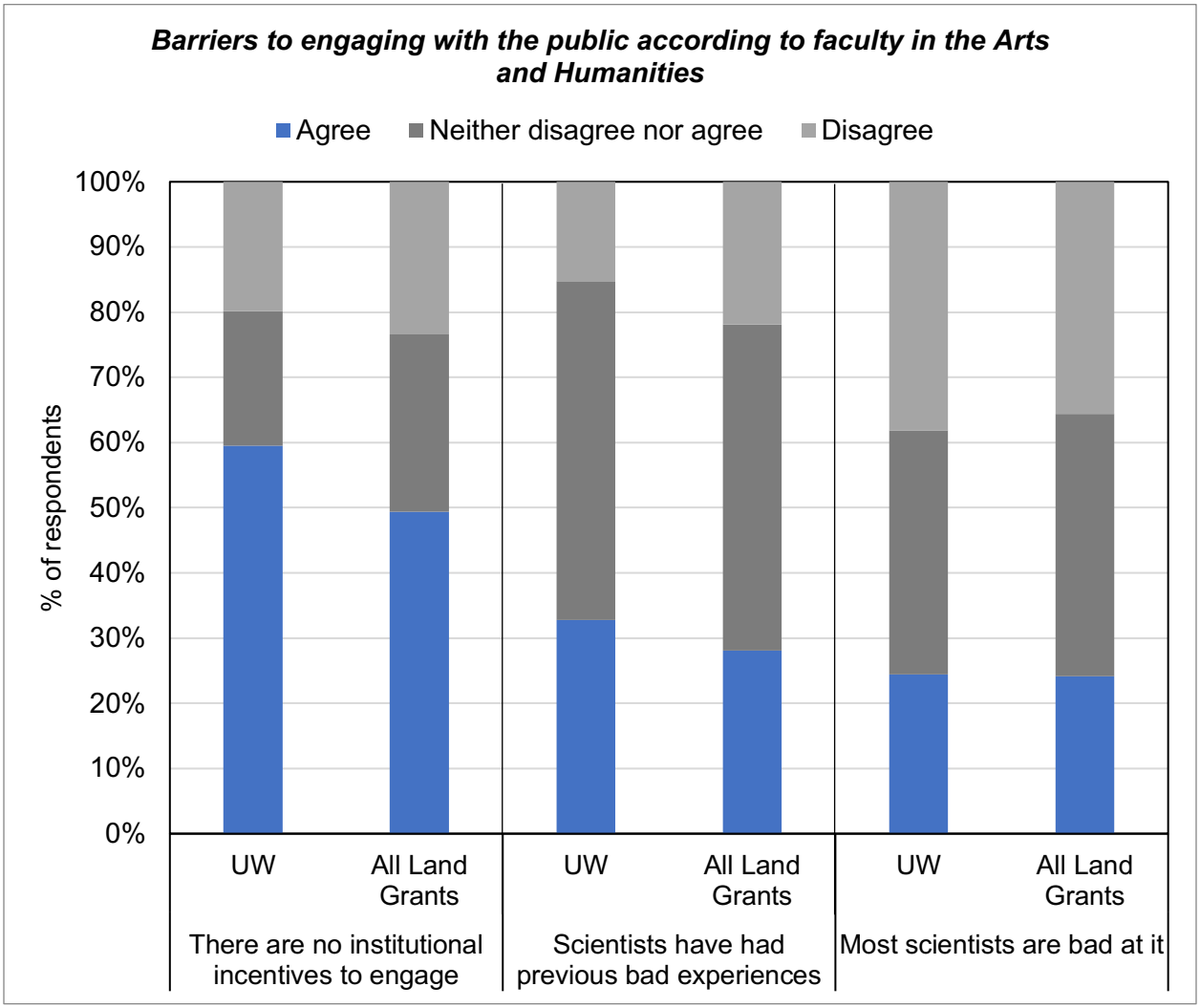


Figure 14.3. Scholar barriers to engagement, according to Arts and Humanities faculty

Part 3: About the Survey

Section 15: Sampling and Procedures

The research team conducted a census survey of faculty members at specific land-grand universities across the U.S. The original university sample pool included 73 land-grant universities (within 69 university systems) established through the Morrill Acts of 1862 and 1890. A team of research assistants manually collected information for all faculty members by department or college from university websites. After compiling the contact lists, any non-eligible positions (non-faculty) were removed. Duplicate records were removed by checking for matching email addresses.

The online Qualtrics-hosted survey was around 20 minutes in length. The survey was conducted from May to July 2018 and had four waves of contact. No incentive was provided. In total, around 103,000 faculty members were contacted in the initial wave.

During the survey period, we removed candidates who were ineligible, including non-faculty members or those unavailable during the survey period. Additionally, we received consistent email bounce-backs from some candidates and removed them from the final sample. A subsequent duplicate record search manually checked first and last names within each university and removed confirmed matches. After the survey closed, 17 universities with a small number of responses (<20 completes) were removed from the sample.

To determine whether our sample is representative of the universities included in our study, we compared our sample to the population of each university (as reported to the Integrated Postsecondary Education Data System (IPEDS), run through the U.S. Department of Education's National Center for Education Statistics). We removed ten universities with problematic gender distribution among respondents (>10% difference of gender distribution between the reported faculty population and the sample). The remaining university comparisons indicate that the samples were representative of their respective universities.

After removing the 27 ineligible universities, the final sample consisted of 46 land-grant universities (within 45 university systems), with N=10,706 survey completes (>80% finished). The final response rate (RR2) was 14.1%.

UW-Madison specifically had an N=564 survey completes (>80% finished) and a final response rate (RR2) of 21.5%.

Land Grant University	Faculty Responses
Auburn University	221
Clemson University	144
Colorado State University	355
Cornell University	132
Iowa State University	209
Kansas State University	218
Louisiana State University	209
Massachusetts Institute of Technology	94
Michigan State University	354
Montana State University - Bozeman	36
New Mexico State University	123
North Carolina State University	371
North Dakota State University	150
Ohio State University	636
Oklahoma State University	126
Oregon State University	260
Pennsylvania State University	351
Purdue University	382
Rutgers, The State University of New Jersey	478
South Dakota State University	119
Tennessee State University	61
Texas A&M University	408
University of Alaska Fairbanks	68
University of Arkansas - Fayetteville	199
University of California - Riverside	116
University of Delaware	170
University of Florida	443
University of Georgia	355
University of Hawaii	170
University of Idaho	116
University of Kentucky	264
University of Maryland - College Park	203
University of Maryland Eastern Shore	43
University of Massachusetts - Amherst	300
University of Minnesota - Twin Cities	447
University of Missouri - Columbia	211
University of Nebraska - Lincoln	310
University of Nevada - Reno	34
University of New Hampshire	174
University of Puerto Rico at Mayagüez	136
University of Rhode Island	139
University of Tennessee	257
University of Wisconsin - Madison	564
University of Wyoming	91
Utah State University	56
Virginia Polytechnic Institute and State University	403

Figure 15.1. Total Faculty Responses from Land Grant Universities

Section 16: Final Sample information

As a sample from a census of land-grant universities, survey respondents represented the range of land-grant universities. Most faculty respondents are located at universities with a Carnegie Classification of Institutions of Higher Education Research 1 designation (Figure 15.1), but they also represent universities with a range of research designations. As with the land-grant universities themselves, respondents are spread across all regions of the U.S. (based on the U.S. Department of Agriculture's Agricultural Research Service regions; Figure 15.2). The largest portion of respondents are employed at midwestern (29%) land-grant universities, followed by respondents at universities in the northeastern (23%) and southeastern (22%) agricultural service regions.

The respondents represent a range of fields (Figure 15.3). After consolidating respondents into the broad categories of Sciences or Arts and Humanities (or other non-science fields), the majority of respondents are in the Sciences (83% of all Land Grant faculty and 77% of Faculty at UW) rather than the Arts and Humanities (17% of all Land Grant faculty and 23% of UW faculty). Within the Sciences, faculty respondents are categorized into social sciences (35% of all Land Grant faculty and 33% of UW faculty), life sciences (31% of all Land Grant faculty and 28% of UW faculty), and physical sciences (19% all faculty). (For more information about the fields of study, see "Section 17: Fields of Study.")

In terms of their primary university positions (Figure 15.4), most faculty respondents are in tenure-track positions (70% of all Land Grant faculty and 79% of UW faculty). Of those holding a tenure-track position, 82% of UW faculty and 77% of all Land Grant faculty are tenured. An additional 22% of all Land Grant respondents and 12% of UW respondents indicate their primary university position is non-tenure track, such as lecturers or adjunct faculty. Respondents hold a range of additional administrative positions (Figure 15.5): around 16% of respondents at all Land Grants and 15% of respondents at UW-Madison are department-level administrators, 4%-5% are college-level administrators, and 2%-3% are university-level administrators. Around 10% of respondents from all Land Grants and 6% of faculty at UW also hold extension appointments with varying appointment percentages (Figure 15.6).

