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Examples of unexpected interactions and outcomes when conveying science and technology to traditional and modern media journalists

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While trying to convey science to both traditional print journalists and modern media journalists, this author has experienced unexpected interactions and outcomes. These can have both desirable and undesired consequences for the scientist. Some examples of these interactions are described, which are associated with quite diverse technical topics, ranging from press and radio interviews covering work on the soundscape of a threatened species (*Ceratotherium simum simum*, the southern white rhinoceros), to a radio interview on the acoustics of coffee roasting that included a surprise guest, to an underwater photo shoot with a National Geographic photographer covering research on an underwater noise abatement system. Guidelines are presented that aim to minimize the undesired outcomes.

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Introduction

Communicating science topics to traditional print and modern media journalists can sometimes lead to unexpected outcomes. The purpose of this paper is to convey some of my experiences which led to both expected and unexpected outcomes. The three examples of scientist-journalist interactions presented here led to the formulation of three practices that should be adopted during communication with journalists. The recommended practices, and the science that generated the resulting media interactions are: 1) management of overstated results, associated with a soundscape study of a captive threatened animal species, 2) management of people involved in interviews, associated with coffee roasting acoustics, and 3) management of one's own expectations associated with an underwater noise abatement project and a National Geographic photo shoot. In this paper, for each of these three cases, the research is briefly discussed to provide the proper context for the media interest, the interaction is described, and take-home points are presented. In the end, I hope these experiences can help others to avoid unexpected outcomes when interacting with journalists.

Management of Overstated Results

In this section, the dissertation work of Dr. Susan Wiseman [1] is described, along with the press interactions it generated. The work involved a soundscape study of a group of captive southern white rhinoceroses at a wildlife preserve (see Fig. 1). This is a threatened species, and the original motivation for the work involved the effectiveness of various active conservation and breeding programs. Wiseman's original hypotheses was motivated by extensive personal observations of rhino behavior and the associated soundscapes at zoos and wildlife parks. The original hypothesis was "Does acoustic noise effect breeding outcomes for captive rhinos?" Through Wiseman's personal experience at various breeding sites she observed a correlation between high ambient noise levels and the lack of breeding success, but never fully quantified the soundscapes or the noise levels. Wiseman's original approach was to measure the soundscapes at sites with various breeding success histories. This proved to be too controversial to pursue, in that sites with low breeding success would not grant access for such measurements. The topic also proved too broad for a single dissertation and it became a descriptive work on the soundscape of a rural wildlife preserve.

When the work was submitted for presentation at meetings, press releases were often generated and phone interviews with journalists took place. Rhinoceroses are charismatic megafauna and stories about charismatic megafauna can gain a large audience. The original idea that motivated the work would be mentioned: "Is acoustic noise related to breeding success?" We would then go on to describe that soundscape measurement is the first step, and that we measured the soundscape at our first experimental site, and describe the kind of noise that was present there. We never found, and never claimed to have found a decisive connection between noise and breeding rates. None-the-less, this would often result in stories with headlines or titles stating: "Researchers say that acoustic noise impacts rhino breeding success." This occurred nearly every time we interacted with journalists and was a surprise to me. I thought scientifically-oriented journalists would be more focused on the actual science. Fortunately, a rigorous public relations protocol by one of the project's supporting institutions demanded that interviews only be granted if the output could be reviewed and if the journalists agreed to an iterative process with the authors. This also included mandatory final review by an institutional official who was more devoted to maintaining scientific integrity that to generating a media splash. In the end the exaggerated results were never actually published. The take-home points:

FIGURE 1: One of the southern white rhinoceroses from the study is shown on the left. Part of the rhino enclosure and one of the acoustic recorders used to study the soundscape is shown on the right.

1. Ask if you can review and comment on material the journalist produces from the interview prior to its publication.

2. This arrangement is often discussed in an email thread, which you should kept for future reference if needed.

3. Consider declining to do the interview if such a review process is not agreed upon.

MANAGEMENT OF PEOPLE INVOLVED IN INTERVIEWS

In this section, the scientific work that drove the public interest was the acoustics of coffee roasting. [2] This was an unfunded project, conducted after my departmental chair told me that I needed more single-author publications. This project has generated far more outside interest than anything else I have worked on. It turns out this is because *A LOT* of people love coffee. I greatly underestimated this.

