Changes in Nonverbal Communication in Public Communication Before and During the COVID-19 Pandemic: Literature Review of Scientific Papers for the 2014-2022 Period

Angela Audrey Sutanto[1], Astri Yogatama[2], Liliana[3], Hans Juwiantho[4]
Petra Christian University
Email: [1]angelasutanto07@gmail.com, [2]astri@petra.ac.id, [3]lilian@petra.ac.id, [4]hans.juwiantho@petra.ac.id

Abstract
Nonverbal communication is all messages or all communication cues that are not words or do not use words. The COVID-19 pandemic has changed aspects of non-verbal communication, especially in gestures, paralinguistic, and micro expression in the context of public communication. This research aims to find the differences in nonverbal communication, gestures, paralinguistic, and micro expression before and during the COVID-19 pandemic. The data are from 30 journals with the central theme of non-verbal communication in the context of public communication and containing specific classifications of gestures, paralinguistic, and micro expressions. This research uses the quantitative-descriptive content analysis method. Meanwhile, the theory used in this study is the theory of J. Schneider, D. Börner, P. van Rosmalen & M. Specht (2017) and Vanessa Van Edwards' characteristics of micro expression (2013). Thus, the aspects of nonverbal communication that have changed the most from before and during the COVID-19 pandemic are gestures (upright and calm body position) and paralinguistic (tempo), meanwhile micro expression did not experience significant changes.
Keywords: *Nonverbal communication, public communication, gesture, paralinguistic, micro expression, COVID-19 Pandemic*.

INTRODUCTION

Nonverbal communication encompasses all messages or cues that do not include words (DeVito, 2011; Chotimah, 2017). The sorts of non-verbal communication featured in natural media are separated into three categories: speech, which is part of paralinguistic and deals with how a person delivers messages, such as volume, tempo, and style of language; interaction, which is behavior; and body language. Kinesics includes facial expressions and body (gestures and body postures) movements that occur during communication.

Nonverbal communication is an essential component of communication. According to experts in interpersonal communication studies, 70% of a person's communication is non-verbal, whereas only 30% involves verbal communication, resulting in an 80% acceptance rate for non-verbal communication (Hull, 2016). Wood (2009) also argues that people will trust in non-verbal communication more than only verbal communication. Consequently,

non-verbal communication can be considered one of the most crucial factors that are assessed when someone communicates.

Nonetheless, the COVID-19 (Coronavirus disease) pandemic, which appeared in early January 2020, has affected many facets of human life, including nonverbal communication. The requirement by each country's government to wear masks and maintain a safe distance has drastically transformed nonverbal communication. Recommendations and obligations to wear masks to avoid COVID-19 have impaired regular communication, particularly interpreting someone's nonverbal communication. The usage of a mask will cause a person's mouth and nose to be covered, resulting in a muffled voice and difficulties recognizing voice intonation. In addition, masks that conceal the bottom and center portions of the face make it more challenging to interpret the non-verbal cues of facial expressions (Mheidly et al, 2020).

Aside from that, online communication, which is believed to be more effective and safer during the COVID-19 pandemic, impedes the flow of communication. A study demonstrates that it is more challenging to offer and receive nonverbal communication via Zoom because the communicator must place himself in the center of the camera, nod excessively to be noticed, attempt to gaze at the camera and not at the screen to optimize eye contact, etc. (Bailenson, 2021). Obviously, there are additional distinctions between nonverbal communication before and during the COVID-19 pandemic.

The earlier study, titled "Presentation Trainer: What Experts and Computers Can Tell About Your Non-Verbal Communication," defines the forms of non-verbal communication and determines which ones are appropriate to use and which ones should be avoided in public speaking, or research from 2014 named "Non-verbal communication: the essential complement of oral and written communication," which distinguishes the types of nonverbal communication This study revealed the wide range of nonverbal communication. However, there is no research that examines non-verbal language before and during the COVID-19 pandemic, making it difficult to determine the impact of this shift despite the fact that it is visible in human-to-human communication.

Considering the issues above, researchers became intrigued by comparing non-verbal communication gestures, micro expressions, and paralinguistic before and during the COVID-19 pandemic. This study will therefore attempt to answer the question, "What are the changes in nonverbal communication in public communication before and during the COVID-19 pandemic in scientific papers for the 2014-2022 period".

According to the background, researchers use four theories in this study, nonverbal communication, gesture, paralinguistic, and micro expression. First, nonverbal communication is a communication whose messages are packaged as nonverbal or stimuli, without words, produced by individuals and the use of the environment by humans who have the potential to be senders or receivers. Non-verbal communication occupies a substantial portion. Through nonverbal communication, individuals can conclude a variety

of emotions, including pleasure, hatred, love, longing, and others (Samovar & Porter, 1991; Gantiano, 2019).

Second, gesture is a form of non-verbal communication in the movement of the hands, shoulders, and fingers. Gesture is also a combination of hand form, orientation, and movement of hands, arms, or torso, as well as facial emotions, used to convey a message from someone, either as a substitute for speech or in conjunction with words (Priyadharshni et al., 2013).

Third, paralinguistic is the study of non-verbal aspects of speech processes (verbal communication), such as vocalization, volume, and pitch. In his book Communication Psychology, Jalaludin Rakhmat describes paralinguistic as the use of language symbols to influence interpersonal perception (Rakhmat, 2004). Further discussing paralinguistic, Rakhmat (2004) divides paralinguistic into four components: voice, or the sound quality when the communicator speaks; intonation, or the highs and lows of funds when the communicator speaks; tempo, or the ideal speech rate, which is neither too fast nor too slow; verbal style, or the variety of communicator dialects; and the interaction or behavior of the communicator while communicating.

