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Source: The Condor, 119(2) : 321-326

Published By: American Ornithological Society

URL: <https://doi.org/10.1650/CONDOR-16-209.1>

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COMMENTARY

Tell me a story! A plea for more compelling conference presentations

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Submitted November 8, 2016; Accepted February 24, 2017; Published May 3, 2017

ABSTRACT

Effective communication with other scientists is an essential component of the scientific process, underlying success in publishing papers, building collaborations, securing grants and jobs, and stimulating further research. Oral presentations at professional meetings provide an opportunity to share research findings with a relatively broad scientific audience. However, many scientists give talks that are crowded with methods and data, accompanied by poor visuals, and, most unfortunately, lacking in narrative arc. Here, I provide strategies for distilling research findings into a short-format talk, capturing the audience's attention, and delivering a compelling and visually engaging story. I argue that the material should be designed to interest a wide range of meeting attendees, not just experts in a narrow field. I also advocate principles of good storytelling, with the aim of leading the audience through a compelling journey of discovery that concludes with a memorable takeaway message.

Keywords: audience, conferences, ornithology, slides, science communication, story-telling

¡Cuéntame una historia! Un llamado a favor de presentaciones más convincentes en congresos

RESUMEN

La comunicación efectiva con otros científicos es un componente esencial del proceso científico, que subyace al éxito en la publicación de artículos, en construir colaboraciones científicas, en asegurar becas y trabajos y en estimular futuras investigaciones. Las presentaciones orales en congresos profesionales brindan una oportunidad para compartir los resultados de investigaciones con una audiencia científica relativamente amplia. Sin embargo, muchos investigadores dan charlas atestadas de métodos y datos, acompañadas por ayudas visuales pobres, e infortunadamente sin un hilo narrativo. En este trabajo presento estrategias para destilar los resultados de una investigación en una charla de formato corto, que capture la atención de la audiencia y entregue una historia convincente y visualmente atractiva. Sostengo que el material debería ser diseñado para captar el interés de un amplio espectro de asistentes al congreso y no solamente la de los expertos en un campo específico de investigación. También abogo por los principios de contar buenas historias con el fin de llevar a la audiencia por un viaje convincente de descubrimiento que concluye con un mensaje memorable.

Palabras clave: audiencia, comunicación científica, conferencia, narración de historias, ornitología, presentaciones de diapositivas

Attending talks at professional meetings is like playing a slot machine: sometimes you win big, but too often the result is disappointment. At least that has been my experience. In talk after talk, I see the same mistakes being made—unclear questions, too much text, unreadable figures, no overarching storyline—and I think about Ernst Mayr bemoaning the talks he witnessed at an ornithological meeting in 1931 (Mayr 2004). Despite all of the scientific advances over the past century, somehow the conference experience has barely improved. There are always a few shining stars, talks that ask intriguing questions, captivate my attention, and leave me with a lasting takeaway message. But far too many presentations meander through a litany of results without having communicated much of anything. I think that we, as a

scientific community, can do better. If we cannot effectively communicate our research to colleagues, then how are we going to communicate it to resource managers, policy makers, the media, and the general public?

There is no single formula for presenting a compelling talk, but here I discuss strategies that I find to be particularly effective, drawing on relevant observations and advice from both scientists and professional communicators. I focus on developing strong messages and visuals (Table 1)—elements that I see as the backbone of any talk—but I also provide a broader range of advice in the Appendix. My motivation for writing this opinion piece does not stem from a belief that I am an excellent speaker. Instead, it derives from my experience as an audience member, with a deep appreciation for well-delivered

TABLE 1. Ten tips for preparing a conference presentation. See the Appendix for an expanded list of tips.

