



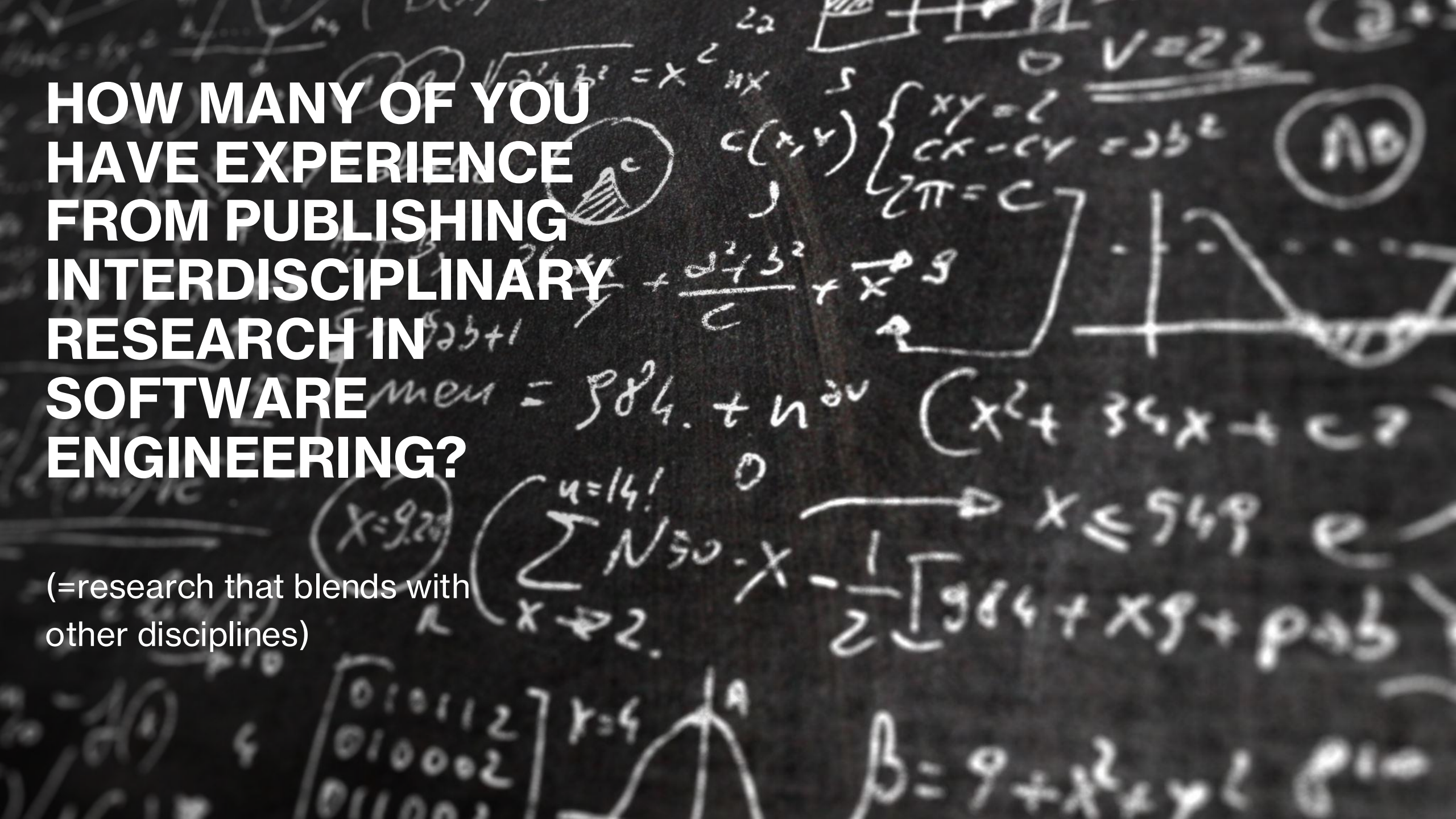
NOT REAL OR TOO SOFT?

