Do you prefer Mobile Instant Messaging or Face-to-face interaction? Influence of personality and communication situations

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Abstract:
Personality characteristics are largely neglected in prior research on media preference and comfort. The roles of personality and communication situations in relation to mobile instant messaging are underexplored. This study investigates whether people's comfort-level and preference for online or face-to-face communication are related to their level of social anxiety and the extent to which they are extraverted or introverted. This influence is mainly present in complex situations where introverts or socially anxious individuals possibly face implications such as having fewer social skills and fearing being judged negatively. A quasi-experimental study (N = 209) on preferences for and comfort with mobile instant messaging or face-to-face interaction in different types of communication situations was conducted. The communication situations used in this study were created based on Media Richness Theory and Politeness Theory and can be distinguished by their level of complexity. The results have shown that social anxiety and extraversion-introversion have a significant effect on communication preference and comfort. However, these personality effects were predominantly found in complex situations.

Keywords: Mobile instant messaging; Media Richness; Politeness; Social anxiety; Introversion

1. Introduction

The past decades have brought significant changes in the way people communicate with each other. The development of Internet-based social technology has considerably increased the variety of communication media available, including social media and mobile instant messaging (e.g., WhatsApp, Facebook messenger) (Hsieh & Tseng, 2017). Using online communication has become commonplace for private interactions (Hertel, Schroer, Batinic, & Naumann, 2008). However, it may be questioned whether mobile instant messaging (MIM) will largely replace face-to-face interaction for private interactions.

The adoption rate of MIM has undergone enormous development in recent years. On August 2014, Whatsapp represented a global mobile Internet user penetration rate of 24%, having more than 600 million monthly active users. By April 2016, the number of users had significantly increased to almost 1 billion (Hsieh & Tseng, 2017). Other MIM applications such as Facebook Messenger also have users on a global level. Facebook Messenger had 900 million monthly active users in 2016 (Hsieh & Tseng, 2017).

Prior research from Kraut et al., (1998) showed that the use of e-mail reduced the use of face-to-face interaction. A similar reduction of face-to-face interaction might be found due to the use of MIM. It may be questioned what factors have an influence on media choice and preference. Several theoretical models were developed in recent years to explain and predict media choice and media preferences (Carlson & Zmud, 1999; Daft & Lengel, 1986; Hertel et al., 2008; Johnson & Johnson, 2006; Pierce, 2009). Some influences considered in these models are the purpose and content of a communication, situational contexts, and the media expertise of the people involved. However, the role of personality factors in interpersonal communication has been neglected (Carlson & Zmud, 1999; Daft & Lengel, 1986; Hertel et al., 2008; Pierce, 2009). Apart from the study of Johnson & Johnson (2006) on the effects of introversion-extraversion and previous usage of the internet on media preference, there is insufficient attention for influences of personality on media preferences for interpersonal communication.

One potentially relevant personality characteristic is social anxiety. Social anxiety is defined as a person's fear of being evaluated and judged in a negative way by other people, which leads

to feelings of inferiority, inadequacy, awkwardness, shame, and sadness (Goldin et al., 2013). These symptoms of depression, fear, and a general uncomfortable feeling can influence one's competence to interact in social settings (Leary, 1983).

Another potentially relevant personality characteristic is introversion versus extraversion. Being introverted defines a person as being shy, reserved, and quiet, whereas being extraverted defines a person as being outgoing, sociable, confident, and talkative (Snyder & Swann, 1978). Extraverts tend to feel more comfortable using synchronous (i.e., immediate response to a message, back and forth) and fast communication media compared to introverts (Hertel et al., 2008; Stokes, 1985). Extraverts are more likely to develop better social skills than introverts because of their stronger interest in direct social interaction (Hertel et al., 2008; Stokes, 1985).

Not only personality but also situational circumstances might influence one's preference for and comfort with interacting either face-to-face or by means of MIM. Media Richness Theory (MRT) (Daft & Lengel, 1986) and Politeness Theory (PT) (Brown & Levinson, 1987) are theories that explain that situations can have a certain complexity. Features of media richness not only show how efficient certain communication media are, and that face-to-face interaction should be used in complex situations but also what the implications are for the fear and psychological needs of the user (Hertel et al., 2008). In Politeness Theory is the concept of face-threatening acts (FTA's), these FTA's are for example compliments, criticisms, apologies, and requests (Brown & Levinson, 1987; Dainton & Zelley, 2015). Face-threatening situations can be created by including these FTA's in communication scenarios, these face-threatening situations are perceived as being complex and can influence the choice of communication medium (Joinson, 2004; O'Sullivan, 2000; Walther, 1996).

It may be questioned whether the effects of personality that were found in prior research also relate to MIM and whether the complexity of the situation also influences preference for and comfort-level with face-to-face interaction or MIM. The main research question has been set in order to find out if personality characteristics and communication situations based on PT and MRT influence the choice of communication medium and if these factors influence a person's comfort-level when interacting face-to-face or by means of MIM.

"To what extent do social anxiety, extraversion-introversion, and communication situations influence people's preference for and comfort-level with face-to-face interaction or MIM?"

2. Theoretical framework

In this chapter, the theoretical body will be discussed. First, personality characteristics and the relationship between the personality characteristics will be examined. After that, communication situations based on Politeness Theory and Media richness Theory will be discussed. Third, the interaction of personality with communication situations will be explored. Further, several hypotheses will be presented through which the data can be viewed and interpreted.

2.1 Personality characteristics

The diversity of individual differences is nearly endless, however, most of these differences are inconsequential in people's interactions with others and have remained mainly undetected

(Goldberg, 1990). Contrarily, social-anxiety, introversion, and extraversion are personality characteristics which do seem to have the potential to have an effect on social interactions (Leary, 1983; Stokes, 1985). In this section, the personality characteristic social anxiety will be examined first. Second, introversion and extroversion will be explored. Third, there will be some additional explanation about the relationship between these personality characteristics.

2.1.1 Main effects social anxiety

People with social anxiety fear and try to evade the judgement of others (Stein & Stein, 2008). The socially anxious individual worries in such situations that he/she will say or do something that results in humiliation or embarrassment (Stein & Stein, 2008). These worries can become so prominent that the socially anxious individual avoids most interpersonal encounters, or suffers in such situations with strong discomfort (Stein & Stein, 2008). Thus, people with social anxiety have fear of being evaluated and judged in a negative way by other people (Goldin et al., 2013; Stein & Stein, 2008). This fear leads to feelings of inferiority, inadequacy, awkwardness, shame, and sadness (Goldin et al., 2013). Socially anxious individuals have a general uncomfortable feeling because of their fear and their feelings which might influence their competence to interact in social settings (Leary, 1983).

Online interaction in a text-based manner may avoid parts of social situations that are feared by socially anxious individuals, such as stammering, blushing, and the reaction of others to the individuals perceived social or physical limitations (Erwin, Turk, Heimberg, Fresco, & Hantula, 2004). Previous research shows that socially anxious individuals tend to make fewer voice calls and prefer to use instant messaging (e.g., e-mail, blogs, Windows live messenger) (Reid & Reid, 2007). They also use instant messaging to kill time, as a diversion, or to avoid some other activity (Reid & Reid, 2007). Moreover, social anxiety is lower when people interact online than when they interact face-to-face, and this anxiety decreased more for individuals with social anxiety than for individuals with low social anxiety (Yen et al., 2012). Besides, online interaction in a text-based manner can substitute face-to-face communication for individuals with social anxiety as a personality characteristic (Erwin et al., 2004). Furthermore, Pierce (2009) found that individuals with social anxiety tend to feel more comfortable using mediated communication (e.g., text messaging, e-mail) as compared to interacting face-to-face. In short, online interaction in a text-based manner has an inherent appeal to socially anxious individuals (Reid & Reid, 2007).

These main effects were found for mediated communication and instant messaging. However, no research has been performed directly on testing how this turns out in relation to MIM (e.g., Whatsapp and Facebook messenger). It is expected that there will be similar main effects found for the personality characteristic social anxiety in relation to MIM.

> Hypothesis (H1a): Individuals with social anxiety have a higher preference for MIM as compared to individuals with low social anxiety.
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> Hypothesis (H1b): Individuals with social anxiety feel more comfortable using MIM as compared to individuals with low social anxiety.

Hypothesis (H1c): Individuals with social anxiety feel less comfortable interacting face-to-face as compared to individuals with low social anxiety.

2.1.2 Main effects introversion-extraversion

Extraversion and introversion are viewed as a continuum, so to be high in one implies being low in the other (Loomis, 1982). Introverts feel more satisfied with less external stimulation (e.g., reading a book, conversing with a close friend) compared to extraverts who feel more satisfied with more external stimulation (for example, going to parties and listening to loud music) (Cain, 2012). Moreover, extraverts prefer to engage in and enjoy social interactions, whereas introverts prefer to avoid social situations and have a tendency to be reserved, shy, or withdrawn in social settings (Fishman, Ng, & Bellugi, 2011). So, characteristics of introverts are being shy, reserved and quiet, while extraverts can be characterised with being more outgoing, sociable, confident and talkative (Snyder & Swann, 1978).

