Exploring the Impact of Computer-mediated Communication Modes on Communication Quality and the Role of Social Anxiety as a Moderator

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Technology Statement

The website Thesaurus and the AI tool ChatGPT were used to find synonyms for words. Microsoft Word was used to help with grammar and spelling in the text and DeepL was used to translate the questionnaire from Dutch to Englisch. Thereby, the AI tool ChatGPT was used to help formulate some questions in the questionnaire and for some steps in the analyses in the program SPSS. No tools were used to generate the text in this thesis. By submitting my thesis for assessment, I hereby confirm that the thesis is my own intellectual property and that ideas as well as language from other sources have been properly cited. All quotes and sourced information have been properly identifiable as such and I have disclosed any technology that I have used in the writing process.

Abstract

Communication is part of our everyday lives and for a large part happens online, where connecting and communicating with each other is made easier through different platforms and with different modes, i.e. having a conversation through Zoom with a video element. However, communication online is not that easy for everyone, e.g., people with social anxiety can struggle with communication, which can influence the quality of communication. Communication quality is important for relationships between people and carrying out daily tasks, which makes it important to have communication of high quality. The study therefore focusses on, if modes of CMC (Zoom audio call with or without video) influences communication quality, and how social anxiety moderates this relationship. Thereby, age was taken into account as an additional exploration, because not much research has been done about the difference in phone use, regarding calling, between different generations. To research this, an experiment was done amongst dyads, born between 1946 and 2012. The experiment was a 2 (Zoom call with video vs. Zoom call without video) x 1 (communication quality) between-subjects design with a continuous moderator (social anxiety). The participants (n = 68) were assigned to one of the conditions and needed to fill in a questionnaire, combined with a conversation via Zoom. Multiple regression analyses were performed to test the formed hypotheses. The results showed no significant effects for CMC modes playing a role in communication quality or for social anxiety moderating this relationship. Thereby, also no significant results were found regarding the different generations. These results do provide several prospects for future research.

Keywords: Communication Quality, Mode of CMC, Social Anxiety, Zoom

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Introduction

Communication in this interconnected world is part of our everyday life (Liu et al., 2010). Having clear, responsive and comfortable communication is important for interactions of high quality (Ibid.). Communication quality is an important factor for relationships, for example it can have a positive impact on the intimacy between people (Emmers-Sommer, 2004). Communication quality has been defined by three components of how people perceive communication quality, namely: clarity, responsiveness and comfort (Liu et al., 2010). When these concepts are met in communication, the perceived quality will be higher than when the conversation is not clear, responsive and comfortable (Ibid.). Online communication methods keep evolving, especially since the COVID-19 pandemic gave rise to remote working and interaction, it becomes more important to understand communication quality within computer-mediated environments, since the components of communication quality, clarity, responsiveness and comfort can be influenced by computer-mediated environments, due to the shortage of non-verbal cues and instant feedback (Blanchard, 2021; Ho & McLeod, 2008).

In computer-mediated communication (CMC) there are many ways to communicate, for example with tools like Microsoft Teams, Zoom and Facetime (Osler & Zahavi, 2022). When having a conversation via an online tool, like Zoom, there are video, audio and text modes. These modes have different pros and cons for people, which can result in differences in communication quality, e.g., feeling more involved in a video mode or not feel as comfortable when not being able to see someone's face in an audio-only mode (Alim et al., 2022; Sprecher, 2014; Tang & Isaacs, 1992). These different modes in digital communication platforms might influence the perceptions of clarity, responsiveness and comfort amongst people, e.g. when the video element can bring more comfort for people, this can improve communication quality (Krouwel et al., 2019; Liu et al., 2010).

What might also influence communication quality is social anxiety, which previous research does not consider, despite the fact that the transition to CMC, with its various communication methods, may not be equally easy for everyone (Sprecher, 2014). Being socially anxious can impact how someone functions and interacts with others, which can make it difficult to participate in CMC and reach a high quality of communication (Wang et al., 2012; Reid & Reid, 2007; Mattick & Clarke, 1998). So, it is important to see how being anxious has an impact on communication quality in different modes of CMC. When experiencing social anxiety, an audio call might be beneficial, as opposed to a video call, since people have better communication quality when fewer non-verbal cues are present (Angelini & Gini, 2023). On the other hand, people who do not experience social anxiety tend to have a better communication quality with a video call (Ibid.). When it is clear, how the communication quality of socially anxious people is influenced, it becomes possible to adjust to this way of communicating, for example by changing the communication mode when meeting with a socially anxious person, and result in better communication quality (Sprecher, 2014). This shows the significant role of the interlocutors' social anxiety in communication.

Another factor that is not considered in previous research regarding different modes of CMC and communication quality is age, which could influence the preference people experience for a mode of CMC and therefore impact their perception of communication quality. The older generations, like the Baby Boomers (born between 1946 and 1964) and Generation X (born between 1965 and 1979) seem to like more direct forms of contact, like video over audio-only, than Generation Y (born between 1980 and 1994) and Z (born between 1995 and 2012), who prefer the communication mode to be textual (Ie et al., 2020). Thereby, it seems to be harder for the older generations to use online communication which could influence their perception of communication quality (Kim & Feng, 2021). Since this has not been researched before, it would be interesting to do exploratory research on the age factor

and explore if the stereotypes about older generations not knowing how CMC works could be refuted.

We know that CMC became a much bigger part of our lives and that it has different aspects. However, we are not yet sure how these different aspects of CMC can influence our communication quality, and how social anxiety will influence communication quality. With the rise of online communication it is important to understand the concepts regarding online communication, to have a broader spectrum of research and to understand how it can benefit people that experience social anxiety. Therefore the following research question was formulated: To what extent do modes of CMC (Zoom audio call with or without video) influence communication quality, and how does social anxiety moderate this relationship?

Theoretical Framework

Communication Quality

Having communication of high quality is important to maintain good relationships with people (Petrič, 2014). People that perceive the communication quality of conversations as higher will be more pleased with a conversation, which will lead to more happiness than when having low quality communication (Milek et al., 2018; Raman et al., 2023). Being content about a conversation and experiencing more happiness because of this, will be positive for one's state of mind (Mehl et al, 2010; Raman et al., 2023).

Given the importance of communication quality on relationships and well-being, understanding the concept is crucial. Communication quality cannot be defined by just one definition as it is a concept that knows multiple dimensions and interpretations. For example, it has been defined by the components: positive, intimate and in control, where the three components play their own part in the perception of communication quality (Montgomery, 1988 in Emmers-Sommer, 2004). Positive, refers to a conversation happening in a supportive manner, where agreement is present (Ibid.). Intimate, refers to people sharing information

about themselves (Ibid.). Last, in control, refers to being able to manage a conversation (Ibid.). These components are suitable to predict how satisfied people are in their relationships with others. Another example, it has also been defined by the components: completeness, timely, accurate, and credible, where the quality of communication is perceived as higher when the conversation contains these components (Mohr & Sohi, 1995; O'Reilly, 1982). The components of this definition are focussed on satisfaction with the communication instead of the relationship with others. Although it is important to keep the different interpretations of communication quality in mind for this research, the focus lies on the experience of communication quality of the conversation itself. The definition of Montgomery (in Emmers-Sommer, 2004) is less fitted for the current study, since it is not focussed on short interactions, e.g. the component intimacy will not fit the current study, since the participants will only have a 5-minute conversation, after which they need to access their perceived communication quality. Thereby, the definition of O'Reilly (1982) and Mohr and Sohi (1995) contains components that are somewhat more focussed on a formal conversation instead of the informal Zoom conversation that the participants will have, e.g., the component completeness, will be more important in a formal conversation where all the information needs to be shared, which is not the case in the informal Zoom conversation in the current study.

The conceptualization of communication quality that is followed in this research is the one that Liu et al. (2010) proposed in their studies. This study shows the conceptualization of quality of communication experience (QCE) and consists of three dimensions, namely: clarity, responsiveness and comfort. Clarity, refers to how well people understand each other (Liu et al., 2010). Responsiveness refers to the behaviour of people in a conversation, like how well people coordinate and respond in a conversation (Ibid.). Lastly, comfort is about how easy and pleasant someone feels in a conversation (Ibid.). This results in communication

being experienced as high of quality when the conversation is clear, when the conversation contains quick and smooth responses and when a high level of comfort is experienced. This conceptualization is chosen because compared to the conceptualizations of Montgomery (in Emmers-Sommers, 2004), Mohr and Sohi (1995) and O'Reilly (1982), it focusses more on the quality and length of the informal conversation participants will have in the current study. In this research it is important to know if people feel comfortable in the conversation and how different the comfort is between different modes of CMC.

