

Impact of PPE Type and Healthcare Worker Characteristics on Perioperative Communication



Onassis Naim MD, Michael Agud BS, Stephanie Hernandez BS, Xiwen Zheng MD, Maria Frosth MD, Walter Diaz MD, Cameron Howard MD, George Semien MD, Benjamin Houseman MD, PhD

Introduction

The use of extensive PPE during for the care of patients with SARS-CoV-2 has significantly impacted the ability of healthcare providers to communicate with each other and with their patients. Challenges in communication represent a risk to patient safety and have motivated the use of written signs, call backs, and other techniques (1-5). However, it is unclear whether certain types of PPE or certain characteristics of healthcare providers impact their ability to communicate effectively. This study examines how specific types of PPE as well as specific healthcare worker characteristics impair communication in the perioperative setting. We also examine the ability of an lasus GP-3 throat microphone to improve communication between providers wearing PPE.

Methods

QUALITATIVE ASSESSMENT: 75 healthcare workers at Memorial Hospital West completed a 19 item survey to qualitatively assess the impact of gender, age, healthcare role (preop nursing, recovery nursing, OR nursing, surgeon, surgery assistant, anesthesia), native language (English, other), respirator type (N95, P100) and eye protection type (face shield, goggles) on employee perception of communication. Data analyzed using Microsoft Power BI . QUANTITATIVE ASSESSMENT: The Bamford-Kowal-Bench(BKB) sentence list, a benchmarked tool for evaluating comprehension of verbal communication, was utilized to analyze communication between healthcare workers wearing varying PPE. Variables in the quantitative analysis included distance between workers (3 versus 6 feet), phone versus in person communication, and ambient noise level (60 dB, 90dB). An lasus GP3-R throat microphone was utilized for speakers to assess its efficacy as an intervention. Data were analyzed using Microsoft Power BI and results are presented. **Results:** Compared to speakers with N95, scores with speakers wearing P100 respirators were consistently lower, particularly with non-native speakers (* = $p < 0.05$) (Figure 1). The throat microphone improved comprehension in all groups, but improvement with non-native speakers wearing P100 respirator was not statistically significant (figure 2). An lasus GP3-R throat microphone showed a statistically significant improvement in comprehension in all groups except non-native speakers wearing P100 respirators (* $p < 0.05$).

Conclusions

This study demonstrates that multiple factors influence the quality of comprehension when wearing PPE. These include speaker respirator type, native language, and the age of both the listener and speaker. The use of lasus GP3-R throat microphone improved comprehension except in the case of non-native speakers wearing a P100 respirator. Limitations include sample size, the use of only two respirator types, and the simulated setting, which may not reflect clinical practice.

Results

Figure 1. Evaluation of in person standardized phrase comprehension under standard conditions

