Undertaking Research in Voice- and Health-Related Workplaces

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Introduction

As we go about our daily lives - at the coffee shop, at work, with our partners and children — we are conducting research to help us better understand and exist in our world. Though I did not realize it, I have been conducting research on my students — listening, observing, testing, learning, applying — since I started teaching. As Hancock, Algozzine, and Lim said in 2021, we are all researchers. To do so in a more formalized capacity, however, requires more intention, more reflection, and more structure. As a voice coach aspiring to work within the intersection of singing and health, my intention is to thoroughly analyze and evaluate the usefulness of research methodologies, paradigms, designs, and methods relevant to the practice of undertaking research in voice- and health-focused workplaces. Noting that in order to learn something, I cannot learn about everything, I have focused my research on the the positivist, constructivist, and pragmatic paradigms, including an overview of axiology, ontology, and epistemology to ground the discussion. I will also explore: mixed methods, quantitative, and qualitative research methodologies, Grounded Theory, Phenomenology & Hermeneutics, and Case Study designs, and participant diaries, observations, and likert scale methods. As ethics and insider research considerations are of the utmost importance when undergoing health-related investigations in any workplace (Ogunrin, Ogundiran, and Adebamowo, 2013), I will also include thorough discussion on these topics before concluding with a summary of emergent themes.

Research Methodologies

When undertaking research, one can collect Quantitative data (i.e., numerical), Qualitative information (i.e., non-numerical), or both when aiming to answer a particular question; the latter, using both quantitative and qualitative investigative tools, is referred to as a Mixed Methods approach (Fetters, Curry, and Cresswell, 2013; Lim, 2024). It is possible to conduct rigorous and meaningful research in voice and health-related workplaces applying any of these three methodologies (Bertino, 2006; Doyle, Brady, and Byrne, 2016; Chua et al, 2023).

Paradigms, Axiology, Ontology, and Epistemology

Before one considers a Methodology, however, it it necessary to define the *paradigm,* or shared way of thinking about solving a problem, that underpins the research (Mackenzie and Knipe, 2006; Brown and Duenas, 2020). A paradigm is the foundation that shapes all subsequent choices when engaging in the collection, analysis, and interpretation of data, helping others understand and contextualize one's research (Mackenzie and Knipe, 2006; Brown and Duenas, 2020). Before selecting a paradigm, Heron and Reason (1997) and Brown and Duenas (2020)

first ask one to pause and reflect upon three questions. The first question is: what do we value? Commonly called *axiology*, what we value in part determines the kinds of questions we ask as it shapes what we feel is worth knowing about (Brown and Duenas, 2020). Understanding whether we appreciate knowledge for the sake of it, or intend to use knowledge as a means to an end, is one differentiating factor among existing paradigms. The second question is: what is reality? Called *ontology*, the study of the nature of reality is another factor differentiating paradigms as it defines what is there to be known (Brown and Duenas, 2020). The third question is: what counts as knowledge? Called *epistemology*, the study of how we gain knowledge, and what knowledge is worth gaining, shapes how we conduct research (Brown and Duenas, 2020).

As our duty as researchers is to choose the paradigm that best fits the question, and axiology, ontology, and epistemology ultimately shape the question, they also ultimately shape the paradigm; however, as the researcher defines the question to be explored, the researcher's own viewpoints also ultimately shape the paradigm, as well (Anderson et al, 2021). In reflecting, I have found that I appreciate knowledge for the sake of it, I can acknowledge both objective and subjective or constructed views of reality, depending on the circumstance, and that I value my intuition and the knowledge that comes from connecting with others above anything I could read in a book. As we will discover in the paradigm investigation below, these viewpoints allow me to be adaptable to multiple paradigms, though I may not fit a textbook definition of any of them.

The *Positivist* paradigm takes the ontological view that reality is objective; the post-positivist paradigm revises this assertion to include the caveat that reality is subject to change as new data is uncovered, new hypothesis are tested, and new explanations are found (Kuhn, 1962). Research set with these paradigms typically holds the belief that single truths exist and are researched for the sake of truth, and typically applies quantitative methodologies to explore data and statistical analyses to interpret results (Masuku, 2023). O'Leary (2004), however, posits that post-positivists might take on a more subjective view of reality, be more intuitive in nature, and appreciate qualitative exploration. This is not the widely held understanding of the paradigm, but is worth noting as it does hypothetically widen the lens for other ontologies and epistemologies to fit under the umbrella of this paradigm.