Modes of CMC

Since people are increasingly communicating through online platforms, it is also important to perceive the online communication as communication of high quality. However, online communication is different from face-to-face communication, since face-to-face communication seems to have more non-verbal cues, a greater feeling of warmth and seems to make is easier to engage than in online communication (Lee et al., 2010). Because of this difference, it could also impact how people perceive the online communication as opposed to face-to-face communication, like perceiving communication quality in a different way. Communicating online, when the quality is perceived as high, can help with preserving friendships, give us a feeling of community and help us form ideas about ourselves and others (Petrič, 2014). However, even in online communication there can be a difference in quality between different modes, like audio or video modes. The modes in online communication also differ from each other and so the communication quality might also differ between the different modes in online communication, e.g., a video mode will contain more non-verbal cues than an audio-only mode.

Following Liu et al. (2010), where the components clarity, responsiveness and comfort play a part, we could expect that it would be different between the modes of CMC. Clarity is important for online communication, but can be affected by modes, as there might be factors

that influence the ease for how clarity can be reached, it is for example important to also be able to share emotions with each other through demonstration or symbolization, which could more easily be done in the video mode compared to the audio-only mode (Liu et al., 2010; Tang & Isaacs, 1992; Axley, 1984; Pearce & Cronen, 1980). Responsiveness, can also be expected to differ between the different modes on CMC. When having a conversation without video, people might be more tended to multitask, whilst a video mode requires more attention and makes it easier for people to be involved (Alim et al., 2022; Tang & Isaacs, 1992). For comfort, it might be hard to feel comfortable when talking online, but there could be a difference between being able to see each other and only being able to hear one another (Liu et al., 2010). When only hearing the other person, the comfort level might not be as high as when being able to see the other persons facial expression and movements (Tang & Isaacs, 1992). It is important that in online communication people experience clarity, responsiveness and comfort, and it is of interest in which way they experience the most of these components (Liu et al., 2010).

The aspects, like video and audio, that are present in CMC, gives us the idea that we can have more interactivity than for example with only text. The principle of interactivity states that the amount of interactivity that is possible on CMC has an influence on the level of communication quality (Burgoon et al., 2002). When more cues are available, such as being able to read one's face via a video element, the richer the media becomes and the higher the interactivity is. The richer a medium is, the better people will achieve their goals for the communication, in this case the communication quality (Sprecher, 2014).

To sum up, online communication with video and audio elements is a richer medium than online communication with an audio-only mode. Therefore, it is likely that people can use it more easily to communicate, since richer media lets people achieve their goals for the communication more easily (Sprecher, 2014). People have more options to make themselves

clear and see when the other person is done talking, which could lead to communication of higher quality, meaning experiencing clarity, responsiveness and comfort in the conversation (Liu et al., 2010). These findings result in the following hypothesis:

H1: Conversations via Zoom audio calls with video result in higher communication quality compared to Zoom audio calls without video

Social Anxiety

People with social anxiety can have a hard time interacting with people, which can make it difficult to participate in CMC (Mattick & Clarke, 1998; Wang et al., 2012). To understand this better, it is important to examine the concept of anxiety itself. Overall, anxiety is seen as an uneasy feeling to an undefined threat (Friedman & Bendas-Jacob, 1997; Taylor & Arnow, 1988). People often worry a lot when experiencing anxiety (Friedman & Bendas-Jacob, 1997; Taylor & Arnow, 1988). People can experience anxiety either in general or about specific situations, where trait anxiety is experiencing an uneasy feeling that occurs often and many situations, e.g., making phone calls and state anxiety, on the other hand, is when someone feels anxious regarding a specific event, e.g., when giving a presentation (Endler & Kocovski, 2001; Krohne & Hindel, 1988). For this research we focus on social anxiety, which is a trait, where repeated fear for social situations is central (Mattick & Clarke, 1998).

Socially anxious people tend to function differently than the general population (Mattick & Clarke, 1998). They often avoid social situations, struggle emotionally or will experience things like sweating, blushing or a raising heartbeat when being in a social setting (Stein & Stein, 2008). This can stand in the way of how people communicate and therefore might impact the perceived communication quality (Archbell et al., 2021). Social anxiety is the anxiety someone feels in social interactions, a person experiences a fear of acting or being seen as embarrassing (Taylor & Arnow, 1988). The social anxiety can present itself in different degrees. Some people are clinically diagnosed and experience more problems

socially, regarding the anxiety than other self-diagnosed socially anxious people when having to meet someone new (Ibid.).

It is a frightening thing to talk to someone when dealing with a high level of social anxiety, whether this is online or offline (Pierce, 2009). When focussing on online communication, people with social anxiety would often rather not talk to people via voice calls but prefer texting (Reid & Reid, 2007). Being afraid to talk to someone in a voice call might negatively impact perceived communication quality. Therefore, it might be beneficial for someone with social anxiety to communicate online, with fewer non-verbal cues, such as only having audio during a call, as opposed to an online video call. Existing research suggests that people with a higher level of social anxiety have better perceived communication quality when fewer non-verbal cues are present (Angelini & Gini, 2023). In contrast, people with lower levels of social anxiety tend to have conversations of higher quality when there are more non-verbal cues, such as a video element, which leads to greater satisfaction for them (Ibid.). The higher perceived quality of communication can be understood through the three dimensions of QCE, when more non-verbal cues are present, such as a video element, people can see each other and use gestures to make themselves more clear (Tang & Isaacs, 1992; Axley, 1984; Pearce & Cronen, 1980). Thereby, when people have more non-verbal cues to react to, such as facial expressions, this might improve the responsiveness. Lastly, the richness of more non-verbal cues present, can improve comfort, since people could feel more at ease when a communication mode is richer (Sprecher, 2014). This shows that interlocutors' level of social anxiety plays an important role in communication and can affect the perceived quality of communication.

Because of the findings above the following hypotheses were formed:

H2: Social anxiety will negatively moderate the relationship between mode of CMC and communication quality.

H3: The more socially anxious people are, the better they perceive communication quality to be, but only in the audio-only condition

Additional exploration

The role of Age

Age and generation might also play a role in the connection between CMC modes, social anxiety and communication quality. The generation someone is born in can have an impact on how familiar they are with things like phones or internet use. For example, a generation like The Baby Boomers (born between 1946 and1964) are often less familiar or did not grow up with computers and online communication methods, while a generation like Generation Z (born between 1995 and 2012) did grow up with digital media and online communications methods (Venter, 2017; Walmsley, 2011).

These differences in generation are also visible when looking at people's preferred communication method. The Baby Boomer generation (1946-1964) seem to mostly use their phones for calling in emergencies, since they tend to prefer direct contact (Ie et al., 2020; Research Guides: Demographics: Age Groups, n.d.). Generation X (1965-1979) seem to use their phones mostly for calling, for daily needs, work and emergencies (Ibid.). They also seem to prefer direct contact (Ibid.). Generation Y (1980-1994), also "Millennials", seem to use their phone a lot and for everything, with texting as the preferred communication mean (Ibid.). Lastly, Generation Z (1995-2012), they rather use their phone for texting accompanied by pictures than communication through (video) calls (Ibid.). This shows that the Baby Boomer generation and Generation X use their phone less and for different purposes than Generation Y and Z and might give an implication to how the different generations prefer different modes of CMC. The Baby Boomers (1946-1964) and Generation X (1965-1979) seem to like direct contact more and therefore might prefer a video mode on CMC to have as

much non-verbal cues as possible, while Generation Y (1980-1994) and Z (1995-2012) prefer texting and therefore might prefer audio-only as opposed to the mode with video.

It seems to be harder for the older generations to use online communication methods, which might also influence the communication quality they perceive. The older generations, both the Baby Boomer generation and Generation X (people born between 1946 and 1979), are for example expected to be less reciprocal in their communication online, they are less likely to respond to a message quickly or respond to something they see on social media, as opposed to younger generations like Generation Y and Z, which might impact their perceived communication quality online (Kim & Feng, 2021). However, there has not been much research about the difference in phone use regarding calling between these generations.

There is also a difference between the younger and older generations when looking at social anxiety. The older generations, The Baby Boomers (1946-1964) and Generation X (1965-1979) seem to be less socially anxious than younger generation, Generation Y (1980-1994) and Z (1995-2012) (Grelle et al., 2023; Twenge et al., 2019). Younger generations seem to experience more stress than older generations, for example due to older generations having fewer combating obligations (Grelle et al., 2023; Twenge et al., 2019). It will be interesting to see if this difference in social anxiety amongst different generations will influence the relationship between mode of CMC and communication quality, since this combination has not been studied before.

Because it is not clear how age would affect a relationship between mode of CMC and communication quality, it will be researched as an additional exploration of age in CMC. Therefore, a sub-research question is formulated: How does age influence the relationship between social anxiety and perceived communication quality in different modes of computer-mediated communication (Zoom audio calls with or without video)?

Research methods

Design

The purpose of this study was to see to what extent modes of CMC (Zoom audio call with or without video) influence communication quality, and how social anxiety moderated this relationship. Age was considered as an additional exploratory factor in the study. Besides this the covariate of familiarity with Zoom was also taken into account in the experiment. The independent variable was the modes of CMC (Zoom audio call with or without video), with a moderator of social anxiety. To test if these variables influenced communication quality, an experimental study was conducted. The design off the study was a 2 (Zoom call with video vs. Zoom call without video) x 1 (communication quality) between-subjects design with a continuous moderator (social anxiety). Participants were selected based on their age, fitting into either the younger generation (born between 1980 and 2012) or the older generation (born between 1946 and 1979). Their social anxiety level was measured before the Zoom audio call (with or without video), to which they were alternately assigned. Afterwards, the communication quality they perceived was measured.