Fourth, micro expression is a brief (1/15–1/25 seconds) facial expression that can reveal a person's concealed feelings (Li et al., 2013). Expression is typically spontaneous and unconscious. These expressions cannot be copied or controlled, hence attempting to pose a micro expression will result in a different outcome from the genuine micro expression (Li et al., 2013).

In addition, Edwards (2013) described the properties of each Micro expression in his study. He mentioned the following seven micro expressions: surprised is characterized by rising of the eyebrow, the skin behind the eyebrows stretching, straight lines on the forehead, eyes that are so wide that the whites of the eyes are visible at the top and bottom, and an open mouth and teeth without widening the mouth; fear is characterized by eyebrows rising and joining in the middle, wrinkles in the middle of the eyebrows, the upper eye is open but the lower half of the eye is depressed and does not reveal the whites of the eye, and the mouth is open and wide, with a tiny inward fold; disgust is characterized by a wrinkled nose, upper eyelids, a raised lower lip and cheeks, and a line around the bottom of the eye; anger is characterized by glaring eyes, pressed lower eyelids, vertical lines between the eyebrows, pressed and thinned lips, and a projecting jaw, the nose is also often bloated; happiness is characterized by rising cheeks, an open mouth with teeth visible, the corners of the cheeks moving back and forth, wrinkles from the nose and outer lips, a little raised and wrinkled or tense lower eye area, and the formation of crow's feet around the eyes; sadness is characterized by the inner corners of the eyes that rise, the skin behind the eyebrows forming a triangle, and with the inside; lastly hate is categorized by a lifted corner of the mouth.

METHOD
This research uses the quantitative-descriptive content analysis method. This research also employed categorical distinctions as the analysis unit. Units of analysis can be used to describe and conclude texts as part of research content (Atsilah et al., 2018). To collect data for research, researchers began by searching all relevant scientific papers using Google Scholar and the keywords '*Komunikasi nonverbal*', '*komunikasi nonverbal dalam kelas*', '*komunikasi nonverbal dalam* public speaking' 'nonverbal communication', 'gesture in communication', 'nonverbal communication in public speaking', 'nonverbal communication in presentation', 'paralinguistic in nonverbal communication', 'micro expression in nonverbal communication', 'pandemic and nonverbal communication', 'nonverbal communication and covid-19', 'nonverbal communication through mask', 'micro expression and pandemic', 'micro expression and covid 19', 'gesture and pandemic', dan 'paralinguistic and pandemic' published in 2014 – 2020, with a total of 323,106 papers. Researchers then used the technique of purposive sampling to obtain a research population and sample based on two criteria: all published journals that discuss nonverbal communication in the public communication category (public speaking, presentations, etc.) and all scientific papers that contain the classification of gestures, paralinguistic, and micro expression. The minimum sample that researchers targeted was 30 samples. According to Roscoe, the minimum appropriate sample size in research is between 30 to 500 (Sugiyono, 2011). At first, researchers managed to find 15 papers during the COVID-19 pandemic between 2020 to 2022. After that, researchers found the other 15 before the COVID-19 pandemic that met the criteria. Data gathering stopped in 2014 after minimum sample size was completed. These 30 papers eventually become the population of the research.

The quantitative content analysis utilized gestures, paralinguistic, and micro expressions as indicators. The indicators and sub-indicators of gestures and paralinguistic in public speaking are derived from the theories of J. Schneider, D. Börner, P. van Rosmalen, and M. Specht. While the micro expression indicators and sub-indicators are based on the micro expression features by Vanessa Van Edwards. Researchers inserted all the research indicators and sub-indicators into the coding sheet on the Microsoft Excel spreadsheet before coding each journal based on the sub-indicators using documentation techniques manually. If the sub-indicator is present in the sample, it is given the value '1'; otherwise, it is given the value '0'. The reason why researchers used manual coding is that, according to Graaf and Vossen (2013), for smaller samples, in content analysis, it is more efficient and effective to use manual coding than automated coding. Other than that, it is also stated that automated coding can sometimes create a misleading idea in objectivity (Graaf et al., 2013). The data from the coding sheet can then be analyzed using the theories and interpreted to provide descriptive data in the form of narratives, graphs, and tables, after which a conclusion can be reached.

The following provides a more detailed explanation of the indicators and sub-indicators that comprise the coding sheet:

Gestures, including: upright and calm body (G1), body sways a lot (G2), slouch body (G3), body facing the audience (G4), body facing away from the audience (G5), chin up (G6), neck

is body-aligned (neck back) (G7), the neck is bend too forward (G8), straight shoulder (shoulder back) (G9), slouch shoulder (G10), moving hand gestures according to what we say (G11), hands are relaxed next to the body (G12), hands touching hair (G13), hands touching the face (G14), crossing arms (G15), hands grabbing of playing an object G16), hands in pocket (G17), hands behind the body (G20), Feet between shoulder and waist width and firmly on the ground (G21), the feet are swaying a lot from front to back or left to right (G22), feet facing audience (G23), crossing legs (G24), standing on one leg (G25), stand with one foot in front of the other (G26).

Paralinguistic, which includes: speaking at the proper volume (P1), speaking at a volume that is too loud (P2), speaking at a volume that is too low (P3), Accurate pronunciation (P4), pronunciation of many words with errors (P5), pronunciation with numerous 'filler sounds' (P6), using a variety of intonation according to the message (P7), monotonous intonation (P8), speaking at the right tempo (P9), speaking with a fast tempo (P10), speaking with a slow tempo (P11), the use of dialect (P12).

