

CAREERS

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HUMAN BEHAVIOUR

Find your voice

Technology and practice can help shy and introverted researchers to succeed when reticence is risky.

BY JULIA ROSEN

Generally speaking, scientists aren't known as a gregarious bunch. Many identify as bookish, introverted, perhaps even a bit awkward. Yet those with more outgoing, extroverted traits might find it easier to thrive in today's scientific culture. That's because researchers in academia and

industry often have to step into the spotlight, by presenting their results at seminars and meetings and forging new relationships with colleagues, funders and, increasingly, the public.

Mastering these skills is especially important for young scientists who are trying to build their reputations and advance their careers. But for many shy or introverted researchers, these tasks can feel daunting, if not downright

terrifying. They can even cause some to question their place in science, says Louise Harkness, a postdoc at the Woolcock Institute of Medical Research in Sydney, Australia, who has blogged about the challenges of being an introverted scientist. "A future in academia is hard for the best scientists," says Harkness, who studies treatments for respiratory disorders. "Let alone for quiet scientists who are too shy to put their work forward."

Still, quiet scientists can compete successfully with their more loquacious counterparts by cultivating their public-speaking and networking skills, as well as by engaging in creative methods of self-promotion that fit their personalities. Researchers will need to acknowledge the political dimensions of professional science and examine their own personality traits and motivations to find approaches that work best for them.

RULES OF THE GAME

Along with the myth that all scientists are introverts, there is also a widespread perception that science operates as a pure meritocracy. Many young researchers think that they just need to do good research and the rest will follow, says Donna Dean, a retired administrator at the US National Institutes of Health and an executive consultant on leadership and talent development for the US Association of Women in Science. That's usually not the case, Dean says. "We can't just sit around and do nothing and assume that people will recognize our achievements."

Indeed, Jonathan Cheek, a personality psychologist at Wellesley College in Massachusetts, says that shy or introverted people can easily get overlooked in a culture of self-promotion. "Social communication skills, such as public speaking, are the largest predictor of career success outside of whatever the technical requirements for that career are," he says. That may not seem fair, he admits, but it's reality.

Acknowledging the importance of 'soft skills' is a good first step, Cheek says, particularly for certain types of introvert (Cheek and his colleagues recognize four different categories: social, thinking, anxious and restrained introversion). Not all introverts are shy, and some of them — all except those who are anxious introverts, according to Cheek — avoid speaking up and drawing attention to themselves simply because they don't wish to or don't find the behaviour rewarding. For those scientists, he says, it can be enough to recognize that there are tangible benefits to ►

► engaging in some form of self-promotion, even if it doesn't come naturally.

For others, the barriers are greater. People who experience general shyness feel discomfort when talking to strangers or in front of crowds (Cheek also helped to develop a shyness scale). And researchers who might sometimes feel unwelcome in science because of their identity — including women, minorities and those in the lesbian, gay, bisexual, transgender and queer (LGBTQ) community — can find themselves struggling to speak out in professional settings, Dean says. She adds that such discomfort might stem from a feeling that they bear the burden of representing their entire demographic group, or because they have been conditioned to be quiet as a result of their background.

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Many in the scientific community agree on the need to help those researchers to amplify their voices, but in the meantime, researchers can help themselves by weighing the costs and benefits of staying quiet. "You have to think about, 'What's standing between me and my goals?'" says Cheek, who identifies as an ambivert, or someone who has both introverted and extroverted traits. If people have already invested years of their life in graduate studies, Cheek says, it's likely that they have a strong stake in continuing their scientific career and so will be willing to push past their shyness.

Sometimes, it just takes finding the right motivation, says Harkness, who overcame some of her quiet tendencies while doing her PhD research at the University of Sydney on gene regulation in asthmatic muscle cells. "I came to this realization that if I don't get up there and present my results, the world is missing out on these results and my thought process," she says (see 'Embrace your quietness').

Almost all scientists, at one point or another, have to share their research in front of crowds — a task that strikes dread into the hearts of many, not just the introverted and shy. Some surveys, such as the Chapman University Survey on American Fears conducted in 2014, show that in the United States, fear of public speaking often tops people's list of phobias, beating even fear of drowning in some cases. "Early in my PhD, I recognized it was something I was abysmal at," says Paul Brack, a PhD student at Loughborough University, UK, who studies ways to produce hydrogen for fuel cells. "I wanted to become average — that was my aspiration."

