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Layman's AI translation - "Vocal activity can influence the autonomic nervous system, which controls involuntary bodily functions like heart rate and breathing, suggesting autonomic markers could be used in voice-related studies."

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Mapping the Neurophysiological Link Between Voice and Autonomic Function: A Scoping Review

by
Carmen Morales-Luque [1,2,3,*,†],
Laura Carrillo-Franco [1,2,3,†],
Manuel Víctor López-González [1,2,3,*],
Marta González-García [1,2,3,‡] and
Marc Stefan Dawid-Milner [1,2,3,‡]

1
Department of Human Physiology, Faculty of Medicine, University of Málaga, 29010 Málaga, Spain
2

Biomedical Research Institute of Málaga (IBIMA Plataforma BIONAND), 29010 Málaga, Spain
3
Unit of Neurophysiology of the Autonomic Nervous System (CIMES), University of Málaga, 29010 Málaga, Spain
*
Authors to whom correspondence should be addressed.
†
These authors contributed equally to this work.
‡
These authors contributed equally to this work.
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Simple Summary

Speaking and singing places complex demands on the body, requiring coordination between breathing, muscular control, and the autonomic nervous system (ANS), which regulates functions such as heart rate (HR) and blood pressure (BP) and mediates stress responses. In individuals with high vocal demands—such as singers, teachers, or actors—this interaction may influence autonomic balance, even in the absence of manifest voice disorders. This review examines how voice production and autonomic regulation are interconnected, focusing on scientific studies that assessed both processes simultaneously.

Abstract

Vocal production requires the coordinated control of respiratory, laryngeal, and autonomic systems. In individuals with high vocal demand, this physiological load may influence autonomic regulation, even in the absence of voice disorders. This scoping review systematically mapped current evidence on the relationship between voice production and autonomic nervous system (ANS) activity in adults, focusing exclusively on studies that assessed both systems simultaneously. A systematic search was conducted in PubMed, Scopus, Web of Science, Embase, and CINAHL, following PRISMA-ScR guidelines. Eligible studies included adults performing structured vocal tasks with concurrent autonomic measurements. Data were extracted and synthesized descriptively. Fifteen studies met the inclusion criteria. Most involved healthy adults with high vocal demand, while some included participants with subclinical or functional voice traits. Vocal tasks ranged from singing and sustained phonation to speech under cognitive or emotional load. Autonomic measures included heart rate (HR), heart rate variability (HRV), and electrodermal activity (EDA), among others. Four thematic trends emerged: autonomic synchronization during group vocalization; modulation of autonomic tone by vocal rhythm and structure; voice–ANS interplay under stress; and physiological coupling in hyperfunctional vocal behaviours. This review's findings suggest that vocal activity can modulate autonomic function, supporting the potential integration of autonomic markers into experimental and clinical voice research.