Extraverts tend to be more interested in interactions with other people as compared to introverts (Cain, 2012; Fishman et al., 2011). Additionally, extraverts are more likely to choose for face-to-face interaction than introverts (Goby, 2006). Extraverts prefer communication media that enable direct and fast communication with others (Hertel et al., 2008). Thus, extraverts are more likely to develop better social skills than introverts because of their stronger interest in direct social interaction (Hertel et al., 2008; Stokes, 1985). In contrast, introverts, being shyer, tend to feel less comfortable meeting up with people (Goby, 2006). Introverts have less need for social interaction and are, therefore, less likely to acquire social skills which makes direct conversations more difficult (Hertel et al., 2008). Thus, introverts tend to feel more comfortable with asynchronous (i.e., a delay between when a message is sent and when a response is given) and written/typed media (Hertel et al., 2008), because introverts like to be in a quiet surrounding and have some time to consider their message (Beauvois & Eledge, 1995). The absence of physical closeness when, for example, communicating online helps to avoid the discomfort and insecurity introverts feel and therefore make communication easier (Goby, 2006). Introverts have a tendency to find their true identity online, while extraverts are more likely to find their true identity offline (Ross et al., 2009). It is expected that similar effects of introversion-extraversion will be found in relation to MIM.

Hypothesis (H2a): Individuals who are introverted have a higher preference for MIM as compared to individuals who are extraverted.

Hypothesis (H2b): Individuals who are introverted feel more comfortable using MIM as compared to extraverted individuals.

Hypothesis (H2c): Individuals who are introverted feel less comfortable interacting face-to-face as compared to extraverted individuals.

2.1.3 Relationship between social anxiety and introversion

It has been firmly established in prior research that introversion shares a relationship with social anxiety (Bienvenu et al., 2001; Eysenck, 1982; Norton, Cox, Hewitt, & McLeod, 1997; Trull & Sher, 1994). Researchers have had difficulty separating introversion and social anxiety, the two constructs were often used interchangeably (Morris, 1979). Introverts have a more internal

focus and have less environmental interaction (Eysenck, 1982; Mull, 2006). Introverts can view themselves as lacking good social skills and good interpersonal functioning (Henjum, 1982). Social anxiety and introversion are related to each other because of the construct low self-esteem (Mull, 2006). While social anxiety and introversion are strongly interrelated (Bienvenu et al., 2001; Eysenck, 1982; Norton, Cox, Hewitt, & McLeod, 1997; Trull & Sher, 1994), not all introverts have social anxiety (Mull, 2006). The fear of being judged unfavourably, disapprovingly, or harshly by others, is linked with social anxiety (Boelen & Reijntjes, 2009). Introversion is not having fear of social judgment, it is more about how a person reacts to stimulation, including social stimulation (Cain, 2012). Socially anxious individuals tend to be afraid of doing something wrong in a social situation (Boelen & Reijntjes, 2009). Introverts are more self-focused and shy in social situations, not necessarily afraid of doing something wrong (Mull, 2006). In this study, it is chosen to view social anxiety and introversion as two separate personality characteristics.

2.2 Communication situations

Media Richness Theory (MRT) (Daft & Lengel, 1986) and Politeness Theory (PT) (Brown & Levinson, 1987) are theories that explain that situations may have complexities which that might influence media choice and media effectiveness. The purpose of using MRT and PT as the foundation of the communication situations is that they provide two different angles to distinguish between complex and simple situations.

2.2.1 Media-richness theory

Media differ in "richness", richness is the ability of information to change interpretation within a specific time frame (Daft & Lengel, 1986). Face-to-face communication is considered the richest, while media with fewer cues (e.g., gestures, vocal intonation) or media which provide slower feedback (e.g., e-mail, blogs) are considered leaner (Daft & Lengel, 1986; Dennis & Kinney, 1998). So, rich mediums have the ability to give direct feedback (Daft & Lengel, 1986; Dainton & Zelley, 2015; Suh, 1999), for example explaining a message more clearly to avoid confusion. According to Media Richness theory (MRT), richer mediums are more effective if the situation/message is complex because richer media have the ability to correct misinterpretations (Daft & Lengel, 1986; Dainton & Zelley, 2015; Suh, 1999). Richer media, enable users to better understand ambiguous messages (complex) and allow users to communicate more quickly (Daft & Lengel, 1986; Dennis & Kinney, 1998). In contrast, leaner media are better for messages with low ambiguity (simple) because rich media provides too much information (Daft & Lengel, 1986; Dennis & Kinney, 1998).

MIM is considered a leaner medium than face-to-face interaction according to the Theory of Media Richness (Daft & Lengel, 1986). However, because of its ability to give feedback in less time than instant messaging (e.g., e-mail, blogs), MIM is still considered a rather rich medium. Moreover, the use of mediated communication may be affected by social developments, settings, and the purpose of use as well (Walther, 1992). Users of mediated communication evaluated several text-based communication media, such as computer conferencing and e-mail as rich or richer than face-to-face interactions (Walther, 1992).

> Hypothesis (H3): Individuals have a higher preference for MIM as compared to face-to-face interaction if the situation is complex.

2.2.2 Politeness theory

At the core of Politeness Theory (PT) is the intangible concept of 'face' (Brown & Levinson, 1987). Goffman (1967) defined the notion of face as "the positive social value a person effectively claims for himself by the line others assume he has taken during a particular contact (p. 213)." Later, Craig, Tracy, and Spisak (1986) defined face as "the self-image they present to others (p. 440)." Within this study, the concept of 'face' is affected by the interaction between people, 'face' is not just an individual occurrence.

The Theory explains why and how persons try to protect, promote, or save face, especially when shameful or embarrassing situations arise unexpectedly (Brown & Levinson, 1987; Dainton & Zelley, 2015). Moreover, certain behaviours can threaten someone's face (Brown & Levinson, 1987). These face-threatening acts (FTA's) are for example compliments, criticisms, apologies, requests, and threats (Brown & Levinson, 1987; Dainton & Zelley, 2015). All speech acts are potentially face-threatening to the listener's or the speaker's face, or to both (Brown & Levinson, 1987; Ogiermann, 2009). Brown & Levinson (1987) further distinguish between negative and positive face, which are types of desires or 'face wants'. Negative face is the desire to be unimpeded in one's actions and positive face is the desire to be approved of (liked) (Brown & Levinson, 1987; Redmond, 2015). FTA's can be toward one's negative face and towards one's positive face (Redmond, 2015). Some examples of positive face threat are criticisms, complaints, and evaluations (Brown & Levinson, 1987; Redmond, 2015). Examples of negative face threat are requests, warnings, and reminders (Brown & Levinson, 1987; Redmond, 2015).

People can lessen face threat by using lean mediums to control the interchange of information about themselves (O'Sullivan, 2000). Instant messaging lack physical and non-verbal cues which are available in face-to-face communication (Plumb, 2013). The reduced-cue nature of instant messages let people create more ambiguous messages and hide undesirable nonverbal cues (O'Sullivan, 2000). In addition, asynchronicity of instant messages reduces or even avoids the risk of imposing on people (Walther, 1996), which lessens face threat. To back these claims, O'Sullivan (2000) found that participants more strongly preferred mediated communication (e.g., text message, e-mail, instant messaging) in face-threatening situations than in non-face-threatening situations. Likewise, research has found a preference for e-mail over face-to-face communication in face-threatening situations (Joinson, 2004).

> Hypothesis (H4): Individuals have a higher preference for MIM as compared to face-to-face interaction if the situation is face-threatening.

2.3 Interaction personality characteristics and communication situations

Although Daft and Lengel (1986) designed MRT for media use, instead of media choice, prior empirical studies of the theory studied the choice of communication medium in certain situations, and not the effects of media usage (Dennis & Kinney, 1998). Besides, few studied the relation between preference for rich or lean mediums (transmits less information; such as non-verbal cues) and personality. For example, Reid and Reid (2004) found out that socially anxious individuals prefer text messaging with a telephone (a rich medium), and Karemaker (2005) found out that extraverted individuals prefer face-to-face over computer-mediated communication (a leaner medium), but only for individuals with low social anxiety. However, Dunaetz, Lisk, and Shin (2015) demonstrated that extraversion also predicts preference for

richer media on its own by controlling for social anxiety. Low socially anxious and extraverted individuals tend to prefer richer mediums whereas high socially anxious and introverted individuals prefer leaner mediums (Dunaetz et al., 2015).

Hypothesis (H5a): Individuals who are socially anxious have a higher preference and feel more comfortable using MIM when the situation is complex as compared when the situation is simple.

Hypothesis (H5b): Individuals who are introverted have a higher preference and feel more comfortable using MIM when the situation is complex as compared to when the situation is simple.

Hypothesis (H5c): Individuals who are low socially anxious more strongly prefer using face-to-face interaction when the situation is complex as compared to when the situation is simple.

Hypothesis (H5d): Individuals who are extraverted have a higher preference and feel more comfortable using face-to-face interaction when the situation is complex as compared to when the situation is simple.

Personality characteristics interacting with face threat also influence the choice and ability to use a communication medium (Feaster, 2010). Socially anxious individuals prefer instant messaging in face-threatening situations because they can mask their inadequacies (Feaster, 2010). The reduced-cue nature of instant messages let people hide undesirable nonverbal cues (O'Sullivan, 2000). It is expected that similar interaction effects can be found for introverts because introverts tend to develop less social skills than extraverts (Hertel et al., 2008).

Hypothesis (H5e): Individuals who are socially anxious have a higher preference for MIM when the situation is face-threatening as compared to individuals who are low socially anxious.

Hypothesis (H5f): Individuals who are introverted have a higher preference for MIM when the situation is face-threatening as compared to individuals who are extraverted.

3. Methods

3.1 Research design

Two predictors are studied in this research, namely: social anxiety (social anxiety/low social anxiety) and introversion/extraversion. The choice of communication medium and comfort-level when communicating online or face-to-face are the dependent variables (see Appendix A). This study has a quasi-experimental 2x2 between-subject design and an experimental 2x2 within-subject factor design. These designs are chosen in order to research if social anxiety and introversion-extraversion have an influence on the choice of communication medium. The quasi-experimental between-subject design tests the participant's personality characteristics by use of personality scale questions, participants are then placed in personality groups based on the score that they get from these questions. The experimental within-subject factor design tests the preference for a communication medium and the comfort-level when using a communication medium in eight communication situations separately (see table 1). There are

four types of situations based on MRT and PT, each type differs based on the complexity and form of threatening face. Moreover, every type of situation has two versions, resulting in eight situations which the participant judges in total (see Appendix B). The participants indicate if they prefer one communication medium over the other. Additionally, they indicate how comfortable they feel when using the communication mediums.