Fortunately, Cheek says, public speaking is not as hard to learn as many people fear, and doesn't require quiet researchers to become extroverts. The main reason, he adds, that most people loathe public speaking is that they haven't done it very much, and getting better at it just takes practice.

Many universities offer resources to help scientists to become comfortable presenting at meetings and to hone their speaking skills, says biochemist Kate Sleeth, interim associate dean of administration and student development at City of Hope hospital in Duarte, California. If an institution has no such offerings, Sleeth — also an introvert, who now chairs the board of directors of the National Postdoctoral Association — recommends seeking out groups such as Toastmasters International, a non-profit organization dedicated to helping its members to become better communicators.

Another strategy is for researchers to develop a presentation style that feels comfortable to them. For Harkness, that involved using her talks to illustrate her thought process, rather than just to disseminate her findings. "I want to take people through the story," she says. Stepping through the evolution of a research project actually made her feel better about presenting her work, she says. "I'm quite proud to show it."

Networking can also be adapted to individual preferences, despite the intimidating connotation that it has for many scientists. "The word 'networking' makes a lot of people feel like they are going to have to come up with some sort of beautifully flowing conversational piece," says Brack, who wrote about the subject in a *Naturejobs* blogpost last year (see go.nature.com/2fx60wc). But he has devised several ways to network that suit him, as an introvert who also used to be very shy.

One strategy involves approaching individuals — rather than big groups — at networking events at meetings with a question or two in mind ahead of time. If Brack strikes up a conversation with a fellow graduate student,

he usually leads with questions about their research, adviser and university. You don't even have to stick to science, says Dean, who still finds networking hard. Perhaps you notice something on someone's name badge — such as being from the same place — or share a hobby or other connection. "Get people talking about themselves," she says.

Dean advises young scientists to set a goal of talking to two or three new people each time they go to a conference, and she urges them to avoid describing their work in self-deprecating terms. Sleeth also suggests taking along an outgoing friend who will help you to feel comfortable, but who will not hog the limelight. Quiet scientists might also consider collaborating with more-extroverted colleagues on research. "It makes it so much easier," Sleeth says.

Ultimately, even if these tasks don't ever feel natural to many quiet scientists, those scientists should not despair, says Steve Blank, who teaches entrepreneurship at Stanford University in California and is the architect of the US National Science Foundation's Innovation Corps Program, which helps scientists to commercialize their discoveries. "By definition, scientists are pretty smart," Blank says. "While you might not have it in your gut, you have enough computing power to emulate it."

PLAYING THE LONG GAME

When making big career choices, quiet scientists might want to consider how different paths in science might suit their personality. For instance, academia probably entails teaching and giving many public talks, whereas government agencies might require more lab work and meetings with agency managers. As entrepreneurs in the tech industry, Blank says, scientists have to sell their ideas to investors and customers. "If you want a leadership role, I'd say the biggest thing you need to learn is to communicate," he says. And that often involves at least learning to emulate an extrovert.

Because of the diverse demands of different scientific trajectories, Cheek recommends that early-career scientists look at literature such as Holland's theory of vocational choice, developed by the late John Holland, a psychologist at Johns Hopkins University in Baltimore, Maryland. "It's sort of a theory about how work environments have personalities," he says. Both people and occupations are ranked against Holland's framework, and three of the categories — realistic, investigative and artistic — are well suited to introverts. These might correspond to more applied, theoretical and creative career paths, respectively.

Scientists should not let such classifications dissuade them from following their aspirations, Cheek says, but they should consider whether their personality is compatible with their intended career choice. "Your preference, when it interacts with the structure of the field, maybe doesn't make your favourite thing the most rewarded thing," he says. Part of finding

SHY SUCCESS

Embrace your quietness

Try these tips for networking and promoting your work.

- Practise public speaking with colleagues or mentors or seek the help of a university programme or organization such as Toastmasters International.
- Develop a presentation style that feels natural to you, such as storytelling.
- At conferences and other professional gatherings, set a goal of talking to two or three new people.
- Use digital tools such as Twitter and Google Scholar to elevate your online profile.
- Join committees and seek out sponsors who can help you to make connections.
- Consider how different paths in science might fit with your personality traits and preferences. **J.R.**



Self-declared introvert Paul Brack presents at a 2016 Royal Society of Chemistry conference.

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a fulfilling career is about finding a good fit.