Participants

The experiment was conducted amongst two target groups: the younger target group of people born between 1980 and 2012 and the older target group of people born between 1946 and 1979. The program G*Power 3.1.9.7 was used to calculate the sample size. This calculation (Test family: T-test; statistical test: Linear multiple regression: Fixed model, single regression coefficient; tail(s): two; effect size: 0.15; α-error: 0.05; power: 0.95; number of predictors: 3) showed that the sample size needed to be 89. Since the participants conducted the experiment in duos, this meant around 45 dyads needed to participate in the experiment. The participants were required to speak Dutch, since the questionnaire was presented in Dutch. To recruit participants a mix of convenience and voluntary response

sampling was used. This involved posting on Instagram, Facebook, LinkedIn and reaching out to personal contacts.

In total, 70 responses were recorded in the questionnaire. These were not all correctly filled out questionnaires. Two responses were removed because these were mistakes made during the experiment by one participant. The participants clicked on the wrong age category twice, namely born before 1946, and therefore was sent to the end of the survey. The participant indicated this during the Zoom meeting, after which it was explained how the participant could complete the questionnaire again. In total, 68 people participated in the experiment and filled out the questionnaire correctly, the descriptive statistics of the participants can be seen in Table 1.

Measurement

To measure the participants' social anxiety, before the Zoom call, fifteen statements were presented (see Appendix A). The statements were divided into two categories: Social phobia and Social interaction anxiety ($\alpha = 0.874$) (Mattick & Clarke, 1998). The anxiety in social situations was measured based on the two subscales of Mattick and Clarke (1998). First, the Social Phobia Scale (SPS) ($\alpha = 0.721$), assessing the fear of acting or being seen as embarrassing (Ibid.). Second, the Social Interaction Anxiety Scale (SIAS) ($\alpha = 0.835$), assessing more overall social interactions (Ibid.). These measures were important for this study, because the focus of the study was the perceived communication quality after having a conversation with a friend and how trait social anxiety moderates this relationship and so, it needed to be measured how socially anxious people were. The scales were modified to align with the current research. There were six statements chosen from the SPS and nine statements from the SIAS, since the scales together included 39 statements and this became too long for the experiment, a selection was made. The best fitting statements for this research were chosen, meaning the statements best fitted to the experiment of the Zoom call, e.g. 'I become

Table 1

Descriptive Statistics of Gender, Age, Previous use of Zoom and Education between the Younger and Older Generations

Variable	Younger generation (*n* = 39)	Older generation (*n* = 29)	Total (*n* = 68)
	n (%) / M (SD)	***n (%) / M (SD)***	***n (%) / M (SD)***
Gender			
Female	18 (46,2)	22 (75,9)	40 (58,8)
Male	21 (53,8)	7 (24,1)	28 (41,2)
Age	39 (57,4) / 23.74 (4.43)	29 (42.6) / 55.62 (5.65)	37.74 (16.64)
Previously used Zoom			
Yes	33 (84,6)	21 (72,4)	54 (79,4)
No	6 (15,4)	8 (27,6)	14 (20,6%)
Highest form of education			
High school	6 (15,4)	2 (6,9)	8 (11,8)
Secondary vocational education	5 (12,8)	6 (20,7)	11 (16,2)
University of applied sciences	7 (17,9)	11 (37,9)	18 (26,5)
Research university (bachelor and master)	21 (53,8)	10 (34,4)	31 (45,6)

tense if I have to talk about myself or my feelings.', because of the vacation memory that needs to be shared or 'I can suddenly become aware of my own voice and of others listening to me' because the dyads needed to listen to each other. One statement in the subscale SPS was made positive, so both subscales included one control-item ('I feel tense if I am alone with just one other person', changed to: 'I do not feel tense if I am alone with just one other person'). Furthermore, the answer options were made equal for all the statements. The statements were given based on a 5-point Likers scale, ranging from 1 = 'strongly disagree' to 5 = 'strongly agree'. A threshold for low ($1 \leq M \leq 1.84$), medium ($1.85 \leq M \leq 3.05$) and high ($3.06 \leq M \leq 5$) anxiety was set by using the mean and one standard deviation up and down.

The quality of the communication during the Zoom conversation was measured with fifteen statements based on the Communication Quality Evaluation (CQE) scale ($\alpha = 0.769$) of Liu et al. (2010) (See Appendix B). The statements were divided into three categories, namely: clarity, responsiveness, and comfort. Clarity refers to how well people understand what the other person is saying and also what the other person means (Liu et al., 2010). This is important to evaluate how information is conveyed and understood, in this case it is important to see how different modes influence the clarity in a conversation. Responsiveness is about the behaviour of people in a conversation (Ibid.). It questions how well people coordinate together and how the reciprocity in the conversation is (Ibid.). In this research it is important to see how well people respond to each other in different modes on Zoom and how this effects their perception of the communication quality. Lastly, comfort is about how comfortable, easy and pleasant someone feels in a conversation (Ibid.). In this research it is important to know if people feel comfortable in the conversation and how different the comfort is between different modes of CMC. Of the fifteen statements, one statement was modified in the category Clarity, so every category had one control-item ('I understood what was important to the other side', changed to: 'I did not understand what was important to the

other side.'). They were measured using a 5-point Likers scale, ranching from 1 = 'strongly disagree' to 5 = 'strongly agree'.

There was also asked if the participants had previously used Zoom, since it could be harder for some participants to work with Zoom. Especially the older generation (born between 1946 and 1979) seem to be less familiar with online communication methods (Kim & Feng. 2021). The more skilled someone is in using the online method, the better the communication quality seems to be (Ibid.). So it was important to know if people were familiar with the online communication platform, Zoom, to see if this had any influence on the quality of a conversation.

Procedure

Participants were recruited via social media and personal contacts of the researcher. They were approached with a message inviting them to participate in this study (Appendix C). The message included an explanation about what the experiment entailed, including the technology they needed, to work on the experiment. The message also included the information that they needed to bring a friend around the same age, who was interested in participating in the experiment with them. This friend could not be someone they had a romantic relationship with, since their strong emotional connection might have influenced their responses and therefore influenced the result of the experiment. If they were interested in participating the information letter and informed consent were already sent in advance (see Appendix D). If they agreed, a date and time was set for the Zoom-meetings. This was done using a Google sheets document, where the couple could register for a time using their 'couple-number' or could choose a time and let the researcher register them. The 'couple-number' was only known by the researcher and the participants in the particular dyad.

The day before the Zoom-meeting, the participants received a message and a link to the Zoom-meeting (see Appendix E). The message entailed some instructions about using

Zoom and the opportunity to ask questions about the working of Zoom. On the day of the Zoom-meeting they could enter the Zoom-meeting through the link they received. They were asked to not put on their cameras when entering the Zoom-meeting. Before entering the Zoom-meeting they had to wait in the waiting room until the researcher let them into the meeting.

Once they entered the meeting they received the instructions for the first part of the experiment. The participants were told to turn off their microphones and fill in the first half of the questionnaire, using the link that would be sent in the Zoom chat. They also got reminded of their 'couple-number', both spoken and via the chat, which they were asked to fill in in the questionnaire. Once the link was sent they would all begin with filling in the questionnaire (see Appendix F).

The questionnaire began with the informed consent they had previously received. The participants needed to agree with the information in this informed consent before they could move on to the next part of the questionnaire. Once they agreed to the terms they needed to fill in their couple number and they received an ID number which they were asked to write down in case they would like to remove themselves from the experiment later on. The next part of the questionnaire were some demographic questions (For example: 'To what age group do you belong?', 'What is the highest level of education you have completed?'). The demographic questions were followed by questions regards the participants' social anxiety. They were presented with fifteen statements about anxiety. Once they filled in these questions, a page with information was presented. The participants were instructed to keep the questionnaire open in their browsers, while they returned to the Zoom-meeting. They returned to the Zoom-meeting with cameras and microphone off.

Once they both returned to the Zoom-meeting they got the instructions prior to the 5-minute talk. They were told they were going to be put in a break-out room, this is a separate

virtual room where the host can divide participants into smaller groups. They were asked to have a conversation about their favourite holiday memory for around five minutes. This topic was chosen since most of the time vacation is an emotionally safe subject, which was necessary because it was not meant for the participants to get emotionally manipulated in the experiment. Thereby, most people have an experience with vacation and are able to talk about it. The participants were told that after five minutes their break-out room would be stopped. In these instructions the participants were also asked to either both keep their cameras off or both turn their cameras on, depending on the condition they were in.