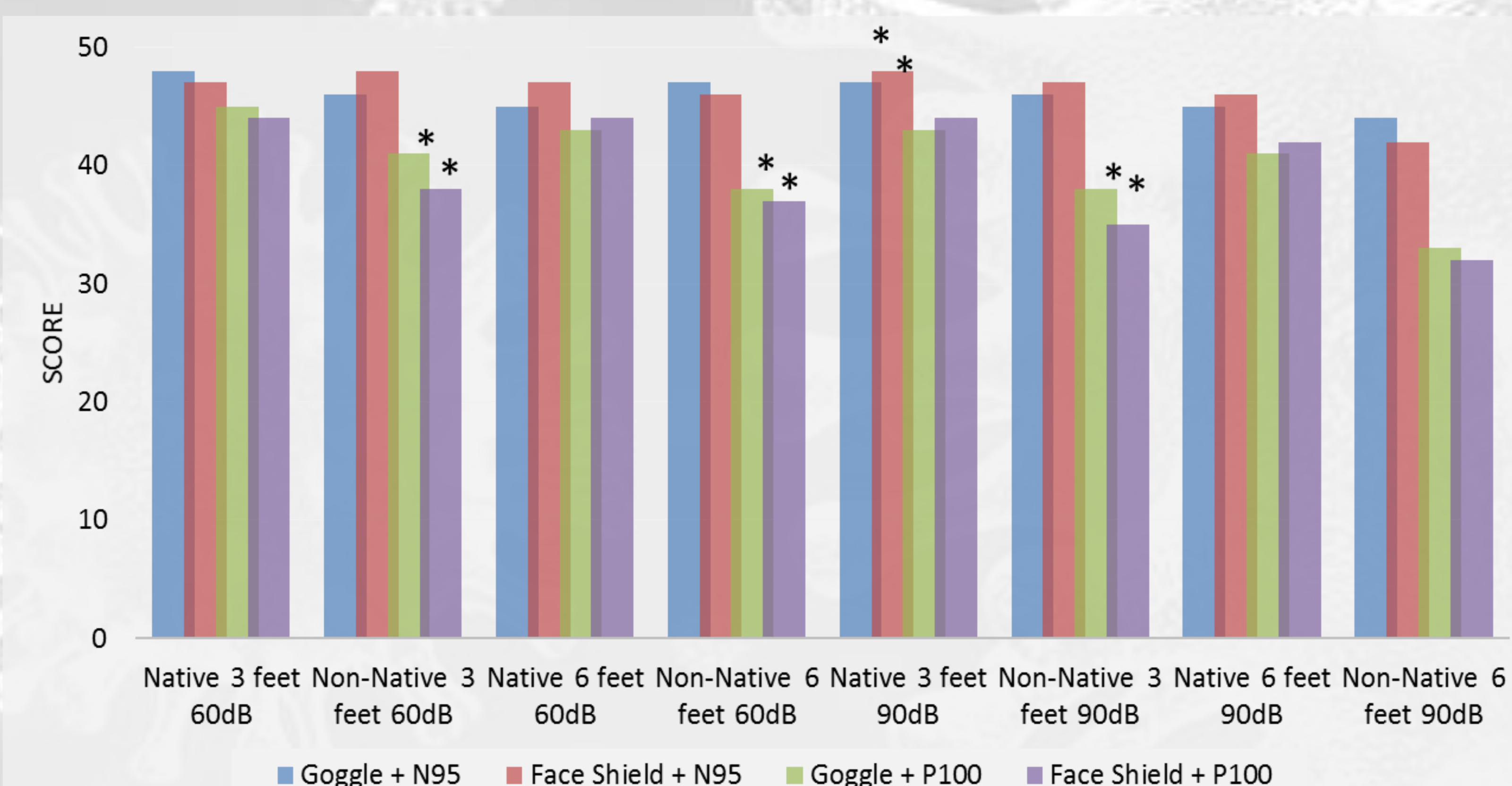


Figure 2. Impact of lasus Throat Microphone on BKB phrase comprehension under standard conditions