Micro expressions include: eyebrows raised in a circle (M1), straight creases on the forehead (M2), eyes wide open (M3), open mouth and teeth without widening the mouth (M4), eyebrows raised and fused (M5), wrinkles in the middle of the brows (M6), the upper eye is open but the lower eyelid is pressed (M7), the mouth is wide open and slightly folded in (M8), the nose is creased (M9), the upper eyelid is lifted (M10), the lower lip is lifted (M11), the cheeks are raised (M12), the eyes are staring intently (M13), the lower eyelids are pressed (M14), the lips are pressed together and thinned (M15), jaw sticking out (M16), nose sometimes puffed up (M17), cheeks up (M18), mouth open with teeth showing (M19), corners of cheeks back and up (M20), lower eye area slightly raised and wrinkled or tense (M21), crow's feet form around eyes (M22), inner corner of eye rises (M22) M23), lower lip corner (M24), jaw raised (M25), lower lip sticking out (M26), one corner of the lip raised (M27).

Researchers examined the validity and reliability of research instruments. The facial validity of Klaus Krippendorff was used in the process of validity test. Researchers examine relevant papers and books to see if the measuring instrument has been accepted and valid. While the reliability test was conducted by using the Klaus Krippendorff formula, agreement between coders was used to determine the test's validity. In this reliability test, a second coder is required on the condition that they possess cognitive abilities (the ability to pay consistent attention to detail), comprehend the technicalities of the analysis performed, and have the same background, experience, or understanding of the material to be studied (Krippendorff, 2004). Research instrument was examined by the expert as a second coder.

RESULTS & DISCUSSION
Reliability and Validity Test
As stated previously, this study utilized Klaus Krippendorff's dependability test (2004). The reliability will be determined using Krippendorff's alpha coefficient, which shows coder agreement. The reliability scale ranges from 0 to 1. 0 indicates no agreement (unreliable),

while 1 indicates the opposite (perfect reliability). In the Krippendorff method, the reliability rate is separated into 3 groups, below 0.667 is considered unreliable, 0.667 to 0.8 is moderately reliable and above 0.8 is highly reliable (Krippendorff, 2004). Neudorf (2002) further explained that at least 10% of the total study units are units whose reliability could be evaluated.

Two coders were involved in this study (researcher and co-coder). Furthermore, in calculating reliability, researchers used the IBM SPSS Statistics 26 program and then added the kalpha.spss plug-in from Andrew F. Hayes' website, Ph.D. (http://afhayes.com/spss-sas-and-r-macros-and-code.html), to calculate each sub-indicator's reliability.

Table 1. Reliability Test Calculation Results

Gesture	Krippendorff's α	Paralinguistic	Krippendorff's α	Micro-expression	Krippendorff's α
G1	1	P1	0,8081	M1	1
G2	1	P2	0,8081	M2	1
G3	0,8081	P3	1	M3	1
G4	1	P4	0,7912	M4	1
G5	0,8081	P5	1	M5	1
G6	1	P6	1	M6	1
G7	1	P7	0,7467	M7	1
G8	1	P8	1	M8	1
G9	1	P9	0,7912	M9	1
G10	1	P10	1	M10	1
G11	0,7912	P11	0,8081	M11	1
G12	1	P12	1	M12	1
G13	1			M13	0,7467
G14	0,8081			M14	1
G15	0,8081			M15	1
G16	1			M16	1
G17	0,8081			M17	1
G18	1			M18	1
G19	0,8081			M19	0,7912
G20	1			M20	1
G21	1			M21	1
G22	1			M22	1
G23	1			M23	1
G24	0,7912			M24	1
G25	1			M25	1
G26	1			M26	1
				M27	1

Source: Data Collection by Author (2022)

According to table 1, after calculation it can be concluded that the Krippendorff's alpha coefficient of each sub-indicator representing gesture, paralinguistic, and micro expression indicators has achieved a score above 0.6 for 7 sub-indicators, or obtained moderate reliability, and above 0.8 for 58 sub-indicators, or obtained high reliability, all of which are above the minimum reliability coefficient in the Krippendorff formula. Thus, the instrument is reliable.

In addition to conducting a reliability test, researchers employed a face validity test, which examines how well a measuring instrument represents information clearly and sensibly and correlates it with current data (Krippendorff, 2004). Therefore, researchers collected data by reviewing the books and periodicals compiled by the scientific field under study. All gesture, paralinguistic, and micro expression sub-indicators were determined to be valid measurement tools. Gesture and paralinguistic measurement instruments originate from the international journal community, the Journal of Computer Assisted Learning, which is published by the Wiley Education Publishing Network in the United States and has been a reputable publication for many years. All existing journals have been assessed for their validity. In the meantime, the micro expression measurement instrument has been published in the book Captivate: The Science of Succeeding with People by Vanessa Van Edwards, a researcher, writer, and behavioral investigator. The book was published by the international Penguin Publishing Group, which is situated in New York, United States, and is a reputable publisher.

Overall findings

According to figure 1, the gesture sub-indicator with the largest increase before the COVID-19 pandemic (blue graph) was G4, which appeared 14 times (13.33%). G6 and G12 are the sub-indicators with the lowest data only appearing 1 time, at 0.95 %. Several gestures, including G7, G8, G9, G22, G25, and G26 did not appear at all. Meanwhile, during the COVID-19 pandemic (red graph), the G4 sub-indicator had the highest data count, appearing 9 times (31.03%). While the sub-indicators with the lowest data count were G3, G5, G10, G13, G15, G16, and G24 only appeared 1 time (3.45%). G1, G6, G7, G8, G9, G12, G14, G17, G18, G20, G21, G22, G23, G25, and G26 did not appear at all.
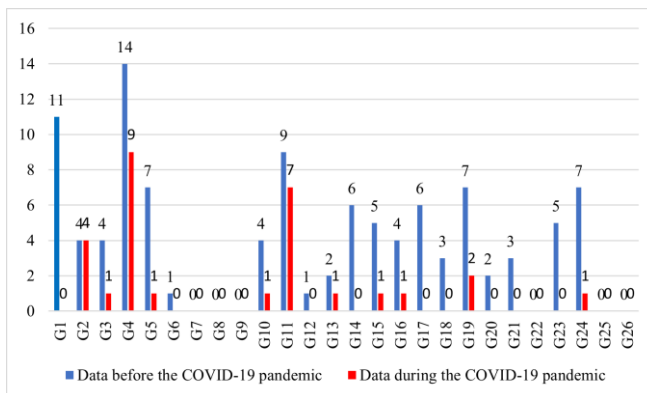