Table 1. The four different types of situations

Type of situation
Simple
Complex
Positive face-threatening
Negative face-threatening

3.2 Preliminary study

A pre-test was administered before finalizing the main-test in order to have eight communication situations. Consequently, having two situations per type of situation (see Appendix B). These eight situations were used in the main test. First, the procedure of the pre-test will be explained. Second, a situation check will be discussed in order to clarify if the situations were judged differently from each other. Third, the results of the pre-test will be presented.

3.2.1 Procedure pre-test

Based on MRT and PT, there were six situations created per type of situation, except for negative face threat. Negative face threat had seven situations which were used in the pre-test. 25 respondents were used to participate in the pre-test in order to have significant and valid results. Thus, 25 respondents were shown 25 situations (six simple situations + six complex situations + six positive face-threatening situations + seven negative face-threatening situations) and for each situation, they had to answer six statements (see table 2).

Table 2. Statements preliminary test – 7-point Likert scale

Statements pre-test	Answer format	Indicates
"The message is potentially threatening to the relationship with the recipient"	agree - disagree	Positive face threat
"The message limits the freedom of choice of the recipient"	agree - disagree	Negative face threat
"The message expresses a negative rating from the recipient"	agree - disagree	Positive face threat
"I think this message is"	clear - unclear	Complexity
"I think this message is"	easy - hard	Complexity
"I think this message is"	simple - complex	Complexity

Statement one and three are indicators of positive face-threat and statement two is an indicator of negative face-threat. Agreeing with these statements shows that a specific situation is deemed face-threatening, positively or negatively. Statements four, five, and six are indicators of complexity. The statements were based on the theories of Brown and Levinson (1987) and Daft and Lengel (1986).

3.2.2 Situation check

The purpose of the situation check is to indicate if the six (Negative face threat has seven situations) situations per type of situation that were created based on MRT and PT were judged differently than the other types of situations.

Table 3. Situation check – difference in judgment of communication situations

Type of situation	Comparing situation	p-value
Positive face threat		
	Negative face threat	0.00
	Complex	0.00
	Simple	0.00
Negative face threat		
	Positive face threat	0.87
	Complex	0.00
	Simple	0.00
Complex		
	Simple	0.00
	Positive face threat	0.04
	Negative face threat	0.67
Simple		
	Complex	0.00
	Positive face threat	0.00
	Negative face threat	0.00

Table 3 shows the p-value acquired from multiple paired sample tests, these values are presented for each comparing situation. It can be concluded that one situation is judged differently than the other if the p-value is less than .05. Most situations passed this test, however, some minor issues were found. On average, participants had the tendency to judge negative face threatening situations similarly to positive face threatening situations (p-value = >.05). Moreover, negative face threatening situations were not judged differently than complex situations on average (p-value = >.05). It was chosen to still include negative face threatening situations for the purpose of this study.

3.2.3 Results of the preliminary study

In order to determine the best two situations per type of situation, mean scores of the statements were evaluated for each situation. Situations two and four of positive face threat were perceived as threatening for the relationship with the recipient and forming negative evaluation from the recipient (see Appendix C, Table 1). Situations three and five of negative face threat were perceived as limiting the freedom of choice for the recipient (see Appendix C, Table 2). Simple situations three and four were seen as the most simple, clear, and easy to communicate (see Appendix C, Table 3). Only complex situation one indicated being judged as complex. Still, situation four was chosen as the second complex situation for the purpose of this research. This was justified by the paired sample t-test that indicates that the simple and complex situations are significantly different from each other. Table 4 shows the eight situations which were used in the main test.

Table 4. The eight situations for the main test

Type of situation	Most fitting communication situations
Positive face threat	(Situation 2) "A friend has the latest version of a group report that must be submitted. You have discovered that the latest version is still full of errors. You want to confront your friend." (Situation 4) "A friend would take notes of a meeting. Now you have found out that he/she has not attended the meeting. You want to confront him/her with this."
Negative face threat	(Situation 3) "You borrowed your friend's laptop. You want to ask if it is all right if you return the laptop a week later." (Situation 5) "You have agreed with a friend to have a drink. However, you want to tell him/her that you only feel like going to one particular bar."
Simple	(Situation 3) "You borrowed your friend's laptop. You want to tell him/her that you will return the laptop tomorrow as promised." (Situation 4) "You have agreed to take notes of a meeting for a friend. You want to tell him/her that you succeeded. "
Complex	(Situation 1) "There have been some misunderstandings between you and a friend. He/she now seems a bit annoyed. You want to make clear what you really meant." (Situation 4) "You are considering quitting your work/study. Before you make a final choice, you want to talk about this with a friend."

3.3 Measures

3.3.1 Social anxiety

A subscale of the Self-Consciousness Scale, which contains six self-report items (see Appendix D) (Scheier & Carver, 1985) was used to measure social anxiety disorder. Participants had to indicate how much each statement is like them on a six-point scale ranging from one (not like me at all) to six (a lot like me) (Scheier & Carver, 1985).

3.3.2 Introversion-extraversion

The introversion scale from McCroskey and Richmond (1998) was used in order to measure if a participant is either introverted or extraverted. This scale covers 12, in which the computed score of those items should be between 12 and 60. Participants had to indicate if they agreed or disagreed with these twelve statements items (see Appendix D). (McCroskey & Richmond, 1998).

3.3.3 Communication preference and comfort

Participants have indicated their preference for using mobile instant messaging or face-to-face interaction on a 6-point scale ranging from one (face-to-face) to six (App/SMS) for each situation. Furthermore, they indicated how comfortable it felt to give the message face-to-face and in addition, they indicated how comfortable it felt to give the message by use of MIM on a 6-point scale ranging from one (totally agree) to six (totally disagree) for each situation. The scales were reformed based on the 8-point scale ranging from zero (not at all) to seven (very much) used by Hertel et al. (2008) (see Appendix D)

3.4 Participants

The main-test was targeted towards Dutch citizens that belong to generation Y, similarly known as Millennials (Dainton & Zelley, 2015). Millennials are born between 1982 and 2003 (aged 15-36) and grew up with the Internet, they are heavy users of it (Hasbullah et al., 2016). Furthermore, Millennials have the highest smartphone ownership amongst generational segments (Nielsen, 2016). The respondents were gathered on the basis of non-probability sampling

3.4.1 Sample size and socioeconomic characteristics

A total of 295 participants filled in the survey but only 209 participants were included and used in the final analysis. 86 participants were excluded because the survey was either not answered completely or the respondent spend less time than five minutes to fill in the survey. Within the total of 209 participants, 156 were females, 50 were males, and three participants would rather not answer this question (see table 2). The mean age of the participants was 22 (m=21.7). Most participants have a bachelor's degree with a total of 142.

Table 5. Education level and gender of the participants

Education level			Gender		
	Frequency	Per cent		Frequency	Per cent
Secondary education (graduated high school)	41	19%	Female	156	75%
Trade/technical/vocational training	16	8%	Male	50	24%
Undergraduate education (Bachelor degree)	142	68%	Rather not answer	3	1%
Postgraduate education (Masters or Doctorate)	8	4%			
Other	2	1%			
Total	209	100%	Total	209	100%

3.4.1 Personality characteristics

A Pearson correlation analysis was conducted in order to determine if social anxiety and introversion were deemed different. The Pearson Correlation score was .425, social anxiety and introversion had no linear correlation. Thus, Social anxiety and introversion are different characteristics. In order to measure if a participant was either introverted or extraverted, twelve statements were presented to each participant. Participants had to indicate on a five-point scale if they agreed or disagreed with the statement, and for each statement, the participant could score between one and five points. Thus, the computed score of these twelve statements was between 12 and 60. Participants scoring between 12 and 36 were defined as being extraverted and participants scoring between 37 and 60 were defined as being introverted (McCroskey & Richmond, 1998). Moreover, six statements were presented to each participant in order to measure if a participant had social anxiety. Participants had to indicate how much each statement was like them on a six-point scale ranging from one (not like me at all) to six (a lot like me). The participant could score between one and six points for each statement, resulting in a computed score between 6 and 36. Participants scoring higher than 21 were defined as having social anxiety (Scheier & Carver, 1985).

Table 6*. Personality characteristics of the participants*

	Extraverted	Introverted	Total
Low social anxiety	89	25	114
Social anxiety	50	45	95
Total	139	70	

Table 6 shows the classification of the participants based on their scores of the personality tests. 55 per cent of the participants, which contains 114 people, were classified as having a low form of social anxiety. Additionally, most participants were classified as extraverted with a total of 139. Most participants had low social anxiety and were extraverted with a total of 89 people. The second largest group are the participants with social anxiety and extraversion.

3.5 Procedure

At the beginning of the survey, participants were shown all communication situations separately and after each situation, they had to answer questions about their communication preference (face-to-face or mobile instant messaging) and comfort-level of using face-to-face interaction or mobile instant messaging in that particular situation. Subsequently, participants filled in scales measuring the level of introversion (or extraversion) and social anxiety. Finally, answering demographic questions and questions about MIM usage (gender, age, education). The survey had a final page in which the researcher expressed his gratitude for participating in the survey (see Appendix D for the survey layout).

