The need for sustainable leadership in academia

A survey of German researchers reveals a widespread lack of training for leadership skills

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Success and productivity in science is measured largely by the number of publications in scientific journals and the acquisition of third-party funding to finance further research (Detsky, 2011). Consequently, as young researchers advance in their careers, they become highly trained in directly related skills, such as scientific writing, so as to increase their chances in securing publications and grants. Acquiring leadership skills, however, is often neglected as these do not contribute to the evaluation of scientific success (Detsky, 2011). Therefore, an early-career researcher may become leader of a research group based on publication record and solicitation of third-party funding, but without any training of leadership or team management skills (Lashuel, 2020). Leadership, in the context of academic research, requires a unique list of competencies, knowledge and skills in addition to "traditional" leadership skills (Anthony & Antony, 2017), such as managing change, adaptability, empathy, motivating individuals, and setting direction and vision among others. Academic leadership also requires promoting the research group's reputation, networking, protecting staff autonomy, promoting academic credibility, and managing complexity (Anthony & Antony, 2017).

Academic leaders lack leadership skills

A recent study identified the neglect of systematic leader selection and development as one of the most pressing challenges for academia in addition to maintaining autonomy, constant change, and uncertainty (Braun et al, 2016). According to the authors, academic leaders are not prepared for their demanding new tasks. An earlier survey of 233 professors from universities in the UK revealed similar data: 60% of the respondents indicated that research output and scholarships were the sole basis for their appointment (Macfarlane, 2011). When the same survey asked professors about their views on the role of leadership, the answers coalesced around six main qualities of professorial leadership: role model, mentor, advocate, guardian, acquisitor and ambassador. This study again clearly outlines the mismatch between the current requirements to become a professor or principle investigator focusing on individual performance and research output and the requirements of an efficient leader in academic research.

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In order to combat the so-called "Peter Principle" according to which *"members of an organization where promotion is based on achievement, success, and merit will eventually be promoted beyond their level of ability"* (Peter & Hull, 1969), researchers should be trained in leadership skills as these are key to successfully navigate the new challenges and responsibilities that come with a leading position (Bryman, 2007). This would not only benefit research at the individual level but also academia as a whole: A recent survey of early-career researchers in Australia reports lack of mentorship, hostile workplace environment, and questionable research practices as major causes why young scientists leave academia (Christian et al, 2021). At the same time, growing evidence suggests that the leadership style of academic supervisors can dramatically affect the mental health and performance of academic employees, especially of PhD students (Christian et al, 2021). Moreover, managing students with mental health issues can also pose enormous challenges on untrained supervisors, creating an unsustainable circle of insecurity and overstress owing to lack of leadership skills (Loissel, 2019).

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The scientific community is slowly beginning to address the pervasive pressure to publish and supporting more fair and

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reliable approaches for research assessment such as those advanced by the San Francisco Declaration on Research Assessment (https://sfdora.org/). However, similar movements to improve leadership and the working environment of younger researchers in academia are rare. Even studies of leadership in research and its effect on employees are scarce. To this end, we conducted a survey of researchers at all career stages in Germany about their perception and experience of leadership in the German academic system. The results highlight the need for change toward a more sustainable academic environment.

We received responses from 585 international academics who are currently working in Germany on their experience with leadership culture in academia. 63% (368) respondents were employed in academia; 34% (197) worked outside of academia or research, while 3% (20) indicated employment as scientists outside of academia. Although the latter two groups were trained in academic institutions, we nonetheless focused our analysis on the 368 academics that are currently employed in academia. 60% (221) of participants were women; 38% (139) were men with an average age of 31 years ranging from 21 to 82 years.