Figure 1. Differences in Gesture before and during the COVID-19 pandemic in Scientific papers 2014-2022 period
Source: Data Collection by Author (2022)

Based on the explanation of figure 1, it can be concluded that there were differences in gesture before and during the COVID-19 pandemic in scientific papers 2014-2022 period. One of the most noticeable changes is found in "upright and calm body (G1) that appeared 11 times from all data." In addition, many important distinctions will be elaborated in the following section.
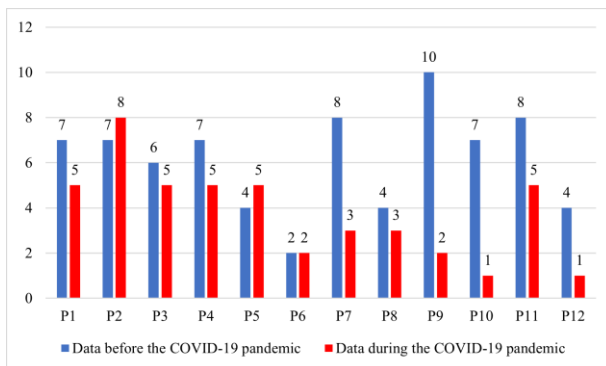

Figure 2. Differences in the Number of Paralinguistic Coding before and during the COVID-19 pandemic
Source: Data Collection by Author (2022)

According to figure 2, the paralinguistic sub-indicator P9 had the highest data count before the COVID-19 pandemic (blue graph), appearing 10 times (13.51%). In contrast, the sub-indicator with the lowest data count, appearing 2 times (2.70%), is P6. In contrast to before the COVID-19 pandemic, graph 4.2 (red graph) shows that during the COVID-19 pandemic the paralinguistic sub-indicator P2 appeared 8 times out of all data. The sub-indicators with the lowest data count were P10 and P12, appearing 1 time (2.22%) each.

Based on the description of figure 2, it can be concluded that there were differences in paralinguistic aspects before and during the COVID-19 pandemic in scientific papers 2014-2022 period. The most major difference comes in the coding 'speaking at the right tempo (P9)'. Apart from that, there are some other differences. The full paralinguistic differences will be discussed in the following discussion.
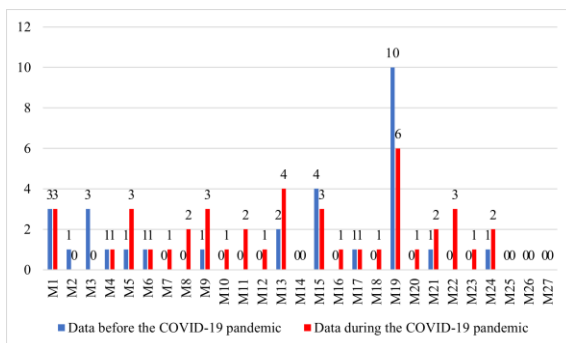

Figure 3. Differences in the Number of Micro Expression Coding before and during the COVID-19 pandemic
Source: Data Collection by Author (2022)

According to figure 3, before the COVID-19 pandemic (blue graph), the M19 as a micro expression sub-indicator had the highest appearance, namely 10 times out of all data (33.33%). While the sub-indicators with the lowest data were, M2, M4, M5, M6, M9, M17, M21, and M24 appeared only 1 time each (3.33%). While several micro expression sub-indicators such as M7, M8, M12, M14, M16, M18, M20, M22, M23, M25, M26, and M27 did not appear at all. Meanwhile, during the COVID-19 pandemic (red graph) above, it can be seen that M19 had the highest data, which appeared 6 times (13.95%). While the sub-indicators with the lowest data were M4, M6, M7, M10, M12, M16, M17, M20, M23, and M26 each appeared only 1 time each (2.33%). Meanwhile, several micro expression sub-indicators such as M2, M3, M14, M18, M25, M26, and M27 did not appear at all. Based on the description of figure 3, it can be concluded that there was a slight difference in the data in micro expression before and during the COVID-19 pandemic in scientific papers 2014-2022 period. This shows that micro expression nonverbal communication did not vary much between before and during the COVID-19 pandemic. However, there are still minor differences, which are explored in the following sections.

Gesture: upright and calm body
G1 represents the most differences in gesture in scientific papers. In journals published before the COVID-19 pandemic, it was discovered that an "upright and calm body" is vital in public communication. According to John, Nagarajan, and Arthi's research (2017), a public speaker must first stand up upright and face the audience. Edwards' (2014) research further on this point by stating that standing upright and calm makes the communicator appear dominant and confident when communicating the information. This demonstrates that 'upright and calm body' is a suggested nonverbal communication gesture when interacting with the public.

It was different though, during the COVID-19 pandemic, according to Dragomir, Fǎrcasiu, and Simon's study (2021), which surveyed 409 Polytechnic students. The University of Timisoara came to the conclusion that one of the causes was that students believed that to bridge the gap generated by online communication or communication with masks, they had to play more gestures with multiple body parts (moving certain body parts or hands). In addition, a study conducted by Saunders, Jackson, and Visram (2021) in the United Kingdom (UK) on the impact of masks on nonverbal communication found that some respondents had to exaggerate body and hand movements in public communication to convey what was meant. As a result of the fact that public communication during the COVID-19 pandemic occurs online or through the usage of masks, various other components of nonverbal communication will be limited. Masks conceal facial expressions from the nose to the lips, which is a form of nonverbal communication that sends emotions to the communicator. Using a mask will result in expressions or things expressed, such as feelings that cannot be clearly transmitted to the message's recipient (public). To compensate for this, the communicator would exaggerate body gestures such as swaying more so that the communicant can get the information clearly. Before the pandemic, 'upright and calm body' was considered the most important thing to do, whereas during a pandemic, 'body sways a lot' is the most effective gesture on public communication.