Basics of the work is described here. Artisanal and home coffee roasters use their ears to monitor cracking sounds produced by roasting coffee beans. These sounds are well known by roasters. To the ear, first crack is louder, lower in frequency, and less frequent. It sounds like popcorn. Second crack is less loud, higher in frequency, and more frequent and sounds like Rice Crispies. For both first and second crack, a few beans begin to crack, a chorus begins, crescendos and ends. The time between the end of the first crack chorus to the beginning of the second crack chorus is on the order of a minute. These sounds are used to inform the roaster of where they are within the heating profile of the roast at any given moment, and to alert the roaster when it is time to terminate the roast. Use of sound is absent in industrial-scale machines. The original hypothesis was: These signals could be recorded with a microphone and the aforementioned characteristics automatically detected to form the basis of an informative display (see Fig. 2) or automatic control system. In short, it worked. A JASA-EL paper was published. [2] JASA public relations issued a press release and reporters began to call.

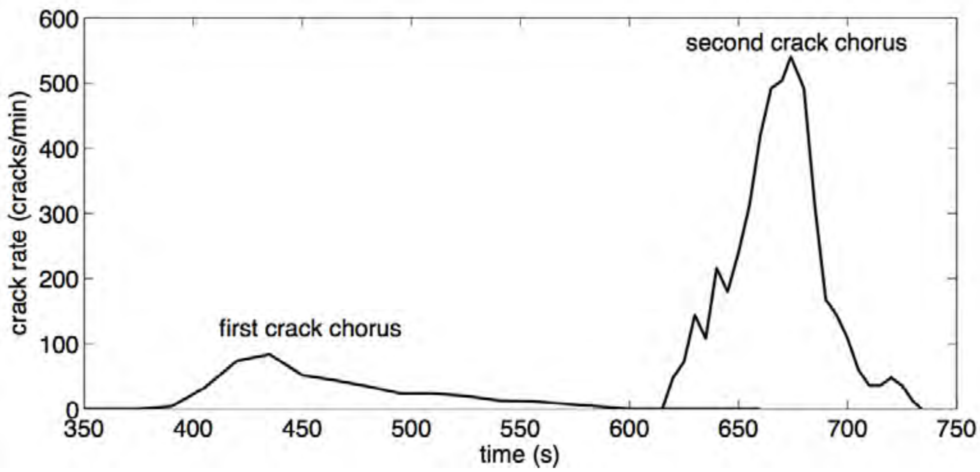

FIGURE 2: The instantaneous crack rate is shown as a function of roast time for a typical espresso bean roast. First crack chorus peaks at around 430 seconds, with a maximum crack rate of about 100 cracks per minute, and second crack chorus peaks at around 675 seconds with maximum crack rate of about 550 cracks per minute. Figure adapted from Ref. [2].

An interview intended for a prerecorded radio show (with accompanying pod-cast and website) was arranged. I checked out the interviewer's previous work. I was pleased with the previous stories. The date was set and the interview took place at my local public radio station. I studied my own work and prepared to answer questions from the journalist. The unexpected part was the presence of a previously undisclosed person on the interview, a well-known (in the coffee world) head of roasting at a medium-sized artisanal coffee company. I didn't know about this other party. It turns out he didn't know about me either, and he only knew it was an interview about roasting, but not about the acoustics of roasting.

The interviewer introduced me. Then he introduced the "surprise guest." My heart rate shot up. The interviewer asked me to explain our work. The interviewer asked the coffee roaster what he thought about it. Luckily, the roaster was quite impressed, and basically said, "When can I start using this, this is going to be amazing." We had a very useful, impromptu discussion about the acoustics of coffee roasting and its practical implementation. In the end, it was a great interview, and the double surprise made for a pretty good radio spot, [3] but it could have gone far worse! The take-home points from this experience are:

1. Ask the interviewer if anyone else will be on the call.

2. My outcome was unexpected and turned out to be beneficial.

3. I would rather not take that chance again.

MANAGEMENT OF ONE'S OWN EXPECTATIONS

This work was a funded project that utilized tethered encapsulated bubbles to attenuate low frequency underwater noise. [4] The primary listeners are marine mammals, so the charismatic megafauna effect was in play again: people are interested in stories about marine mammals. We were able to greatly attenuate low frequency anthropogenic underwater noise and press releases by the ASA helped spread the word. We were contacted by National Geographic with interest in both web and magazine content. We were super excited, we had all read the magazine since we were kids! The interviews went fine, and all the text that resulted was fine, but the piece was very short. A photographer was dispatched to our lab to get super cool science pictures for both the magazine and web article.

