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〈Research Report〉

Mask-wearing and Its Effect on Listening Comprehension: A Preliminary Study

Kevin Clark, Steven Silsbee

Abstract

The beginning of 2020 saw mask-wearing become prevalent on an international scale as a means of combating the spread of COVID-19. Both teachers and students in Japan were required to wear masks in class. Two years later, while many countries have now canceled required mask mandates, mask-wearing requirements continue to be commonplace. As such, there is a need for an investigation into the benefits and drawbacks of mask-wearing in an educational context (Spitzer, 2020). In this proposed study, first-year Japanese students studying ESL at a Japanese university are randomly assigned one of three identical listening passages (video with mask on, video with mask off, and audio only). Afterward, participants complete a comprehension activity and self-report regarding their beliefs about their listening comprehension. The purpose of the study is to measure what effects mask-wearing has on English listening comprehension among ESL students and how ESL students perceive their own listening comprehension. Results are expected to show that students shown the video with no mask perform better on the comprehension activity than those who are shown the video with a mask and the audio-only recording. The audio-only group is expected to comprehend the least of the three groups. The authors then discuss the rationale for the study and raise questions that could lead to further study.

Key words: nonverbal communication, visual cues, listening comprehension, mask-wearing

1. Introduction of concepts and review of existing literature

1. 1 A Failure to Communicate?

In a famous scene from the 1967 film Cool Hand Luke (Rosenburg, 1967), the character of Luke, having attempted to escape from a Florida prison camp, is publicly punished by the warden in the prison yard. As he carries out the punishment, the warden turns to the watching prisoners and delivers the line, “What we’ve got here is failure to communicate,” underscoring the fact that if the prisoners don’t follow the rules, they will be punished. However, one could say that both the characters of Luke and the warden are communicating successfully. By attempting to escape, Luke is boldly making the statement

that he is not about to adhere to the rules, while the intense corporal punishment given by the warden clearly demonstrates what happens to those who flout them. At the very least, it could be argued that both messages were understood, but simply ignored.

Interestingly, earlier that same year, Watzlawick & Beavin (1967) made the claim that one cannot not communicate:

> It is first of all necessary to remember that the scope of "communication" is by no means limited to verbal productions. Communications are exchanged through many channels and combinations of these channels, and certainly also through the context in which an interaction takes place. Indeed, it can be summarily stated that all behavior, not only the use of words, is communication (which is not the same as saying that behavior is only communication), and since there is no such thing as a non-behavior, it is impossible not to communicate…very much as a man in a waiting room may stare at the floor if he wants to be left alone by other persons present. But this behavior itself amounts to the message "Leave me alone" and is normally understood by the others as such. All behavior is communication. (p. 5)

The foundation of communication concerns itself with transmitting and receiving messages, with the primary goal being successful understanding, even if the message is ambiguous or clear (West & Turner, 2018, p. 4). However, as stated above, whether or not messages are received in the way they were intended, there is still successful message transmission through any behavioral act.

1. 2 Visual Cues, and Learning

The acts of escaping and punishment are two examples that effectively show the power of nonverbal communication. Generally speaking, nonverbal communication is considered to be communication that is performed through features that exist outside of verbal elements such as words (so long as we consider words to be verbal in nature) (Knapp, Hall, & Horgan, 2013, p. 8). Nonverbal behavior can be expressed in many forms and degrees of nuances that convey a spectrum of moods, attitudes, and feelings at the time of interaction as well as in general (Mehrabian, 2017).

Visual cues, such as facial expressions have been considered to have an effect on perceptions of personal attributes (Knutson, 1996). Studies have reported that not only are individuals with positive facial expressions perceived as having favorable attributes but they also often self-report as being outgoing and affable (Harker & Keltner, 2001; Riggio & Friedman, 1986).

