Fatal Flaws in Voice Research and How to Avoid Them, Part Two: Qualitative Studies

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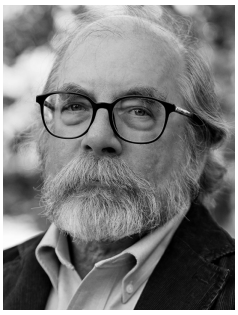

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This article is the second part of a two-part series examining so-called "fatal flaws" in voice science, with an emphasis on qualitative studies. This type of research looks for evidence to explore real-world phenomena, and asks questions like, "why?" or "I wonder what, or how?" The most common errors noted in qualitative studies include researchers' overestimation of their expertise, failure to practice intellectual humility, failure to control for researcher bias, and privileging the "expert in the room" rather than participants' perspectives. Interview protocols are examined, including a common method for ensuring trustworthiness called "member checking." Recommendations for avoiding common errors in survey research, both qualitative and quantitative, are discussed.

INTRODUCTION

In our previous column, we examined common flaws in studies in which researchers collect and analyze measures, often to test a hypothesis.[1] Examples of this type of study are typically referred to as "quantitative" research because they seek to quantify or count things that are being measured. In acoustic studies, we may be interested in counting the number of vibrato cycles per second (rate) or which harmonic is dominant in a spectrum. In aerodynamics, we may want to know the minimum amount of subglottal pressure needed to begin and sustain phonation (called "phonation threshold pressure"), or how many liters of air a singer can exhale after their lungs are completely filled (vital capacity). For many readers, voice science is synonymous with lab-based quantitative studies, but there are many types of research.[2]

Singers are people whose complex behaviors, attitudes, experiences, and language are often difficult to understand with quantifiable (countable) measures. How did the singer feel after singing the piece? What did the singer experience in the audition? What did the singer say after their voice lesson? In qualitative studies, we use disciplined inquiry to understand the "how" and "why" behind questions like this by, for example, allowing participants to explain what they are thinking, feeling, or experiencing.[3]

In part two of this "fatal flaws" series of articles, we will discuss principles of qualitative research, common problems seen in this type of study, and how to avoid them. Of course, flaws are present in all research because our knowledge is continually changing. What we think is correct today may be quite outdated in a few years. Science is not static, we never know what we do not know, and the more we learn, the more there is to know.[4]

INTELLECTUAL HUMILITY—WE MAY BE WRONG

Whether conducting a qualitative or a quantitative study, voice scientists should be willing to acknowledge that they might be wrong, practicing what psychologists call "intellectual humility." As counterintuitive as it may seem, intellectual humility is not incentivized in academia's "publish or perish" environment.[5] In quantitative studies, researchers may be reluctant to submit papers for publication with negative findings (studies in which data do not agree with what the researchers originally hypothesized), and journal editors and reviewers may be reluctant to print them. Publications that acknowledge flaws (fatal or not) are incredibly valuable. Researchers may reflect, "What I studied didn't provide take-aways. However, knowing what I know now, the next project may move us further forward." If we do not share "failed" research (where the findings are contrary to what was expected), we can waste valuable time and money by repeating studies that have already been conducted.[6]

A lack of humility may also be seen in studies in which authors overestimate their expertise or fail to collaborate with experts in neighboring professions. In the cognitive sciences, this overestimation is referred to as the "Dunning-Kruger Effect," and it can torpedo the value of a study.[7] For example, a study surveying singers who experienced COVID-19 could be very useful for voice pedagogues (e.g., Dove et al.[8]). If, however, singing teachers conducted such a survey without input from medical and epidemiological collaborators, the study would invariably be flawed. As stated earlier, we never know what we do not know, but interdisciplinary collaboration with colleagues in neighboring professions helps us to avoid the most egregious errors. Singing voice pedagogues are encouraged to build professional relationships with colleagues in psychology, laryngology, speech language pathology, education sciences, physical therapy, and other pertinent fields. These collaborations may not be actively promoted (or rewarded) in academia, but we have much to teach each other. When we work together, we produce better science and advance our understanding of singing.

SWITCHING MINDSETS

Readers of this column may be more familiar with quantitative methods (in which measures in units that can be counted are collected) than with principles of qualitative research. Those of us trained in quantitative voice research methods (e.g., how to collect and analyze acoustic information) may unwittingly carry quantitative habits of mind with us when we leap into qualitative methods (e.g., when studying a singer's behaviors or attitudes). When conducted correctly, both types of scientific inquiry are disciplined and rigorous, despite stereotypes to the contrary. Understanding the philosophical differences between these different approaches helps us to avoid quantitative-type errors when looking at behavior qualitatively. Thus, switching from the quantitative into qualitative mindset requires an intellectual and perceptual resetting of the assumptions we hold (our habits of mind), and about the nature of research in these two domains.

