Outlining the Hidden Curriculum: Perspectives on Successfully Navigating Scientific Conferences

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Outlining the Hidden Curriculum: Perspectives on Successfully Navigating Scientific Conferences

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ABSTRACT: Scientific conferences and meetings are valuable opportunities for researchers to network, communicate, and develop knowledge. For early career scientists, conferences can also be intimidating, confusing, and overwhelming, especially without having adequate preparation or experience. In this Perspective, we provide advice based on previous experiences navigating scientific meetings and conferences. These guidelines outline parts of the hidden curriculum around preparing for and attending meetings, navigating conference sessions, networking with other scientists, and participating in social activities while upholding a recommended code of conduct.

KEYWORDS: scientific conferences, presentations, networking, code of conduct, diversity, equity, and inclusion

Academia's hidden curriculum is a set of social and professional norms that are inherently understood by some but not readily apparent to others, particularly to individuals from historically excluded groups. These unwritten rules profoundly impact how scientists develop, what career path they choose, and their overall potential for success. Therefore, to promote diversity, equity, and inclusion (DEI) as fundamental values within scientific endeavors, the knowledge within the hidden curriculum must be made accessible to all. Furthermore, some of these long-standing norms should be challenged and met with more inclusive strategies to shape scientific communities. In this Perspective, we will discuss the hidden curricula related to scientific meetings including sharing knowledge from members of the American Society of Pharmacognosy's (ASP) DEI Committee. This will enable scientists at all stages to successfully navigate conference dynamics and professional spaces and to help mentors more effectively advise their trainees.

Scientific conferences and meetings are exciting places to share research ideas and results, develop critical professional networks, and connect with scientific communities. These forums can also be intimidating, confusing, and overwhelming, especially for early career researchers as they develop networking skills, self-confidence, and the courage to exchange ideas. Participants will most likely engage with a diverse audience of attendees, sometimes in a non-native language (typically English). Most researchers first enter these spaces with some trepidation but with practice and experience can learn over time to navigate these interactions more comfortably and define and achieve goals for each scientific conference. The lessons learned can vary depending on the conference size [e.g., ACS National Conferences (ACS) can host >10 000 attendees while Gordon Research Conferences (GRC) are typically limited to 200], the organization responsible for hosting/managing, and the general environment (heavily influenced by attendees), among many other factors. As active ASP members, we recommend that attendees direct their efforts toward active participation in learning, cultivating curiosity through questions and presented ideas, and utilizing all conference-related resources to facilitate scientific growth. Other societies have also recognized the need to demystify the hidden curricula of conferences, such as the American Society of Microbiology, which has implemented a Binning Singletons program that facilitates networking and providing support for their conference attendees.

Conferences comprise a wide array of events that may include symposia, oral and poster sessions, socials, workshops, awards ceremonies, receptions, and banquets. They typically host a variety of attendees, such as early career scientists (e.g., students, postdoctoral scholars), vendors, industry scientists, principal investigators at different career stages, organizers, government officials, program officers, journal editors, and many others. Conference delegates often come from diverse backgrounds and represent different institutions, disciplines, and interests. Therefore, it is essential to create an environment that fosters inclusivity, diversity, and equity. This can be achieved by implementing strategies such as providing clear and accessible information about the conference, promoting diversity in the speaking line-up, and ensuring that all participants feel welcomed and valued.

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cultures and countries with different expectations, prior experiences, and norms that tend to inform their behaviors regarding conferences. Personalities also play a significant role in how scientists interact in conference spaces. For example, individuals exhibiting more introverted character traits may need to take breaks to re-energize (some conferences have quiet rooms\textsuperscript{8}), whereas people with extrovert character traits may want to attend all events, particularly socials.

This Perspective aims to provide instruction to scientists who lack experience attending and navigating a scientific meeting. The topics to be discussed are the following:

(1) Preparing to attend and present at a scientific conference;
(2) Understanding general conference dynamics and expectations;
(3) Establishing a general framework for good practices and a respectful code of conduct;
(4) Maximizing the benefit of conference attendance and participation.

