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SMALL GROUP CONVERSATIONS: COMMUNICATION BEHAVIOUR AND SUCCESS

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ABSTRACT

Everybody wants to experience success in their conversations. Conversing successfully in groups is a fundamental aspect of human interaction that is essential for building relationships, sharing knowledge, and achieving goals. However, engaging in group conversations can be challenging for people with impaired hearing. In this talk, I begin by describing how the concept of conversation success is viewed by people with normal (NH) and impaired hearing (IH). I will then explore some behaviours observed in successful versus unsuccessful conversations emerging from a face-to-face conversation experiment involving 18 groups of 4 people (quartets). Each quartet was composed of two people with NH and two with IH that held six conversations in low, medium, and high levels of background noise. Participants with impaired hearing wore their own hearing aids binaurally and they were unaided in half of the conversations. This talk will focus on vocal activity data, such as silence distributions, and shared laughter recorded in synchrony with continuous participant feedback. The findings will provide insight into the perception of conversation success and the communication behaviours linked to it.

Keywords: *conversation success, hearing loss, group conversation*

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1. INTRODUCTION

Group conversations fulfil our need for social connections and enhance our sense of community. Whether it is a family dinner table discussion, a business meeting among co-workers, student discussions in a classroom setting, a social gathering among friends or a group therapy session, group conversations are part of our daily lives. Conversing successfully in groups is a fundamental aspect of human interaction that is essential for building relationships, sharing knowledge, and achieving goals. However, individuals with hearing impairments may face challenges when participating in group conversations. Although hearing aid devices are providing significant improvement, engaging in group conversations remains one of the most reported complaints of people with hearing loss [1]. Previous research has identified seven key factors that contribute to conversation success, including being able to listen easily, being spoken to in a helpful way, feeling engaged and accepted, sharing information as desired, perceiving a flowing and balanced interaction, experiencing positive emotions, and not having to engage coping mechanisms [2]. However, little is known about how conversation success is perceived in real-life group interactions and what behaviours contribute to successful versus unsuccessful conversations.

Communication behaviours have been previously studied in challenging conditions [3, 4, 5, 6]. For instance, in the context of conversational turn-taking, some studies indicate that the intervals from when one speaker stops talking to when the next one starts, are not precise [3]. While some studies show that the gaps tend to decrease in higher background noise levels [6], other studies have found the contrary, showing that this gap gets longer under similar conditions [4]. Laughter is another extensively studied behaviour. In communication, it has been shown that it is

contagious, and it appears more often in the presence of others than alone [7]. While it serves various purposes, it is more often attributed to positive experiences [8].

While these studies focused on dyadic and triadic interactions, the current study explored moments of silence (time without any vocal activity) and shared laughter in four-way interactions and link them to the subjective perception of conversation success. Also, we search to understand the role of hearing aids in face-to-face group conversations.

2. OBJECTIVES

The objective of this study is to investigate the factors that contribute to successful group conversations for individuals with normal and impaired hearing. Based on previous research, we hypothesize (A) that self-perceived conversation success is influenced by background noise levels and the use of hearing aids. Furthermore, we expect (B) to observe differences in participants' vocal behaviour, such as less silence and more shared laughter during successful conversations.

3. METHODS

Participants (N=72, mean age: 62.5) were grouped in 18 mixed-gender quartets composed of two participants with normal hearing and two with moderate hearing loss. Participants with hearing loss were all experienced binaural users. Their task was to hold six conversations of six minutes each while exposed to low (40 dBA), medium (54 dBA), and high (72 dBA) levels of background noise. In half of the conversations, participants with impaired hearing removed their hearing aids. Each conversation in this study was centred around a consensus topic provided to the participants, such as the hypothetical scenario of having to choose between living underwater or in space to survive if life on land was no longer possible. Throughout the conversations, audio, visual, and motion capture data were recorded. Following each conversation, participants completed a survey based on the seven key factors of conversation success, with conversation success being assessed during the conversation using a slider [9] and after the conversation using a survey question with five response options on a Likert scale. In this presentation, we focus on the perception of conversation success after the conversation and on participants' vocal activity derived from the audio data stream.

4. RESULTS

4.1 Conversation success ratings

A Friedman test was conducted to determine if the perception of conversation success was affected by background noise levels in both aided (HA) and unaided (UA) conditions (hypothesis A). Results showed significant differences between the three levels of background noise $\chi2(df = 2, N = 71) = 60.41$, $p < .05$, respectively $\chi2(df = 2, N = 71) = 40.62$, $p < .05$. Follow-up pairwise comparisons using Whitney - Wilcoxon signed-rank tests showed a significant drop in conversation success ratings between low and high background noise levels, and between medium and high background noise levels ($p < .001$), but no differences between low and medium background noise levels ($p > .05$). In terms of aiding, significant differences were observed only for participants with impaired hearing, showing lower conversation success ratings in low and medium background noise conditions when they were not wearing hearing aids ($p < .05$). No significant differences were seen between participants with normal and impaired hearing (Fig. 1).
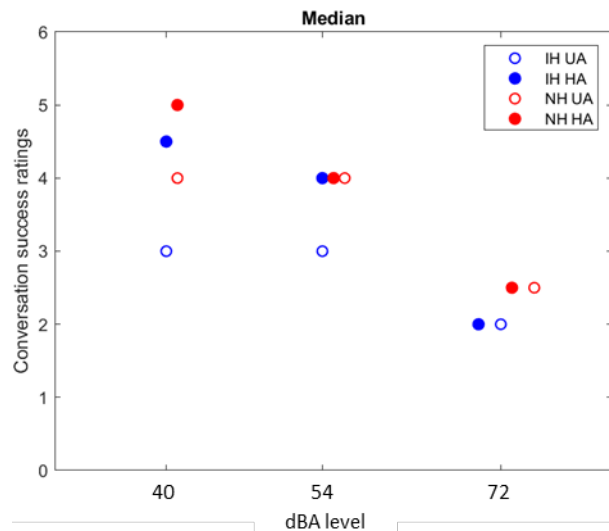

Figure 1. Ratings of conversation success (medians) in quiet, medium, and loud background noise conditions for participants with normal and impaired hearing.