The majority, 41%, of participants held a PhD/MD, followed by 38% with a master's degree, while a minor of participants held a bachelor's degree (21%). 16% specified as group leaders or professors, 19% as postdocs, 31% as PhD students, 14% as research assistants—defined as a graduate who is employed on a temporary or part-time basis — and 20% as students. Of those working in academia, 46% plan to stay in academia ("Yes"; 55% women, 38% men), 26% are planning to leave academia ("No"; 57% women, 42% men), and 23% are currently undecided ("Maybe"; 72% women, 27% men). While the gender ratio was similar for staying or leaving academia ("Yes" or "No"), noticeably more women than men indicated indecisiveness ("Maybe") regarding their plans to stay in academia. Moreover, many participants who plan to stay in academia expressed doubts about combining a career in science with family planning. The 37% of surveyed participants working outside academia gave various reasons why the left. Among the most cited ones are poor career prospects and a lack of job security, underscoring widespread concerns of those who are still working in academia.

Academics feel unprepared for leadership in academia

Of the surveyed academic participants, 59% indicated to be currently in a leading position (53% women, 45% men; Fig 1). Of the others, 78% are pursuing a leading position. However, 77% of all academic participants stated that they did not feel well prepared for a leading position (Fig 1). Among the current leaders, 73% also stated that they did not feel well prepared for the leading position they currently hold (54% women, 44% men; Fig 1). The situation is slightly better for those working outside of academia: 51.8% of current leaders said they did not feel prepared for their position.

To better understand the needs of the academic community, we asked about their interest in leadership training. The majority expressed great interest in a training or coaching program to support their leadership development (Fig 2). The preferred formats ranged from network building to personal coaching to workshops as well as lectures or online seminars. About 62% of current leaders also expressed interest in participating in leadership development training together with their team. More than 82% of the participants saw it as the duty of the institutions to offer appropriate training.

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Overall, our survey, albeit limited, shows a great lack of leadership training in academia, with even 64% of current academic leaders in Germany feeling not well prepared for the position they currently hold. On the other hand, it also shows a great demand and interest in leadership training programs even among respondents at more advanced career stages who did not feel well prepared for their current leading position.

A call for leadership training opportunities and support

Academic leadership is usually defined from the perspective of a group leader or professor. From our point of view however, leadership in science starts at an earlier stage when supervising or mentoring students, which is common during the course of a PhD. We therefore defined leadership as a skill requirement for a scientific career that starts as early as the PhD. The concept of leadership in academia is highly complex. Academic leaders are required to meet the interests of a wide range of different stakeholders, while being held to the highest standards of excellence in research and teaching. At the same time, academic leadership ranges across multiple levels, from an individual level, to the level of a research group to the organization (Braun *et al*, 2016). In addition, many academics have to deal with additional challenges: the quality of mentoring, the ability to balance temporary contracts with high-quality research, and the need to maintain motivation, creativity, and innovation of their team (Braun *et al*, 2016).

Our survey is very much limited to reflecting the current state on academic leadership in Germany albeit of one of the leading countries in international research. The problem is, however, global, and only few international studies on leadership in academia exist currently. One survey of academic leaders at Chinese and European universities noted a lack of conceptualization of academic leadership and attempts to provide a new definition: "an influence of one or more people with an academic profile on academic behavior, attitudes or intellectual capacity of others based on commitment and power in order to achieve managerial, structural, and institutional vision values" (Dinh *et al*, 2020).