Quantitative studies (in which we measure things that are counted) tend to adopt a *positivist* habit of mind. This means that variables are fixed and unchanging, they can be measured, these measurements lend themselves to statistical analysis, and statistical analysis is fixed. A t-test is a t-test, it will always be a t-test, and it measures a specific kind of relationship, and always will measure that specific kind of relationship.[9]

Qualitative studies adopt a more *constructivist* habit of mind. The goal is to explore the phenomenon or set of conditions, not to test hypotheses, even though this sort of exploration may, at times, reveal hypotheses that can then be tested quantitatively. This starts with the problem statements themselves. The term "problem statement" is one that has been inherited from quantitative methodology and tends to suggest a conclusion (hypothesis) that we seek to test (against a standard or expectation). In the qualitative domain, problem statements are framed more as a set of phenomena, a puzzlement or wonderment, or a set of conditions we want to explore in order to discover the potentially-nuanced dimensions that characterize them, as opposed to testing a hypothesis.

Singing presents researchers with many fascinating phenomena, puzzlements or wonderments, that are ideal for qualitative studies. In the researcher's eye, the conditions we set out to explore manifest themselves as a function of being alive in the world, observing real world experiences. Some qualitative studies make us ask ourselves questions like, "why is it that . . . ? or "I wonder what/how . . . ?" The examples above ("How did the singer

feel after singing the piece? What did the singer *experience* in the audition? What did the singer *say* after their voice lesson?") are just such questions and require a different approach to thinking about the phenomenon *per se*. Both the embedded *ontology* (what is real) and *epistemology* (what is true) are associated with the conditions or setting, and the definitions of truth and reality are embedded in the specifics of the situation or the set of conditions. Because one cannot "know" how a singer feels after singing a piece (it is not something that is objectively evident), the condition itself suggests that the data we need resides within the singer. It is the singer's feelings that we seek to understand, after all. Thus, the ontological premise needs to recognize that the reality of the phenomenon will be *how the singer feels* (and those feelings are "real") and that the words the singer uses to describe the feelings are the data (it is the singer's "truth").

Qualitative methodology seeks to reveal the truth from the perspective of the participant, not from the perspective of the researcher. It seeks to draw out the data rather than lead the participant down a path that has "correct" answers.[10] In general, qualitative researchers "situate themselves in their work, use open-ended questions and emergent analysis, and develop close relationships with participants in order to explain in great detail the particular experience or phenomenon under study."[11] Others define qualitative research as "an approach to social science research that emphasizes collecting descriptive data in natural settings, uses inductive thinking, and emphasizes understanding the [subject's] point of view."[12] Another definition reads, "a type of research that focuses on qualities such as words or observations that are difficult to quantify and lend themselves to interpretation or deconstruction."[13]

BIAS IN QUALITATIVE RESEARCH

The concept of researcher bias was discussed in a previous column, but it bears mentioning again.[14] Many scientists go to great lengths to recognize and reduce their own biases, but this is not always the case. Researcher bias is often raised as a "limitation" in qualitative studies, but two points need to be made about the concept of "bias." The first is that all research is susceptible to researcher bias, even positivistic, quantitative studies. The quantitative researcher selects the variables included in the study and as a result, rejects other variables for any number of reasons. This choice is a subjective act. We cannot know the universe of possibilities informing a cause-and-effect relationship, nor can we look at everything all at once. So bias is present in quantitative research, but it is not traditional practice to discuss it.

As for the second point regarding bias: Qualitative researchers do not deny the existence of bias in both the identification of the phenomenon to be explored, and in the rationale for why a particular phenomenon merits exploration. In qualitative research, the researcher tends to let the reader know what they think upfront, revealing their positionality with respect to the thing being explored. They may ask themselves: "How close are we to this thing we are exploring, and how is that shaping how we are thinking about this thing?" Qualitative researchers need to have the ability to be reflective (and reflexive) practitioners so they can control for that bias from the conceptualization of the study, throughout its execution, and to the final analysis.

