Personality Traits and Nonverbal Communication Patterns

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Abstract

The use of the personality trait five-factor model in communication research is very limited so far. In the present study the focus is on nonverbal correlations to personality traits. It was possible to identify nonverbal patterns in relation to personality traits. The extraversion dimension is associated with both a contact dimension (extraverts stand closer, engage in mutual gaze) and an expressiveness dimension (extraverts prefer face-to-face interaction, a varied tone of voice, varied gestures and facial expressions). The openness dimension is associated with low context (verbal, direct and explicit communication relying on context to a low degree). The agreeableness dimension is associated with high context (indirect, implicit and nonverbal communication style relying strongly on context).

Keywords: five-factor model, nonverbal communication, communication style, contact, context, expressiveness

1. Introduction

1.1 The initial problem

Psychology and social psychology scholars are doing studies on personality traits trying to map the territory and relate the traits to emotions, attitudes, abilities and behaviors (McCrae & Costa, 2006; Furnham, 2008; Matthews, Deary, & Whiteman, 2013). Communication scholars are also, to some limited degree, interested in personality and communication style (McCroskey & Daly, 1987; McCroskey, Daly, Martin, & Beatty, 1998; de Vries et al., 2013). The overlap so far, between the disciplinary fields, is minimal. This is unfortunate since the leading model in personality studies, the so called *five-factor model*, may offer great potential to correlate individual differences with a variety of communicative behavior (Daly, 2011). Personality differences affect how individuals express themselves (Koppensteiner & Grammer, 2011), thus reasonably how individuals communicate. The study presented in this paper is taking one step towards building bridges between the disciplinary fields.

The present study is based on a personality trait inventory of a new kind but grounded in a highly reliable model. Since the inventory is new it is wisest to test it on some aspects related to communication that already have been studied a little: nonverbal communication. Therefore the first step is to focus on nonverbal aspects of communication. The second step of the investigation is to find correlations between personality traits and nonverbal aspects of human communication. How could that possibly be done? Influenced by some, often used dimension in intercultural studies, culture dimensions including or relying on nonverbal components it is possible to design a questionnaire that can capture participants' attitudes and preferences on nonverbal behavior. The cultural dimensions that have influenced the design are:

- Contact cultures vs. non-contact cultures (Hall, 1969).
- Expressive vs. reserved cultures (Matsumoto & Hwang, 2013).
- High context cultures vs. low context cultures (Hall, 1977).

The contact dimension is differentiating between systematic behaviors of for example standing close and exerting frequent touching compared to systematic behavior of standing apart and avoiding touch. The expressiveness dimension is related to the previous one. In expressive cultures they use a wide variety of means or channels in concert to produce and convey the intended message. The number of means, or production modalities (Burgoon, Guerrero, & Manusov, 2011; Allwood, 2014), regularly used is wide. The more reserved side of the dimension is about being more restrained and moderate in the use of channels or production modalities. The number of modalities used is lower and the energy invested is lower.

The context dimension is implying that individuals/groups on the one end are extracting meaning in a message from the

context, from nonverbal cues and from an indirect verbal communication and on the other end are delivering and interpreting messages based on explicit, detailed and direct *verbal* communication (see figure 1). The high context way is group and relationship oriented while the low context way is individual and task/message oriented. From a high context perspective, explicit and direct communication might endanger the relationship. From a low context perspective, implicit and indirect communication might jeopardize or undermine the task/message.
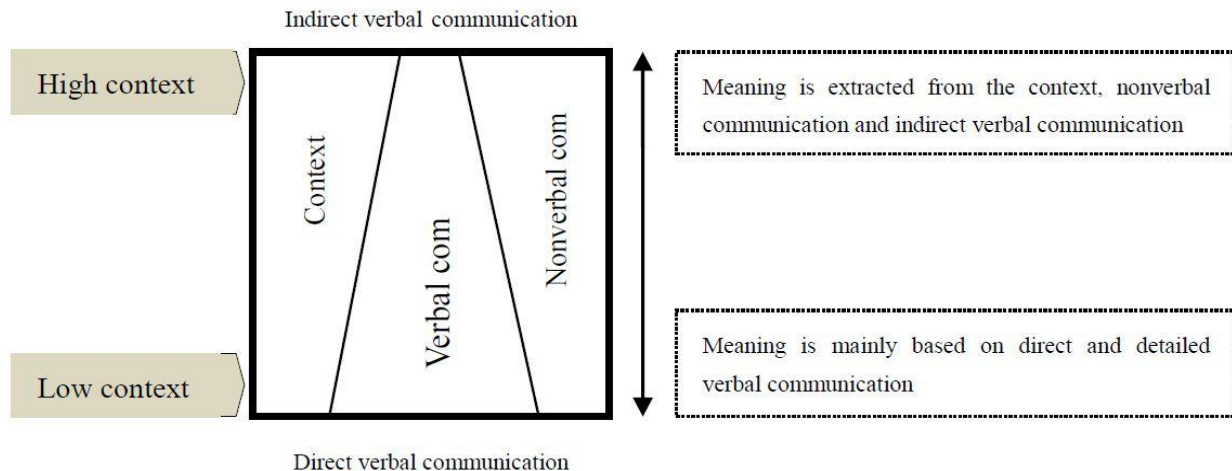