When the participants returned to the main Zoom-meeting, after the break-out rooms were closed, they got the instructions to go back to the questionnaire and fill in the rest of the questions. They were asked to come back to the Zoom-meeting and turn on their camera and sound, once they were done with the questionnaire. The final parts of the questionnaire included two questions about the favourite holiday memory of the two participants. After these questions, fifteen statements about the perceived communication quality of the conversation in Zoom needed to be answered. These statements needed to be answered on a 5-point Likert-scale. When the statements were filled in, the participant got one last question about whether they had a Zoom-meeting with or without camera. After this the participants returned to the Zoom-meeting where they were debriefed and thanked for their participation.

Data Analysis

The collected data was analysed using SPSS. To test the three hypotheses, two regressions were performed. In the first test the variable modes of CMC was used in the regression to test the influence on communication quality. The second regression that was performed included the variables mode of CMC and social anxiety, to test the moderation effect of social anxiety on communication quality. Besides this, two exploratory regressions were performed to analyse the effect of age on the relation between modes of CMC, social

anxiety and communication quality and last the correlation between the differences in communication quality and social anxiety in the dyads was analysed.

Results

Attention check

It was examined whether the participants followed up the instructions of having a Zoom conversation with either the video turned on or off, with an attention check at the end of the questionnaire asking if they had a conversation with video. In total 36 participants (52,94%) had a Zoom conversation with video and 32 participants (47,06%) had a Zoom conversation without video. However, 37 participants (54,41%) indicated that they had a conversation with video and 31 participants (45,59%) indicated they did not have a Zoom conversation with video. This means one participant did not pass the attention check. Since the other person in this dyad did report the condition correctly, the participant will not be removed from the sample and it will be assumed that the right condition was used and that the attention check was filled in wrong.

Regression Analyses

Effect CMC on Communication Quality

To test whether conversations via Zoom audio calls with video result in higher communication quality compared to Zoom audio calls without video (H1), a linear regression was performed. On average, the *communication quality* for a Zoom meeting with video (M = 4.31, SD = 0.37) showed little difference to the condition Zoom meeting without video (M = 4.26, SD = 0.36). The standardized residual was not normally distributed for ($z_{skewness}$ = -0.04 and $z_{kurtosis}$ = -1.98) and the homoscedasticity was not met. Therefore, the p-value may not be reliable and a bootstrapped 95% confidence interval will be provided.

The regression analysis showed that *communication quality* cannot be predicted by *mode of CMC*, b = -0.06, β = -0.08, $t(66)$ = -0.64, p = .524. As the bootstrapped confidence

interval crosses zero (95% CI [-0.23, 0.12]) the results cannot be generalized to the population. Therefore, it can be concluded that H1 is not supported by the data.

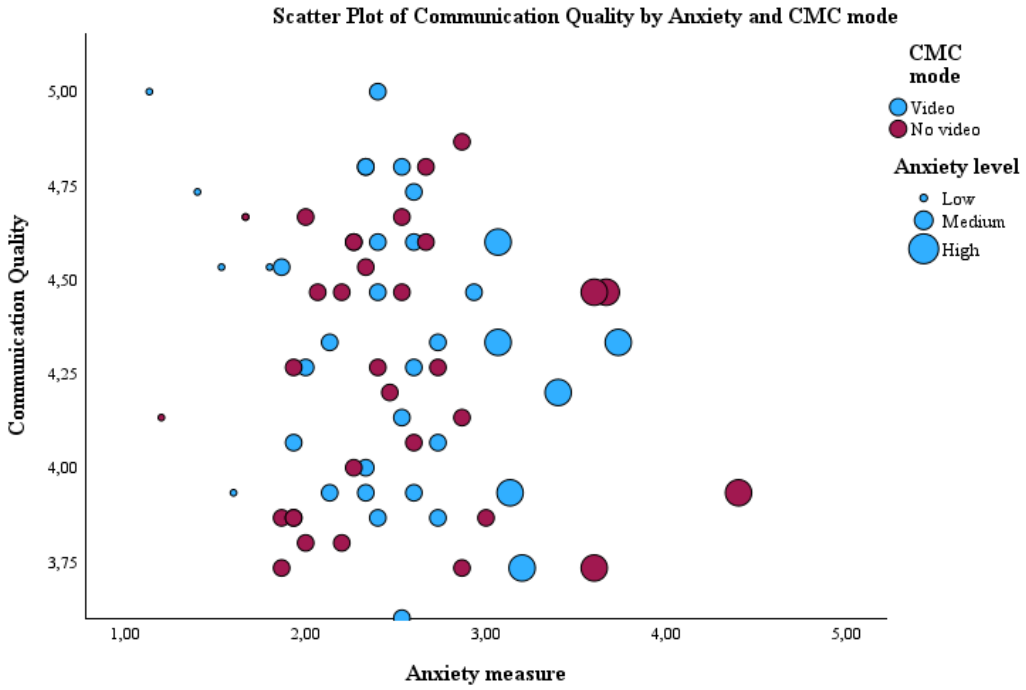
Moderation Social Anxiety

A more complete regression analysis was performed to test whether social anxiety will negatively moderate the relationship between mode of CMC and communication quality (H2) and to test if socially anxious people perceive communication quality to be better in the audio-only condition (H3). The dependent variable was *communication quality* (M = 4.29, SD = 0.36). The analysis included *mode of CMC* as independent variable, *social anxiety* as the moderator (M = 2.45, SD = 0.61), and *mode of CMC * social anxiety* as the interaction term. The standardized residual was not normally distributed ($z_{skewness}$ = -0.13 and $z_{kurtosis}$ = -2.02). In Figure 1 it is shown that more participants show less social anxiety. The suggested threshold for high social anxiety lies at $M > 3.06$, calculated by adding one standard deviation to the mean of the social anxiety. As can be seen in Figure 1 the scatter plot shows more people are around the mid-point of social anxiety ($1.85 \leq M \leq 3.05$) than people that experience high levels of social anxiety ($3.06 \leq M \leq 5$). Therefore, the p-value may not be reliable and more weight should be places on the bootstrapped 95% confidence interval.

The regression analysis showed that the interaction term (*CMC * social anxiety*) did not significantly predict *communication quality*, b = 0.04, β = 0.10, $t(64)$ = 0.80, p = .428. As the bootstrapped confidence interval does cross zero (95% CI [-0.05, 0.12]) the results cannot be generalized to the population. Therefore, it can be concluded that both H2 and H3 are not supported by the data. Thereby, the covariate *previous use of Zoom* dud also not show a significant result and therefore gave no relevant insights in the study.

Figure 1

Communication Quality by Social Anxiety and mode of CMC



Additional Exploration

Age in CMC

To perform an additional exploration of age in CMC, a sub-research question was formulated: How does age influence the relationship between social anxiety and perceived communication quality in different modes of computer-mediated communication (Zoom audio calls with or without video; sub-RQ1)? The age of the participants in the sample was not equally distributed, more participants belonged to the younger generation than to the older generation. Between the two generations no significant difference was found in *social anxiety* ($F(66) = 0.63$, $p = .430$). An analysis of the correlation between *communication quality* and Age_{cont}, with a split of the modes of CMC, showed no significant results (see Figure 2). To further analyse the question, two regression analyses were performed, since age was measured in two ways, both ways were tested.

In the first regression Age_{cont} was concluded in the analysis. The first step, contained analysing a possible correlation between *social anxiety* and $Age_{cont.}$ This showed that there was no significant relationship between these two variables ($r = -.03$, $p = .821$) (see Figure

G1). Then, a regression analysis was performed. The dependent variable was *communication quality*. The analysis included *mode of CMC* as independent variable, *social anxiety* and Age_{cont} as the moderator and the interaction terms of *age, mode of CMC* and *social anxiety*.