1. Avoid the temptation to treat your target audience as experts.
2. Decide on a cohesive storyline and omit information tangential to that story.
3. Set the stage in a compelling way, for instance by framing a problem to be solved.
4. Start broad, not with specific details about your study system.
5. Clearly articulate one or two questions and stick to answering those questions.
6. Aim for slides that communicate your message visually, rather than through text.
7. Avoid abbreviations (e.g., for species names, age groups, locations).
8. Keep methods to a minimum, unless they are unconventional or you are testing them.
9. Make sure all figures are legible and clear.
10. Leave your audience with a minimal number of clear takeaway points.

science talks and a desire to see more of them. Scientists are increasingly trained to distill research findings for audiences that lack a strong background in science (Baron 2010). However, we often fail to put those strategies to work when communicating with other scientists, which is unfortunate because many scientists lack deep knowledge of topics outside their immediate field (Pickett et al. 1991). All audiences, even those composed entirely of scientists, stand to benefit from oral presentations that communicate research in a captivating, easily understood format.

Tell a Story

The presentations that best capture my attention are the ones that tell a story. Not a story designed for entertainment purposes—a story in the sense that the presenter does not simply state a series of results but instead uses principles of good storytelling (setting the scene, building tension) to lead the audience through a journey to solve a problem (Olson 2015). One way to do that is to apply the “and, but, therefore” strategy outlined by Olson (2015), a former biology professor who now writes and directs movies in Hollywood. He suggests framing your story’s plot by proclaiming something that scientists know **and** something else that scientists know, **but** then pointing out a critical unsolved problem or point of debate that, **therefore**, highlights a need for your particular study. For instance, an avian ecologist might say that “migratory birds are declining **and** they face a myriad of threats, **but** they are hard to track through the annual cycle so it has been challenging to pinpoint factors underlying their decline. **Therefore**, I conducted this study to track the year-round movements of migratory birds.” Forcing yourself to distill your study into a concise “and, but, therefore” statement can be a useful first step when

preparing a presentation. That central nugget of an idea can then be used to develop a compelling introduction and identify the elements of your research that are most critical for telling the story.

The most effective “and, but, therefore” statement is not always obvious and sometimes requires considerable thought. When selecting one, it is important to recognize that your audience may not be immediately fascinated by details and questions specific to your study system. Instead, think more broadly about why your research is compelling. Do you address a long-standing question about how species evolve? Does your work fit into a larger debate about how climate change may impact bird populations? Are you testing a new method that has the potential to address previously intractable problems? Try to frame your study broadly so that, when you get to the specifics, your audience is in a position to understand and appreciate your contribution to the field (Pickett et al. 1991).

Beyond intrigue, your story also needs simplicity. Wheelwright (2014), in his own plea for better conference presentations, noted that “there’s a reason...we tell tales about three guys—not 48 or 213 guys—walking into a bar: an arresting, unforgettable story cannot have too many moving parts.” Many scientists seem to think that their colleagues will be impressed if they show as many different results as possible. Or they think they will be exposed if they don’t show all the steps in a series of analyses. A better strategy is to keep methods and tangential results to a minimum, and to spend the bulk of your time clearly laying out and articulating one or two specific questions and presenting the principal results that address those questions (Pickett et al. 1991). Simple is better regardless of your audience, but it is particularly important for conference presentations. An attendee could easily see more than a dozen talks in a day, so you cannot expect them to be able to digest and remember a complicated story. Focus on a few key research findings and build an intriguing story around them.

Your ultimate goal should be to leave the audience with a memorable takeaway message. To do that, you need to provoke their curiosity with a compelling introduction and lead them through your findings in a logical way. But you also need a strong ending, with conclusions that emphasize how your work helps to resolve the problem identified in the introduction. Spend at least 2 minutes at the end of your talk reiterating your central findings, what they mean, and where you think the research should go from there. The conclusions and future directions may seem obvious to you, but your audience has only been engaged for 10 minutes, so you need to spell it out for them.