Figure 1. A model of the context dimension.

It is possible, or even probable, that some personality traits correlate to some of these dimensions. The purpose of the study presented in this paper is to find possible correlations between personality traits (based on the five-factor model) and patterns of nonverbal behavior based on measurable components derived from the above described dimensions (the contact dimension, the expressiveness dimension and the context dimension). In doing so the outline of the paper is a presentation of the five-factor model, a presentation of previous research on nonverbal behavior related to personality traits, a section on expected outcomes (presenting a set of working hypotheses) followed by a method section, a result section and a discussion of the potential and outcome of the study.

1.2 Personality traits – the five-factor model

For millennia people have been described in terms of temperaments. We seem to have a tendency to put labels on others and we also seem to have differences that have some kind of regularity or pattern. Personality and personality traits have been studied closely since Freud and Jung. Jung distinguished between introverts and extraverts. Some scholars have carried on in that tradition while others have chosen alternative ways to describe differences in man. There is a large variety in the study of personality (Mischel, 1999) but the tradition that has gained a lot of attention the last decades is the one focusing on the five-factor-model (Matthews, Deary, & Whiteman, 2013). This model is based on five distinguishable personality traits. The work around Paul Costa and Robert McCrae has paved the way for the five-factor-model (see Furnham, 2008). They managed to include a lot of previous empirical material as well as theoretical attempts in their new model. A scattered scene of traits became grouped in one model (Costa & McCrae, 1992; cf Hong, Paunonen, & Slade, 2008).

The five traits are shown to be consistent and stable over time (McCrae & Costa, 2006). Traits have to be stable and not change from one day to another or be affected by a temporary mood or external factors. People have been followed for years to see to what degree the traits may change. The stability over time is high (Abe, 2005; McCrae & Costa, 2006; Hampson, Andrews, Barckley, & Peterson, 2007; Nass, 2012; Edmonds, Goldberg, Hampson, & Barckley, 2013; cf. Neppl et al., 2010). There are also strong correlations between self-report, parent reports, teacher reports and friend reports (McCrae & Costa, 2006; Barbaranelli et al., 2003). The stability between reports is also high. It is safe to say that personality traits, studied with a reliable test, can be useful.

McCrae and Costa (2006; also Costa & McCrae, 1992; Mervielde, Buyst, & De Fruyt, 1995; Di Blas & Carraro, 2011) believe that personality traits are based on a series of related components called facets. Every trait has an opposite and the facets describe that end as well. Table 1 gives an overview of personality traits and the related facets.

Table 1. Personality traits and facets. Taken from McCrae & Costa (2006).

Personality traits	Facets
Extraversion (E)	Talkative, a joiner, physically active, affectionate, passionate, fun-loving
Introversion	Reserved, seeking solitude (a loner), physically passive, quiet, sober, unfeeling
Open to new experiences (O)	Imagination, creativity, originality, prefer variety, curiosity, liberal
Traditionalist	Down to Earth, uncreative, conventional, uncurious, prefer routines, conservative
Conscientiousness(C)	Conscientious, hard-working, ambitious, well organized, persevering, punctual
Careless	Quitting, negligent, lazy, disorganized, aimless, late
Agreeableness (A)	Softhearted, trusting, generous, acquiescent, lenient, good-natured
Self-centered	Suspicious, ruthless, stingy, antagonistic, critical, irritable
Neuroticism (N)	worrying, temperamental, self-pitying, self-conscious, emotional, vulnerable
Emotionally stable	Calm, even-tempered, self-satisfied, comfortable, unemotional, hardy