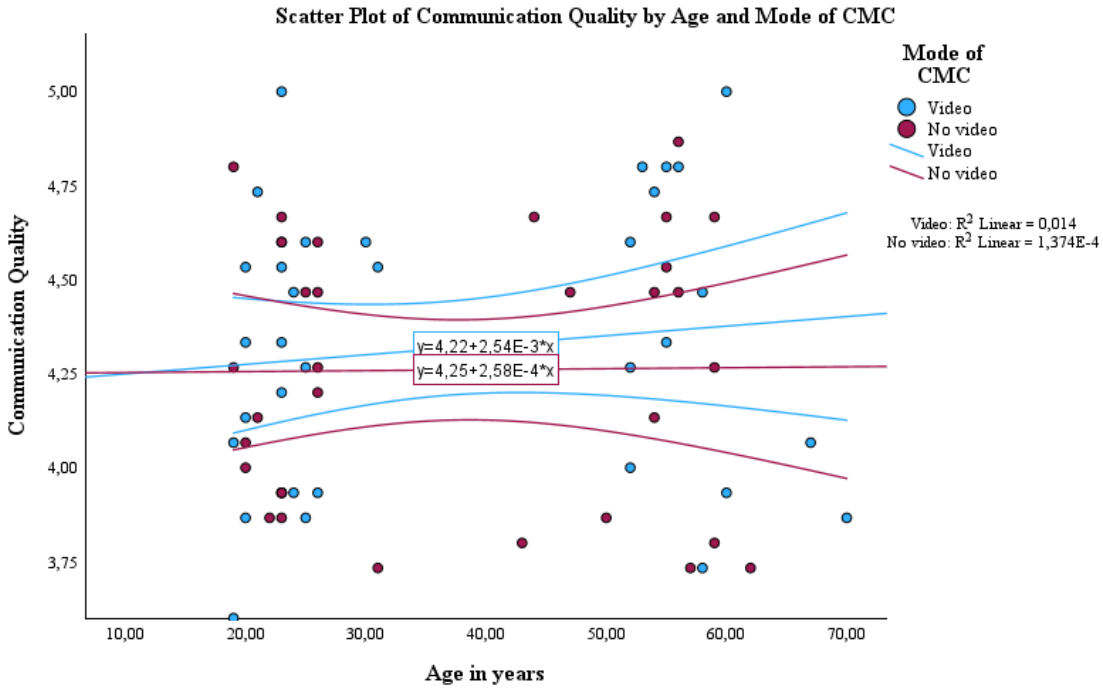
The regression analysis showed that the interaction terms *mode of CMC * age* (b = -0.02, β = -0.08, $t(62) = -0.21$, p = .834), *mode of CMC * social anxiety* (b = -0.02, β = -0.11, $t(62) = -0.86$, p = .395) and *mode of CMC * age * social anxiety* (b = -0.02, β = -0.08, $t(62) = -0.60$, p = .552) did not significantly predict *communication quality*. The correlation showed that Age_{cont} does not play a part in predicting *social anxiety* and the regression showed that none of the variables, *mode of CMC,* Age_{cont}*, social anxiety* and their interactions, had a significant effect on *communication quality*. The results should be interpretated with care, since the assumptions were not met, see Appendix H for additional statistics on the exploratory research of age.

Second, Age_{cat} was included in the analysis, i.e., as older generation, born between 1946 and 1979 and as younger generation, born between 1980 and 2012. A regression analysis was performed with the same terms that were used for the other regression analysis, but with the categorical variable of age. The assumptions of linearity, homoscedasticity and normality were met.

The regression analysis showed that the interaction terms *mode of CMC * age* (b = 0.01, β = 0.04, $t(62) = 0.09$, p = .928), *mode of CMC * social anxiety* (b = -0.03, β = -0.11, $t(62) = -0.89$, p = .375) and *mode of CMC * age * social anxiety* (b = -0.02, β = -0.11, $t(62) = -0.85$, p = .397) did not significantly predict *communication quality*. The regression showed that *mode of CMC,* Age_{cont}*, social anxiety* and their interactions did not have a significant effect on *communication quality*.

Figure 2

Communication Quality by Age and Mode of CMC



Dyads research

The participants participated as a dyad, which might give some interesting insights in the results. The participants could have been very differently in social anxiety or interpretated the conversation as different in communication quality. To explore this amongst the dyads, new variables were created and explored. Within the dyads the mean of *social anxiety* was created. To see how far the dyad social anxiety score was from the individuals social anxiety score, the difference was calculate. This difference showed that the majority of the participants had social anxiety averages that were closely clustered together, however there are a few dyads that show a bigger difference in *social anxiety*, from each other. These results are summarized and can be seen in Figure G2.

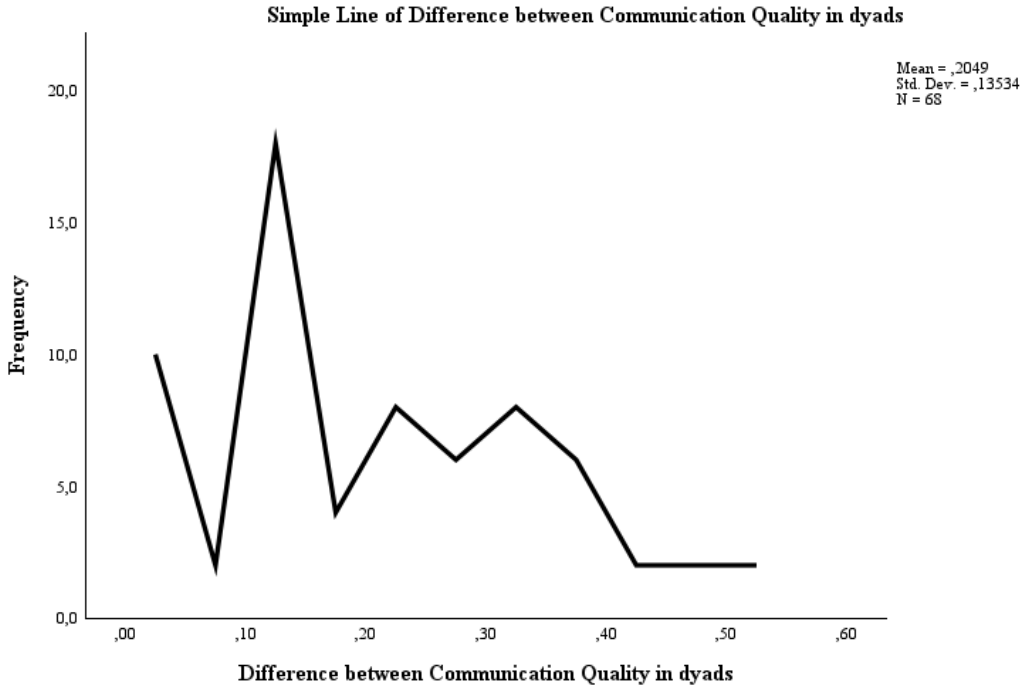
Withing the dyads the mean of *communication quality* was also created. Thereby the difference between *communication quality* and the *mean of communication quality of the dyads* was also calculated, to see how far the dyad communication quality score was from the individuals communication quality score. The difference between communication quality from the dyads showed a lot of small differences. Most of the dyads interpreted the

communication quality close to the same. However, there are some dyads that did not interpret the *communication quality* in the same way as can be seen in Figure 3.

To see if this could be a result of *social anxiety*, the relation between *the difference in social anxiety from the dyads* and *the difference in communication quality from the dyads* was analysed. To measure the strength and direction of the variables a correlation analysis was done. The analysis showed no significant linear relation between the variables, $r = .09$, $p = .483$. This can also be seen in Figure G3, where a clear spread in the scatterplot is present, which shows no linear relation between the variables. This exploration shows that the majority of the participants shared similar social anxiety levels with their conversation partner and had a similar perception of the communication quality of the conversation. Thereby, the regression shows that the similar perception of communication quality cannot be predicted the similar levels of social anxiety.

Figure 3

Difference between Communication Quality in Dyads



Discussion

Findings

The aim of the research was to see to what extent modes of CMC (Zoom audio call with or without video) influence communication quality, and how social anxiety moderates this relationship. The study was done amongst friends born between 1946 and 2012. The results showed no significant relations between modes of CMC, social anxiety and communication quality. Therefore, the current data does not support definitive conclusions.

The results of the analysis showed that for the first hypothesis, i.e. conversations via Zoom audio calls with video result in higher communication quality compared to Zoom audio calls without video, no significant difference was found in the communication quality between a Zoom conversation with or without video. This does not align with the principle of interactivity that states that the amount of interactivity influences communication quality, where more possibility for interactivity should improve the communication quality (Burgoon et al, 2002). It is also not in line with the study of Sprecher (2014), who stated that the richer a medium is, the better people will achieve their goals for the communication. This could be due to the fact that in the present study, people did not perceive the two modes of CMC to be different in their level of interactivity and so there was no difference in perceiving communication quality. This can be explained by the fact that people were familiar with each other, 60 participants stated to be friends (88,2%), 3 said they were acquaintances (4,4%) and 5 (7,4%) said to be something else, of which, 3 colleagues (4,4%), 1 good colleague (1,5%) and 1 sister (1,5%). This familiarity, which results in more comfort, could have decreased the need to rely on the cues present in the video condition for high communication quality, so the communication quality remained the same in both modes (Oishi et al., 2011).

The second hypothesis suggested that social anxiety will negatively moderate the relationship between mode of CMC and communication quality and the third hypothesis, as a

specification suggested that the more socially anxious people are, the better they perceive communication quality to be, but only in the audio-only condition. The hypotheses were not supported by the data, no significant moderation was found between social anxiety and the relationship between mode of CMC and communication quality. The results are not in line with the literature. People with more social anxiety were expected to experience worse communication quality than people with less social anxiety, who were expected to experience better communication quality, since people with more social anxiety were expected to be more nervous to talk with their friend in an online setting than people that are less anxious (Pierce, 2009; Reid & Reid, 2007). This might be because the social anxiety of the participants in the research did not variate that much, which does not give a fully correct representation of highly anxious people or, in contrast, people that feel not anxious at all. As shown in Figure 1, a greater number of participants showed less social anxiety and very few participants showed high levels of social anxiety, the participants are mostly clustered around the middle of the scale. This can be explained due to the fact that the sample size was not big enough for there to be a bigger variance of social anxiety present. It is also not in line with the research of Angelini and Gini (2023) that found, when fewer non-verbal cues are present, the communication quality is perceived as higher for people with social anxiety. This could be because, only trait social anxiety was measured in the current study and state social anxiety was not measured. The trait social anxiety that was measured is a stable measure, as opposed to state social anxiety, which can change at any circumstances (Endles & Kocovski, 2001; Krohne & Hindel, 1988). Measuring the state social anxiety could potentially lead to different outcomes of the study.