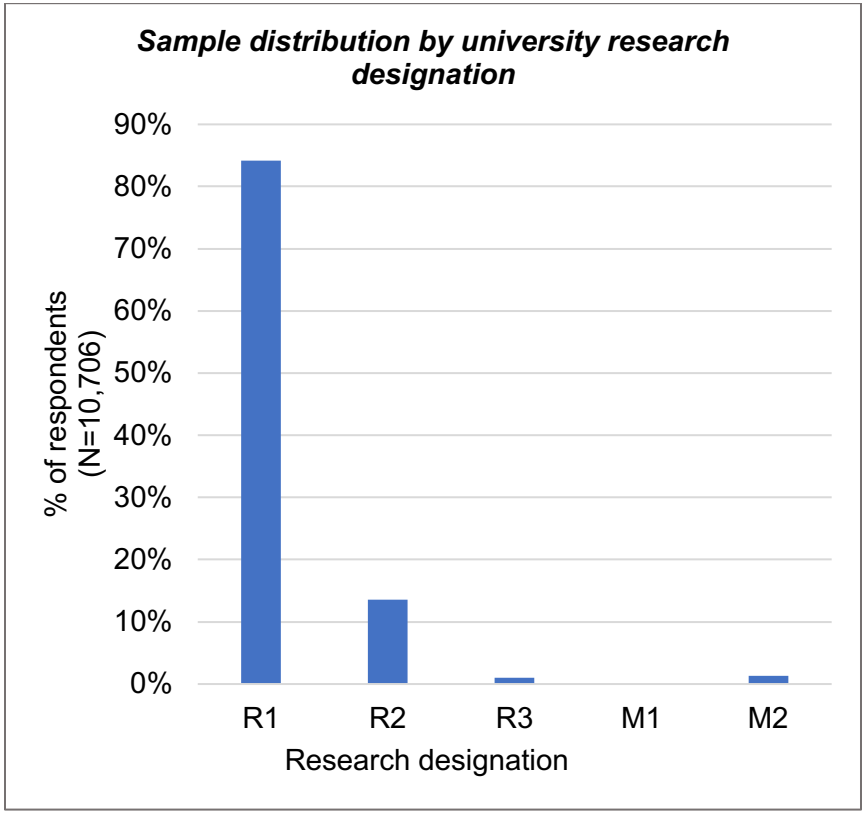


Figure 16.1. Distribution by research designations

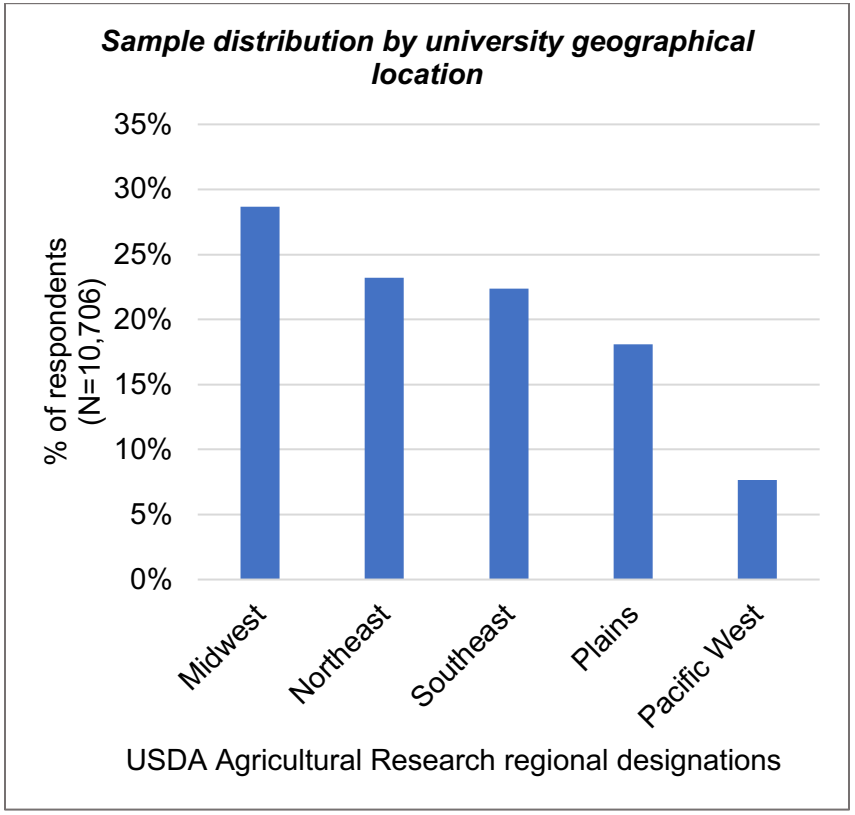


Figure 16.2. Distribution by U.S. regions

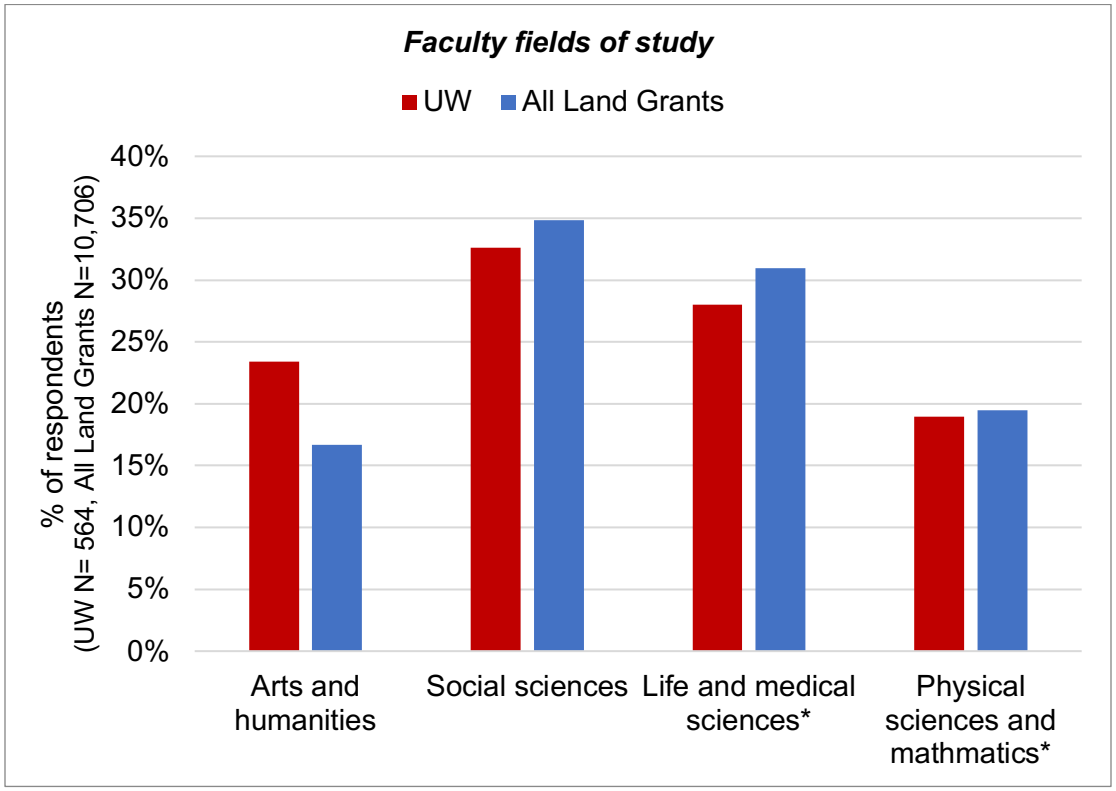


Figure 16.3. Respondents' fields of study

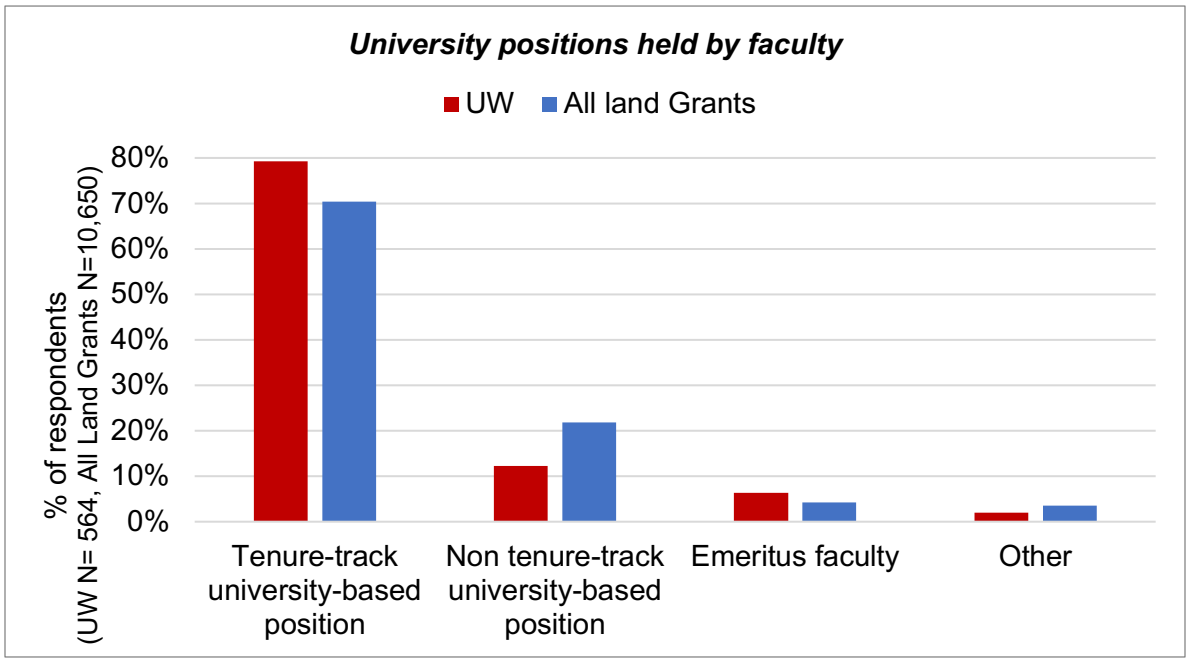


Figure 16.4. Respondents' primary university position

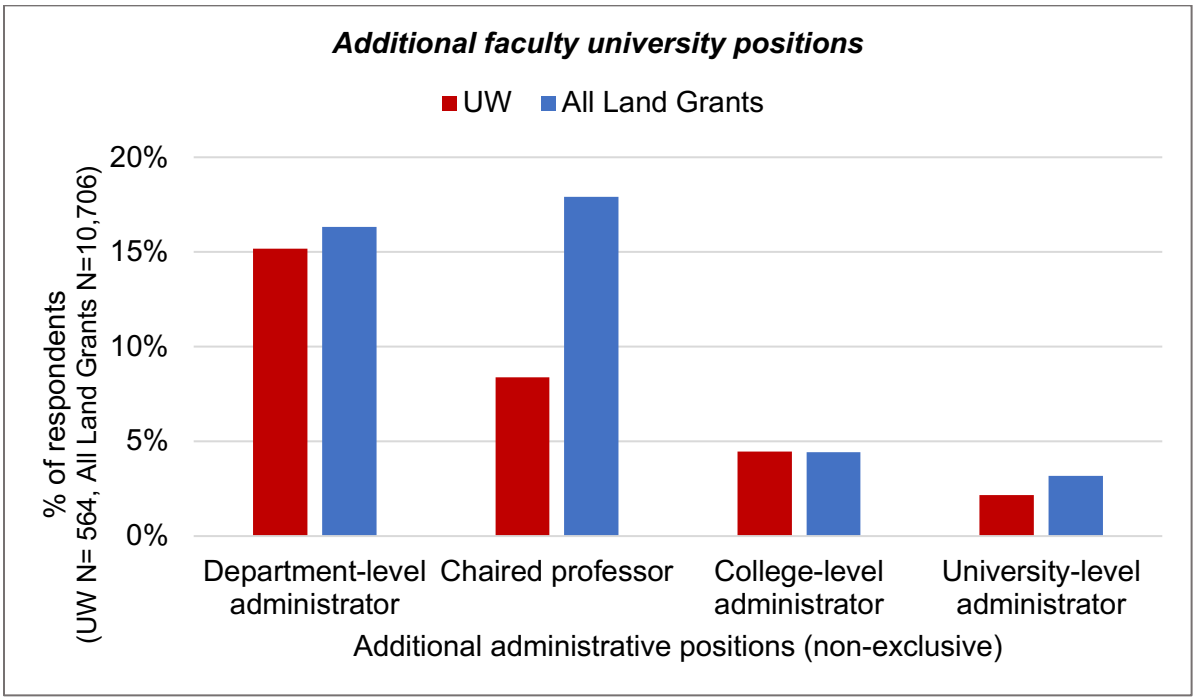


Figure 16.5. Respondents' additional university positions

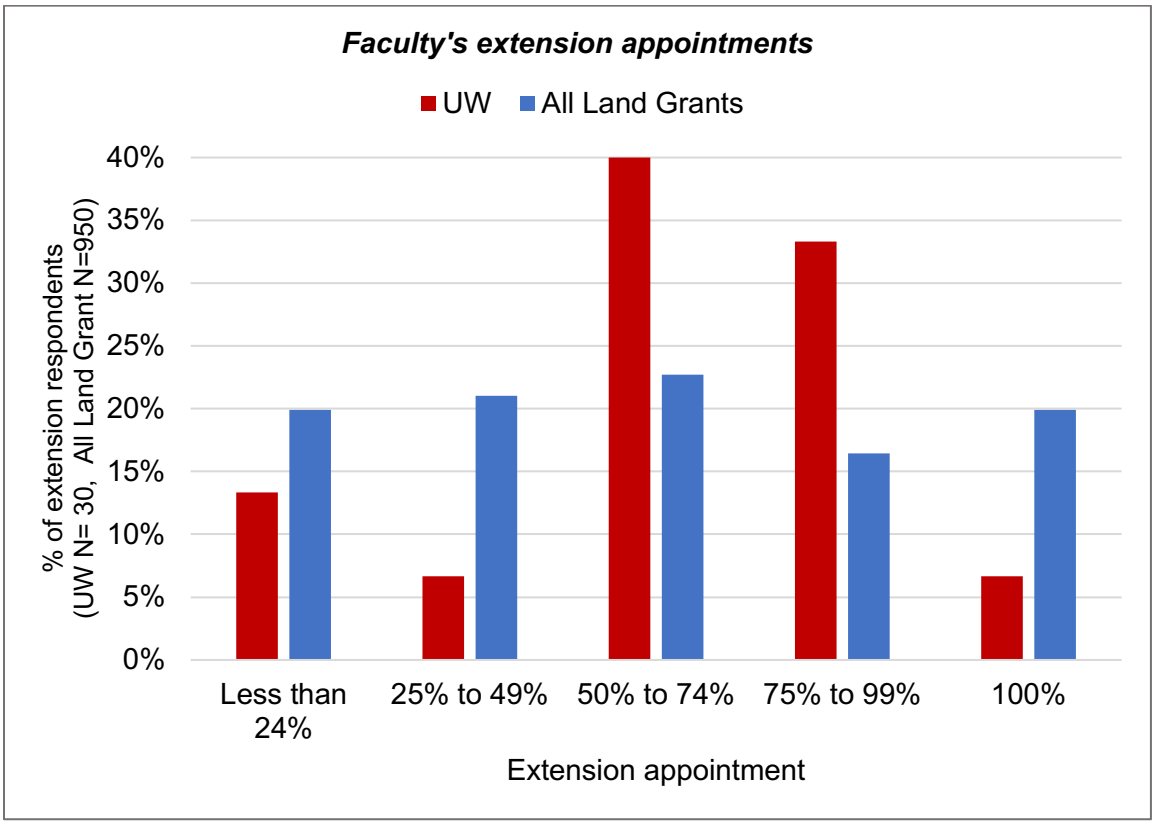


Figure 16.6. Respondents' extension appointments

Section 17: Fields of study

In the survey, respondents are asked to indicate their field of research. The *Arts and Humanities* are included as a broad group (N=1,783 for all Land Grants and N=132 for UW) and consisted of those in the arts and humanities or other non-science, profession-based fields. For those in a *Science-related* field (as defined by the research areas identified by the National Science Foundation), respondents' fields of study was split into: 1) *life sciences* (N=3,313 for all Land Grants and N=158 for UW) – agriculture and food; biological sciences; and medical sciences, 2) *physics and maths* (N=2,087 for all Land Grants and N=107 for UW) – computer and information sciences; engineering; geoscience; and math and physics, and 3) *social sciences* (N=3,730 for all Land Grants and N=184 for UW) – environmental resources and education; social, behavioral, and economic sciences; education