$\blacksquare$ PREPARING FOR THE CONFERENCE

After endless days of data collection, crafting a compelling scientific story, and writing and editing an abstract, what other considerations are necessary before traveling to a scientific conference? To maximize the learning experience, we recommend bringing a notebook or tablet to take notes in real time, since after the conference it may be difficult to recall all this information. We also advise carefully exploring the full conference schedules days in advance. Before the conference, invest time talking with your advisor and other lab members about what you hope to gain from the conference to set personal intentions and goals. We also recommend that during the conference attendees take opportunities to expand their scope of knowledge by visiting posters and oral sessions that are seemingly less related to their own research.

**Accommodations and Travel Planning.** Being comfortable in any space requires understanding of our own needs. Consider the conference location (e.g., local, national, or international) when booking accommodations to ensure a comfortable travel time to the conference venue and access to basic needs (e.g., food, ATM, transportation). Furthermore, trainees should openly discuss accommodation and travel with their research advisors, particularly regarding what costs will be covered. This may include searching for travel funding from multiple sources, including department or college-level funding, conference travel grants, and volunteering at conferences for reduced registration rates. Some conferences start early in the morning, so make sure the chosen lodging will allow for on-time arrival and, if necessary, have the option to return to rest during breaks. Are you worried about traveling, or does traveling wear you out? Try to arrive a day early and have time to settle in. Are you an avid coffee drinker? Locate coffee houses or espresso shops near the conference site or hotel. Need afternoon “power naps” to function well? Consider this a priority and try to stay as close as possible to the conference site (even on-site). Do social interactions tend to feel draining? Ensure time and location to take well-planned breaks during the day. We recommend accommodations that provide the most comfortable experience and encourage mutual support among attendees to ensure a safe environment where we prioritize each other’s well-being. As conference planners continue to become more aware of and proactive about diverse needs, we encourage participants to inquire about accessibility, childcare, and/or visas for international attendees.\textsuperscript{9,10}

**Dress Code.** It is beneficial to ask mentors and previous attendees about the dress code and read the conference’s dress code policy. Some conferences recommend business casual or even more formal attire (e.g., at a conference banquet), while at others, flip-flops and shorts are deemed appropriate by the community. Presenters should wear a comfortable and appropriate outfit on the day of their presentation. Poster presentations include up close and personal interaction, while the audience in oral presentations is significantly farther away. Generally, it helps to wear attire that is both comfortable and evokes confidence. Conference days will be long; therefore, comfort should be a priority while authentically and professionally presenting oneself. Doing a test run of your presentation outfit can be a good way to decide if you will be comfortable or distracted while wearing it at the conference. Some institutions have “Career Closets” which provide professional outfits if trainees do not have or cannot afford professional clothing.\textsuperscript{11}

**Presentations.** There are several books and articles that we recommend consulting as attendees prepare to engage in a poster or oral presentation at a conference.\textsuperscript{12−16} Regarding bringing a poster to a meeting, consult with your advisor(s) beforehand, since pre-established standards may be in place to prepare, pay for, print, and transport posters to a conference. If traveling with a poster, consider the type of poster and how to carry it. For example, a poster tube with a strap can protect and carry posters printed on heavy weight paper. Another option is to print posters on cloth, which neatly folds in luggage but may also leave creases. Printing a poster well in advance will help to avoid last-minute stress and expedited service fees, as well as reduce the risk of facing malfunctioning printers and other potential problems as the conference approaches. Labeling poster tubes with personal information such as name, address, phone number, and email address can be handy if tubes get lost in transit to the meeting. For oral presentations, it is beneficial to generate an alternate PDF version of the slides and have it saved on a flash drive along with a copy in its standard format (e.g., PowerPoint). We also recommend having a cloud copy that can be remotely accessed and retrieved from any Internet-enabled device (e.g., Google Drive, Dropbox).

