



Familiar voices are more intelligible, even if they are not recognized as familiar

Background

In our everyday lives, we are often faced with the difficult task of trying to understand what someone is saying when there are other conversations going on around us. At some point, we have all been in a crowded café trying to listen to someone talking - speech can be more difficult to hear in such an environment, making it harder to understand what the person at your table is saying.

However, we are much better at understanding speech if we're familiar with someone's voice, say we are in the busy café with a friend or spouse. We have shown in some of our previous work that this benefit is substantial—people understood approximately 15% more sentences when they were spoken by their friend or spouse than when they were spoken by a stranger. This finding suggests that, over time, we learn something about the voices of the people we frequently talk to, which helps us to better understand the words they say.

When we look at someone's face, the parts of the face we focus on to recognize who they are can differ from the parts of their face we focus on to tell if they are happy or sad. Something similar might happen when we listen to voices.

The Research

For this study we asked: Why does being familiar with someone's voice help us understand what they're saying? We tested which voice properties (voice pitch and timbre) we use to understand words that are spoken by someone familiar. We also tested whether we use these voice properties in a similar way when we try to recognize someone from their voice, such as recognizing the voice of one of your parents when you pick up the phone.

Timbre is the natural character of a voice or sound that makes it unique from others, separate from the pitch or volume. If a guitar and piano play the same note at the same volume, they will still sound different – that's timbre. We manipulated the timbre of people's friends' voices to see if they would still be both recognizable and understandable.

Key Points

This research has demonstrated that it's easier to understand someone who is familiar to us (compared to someone unfamiliar) even if we can't recognize them from their voice. As listeners, we focus on certain parts of speech sounds for specific purposes. For example, there may be some situations in which you can understand words spoken by your mother very well, better than you could understand a stranger in the same situation, even if you can't tell that it's your mother speaking.

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The Findings

In manipulating the timbre of a familiar voice, we found that listeners were unable to recognize that the manipulated voice was their friend's voice. However, even though this manipulated voice was unrecognizable, people were still able to understand words spoken in this manipulated voice better than they could understand the same words spoken by a stranger.

Our findings demonstrate that we pick out different information from a voice, depending on whether we're simply trying to recognize the voice as a friend, spouse or parent on the phone, or whether we're trying to understand the words they're saying. This is relevant to the long-standing question of whether we separate what someone is saying (the content of the words that they're saying) from who is saying it (the identity of the person). The finding that speech is easier to understand when it's spoken by someone familiar demonstrates that we don't process the content of speech entirely separately from the identity of the person who's saying it. Nevertheless, these new results show that we do process these characteristics somewhat differently—we focus on different parts of speech sounds when we try to understand the content of words compared to when we try to recognize the identity of the person who's speaking.

We all know how challenging it can be to try to understand what someone is saying when there is a lot of background noise. It becomes even more difficult to listen in noisy places as we get older, and for people who have hearing loss. Helping people understand the factors that enable us to better understand speech in noisy places should help all of us communicate better. Understanding the factors that improve speech intelligibility is also relevant to industries who develop interventions to improve hearing, and to clinicians who frequently encounter patients who report difficulties listening in noisy places. Given that voice properties affect our ability to recognize a person and to understand speech, this research is also relevant for people who design artificial agents (e.g. robots) with whom we communicate, which are becoming increasingly commonplace in our society. These artificial agents will be exposed to the voices of some humans more than others, and may have voices of their own, which we have to understand and recognize.

Next Steps

The next challenge is to understand how people become familiar with voices over time. How much experience with someone's voice do we need to better understand what they're saying? Is this more or less than the length of experience we need to recognize someone from their voice? Obviously, we become familiar with the voices of radio presenters even though we've never met them in person. If we can work out how people become familiar with a voice, we should be able to train voices to become familiar, and this might be useful for improving our ability to communicate in everyday situations.

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