Gesture: slouch body and shoulders

Another difference in gestures can be seen in the G3 and G10, which appeared four times before the COVID-19 pandemic and one time during the pandemic in scientific papers. Both before and during the pandemic, slouch bodies and shoulders were viewed negatively. Therefore, the difference is not particularly significant. Before the COVID-19 pandemic, a research by John, Nagarajan and Arthi's (2017) stated that slouch bodies and shoulders give the sense that the communicator does not wish to speak with audiences. Mandal's (2014) research also stated that slouchy bodies and shoulders give the impression of someone being angry when delivering the message. However, during the COVID-19, this behavior will increase during public communication. According to research conducted by Real, Carandang, Contreras, and Diokno (2021) on 283 Philippine Junior High School students in Doha, Qatar, 2020-2021, the majority of students felt as if they were slouching when expressing something to the class during online lessons. According to a study published in the International Journal of Physiotherapy, students who spend a significant amount of time in front of a computer or laptop often slouch their body and shoulders because they utilize improper equipment (non-ergonomic chairs or tables) and there is no alignment between the laptop and the user (Hussain et al., 2015).

This indicates that, despite the fact that 'slouch body and shoulders' is a gesture that is not encouraged in public communication before or during the COVID-19 pandemic in scientific papers. During the COVID-19 pandemic, however, it is likely that these gestures will be used more frequently in public communication because, during online public communication communicator usually sits for an extended period of time, using non ergonomic chairs or tables, and sits out of alignment with a laptop makes it easier for the body to slouch.

Gesture: moving hand gestures according to what we say

Aside from that, another distinction between gestures before and after the COVID-19 pandemic is that G11 appeared 9 times before and 7 times after the pandemic in scientific papers. This difference is also not quite significant because moving hand gestures according to what we say, in both the data before and after the COVID-19 pandemic is considered a good thing and should be done. According to Aisyah (2018), a public speaker who moves his or her hands according to what is being said during public speaking can make the audience understand more about what the public speaker is talking about. In support of this claim, Mandal (2014) claims that hand gestures can generally be used by public speakers to indicate emotions, open or close a discourse, and clarify what is being said. In classroom communication, teachers usually use hand gestures to clarify verbal communication such as when they want to point to an object, or gestures that imply silence, call, or say something (Baroona, 2019). This is done so that students can focus and pay attention to the teacher's explanation and better understand the meaning of what the teacher explains (Sugiarno & Ginting, 2019).

The difference is that during the COVID-19 pandemic, these gestures became even more important, in Dragomir's research, Fărcasiu and Simon concluded one of the points was that students felt that in communicating they had to play more gestures with several limbs

(moving the body or hands) to bridge the gap caused by online communication or communication with masks so that messages can be delivered better (2021). In addition, Saunders, Jackson, and Visram's research showed that some respondents had to make exaggerated hand gestures when communicating with the public while wearing masks so that the audience could understand what was being said (2021).

The difference is that hand gestures to move according to what we said should be doubled whether communicating online or using masks during the COVID-19 pandemic. It will fill the communication gaps (online communication and the usage of masks) that emerge during pandemic, so messages convey more effectively.

Gesture: hands touching the face
Another significant difference between the gestures before and during the COVID-19 pandemic in public communication is G14, which appeared 6 times the pandemic but none during pandemic in scientific papers. Before the COVID-19 pandemic, the gesture of 'hands touching the face' was discouraged because, according to Mandal (2014), a public speaker touching his or her face while talking would appear embarrassed and/or hesitant about what he was saying. Moreover, according to research by Peleckis, Peleckiene, and Polajeva (2016), a public speaker will appear to avoid the audience if he constantly touches his or her face while speaking. During the COVID-19 pandemic, though, this data could not be found, due to advice from the World Health Organization (WHO) (2020), that stated touching your eyes, nose, and mouth during the COVID-19 pandemic is not advised to prevent the spread of the virus. This results in no one covering their face during COVID-19 public communication to avoid spreading the COVID-19 virus.

From this, it can be concluded that before the COVID-19 pandemic, 'hands touching the face' was not recommended to use because doing so would give the impression that the communicator is shy, hesitant in conveying the message or trying to distance themselves from the audience. During the COVID-19 pandemic, this gesture was omitted from public communication journals due to WHO rules that prohibit touching the eyes, nose, or mouth.

Paralinguistic: speaking in the right tempo
From the perspective of paralinguistic, the most significant difference is in P9, which appeared 10 times before the COVID-19 pandemic and 2 during the pandemic in scientific papers. Before the COVID-19 pandemic, the right speaking tempo was essential because speaking at an appropriate tempo was a factor in determining a public speaker's authority. It also gave the impression that a public speaker had high credibility (Khotimah, 2019). Normal speech tempo differs in each source of the research sample, with some stating that 100 words per minute (Edwards, 2014), 111 to 140 words per minute (Winoto et al., 2017), and up to 150 words per minute (Mary, 2019). From this, it can be estimated that the ideal communication's tempo is between 100 and 150 words per minute. A fast speaking tempo gives the impression that the public speaker is nervous, not serious about conveying the message, tense, angry, and afraid. Whereas a slow speaking tempo gives the idea that the public speaker does not know what to say, shy, dull, and will bore the audience, thus makes communication less effective (Mary, 2019, Winoto et al., 2017).