Repetition, practice, and experience forge excellent public speakers and presenters. Practicing both oral and poster presentations several times will be critical to delivering a clear and concise message. Practice talks are an excellent exercise to engage with lab mates, friends, or family members as practice audiences. Recording and reviewing practice talks can be another valuable method to create self-awareness about presentation skills, including time management, the overuse of specific words such as filler words and hesitation markers, and other tendencies. Another helpful resource for those seeking to improve their presentation competence is Toastmasters International,\textsuperscript{17} which hosts local chapters worldwide to teach public speaking and leadership skills. In preparation for the presentation, study the material in detail and identify predictable questions. During the presentation, refrain from

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overclaiming or speaking about unfamiliar concepts, especially considering that there is likely a room full of people working in related scientific fields. Instead, focus on the specific scientific research within the presentation and support statements with references or convincing data, keeping your presentation straightforward while sticking to your strengths. If you do not know the answer to a question, it is important to say so. Staying within the allotted times is essential since the conference audience will appreciate quality over quantity and taking too long could result in rushing or an abrupt and incomplete ending.

Who Will Be There? Several weeks before the conference, check to see if there is a list of registered attendees and a finalized conference program that includes names and affiliations of presenters. This information may be distributed by email, available online at the conference website, or in event-specific smartphone apps. The conference schedule is an excellent resource for learning who will be at the meeting and what sessions to prioritize attending. Knowing the attendees may inspire reading journal articles about a particular topic or by a specific author, which will make the attendee better prepared for a potential interaction and/or allow them to follow the presentation more readily. Attendees may also plan to meet program officers, company representatives, and other useful contacts that may provide avenues toward a future career. Since significant time, energy, and money go into attending conferences, make the best use of this opportunity by planning and setting goals for meeting key people. Business cards can be useful for networking, and simple versions can be made using a basic printer or commercial printing services if professional printing is unavailable. As the adoption of digital business cards (e.g., QR codes) becomes widespread, technical know-how is supplanting challenges in cost accessibility of printed materials. Other options to stay in touch with professional networks include adding new contacts on LinkedIn or following up with an email. As the conference progresses, it is normal to lose track of names, contact details, or specific circumstances of meeting new connections. Try to document essential contact information during each day of the event, especially for those contacts that may prove essential (e.g., potential research mentors, collaborators, or employers).

PARTICIPATING IN THE CONFERENCE

After long hours of traveling, participants will be excited and ready to engage, anticipating the presence of other attendees who might be conducting research related to their own. Conference attendees are encouraged to seize the opportunity by posing detailed questions, maintaining well-organized notes, recording key references for future reading, and exchanging contact information (e.g., email addresses) for networking purposes. Additionally, they should be ready to summarize and discuss their own work if approached by others with questions. In this section, we discuss several other factors that will help maximize the overall participation of attendees in a scientific conference.

Name Badges. Review the conference schedule and check-in as soon as possible during the appropriate time slots. Doing so will result in receiving the name badge and other conference-related materials. Review the information on the badge, which usually includes name, institution, position, and more recently, pronouns. If any of the information is incorrect, ask the conference organizers if they can reprint the badge. Many conferences have this service available on-site. Name tags/badges play a crucial role in networking. Forget someone’s name or want to refer to an attendee correctly? Look for and read the person’s name badge. Be sure when you are presenting or introducing yourself that your name badge is visible and turned the correct way for others to easily read your information.

Time Management. It is challenging (sometimes impossible) to attend every event at a conference. Attendees should preplan their schedules to maximize attendance at sessions of interest and not feel guilty about not attending every single session or event. In this sense, they are encouraged to discuss conference expectations with their advisor or supervisor in advance. A conference is a special and rare opportunity to expose oneself to cutting-edge knowledge and different perspectives. Therefore, attendees are encouraged to challenge themselves with a rigorous and well-planned schedule to maximize learning and ensure attendance at scientific talks and activities of most interest. Prioritize quality over quantity and participate as much as possible without compromising your physical or mental well-being.

Presenting. For poster presentations, it is crucial to carefully review the schedule and determine the poster number and the specific time and location of the presentation. Typically, posters are set up and removed in designated time slots, as detailed in the schedule. Upon arrival at the conference site, locate the designated poster room and the assigned board by poster number. It can be beneficial to have assistance while setting up the poster since these can be bulky and can crease if not set up correctly. It is helpful to have a 1, 3, and 5 min version of your poster presentation prepared. This gives visitors to your poster options and starts interactions in an engaged manner. Presenters should practice ahead of time and prepare to introduce themselves, present their research, and be open to answering questions. During the poster session, attendees will freely navigate the displays and poster presentations. Depending on the conference, beverages such as beer, cocktails, or wine may be served during this session. While it may be acceptable to consume alcohol in this scenario, presenters need to know their limits and remain mindful of the primary purpose of their poster presentation. The goal is to deliver an excellent scientific presentation while maintaining professionalism throughout the session. In addition, if a fellow research group member is delivering an oral presentation, they may promote the poster number during their talk, directing interested individuals to where they can find more information on the research topic.