4. Results

The results are shown in this section of the research paper. First, a reliability analysis was conducted for the different variables and situations. Second, the main effects and interaction effects of the independent variables and the situations on preference are analysed using repeated measures ANOVA. Third, a repeated measures MANCOVA was conducted in order to examine the relationship and effects between the independent and dependent variables for the different comfort-levels. The hypotheses will be evaluated throughout the results.

4.1 Reliability analysis

4.1.1 Reliability personality scales

For the subscales measuring Introversion and Social anxiety, the subsequent reliabilities (Cronbach's $\alpha = .85$ for Introversion and $\alpha = .78$ for Social anxiety) were more than satisfactory considering the limited number of items. These scales can be considered reliable.

4.1.2 Reliability of the situations

The reliability of the different types of situations was analysed (see table 7). A Cronbach's alpha score is reliable if the score is at least 0.70 (Gidron, 2013). However, because the internal reliability of only two situations was measured, it was chosen to accept a score of at least 0.60. Certain situations showed reliability issues. For preference, the complex situations cannot be observed as one to perform analysis on (Cronbach's $\alpha = 0.38$). Similarly, the negative face threat situations failed to provide a reliable score (Cronbach's $\alpha = 0.36$). Participants rated the

two situations of these types of situations differently. Therefore, it was chosen to compare the simple situations only with the positive face threatening situations, thus excluding the complex and negative face situations in order to conduct a valid analysis. For comfort-level when using MIM, the negative face threat situations were rated differently from each other (Cronbach's α = 0.45). Thus, it was chosen to combine the complex situations, positive face threat situations, and the negative face threat situations into one situation, named 'complicated situation' for valid and efficient analysis (Cronbach's α = 0.72). With the aim to perform a similar analysis for comfort, it was chosen to also combine the complex situations, positive face threat situations, and the negative face threat situations of comfort interacting face-to-face into one situation, named 'complicated situation' (Cronbach's α = 0.77).

Table 7. Reliability scores of the situations

Preference for face-to-face or MIM	Cronbach's α	
Simple situation 1 + Simple situation 2	0.66	
Complex situation 1 + Complex situation 2	0.38	
Positive face threat situation 1 + Positive face threat situation 2	0.62	
Negative face threat 1 + Negative face threat 2	0.36	
Comfort interacting face-to-face		
Simple situation 1 + Simple situation 2	0.71	
Complex situation 1 + Complex situation 2	0.54	
Positive face threat situation 1 + Positive face threat situation 2	0.64	0.77*
Negative face threat 1 + Negative face threat 2	0.62	
Comfort using MIM		
Simple situation 1 + Simple situation 2	0.61	
Complex situation 1 + Complex situation 2	0.61	
Positive face threat situation 1 + Positive face threat situation 2	0.57	0.72*
Negative face threat 1 + Negative face threat 2	0.45	

* Cronbach's α of complicated situation

4.2 Analysis of preference

A repeated measures ANOVA test has been conducted in order to find significant effects of the situations, personality characteristics, and the interaction between the situations and the personality characteristics on preference (see Table 8). The situation solely had a main effect on preference ($p < .05$). The personality characteristic, introversion-extraversion, showed an interaction effect with the situation on preference ($p < .05$). There was no main or interaction effect on preference found for the personality characteristic social anxiety. Moreover, there was no effect found for the interaction of the personality characteristics on preference.

Table 8. Repeated measures ANOVA Test Preference

Preference Face-to-face vs. MIM	*F*	*Sig.**	*Partial Eta Squared*
Introversion-extraversion	4.51	.32	.01
Social anxiety	.33	.12	.01
Situation	161.71	.00	.44
Introversion-extraversion * Social anxiety	.05	.56	.00
Situation * Introversion-extraversion	4.51	.04	.02
Situation * Social anxiety	.33	.56	.00
Situation * Introversion-extraversion * Social anxiety	.05	.83	.00

* Significant effect if significance level = < .05

4.2.1 Main effects situations

Significant situational influence was found. Participants indicated having a higher preference for MIM in a simple situation. In positive face threatening (complex) situations, the participants had slightly more preference for face-to-face interaction. Hypothesis 3 and 4 are rejected based on these results

> Hypothesis (H3): Individuals have a higher preference for MIM as compared to face-to-face interaction if the situation is complex.
>
> Hypothesis (H4): Individuals have a higher preference for MIM as compared to face-to-face interaction if the situation is face-threatening.

Table 9. Situational effects on preference

Situation	Mean*	N	Std. Deviation
Simple	4.9	209	1.4
Positive face threat	2.9		1.4

*1 = high preference for face-to-face interaction, 6 = high preference for MIM

4.2.2 Interaction effects introversion-extraversion on preference

The interaction effect of the situation with the personality characteristics introversion and extroversion is prominent (see Table 10). Introverts and extraverts had a different preference in simple situations than in positive face threatening situations. In simple situations, both introverts and extraverts had a higher preference for MIM. In positive face threatening situations (complex situations), introverted individuals had a higher preference for MIM than extraverted individuals. Extraverted individuals more strongly preferred face-to-face interaction in positive face threatening situations. Hypothesis 5b is rejected based on these results, whereas hypothesis 5d and 5f are confirmed based on these results.

> Hypothesis (H5b): Individuals who are introverted have a higher preference using MIM when the situation is complex as compared to when the situation is simple.
>
> Hypothesis (H5d): Individuals who are extraverted have a higher preference using face-to-face interaction when the situation is complex as compared to when the situation is simple.
>
> Hypothesis (H5f): Individuals who are introverted have a higher preference for MIM when the situation is face-threatening as compared to individuals who are extraverted.

Table 10. Introversion-extraversion and situation interaction effects on preference

Personality	Situation	Mean*	N	Std. Deviation
Extraversion	Simple	4.9	139	1.4
	Positive face threat	2.8		1.4
Introversion	Simple	4.8	70	1.3
	Positive face threat	3.3		1.4

*1 = high preference for face-to-face interaction, 6 = high preference for MIM

4.3 Analysis of comfort

A repeated measures MANCOVA test has been conducted in order to find significant effects of the situations, personality characteristics, and the interaction between the situations and the

personality characteristics on comfort (see Table 11). First, there is a statistically significant difference in comfort influenced by introversion-extraversion ($p < .05$). Thus, introversion-extraversion has a main effect on comfort. Moreover, a main effect of the situations was found for comfort ($p < .05$). The personality characteristic, social anxiety, showed minor influence ($p < .09$). However, the mean scores of social anxiety interacting with the situations will be observed because a significant interaction effect was found between social anxiety and the situations ($p < .05$). There were no effects found for introversion-extraversion interacting with the situations, the interaction of the personality characteristics, and the situations interacting with social anxiety and introversion-extraversion.

Table 11. Repeated measures MANCOVA Test comfort

Comfort interacting Face-to-face vs. using MIM	F	Sig.	Partial Eta Squared
Introversion-extraversion	6.25	.00	.06
Social anxiety	2.53	.08	.02
Introversion-extraversion * Social anxiety	1.40	.25	.01
Situation	131.01	.00	.56
Situation * Introversion-extraversion	.92	.40	.01
Situation * Social anxiety	4.26	.02	.04
Situation * Introversion-extraversion * Social anxiety	1.70	.19	.02

* Significant effect if significance level = < .05

4.3.1 Main effects situations on comfort using MIM

Table 12 shows the mean scores of the situations based on comfort using MIM. The situational influence the situations are directly visible. Participants had the tendency to feel less comfortable using MIM when the situation was complicated as opposed to when the situation was simple.

Table 12. Situational effects on comfort MIM

Situation	Mean*	N	Std. Deviation
Simple	1.8	209	1.2
Complicated	3.3		1.0

*1 = totally agrees feeling comfortable using MIM, 6 = totally disagrees feeling comfortable using MIM

4.3.2 Main effects situations on comfort interacting face-to-face

The situational effects are still visible, but less prominent than the effects on comfort using MIM. Similarly, participants indicated feeling less comfortable interacting face-to-face when the situation was complicated as opposed to when the situation was simple. However, the difference in mean scores between the situations is minimal.

Table 13. Situational effects on comfort Face-to-Face

Situation	Mean*	N	Std. Deviation
Simple	1.8	209	1.2
Complicated	2.1		0.9

*1 = totally agrees feeling comfortable interacting face-to-face, 6 = totally disagrees feeling comfortable interacting face-to-face

4.3.3 Main effects introversion-extraversion on comfort using MIM

The main effect of introversion-extraversion is not significant for comfort using MIM (see Table 14). The mean scores indicate that both introverts and extraverts have an almost equal

comfort-level when using MIM. Nonetheless, introverts felt slightly more comfortable using MIM than extraverts. Hypothesis 2b is confirmed based on these results.

> Hypothesis (H2b): Individuals who are introverted feel more comfortable using MIM as compared to extraverted individuals.

Table 14. Introversion-extraversion effects on comfort MIM

Situation	Mean*	N	Std. Deviation
Extraversion	2.92	139	0.9
Introversion	2.87	70	0.9

*1 = totally agrees feeling comfortable using MIM, 6 = totally disagrees feeling comfortable using MIM

4.3.4 Main effects introversion-extraversion on comfort interacting face-to-face

The main effect of introversion-extraversion is stronger for comfort interacting face-to-face than for comfort using MIM. Table 15 shows that introverts tend to feel less comfortable interacting face-to-face than extraverts. Hypothesis 2c is confirmed based on these results.

> Hypothesis (H2c): Individuals who are introverted feel less comfortable interacting face-to-face as compared to extraverted individuals.