and human resources (removing those who also selected arts and humanities). Social sciences fields were given a priority over the other fields (i.e., if respondents selected a social sciences field, they were placed in that category), while life and physical sciences are non-exclusive (N=207 for all Land Grants and N=17 for UW overlap).

Section 18: Respondent demographics

Over half of the survey respondents are male (58% of faculty at all Land Grants and 59% of faculty at UW). The average (median) age of respondents is 53 years old with respondents distributed across all age groups (Figure 16.1). As seen in Figure 16.2, most respondents report their race as White (82%), followed by Asian (10% of faculty at UW, 7% of faculty at all Land Grants), Hispanic or Latino (6% of faculty at all Land Grants 4% of faculty at UW), and Black (4% of faculty at all Land Grants and 3% of faculty at UW).

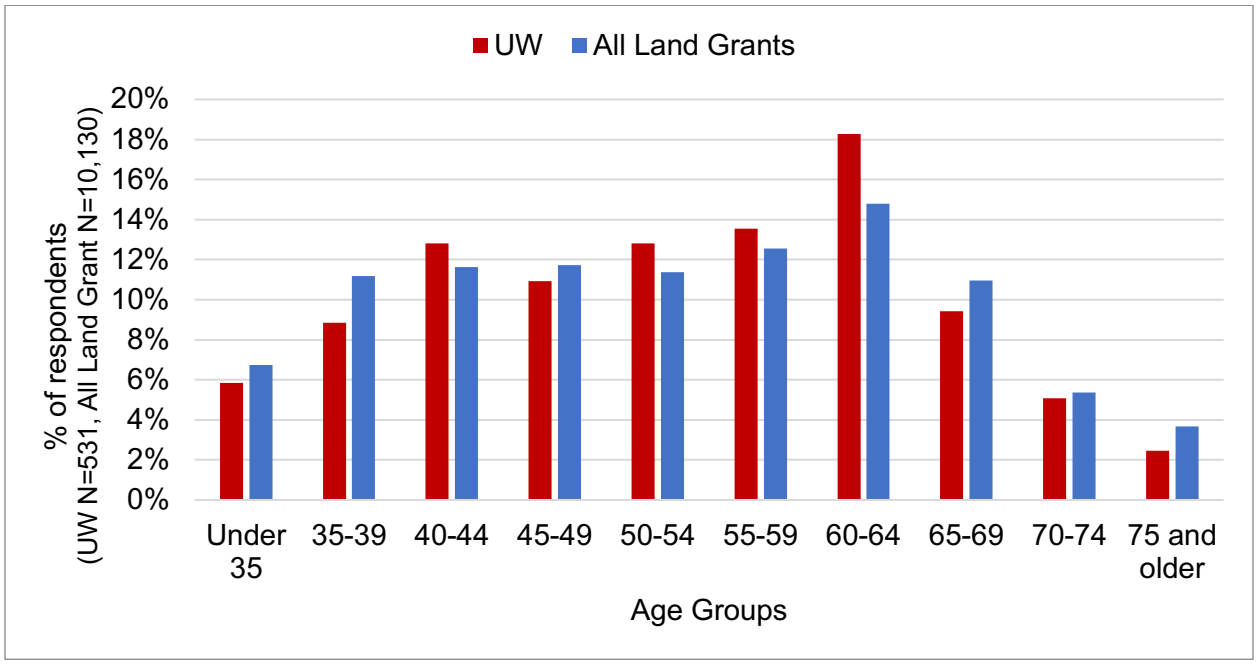


Figure 18.1. Respondents' ages

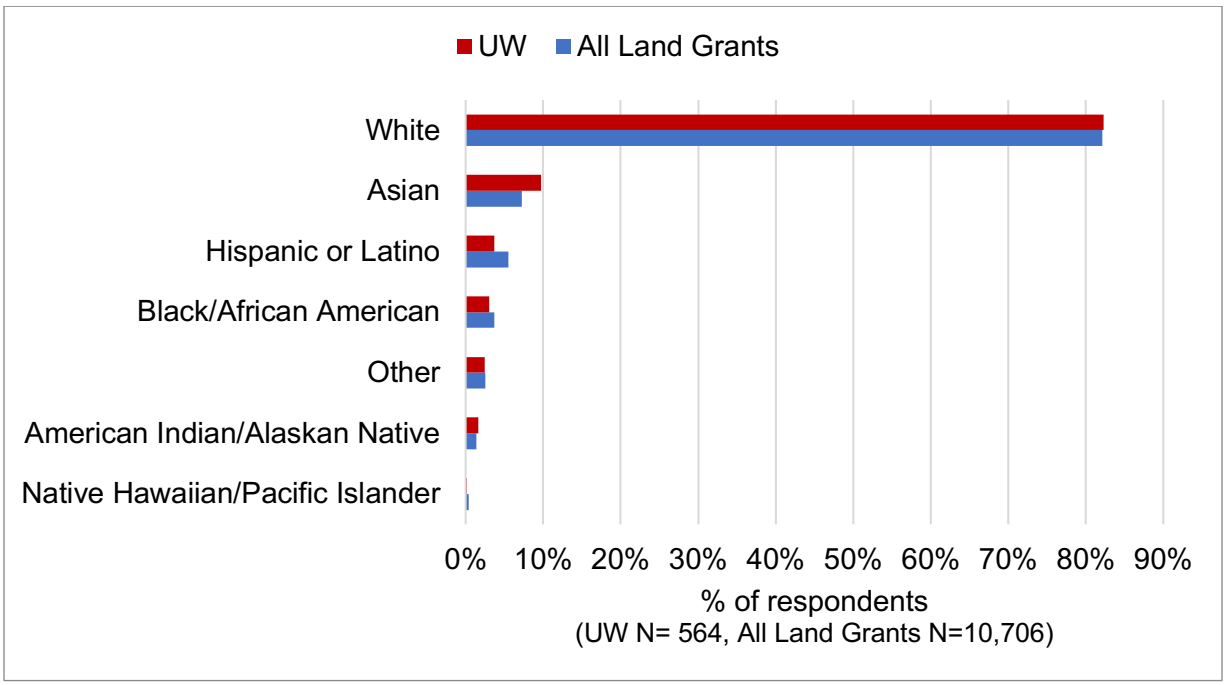


Figure 18.2. Respondents' races

Appendix A: Responses across regions of the U.S.

In addition to the field-based sections presented above, we also looked at survey responses across different regions of the U.S., using the U.S. Department of Agriculture's Agricultural Research Service regions. Responses were generally comparable across the regions. (For more information about the regional distributions, see "Section 15: Sampling and Procedures.")