The significance of facial expressions in the realm of language learning has been reported in past studies (See Bavelas & Chovil, 2000; Gullberg, 2010; McNeill, 2000). In a study examining the communicative (among other) implications of audio versus video conferencing, Barley (2021) noted:

> Naturally, gestures, facial expressions, and gaze are not accessible in audio-graphic conferencing. To compensate for the lack of non-verbal language, speakers have to rely predominantly on verbal input occasionally augmented with emoticons available in text chat. Based on the non-verbal communication literature reviewed above, it can be anticipated that this limitation would present challenges in two areas: interaction monitoring and comprehension. (p. 102)

This is supported by Sueyoshi & Hardison (2005), whose findings report that when given either an English video presentation containing gestures and facial cues, a video with no gestures or facial cues, or an audio-only presentation, non-native speakers of English scored significantly higher at both low-intermediate and advanced levels when shown the video with gestures and facial cues.

1．3 Covid-19, Pedagogy, and Learning

The impact of Covid-19 on both teaching and learning is still being felt and measured. Billions of students and educators have been affected both psychologically and behaviorally as a result of social distancing and other limitations brought about by the pandemic (Akat & Karatos, 2020; Ozer, 2020). Many of those affected by the switch to an online learning system were unaware of the difficulties that such an arrangement would present. Many teachers were forced to learn technology that was new to them and had to adjust their teaching techniques and use of materials. Students with social and learning difficulties were especially affected, as it was difficult to meet their special needs (Hoofman & Secord, 2021).

Later, as schools returned to normal operation, a hotly debated issue arose from the practice of mask-wearing. The aversion to wearing a mask has often been political in nature (Young, Bleakley, & Langbaum, 2022), but a more practical complication lies in how the wearing of face masks affects communication. If, as Buck, et al. (1972) stated nearly fifty years ago, effective communication relies in part on the accurate sending and receiving of nonverbal facial expressions, then to what extent does covering half the face with a mask affect communication?

Knollman-Porter & Burshnic (2020) contend that “face masks can soften a speaker’s voice, conceal vocal tone, and hide facial expressions that relay essential non-verbal information” (p. 7). Spitzer (2020) expands on this idea:

> For effective verbal communication, covering the mouth with cloth has two detrimental consequences: First, the auditory signal is impaired, as face masks may dampen sound amplitude, and especially may absorb frequency bands used in speech. Second, the visual signal from the lips is completely obstructed. ... We tend to look closely at the mouth of somebody under circumstances

of impaired sound comprehensibility, such as noisy environments, and low-quality sound in movies and video calls. (p. 7)

By removing those nonverbal facial expressions and cues from the equation, there is a possibility that we may be creating barriers between teachers and students, leading to a communicative breakdown.

Yet the effects of Covid-19 on education have not all been problematic. The situation brought on by the pandemic forced many schools and other educational institutions to re-evaluate both pedagogical approaches and ideas about learning (Sun, Tang, & Zuo, 2020; Clark & Silsbee, 2021; Coman, et al., 2020). As online learning moved from an option to a requirement, both teachers and students found aspects that were pleasing to them, such as convenience, time-cost effectiveness, increased participation, and overall safety (Hussein & Badawi, 2021). One additional advantage of classes taught synchronously (in real-time) over video conferencing platforms is the possibility for teachers and students to have lessons without wearing masks, thereby allowing for unhindered visual facial cues. This is a crucial factor, as Giovanelli, et al. (2021) assert:

> … hiding the lower part of a face undermines the efficacy of a conversation not only linguistically but also from a nonverbal point of view. While this result merits further investigation, it may suggest that when interacting with people wearing a mask, we not only feel less confident about our listening experience overall, but we are also less capable of monitoring whether we understood the message correctly or not. (p. 8)

Based on the literature provided above, the following paper will introduce and outline a proposed study regarding the impact, if any, of mask-wearing acting as a barrier to communication. It will also collect student self-reported data detailing their perceptions with respect to their own understanding of messages delivered with and without communicative barriers. It is the authors' intention to gain insight into the following questions:

1. What effect does wearing a mask have on listener comprehension?
2. What perceptions do listeners have regarding the absence of facial cues from the speaker?

The following sections will detail the proposed methodology of the study and points of consideration that are likely to be relevant.