For the exploratory sub-research question, i.e., how age influences the relationship between social anxiety and perceived communication quality in different modes of computer-mediated communication (Zoom audio calls with or without video), no significant results

were found. Age was not equally distributed and no difference was found in social anxiety between the age groups, which defies age stereotypes, like younger generations being more socially anxious than older generations (Grelle et al., 2023; Twenge, 2019). Both for the continuous and categorical variable of age, no evidence was found for the influence on the relationship between mode of CMC, social anxiety and communication quality. The preference for online communication methods of the younger generations (born between 1980 and 2012) and the preference for offline communication methods of the older generations (born between 1946 and 1979) that was found by Ie et al. (2020) does not show in their perception of communication quality in this research. This means, that if the preference for mode of CMC between the different age groups is still present, it seems to not be related to the perceived quality of communication. It could also be that there was no difference between how different ages interpreted the experiment, which could be explained due to the fact that the COVID-19 pandemic resulted in habituation to online communication methods (Peng & Yu, 2022; Martínez-Alcalá, 2021). This could also explain why no significant effects were found for the covariate experience on Zoom. People have been using Zoom and other online tools a lot in the period that COVID-19 was present, which was also prominent in the research, where the majority had already used Zoom in the past.

For the exploration of the dyads multiple differences were analysed. The majority of the participants in a dyad shared similar social anxiety levels. Besides social anxiety levels, the communication quality in the dyads was analysed. Most of the dyads had a similar perception of the communication quality of the conversation, which could be explained due to the fact that the participants were similar in their social anxiety level. That people who know each other well can show a lot of similarity has been proven (Brechwald & Prinstein, 2011; Davis & Rusbult, 2001; Kandel, 1978). The interpersonal relation that people have can result in alignment between the two personalities, people try to agree with each other or understand

each other to maintain their relationship (Davis & Rusbult, 2001). The correlation analysis between the difference in social anxiety and the difference in communication quality, showed no significant effect, which shows there is no linear relationship. This could be explained by the similarity in social anxiety levels of the dyads or by the possible similarity between the friends. When pairing strangers this may result in very different outcomes.

Limitations and suggestions for future research

There are some limitations that might explain the results of the study. First of all, communication quality is a complex concept and it is possible that the measures used were not the best fit for this research. Even though the scales were chosen and used with care, it might be possible that the concept communication quality was not properly measured for the Zoom conversation. Since a part of the measure was 'comfort' and the dyads were familiar with each other, which already increases comfort, it could have influenced the outcomes of the study (Oishi et al., 2011). However, the scale was extensively tested by Liu et al. (2010) and reliable in the current study.

Thereby, since the interlocutors were mostly friends (N = 60, 88,2%), the relationship between the interlocutors could explain the results. Also, the Zoom conversation was informal, partly because the participants knew each other and spoke about vacation memories, which can also influence the way people perceive communication quality. Namely, knowing the other person, can make you feel more comfortable when speaking, which makes it easier to know how to talk to each other (Oishi et al., 2011). For future research, it could be interesting to see the difference between people that know each other and strangers and therefore add a condition for strangers.

As a third limitation, the familiarity with Zoom might have influenced the relationship between mode of CMC and communication quality. During COVID-19 a lot of people had to work with online communication methods (Osler & Zahavi, 2022.). Since much of the

research supporting this study was conducted before COVID-19, this might be an explanation to why the results differ from each other. People are more familiar with Zoom and therefore experience less trouble when communicating through this application.

Lastly, as the calculation in G*Power 3.1.9.7 showed 89 people needed to participate in the study, however only 68 people participated in the experiment. Having more participants might help with more variation on social anxiety levels included in the research, which would give the opportunity to compare different levels of social anxiety. So, for future research, it is recommended to have a larger sample.

Implications

Although this study did not find any significant results for the proposed hypotheses, there are still some scientific and practical implications. The academic relevance lies in the results of the study that can contribute to the ongoing discussion about CMC. In result to this study, certain theories and previous research might be challenged, such as the principle of interactivity and medium richness, since those did not result in higher communication quality, as in research of Burgoon et al. (2002) and Sprecher (2014). Research about CMC from before COVID-19, such as the principle of interactivity and media richness, could be reevaluated, since the pandemic likely caused the society to engage more in the digital world than they would have done and be more reliant on the digital world than they would have been without COVID-19, which could change the way people perceive CMC. This could be a start of reevaluating some of this theory, which could lead to forming new models.

Thereby, the study also has some practical relevance. The results suggest that people do not necessarily need to prefer video calling through Zoom to have better communication quality, since no significant effect was found that this should result in better communication quality. This could mean that it might be easier for people to maintain good relationships with each other while not being close to each other, when no video element needs to be present to

have good communication quality. This could be positive for students abroad, long-distance relationships and expats on work trips. This could be further researched and may give people the reassurance to maintaining good quality of communication, while not being present. This could also be a good sign for socially anxious people, since communication quality could be maintained with fewer non-verbal cues, which is likely to be more comfortable for socially anxious people. Lastly, no difference in communication quality was found in the younger and older generation, when communicating through CMC. This could mean that the stereotype, that older people are not skilled enough to communicate well on online platforms, might not be true or at least not in that degree. In 2024, the older generations might have caught up more with the younger generation than is generally thought.

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Appendix A

Anxiety measurement

Combination of the Social Phobia Scale (SPS) and the Social Interaction Anxiety Scale (SIAS).

Based on the research of (Mattick & Clarke, 1998).

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Social Phobia					
I can suddenly become aware of my own voice and of others listening to me.	O	O	O	O	O
I fear I may blush when I am with others.	O	O	O	O	O
I am worried people will think my behaviour is odd.	O	O	O	O	O
I worry I will lose control of myself in front of other people.	O	O	O	O	O
I worry I might do something to attract the attention of others.	O	O	O	O	O
I do not get tense when I speak in front of other people.*	O	O	O	O	O
Social Interaction Anxiety					
I have difficulty making eye-contact with others.	O	O	O	O	O
I become tense if I have to talk about myself or my feelings.	O	O	O	O	O
When mixing socially I am uncomfortable.	O	O	O	O	O
I feel tense if I am alone with just one other person.	O	O	O	O	O
I have difficulty talking with other people.	O	O	O	O	O
I find it easy to think of things to talk about. *	O	O	O	O	O
I worry about expressing myself in case I appear awkward.	O	O	O	O	O
I find myself worrying that I won't know what to say in social situations.	O	O	O	O	O
I feel I will say something embarrassing when talking.	O	O	O	O	O

Appendix B

Communication quality measurement

Scale based on the Communication Quality Evaluation (CQE) scale (Liu et al, 2010).

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Clarity					
I understood what the other side was saying.	O	O	O	O	O
I did not understand what was important to the other side.*	O	O	O	O	O
We clarified the meaning if there was a confusion of the messages exchanged.	O	O	O	O	O
I think the other side understood me clearly.	O	O	O	O	O
The messages exchanged were easy to understand.	O	O	O	O	O
Responsiveness					
The other side responded to my questions and requests quickly during the interaction.	O	O	O	O	O
The conversation ran smoothly without any uncomfortable silent moments or did not notice any uncomfortable silent moments.	O	O	O	O	O
I was willing to listen to the other side's perspectives.	O	O	O	O	O
When the other side raised questions or concerns, I tried to address them immediately.	O	O	O	O	O
One or both of us kept silent from time to time.*	O	O	O	O	O
Comfort					
I was nervous talking to the other side.*	O	O	O	O	O
I felt the other side trusted me.	O	O	O	O	O
I felt the other side was trustworthy.	O	O	O	O	O
I felt comfortable interacting with the other side.	O	O	O	O	O
The other side seemed comfortable talking with me.	O	O	O	O	O

Appendix C

Message to send and post to recruit people

Hello,

For my master thesis I am looking for respondents who would like to participate in an experiment. This experiment will be part of a study on communication quality via online communication tools (in this case Zoom). The experiment entails answering a couple questions in a questionnaire and having a conversation with a friend via the Zoom application. The Zoom-meeting will be about 5 minutes and the experiment as a whole will be 15 to 20 minutes total. The conversation will not be recorded, besides this the data entered in the questionnaire will be anonymous and cannot be linked to a person. The data will be stored till (roughly) august 2024 and only be available for me and my thesis supervisor.

To participate in the experiment you must meet the following requirements:

- Are you Dutch-speaking?
- Do you have a friend around the same age that would like to participate with you and with whom you did not have or are not currently having a romantic relationship?
- Do you have either a smartphone or a laptop with access to the internet?
- And are you born between the years 1946 and 2012?