On the challenges of publishing
interdisciplinary software engineering
research

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HOW MANY OF YOU HAVE EXPERIENCE FROM PUBLISHING INTERDISCIPLINARY RESEARCH IN SOFTWARE ENGINEERING?

(=research that blends with
other disciplines)



REAL SOFTWARE ENGINEERING IS INTERDISCIPLINARY?

- Software engineering (SE) is an interdisciplinary field that integrates both social and technological dimensions.
- However, interdisciplinary subjects may not be regarded with the same level of importance as more technical subjects.
- This can result in reviews for submissions in SE venues that are negative or even harsh toward interdisciplinary topics.

THE DEFINITION

- Research that blends with other disciplines can be called multi-, cross- or interdisciplinary research.
- During our research process, we utilized the definition of T. Klein from “Typologies of Interdisciplinarity: The Boundary Work of Definition,” in The Oxford Handbook of Interdisciplinarity, Oxford University Press.
- **“Definition of interdisciplinary software engineering research: The integration of concepts, methodology, procedures, epistemology, terminology, data, and organization of research from other disciplines into software engineering research projects.”**

ACADEMIC GATEKEEPING?

- Interdisciplinary research requires building the right kind of collaboration opportunities, aligning various research methodologies, having open-minded funding possibilities, and having access to publishing platforms.
- Research has shown that, especially for younger academics, pressure to obtain funding could affect their willingness to engage in interdisciplinary research.
- Part of larger discussion of research method and theories in SE.

A magnifying glass is positioned over a bar chart. The chart has two columns labeled 'Q2' and 'Q3'. Each column contains two bars, one blue and one green. The magnifying glass is focused on the 'Q2' column, making the bars and labels appear larger and more detailed. The background is a light blue color.

RESEARCH MOTIVATION

Research questions:

[RQ1] Which demographics of SE researchers are associated with publishing difficulties, negative feedback, or a change of research direction?

[RQ2] What specific challenges have SE researchers faced when working on interdisciplinary topics?

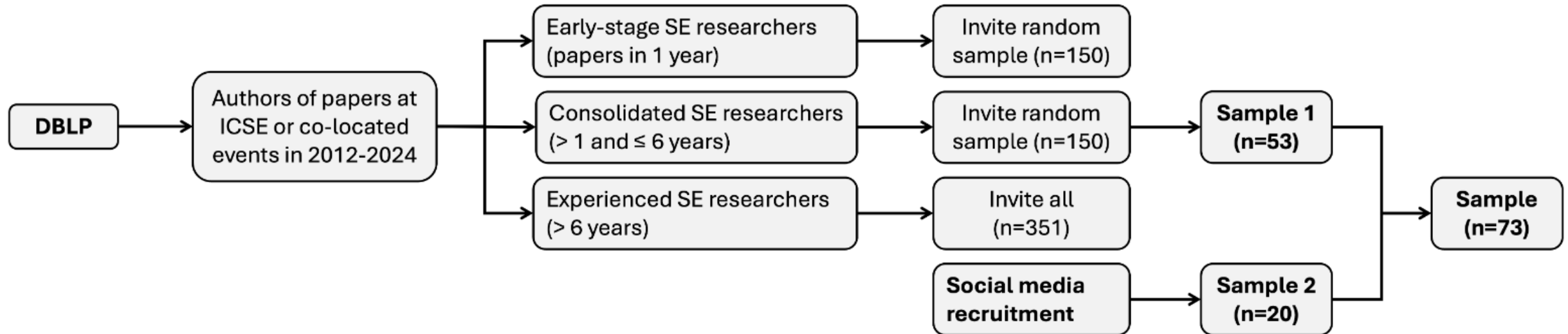
[RQ3] What recommendations do participants offer for improving the research environment to better support interdisciplinary studies in SE?

RESEARCH PROCESS

- We conducted an anonymous online survey to collect feedback from SE researchers.
- We used two different sampling strategies to recruit participants:
 - **Sample 1:** Researchers who have published at the International Conference on Software Engineering (ICSE) or co-located events, based on a sampling frame derived from DBLP, recruitment August-September 2024 (n=53).
 - **Sample 2:** SE researchers who do not necessarily have published at ICSE or co-located events, especially more junior ones, recruitment in September 2024 (n=20).

