Conference scheduling undermines diversity efforts

To the Editor — Scientific conferences incorporate diversity-focused events into their programming to increase their diversity and inclusivity and to improve the conference experience for scientists from underrepresented groups (URGs)[1]. While simply adding diversity-focused events to conferences is positive, maximizing their impact requires that conferences organize and schedule these events to minimize well-acknowledged, problematic patterns such as the minority tax[2]. To our knowledge, the programming of diversity-focused events at conferences has not been systematically reviewed to identify the extent of these shortcomings and how they can be addressed.

The status quo

We assessed diversity-focused programming at 29 major biology conferences from 2010 to 2019, noting events tailored to three underrepresented and marginalized groups in biology: women, ethnic and racial minority groups, and the LGBTQ+ community (see Supplementary Information for further methods). Since 2010, diversity-focused events have become more common but frequently address only a subset of URG communities. In general, the percentage of conferences with diversity-focused events increased from <50% in 2010 to >75% in 2019. On average, women were the most frequent focus of these events and the LGBTQ+ community was the least frequent focus (Fig. 1a).

Formats of diversity-focused events depend on whether they are targeting URGs or the broader conference audience (that is, the conference community including non-URGs). In the last three years, 21 (72%) of the surveyed conferences included diversity-focused events (87 events in total). The most common formats were socials (37%), workshops (30%) and symposia (15%). Diversity-focused events targeted either URGs (45%) or the broader conference audience (55%). URGs were primarily targeted with socials (67%), whereas broader audiences were targeted with a mixture of workshops (35%), symposia (27%) and socials (13%) (Fig. 1b). Socials and workshops were mostly used for events that focused on women (38% and 35%, respectively), as well as ethnic and racial minority groups (50% and 33%, respectively), whereas 70% of events focusing on the LGBTQ+ community were socials.

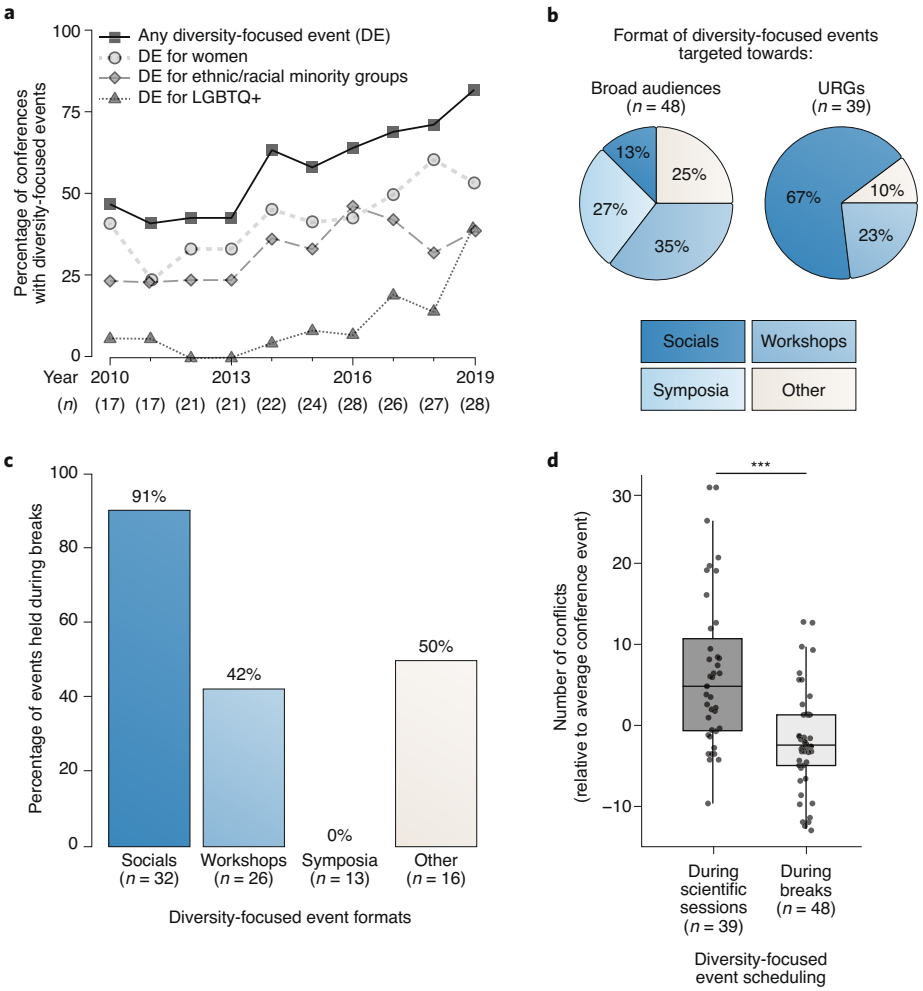

Fig. 1 | Patterns in the targeted audiences, formats and scheduling of diversity-focused events. **a**, Diversity-focused events (DEs) featuring specific groups became more common over time. **b**, Formats of DEs varied based on their target audiences. **c**, Whether DEs occurred during breaks depended on their formats. **d**, The number of conflicts with DEs depended on whether they were scheduled during breaks. ***$P < 0.001$, see Supplementary Information.

Across all formats, 55% occurred during breaks rather than during scientific sessions, including 91% of socials and 42% of workshops (Fig. 1c). Events focused on women and ethnic and racial minority groups commonly occurred during breaks (54% and 50%, respectively), as did 90% of events focused on the LGBTQ+ community.