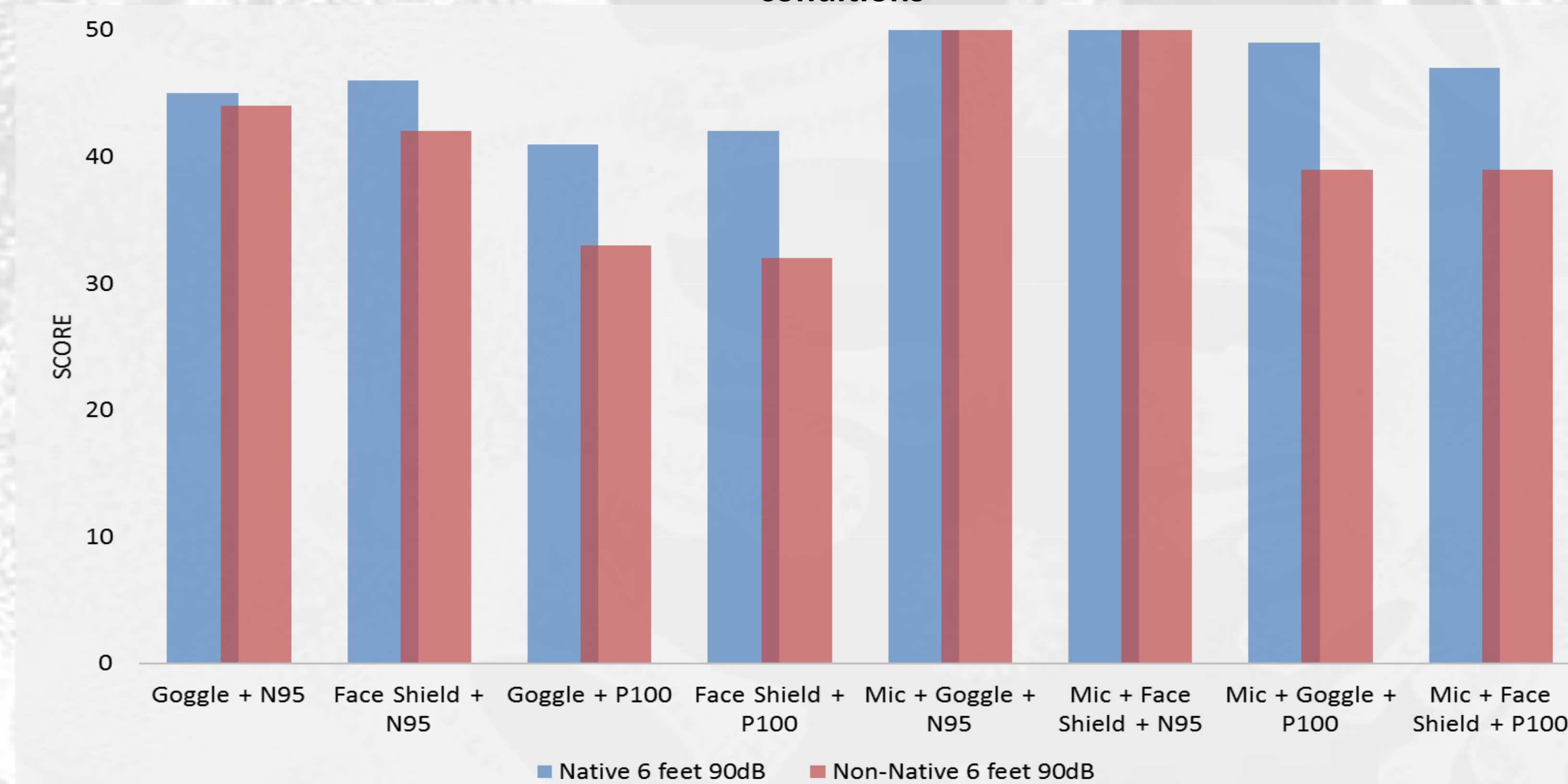
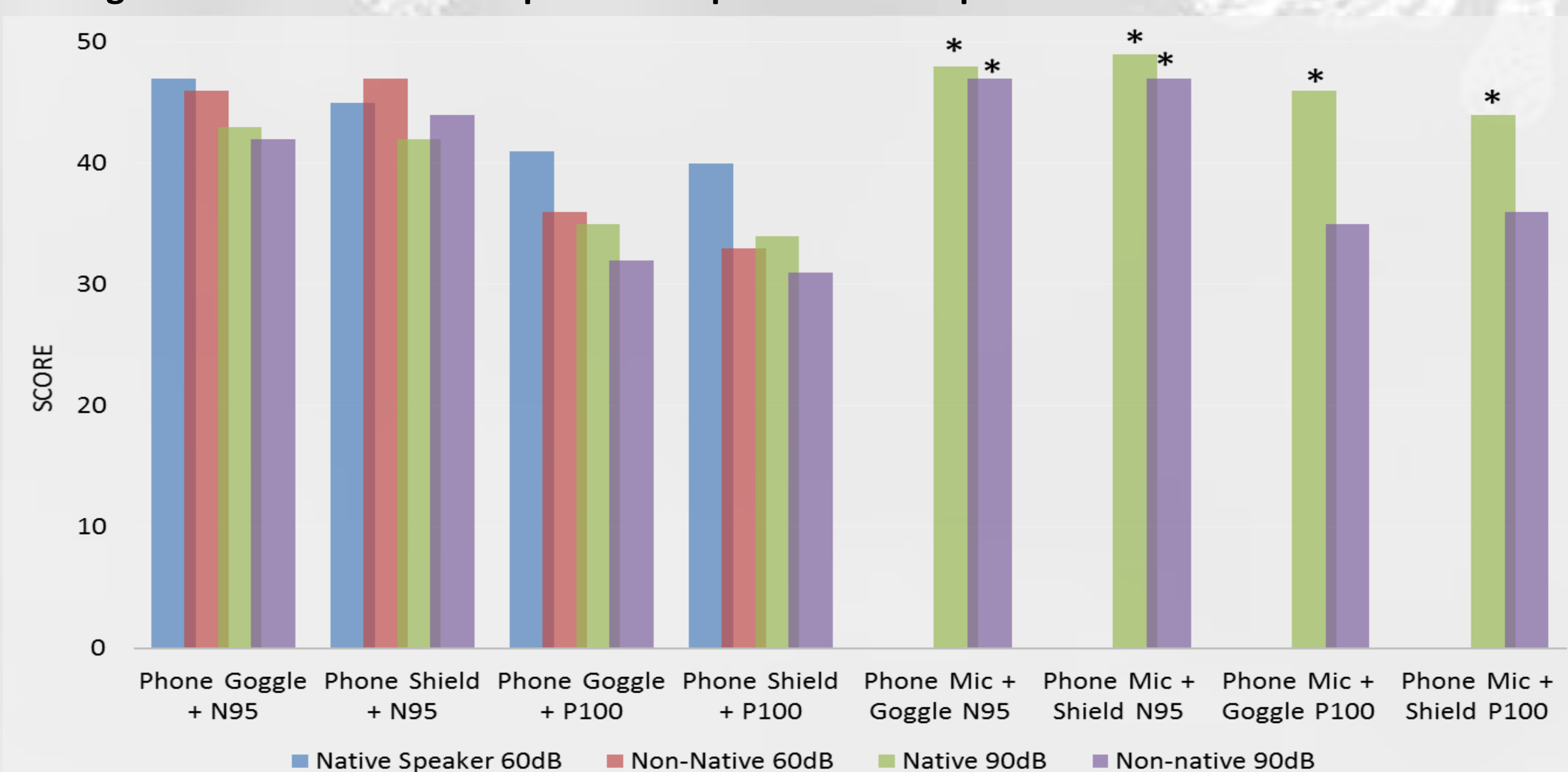


Figure 3. Evaluation of BKB phrase comprehension via phone call under standardized conditions



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