It goes without saying that the material you present must be tailored to the needs and interests of the audience in question (Janzen 1980). At ornithology conferences, I

consider an appropriate target audience to be someone who asks different questions with a different study system. For instance, you could imagine a disease ecologist sitting in a session on speciation, or a seabird biologist listening to a talk on passerine vocalizations. Science is both increasingly collaborative and increasingly specialized; an ability to communicate beyond scientists in your immediate field is important. While it may be tempting to tailor your presentation for the expert that you hope (or fear) will be in attendance (e.g., by packing it with methodological minutiae and mountains of data), such a strategy will come at the expense of communicating clearly to everyone else in the room. This does not mean that you cannot deliver an intellectually sophisticated story; it simply means that you should aim to tell that story in a way that will reach a wide range of meeting attendees, not just those giving talks in the same session. As noted by Pickett et al. (1991), “the success of your talk should be judged by its ability to engage and enlighten non-specialists.”

One of the central challenges to communicating at an appropriate level relates to a counterintuitive notion that scientists suffer from “the curse of too much knowledge” (Heath and Heath 2007, Baron 2010). Once you have achieved depth of knowledge on a subject, Heath and Heath (2007) argue that it is very difficult to put yourself into the mindset of your audience because “you can’t unlearn what you already know.” That can cause blind spots when communicating—even to other scientists—leading presenters to leave out important information that they take for granted but is not common knowledge; to include information that is tangential to the central message because, from their specialized vantage point, they find it fascinating; or to fail to lead the audience through the study in a logical, compelling way because the logic and motivation behind the study are plainly obvious to them. As scientists, we must recognize that our depth of knowledge can actually be a hindrance to effective communication, and in response work especially hard to determine which details are most relevant to our audience.

Use Strong Visuals

In addition to a clear story, strong slides can help make a lasting impression and differentiate your presentation from those of other scientists. The audience is more likely to remember details when verbal communication is coupled with visual communication (Sadoski and Paivio 2001), so visually oriented slides are your best bet. Avoid slides that consist of little else than a series of bullet points. Text on a slide may be helpful for you, the speaker, because it serves as a prompt that reminds you what to say. But it does little to help your audience, who can read faster than you can speak, and often only serves to divide the audience’s attention (Janzen 1980). Alley and Neeley (2005) recommend an alternative slide design that (1) succinctly

describes the main message in the title using a complete sentence (e.g., “Island Scrub-Jays in pine habitat have longer bills.”), and (2) uses the remainder of the slide to communicate that message visually (e.g., displaying a graph of bill length in different habitat types). Under this framework, text can still be used sparingly, but ideally it should be arranged in a visually strategic manner (e.g., brief text beside pictures or, better yet, text within pictures that fill the slide) rather than as a bulleted list. It takes more thought and effort, but your presentations will be more striking and memorable if you aim to create a visual representation of the accompanying dialogue. For instance, instead of using text to describe different predicted outcomes, show the outcomes using figures. Instead of describing your methods with a series of bullet points, show pictures representing the various steps (perhaps with brief text) and allow your audience to focus their attention on what you are saying. You may not want to adhere to Alley and Neeley’s (2005) approach for your entire presentation, but it is always a good idea to think about how you can translate your main points into images whenever possible.

Your slides and dialogue should also be crafted with clarity in mind. When listening to oral communication, your audience does not have the luxury of pausing to study a figure or look up unfamiliar terminology, so you risk losing their attention the moment you confuse or overwhelm them. This is especially true for short, conference-style talks, where attendees are easily distracted into thinking about what talk (and room) they want to go to next. To minimize the potential for confusion, present material at a reasonable pace and pay attention to details your audience may not be familiar with, being careful to avoid unexplained jargon, to remove abbreviations (e.g., for species names), and to make figures concise and legible (see the Appendix for additional tips). Also be sure to practice your talk for clarity and timing, ideally with audience members who can give constructive feedback. That way, you can ensure that you have included a reasonable number of slides and will not be forced to rush through the final few minutes of your presentation. The rush at the end leaves the audience with one take-home message: you were not prepared for your talk.