However, this is different during the COVID-19 pandemic. The use of masks to cover the mouth and nose will make communication more difficult, as the sound will be less precise than without a mask. Consequently, it is recommended to talk slowly in public communication during the COVID-19 pandemic. According to research by Mheidly, Fares, Zalzale, and Fares (2020), during the COVID-19 pandemic, a communicator must be able to talk slowly enough to be adequately heard while wearing a mask to maintain good communication. In support of this claim is the research conducted by Dragomir, Fărcasiu, and Simon (2021), which concluded, among other things, that students felt compelled to talk more slowly to compensate for the shortcomings produced by online communication or communication while using a mask. For communication to flow smoothly during the COVID-19 pandemic, the speaker's tempo has to be slower than before the pandemic. In addition, a study conducted by Saunders, Jackson, and Visram (2021) revealed that a number of respondents stated that, when interacting in public, they had to speak more slowly, particularly if the venue or space in which they were speaking was vast, as the audience would otherwise be unable to hear them.

Thus, it can be concluded 100 to 150 words per minute was an appropriate tempo before the COVID-19 pandemic. But during the pandemic the speaking tempo must be done slower than that for online communication and a covered mouth by mask.

Paralinguistic: Volume
The speaking volume as part of paralinguistic has a difference before and during the pandemic in scientific papers. Mary (2019) believes it is essential for a public speaker to be able to adjust the volume appropriately before the COVID-19 pandemic. Speaking too loudly conveys the message that the speaker is angry and it disturbs the audience's ability to comprehend the message's meaning. Contrary, speaking too quietly conveys the message that the speaker lacks confidence, and messages cannot be fully received because they are not heard. Moreover, speaking appropriately will express that a public speaker is authoritative and credible (Khotimah, 2019).

During the COVID-19 pandemic, an ordinary medical mask can reduce the speaker's volume by 3 to 4 dB (decibels), while a tighter mask like the N95 can lower the speaker's volume by as much as 12 dB. Therefore, public speakers must generally increase their volume to account for the reduced volume induced by masks (Mheidly et al., 2020). There is a connection between volume variation and face micro expression. Wearing masks causes the restriction of facial emotions from the middle of the nose to the lips. Meanwhile, facial expressions are crucial because they are one of the centers of human expressions, which generally convey the communicator's emotions and nonverbal to the public. By wearing a mask, this will conceal communicator emotions to others. Louder volume will help communicators to convey emotions from a covered nose and mouth (Dragomir et al., 2021). A public speaker must boost his or her voice volume by 15% for the audience to hear him clearly in online communication (Baileson, 2021). Evidence of this statement can be seen in research belonging to Saunders, Jackson, and Visram (2020) which examined the impact of wearing masks on nonverbal communication in the United Kingdom (UK). Some

respondents admitted that they had to speak at a very loud volume (shouting level) when speaking to audiences to be heard.

Thus, the volume of sound must be just appropriate while speaking to the public (not too loud or soft) before the COVID-19 pandemic. During the COVID-19 pandemic, the use of masks that conceal the voice and facial emotions makes communication more difficult but may be solved by speaking louder to the public.

Paralinguistic: Accurate Pronunciation
In addition, the paralinguistic difference between before and during the COVID-19 pandemic is P4, which appeared 7 times before pandemic and 5 times during the COVID-19 pandemic out of all data in scientific papers. Before and during the COVID-19 pandemic, accurate pronunciation was essential for effective public communication. Communicators must be able to choose the right words, pronounce the words correctly according to the *Ejaan Yang Disempurnakan* (EYD) (Asiyah, 2018). According to Sheth (2017), a public speaker must talk with accurate pronunciation of words that adhere to grammatical rules, as this is one of the criteria for judging a public speaker's competence. A public speaker who speaks with numerous grammatical errors and filler noises would appear ignorant and uninterested in the message given to the audience (Mary, 2019).

During the COVID-19 pandemic, a presenter must convey messages with accurate and clear pronunciation so that the audience can understand the contents of the presentation (Real et al., 2021; Riskiati et al., 2021). However, using a mask covering the mouth made it more difficult for communicators to pronounce words accurately. Research conducted by Saunders, Jackson, and Visram (2021), found respondents admitted that some communicators could not be heard speaking clearly and accurately when wearing masks, and if they became communicators in public communication, they were forced to speak more carefully and as briefly as possible so that the pronunciation is clear and accurate for the audience. The conclusion of Dragomir, Fărtasiu, and Simon's (2021) show that students believed they needed to be more careful with their pronunciation and speak more clearly so that the audience could hear them. Therefore, it may be argued that accurate pronunciation is even more crucial during the COVID-19 pandemic than it was before to facilitate more efficient communication.

Paralinguistic: Using a variety of intonation according to the message
Another distinction between paralinguistic before and during the COVID-19 pandemic is in P7, which appeared 8 times before the pandemic and 3 during the pandemic in scientific papers. Before and during the pandemic, it was advised that varied intonations should be used based on the message while interacting with the public. Edwards says that it is crucial for public speakers to use a diversity of intonations while communicating with the public, as monotonous intonation will cause the listener to become drowsy (2014). Mary also noted that to manage conversational communication, a presenter must be able to employ varying intonation depending on the content given, such as differentiating tone when providing material and questions (2019).

However, communication using a mask that covers the nose and mouth as part of nonverbal communication during the COVID-19 pandemic is problematic. Since it is limited, it is necessary to make an effort to compensate for the loss of this aspect; one approach to do so is to use a more diverse expression. According to research conducted by Saunders, Jackson, and Visram, respondents stated they had to employ more expressive intonation than usual when speaking in public (2021). Therefore, it can be concluded that in public communication during COVID-19, aspects of various intonations are something that is recommended.

Micro expression

As described previously, none of the micro expression sub-indicators show a significant difference. Before the COVID-19 pandemic, however, all micro expressions shown by communicators during public communication were visible to the audience. During the COVID-19 pandemic, communication using the mask correctly would cover half of the face (around the nose to mouth), making it difficult for the audience to see the communicator's facial expressions (Mheidly et al., 2020). So, the communicator must continue to use the other half of the face that are not covered by a mask, such as the eyes or eyebrows, which must be accentuated so that the message is appropriately delivered to the audience (Dragomir et al., 2021).