Table 15. Introversion-extraversion effects on comfort face-to-face

Situation	Mean*	N	Std. Deviation
Extraversion	1.9	139	0.7
Introversion	2.3	70	0.9

*1 = totally agrees feeling comfortable interacting face-to-face, 6 = totally disagrees feeling comfortable interacting face-to-face

4.3.5 Main effects social anxiety on comfort using MIM

The significant score in Table 11 showed that social anxiety did not have a strong effect, thus it is expected that the mean score between social anxiety and low social anxiety will not show much variance. However, differences between the mean scores will still be examined. Table 16 shows that participants with social anxiety felt (slightly) more comfortable using MIM than participants with low social anxiety. Hypothesis 1b is confirmed based on these results.

> Hypothesis (H1b): Individuals with social anxiety feel more comfortable using MIM as compared to individuals with low social anxiety.

Table 16. Social anxiety effects on comfort MIM

Situation	Mean*	N	Std. Deviation
Social anxiety	2.8	95	0.9
Low social anxiety	3.0	114	0.9

*1 = totally agrees feeling comfortable using MIM, 6 = totally disagrees feeling comfortable using MIM

4.3.6 Main effects social anxiety on comfort interacting face-to-face

Again, the mean scores were not expected to show much variance. Table 17 indicates that participants with low social anxiety felt (slightly) more comfortable interacting face-to-face than participants with social anxiety. Hypothesis 1c is confirmed based on these results.

Hypothesis (H1c): Individuals with social anxiety feel less comfortable interacting face-to-face as compared to individuals with low social anxiety.

Table 17. Social anxiety effects on comfort face-to-face

Situation	Mean*	N	Std. Deviation
Social anxiety	2.1	95	0.8
Low social anxiety	2.0	114	0.8

*1 = totally agrees feeling comfortable interacting face-to-face, 6 = totally disagrees feeling comfortable interacting face-to-face

4.3.7 Interaction effects social anxiety on comfort using MIM

Participants with low social anxiety felt less comfortable using MIM in a complicated situation than participants with social anxiety (see Table 18). Furthermore, participants with social anxiety and participants with low social anxiety felt almost equally comfortable using MIM in a simple situation. Hypothesis 5a is rejected based on these results.

Hypothesis (H5a): Individuals who are socially anxious feel more comfortable using MIM when the situation is complex as compared when the situation is simple.

Table 18. Social anxiety and situation interaction effects on comfort using MIM

Personality	Situation	Mean*	N	Std. Deviation
Low social anxiety	Simple	1.8	114	1.3
	Complicated	3.4		1.0
Social anxiety	Simple	1.7	95	1.1
	Complicated	3.1		1.0

*1 = totally agrees feeling comfortable using MIM, 6 = totally disagrees feeling comfortable using MIM

4.3.8 Interaction effects social anxiety on comfort interacting face-to-face

Interaction effects of social anxiety on comfort interacting face-to-face were found and displayed in table 19. The difference in comfort influenced by the situation was not significant for participants with low social anxiety but significant for participants with social anxiety. Participants with social anxiety had less comfort interacting face-to-face than people with low social anxiety when the situation was complicated, this effect was reversed in a simple situation. It can be stated that the complexity of the situation had a stronger influence on people with social anxiety than people with low social anxiety.

Table 19. Social anxiety and situation interaction effects on comfort interacting face-to-face

Personality	Situation	Mean*	N	Std. Deviation
Low social anxiety	Simple	1.9	114	1.3
	Complicated	2.0		0.9
Social anxiety	Simple	1.8	95	1.1
	Complicated	2.2		0.8

*1 = totally agrees feeling comfortable interacting face-to-face, 6 = totally disagrees feeling comfortable interacting face-to-face

5. Discussion

The objective of this study is to find out if personality characteristics and communication situations influence the choice of communication medium and if these factors influence a person's comfort-level when interacting face-to-face or by use of mobile instant messaging. To achieve this objective the following central research question has been set: "To what extent do social anxiety, extraversion-introversion, and communication situations influence people's preference for and comfort-level with face-to-face interaction or MIM?" This question was answered with a quasi-experimental 2x2 between-subject design and an experimental within-subject factor design. First, the main findings of this research will be discussed with a summary of the hypotheses. Second, theoretical implications will be specified. Third, the limitations and suggestions for future research will be given. Last, the conclusions of this research will be presented.

5.1 Main findings

Based on findings from Daft & Lengel, (1986), Dennis & Kinney (1998), O'Sullivan (2000), and Walther (1992) it was expected that individuals had a higher preference for MIM as compared to face-to-face interaction when the situation was complicated or positive face threatening. MIM is considered a richer medium than face-to-face interaction for users of mediated communication (Walther, 1992), and richer media enable users to comprehend complex messages quickly (Daft & Lengel, 1986; Dennis & Kinney, 1998). Moreover, O'Sullivan (2000) found that individuals more strongly preferred mediated communication (e.g., text message, e-mail, instant messaging) in face-threatening (complex) situations than in non-face-threatening situations. It was found that situations based on MRT and PT had an influence on an individual's communication preference (see Table 8). However, individuals had a higher preference for MIM when the situation was simple. An explanation could be that the message is not so significant or important in these simple situations, a simple detached message suffices. Contrarily, individuals preferred face-to-face interaction when the situation was positive face threatening (complex) (see Table 9). Thus, hypotheses 3 and 4 were rejected.

The interaction of the personality characteristics introversion and extraversion with the communication situations also influenced the preference of the individual (see Table 8). Introverts and extraverts had a different preference in simple situations than in positive face threatening situations (see Table 10). In simple situations, both introverts and extraverts had a higher preference for MIM. In positive face threatening situations (complex situations), introverted individuals had a higher preference for MIM than extraverted individuals. Based on findings from Goby (2006) and Dunaetz et al. (2015) it was expected that introverts have a higher preference using MIM when the situation is complex as compared to when the situation is simple. Goby (2006) found that the absence of physical closeness when, for example, communicating online helps to avoid the discomfort and insecurity introverts feel and therefore make communication easier. Moreover, Duneatz et al. (2015) found that introverted individuals prefer leaner mediums. Nonetheless, the results showed that introverts had a stronger preference for MIM in a simple situation, so hypothesis 5b is rejected.

It was also found that extraverted individuals more strongly preferred face-to-face interaction in positive face threatening situations. This might be explained by the characteristic of extraverts who tend to be more interested in interactions with other people as compared to introverts (Hertel et al., 2008). It was expected that individuals who are extraverted more

strongly prefer using face-to-face interaction when the situation is complex as compared to when the situation is simple (Hypothesis 5d). This was hypothesized based on a finding from Dunaetz et al. (2015), who found that extraverted individuals tend to prefer richer mediums, whereas introverted individuals prefer leaner mediums and the Theory of Media Richness, which mentioned that a communication channel should be matched to the content of the information that needs to be communicated (Daft & Lengel, 1986). The results confirm hypothesis 5d. Moreover, hypothesis 5f can also be confirmed in line with findings from Hertel et al. (2008), who found that introverts tend to feel more comfortable with media that is asynchronous and written/typed, and Karemaker (2005) who found that extraverted individuals prefer face-to-face over computer-mediated communication.

Personality and situations also have an influence on how comfortable an individual feels when using communication media. Table 11 showed that the different communication situations had a main effect on comfort. Participants had the tendency to feel less comfortable using MIM when the situation was complicated as opposed to when the situation was simple (see Table 12). Participants likewise indicated feeling less comfortable interacting face-to-face when the situation was complicated as opposed to when the situation was simple (see Table 13). It was hypothesized that individuals who are introverted feel more comfortable using MIM as compared to extraverted individuals (H2b). This hypothesis was based on findings from Hertel et al. (2008) and Beasuvois & Eledge (1995) who found that introverts tend to feel more comfortable with asynchronous and written/typed media. The results showed a minor personality effect on comfort for introversion and extraversion (see Table 14). Introverts felt slightly more comfortable using MIM than extraverts. Thus, hypothesis 2b can be confirmed. It was also expected that individuals with social anxiety feel more comfortable using MIM as compared to individuals with low social anxiety (H1b). This was hypothesized based on findings from Pierce (2009), who found that individuals with social anxiety tend to feel more comfortable using mediated communication as compared to interacting face-to-face. The results in Table 16 showed similar effects. Participants with social anxiety felt (slightly) more comfortable using MIM than participants with low social anxiety. So, hypothesis 1b can be confirmed.

Personality effects on comfort interacting face-to-face were also found. Hertel et al. (2008) identified that introverts tend to have less social skills because of their low interest in direct interaction. Hence, introverts tend to feel more comfortable communicating with asynchronous media. This form of communication makes it possible to take some time to consider the message that needs to be communicated. Prior research found that introverts like to be in a quiet surrounding and have some time to consider their message (Beauvois & Eledge, 1995). On the contrary, extraverted individuals prefer face-to-face over instant messaging (Karemaker, 2005). It was hypothesized based on these findings that individuals who are introverted feel less comfortable interacting face-to-face as compared to extraverted individuals (hypothesis 2c). Table 15 shows that introverts tend to feel less comfortable interacting face-to-face than extraverts. The results were in line with previous findings, confirming this hypothesis.

Based on previous research from Erwin et al. (2004), Reid and Reid (2004), and Pierce (2009), it was hypothesized that individuals with social anxiety will feel less comfortable interacting face-to-face as compared to individuals with low social anxiety (hypothesis 1c). This hypothesis is confirmed because Table 17 shows that participants with low social anxiety felt (slightly)

more comfortable interacting face-to-face than participants with social anxiety. Low socially anxious individuals face fewer complications when interacting face-to-face (Erwin et al., 2004).