RESEARCH PROCESS

- Three strata in our sampling, 150 randomly selected from each of them, total 450 names.
- The SPARQL query and the sampling scripts we used are part of our supplementary material.



THE SURVEY

Variable	Question	Values and Coding
EXPERIENCE →RQ1	Are you:	1 = Early-stage SE researcher (up to 7 years from your first peer-reviewed paper) 2 = Consolidated/middle-career SE researcher (8–12 years of research) 3 = Experienced SE researcher (more than 12 years of research)
COUNTRY	Choose the country of your affiliation from drop-down menu:	Drop-down menu with country names
GENDER →RQ1	What gender do you identify as?	Woman / Man / Non-binary / Prefer not to say / Other, please specify: (open-ended)
MARGINALIZED_GROUP →RQ1	Do you identify as belonging to a marginalised group in the context of your professional environment?	0 = No 1 = Yes
	Yes → Which group (Please select all that apply)	Gender / Ethnicity / Age / LGBTQ+ / Other
TOPICS	On which interdisciplinary research topics related to software engineering do you work? Below are some examples, but feel free to list any other topics not mentioned.	Artificial Intelligence (AI) / Cognitive Science and Psychology / Cybersecurity / Data Science and Big Data / Digital Humanities / Diversity, Equity, and Inclusion (DEI) / Education / Fairness / Health Informatics / Human-Computer Interaction (HCI) / Internet of Things (IoT) / IT Ethics / Legal Aspects of Computing / Software Business / Sustainability / Other interdisciplinary topic (open-ended)
VENUES	To which software engineering conferences and journals do you usually submit your interdisciplinary software engineering research papers? Please select all that apply.	List of publication venues (including an open-ended option for listing other venues)
DIFFICULTIES →RQ1	Have you experienced difficulties related to the acceptance or review process of interdisciplinary research in software engineering?	0 = No 1 = Yes NA = I don't know
	Yes → Can you provide more details on those difficulties?	Open-ended
NEGATIVE_FEEDBACK →RQ1	Have you experienced negative feedback from colleagues or other researchers related to your interdisciplinary research focus?	0 = No 1 = Yes NA = I don't know
	Yes → Can you provide more details on the feedback received?	Open-ended
REVIEWS_POSITIVE	Would you like to share examples of some positive review comments you received about your interdisciplinary SE research? Please provide detailed comments in the box below.	Open-ended
REVIEWS_NEGATIVE →RQ2	Would you like to share examples of some negative review comments you received about your interdisciplinary SE research? Please provide detailed comments in the box below.	Open-ended
CHANGED_DIRECTION →RQ1	Have you changed your research directions because of feedback on your interdisciplinary research?	0 = No 1 = Yes, due to negative feedback 1 = Yes, due to positive feedback NA = I have been thinking of changing it, but haven't done so yet
CHANGES →RQ3	What changes would you like to still see in the way interdisciplinary research is reviewed or discussed in the software engineering community?	Open-ended
ADVICE →RQ3	What advice would you give to researchers new to publishing interdisciplinary research in software engineering?	Open-ended
FURTHER_COMMENTS →RQ2,3	Do you have any further comments related to this survey?	Open-ended

DEMOGRAPHICS

Variable	Response Distribution
EXPERIENCE	18 Early-stage, 12 Mid-career, 43 Experienced
COUNTRY	15 USA, 8 Canada, 8 Germany, 7 Finland, 6 Italy, 3 Australia, 3 Netherlands, 3 Sweden, 18 Other, 2 NA
GENDER	49 Man, 21 Woman, 0 Non-binary, 1 Other, 2 Prefer not to say
MARGINALIZED_GROUP	51 No, 20 Yes (13 Gender, 8 Ethnicity, 5 LGBTQ+, 3 Age, 2 Other), 2 NA

TABLE III
CONTINGENCY TABLE FOR BEING A MEMBER OF A MARGINALIZED GROUP AND HAVING RECEIVED NEGATIVE FEEDBACK.