If you meet these requirements and are interested in participating, please send me a message. It would help me enormously with my research into the quality of communication and thus to complete my thesis with a passing grade.

So please send me a message, then I will send you further information and can we arrange a date and time.

Thank you in advance!

Appendix D

Information letter and informed consent

Dear participant,

Thank you for agreeing to participate in this experiment!

This experiment is part of the research for my master's thesis in Business Communication and Digital Media at Tilburg University. The experiment will be part of my research into the quality of communication on online communication tools.

During the experiment, you will have a short conversation (about a topic you will hear more about later) with a friend via the Zoom application. Before and after this conversation, you will be given a short questionnaire. There are no right or wrong answers in this questionnaire. It will ask about your personal experience. Participation in the experiment can be stopped at any time without explanation.

The entire experiment will take approximately 15 to 20 minutes. The responses will be stored anonymously and deleted after the completion of my thesis. The data will only be used for the research of this thesis and will only be available to me and my thesis supervisor. Participation in the research has no negative consequences. By continuing with the research, you agree to the use of the data.

If you have any questions or comments, you can contact Sanne Brussee (researcher) or Nadine Braun (supervisor) via e-mail: s.brussee@tilburguniversity.edu, n.braun@tilburguniversity.edu

Thank you in advance for participating in this experiment!

Appendix E

Message the day before the experiment

Hello,

Thank you for agreeing to participate in the experiment! At the bottom of this letter, you will find the link you need to join the Zoom meeting at the scheduled time (Day, Date, Time). It is recommended to participate via a laptop, but if this is not possible, you can also join via a phone with internet access.

Instructions for Zoom

Laptop: When participating in the study via your laptop, you can click on the Zoom link. If you do not have the Zoom application, there is an option to click on: join via your browser. The Zoom link will then open in an internet page.

If you have the application installed you can click on the link, and the Zoom application will open.

Phone: When participating via your phone, you will first need to download the Zoom application on your phone. Once the application is installed, you can click on the Zoom link, and the application will open.

If you need more information about how Zoom works or need help with a specific step, please let me know!

When you join the Zoom meeting, the camera will be turned off, please keep it turned off. Consent must be given for the camera and microphone.

On *day, date, time*, you can join the meeting. In this meeting you will receive further instructions on what to do. You will be asked about a favourite holiday memory during the meeting. If you have any questions before the meeting, you can contact me.

The conversation will not be recorded, and you can stop participating in the study at any time without explanation!

Zoom link: …

Appendix F

Questionnaire (Qualtrics)

Thesis communication quality

Start of Block: Informed consent

Informed consent: Dear participant,

Thank you for agreeing to participate in this experiment!

This experiment is part of the research for my master's thesis in Business Communication and Digital Media at Tilburg University. The experiment will be part of my research into the quality of communication on online communication tools.
During the experiment, you will have a short conversation (about a topic you will hear more about later) with a friend via the Zoom application. Before and after this conversation, you will be given a short questionnaire. There are no right or wrong answers in this questionnaire. It will ask about your personal experience. Participation in the experiment can be stopped at any time without explanation.

The entire experiment will take approximately 15 to 20 minutes. The responses will be stored anonymously and deleted after the completion of my thesis. The data will only be used for the research of this thesis and will only be available to me and my thesis supervisor. Participation in the research has no negative consequences. By continuing with the research, you agree to the use of the data.
If you have any questions or comments, you can contact Sanne Brussee (researcher) or Nadine Braun (supervisor) via e-mail: s.brussee@tilburguniversity.edu, n.braun@tilburguniversity.edu

Thank you in advance for participating in this experiment!

- ○ Yes, I agree to the above information and participate in the experiment. (1)
- ○ No, I do NOT agree to the above information and will not participate in the experiment. (2)

Skip To: End of Survey If Dear participant, Thank you for participating in this experiment! This experiment makes part you... = No, I do NOT agree to the above information and will not participate in the experiment.

End of Block: Informed consent

Start of Block: Couple and ID

*

Couple number: What is your couple's number? Couple: (fill in only the number)

_____

Random ID: Here is your ID number: ${e://Field/Random%20ID}

Write this down somewhere! Should you change your mind after the experiment, we can use this number to delete the data.

End of Block: Couple and ID

Start of Block: Demographic questions

Age 1: What is your age in years?

_____

Age 2: What age group do you fit into?

- ○ Born before 1946
- ○ Born between 1946-1979
- ○ Born between 1980-2012
- ○ Born after 2012

Skip To: End of Survey If What age group do you fit into? = Born before 1946
Skip To: End of Survey If What age group do you fit into?= Born after 2012

Gender: What is your gender?

- ○ Male
- ○ Female
- ○ Non-binary
- ○ I'd rather not say
- ○ Other

Language: Do you speak Dutch?

- ○ Yes
- ○ No

Skip To: End of Survey If Do you speak Dutch? = No

Education level: What is your highest completed or current education?

- ○ Elementary school
- ○ Secondary education (high school)
- ○ Intermediate vocational education (MBO)
- ○ Higher vocational education (HBO)
- ○ University bachelor (WO bachelor)
- ○ University master (WO master)
- ○ Other, namely _____

Page Break

Zoom: Have you ever used the online communication tool Zoom?

- ○ Yes
- ○ No

Friends check: What is the bond with the person you are doing the experiment with?

- ○ Romantic relationship
- ○ Friend
- ○ Acquaintance
- ○ Stranger
- ○ Other, namely _____

Skip To: End of Survey If What is the bond with the person you are doing the experiment with?= Romantic relationship
Skip To: End of Survey If What is the bond with the person you are doing the experiment with? = Stranger

Bond: How well would you describe your bond with this person?

- ○ Extremely bad
- ○ Somewhat bad
- ○ Not good and not bad
- ○ Somewhat good
- ○ Extremely good

End of Block: Demographic questions

Start of Block: Anxiety measure

Social phobia: Please indicate the extent to which you agree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I can suddenly become aware of my own voice and of others listening to me. (1)	○	○	○	○	○
I dread blushing when I am with others. (2)	○	○	○	○	○
I worry that people will think my behavior is odd. (3)	○	○	○	○	○
I worry about losing control of myself in front of other people. (4)	○	○	○	○	○
I worry that I will do something that attracts the attention of others. (5)	○	○	○	○	○
I don't get tense when speaking in front of other people. (6)	○	○	○	○	○

SInteraction anxiety: Please indicate the extent to which you agree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I find it difficult to make eye contact with others. (1)	○	○	○	○	○
I get tense when I have to talk about myself or my feelings. (2)	○	○	○	○	○
In social interactions, I feel uncomfortable. (3)	○	○	○	○	○
I feel tense when I am alone with only one other person. (4)	○	○	○	○	○
I have difficulty talking to other people. (5)	○	○	○	○	○
I find it easy to think of topics to talk about. (6)	○	○	○	○	○
I worry about expressing myself for fear of appearing awkward. (7)	○	○	○	○	○
I find myself worrying about not knowing what to say in social situations. (8)	○	○	○	○	○
I feel that I will say something embarrassing while talking. (9)	○	○	○	○	○

End of Block: Anxiety measure

Start of Block: Information

Information To continue with the experiment you will have to return to the Zoom meeting. Here you will first be alone with the researcher who will give a short explanation.

The idea is that you will have a conversation with the friend you are participating in this experiment with. We will ask you to find out about each other's favourite vacation memory. The conversation will last about 5 minutes, after which the researcher will return you to this questionnaire.

It is important that you do not close this questionnaire. Leave it open and go to the Zoom meeting on a different tab.

Once you have had the conversation via Zoom you may click through to the next page.

End of Block: Information

Start of Block: Back survey

Welcome back Welcome back to the questionnaire!

You may now complete the rest of the questions.

End of Block: Back survey

Start of Block: Vacation memory

Memory of oneself: In one sentence, what is your favourite vacation memory?

_____

Memory other: In one sentence, what is the other person's favourite vacation memory?

_____

End of Block: Vacation memory

Start of Block: Communication quality

Clarity: Indicate the extent to which you agree with the following statements about the conversation you just had.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I understood what the other person was saying. (1)	○	○	○	○	○
I did not understand what the other person thought was important. (2)	○	○	○	○	○
We clarified the meaning when there was confusion about the statements exchanged. (3)	○	○	○	○	○
I think the other side understood me well. (4)	○	○	○	○	○
The statements exchanged were easy to understand. (5)	○	○	○	○	○

Responsiveness: Indicate the extent to which you agree with the following statements about the conversation you just had.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
The other party responded quickly to my questions and requests during the interaction. (1)	○	○	○	○	○
The conversation went smoothly with no uncomfortable silent moments or I did not notice any uncomfortable silent moments. (2)	○	○	○	○	○
I was willing to listen to the other party's perspectives. (3)	○	○	○	○	○
When the other party raised questions or concerns, I tried to address them immediately. (4)	○	○	○	○	○
Either or both of us occasionally remained silent. (5)	○	○	○	○	○

Comfort: Indicate the extent to which you agree with the following statements about the conversation you just had.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
I was nervous while talking to the other party. (1)	○	○	○	○	○
I felt that the other party had confidence in me. (2)	○	○	○	○	○
I felt that the other party was trustworthy. (3)	○	○	○	○	○
I felt comfortable interacting with the other party. (4)	○	○	○	○	○
The other party seemed comfortable while talking to me. (5)	○	○	○	○	○

End of Block: Communication quality

Start of Block: Video or not

Video or not: Did you have a conversation with the camera on?