Analysis

As discussed earlier, several aspects of nonverbal gesture, paralinguistic, and micro expression changed both before and during the COVID-19 pandemic in scientific papers. According to researchers, this change has significantly impacted the criteria for positive and negative nonverbal communication in public communication. The standards before the COVID-19 pandemic were rigid from the past and have not changed significantly, such as the body having to be upright and calm, the appropriate tempo of the voice, etc. (more details in table 2). During the COVID-19 pandemic, however, the use of masks, social distancing, and online communication altered these decades-old standards of nonverbal communication. To accommodate the COVID-19 circumstance, a new standard of non-verbal communication was created and universally recognized. Nonverbal communication standards are no longer inflexible but adaptable to the situation. Due to changes in other conditions, there may be additional criteria in the future.

Table 2. Changes in Nonverbal Communication's Aspects Before and During the COVID-19 Pandemic

Changes	Before the COVID-19 Pandemic	During the COVID-19 Pandemic
Body Posture	Upright and calm body was recommended and the body sways a lot was not recommended	Body sways a lot was done to fill the communication gaps and upright and calm body was no longer valid
Slouch body and shoulders	Not recommended and rarely done in public communication	Not recommended but happened more frequently in public communication

Moving hand gestures according to what we say	Recommended, helped in ensuring an effective communication	Should be doubled to fill the communication gaps
Hands touching the face	Not recommended, public speaker would look embarrassed or hesitant	Not recommended, to prevent the spread of COVID-19 virus
Volume	Proper volume was recommended	Louder volume was recommended
Pronunciation	Accurate pronunciation was recommended	Accurate pronunciation was more crucial to facilitate more efficient communication
Intonation	Various intonation according to the message is recommended	Intonation should be more varied
Tempo	Recommended tempo when speaking was 100-150 words per minute	Recommended tempo when speaking was slower than 100-150 words per minute
Micro expression	Could be practiced as usual, visible to the audience	Must showed and accentuated parts of the face that was not covered by mask (eye or eyebrows)

Source: Data Collection by Author (2022)

In addition, nonverbal communication's aspects have benefited from the COVID-19 pandemic. Before COVID-19, 'hands holding face' was viewed negatively and was not recommended; yet, communicators continue to do it out of habit, accident, and so on. The COVID-19 pandemic, which encourages people to avoid touching their faces to prevent the spread of the virus, makes it simpler to ignore this part of nonverbal communication, which should not be employed in public communication.

However, the COVID-19 pandemic has also negatively affected aspects of nonverbal communication, especially in public communication. Using a mask that extends from the nose to the lips for communication renders certain micro expressions invisible. This diminishes the emotional bond between the communicator and the audience. It will be difficult for the communicator to convey his or her emotions to the communicant. The communicator must use extra effort to transmit this feeling through other aspects of nonverbal communication, which impedes effective communication. Other than that, online communication sometimes allows communicators to slouch their bodies and shoulders more than they should. This is because during online public communication communicator usually sits for an extended period of time, using non ergonomic chairs or tables, and sits out of alignment with a laptop and as it has already been explained this is one of the gesture that should not been done in public communication because it implied that the communicator does not want to speak to the public.

CONCLUSION

Based on the results of findings and the subsequent discussion, there are differences between the gestures, paralinguistic, and micro expressions used in public communication before and during the COVID-19 pandemic. The most significant difference in gestures lies in changes in body position. Before the pandemic, upright and calm gestures made by communicators were considered positive and the body sways a lot was considered negative. However, during the COVID-19 pandemic, swaying was viewed favorably. Other differences are that the body and shoulders slouch more frequently during the COVID-19 pandemic compared to before the COVID-19 pandemic, and hand gestures to move according to what we said should be performed more regularly during the COVID-19 pandemic.

The most major paralinguistic change has to do with tempo. Whereas before the COVID-19 pandemic it was advised that communicators speak at an appropriate tempo of 100 to 150 words per minute, during the COVID-19 pandemic it was necessary to speak more slowly. During the COVID-19 pandemic, communicators must also use a louder voice (volume), a more varied intonation, and a more accurate pronunciation compared to before the COVID-19 pandemic.

Finally, in terms of public communication, there were no notable changes in micro expression before and during the COVID-19 pandemic. During the COVID-19 pandemic, however, it was necessary for communicators to accentuate other facial features, such as eyebrows or eyes, to convey their emotions to the communicant.

REFERENCES

Asiyah, S. (2018). Implementasi Komunikasi verbal dan non verbal dalam kegiatan public speaking santri di pondok pesantren darul falah amsilati putri bangsri jepara. *Jurnal An-Nida 10*(2), 153-165. http://eprints.walisongo.ac.id/id/eprint/8680/

Atsilah, A., Utami, Y. S. & Tripambudi, S. (2018). Public offcial's personal branding on social media: content Analysis on DediMulyadi fan page timeline on october 2017. *The Indonesian Journal of Communication Studies, 11*(1), 52-60. https://doi.org/10.31315/ijcs.v11i1

Bailenson, J. N. (2021). Nonverbal overload: A theoretical argument for the causes of Zoom fatigue. *Technology, Mind, and Behavior*, *2*(1). https://doi.org/10.1037/tmb0000030

Baroona, P. (2019). The Impact Non-Verbal Communication the Learning Process. *Journal of Education, Linguistics, Literature, and Language Teaching, 2*(2). https://ejurnalunsam.id/index.php/ELLITE/article/view/1738.