2. Proposed Study Methodology

2.1 Participants

Participants in the study will consist of 120 first-year students at a private university in Chiba, Japan. All students participating in the study speak Japanese as their L1 and English as their L2. In addition, all students will be enrolled in the same compulsory four-skill English language course at the time of the study. This English multi-skills course is designed to build upon students' basic English knowledge at a linguistic and cultural level and to develop their communicative ability. The course targets the use of CEFR-J A1-B2 vocabulary and CEFR A1-A2 grammar forms in different communicative contexts that enable students to gain confidence in their use and understanding of English.

Students will be distributed into three groups of forty students each. Student placement in each group will be determined by their English course placement test scores, which were originally used to determine which level class each student be placed in when taking the course. The goal in the creation of each group in the study is to have an even distribution of overall English ability levels between the three groups in order to achieve a higher level of reliability in the study findings. In accordance with ethical codes of research, to protect students' privacy any student data for group selection will not be available to any participants, nor be reported in research. No data regarding class performance will be used in the study. Any data gathered from students in the study itself will only be used within the terms of the consent form, and only with the expressed consent of the participant.

2.2 Materials

For the listening comprehension portion of the study, there will be three different multimedia files for students to use. Students in one group will watch a video of an instructor speaking for two minutes. The instructor will use only vocabulary and grammar that the students have already studied, and the content will be limited to familiar sentence structures and topics. In the first group, the instructor will not be wearing a mask and all visual cues on his face will be unobstructed. The second group will watch a video with the same instructor wearing a mask. The audio in the second video will be identical to that of the first video. It will be taken from the first video and dubbed over, meaning that the only difference between the two videos will be the mask obstructing visual cues on the speaker's face. It is important to note that hand gestures and body language will not be used, in order to isolate the impact of the presence or absence of visual cues in the face. The third group will listen to the same audio used in the other two groups, but it will be presented as an audio file only. All three multimedia files will begin with an identical sound check, which will provide an opportunity for the volume of each file to be adjusted to a comfortable listening level for each participant.

Data collection from students will consist of two methods. First, upon completion of a single viewing/

listening to the multimedia content provided to students, they will be required to answer questions testing their comprehension of the video/audio they used. This will be a multiple-choice test made available to them on the university's learning management system, Manaba. Students from all three groups will be given an identical test. After completion of the test, they will be asked questions designed to gauge what perceptions they have regarding the absence or presence of visual facial cues from the speaker. Students will be given a survey with these questions presented with a 6-point Likert Scale to provide their responses. All participants will also be asked to confirm that they only viewed or listened to the file one time, as per the written instructions given to each student, before beginning the study.

2.3 Procedure

Students participating in the study will first each be selected for one of the three groups in the study. The selection process will be based on the scores they each received on the placement test at the end of the prior semester. Students with similar scores will be evenly distributed across the three groups to ensure similar mean and mode values correlating with their language ability in each group. Students will each be given one of the three versions of the study; either the video with the speaker wearing a mask, the video with the speaker not wearing a mask, or the audio-only file.

With the exception of the multimedia file, all other aspects of the study and data collection will be identical. The study materials will be given to students individually through the university learning management system. The study materials with each are completed individually in compliance with the instructions accompanying the materials. Instructions for each group will indicate that they will be required to answer comprehension questions regarding what they hear in the multimedia file. They will also be given a survey asking qualitative questions about their own perceptions of their listening comprehension. Participants will be instructed to first listen to the file one time only, completely from start to finish without pausing before accessing the comprehension questions and survey. In addition, they will be told that the beginning of the file will provide an opportunity for them to adjust the volume of the audio to a comfortable listening level. After listening to the file, participants will answer multiple-choice questions about what they heard the speaker say.

Participants will then answer qualitative questions regarding their perceptions of their listening comprehension based on a 6-point Likert Scale. At the end of the survey, all participants will be required to confirm that they accessed the file only once and listened to or viewed it completely from start to finish without pausing. Before beginning any part of the study, they will also be asked to read and agree to a consent form acknowledging that they understand and agree to participation in the study, as well as the use of the data given for the study for research and possible future studies. All data from students will be returned to the proctors of the study anonymously. Any participant who does not agree to terms of the consent form will have any data set submitted marked as unreliable and be omitted completely from the study.