A crucial step for developing sustainable leadership practices in academia is providing researchers with adequate training opportunities. Some examples for the success of training at universities come from Pakistan or New Zealand where such programs strongly increased leaders' awareness and self-confidence (Harris & Leberman, 2012; Zulfqar *et al*, 2021). One option would be using leadership skills and training frameworks from other fields. Concepts such as New Work and Agility, originally from the start-up world, aim to create and support an innovative and creative work culture (Nafei, 2016). These concepts are based on self-motivation and creativity, which makes them also suitable for scientists, who are strongly motivated by purpose. Pioneer organizations such as the German Scholarship Organization are already developing training programs to support the development of expertise
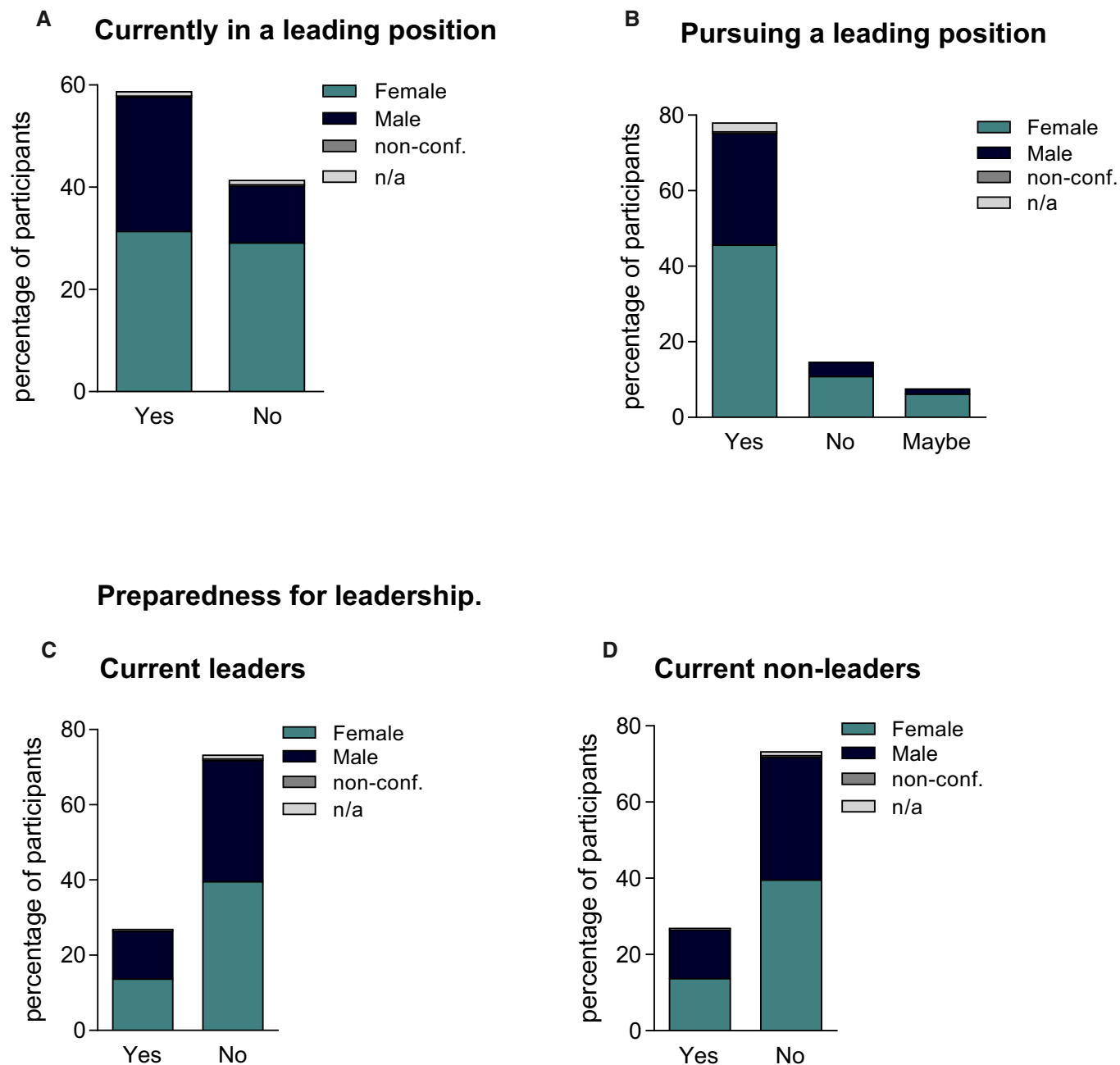
A **Currently in a leading position**

B **Pursuing a leading position**

Preparedness for leadership.