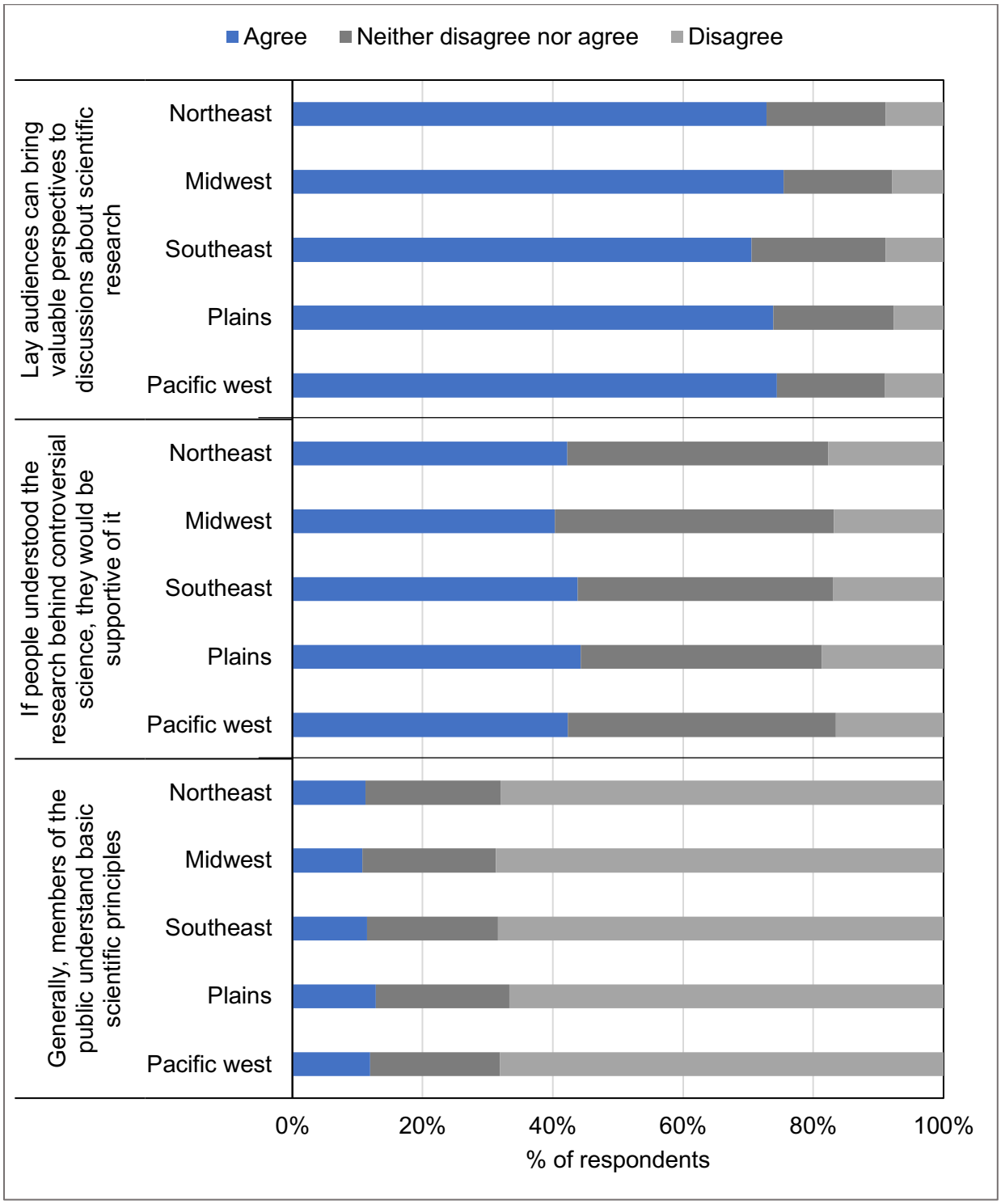


Figure A.1. Views of the public regarding science by U.S. regions

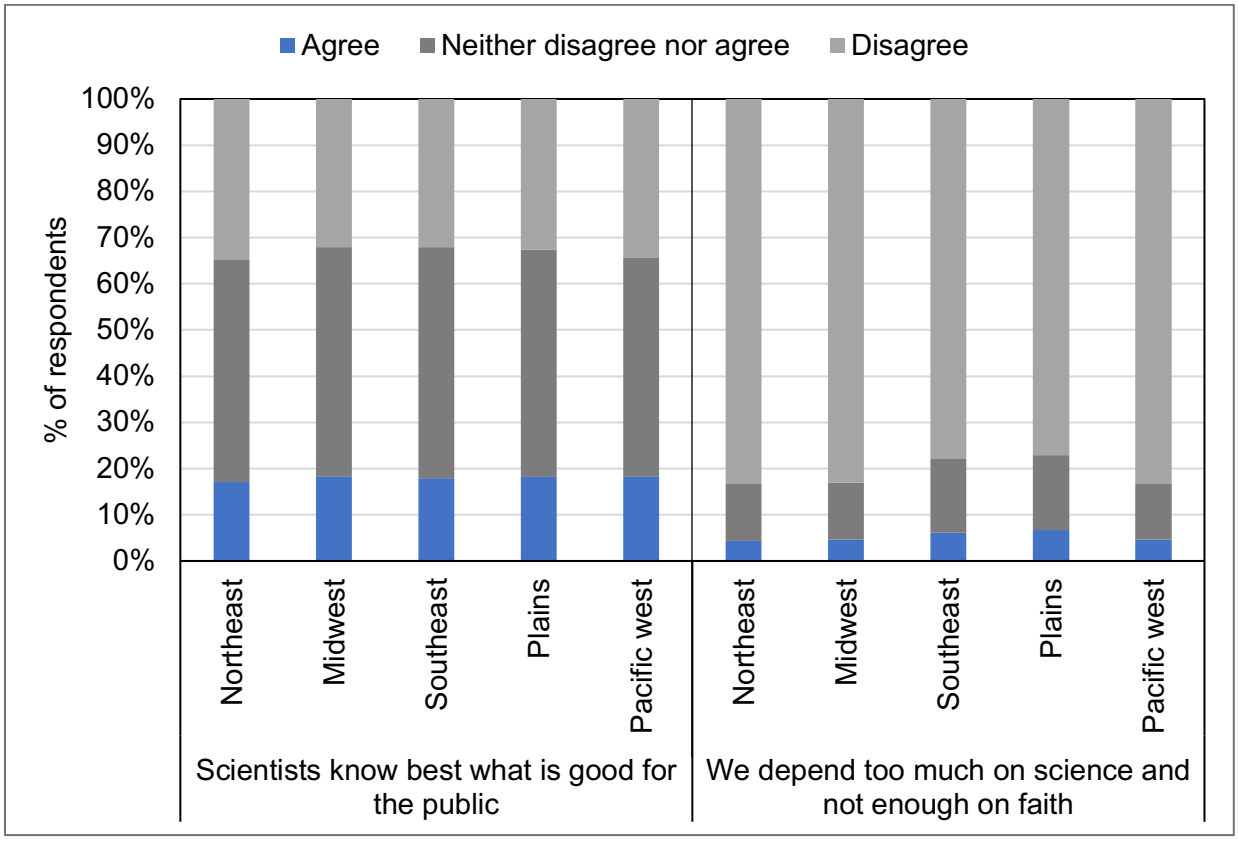


Figure A.2. Views of science in society by U.S. regions

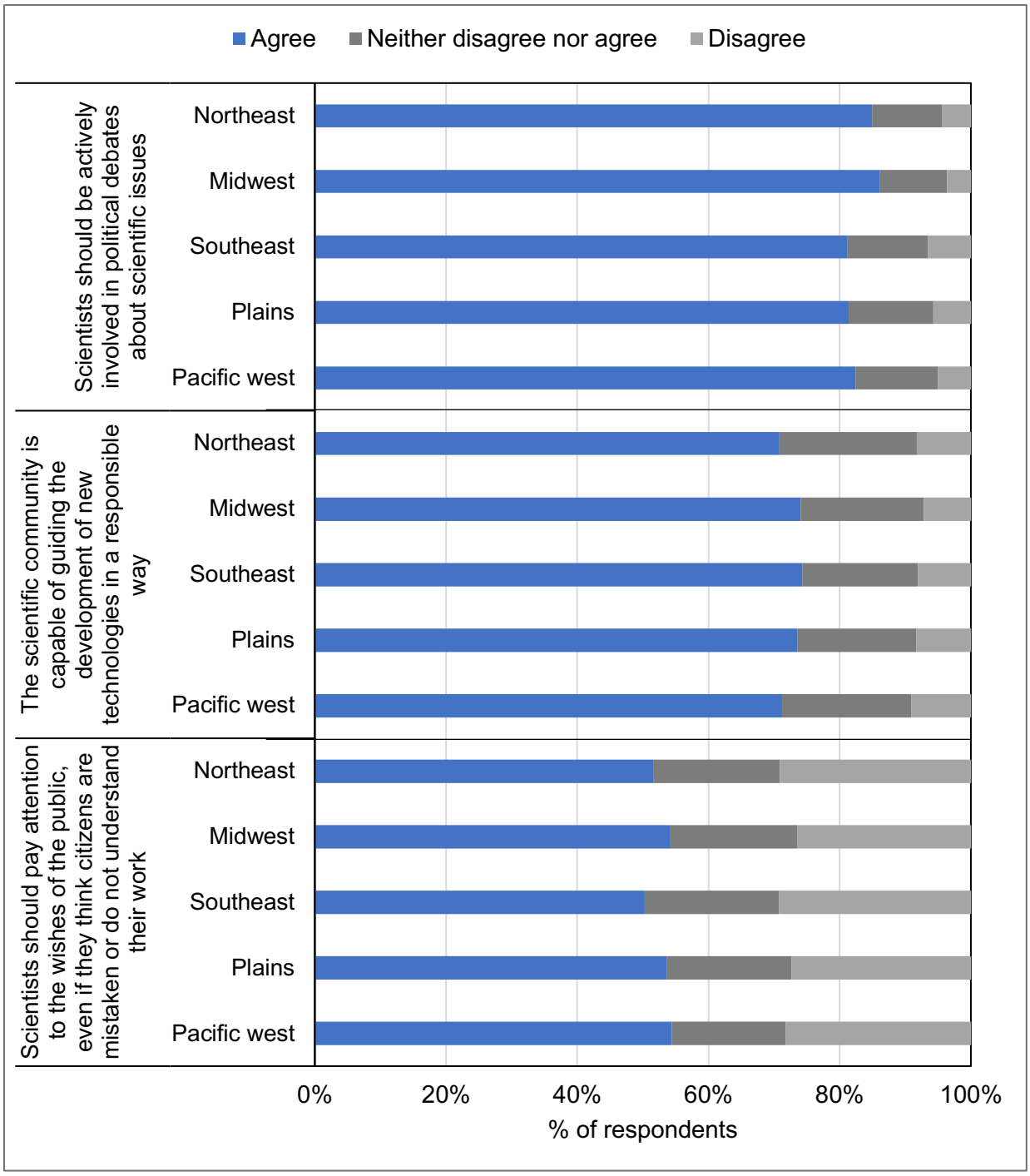