Final Thoughts

The ability to effectively communicate research findings with other scientists is an essential component of the scientific process. Here I focus on conference talks, but the same communication strategies can be applied to preparing job interview seminars, manuscripts, and outreach for non-scientist audiences. In fact, working to distill your message in a short talk for other scientists can be a useful prelude to those other tasks, because it can help you hone in on the salient details and the most compelling story.

Talks are creative, personal endeavors, and I do not expect all members of the ornithological community to agree with, let alone implement, the strategies outlined here. Instead, it is my hope that this opinion piece generates thought and discussion about how to best communicate our science. And I hope we all see better talks at the next conference.

ACKNOWLEDGMENTS

The opinions expressed here were shaped by countless scientists and mentors. Some inspired me by delivering compelling talks; others helped me by giving feedback and discussing presentation strategies. I am also grateful for training from the American Association for the Advancement of Science's Mass Media Fellowship Program, which—through National Geographic—gave me experience communicating science in a newsroom. This manuscript was improved by comments from C. Aldridge, D. Broder, C. Ghalambor, G. Hess, R. Montgomerie, S. Oyler-McCance, H. Sofaer, P. Stevens, P. Stouffer, N. Wheelwright, and others.

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APPENDIX. Tips for Preparing Conference Presentations

Talk Framework

- Avoid the temptation to treat the experts in the room as your target audience. Try to craft your presentation so non-specialists will be able to understand why your study is important, how you addressed your question(s), and what you found.
- Decide on a cohesive storyline and do not include information that is tangential to that story. Unnecessary

details, especially if they are not explained well, may confuse your audience and cause them to tune out.

- Start your introduction broadly and work your way toward the specifics. Give the audience a clear sense of the motivation behind your study.
- Do not assume your audience harbors a deep fascination with your study system. They will appreciate your study more if you can frame it in the context of a larger field of research. This advice still applies even if you study a charismatic species.
- Create tension to pique audience curiosity, for instance by pointing to a problem that your work is trying to solve. If your work informs a debate in the scientific literature, highlight the opposing views and how your study fits into that debate.
- Clearly articulate one or two questions and stick to answering those questions. Do not present a litany of results that are only loosely related to one another. Resist the temptation to show a result that is tangential, for instance because you want to demonstrate that you have used the latest and greatest method, and focus on the results that help you tell your story.
- Keep your story simple. If you have too many characters (e.g., species), scenes (e.g., study locations), or plots (e.g., questions), many audience members will be lost in a sea of information and afterwards will be unable to recall your key takeaway points.
- Don't skimp on your conclusion. Go back to the big-picture motivation behind your work and articulate how your findings advance the field or bring to light new questions.
- Start thinking about your talk framework well in advance of your presentation. It takes time and practice to develop an effective presentation. One strategy is to create an outline a few weeks in advance, which can get you thinking about the story structure and will put you in a better position when the time comes to create your slides.
- Keep note of presentation styles that you find to be particularly effective. While different from conference presentations in many respects, job interview seminars are often great opportunities to learn new and effective presentation tricks because they are directed at a broad scientific audience and presenters put considerable effort into preparing them.

Slides

- Try to use as little text as possible. Consider it a challenge to present your ideas, methods, and findings visually as much as possible.
- When using text, display it in large font (at least 24 pt., but ideally larger), staying within the same font family,

and be as concise as possible. Try to have no more than 20 words per slide. You don't want the audience to tune you out while they read your slides.