The *Constructivist* paradigm is guided by the understanding of socially constructed reality that can be best understood from pattern recognition as opposed to hypothesis-driven inquiry (Mackenzie and Knipe, 2006). As it adheres to the belief that there are no universal truths, it centers qualitative exploration (Anderson et al, 2021). As this paradigm is guided by a socially

constructed reality, it also includes an examination of the researcher's own biases as they may play a role in how data is collected, analyzed, and interpreted (Da Costa, Hall, and Spear, 2016).

Unlike the positivist or constructivist traditions, the *Pragmatic* paradigm fully centers the question over beliefs regarding axiology, ontology, or epistemology; the pragmatist's intention is to collect, analyze, and interpret the data and information that will best serve the research question at hand, frequently employing a *mixed methods* approach — or utilizing both quantitative and qualitative collection strategies to support inquiry (Anderson et al, 2021).

Qualitative Methodological Applications

While qualitative methodology holds barriers to producing generalizable, causal, reproducible results and can require greater time and knowledge to perform, it enables deeper insights, values participant experiences and perspectives, and allows for reflexivity and flexibility (Lim, 2024). Regarding Singing for Health applications, Chua et al's 2023 literature review summarizing the findings from qualitative studies exploring the lived experience of those with obstructive sleep apnea (OSA) concludes that the richness of insights and themes revealed in qualitative studies facilitates more patient-oriented care and informs the development of better patient-reported methods of data collection. Given that in the healthcare field, the positivist approach — and with it, a more quantitative methodological mindset — has been the traditional research methodology due to qualitative research's shortcomings regarding causality, generalizability, and reproducibility, a qualitative lens can help add more meaning and enrich the conversation around health (Brown and Duenas, 2020).

Quantitative Methodological Applications

Bertino's 2006 paper exploring the effects of surgeries to treat OSA on the voice, in contrast, applies a quantitative methodology to reveal differences in the formant frequencies of several vowels pre-and post-surgery. A quantitative methodological approach leads to research that is generalizable, can show causality, and can be scaled and reproduced — thus having a high degree of merit in a both a voice and health context — but the methodological approach can also be limited in terms of contextual understanding, flexibility, and complexity, perhaps even leading to data dredging, or drawing tenuous conclusions in an effort to find meaning in the numbers (Lim, 2024). It has also been argued that quantitative research is more objective (Lim, 2024), though a 2024 study by the Quality Assessment Group for Quantitative Research, Systematic Review and Guidelines/Consensus of Chinese General Practice found that of the quantitative research published by Chinese primary care and general practice practitioners in

2021, 72% showed risks of bias. As quantitative researchers are still human, and even quantitative data must be interpreted to a certain extent, bias is possible and even inevitable, and quantitative bias analysis has been developed as a potential mitigation for biases in quantitative research (Lash et al, 2014).

Mixed Methods Applications

As a Mixed Methods approach to research methodology allows for broader and deeper investigation, notably in health-related settings, this approach may be particularly fitting for undertaking research in a Singing for Health work-based setting (Creswell, 2015; Doyle, Brady, and Byrne, 2016). Rationales for using a Mixed Methods approach to research include: triangulation —i.e., offsetting the biases or weaknesses of one method of data collection by using multiple methods to achieve convergence or corroboration; the opportunity to both explain or further explore initial findings; greater comprehensiveness of scope; and even the opportunity to ask multiple questions in the same study (Greene, Caracelli, and Graham, 1989; Doyle, Brady, and Byrne, 2016). Each of these strengths is the basis for a Mixed Methods design: convergent (giving equal weight to quantitative and qualitative data analysis), explanatory (qualitative data supporting previously-gathered quantitative data), exploratory (quantitative data supporting previously-collected qualitative data), and embedded (gives the potential to ask two questions, with one data set taking the lead and the other being secondary) (Doyle, Brady, and Byrne, 2016; Ngulube, 2022). It is also interesting to note that in recent years, funders for healthcare research have also required a Mixed Methods approach to conducting research, providing not just a philosophical but also logistical rationale for choosing this methodology (Doyle, Brady, and Byrne, 2016). That being said, Mixed Methods research does have drawbacks, including that it requires deep knowledge of both qualitative and quantitative methodologies and how they interact — potentially leading to more costly and time-intensive research — and it could reveal clashes in data sets that are hard to interpret (Regnault, Willgoss, and Barbic, 2018).