Interaction effects were also found for comfort (see Table 18 and Table 19). Social anxiety interacting with the communication situation influenced the individual's comfort-level when interacting face-to-face and when using MIM. It was expected that individuals who are socially anxious feel more comfortable using MIM when the situation is complex as compared when the situation is simple (H5a). This hypothesis is rejected because individuals felt more comfortable in the simple situations in general. An explanation can be that socially anxious individuals feel more comfortable using MIM in simple situations because simple situations are more likely to be solved with simple answers and also with fewer cues. Correspondingly, a communication channel can be matched to the content of the information that needs to be communicated (Daft & Lengel, 1986). It was also found that participants with social anxiety had less comfort interacting face-to-face than people with low social anxiety when the situation was complicated, this effect was reversed in a simple situation. Thus, the complexity of the situation had a stronger influence on people with social anxiety than people with low social anxiety.

Table 20. Hypotheses - evaluation

Hypotheses		Evaluation
1a	Individuals with social anxiety have a higher preference for MIM as compared to individuals with low social anxiety.	Rejected
1b	Individuals with social anxiety feel more comfortable using MIM as compared to individuals with low social anxiety.	Confirmed
1c	Individuals with social anxiety feel less comfortable interacting face-to-face as compared to individuals with low social anxiety.	Confirmed
2a	Individuals who are introverted have a higher preference for MIM as compared to individuals who are extraverted.	Rejected
2b	Individuals who are introverted feel more comfortable using MIM as compared to extraverted individuals.	Confirmed
2c	Individuals who are introverted feel less comfortable interacting face-to-face as compared to extraverted individuals.	Confirmed
3	Individuals have a higher preference for MIM as compared to face-to-face interaction if the situation is complex	Rejected
4	Individuals have a higher preference for MIM as compared to face-to-face interaction if the situation is face-threatening.	Rejected
5a	Individuals who are socially anxious have a higher preference and feel more comfortable using MIM when the situation is complex as compared when the situation is simple.	Rejected
5b	Individuals who are introverted have a higher preference and feel more comfortable using MIM when the situation is complex as compared to when the situation is simple.	Rejected
5c	Individuals who are low socially anxious more strongly prefer using face-to-face interaction when the situation is complex as compared to when the situation is simple.	Rejected
5d	Individuals who are extraverted have a higher preference and feel more comfortable using face-to-face interaction when the situation is complex as compared to when the situation is simple.	Confirmed

5e	Individuals who are socially anxious have a higher preference for MIM when the situation is face-threatening as compared to individuals who are low socially anxious.	Rejected
5f	Individuals who are introverted have a higher preference for MIM when the situation is face-threatening as compared to individuals who are extraverted.	Confirmed

5.2 Theoretical implications

Preceding research on communication preferences mainly measured external or situational influences (Carlson & Zmud, 1999; Daft & Lengel, 1986; Dennis & Kinney, 1998; Walther, 1992). The key implication of this paper is that communication preferences and comfort using MIM or face-to-face interaction are also influenced by personality characteristics and at the same time influenced by the complexity of the situation. An important contribution to this field of research is the influence and addition of Politeness Theory and Media Richness. It was questioned whether the richness of a communication medium (i.e., number of cues, synchronicity) not only has an impact on the efficiency of information interchange but at the same time has an impact on the fears and the needs of an individual. To be more specific, it was debated that the preferences for and comfort to use mobile instant messaging (MIM) or face-to-face interaction should be partially decided by the potential of the communication medium to fulfil specific needs of the individual, these needs are in turn connected to their personality characteristics. The capability of a communication medium to satisfy these needs depends on media richness. It was debated that individuals who are inclined to use mediated communication evaluate MIM as being a rich medium, sometimes evaluating mediated communication as even richer than face-to-face interaction. The influences of personality characteristics on preferences and comfort tend to be more visible in situations that relate to the implications that the personality characteristic faces. It is suggested that individuals face more implications in complicated situations (e.g., complex, face-threatening). Socially anxious individuals can feel shy, ashamed, or awkward and introverts can similarly feel shy which makes it more difficult to solve situations with complications.

5.3 Limitations and recommendations for future research

Before coming to the conclusion, limitations of this study and recommendations for future research should be mentioned. First, in this study it was chosen to focus on the comparison of mobile instant messaging and face-to-face interaction, these two media differ based on media richness. It would have an exploratory interest to replicate this study, but splitting the variable media richness into multiple aspects (e.g., synchronicity, effectiveness, time). When looking at media richness this way, more differentiating communication channels can be compared to each other. These differentiating communication channels can then be further explored with personality effects and the interaction with the more detailed media richness aspects. A second limitation was found when testing the reliability scores of the different situations. At first, four different forms of communication situations were created based on Politeness Theory and Media Richness Theory with two versions of each situation, summing up to a total of eight situations. A pre-test was administered before finalizing the main test, however, in the main test, it turned out that some situations were judged differently despite using the same theoretical input. The complex situations and the negative politeness situations failed the reliability test for preference and negative politeness situations also failed the reliability test for comfort when interacting face-to-face. The two versions of these situation types were judged differently. In order to perform analysis, reliable situations are needed. It was chosen to compare the simple

situations with the complicated situations for comfort (simple vs. complex + positive face + negative face), because face-threat makes the situation more complicated. Moreover, in order to test preference, simple situations were only compared to positive politeness situations. Replications are required were the situations succeed in being judged differently, resulting in having more situations to compare with which in turn will add more knowledge to this field. When replicating, researchers should be aware that the situations require multiple pre-tests with different groups in order to create reliable and valid communication situations to be used in the main test. A third limitation that should be mentioned is the sample size. Based on the number of variables included in this research, the number of participants used in the main test sufficed. However, a bigger sample size would be even more desirable because of the complicated personality constructs present in this study. A bigger sample size can prove to be useful in order to have sufficient participants for each personality characteristic and personality characteristic combinations.

This study mainly focused on media preferences and comfort for hypothetical friend-related (personal) communication scenarios. Additional research is needed to reproduce these findings in physical communication settings. In these settings, multiple aspects can be measured, such as stress, the efficiency of communicating, and other behavioural features. Because the results in this study were relatively strong, despite being in a one-dimensional setting, comparable or even more significant effects of situations and personality characteristics can be found in a more multifaceted physical setting.

5.4 Conclusions

The conclusions towards the central research question will now be drawn. The central research question of this research is: *"To what extent do social anxiety, extraversion-introversion, and communication situations influence people's preference for and comfort-level with face-to-face interaction or MIM?"*

In this study, it was found that individuals had a higher preference for MIM when the situation was simple. Moreover, individuals had slightly more preference for face-to-face interaction in positive face-threatening situations. However, individuals with the personality characteristic introversion had a higher preference for MIM in positive face-threatening situations.

Individuals felt less comfortable using MIM when the situation was complicated as opposed to when the situation was simple. Similarly, individuals felt less comfortable interacting face-to-face when the situation was complicated as opposed to when the situation was simple. Individuals with introversion and individuals with extraversion felt almost equally comfortable in simple situations. Nonetheless, introverts felt slightly more comfortable using MIM than extraverts. Extraverts felt more comfortable interacting face-to-face than introverts.

It was also found that individuals with social anxiety felt more comfortable using MIM than participants with low social anxiety. In contrast, individuals with low social anxiety felt more comfortable interacting face-to-face than participants with social anxiety.

Situational simplicity and complexity interacting with personality also had an influence on the comfort of a person. Individuals with low social anxiety felt less comfortable using MIM in a complicated situation than individuals with social anxiety. In addition, individuals with social anxiety and individuals with low social anxiety felt almost equally comfortable using MIM in

a simple situation. Furthermore, individuals with social anxiety had less comfort interacting face-to-face when the situation was complicated than individuals with low social anxiety, this effect was reversed if the situation was simple. It can be concluded that situations based on PT and MRT have a significant influence on a person's comfort-level and preference for a communication medium. Personality characteristics can also have significant influence, however, these effects are more visible in complex settings where personalities have a higher chance of facing implications.

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Appendices

Appendix A

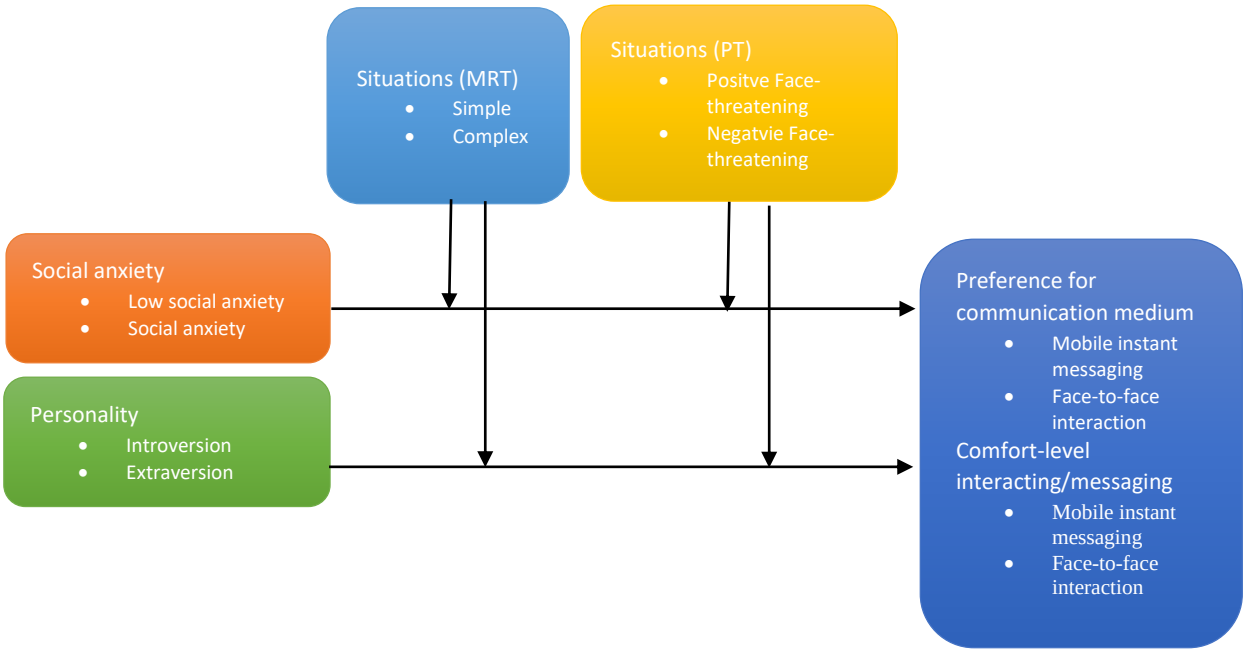

Figure 1. Research model

Appendix B

Table 1. Communication situations

Media Richness Theory		Politeness Theory	
Simple	Complex	Positive Face-threatening	Negative Face-threatening
Situation 1	Situation 3	Situation 5	Situation 7
Situation 2	Situation 4	Situation 6	Situation 8

