

FRAMEWORK FOR REDUCING VARIABILITY AND SELECTION BIAS IN TEACHER VOCAL HEALTH RESEARCH

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ABSTRACT

Studies of vocal health have evidenced a teacher's significant risk for voice problems and have identified potential risk factors. However, these studies' usability, including using the results to develop appropriate interventions, has been hampered by the variability in the study designs. To address this issue, two new tools have been developed: [1] a Teacher Research Registry (TRR) and [2] a Teacher Vocal Health Survey Instrument (TVHS). The TRR provides a larger demographic and geographic pool using a three-pronged approach of broad-based recruitment, demographic selectivity, and high volume. The TVHS is based on mixed research methods that include a systematic review of literature, qualitative interviews, and focus groups testing. The combined use of TRR and TVHS facilitates a wide range of innovative teacher cross-sectional and longitudinal studies. Further, it will increase the number of teachers available for studies, thereby mitigating the costs of general recruitment and follow-up studies, while enabling subject-specific recruitment (e.g., age, grade level, experience). Finally, it will improve study designs by reducing the effect of study-specific selection bias or other non-representative sampling methods, thereby creating more robust measurement and survey instruments and increasing reproducibility.

Keywords: *Schoolteachers, Vocal Health, Mixed Methods, Risk Factors, selection bias*

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1. INTRODUCTION

Decades of research on schoolteachers' vocal health have demonstrated that teachers are at significant risk for voice problems with potential risk factors including individual physiology, individual behaviors and habits, classroom environment, extracurricular activities, and previous vocal hygiene training. While this research has been helpful, developing and implementing effective interventions has been hindered by variability in the studies themselves. For example, the reported prevalence of voice problems in teachers varies widely, ranging from 9% to 94% [1] indicating that some of this variability could be caused by issues with the study designs, for example inadequate sampling or selection bias [2]. Addressing these issues will be crucial to improving our understanding of vocal health in teachers and developing effective interventions to support their vocal well-being.

Two novel tools are being developed to reduce variability and increase usability of research findings: (1) Teacher Research Registry (TRR) and (2) Teacher Vocal Health Survey Instrument (TVHS). It is hypothesized that these tools could reduce variability in research data in three ways: (1) increasing the number of teachers involved in the studies, (2) reducing the effect of selection bias or other non-representative sampling methods, and (3) creating more robust measurement and survey instruments.

2. METHODS TOWARDS REDUCING BIAS

2.1 Teacher Research Registry (TRR)

The TRR (<https://teachers4research.msu.edu/>) provides researchers the opportunity to obtain a broad demographic and geographic pool using a three-prong approach of