Research Designs

As a voice practitioner with a consistent meditation practice, I am drawn to Grounded Theory (GT) as it centers on what Buddhist theory refers to as *beginner's mind*, or the idea of bringing an openness to experiences rather than relying on assumptions (Younie, 2017). First formulated by Glaser and Strauss in 1967, the design's main characteristic is to start with the data — i.e., use an inductive mindset and proceed in research with as much curiosity and as little assumption as possible, to eschew hypothesizing, and delay literature review until after the first round of data collection (Turner and Astin, 2020; Tarozzi, 2020). This mindset is one

relevant to working in a 1:1 capacity, whether in the voice studio or in a health setting, as this type of engagement is supported by a practitioner who is present, curious, and responsive (Younie, 2017; Turner and Astin, 2020). GT is responsive to the needs of the research, allowing more novel insights to emerge, while still maintaining structure and rigor (Tarozzi, 2020). It is interesting to note, though, that by trying to avoid assumptions and bias, and delaying the literature review to make this possible, the Theory as practiced above may align with a positivist mindset, even though it is a Qualitative Design that does not begin with a hypothesis, in that it seeks to treat data collection as an objective practice; engagement with the literature at an earlier point, then, could align this design with a more pragmatic or even constructivist paradigm as it would then invite prior knowledge gained from a literature review to inform research (Turner and Astin, 2020). Though my prior knowledge of my chosen research area, then, may seem like a barrier to my using GT as a design, alignment with a paradigm other than positivist may mitigate this limitation.

The *Phenomenology & Hermeneutics* design is complementary to both the constructivist and pragmatic paradigms analyzed and my own experience because it addresses researcher bias in the conducting of research, whether in studying a phenomenon through collecting data about the lived experience (Phenomenology), or through the study of the narrative of those experiences after-the-fact (Hermeneutics) (Laverty, 2003). While phenomenology asks the researcher to bracket their beliefs, hermeneutics and herneneutical phenomenology ask the researcher to integrate their beliefs, inviting the researcher to take a familiar learning cycle like the Kolb Cycle or DEBRIEF model one step beyond reflection into reflexivity, and explore how their own beliefs might shape research process and outcomes (Laverty, 2003; Allan, 2011; Kolb, 2018; Damsgaard, 2020). In their 2022 paper, authors Doering, McAra-Couper, and Gilkison apply the hermeneutic phenonenological design to studying the woman-midwife relationship in Japanese maternity care. The researchers conduct interviews to better understand the phenomenon in question as revealed and understood through lived experience, then interpret the information gathered to uncover the theme of ‘having a voice’— also illustrating that this design can be applied to both a health setting and a voice setting, however the word ‘voice’ might be interpreted (Doering, McAra-Couper, and Gilikson, 2022).

I was also drawn to the *Case Study* approach as each student in a voice studio is, in essence, a case study — in my voice studio, I treat students as individuals but also benefit from finding themes as they emerge to help my practice. While allowing for qualitative information collection, case studies can also support a more hypothesis-driven investigation, thereby being useful to any of the three paradigms explored, and supporting a mixed methods approach to research

(Eisenhardt, 1989). Case studies can also be especially relevant for emerging or nascent topic areas (Eisenhardt, 1989). For example, Birch's 2004 paper studying how Buteyko breathing can support patients with obstructive sleep apnea (OSA), a breathing disorder, makes use of the case study design to delve more deeply into the subject and apply a novel approach to a common ailment; the study reports that mere months after attending a five-day Buteyko breathing intensive course, the patient was shown to have been cured of OSA symptoms. This is, however, only one data point, and one limitation of case studies is their lack of generalizability — more research must be performed to show that what is found for one person may also be found for another or a larger group of people (Gerring, 2007).