C **Current leaders**

D **Current non-leaders**

Figure 1. Leadership status of participants.

(A) Percentage of participants currently holding a leading position (Yes) and currently not holding a leading position (No) including gender distribution within each group. (B) Percentage of participants pursuing (Yes), potentially pursuing (Maybe), and not pursuing (No) a leading position including gender distribution within each group. (C) Percentage of current leaders that feel prepared (Yes) or not prepared (No) for a leading position. (D) Percentage of current non-leaders that felt prepared (Yes) or not prepared (No) for a leading position. n/a: no data available.

beyond knowledge acquisition and science-centered education. Additionally, more and more academic institutions now offer leadership training for scientists and their institutions, such as, for example, the courses by the European Molecular Biology Organization (EMBO, https://lab-management.embo.org/),

the Helmholtz Leadership Academy (https://www.helmholtz.de/en/jobs-talent/the-helmholtz-leadership-academy/), or the Howard Hughes Medical Institute (HHMI, https://www.hhmi.org/about/leadership). Their success and the growing demand underline the rising awareness for academic leadership training.

Our data further indicate that the majority of current leaders in the German academic system do not feel sufficiently prepared for their position and express great interest in training courses by their institutions (Fig 2), which highlights the important role of institutions themselves in the
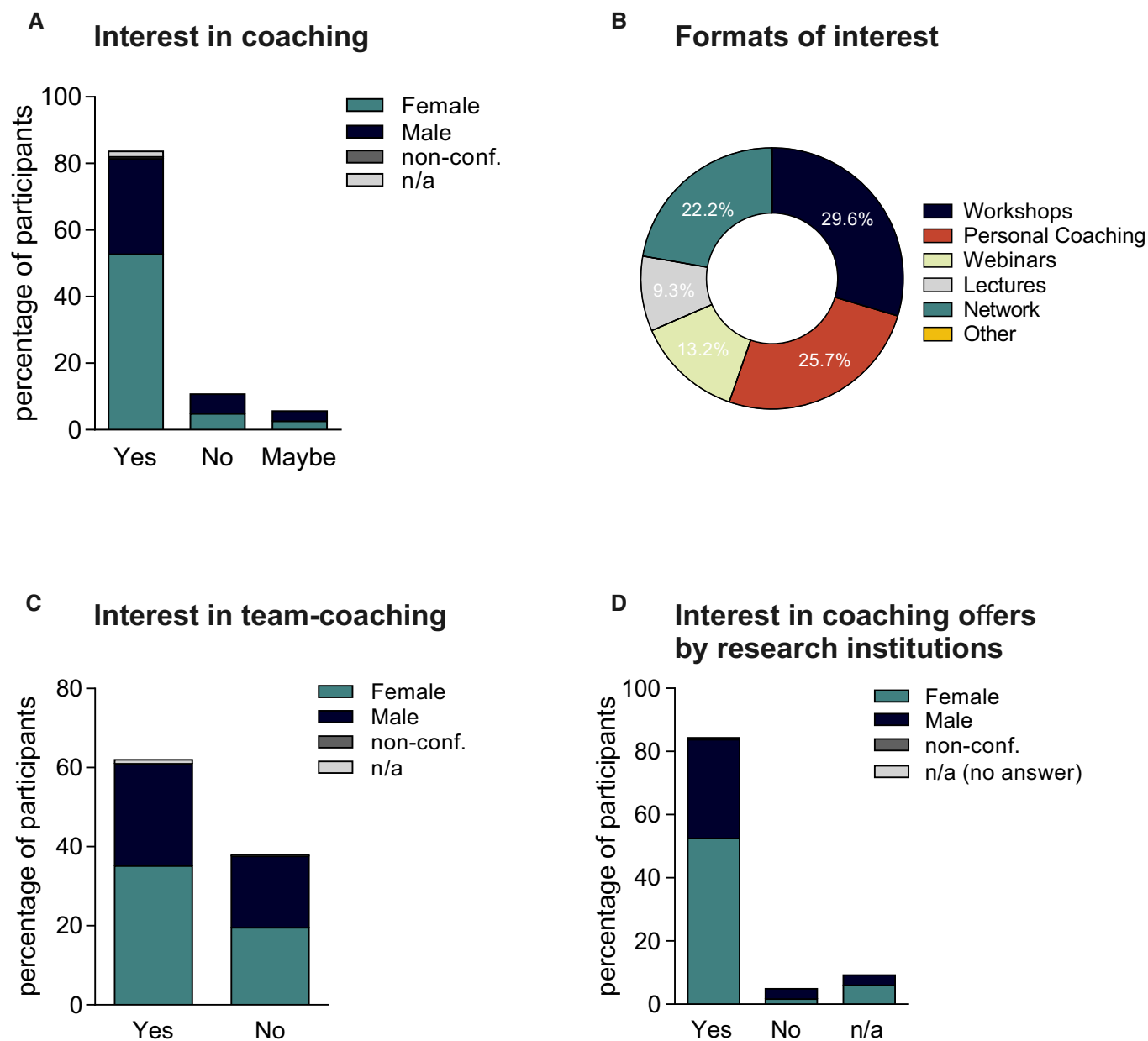
A Interest in coaching