PRIVILEGING THE PARTICIPANT'S EXPERIENCE, NOT THE EXPERT'S OPINION

For better or worse, bias is a constant companion in scientific inquiry. Researchers must do their best to be disciplined, conscious of their own biases, and on guard against its potentially insidious influence on the work. In qualitative studies, this is achieved by privileging the experience of the participant (the "other"). And while the act of "othering" may be considered a form of bias in some circles, in qualitative research it is a virtue. We recognize that the participant is "not me." The act of "othering" is an act of humility—we cannot know a person's experience as they know it, and their experiences may differ considerably from our opinions and preconceptions. Researcher reflexivity is vital.

To the self-reflective practitioner, a common indicator of a failure to appropriately "other" the object of inquiry is a failure to jettison the primacy of "self." Our Western notions of "individuality" and "individualism" are deeply ingrained and can be difficult for us to discard. In many respects, this is a lot like preparing to be a psychotherapist, where one typically goes through psychoanalysis oneself before one can perform

psychoanalysis on another. A checklist for such self-examination may include exploring the extent to which one holds a humanistic orientation toward the social world, one's relative comfort with ambiguity and willingness to take risks, one's predispositions toward the analytical and introspective, and one's embrace of the substantial commitment required to conduct qualitative research. The qualitative researcher also needs to be flexible, open-minded, and willing to see things from multiple perspectives. Regarding the examination of the lived experience:

> . . . the central assumption that there is an *essence* to an experience that is shared with others who have also had that experience. The experiences of those participating in the study—those who have had a similar experience—are analyzed as unique expressions and then compared to identify the essence.[15]

This "othering" is reflected in how data are gathered. Quantitative researchers privilege "instrumentation" (the survey, the machine, the scale); truth emerges from faithfulness to method. In these studies, the data itself reveals "truth." In contrast, with qualitative studies there is no one method for gathering data. For example, the only way we can know how a singer feels after singing the piece is by asking them; but there are any number of ways of asking, and the manner of asking may well influence what they say in response to the question. It would be a "fatal flaw" for qualitative researchers to selectively choose (with deliberate or hidden bias) only participants' statements that agree with researchers' preconceptions. The data we capture must absolutely be the words of the singer (the participant), and those words must authentically describe how the singer feels. This will also inform the analysis (coding) of that data, addressed briefly later.

Above all, qualitative research seeks to capture the participant's perspective. It would be a "fatal flaw" to say that their perspective is "wrong"; it is, after all, their perspective. And not all participants in a study may have the same perspective. Qualitative research allows responses from across the spectrum of participants, and its analysis may reveal commonalities worthy of quantitative inquiry. It may also reveal differences in participants' experiences that inspire further research to reveal the nature of these differences. In other words, an initial qualitative inquiry may reveal strong relationships among phenomena that might lead to conducting quantitative research. For example, a quantitative study could explore causality between (and among) phenomena that may not otherwise have been revealed without an initial qualitative examination of the topic.

If we relentlessly hold the view that quantitative and qualitative research are diametrically opposed and can never complement one another, we will fail to see the connections or complementary relationship that exists between these two general classes of research. If we remain in our silos (and possibly retain a contemptuous view of the other form of research), recognizing the complementarity is impossible.

DATA ANALYSIS

As mentioned earlier, quantitative and qualitative studies can be equally rigorous, and each can be used (often in a complementary manner) to advance our understanding of the voice. Because they are grounded in different ontological and epistemological assumptions, however, qualitative and quantitative studies collect different sorts of data and use very different methods of data analysis. In this respect, they are apples and oranges. As noted above, quantitative methods tend toward a more positivistic approach; that is, a given statistical analysis is always appropriate to answering a specific kind of research question. The number is always the number (as measured by the instrumentation), and the statistical test performed is always that test, regardless of the numbers involved.

Qualitative data are often in the form of words (as opposed to numbers). There may occasionally be reasons to count the number of times a certain word appears in an interview, and this type of counting is a common feature of software tools used to analyze qualitative data. But such analysis only captures the "manifest meaning" of the interview, and assumes that the word has a given, understood and unchanging meaning in all contexts. Those of us who work with students know that the meanings of words are highly dependent upon context. For example, if I sanction an action, do I support, or condemn that action? Another fatal flaw of qualitative research would be analyzing the data only for the "manifest meaning" of words. Coding must adopt an approach that gets at the latent meaning

of the word or phrase to understand the data properly. What is the speaker saying *in context* and how does that context matter?

INTERVIEW PROTOCOLS

The data collection technique most associated with qualitative research is the interview, and interview protocols differ from surveys, or observational or measuring protocols, in several ways. Interviews allow respondents to express in their own words what they want researchers to know. Researchers can then ask follow up questions for clarity or a better understanding of what was meant. Often, researchers are interviewing people who do things they know nothing about. Another advantage of interviewing is that it is just fine to skip questions on one's protocol if the respondent has already answered them, even if they have done so unawares. One can also adjust the protocol on the fly, which is useful, for example, when encountering respondent fatigue.