Appendix C

Pre-test results

Table 1. Preliminary test results communication situations positive face-threat

PPFT = Positive politeness face threatening (Question 1, 2, 3)	Mean*	Count
PPFT situatie 1 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	4,15	20
PPFT situatie 1 - De boodschap beperkt de keuzevrijheid van de ontvanger	4,20	20
PPFT situatie 1 - De boodschap drukt een negatieve waardering van de ontvanger uit	3,95	20
PPFT situatie 2 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	2,90	20
PPFT situatie 2 - De boodschap beperkt de keuzevrijheid van de ontvanger	3,40	20
PPFT situatie 2 - De boodschap drukt een negatieve waardering van de ontvanger uit	2,65	20
PPFT situatie 3 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	3,52	21
PPFT situatie 3 - De boodschap beperkt de keuzevrijheid van de ontvanger	2,81	21
PPFT situatie 3 - De boodschap drukt een negatieve waardering van de ontvanger uit	3,62	21
PPFT situatie 4 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	3,10	21
PPFT situatie 4 - De boodschap beperkt de keuzevrijheid van de ontvanger	3,76	21
PPFT situatie 4 - De boodschap drukt een negatieve waardering van de ontvanger uit	2,62	21
PPFT situatie 5 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	3,60	20
PPFT situatie 5 - De boodschap beperkt de keuzevrijheid van de ontvanger	3,15	20
PPFT situatie 5 - De boodschap drukt een negatieve waardering van de ontvanger uit	3,80	20
PPFT situatie 6 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	2,45	20
PPFT situatie 6 - De boodschap beperkt de keuzevrijheid van de ontvanger	2,70	20
PPFT situatie 6 - De boodschap drukt een negatieve waardering van de ontvanger uit	2,65	20

*1 = Strongly agree, 7 = Strongly disagree

Indicators PPFT Question 1 + Question 3	Cronbach's Alpha
PPFT situatie 1	0,789
PPFT situatie 2	0,728
PPFT situatie 3	0,677
PPFT situatie 4	0,753
PPFT situatie 5	0,605
PPFT situatie 6	0,859

Table 2. Preliminary test results communication situations negative face-threat

NPFT = Negative politeness face threatening (Question 1, 2, 3)	Mean*	Count
NPFT situatie 1 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	3,71	21
NPFT situatie 1 - De boodschap beperkt de keuzevrijheid van de ontvanger	3,76	21
NPFT situatie 1 - De boodschap drukt een negatieve waardering van de ontvanger uit	3,76	21
NPFT situatie 2 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	5,35	20
NPFT situatie 2 - De boodschap beperkt de keuzevrijheid van de ontvanger	4,20	20
NPFT situatie 2 - De boodschap drukt een negatieve waardering van de ontvanger uit	5,10	20
NPFT situatie 3 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	4,25	20
NPFT situatie 3 - De boodschap beperkt de keuzevrijheid van de ontvanger	3,25	20
NPFT situatie 3 - De boodschap drukt een negatieve waardering van de ontvanger uit	5,10	20
NPFT situatie 4 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	2,70	20
NPFT situatie 4 - De boodschap beperkt de keuzevrijheid van de ontvanger	2,35	20
NPFT situatie 4 - De boodschap drukt een negatieve waardering van de ontvanger uit	3,10	20
NPFT situatie 5 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	4,71	21
NPFT situatie 5 - De boodschap beperkt de keuzevrijheid van de ontvanger	2,62	21
NPFT situatie 5 - De boodschap drukt een negatieve waardering van de ontvanger uit	4,67	21
NPFT situatie 6 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	5,00	21
NPFT situatie 6 - De boodschap beperkt de keuzevrijheid van de ontvanger	4,14	21
NPFT situatie 6 - De boodschap drukt een negatieve waardering van de ontvanger uit	4,14	21
NPFT situatie 7 - De boodschap is mogelijk bedreigend voor de relatie met de ontvanger	4,00	21
NPFT situatie 7 - De boodschap beperkt de keuzevrijheid van de ontvanger	3,24	21
NPFT situatie 7 - De boodschap drukt een negatieve waardering van de ontvanger uit	5,43	21

*1 = Strongly agree, 7 = Strongly disagree

Table 3. Preliminary test results communication situations simple

Situation	Scale (Question 4, 5, and 6)	Mean*	N	Cronbach's a
Simpele situatie 1	Helder:Vaag	1,95	22	
Simpele situatie 1	Makkelijk te communiceren:Moeilijk te communiceren	2,00	22	0,979
Simpele situatie 1	Eenvoudig:Ingewikkeld	2,05	22	
Simpele situatie 2	Helder:Vaag	1,85	20	
Simpele situatie 2	Makkelijk te communiceren:Moeilijk te communiceren	2,35	20	0,939
Simpele situatie 2	Eenvoudig:Ingewikkeld	2,25	20	
Simpele situatie 3	Helder:Vaag	1,80	20	
Simpele situatie 3	Makkelijk te communiceren:Moeilijk te communiceren	1,80	20	0,996
Simpele situatie 3	Eenvoudig:Ingewikkeld	1,80	20	
Simpele situatie 4	Helder:Vaag	1,70	20	
Simpele situatie 4	Makkelijk te communiceren:Moeilijk te communiceren	1,75	20	0,982
Simpele situatie 4	Eenvoudig:Ingewikkeld	1,75	20	
Simpele situatie 5	Helder:Vaag	1,90	20	
Simpele situatie 5	Makkelijk te communiceren:Moeilijk te communiceren	2,00	20	0,966
Simpele situatie 5	Eenvoudig:Ingewikkeld	1,90	20	
Simpele situatie 6	Helder:Vaag	2,10	21	
Simpele situatie 6	Makkelijk te communiceren:Moeilijk te communiceren	*2,33*	*21*	0,963
Simpele situatie 6	Eenvoudig:Ingewikkeld	*2,33*	*21*	

*Scale: 1-7

Table 4. Preliminary test results communication situations simple

Situation	Scale (Question 4, 5, and 6)	Mean*	N	Cronbach's a
Complexe situatie 1	Helder:Vaag	3,25	20	
Complexe situatie 1	Makkelijk te communiceren:Moeilijk te communiceren	4,30	20	0,856
Complexe situatie 1	Eenvoudig:Ingewikkeld	4,30	20	
Complexe situatie 2	Helder:Vaag	2,00	20	
Complexe situatie 2	Makkelijk te communiceren:Moeilijk te communiceren	2,30	20	0,937
Complexe situatie 2	Eenvoudig:Ingewikkeld	2,10	20	
Complexe situatie 3	Helder:Vaag	2,65	20	
Complexe situatie 3	Makkelijk te communiceren:Moeilijk te communiceren	2,80	20	0,962
Complexe situatie 3	Eenvoudig:Ingewikkeld	2,75	20	
Complexe situatie 4	Helder:Vaag	2,20	20	
Complexe situatie 4	Makkelijk te communiceren:Moeilijk te communiceren	3,15	20	0,713
Complexe situatie 4	Eenvoudig:Ingewikkeld	3,30	20	
Complexe situatie 5	Helder:Vaag	2,50	20	
Complexe situatie 5	Makkelijk te communiceren:Moeilijk te communiceren	2,75	20	0,888
Complexe situatie 5	Eenvoudig:Ingewikkeld	2,85	20	
Complexe situatie 6	Helder:Vaag	2,65	20	
Complexe situatie 6	Makkelijk te communiceren:Moeilijk te communiceren	2,35	20	0,935
Complexe situatie 6	Eenvoudig:Ingewikkeld	2,35	20	

*Scale: 1-7

Paired sample t-tests comparisons between the different conditions

Table 5. Mean scores question 4, 5, 6 simple vs. complex

	Mean*	N	Std. Deviation
Simple question 4, 5, 6	1,8972	20	1,38347
Complex question 4, 5, 6	2,8083	20	1,34841

*1 = simple, 7 = complex

Table 6. Paired sample simple vs. complex

	Paired Differences				t	df	Sig. (2-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
Simple question 4, 5, 6 - Complex question 4, 5, 6	-,91111	1,04518	-1,40027	-,42195	-3,898	19	,001

H0: there is no significant difference in judgement of simple and complex situations

H1: there is significant difference in judgement of simple and complex situations

The P-value is less than .05 (.001), thus the null hypothesis is rejected. The simple situations are judged differently than complex situations. Table 5 strengthens this difference by showing the mean scores of the simple and the complex situations. Complex situations (2.8083) are deemed more complex as compared to the the simple situations (1.8972).