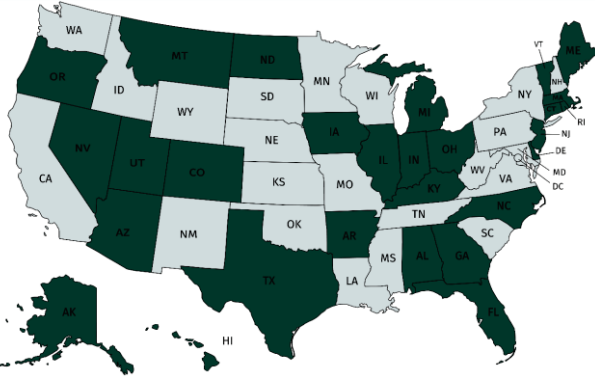


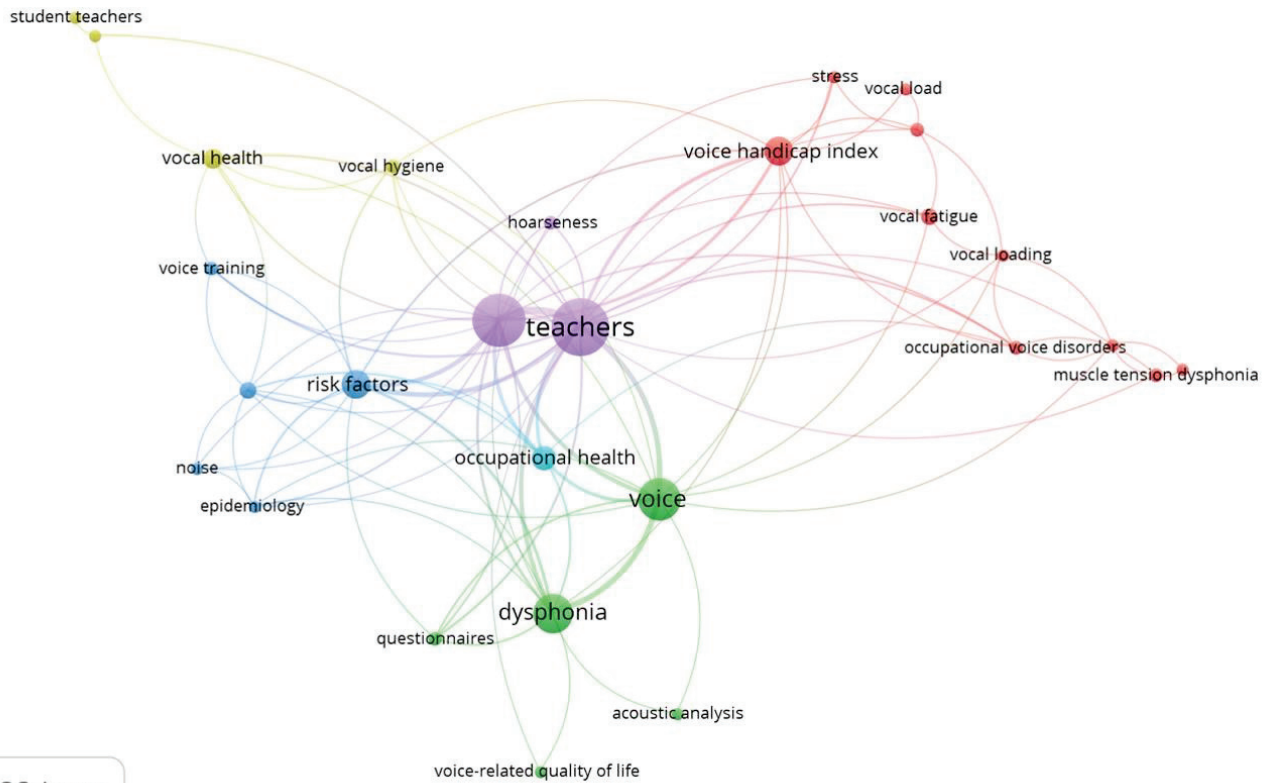
Figure 1. Currently completed states.

(1) general or broad-based recruitment, (2) demographic selectivity, and (3) high volume or large numbers of participants. Contact information for teachers across the US (28 of 50 states completed) is being systematically collected from small-, mid- and large-sized schools. Further, using US Government databases on schools, each contact has been tagged to demographic information about the related school and community.

2.2 Teacher Vocal Health Survey Instrument (TVHS).

The Teacher Vocal Health Survey (TVHS) is a new survey instrument which was carefully developed by utilizing a mixed research approach, which consisted of a systematic literature review, qualitative interviews, and focus group testing. The literature search adhered to the PRISMA statement [3] to identify relevant scientific articles on occupational voice issues in teachers over the past two decades.

From the identified literature, a co-occurrence map was generated to summarize the relationships between relevant concepts (Figure 2). For example, the most frequent keywords were *teachers* and *voice*. To gather further insights into teachers' perceptions of voice as a working tool and their experiences with voice disorders, 10 focus groups with teachers were conducted; 15 pre-written questions, covering topics related to teacher experiences in the classroom, were used to guide the discussion. Using these findings in conjunction with focus groups data, the TVHS survey instrument is being developed and refined to ensure its validity and comprehensiveness.



VOSviewer

Figure 2: The keyword co-occurrence network.

3. CONCLUSION

The integration of the Teacher Recruitment Registry and the Teacher Vocal Health Survey will facilitate a range of innovative studies on teachers, including both specific and general cross-sectional and longitudinal research. By enabling subject-specific recruitment based on factors such as age, grade level, and experience, the combined use of these tools will reduce selection bias, increase the reproducibility of results, and minimize the costs associated with general recruitment and follow-up studies.

4. ACKNOWLEDGMENTS

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