MARGINALIZED_GROUP	NEGATIVE_FEEDBACK	
	No	Yes
No	30	15
Yes	6	12

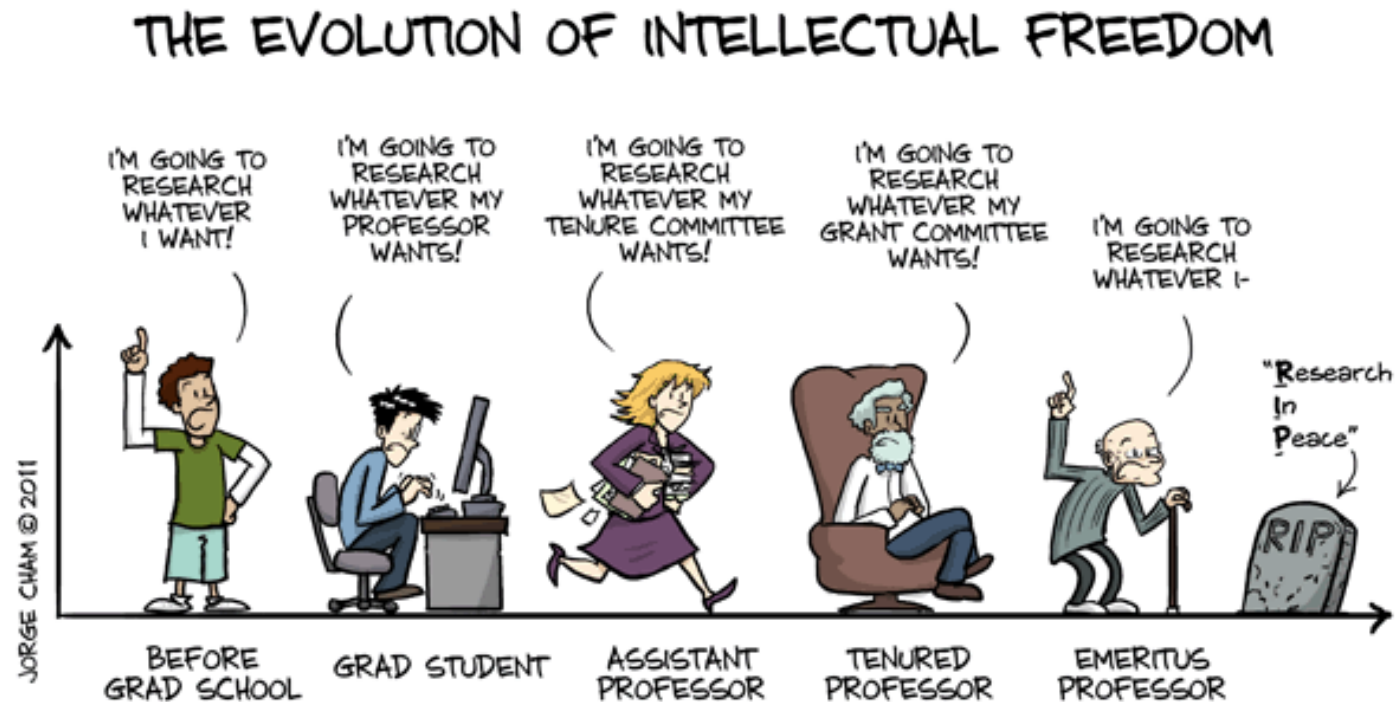
47 reported publication difficulties, 28 received negative feedback, 17 changed research direction, 4 were considering changing the research direction.

From those 17, 7 changed their direction due to positive feedback and 10 due to negative feedback.

Participants belonging to marginalized groups were significantly more likely to receive negative feedback.

DEMOGRAPHICS

Experienced researchers were significantly less likely to change research direction ($p < 0.001$).