Table 7. Mean comparison positive politeness Face threatening

Question 1 and 3		Mean*	N	Std. Deviation	Std. Error Mean
Pair 1	Positive face threat	3,2125	20	,91306	,20417
	Negative face threat	4,2500	20	,77401	,17307
Pair 2	Positive face threat	3,2125	20	,91306	,20417
	Complex	5,7750	20	,86268	,19290
Pair 3	Positive face threat	3,2125	20	,91306	,20417
	Simple	6,3083	20	,47071	,10525

*1 = Strongly agree, 7 = Strongly disagree

Table 8.Paired Samples Test positive politeness Face threatening

Question 1 and 3		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Positive face threat vs. Negative face threat	-1,03750	,78488	,17550	-1,40484	-,67016	-5,912	19	,000
Pair 2	Positive face threat vs. complex	-2,56250	1,02985	,23028	-3,04448	-2,08052	-11,128	19	,000
Pair 3	Positive face threat vs. simple	-3,09583	1,02394	,22896	-3,57505	-2,61662	-13,521	19	,000

Table 9. Mean comparisons simple

Questions 4, 5, and 6		Mean*	N	Std. Deviation	Std. Error Mean
Pair 1	Simple	1,8972	20	1,38347	,30935
	Complex	2,8083	20	1,34841	,30151
Pair 2	Simple	1,8972	20	1,38347	,30935
	Positive face threat	3,4861	20	1,06083	,23721
Pair 3	Simple	1,8972	20	1,38347	,30935
	Negative face threat	2,9286	20	,85498	,19118

*1 = simple, 7 = complex

Table 10. Paired Samples Test Simple

Questions 4, 5, and 6		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Simple vs. complex	-,91111	1,04518	,23371	-1,40027	-,42195	-3,898	19	,001
Pair 2	Simple vs. positive face threat	-1,58889	1,25933	,28159	-2,17827	-,99951	-5,642	19	,000
Pair 3	Simple vs. negative face threat	-1,03135	1,10588	,24728	-1,54892	-,51378	-4,171	19	,001

Table 11. Mean comparisons complex

Questions 4, 5, and 6		Mean*	N	Std. Deviation	Std. Error Mean
Pair 1	Complex	2,8083	20	1,34841	,30151
	Simple	1,8972	20	1,38347	,30935
Pair 2	Complex	2,8083	20	1,34841	,30151
	Positive face threat	3,4861	20	1,06083	,23721
Pair 3	Complex	2,8083	20	1,34841	,30151
	Negative face threat	2,9286	20	,85498	,19118

*1 = simple, 7 = complex

Table 12. Paired Samples Test Complex

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Complex vs. simple	,91111	1,04518	,23371	,42195	1,40027	3,898	19	,001
Pair 2	Complex vs. positive face threat	-,67778	1,35564	,30313	-1,31224	-,04332	-2,236	19	,038
Pair 3	Complex vs. negative face threat	-,12024	1,22852	,27470	-,69520	,45473	-,438	19	,667

Table 13. Mean comparisons Negative Politeness Face threatening

Question 2		*Mean**	*N*	*Std. Deviation*	*Std. Error Mean*
Pair 1	*Negative face threat*	*3,3500*	*20*	*,96499*	*,21578*
	Positive face threat	*3,3083*	*20*	*1,24049*	*,27738*
Pair 2	*Negative face threat*	*3,3500*	*20*	*,96499*	*,21578*
	Simple	*5,8583*	*20*	*1,08185*	*,24191*
Pair 3	*Negative face threat*	*3,3500*	*20*	*,96499*	*,21578*
	Complex	*5,2583*	*20*	*1,14513*	*,25606*

*1 = Strongly agree, 7 = Strongly disagree

Table 14. Paired Samples Test Negative Politeness Face threatening

Question 2		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Negative face threat vs. positive face threat	,04167	1,13189	,25310	-,48807	,57141	,165	19	,871
Pair 2	Negative face threat vs. simple	-2,50833	1,13487	,25377	-3,03947	-1,97720	-9,884	19	,000
Pair 3	Negative face threat vs. complex	-1,90833	,91728	,20511	-2,33763	-1,47903	-9,304	19	,000

Appendix D
Main test layout

Alvast hartelijk bedankt voor je deelname aan dit onderzoek. Voor mijn master these doe ik onderzoek naar de effecten van bepaalde situaties op communicatievoorkeur. In deze test bevinden zich 8 situaties en ik wil graag kort wat vragen stellen per situatie. Na de situaties zijn er nog wat persoonlijke vragen. Ik wil je vragen elke situatie goed op je te laten inwerken en de vragen zo eerlijk mogelijk te invullen. Er zijn geen goede of slechte antwoorden, zolang de antwoorden weergeven hoe jij denkt over deze situatie.

Het onderzoek zal ongeveer 15 minuten van je tijd in beslag nemen. Er zal vertrouwelijk met je gegevens worden omgegaan en de resultaten worden geheel anoniem verwerkt.

Natuurlijk kan je op elk moment stoppen met de vragenlijst maar ik hoop dat je de vragenlijst volledig invult.

Mocht je nog vragen of opmerkingen hebben over het onderzoek, neem dan contact met mij op via 06-81255015 of t.r.blaauw@student.utwente.nl.

Nogmaals hartelijk dank voor je deelname aan dit onderzoek.

Met vriendelijke groet,
Thom Blaauw

Ook in intro face-to-face of mobile instant messaging (denken aan sms of apps als whatsapp)

<u>Questions per situation</u>

Hoe zou je het liefst communiceren in deze situatie

Face-to-face o o o o o o via app/sms

Ik zou mij op mijn gemak voelen als ik in deze situatie via app of sms communiceer

Helemaal mee eens o o o o o o Helemaal mee oneens

Ik zou mij op mijn gemak voelen als ik in deze situatie face-to-face communiceer

Helemaal mee eens o o o o o o Helemaal mee oneens

Questions per situation (English version)

How would you prefer to communicate in this situation

Face-to-face o o o o o o via app / sms

---------- ---------- ---------

I would feel comfortable if I communicate using app or SMS in this situation

Totally agree o o o o o o Totally disagree

I would feel comfortable if I communicate by interacting face-to-face in this situation

Totally agree o o o o o o Totally disagree

Social anxiety scale

Het kost me tijd om mijn verlegenheid opzij te zetten in nieuwe situaties.

Helemaal niet zoals ik o o o o Helemaal zoals ik

Ik kan moeilijk werken als iemand me in de gaten houdt.

Helemaal niet zoals ik o o o o Helemaal zoals ik

Ik schaam me heel gemakkelijk.

Helemaal niet zoals ik o o o o Helemaal zoals ik

Ik kan gemakkelijk met vreemden praten. (reverse)

Helemaal niet zoals ik o o o o Helemaal zoals ik

Ik voel me nerveus als ik voor een groep spreek.

Helemaal niet zoals ik o o o o Helemaal zoals ik

Grote groepen maken me nerveus.

Helemaal niet zoals ik o o o o Helemaal zoals ik

Social anxiety scale (English version)

It takes me time to get over my shyness in new situations.

It is hard for me to work when someone is watching me.

I get embarrassed very easily.

It is easy for me to talk to strangers. (R)

I feel nervous when I speak in front of a group.

Large groups make me nervous.

Introversion scale

1. Helemaal mee oneens
2. Mee oneens
3. Neutraal
4. Mee eens
5. Helemaal mee eens

_____1. Ben je geneigd om bij sociale gelegenheden op de achtergrond te blijven?
_____2. Vind je het leuk om jezelf sociaal te mixen met mensen?
_____3. Ben je geneigd om je kennissen te beperken tot een kleine groep?
_____4. Vind je het leuk om veel sociale afspraken te hebben?
_____5. Zou jij jezelf een zorgeloos persoon noemen?
_____6. Kun je jezelf meestal laten gaan en een leuke tijd hebben op een feestje?
_____7. Zou je erg ongelukkig zijn als je ervan weerhouden werd veel sociale contacten te leggen?
_____8. Neem je meestal het initiatief om nieuwe vrienden te maken?
_____9. Vind je het leuk om grappen uit te halen met anderen?
_____10. Ben je meestal een "goede mixer?"
_____11. Heb je vaak "de tijd van je leven" bij sociale gelegenheden?
_____12. Krijg je meer voldoening uit sociale activiteiten dan uit iets anders?

Introversion scale (English version)

_____1. Are you inclined to keep in the background on social occasions?
_____2. Do you like to mix socially with people?
_____3. Are you inclined to limit your acquaintances to a select few?
_____4. Do you like to have many social engagements?
_____5. Would you rate yourself as a happy-go-lucky individual?
_____6. Can you usually let yourself go and have a good time at a party?
_____7. Would you be very unhappy if you were prevented from making numerous social contacts?

_____8. Do you usually take the initiative in making new friends?
_____9. Do you like to play pranks upon others?
_____10. Are you usually a "good mixer?"
_____11. Do you often "have the time of your life" at social affairs?
_____12. Do you derive more satisfaction from social activities than from anything else?

Whatsapp usage

Welke instant messaging kanalen gebruik je?
0 Whatsapp
0 Facebook messenger
0 Sms
0 Anders namelijk…

Hoevaak gebruik je de bovenstaande instant messaging applicaties per week?
0 1 dag
0 2 dagen
0 3 dagen
0 4 dagen
0 5 dagen
0 6 dagen
0 7 dagen

Hoeveel keer per dag gebruik je whatsapp (om boodschappen te lezen of te verzenden)
Ook voor sms

Hoeveel tijd per dag besteed je aan de bovenstaande instant messaging applicaties?
…. Minuten

Hoe belangrijk zijn de bovenstaande instant messaging applicaties om sociale contacten te onderhouden?

Heel onbelangrijk heel belangrijk

Hoe belangrijk is het om voor werk of studie gerelateerde zaken gebruik te maken van de bovenstaande instant messaging applicaties?

Heel onbelangrijk heel belangrijk