Research Methods

Likert scales have been employed extensively to gather information about a patient's lived experience in a healthcare setting, and how that experience may change before and after a treatment; for example, In their 2009 study, Guimaraes et al employ the Epworth Sleepiness Scale (ESS) to better understand levels of sleepiness in patient suffering from OSA before and after oropharyngeal treatment. The ESS is an example of a likert scale; it asks patients to measure their level of sleepiness on a sale of 0 to 4 (Goncalves et al, 2023). While the ESS has been shown to be a valid and valuable tool for assessing sleepiness across populations (Lapin et al, 2018; Gonclaves et al, 2023), there is larger debate about how to analyze the data generated by a likert scale. Though the differences between the numbers on the scale are ordinal (we can give them an order, i.e. we know 'slight' is lower than 'high'), likert scale data is frequently treated as intervalic data for analysis, i.e. the difference between 'slight' and 'moderate' is 1) the same for everyone, and is 2) the same as the different between 'moderate' and 'high' (Wu and Leung, 2017). Likert scale responses may also be both culture-dependent and highly subjective, making it challenging to draw generalizations from the data gathered (Heine, Lehman and Peng, 2022). Perhaps the expansion of the scale to 11, as proposed by Wu and Leung, may increase the validity of using the scale as intervalic data, but it is important to keep the many limitations of likert scales in mind when applying this method of research (Wu and Leung, 2017).

In their 2002 study documenting the impact of singing on snoring and daytime sleepiness, Ojay uses both *observations* and *participant diaries* to gather data about the snoring frequency of their study participants. Ojay engages in direct and overt observation, recording the minutes of snoring before and after treatment, then engages in quantitative analysis to extract conclusions. Applying the same observation method to all participants in this way supports uniformity among

data collection, one of the merits of this method, and of quantitative data collection and analysis more broadly (Lim, 2024).

However, regarding snoring, other data points — such as degree of experienced sleepiness — can also be important to capture. *Participant diaries* have been used extensively in the medical field to capture more longitudinal data on a variety of health concerns as experienced by a patient, including diabetes, dementia, and HIV (Seguin et al, 2022). In my own voice-related work setting, I ask my students to employ a diary during their practice to record anything of note, allowing them to bring questions that arise during practice into our lessons. I have observed that this tool gives my students a way to engage with their practice more deeply and lead themselves in a reflective cycle just as though I were in the room with them. In their 2024 paper, Olorunfemi similarly notes that a diary can allow a participant to record experience and engage in sense-making of that experience, leading to more sustained engagement over time. In their 2022 study regarding hypertension patients in the Phillippines, Seguin et al also note that participant diaries allow for the capturing of nuance and patient experience over time, something a single interview or questionnaire may not achieve. As a method, diaries can be used with a positivist, constructivist, or other paradigm, and using a qualitative, quantitative, or mixed methods approach (Hyers, 2018). Participant diaries also give the participant control over the data that is collected, which can be seen as both a strength and a limitation (Bijoux and Myers, 2006). Other limitations of this method include: potential barriers to use when in digital form (Seguin et al, 2022), erroneous conclusions by the participant if used in isolation (Olorunfemi, 2024), a potentially expansive data set (Hyers, 2018), and a participants' fear of judgment for what is recorded and shared (McCombie et al, 2024).

Ethics and Insider Research

Considering potential impact on the participant leads us to a broader conversation about *ethics* in the context of research. In ethics, the researcher aims to simultaneously hold and balance beneficence, or doing good, and non-maleficence, or not doing harm, when conducting research, as well as considering respect for participants and their autonomy, and distributive justice (Beauchamp and Childress, 2001). Several frameworks also exist to help think more deeply about ethical considerations in the workplace, including Care, Justice, Critique, Community, and Profession (Mathur and Corley, 2014). Tactical measures that can be taken to ensure these principles are actionable include: protecting anonymity and confidentiality during and after the study (for example, with data archiving), giving participants the chance to enter the study on an informed, voluntary, and competent basis and allowing them to withdraw, and supporting participants after-the-fact with a debriefing (Aside et al, 2021). A structured ethics

appendix can serve as a format for researchers to both communicate these measures in a paper and further improve upon them (Asiedu, 2021).