○ Yes

○ No

End of Block: Video or not

Appendix G

Figures and tables result section

Figure G1

Correlation between Age_{cont} and Social Anxiety with a regression line.

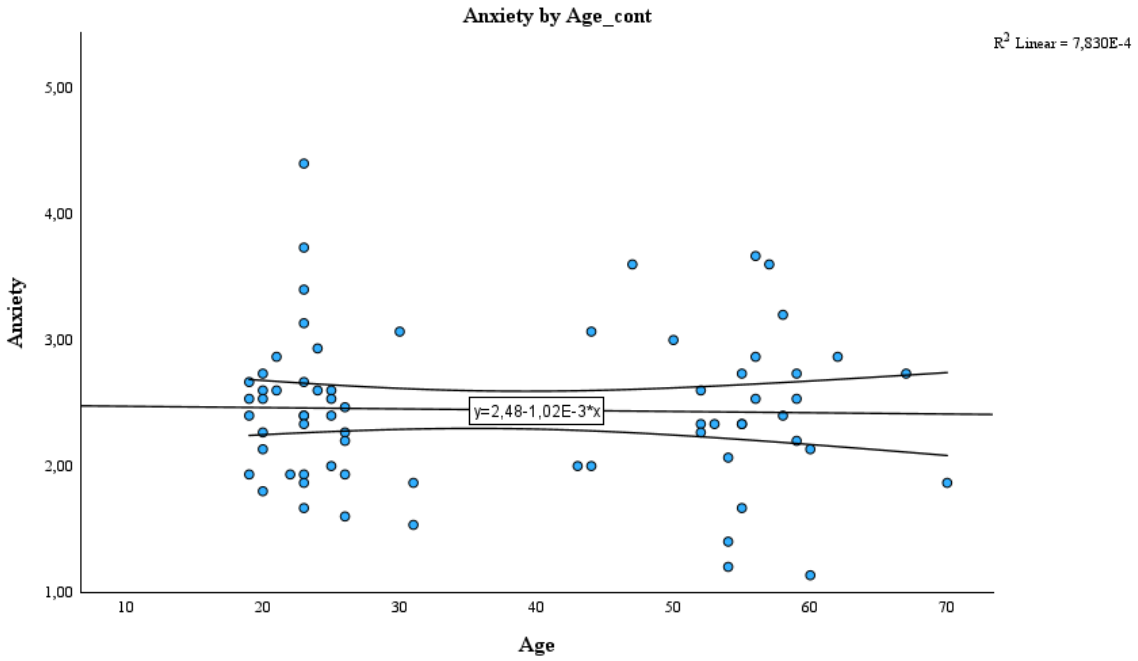


Figure G2

Difference between Social Anxiety in Dyads

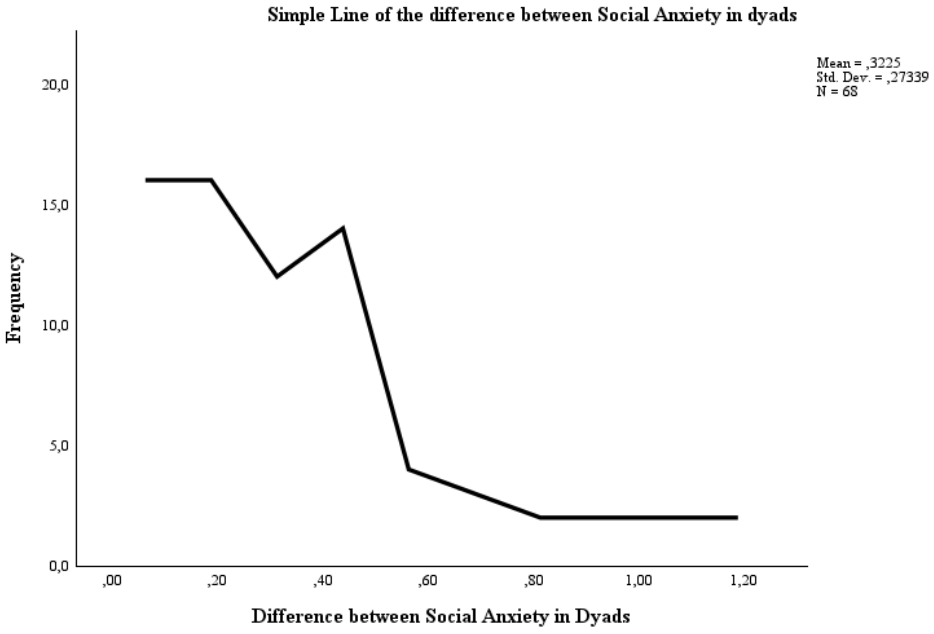
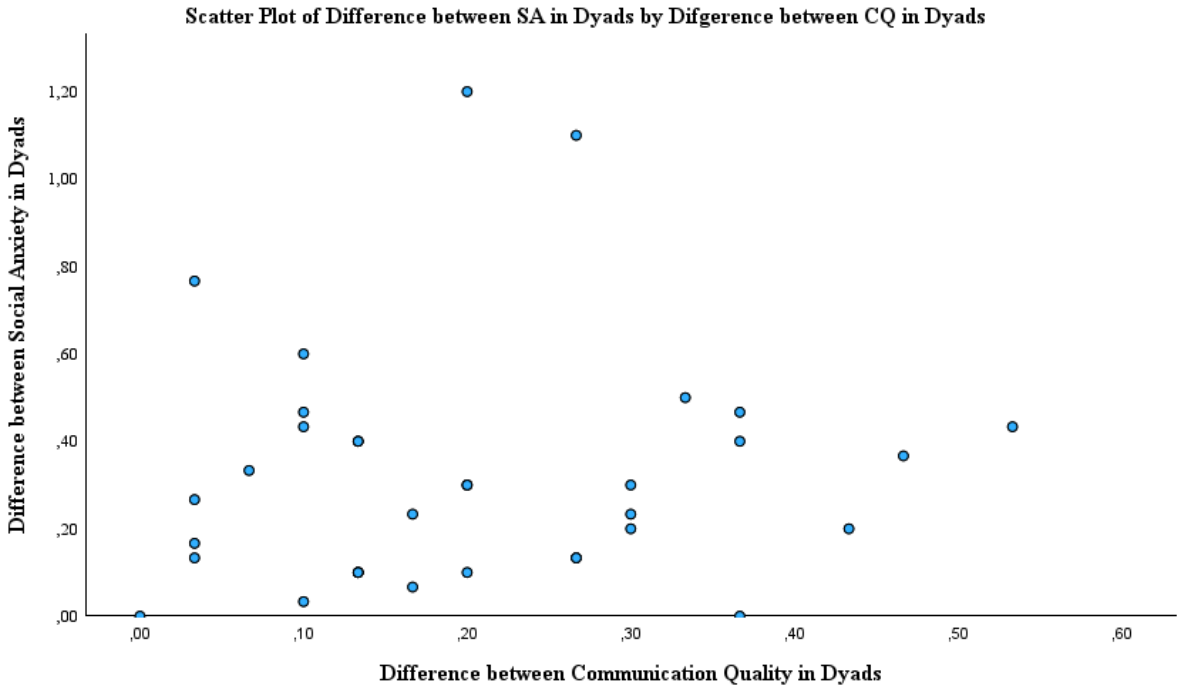


Figure G3

Difference between Social Anxiety in Dyads by Difference between Communication Quality in Dyads



Appendix H

Additional statistics for the exploration of age

Mean and standard deviations of the variables

Communication quality (M = 4.29, SD = 0.36)

Social anxiety (M = 2.45, SD = 0.61)

Age_{cont} (M = 37,34, SD = 16.64)

The assumptions for the continuous variable of age

The standardized residual was not normally distributed for ($z_{skewness}$ = -0.29 and $z_{kurtosis}$ = -2.03). Therefore, the p-value may not be reliable and more weight should be places on the bootstrapped 95% confidence interval. Since the bootstrapped confidence interval includes zero (95% CI [-0.05, 0.12]) the results cannot be generalized to the population.

The number of participants and the percentages

Older generation, born between 1946 and 1979 (N = 29, 42,6%)

Younger generation, born between 1980 and 2012 (N = 39, 57.4%)

The assumptions for the categorical variable of age

The assumptions of linearity, homoscedasticity and normality ($z_{skewness}$ = -0.29 and $z_{kurtosis}$ = -1,95)