QUALITATIVE ANALYSIS

In our qualitative analysis, we identified two high-level categories that describe challenges researchers face when conducting and publishing interdisciplinary SE work (RQ2), **topic-related** and **reviewing-related** challenges.

Additionally, one more category emerged that contained general advice for researchers conducting interdisciplinary work in SE on how to **deal with the broken system.**

TOPIC-RELATED CHALLENGES

- Research seen as out of scope
- Research seen as disconnected from SE
- Negative views towards an interdisciplinary research focus
- Research seen as irrelevant or lacking novelty

- *"Mainly from CS/SE, who would argue that this is not CS/SE and should be targeted at psychology, vocational studies, etc. venues." - ID37*
- *"They were joking about my super-soft perspective on software engineering, not taking it really seriously." ID28*
- *"Just some regular commenting [...] is my research in the scope of SE or IS [Information Systems]?" ID70*
- *"Some reviewers failed to see the implications of legal aspects in software engineering." ID7*

REVIEWING-RELATED CHALLENGES

- Invalid methodological criticism
 - Lack of expertise among reviewers
 - Getting interdisciplinary grants
 - Aligning interdisciplinary teams
 - Lack of professionalism and negative attitudes
- *“Sometimes we (from CS) are not used to the other areas’ theoretical frameworks, instruments, and styles. [...] It is always a learning experience, but it is hard to adapt to so many variables.” ID37*
 - *“Reviewers often may have very different disciplinary backgrounds, and will ask for different and even occasionally conflicting revisions.” ID50*
 - *“Reviewers often don’t have the expertise to properly judge the multi-disciplinary work. For example, it is discouraging when parts of a paper that report research led by a psychologist or AI researcher are criticized by an SE reviewer for being incorrect [...].” ID3*

DEALING WITH CHALLENGES

Dealing with Topic-related Challenges:

- *“Have a strong publication record or be an exceedingly good writer” ID46*
- *“To team up with a more senior researcher who stands a better chance of being listened to” ID61*
- *“Have a good supervisor with an established name, because then there is a good chance to make it as researcher.” ID64*
- *“Focus on the impact to SE” ID48*

Dealing with Reviewing-related Challenges:

- *“I would love to see editors/chairs push back or even discount reviews that are just stubborn.” ID54*
- *“I also believe that editors are not exercising thoughtfulness about their role in this process, and that this community needs to take seriously the covert replication crisis that is undoubtedly plaguing it.” ID57*
- *“Acknowledging the increased effort required to achieve interdisciplinary research.” ID1*
- *“Find likeminded interdisciplinary researchers and share your experiences and publication strategies!” ID4*

DEALING WITH A BROKEN SYSTEM

- *Stay strong and believe in your research! Make sure that your methodology section is crystal clear and strong - then they can't do anything." ID23*
- *"Be prepared to have long anonymous discussions with referees when responding to their feedback!" ID9*
- *"Do not publish in software engineering venues. Rather, publish in the venues of your other fields which have better established empirical, methodological, and scientific norms." ID57*
- *"Create new publications venues." ID14*
- *"Get involved in program committees and editorial boards to influence others." ID61*
- *"Discussion, discussion about the challenges!" ID23*
- *"Honestly, it is better to avoid it." ID55*

SUMMARY OF THE RESULTS



RQ1 (Demographics): Participants in marginalized groups were significantly more likely to receive negative feedback than other participants. Besides, more experienced researchers were significantly less likely to have changed their research direction.