- Avoid using abbreviations unless they are universally recognizable (e.g., DNA). Do not use acronyms instead of species names (e.g., AMRE instead of American Redstart) or age groups (e.g., AHY instead of after-hatch year; in this case it might just be best to say adult). Sometimes abbreviations are necessary when many study locations are involved, but it is better if you can think creatively and come up with more informative labels (e.g., high-elevation site vs. low-elevation site).
- Keep methods to a minimum, unless they are unconventional or you are testing them.
- Try to avoid showing equations, unless they are central to your story and you can take time to explain them. You do not want the audience to get distracted studying an equation (which may be displayed just to please the experts) and in the meantime miss an important point.
- Do not copy and paste figures from manuscripts. Axes labels and other important elements are often unreadable due to their small font size. Also, publication-quality figures can be too complicated for an audience to digest in 1–2 minutes. Take the time to redo your key figures so they communicate your results clearly. Increase font size so the text is readable even for people in the back of the room. Make sure it is clear what the axes labels and legend categories represent (remember your audience cannot refer to a figure caption, and they may not remember information on past slides). You may even want to change the *y*-axis label to a horizontal orientation for ease of reading.
- Use of color can make slides more lively, and it can also help with clarity. For instance, you could assign a color to each group under study (each species, each habitat type, etc.) and keep that color consistent across maps, graphs, and other visual elements. But watch out for color combinations that cannot be differentiated by color-blind people. Online tools are available to figure out how your slides will appear to people with different forms of color blindness (e.g., <http://www.vischeck.com/>).
- Do not show more than two figures per slide, preferably only one. Allow them to fill up the entire screen, save perhaps a short phrase summarizing the main takeaway point.
- It is best to show your results using figures rather than tables. If you must use a table, only show table elements that are really needed to communicate your message and do not use an excessive number of significant digits. Remember: simple is better, especially in short, conference-style talks.
- Do not use so many slides that it causes you to rush through your delivery. It is always better to err on the short side.
- If you have to exclude a results slide (e.g., because you are short on time, it is tangential to your central story, or it would only interest the experts), consider placing it after the slide that will be displayed during the question session. If your audience asks about it then you will be prepared with a visually supported answer.
- If you like wide-screen slides, find out in advance if the conference venue accommodates them. Text and figures will be much smaller if wide-screen slides are projected onto a screen that only accommodates standard 4:3 slides.
- The creation of visually engaging slides is more time intensive than the creation of standard text-heavy slides, so plan accordingly.

Talk Delivery

- You may want to write out a script for your talk before you begin practicing, but keep in mind that oral sentence structure is very different than written sentence structure (written sentences are longer and much more complicated). One strategy is to write out a rough script, or an outline of the points you want to convey on each slide, and to develop proper phrasing through oral practice sessions.
- Practice your talk so that you are familiar with the points you want to make and how you are going to make transitions between slides, but do not practice too much. Talks that are 100% memorized are not as engaging because the conversational quality is often lacking. For instance, the speaker does not pause in places where they would in a regular conversation and the sentences are delivered too rapidly. If you memorize everything, you also run the risk of getting flustered if you lose your spot.
- The last point aside, memorize exactly what you are going to say for your first few slides. That is when you will be the most nervous and it will help to know exactly what you are going to say so you can get into the flow of the talk and feel more comfortable.
- Know how you are going to make tricky transitions between slides/topics. Often this is key to delivering an easily understandable narrative arc.
- Make eye contact with your audience; do not fixate on your slides. It sometimes helps to find a few eager-looking people in the audience and to focus your delivery on them.
- Leaving the podium and walking around can help keep your audience awake and focused on you. Just make sure they can hear you if you do not have a microphone.
- Take the time to explain what a figure is showing. It may be obvious to you because you produced the figure, but your audience will probably benefit from an orientation.
- Do not end your talk with acknowledgments: end with the take-home point. If someone made a substantial

contribution (e.g., they did all the work and you are just presenting, or you analyzed 30 years of data they collected) then you will want to specifically acknowledge them at a natural place within the talk, but otherwise it is fine to show typical acknowledgment

information, such as funding sources, on slides but not to talk about it.

- Remember to show enthusiasm! This is critical. If you do not seem interested in your research, how can you expect the audience to be interested in it?