There are many interview forms, and the form one chooses depends on what one wants to learn in the study. If the researcher is interested in the respondent's personal, idiosyncratic experience related to a phenomenon of interest (e.g., what a singer experienced when performing on Broadway), then narrative inquiry is one's approach. Narrative interviews have a particular structure that allows one to get the life story of the respondent vis-à-vis the phenomenon. This kind of interview is very different from a descriptive interview, where one is seeking to gather perceptions of the participants with respect to a particular event (e.g., "What did you see going on here?"). The form of interview researchers choose will influence the data collected. For more information on the structuring of interview protocol vis-a-vis epistemological traditions, see the endnotes for suggestions.[16]

Related to getting at the participant's reality, it is sometimes useful in qualitative data-gathering for the researcher to give participants the impression that the researcher is a bit clueless. This may cause the participant to think, "Oh, they really don't know much about what I am doing here, so let me help the researcher understand what is really involved in all of this that I am doing." The goal is to get the participant in a place where they can educate researchers rather than be interrogated by them. And this, too, is an act of humility, both acknowledging that the researcher is not in a class above the participant, and that the participant holds the data that the researcher seeks to reveal and examine. In many respects, the participants will always know more than the researchers.

MEMBER CHECKING

Interviews help researchers better understand participants' perspectives, but there are "fatal flaws" inherent in this type of qualitative inquiry. Participants' feelings, memories, and even their interpretations of experiences are not stable; they change and transform with time.[17] Interviewers may also introduce errors by mishearing or misinterpreting the participant's response to a question. How can we be sure that the data collected in an interview reliably represents the authentic perspectives of the participants? A common technique for ensuring trustworthiness in qualitative studies is called "member checking." Following the interview, researchers transcribe the questions and responses, share the text with the participants, and give participants the opportunity to review and correct the transcript. This allows participants to be certain that the researcher "got it right," and it gives researchers the opportunity to practice intellectual humility by acknowledging that they (the researchers) may have misunderstood what was said (or what was meant). Member checking is an important component of studies using participant narratives, and precautions should be followed to prevent common errors. For an excellent discussion of these typical mistakes, see Carlson and Carlson.[18]

SURVEY DESIGN

There is one method of data collection that shares similarities with interviewing: the survey. For quantitative research, surveys tend to seek to reveal the most common or the most powerful response. Responses are closed-ended (generally) and discrete, and tend to start off as if there is a single corrent answer (although ideally not in this form: "Have you stopped kicking your dog?"). In qualitative studies, surveys can be a fallback to interviewing. They are somewhat analogous to a written interview protocol, except that the responses tend to be open-ended, such as: "in your own words, tell me about. . . ." Their design is not that of a psychometrician but that of an interviewer. One may be tempted to

use a survey as a fallback when access to participants is difficult or when face-to-face encounters may be challenging. A survey-like instrument is also useful, or even required, perhaps, for observational studies: What things is one setting out to "observe" (e.g., what behaviors, interactions, arrangements) that would constitute the data needed to answer the research question(s)?

Whether one uses a survey as a substitute for an interview, or as a guide for observation, the design of the instrument (open- vs. closed-ended questions) and its analysis (coding not counting) are two steps in which some researchers make fatal flaws. In qualitative studies, surveys are limited by their inability to ask follow-up questions (for clarity, detail) that one would have in an interview. It is also important to remember that surveys should not be designed as a set range of boxes to check, but rather, participants should be encouraged to educate us.

A word of caution: certain scales may be employed in both quantitative and qualitative research. Even if the scale looks the same, the interpretation needs to be appropriate for the study design. Take Likert-type scales as an example: to the quantitative researcher, the scale's numbers suggest that they are discrete, ordinal indicators that are subject to statistical analysis; this is a common fatal flaw, but one that is typically not recognized. To the qualitativist, the numbers are not ordinal but nominal indicators: they are proxies for respondents' perceptions. Unless each number has an absolutely discrete meaning which can all be interpreted the same way, these scales are not even nominal. And seldom do they have uniquely discrete descriptions of what the numbers mean for each question. At best, all we have with these numbers is a poor approximation of what the respondent thinks. While one person may "strongly agree" with the prompt, another may be neutral. But in terms of how these two respondents are making sense of the prompt, they may both use the exact same number—and we will not know this, because the participant cannot tell us.