Figure A.3. Views of scientific decision-making by U.S. regions

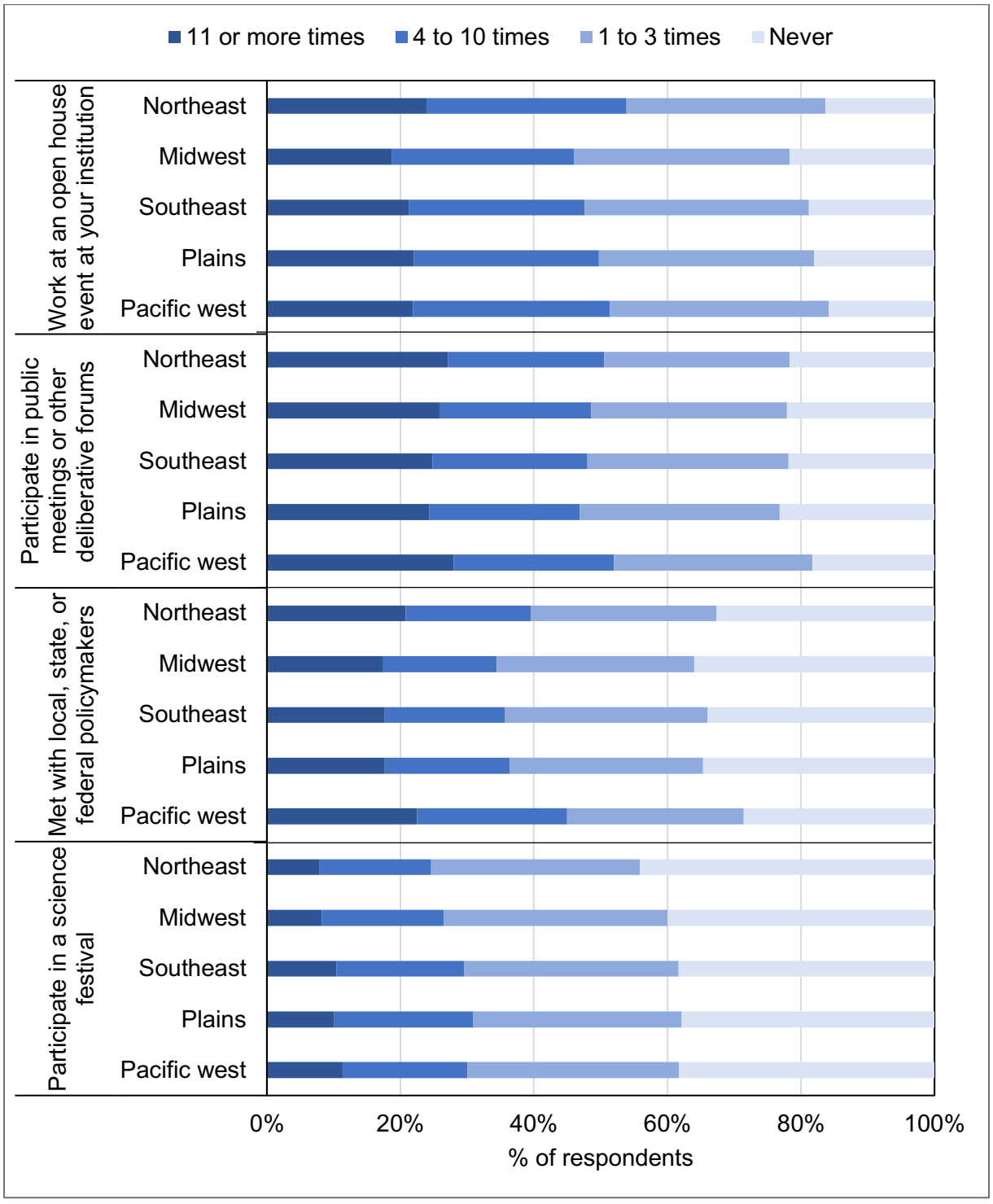


Figure A.4. Participation in infrequent public engagement efforts by U.S. regions

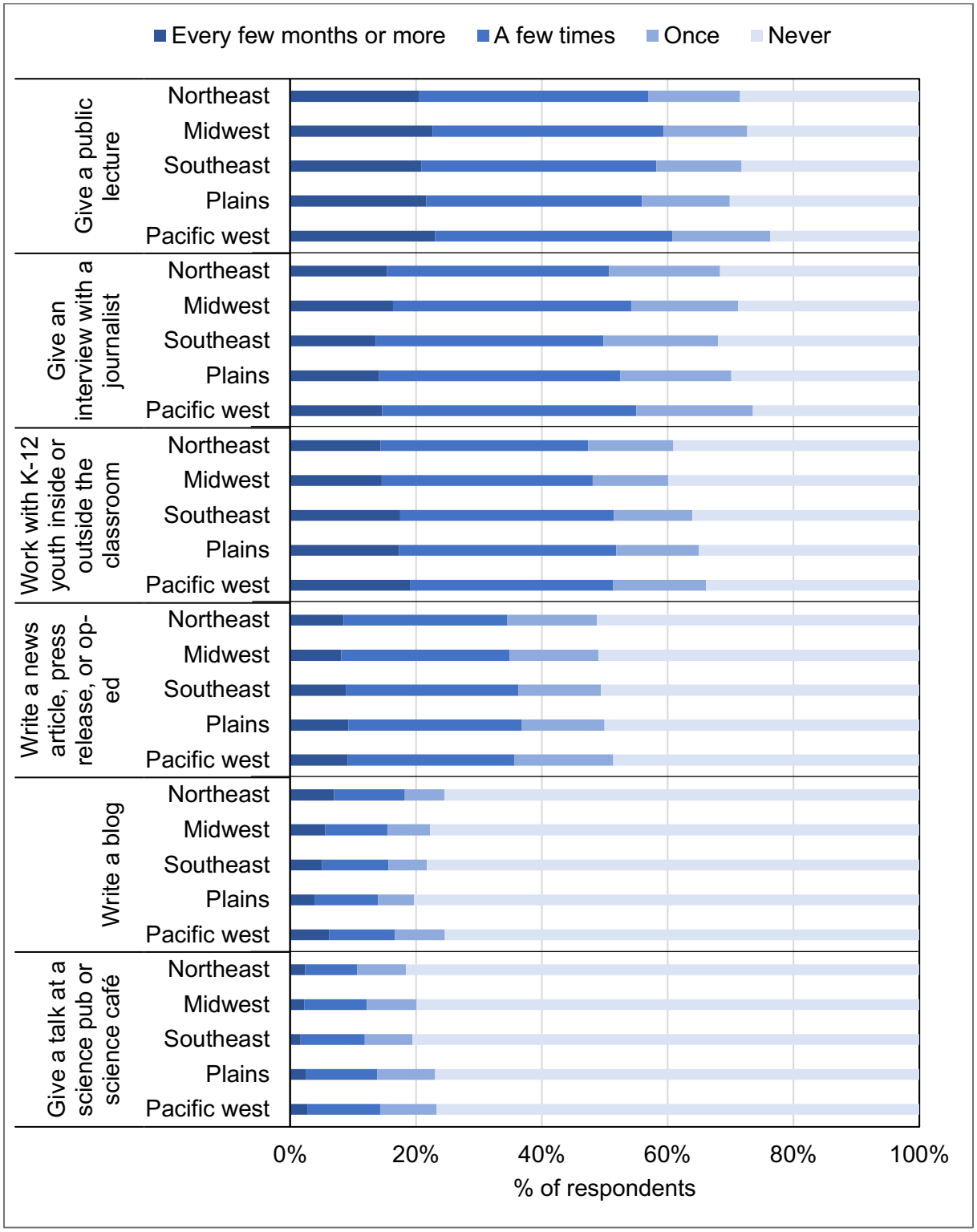
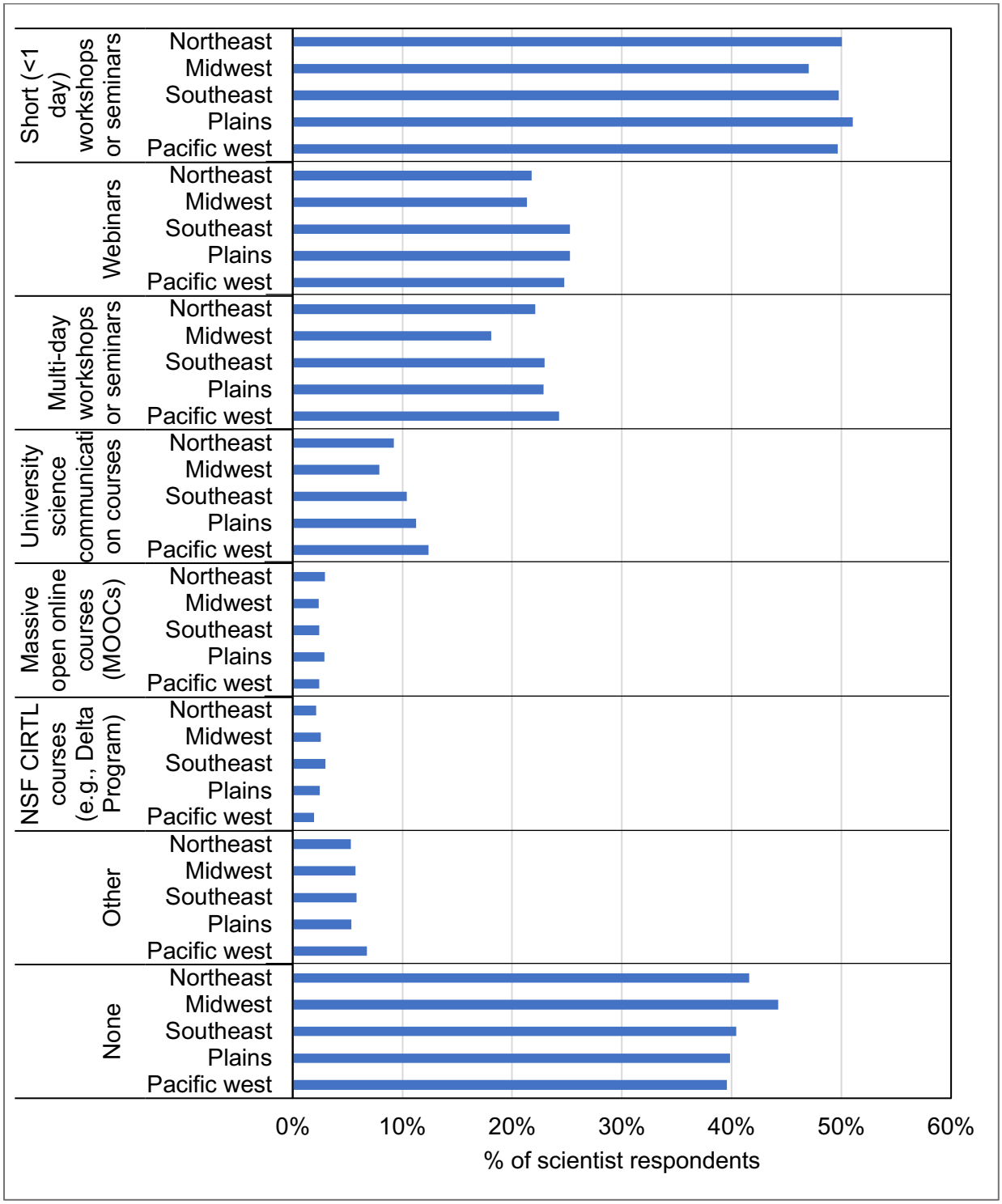