3. Expected Results

Based on the findings of similar studies on listening comprehension, the authors expect that participants who view the video with the speaker not wearing a mask will on average score higher overall in the comprehension section of data collection, compared to the other two groups. In particular, items on the comprehension section that rely on words that sound similar but are formed using visibly different positions of the mouth are expected to have an even higher average of correct responses in this group. Participants viewing the video with the speaker wearing a mask, as well as participants listening to the audio-only file, are expected to have similar results. Both of these groups are expected to have a lower average of correct responses, especially those that rely more heavily on visual cues that are obstructed by mask-wearing. For the qualitative data collected from the survey taken after the test, based on prior research, the authors anticipate responses from all groups that reflect a tendency for listeners to experience a diminished ability to comprehend speakers due to their faces being obstructed by masks.

4. Discussion & Future Applications

It is the authors' opinion that if we are to continue following the practice of wearing face masks in the classroom, it is important to better understand what impact this may have on the quality of the language education that students are provided with. If the results of the study show significant evidence of a negative effect on listening comprehension, it should be the responsibility of educators to consider two questions: First, is there a viable alternative in the classroom to mask-wearing that can allow listeners to pick up on facial visual cues that would otherwise be obstructed? In addition, at what point do the benefits of not wearing a mask in class outweigh the risks inherent in the spread of infection? These are questions that must be addressed not only by instructors but also by the administration which must make decisions for the entire institution.

The authors believe that these questions should be answered objectively by making informed decisions, supported by research and empirical evidence. As such, the authors of this study hope to provide data that can help better determine the answers to these questions. In this way, language programs can take the best course of action moving forward to provide students with the best opportunities to improve their English comprehension skills in oral communication.

5. Limitations

In order to collect data from a large group of students and to ensure the language ability of students was similar across each of the three groups, providing the study materials through the learning

management system was necessary. The main limitation of this is that each student must complete the study individually. Without the presence of a proctor during the playing of the multimedia files, there is a chance that participants may not follow the directions on how to play the multimedia correctly. To minimize this limitation, students are asked to confirm that they were able to successfully follow the instructions, played the file once, and listened or viewed from start to finish without pausing. Any participant who does not check that they did will have their data set marked as unreliable and be omitted from the study.

6. Conclusion

While the need to prevent the spread of disease using masks is understandable, any detrimental side effects of doing so must also be weighed against the benefits carefully. By analyzing both the negative and positive effects through an objective lens and establishing to what degree those effects influence English oral communication, an informed decision can be made for the future of mask-wearing in the classroom. With evidence to support the relationship between mask-wearing and listening comprehension, a more informed discussion can take place on how best to reduce any negative impact of mask-wearing on listening comprehension while balancing it with the need to prevent the spread of disease.

References

Akat, M., & Karataş, K. (2020). Psychological effects of COVID-19 pandemic on society and its reflections on education. *Electronic Turkish Studies*, *15*(4).

Barley, N. (2021). Audio vs. Video Conferencing for Language Learning: Choosing the Right Tool for the Right Job. In *Digital Pedagogies and the Transformation of Language Education* (pp. 97-121). IGI Global.

Bavelas, J. B., & Chovil, N. (2000). Visible acts of meaning: An integrated message model of language in face-to-face dialogue. *Journal of Language and Social Psychology*, *19*(2), 163-194.

Buck, R. W., Savin, V. J., Miller, R. E., & Caul, W. F. (1972). Communication of affect through facial expressions in humans. *Journal of personality and social psychology*, *23*(3), 362.

Clark, K., & Silsbee, S. (2021). An Analysis of the Development of an Online Language Learning Program. *Josai International University Bulletin*, *29*(2), 165-178.

Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. *Sustainability*, *12*(24), 10367.

Giovanelli, E., Valzolgher, C., Gessa, E., Todeschini, M., & Pavani, F. (2021). Unmasking the difficulty of listening to talkers with masks: lessons from the COVID-19 pandemic. *i-Perception*, *12*(2), 2041669521998393.