Oral presentations are substantially different from posters. They involve technical aspects of audio and video media management (e.g., laser pointers, projectors, and microphones). Follow instructions from the organizers about whether individual laptops will be used or if presenters must upload their talks on conference computers. For the latter, the file name should contain the presenter’s name and ensure slides are compatible with the conference’s platform. Some conferences will allow or even expect presenters to use their laptops. Verify this ahead of the conference and work with the on-site media management team. We recommend that presenters arrive at least 30 min before their session’s scheduled start time. Arriving early will allow time to test laptop or media device compatibility and to double-check that the presentation slides appear and transition as expected before the oral presentation. It also will allow time to learn how to use the laser pointer and slide advance the conference may
provide. Bringing a personal slide advancer, especially after using it during practice talks, is a great way to feel familiar with a device and boost confidence. Ensure devices are charged beforehand, bring extra batteries, and test again before the presentation. In addition, it is good practice to check in with the session chair and provide them with the proper pronunciation of one’s name for the speaker introduction. Once the session is about to begin, sit close to the presentation booth or stage and be as attentive as possible to the other presentations. Previous speakers may show concepts and slides that are also relevant to your own presentation and that can be referenced during your talk. At the beginning of an oral presentation, use the first 5—10 s to thank the organizers and session chair for the invitation while ensuring the pointer/clicker works. At this point, breathe and enjoy the moment. If technical difficulties arise, do not panic. Let the media team help get things back on track while continuing the current line of thought and trying to stay focused, slowing down if necessary.

When one is not presenting, it is good practice and a beneficial experience to interact in oral and poster sessions by asking questions. Throughout the conference, it is important to recognize gender, power, and identity dynamics that can occur during oral and poster presentations as well as during question-and-answer sessions. Some conferences are actively seeking to reduce these long-standing dynamics using techniques such as asking for trainee questions first and/or taking questions from the back of the room first.

**CODE OF CONDUCT**

All scientific conferences should have a code of conduct published on their website or available during the event. This code establishes guidelines for creating inclusive environments and policies for managing harassment, discrimination, and other unacceptable behavior. Many of these will be shared explicitly with attendees during registration and may require acknowledgment. Conferences should be spaces committed to sustaining and contributing to a friendly, safe, and welcoming environment for all while promoting DEI regardless of sexual orientation, ability, ethnicity, race, religion, and gender, as well as any other diversity being represented.

Unfortunately, unacceptable behavior can take place at academic conferences. Unacceptable behavior includes intimidation, harassment, abusive, discriminatory, derogatory, or demeaning conduct by conference attendees, and failure to fulfill the conference’s code of conduct and local laws. Specifically, harassment includes threatening, intimidating, or offensive comments about a person’s appearance, age, sexuality, religion, ethnicity, or ability. The inappropriate use of nudity and profanity, unwelcome sexual advances, texts, recordings, and disruptive behavior are also considered harassment and unacceptable behavior. Other examples include undesired physical contact, written or verbal communication, or other actions, including intimidation, threats, bullying, or use of force or violence against anyone, and any lewd or violent language or behavior. Violating the code of conduct could result in severe consequences, such as ejection from the current conference, exclusion from future conferences, social activities, awards/fellowships, and professional society membership. In some cases, violations are reported to the offender’s employer or law enforcement officials. A one-time offense can drastically impact one’s career path. Establishing a good reputation takes time, whereas a bad reputation can be gained instantly. Thus, we have outlined a recommended code of conduct for those attending a meeting, outlining the expectations for participant behavior. In general:

- Be considerate and respectful in all conference spaces and interactions, including those that may occur off-site.
- Be mindful of the surroundings and fellow conference attendees. If a situation requires attention or anyone is distressed, immediately relay this information to designated conference officials.
- Refrain from using vulgar language.
- Refer to individuals by their name and pronouns.
- Do not harass or engage in inappropriate behavior toward others. Harassment may encompass remarks or humor centered around disparities between genders or sexual subjects, unsolicited approaches or propositions for dates or sexual involvement, or the utilization of language or visuals that demean or degrade others.