Figure A.5. Participation in frequent public engagement efforts by U.S. regions



Note: Only scientists received this question. CIRTL=Center for the Integration of Research, Teaching, and Learning

Figure A.6. Participation in science communication trainings by U.S. regions

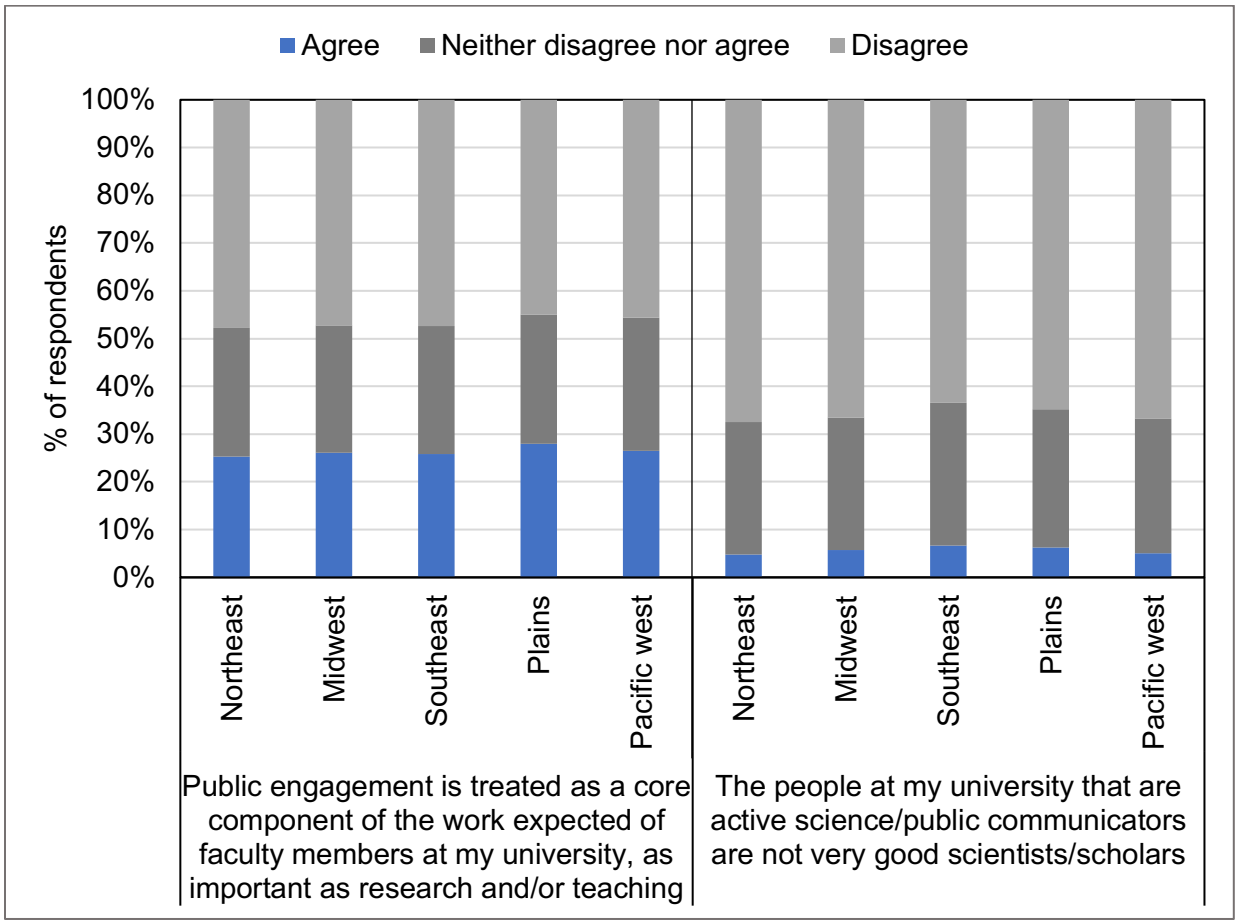
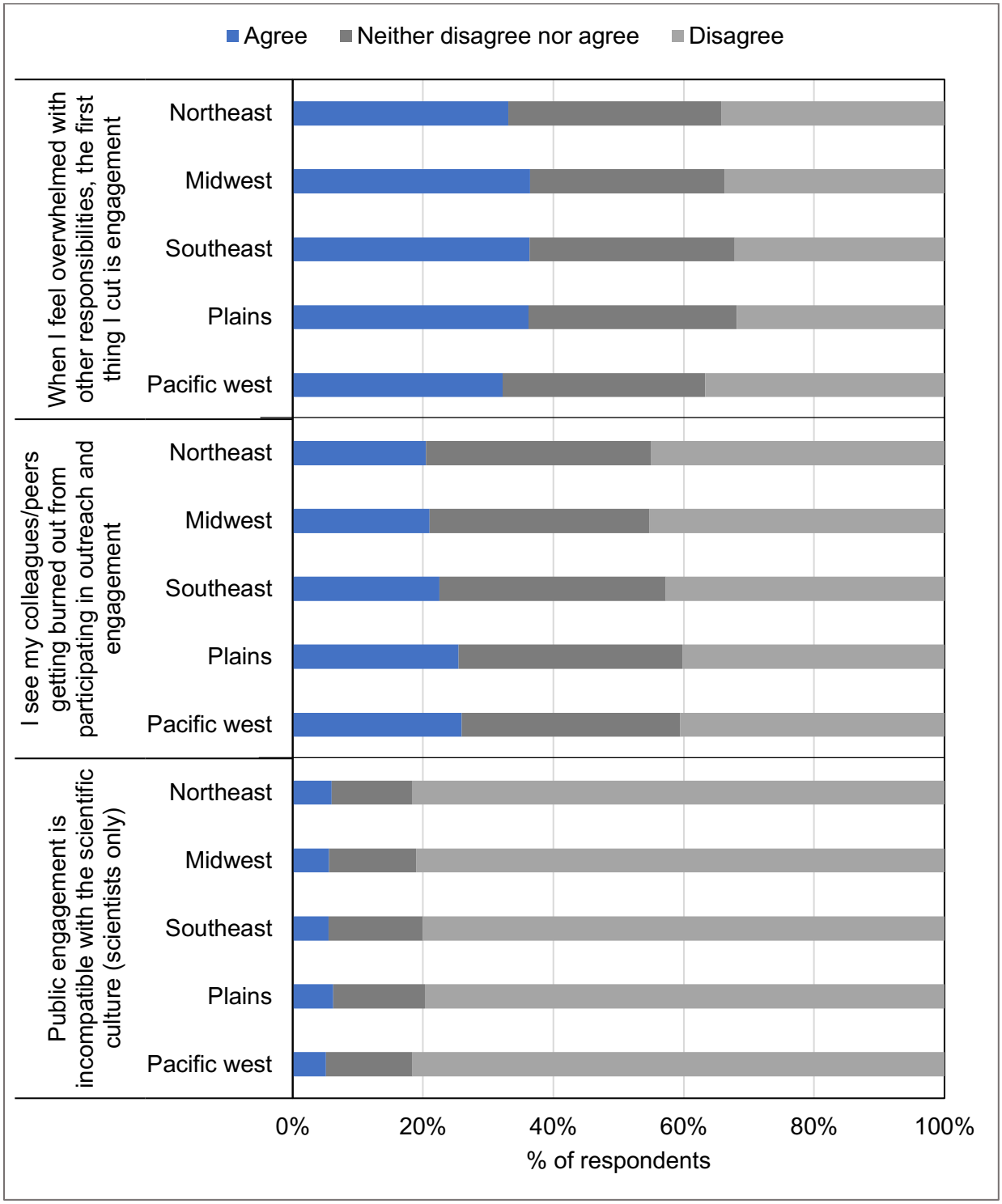


Figure A.7. University climate for public engagement by U.S. regions



Note: Only scientists were asked "Public engagement is incompatible…"