Chotimah, C. (2017). *Strategi komunikasi lembaga pendidikan dengan masyarakat*. Tulungagung: IAIN Tulungagung Press

DeVito, J. A. (2011). *Komunikasi antarmanusia*. Tangerang Selatan: Karisma Publishing.

Dragomir, G. M., Fărcaşiu, M. A., & Şimon, S. (2021). Students' perceptions of verbal and non-verbal communication behaviors during and after the covid-19 pandemic. *Applied Sciences (Switzerland)*, *11*(18). https://doi.org/10.3390/app11188282

Edwards, P. N. (2014). *How to give an academic talk, v5.2*. Michigan: University of Michigan

Edwards, V. V. (2013). *Captivate: The science of suceeding with people*. New York: Penguin Publishing Group

Gantiano, H. (2019). Fenomena facebook sebagai sarana komunikasi sosial. *Dharma Duta 15*(1). https://doi.org/10.33363/dd.v15i1.163

de Graaf, R., & van der Vossen, R. (2013). Bits versus brains in content analysis. Comparing the advantages and

disadvantages of manual and automated methods for content analysis. *Communications*, *38*(4), 433–443. https://doi.org/10.1515/commun-2013-0025

Hull, R. H. (2016). The art of nonverbal communication in practice. *The Hearing Journal, 69*(5), 22-24. https://doi.org/10.1097/01.HJ.0000483270.59643.cc

Hussain, et al. (2015). Awareness of good posture and computer ergonomics among medical students of ISRA university. *International Journal of Physiotheraphy, 2*(6), 987-991. https://doi.org/10.15621/ijphy/2015/v2i6/80758

John, A. D., Nagarajan, G. & Arthi, M. (2017). Non verbal communication in public speaking. *International Journal of Research in Humanities, Arts and Literature, 5*(2), 97-100. www.impactjournals.us

Khotimah, I. H. (2019). *Komunikasi nonverbal dalam diklat*. Madura: Institut Agama Islam Negeri Madura

Krippendorff, K. (2004). *Content analysis: an introduction to its methodology*. New York: Sage Publication.

Li, X., Pfister, T., Huang, X., Zhao, G., & Pietikainen, M. (2013, April). *A spontaneous micro-expression database: Inducement, collection and baseline. Automatic Face and Gesture Recognition (FG), 2013 10th IEEE International Conference and Workshops on (pp. 1-6)*. IEEE. https://www.computer.org/csdl/proceedings/fg/2013/5545/00/06553717.pdf

Mandal, F. B. (2014). Nonverbal communication in human. *Journal of Human Behavior in the Social Environment, 24*(4), 417-421. https://doi.org/10.1080/10911359.2013.831288

Mary, T. H. (2019). Non-verbal communication. India: Pandit Deendayal Energy University

Mheidly, N., Fares, M. Y., Zalzale, H. & Fares, J. (2020). Effect of face masks on interpersonal communication during the COVID-19 pandemic. *Frontiers in Public Health, 8*. https://doi.org/10.3389/fpubh.2020.582191.

Peleckis, K., Peleckiene, V., & Polajeva, T. (2016). Towards sustainable entrepreneurship: role of nonverbal communication in business negotiations. *Journal of Entrepreneurship and Sustainability Issues, 4*(2), 228-240. https://doi.org/10.9770/jesi.2016.4.2(10)

Priyadharshni, V., & Anand, M. S. (2013). Hand gestur recognition system using hybrid technology for hard of hearing community, *International Journal of Enginering*. http://ww.thetic.in/index.php/ijemcs/article/view.pdf

Rakhmat, J. (2004). *Psikologi Komunikasi*. Bandung: PT. Remaja Rosdakarya

Real, J. A. B., Carandang, M. A. D., Contreras, A. G. L., Diokno, P. C. J. (2021). The perceived effects of using nonverbal language to the online communication of the Junior High School students. *International Journal of Research Publication, 73*(1), 11-22. https://doi.org/10.47119/IJRP100731320211823

Riskiati, Noni, N. & Jabu, B. (2021). *Teacher's verbal and nonverbal communication in online EFL class* [Thesis, Universitas Negeri Makassar]. http://eprints.unm.ac.id/20962/

Samovar, L. A., & Porter, R. E. (1991). *Communication between culture*. California: Wadsworth.

Saunders, G. A., Jackson, I. R. & Vistram, A. S. (2021). Impacts of face coverings on communication: an indirect impact of COVID-19. *International Journal Of Audiology, 60*(7), 495-506. https://doi.org/10.1080/14992027.2020.1851401

Schneider, J., Börner, D., van Rosmalen, P., & Specht, M. (2017). Presentation Trainer: what experts and computers can tell about your nonverbal communication. *Journal of Computer Assisted Learning*, *33*(2), 164–177. https://doi.org/10.1111/jcal.12175

Sheth, T. (2017). Non-verbal communication: A significant aspect of proficient occupation. *International Journal of Humanities and Social Science, 22*(11), 69-72. https://doi.org/10.9790/0837-2211066972

Sugiarno, S., & Ginting, R. (2019). Komunikasi nonverbal guru dalam meningkatkan prestasi belajar siswa di SMP Muhammadiyah 7 Medan. *Persepsi: Communication Journal, 2*(1), 1-19. https://doi.org/10.30596%2Fpersepsi.v2i1.3914

Sugiyono. (2011). *Metode penelitian kuantitatif kualitatif dan R&D*. Bandung: Afabeta

Winoto, Y., Yusuf, P. M. & Sukaesih. (2017). Memahami aspek paralinguistik dalam kegiatan penyuluhan perpustakaan. *Edulib: Journal Of Library Information Science, 7*(2), 60-73. https://doi.org/10.17509/edulib.v7i2.9383

Wood, J. T. (2009). *Gendered lives: Communication, gender, and culture*. USA: The University of North Carolina

World Health Organization (WHO). (2019). *Advice for the public: Coronavirus disease (COVID-19)*. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public