**NAVIGATING SOCIAL EVENTS**

Many conferences serve alcoholic beverages as part of receptions, poster sessions, closing banquets, or social events. These events can be great for meeting people and creating meaningful professional networks. Even so, attendees are not expected to attend social functions or to consume alcoholic beverages where they are offered and should not feel pressured to consume alcohol or other substances. Moreover, we strongly encourage all delegates to establish a healthy dynamic where no one feels influenced to consume alcoholic beverages and colleagues care for each other—for example, asking for nonalcoholic drink options without judgment. A nondrinking attendee giving away their free drink vouchers or tickets from conference events is appreciated among colleagues and is one of many ways to participate in social functions without consuming alcohol. For those who decide to consume alcohol, be mindful of limits and remember that conferences are professional events. Even after a couple of drinks, attendees’ demeanors should be tempered by the seriousness of the event and the professional task at hand. The environments around these events often blur the lines between professional connections and personal friendships, and we recommend navigating the path with care and caution. Any unprofessional actions may make future professional interactions difficult and/or have grave consequences. Festivities can sometimes continue off-site with or without other conference delegates. However, the conference code of conduct still applies even in these off-site locations, as well as during nonscientific conversations and fun recreational activities. In all spaces, attendees should be aware of their surroundings and report unacceptable behavior. As a community, we are collectively responsible for creating and sustaining a safe and inclusive environment for everyone to comfortably participate.

**EXPANDING PROFESSIONAL NETWORKS**

Some participants reach a conference and retreat to the comfort of staying with a small group of known colleagues and friends, whether these are relationships established at home institutions, through early interactions at the event, or from past years of shared experiences. We strongly encourage attendees to reach beyond their “comfort zone” and meet the authors of field-related scientific publications, admirable scientists to learn from or collaborate with, or anyone who catches the attention of attendees during the event. Presenters...
may not stay for the entire duration of the meeting, so it is important to proactively approach them when an opportunity arises or to ask a peer, mentor, or member of the conference organizing committee to make an introduction. Many delegates attend conferences to meet new people in the field and make new connections. Senior scientists were once early career scientists, so talking to them need not seem overly intimidating. Furthermore, if a meeting results in a positive interaction, we recommend retaining this new connection through email contact or professional social media (e.g., LinkedIn) to fully benefit from the professional and social network expansion. Conferences may also have specific ways to engage with social media (e.g., using conference specific hashtags or account handles for tagging), and this is a great way to create and stay in touch with collegial networks, all while remaining cognizant of professionalism in social media posts. Conference interactions and networks have developed into many career opportunities, successfully funded grant submissions, and new fruitful research collaborations.

□ FOLLOWING UP AFTER THE CONFERENCE

Talking, discussing, and learning about fascinating science, as well as making new friends and professional colleagues over several days, can be exhausting. Upon returning home, attendees will likely have a backlog of personal and professional obligations, but even though the conference has officially ended, the experience can still be ongoing. Once recharged and ready, attendees should contact the people they met at the conference. We recommend following through with promised emails during the week after a conference, sharing information that has been offered (e.g., publication, protocol, or method), and connecting on appropriate professional social media platforms. Think about how these new network connections can be research collaborators or mutually beneficial in other ways in the future. All that networking will pay off by establishing a good relationship via follow-up communication.

□ CONCLUSIONS

As attendees reflect on their time and interactions at a conference, they should understand that they have now gained invaluable experiences. It is worth noting that other attendees at the same conference may have had very different perspectives and occurrences. We recommend that attendees share their stories in group meetings and through personal interactions with younger scientists, peers, and mentors. Everyone can benefit from learning about attendees’ experiences and their newly established connections at the scientific conference. Moreover, openly communicating insights concerning conference dynamics and all other scientific endeavors will be key in providing equitable access to hidden curricula. Finally, we hope this article motivates readers to make consistent and concerted efforts to inquire about subjects and knowledge that are sequestered in hidden curricula and make it broadly accessible in open-access published formats.

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