B Formats of interest

C Interest in team-coaching

**D Interest in coaching offers
by research institutions**

Figure 2. Interest in leadership training.

(A) Percentage of participants that is interested (Yes), potentially interested (Maybe), not interested (No) in coaching. (B) Percentage of participants interested in different formats of leadership training including workshops (cyan), personal coaching (orange), online seminars (lime green), lectures (light gray), network building (turquoise), other (yellow). (C) Percentage of current academic leaders interested (Yes) or not interested (No) in team-coaching. (D) Percentage of participants interested (Yes) or not interested (No) in coaching offers by research institutions. n/a: no data available.

development of the next generation of scientists. By investing in leadership competencies, research institutions and universities may increase the potential of academic excellence (Aguirre & Martinez, 2006). By sensitizing early-career researchers to typical challenges, such as lack of job security, power structures, or imposter syndrome—reasons why many excellent people leave academia—and providing better support, institutions could retain more excellent scientists in academia. And by promoting more diversity among their leaders, research institutions may also contribute to fairer and better research (Aguirre & Martinez, 2006).

Some institutions have already integrated courses and are leading by example, such as the University of Sheffield's online resources on developing leadership skills or the Leaders Support and Development Program of the UK's National Institute for Health Research (NIHR). The efficacy of such programs was demonstrated by an Australian study reporting the development of a career-development training program for early-career researchers at an Australian university and its immediate impact on research

productivity on the individual as well as organizational level (Browning *et al*, 2014).

"*By investing in leadership competencies, research institutions and universities may increase the potential of academic excellence*"

Our survey revealed that most academics aspire to leading positions in academic research but do not feel well prepared while bemoaning a general lack of leadership skills. This feeds into the overall need to transform the science work culture from a "stick and carrot" environment where scientists work solely toward their next publication or grant into an innovation-driven culture based on enthusiasm, self-motivation, and creativity. The emphasis on excellence and the challenges of solving increasingly complex societal and environmental problems in global collaborations means that leadership skills beyond mere team and time management are needed. They are also needed to provide role models for young researchers and give them a better perspective in academia and a unique framework to enhance their knowledge and skills. One answer to this question, in addition to offering more training programs for scientists at all career levels, could be adopting work and leadership concepts from highly innovative industries and start-ups. At the end of the day, this would benefit the majority of current and future researchers faced with the responsibility to lead others, thereby improve the efficacy and productivity of science and make science more sustainable by retaining more researchers in the system.

Expanded View for this article is available online.

Conflict of interest

The authors declare that they have no conflict of interest.

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