CONCLUSION

Scientific research is an amazing tool to describe reality and uncover the "truth" about a phenomenon. And "truth" is invariably complex: the more we learn, the more we realize that there is yet to know. This is especially true of the singing voice. Whether quantitative or qualitative, all research is flawed to some extent because it is carried out by imperfect people who occasionally make mistakes. To prevent the most egregious "fatal flaws" in qualitative studies, voice researchers are encouraged to 1) actively collaborate with experts in neighboring professions, 2) thoughtfully examine their own biases and preconceptions, 3) prioritize the perspective of the participant, allowing them to educate the researcher, 4) remember that context matters, and above all, 5) practice intellectual humility at every opportunity. We hope that this column demonstrates to the reader that voice science, often viewed as synonymous with lab-based quantitative research, is also rich with opportunities for rigorous qualitative research to better understand the "how" and "why" behind singers' complex behaviors, attitudes, experiences, and language.

NOTES

1. John Nix, "Fatal Flaws in Research and How to Avoid Them, Part 1," *Journal of Singing* 80, no. 3 (January/February 2024): 315–319.
2. The authors recognize that "artistic research" or "art-based research" has grown considerably in the last 20 years. For more information, see the *Vienna Declaration on Artistic Research*, available at: https://cultureactioneurope.org/news/vienna-declaration-on-artistic-research/). To date, "artistic research" has not demonstrated utility in advancing our functional understanding of the voice. When the authors use the terms, "research" or "researchers," they do not intend to include this type of inquiry.
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9. See also Wayne K Hoy and Curt M Adams, *Quantitative Research in Education: A Primer* (Los Angeles: Sage Press, 2016).
10. For an extended discussion of this topic, see Wayne A. Babchuk and Manijeh Badiee, "Realizing the Potential of Qualitative Designs: A Conceptual Guide For Research and Practice," *29th Annual Midwest Research-to-Practice Conference In Adult, Continuing, Community and Extension Education Conference Proceedings* (2010): 25–31.
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14. David Meyer and Ron Scherer, "Practical Voice Science: Reading and Evaluating Scientific Papers," *Journal of Singing* 80, no. 2 (November/December 2023): 173–182, https://doi.org/10.53830/DXEV2589.
15. Catherine Marshall and Gretchen B Rossman, *Designing Qualitative Research* (Thousand Oaks: Sage Publications, 2015).
16. For basic qualitative research, see Maxwell; John A. Maxwell, *Qualitative Research Design: An Interactive Approach* 2nd Ed.(Thousand Oaks: Sage, 2005). For an ethnography approach, see James P. Spradley, *The Ethnographic Interview* (New York: Holt, Rinehart, and Winston, 1979); and Harry F. Wolcott, *Ethnography: A Way of Seeing* (Walnut Creek: AltaMira, 1999). For phenomenology, see van Manen; John van Manen, *Tales of the Field: On Writing Ethnography* (Chicago: University of Chicago Press, 1988) and van Manen, *Researching Lived Experience: Human Science For An Action Sensitive Pedagogy* (London, Ontario: The University of Western Ontario, 1990). For a grounded theory approach, consider Glaser and Strauss, Bernard Glaser and Anselm Strauss, *The Discovery of Grounded Theory* (Chicago: Aldine, 1967); and Anslem Strauss and John Corbin, *Basics of Qualitative Research: Grounded Theory Procedures and Techniques* (Newbury Park, Sage, 1990). For case study research, see Robert K. Stake, *Qualitative Research: Studying How Things Work* (New York: The Guilford Press, 2010) and Robert K. Yin, *Case Study Research: Design and Method* 3rd Ed. (Thousand Oaks: Sage, 2003). For narrative inquiry, see F. Michael Connelly and D. Jean Clandinin,"Stories of Experience and Narrative Inquiry," *Educational Researcher* 19, no. 5 (1990): 2–14. Available at https://www.jstor.org/stable/1176100; D. Jean Clandinin and F. Michael Connelly, *Narrative Inquiry: Experience and Story in Qualitative Research* (San Francisco: John Wiley & Sons, 2004).
17. See D. Jean Clandinin and F. Michael Connelly, *Narrative Inquiry: Experience and Story in Qualitative Research* (San Francisco: John Wiley & Sons, 2004).
18. See Julie A. Carlson, "Avoiding Traps in Member Checking," *Qualitative Report* 15, no. 5 (2010): 1102–1113. Available at http://www.nova.edu/ssss/QR/QR15-5/carlson.pdf

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