That's what Harkness has begun to realize, although she didn't formally consult Holland's theory. After her PhD, she moved to the Woolcock Institute, where research groups are smaller and more tightly knit, she says. That makes it a good place for her as a young, introverted scientist, she explains.

WRITING NEW RULES

Public speaking and in-person networking are seen as crucial to success in science and so many other fields partly because our culture tends to be geared towards extroverts. At least, that's the argument in *Quiet* (Broadway, 2013), a book by US writer and lecturer Susan Cain about the power of introverts. Her central argument is that society often treats introversion as a personality flaw, but that introverts should be valued. Quiet scientists can show off their strengths in a variety of ways.

David Steen has had great success with social media. A wildlife ecologist at Auburn University in Alabama, he is a proud introvert. "I don't manage it — I embrace it," he says. Steen describes himself as the guy who sits in the back of meetings and doesn't say much; similarly to many introverts, he prefers to gather his thoughts before he speaks.

Then, he communicates through tools such as Twitter, where he has more than 12,800 followers (*Slate* magazine crowned him "best biologist on Twitter" in 2015). The medium offers him the opportunity to gain visibility and to interact with the broader scientific community at his own pace and on his terms. "Can take all day to write a tweet," said Steen, in a tweet. "Compare that to the brief window of time you have during a

meeting to come up with verbal eloquence."

Cheek recommends creating a Google Scholar profile and becoming active on ResearchGate and Academia.edu. Researchers can also use LinkedIn to advertise scientific qualifications and promote publications and awards, Brack says. "You can share that in a way that you don't feel like you are ramming it in people's faces, or being overbearing."

Shy and introverted researchers can advance their careers in other ways that feel compatible with their personalities. Brack recommends joining committees, as he did recently to help organize a chemistry conference in Scotland. "I find that I need to be around someone quite a while before I'm comfortable enough to really talk to them and make that sort of a connection," he says. "Being in a committee is quite useful for that." Researchers can also follow up on meetings and seminars with e-mails to contribute to and stay involved in scientific discussions, particularly if they don't want to speak up in a group setting.

Regardless of the strategy that researchers choose, Sleeth recommends seeking out a mentor, or even a sponsor — whom she defines as someone who will advocate for and endorse young scientists — and especially shy and introverted ones. That person could be their adviser or it could be a co-author or colleague, she says. The important thing is that they help to open doors for young scientists and advertise their strengths and accomplishments. "Because then you're not bragging," she says. "Someone else is doing it on your behalf." ■

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GENDER

Co-author differences

Female faculty members at US research universities have fewer co-authors than do men over the entirety of their career, according to a study published last month (X. H. T. Zeng *et al. PLoS Biol.* **14**, e1002573; 2016). The study says that on average, women have shorter careers and lower publication rates, both of which contribute to the difference in their number of co-authors. Analysing the publication records of 3,980 faculty members across six disciplines in science, technology, engineering and mathematics, the authors found that women are more open than are men to new collaborations, a career strategy that has been found to produce higher-impact research. Yet the study also found gender differences in some disciplines. For example, female molecular biologists typically work in smaller teams than do their male counterparts. Looking specifically at the sub-field of genomics, which tends to produce work conducted by large teams, the authors also found that female scientists are under-represented as co-authors.

INCOME

UK pay gap

Men who work in the UK science and technology sector earn 24% more than women who work in the sector, according to the Annual Survey of Hours and Earnings from the UK Office for National Statistics (ONS). The survey found that for full- and part-time workers across all sectors, the gender pay gap is 18%, the lowest since the survey was launched in 1997, when the gap stood at 27.5%. The UK government will require all employers with more than 250 staff members to begin publishing their gender pay and bonus gaps from April 2017 in a bid to help women to overcome income barriers. In another effort to achieve parity, the government will coordinate with businesses to raise the number of women on executive boards to 33% by 2020. It has already extended the right to request flexible working, which could include flextime and teleworking, to all employees; introduced shared parental leave; offered support to female entrepreneurs for launching and growing a business; and increased the national living wage. Tackling the pay gap could add £150 billion (\$US187 billion) to the nation's annual gross domestic product in 2025, according to estimates.

CORRECTION

The Careers Feature 'Find your voice' (*Nature* **540**, 157–159; 2016) misrepresented Steve Blank's role in the NSF Innovation Corps Program. He didn't just work with the programme, he is its architect.