For the photo shoot, we prepared our state-of-the-art underwater test system (large tethered encapsulated bubbles, see Fig. 3), which was the subject of our recent paper, as well a standard system (freely rising small bubbles) that we used for comparison purposes, which did not work for low frequency underwater noise abatement. Guess which one the National Geographic photographer, and the editorial staff, liked better: the freely rising bubble curtain which was the status-quo system, not the new breakthrough system. Hence, the unexpected outcomes from this were: I thought we would have some staged shots where we could easily illustrate our system and iterate to get the best shot. Instead, the photographer basically continuously took photos while we were doing a couple of acoustic tests. He told us he shot about 8000 images during that one day. In the end, the photographer and editors went through those pictures in our absence and chose their own favorite. We had no input at all. In the end, the published pieces are attractive, [5, 6] its just not what we expected. Out of the 8000 images the photographer took, they only used one, and then asked to use one of our own images, plus a video that we had produced ourselves. The take-home points from this experience:

1. Don't expect that your ideas for the piece will be adopted.
2. The media may not cover the story the way you envisioned.
3. It may be worth it anyway, depending on how famous the journalist or media outlet is.

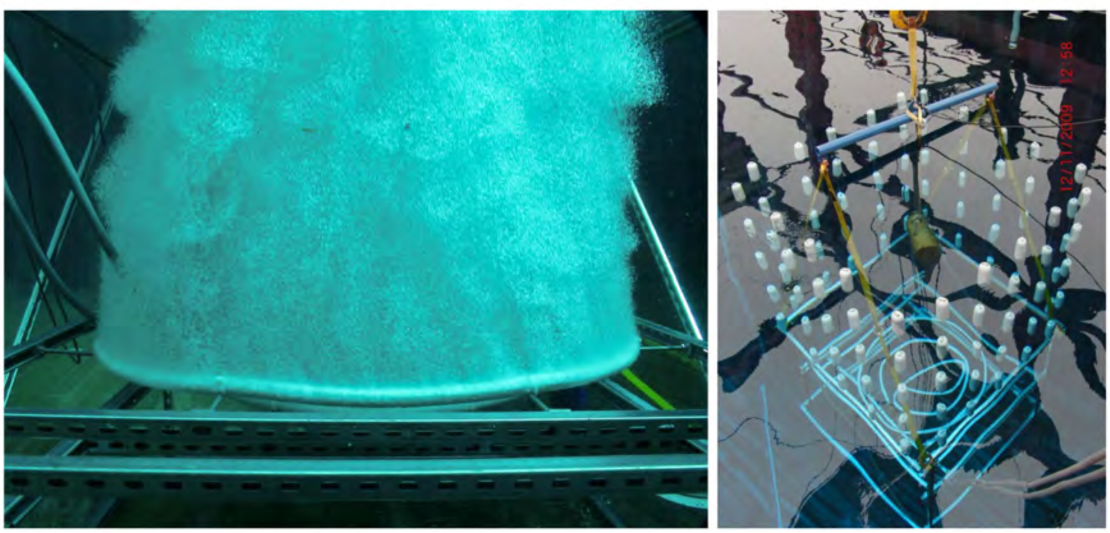

FIGURE 3: A freely rising bubble screen on the left (photo credit: James Piper). Our tethered encapsulated bubble curtain on the right.

SUMMARY AND CONCLUSIONS

In this paper three different media interactions, and the science that generated them, were described in which both expected and unexpected outcomes occurred. Take-home points were provided for each case. One can summarize the lessons learned from these experiences and offer the following suggestions:

1. Try to minimize overstated results: Review and iterate with writers and content authors.
2. Try to manage or at least know something about the people involved in interviews: Ask who will be on the call.
3. Manage your own expectations: Even when you try, you don't always get what you were hoping for.

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