4.2 Communication behaviours

Preliminary behavioural data analysis is shown together with participants' self-perceived conversation success

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(hypothesis B). This is approached on two levels: a) conversation level, combining data from all four participants into one value (e.g., shared laughter) and b) individual level, considering one value per participant (e.g., speech time).

Conversation level: in this analysis, silence is defined as the time (seconds) with no vocal activity recorded. Shared laughter is defined as time (seconds) with at least two participants laughing at the same time. The conversation success rating is represented by the mean of the ratings gathered from all four participants per conversation. Conversations were split into successful (ratings > 3) and unsuccessful (ratings < 3). T-tests were employed to explore differences in shared laughter and silences between successful and unsuccessful conversations. Results showed no significant differences for the shared laughter (p >.05), people laughing together in both successful and unsuccessful conversations (Fig. 2). In terms of time spent in silence, the results show a significant difference (p <.05), with longer periods of silence recorded in unsuccessful conversations (mean 77.05s) than in successful conversations (mean 100.57s) (Fig. 3).
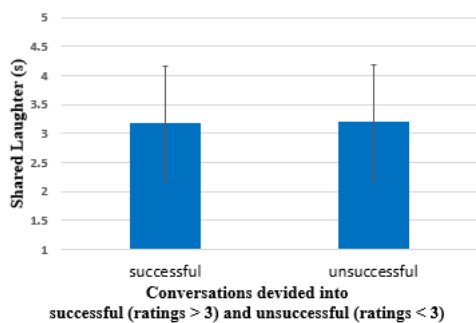

Figure 2. Mean time (s) and standard deviation of shared laughter plotted against the perception of conversation success.
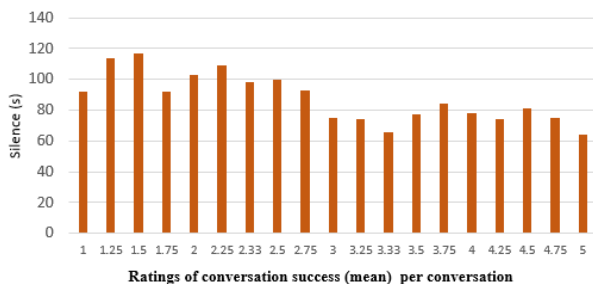

Figure 3. The mean of periods of silence (s) plotted against the means of conversation success (across participants in one quartet).

Individual level: in this analysis, speech time is defined by the time (seconds) a participant is talking per conversation. Conversation success is defined by the individual rating of success per conversation (1 = unsuccessful, 5 = successful). The same procedure was applied, with data being split into two groups, successful (ratings > 3) and unsuccessful (ratings < 3). T-test comparison showed no significant differences, participants talked similar amounts in conversations they rated as successful or unsuccessful (Fig. 4).
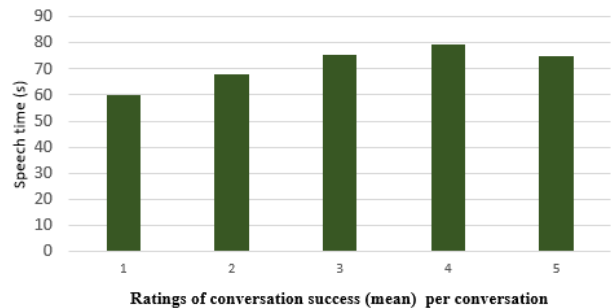

Figure 4 Time spent talking plotted against individual ratings of conversation success per conversation.

5. DISCUSSION

Our hypothesis (A) was confirmed as the ratings of conversation success showed a decline with an increase in background noise. Notably, ratings of success were found to be relatively similar between low and moderate levels of background noise, which aligns with prior research demonstrating that disturbance thresholds typically occur around 66.9 dBA. [10]. The results show that the use of hearing aids provides a clear advantage for people with hearing loss when conversing with low to moderate levels of background noise. However, as expected, challenges persist when dealing with loud background noise. The absence of significant differences between participants with normal and impaired hearing may be due to the moderate hearing-loss threshold of the latter group. It is possible that comparing adults with normal hearing to those with severe hearing impairment would yield different outcomes.

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Results partially confirmed our second hypothesis (B). Shared laughter appears to not be an indicator of successful conversations. Although laughter is a cross-cultural expression of positive emotions [8], the results confirm laughter's different functions such as social bonding or de-escalating negative emotions [11]. Further, our findings suggest that unsuccessful conversations are characterized by longer silences. This aligned with our expectations, as extended pauses can have a negative impact on communication [4]. However, recent research indicates that the degree of familiarity between conversational partners may mediate how extended pauses are perceived [12]. Therefore, further investigation is necessary for a more nuanced understanding of the role of silence in conversations.

Upcoming analyses will consider experimental variables, such as background noise level and the use of hearing aids, as covariates to further refine the preliminary results on conversation success.

6. CONCLUSION

This study delves into the daily challenges faced by individuals with normal and impaired hearing while engaging in group conversations, particularly in the presence of background noise. By integrating participants' perceptions of conversation success with their observed behaviour, this study provides a first description of characteristics that differentiate successful and unsuccessful conversations with the goal to promote social inclusion, and ultimately improve the overall quality of life for this older population.

7. ACKNOWLEDGMENTS

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