Diversity-focused events scheduled during scientific sessions had more conflicting events than those scheduled during breaks (Fig. 1d). Compared to an average event at each conference, diversity-focused events that occurred during scientific sessions overlapped with 5.9 more events, whereas diversity-focused events that occurred during breaks overlapped with 2.3 fewer events (Fig. 1d).

We thus identified three patterns that characterize the current model of

Box 1 | What changes can make a difference?

- Have at least one schedule block, outside of breaks, that exclusively offers parallel diversity-focused events. Events should target and offer tailored resources to specific communities, such as specific URGs and the broader conference community[3,4]. For example, a workshop for inclusive teaching practices could run parallel to networking events and professional development training sessions for specific URG communities. This scheduling represents an opt-out approach, where attendees must make a conscious decision not to attend these events, and it can therefore boost attendance at diversity-focused events[11].
- Align diversity-focused programming with long-term goals for diversity initiatives. Each diversity-focused event should move a conference closer to achieving its goals. The format of each diversity-focused event should be determined by its goals.
- Evaluate whether diversity-focused events accomplish their goals. Evaluations should be made with specific URG communities in mind, not a single overarching URG community. For example, evaluations could include surveying the audience immediately before and after each event, as well as several months after the conference to gauge long-term effects of the events. Diversity-focused programming should be modified in response to evaluations.
- Organizers and hosts of diversity-focused events should represent a cross-section of the conference community. Event leaders should represent each of the targeted audiences across the entire conference community.

diversity-focused programming at biology conferences: (1) a general increase in diversity-focused programming over time; (2) biases in the formats of events offered to broader audiences versus URGs; and (3) a conflict between placing diversity-focused events in competition with the scientific programme or with scheduled breaks.

Shortcomings of the status quo

Diversity-focused events featuring specific URG communities are increasing in frequency, but biases in event formats targeted to broad versus underrepresented groups suggest that conferences do not provide resources tailored to the unique issues faced by each URG community. Furthermore, many issues faced by URGs at conferences and throughout academia are driven by cultural patterns and institutional policies; helping specific URG communities succeed requires conferences to host diversity-focused events that provide relevant resources to URGs and the broader community[3,4].

Many diversity-focused events are scheduled in competition with scientific sessions, which can reduce their attendance and overall impact[5]. In addition, simultaneously scheduling diversity-focused events and scientific events, especially feature scientific events such as plenary lectures, effectively penalizes the audience of diversity-focused events because they miss the dissemination of important scientific information, while their colleagues who skip diversity-focused events do not.

Most conferences schedule diversity-focused events during breaks rather than during scientific sessions. However, conferences are psychologically taxing, and break times are critical opportunities for emotional and mental recovery. Scheduling diversity-focused events during conference breaks selectively burdens URGs and their allies by limiting their opportunities to recover from stress and thus impacting their overall conference experience[6,7].

Logistical burdens and psychological detriments to URGs are especially evident for individual URGs who are repeatedly selected to organize and facilitate diversity-focused events[2]. These stressors are in addition to the elevated baseline of stress, with known physiological consequences, that URGs can experience in academic settings, which are often predominantly white, male, cisgender and heterosexual spaces where microaggressions, harassment or other oppressive practices may be prevalent[8]. Individuals who experience high levels of stress at a conference are unlikely to attend the conference again[9].

In Box 1 we list several recommendations that could reduce the logistical burdens and psychological stress associated with the current model of diversity-focused event programming. These recommendations will welcome diverse perspectives into our common pursuit of scientific innovation and promote positive outcomes for our science and our community[10]. Although these suggestions disrupt the status quo, it is important to note that the modern conference structure is only several decades old and therefore not rooted in immutable tradition. All conferences are capable of some changes to their normal operations if promoting diversity and inclusion in a timely manner is embraced as a true priority.

Reporting Summary. Further information on research design is available in the Nature Research Reporting Summary linked to this article.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request. ❐

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Competing interests

The authors declare no competing interests.

Additional information

Supplementary information is available for this paper at https://doi.org/10.1038/s41559-020-1276-5.

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Software and code

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Data collection	No software used for data collection
Data analysis	Data analyzed with R Statistical Software (version 3.5.3) using built-in functions from the following packages: lme4, emmeans, and lmerTest. Specific functions are listed in the Supplementary Information (Supplementary Methods) where relevant.

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Life sciences study design

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Sample size	Sample size of the conferences surveyed was determined by the list of biology conferences affiliated with the American Association for the Advancement of Science (AAAS) and listed on the website of AAAS. All of the 29 listed biology conferences were used.
Data exclusions	No data were excluded from the study.
Replication	The study was observational, not experimental, and we used all biology conferences listed on the AAAS website, so replication was not possible. The surveyed biology conferences spanned a wide range of attendance sizes and subfields, thus our findings should apply to most biology conferences.
Randomization	Biology conferences were chosen based on their listing on the AAAS website. Therefore, the subfields and sizes of the studied conferences are close to random. Randomized surveys of each conference's scheduling conflicts were done using a random number generator.
Blinding	Blinding is not relevant to this study because it was observational, not experimental. Assessments of each diversity-focused event's format and targeted audience were independently confirmed by at least 2 co-authors.

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