Figure A.8. University barriers related to public engagement by U.S. regions

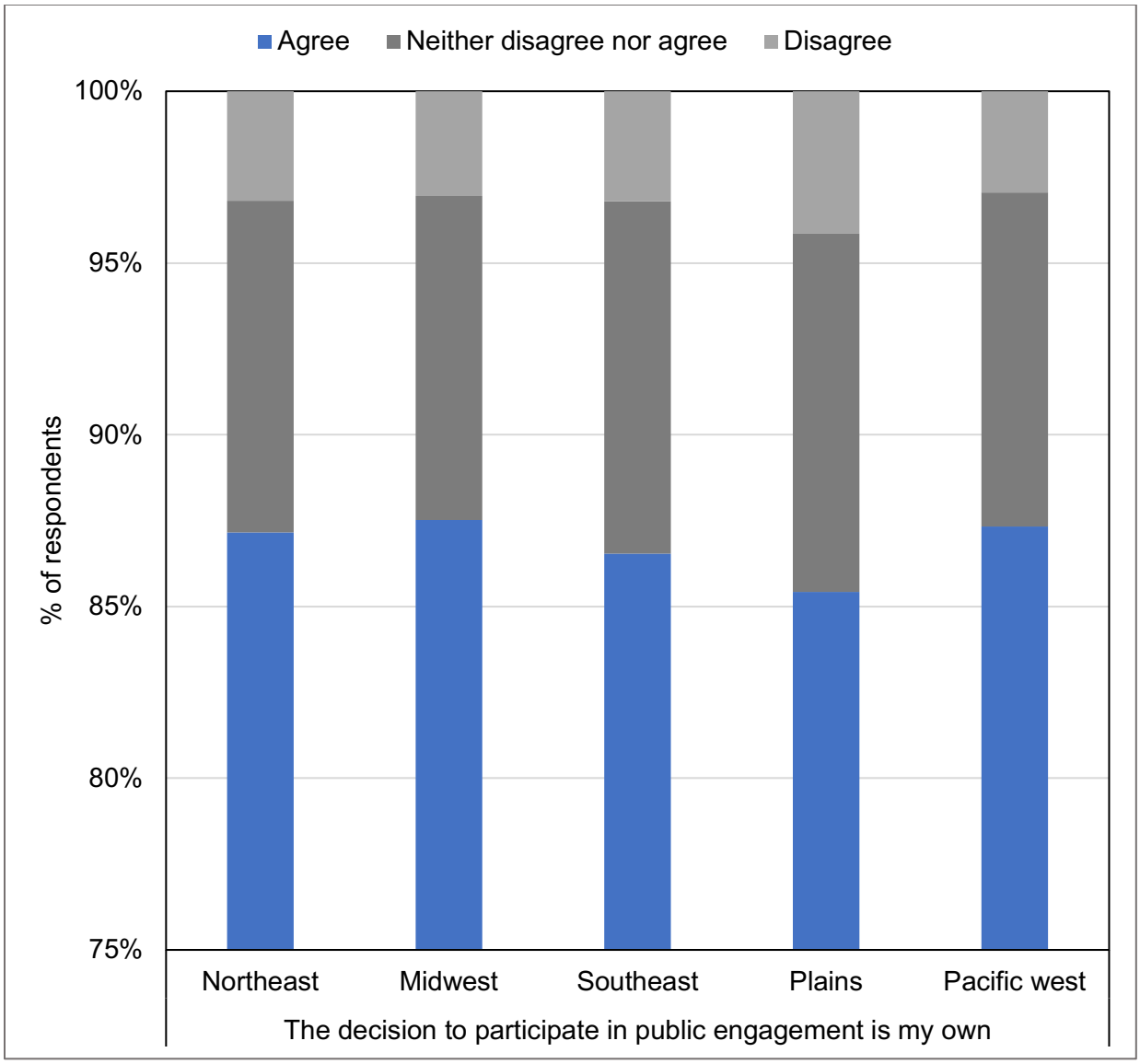


Figure A.9. Autonomy to participate in engagement by U.S. regions

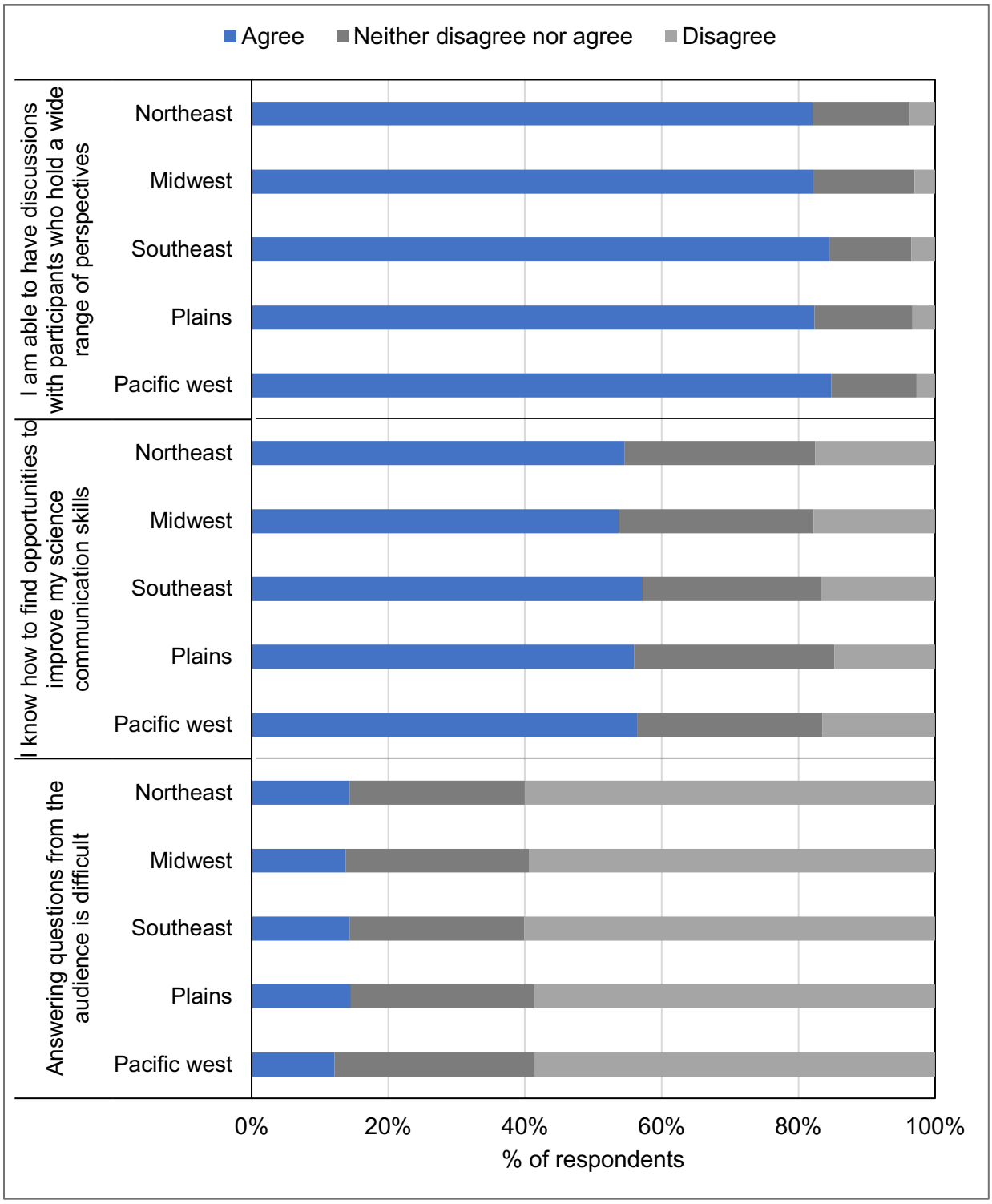


Figure A.10. Self-efficacy related to public engagement by U.S. regions

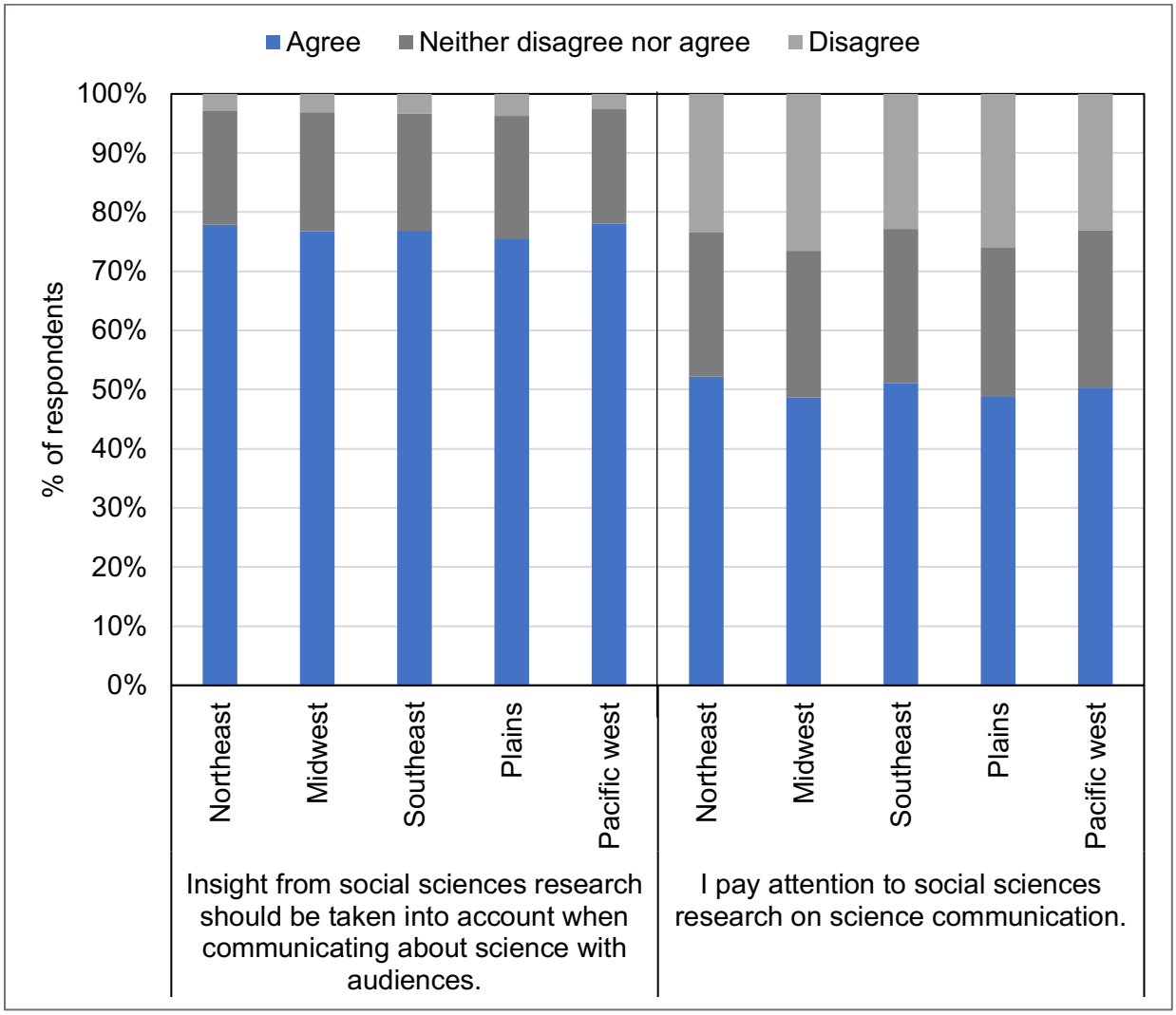


Figure A.11. Use of social science research for science communication by U.S. regions