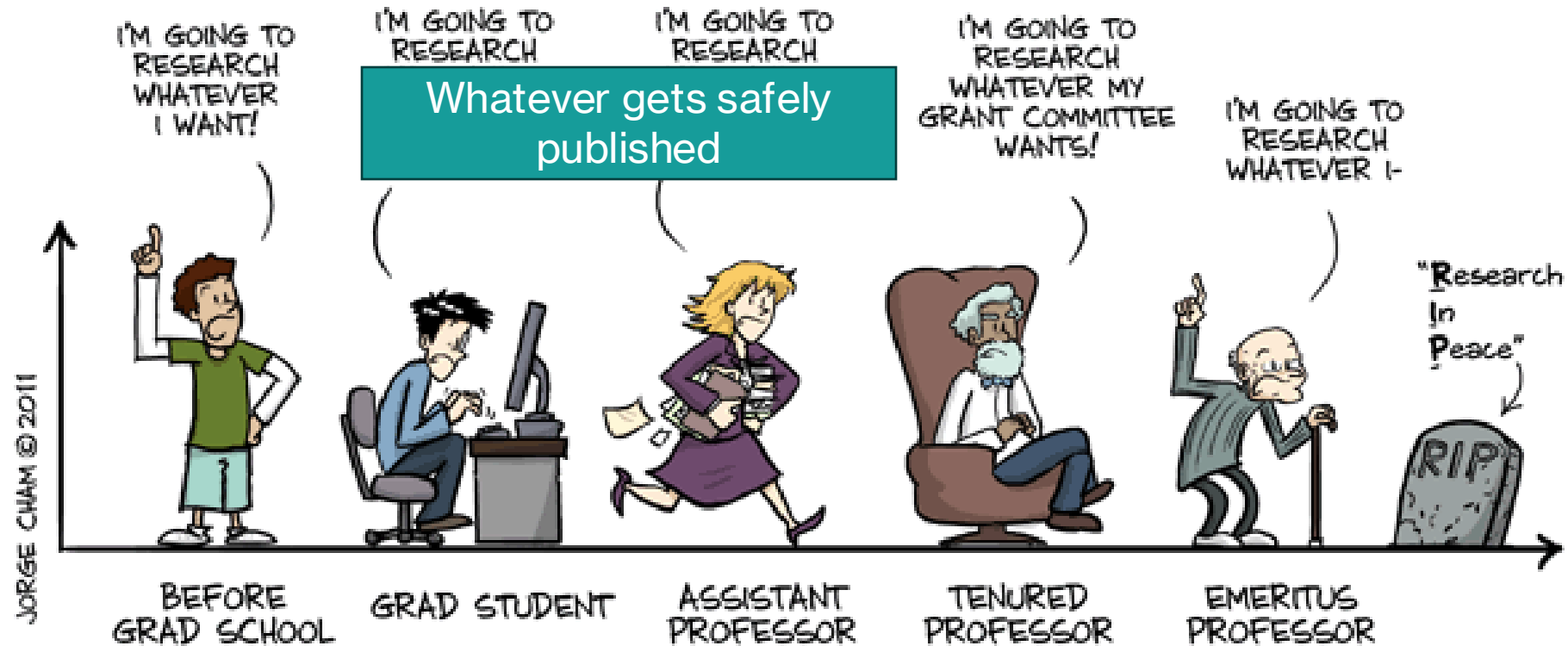


RQ2 (Challenges): Topic-related challenges include interdisciplinary research being considered out of scope or not relevant to the field of SE. Reviewing-related challenges include invalid review criticism, lack of reviewer expertise, or even lack of professionalism among reviewers



RQ3 (Recommendations): Recommendations that our participants mentioned include focusing papers narrowly on specific SE concerns, but also including senior researchers in the team or establishing clearer submission guidelines or new venues for interdisciplinary SE research. Participants also expressed the need for a continuous debate about the identified challenges

THE EVOLUTION OF INTELLECTUAL FREEDOM



DISCUSSION

- Our findings suggest that SE, as a young research discipline, is still maturing in its acceptance of interdisciplinary research. This was especially visible in our participants' experiences of challenges and negative feedback.
- SE community must work collectively toward making interdisciplinary research more visible and valued.
- Would there be need for 'liaison officers' or 'interpreters' who can bridge terminological and methodological gaps between different disciplines?
- It is sometimes hard to recognize which challenges are because of empirical methods, and which are due to interdisciplinary research topics – this requires more attention in the future.

THANK YOU!

COMMENTS? IDEAS? DISCUSSION?

Sonja



Grischa



Ronnie



Sebastian



The paper



Supplementary material