Another ethical consideration is the role of boundaries - between researcher and participant, and of research in a Singing for Health context, especially as this may involve providing health-related care in a voice-based context. This leads us to the topic of *insider research*; when the researcher is a member of the group being studying, and is considered to be on similar footing with research participants (Brannick and Coghlan, 2007). Insider research may help to assuage fears of judgment, a noted limitation of participant diaries (McCombie et al, 2024). It might be worthwhile to consider why this might be the case. Is it possible, then, that insider researchers may possess and/or express more empathy for research participants, and so participants felt less judged by researchers with insider status? In their 2017 story, Ross notes that they were able to express empathy for participants during interviews as a result of shared emotional experiences which stemmed from the sameness of their identities as related to the study. It is not clear if data gathered by other methods (such as participant diaries) would foster the same degree of empathy but it is a meaningful finding nonetheless.

In their 2013 paper, Humphrey discusses several difficulties in performing insider research in a social work higher education setting, including that some participants disclosed personal trauma during interviews that was outside the scope of the research being conducted. As a voice coach, I have also experienced the difficulty of holding space for my students while containing my own emotional response during a disclosure, and the difficulty of creating and holding boundaries for what is not technically a Therapeutic space, as I am not a licensed therapist; I anticipate this might be even more challenging in the Singing for Health context.

It's also important to note that 'insider' vs 'outsider' nomenclature may unnecessarily, incorrectly, and even dangerously frame the status of a researcher in a binary — that is, either we are the same as our participants or we are different (Chavez, 2015). We all contain multitudes (Whitman, 1891), and our identities and viewpoints can even contradict themselves. Were I to engage in studying the impact of singing exercises on obstructive sleep apnea, I will share some characteristics with my participants — I am a singer, I am a student of voice — but I do not have obstructive sleep apnea. As my wife does, however, it is a subject I care about deeply. Though the notion of sameness can have may advantages regarding the conducting of research — including better access to participants, responsible data collection, and insightful data analysis — it can also cause a great deal of assuming (Chavez, 2015). One mitigation for this propensity for assumption is engaging in a reflexivity practice to more deeply understand the

relationship between researcher and participant, including the impact of any biases on that relationship (Brannick and Coghlan, 2007).

Another concern regarding insider research in a voice-or health-related work setting is the issue of voluntary consent concerning participation, mandatory from an ethical perspective. Researchers undergo the process of *sampling***,** or ensuring that the participants studied accurately represents the larger population possessing the characteristic of interest to the researcher, when enlisting participants for a study; sampling can be probability (random) or non-probability (non-random) (Berndt, 2020). Non-probability sampling, including quota, purposive, convenience, and snowball, involves more judgment on the part of the researcher (Berndt, 2020; Novosel, 2023). Though research requires informed, voluntary consent, it is possible that a participant could feel influenced by the insider researcher to participate, blurring the line of voluntary (Golding and Ince, 2024). Furthermore, though the confines of this discussion will not permit it, it is also worth exploring the participant experience in an insider research context - i.e., if the participant believes there to be a desired outcome to the study, participation in the research could cause emotional harm to participants by placing pressure on them to succeed, even if this is not the intent (Fleming, 2018).

King and Van Looy's VOCAL model may be a potential mitigation for both voluntary consent and the maintaining of boundaries in a Singing for Health context (Van Looy and King, 2023). VOCAL, in this case, is an acronym that stands for Verify understanding, Open communication, Consent and customize, Assess sensations and feedback, and Listen and adjust (Van Looy and King, 2023). King and Van Looy apply this framework to engaging in acupuncture in the voice studio, but it is also more broadly applicable.

Conclusion

Though it is possible to investigate Singing for Health questions via a variety of methodologies (Bertino, 2006; Chua, 2023), a mixed methods approach, incorporating both evidence-based investigation and patient-oriented exploration, may be the best fit for my interest in exploring Singing for Health questions in a 1:1 capacity (Creswell, 2015; Doyle, Brady, and Byrne, 2016; Younie, 2017; Turner and Astin, 2020). Given this, as well as my own leanings towards axiology, ontology, and epistemology, the pragmatic paradigm may be the best choice for the foundation of my research (Anderson et al, 2021). As each of the three research designs investigated have merit in a Singing for Health context (Birch, 2004; Younie, 2017; Doering, McAra-Couper, and Gilikson, 2022), I will re-evaluate once I have chosen my research question. Regardless of the choice, conducting ethical research will require me to engage in a reflexivity

practice to ensure the safety of both myself and my research participants (Brannick and Coghlan, 2007)

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