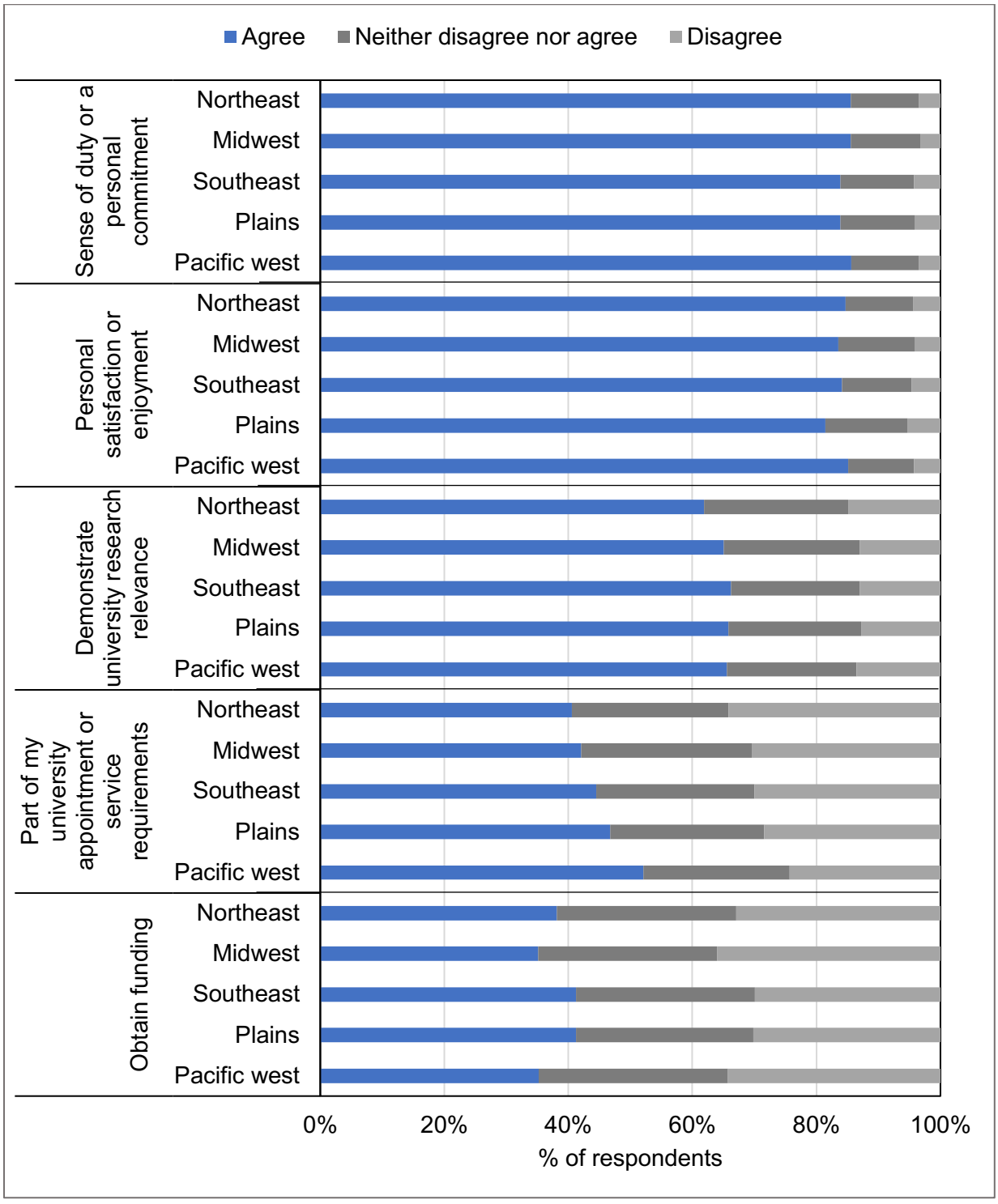


Figure A.12. Motivations for engagement by U.S. regions

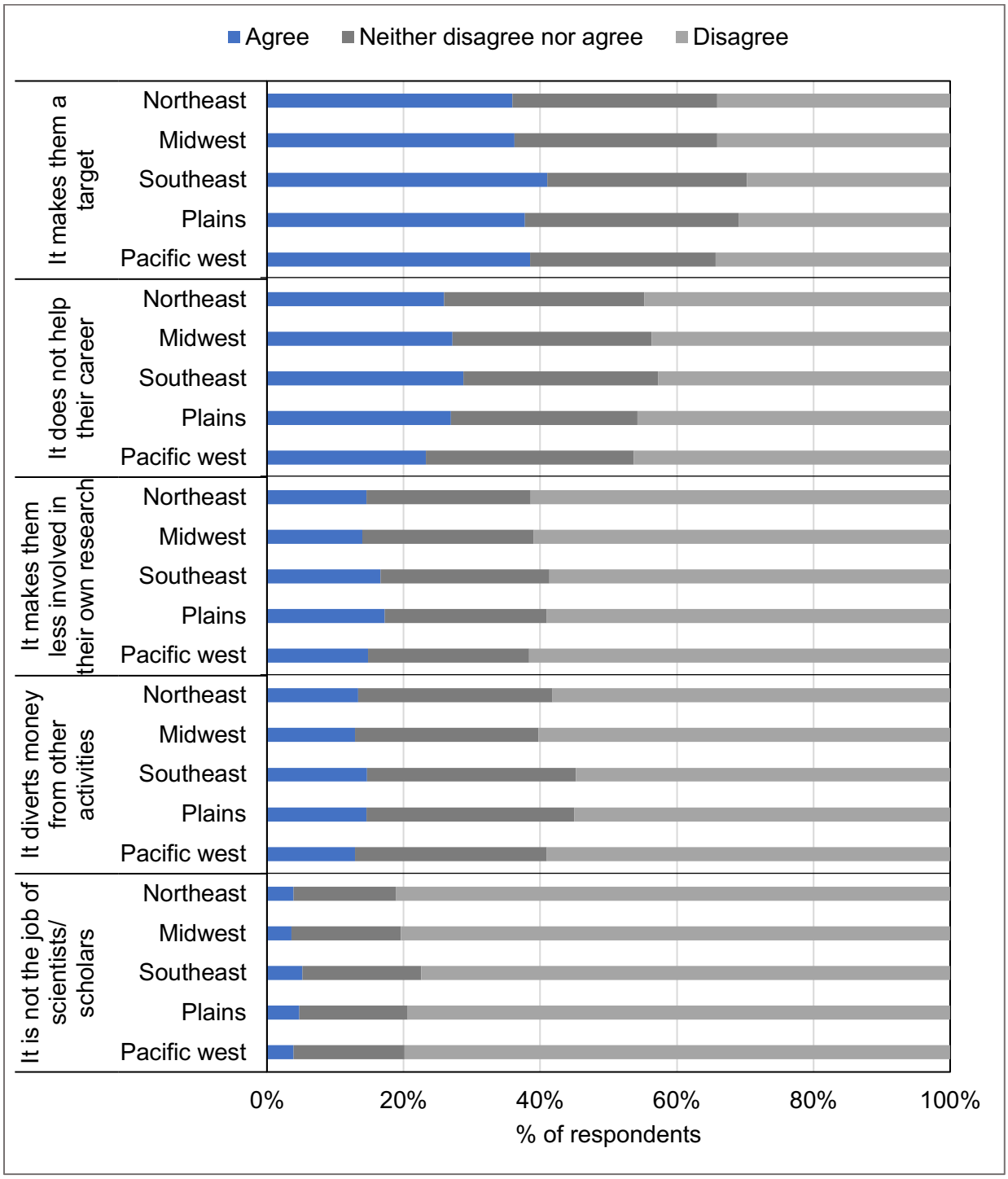


Figure A.13. Drawbacks to engagement by U.S. regions

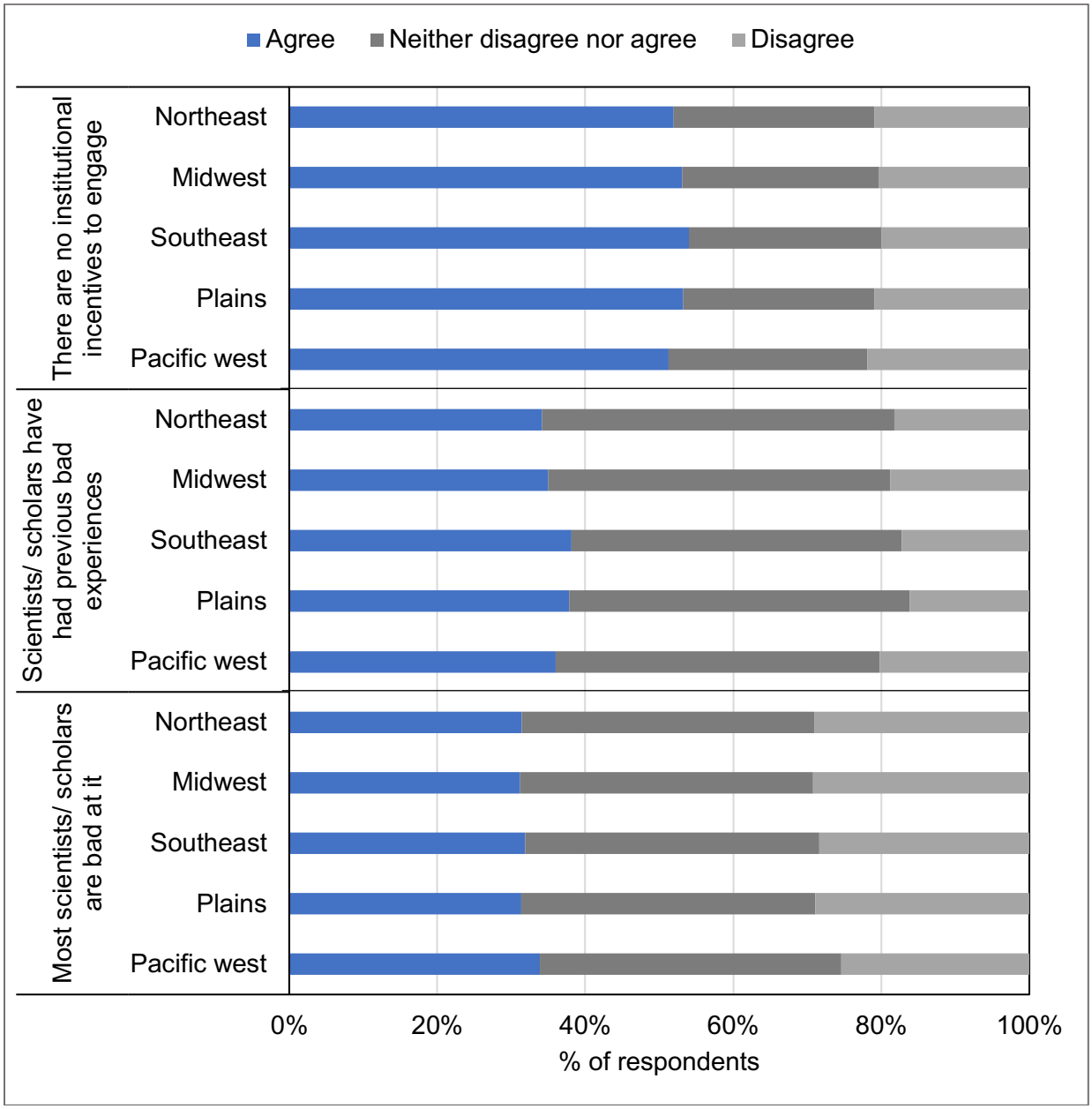


Figure A.14. Barriers to engagement by U.S. regions