The five-factor model contains five dimension and each dimension can be seen as a continuum from one extreme end to another (e.g. high on extraversion to high on introversion). This means that every individual is placed somewhere on the continuum of each dimension making up a complex set of combinations. Every individual can have a dominant personality trait or several dominant personality traits. If a person does not recognize him- or herself to be in one of the extreme ends, such as agreeable or self-centered, but rather more in the middle these traits are less essential for how the person for example make decisions and behave. Dominant personality traits, on the other hand, have an obvious effect on the individual. It is therefore expected that an individual who has a dominant extraverted trait is talkative and dislike being alone and therefore makes decisions that goes in line with sociability and often hanging out with others. Matthews, Deary and Whiteman (2013) emphasizes that strong personality traits makes it likely that a person often acts in a particular way but in certain situations it is possible to act in an untypical, more situation dependent way. Even the most orderly can be sloppy at times and the most introverted may like to join the group of friends at some point.

1.3 Previous studies

Within the field of communication there has been done some studies about certain traits like aggressiveness (Infante, 1987), argumentativeness (Rancer, 1998), involvement (Bell, 1987) and communication apprehension (McCroskey & Beatty, 1998; McCroskey, Heisel, & Richmond, 2001). These traits can be related (1) directly to the big five traits, involvement is very similar to extraversion, aggressiveness strongly correlates with low levels of agreeableness (Gleason, Jensen-Campbell & South Richardson, 2004; Barlett & Anderson, 2012; de Vries et al., 2013), or (2) to combinations of big five traits, communication apprehension is a mix of high neuroticism and low extraversion (that is, introversion) (McCroskey & Beatty, 1998; McCroskey et al., 2001). It is also probable that low levels of agreeableness together with high levels of extraversion, high levels of neuroticism and/or high levels of openness lies behind argumentativeness (cf. Barlett & Anderson, 2012). Still very few or no studies have been conducted within the field of interpersonal communication based on the five-factor model (Daly & Bippus, 1998; Daly, 2011). Most interest has been focused on the extraversion dimension (La France, Heisel, & Beatty, 2004). The studies that can be found with relevance for the field of interpersonal communication originate from the disciplines of psychology or social psychology. Some of the main outlines will be presented.

The most well-known results with obvious communicative significance are either examples of nonverbal behavior or physical appearances.

First of all extraversion is associated with expressiveness (Argyle, 1988; de Vries et al., 2013) which is a complex of several ways to use nonverbal means (see Matsumoto & Hwang, 2013; Young, 2011). Introversion is therefore associated with low expressiveness or being reserved. Neuroticism is possibly also related to low expressiveness (Argyle, 1988). Introverts have more difficulties encoding emotional expressions (Hargie, 2011). Extraverts also pay more attention to nonverbal cues than their counterparts as a possible consequence of high involvement and need for social stimulation (Burgoon, Buller & Woodall, 1996).

Individuals high on extraversion prefer to stand close to the conversation partner and they also like to sit close to the co-communicator. Individuals low on extraversion, that is introversion, prefers to stand and sit at a distance when in a conversation (Knapp & Hall, 2006; also Argyle, 1988; Hargie, 2011). Extraversion is related to more frequent and more

rapid body movements (Oberzaucher & Grammer, 2008) while neuroticism is involved in more self-touching behavior (Argyle, 1988).

Extraversion is associated with more frequent and more intense smiles and positive affect as displayed in the face (Ruch, 2005; also Argyle, 1988; Oberzaucher & Grammer, 2008). Extraversion is also associated with more facial expressions of sadness, probably as a result of their frequent social contacts (Keltner, 2005). They are affectionate and emotionally open. Neuroticism is related to facial expressions of anger, contempt and fear. When individuals that score high on neuroticism observe others while smiling they less often smile back. Agreeableness is positively correlated with laughter and a sympathetic facial display (eyebrows of sadness, moving head forward and a concerned gaze) when they interact with someone in an embarrassed situation. Conscientiousness is associated with low levels of negative facial expressions and laughter. Individuals that score high on the conscientiousness scale can display a controlled smile, aversion to eye contact and touching their own face in social situations that produce some kind of distress (Keltner, 2005).

People that score high on extraversion typically spend more time on mutual eye contact during conversations than other traits. Neuroticism is negatively correlated with mutual gaze (Argyle, 1988; also Burgoon, Buller & Woodall, 1996; La France, Heisel & Beatty, 2004; Oberzaucher & Grammer, 2008). Except for extraversion, also agreeableness and openness are associated with mutual gazing behavior (Knapp & Hall, 2006).

When it comes to the voice and speech characteristics most results are related to extraversion. Extraverted talk more, they produce more words and talk longer when they have the turn (Argyle, 1988). Extraverted talk faster, louder, with shorter pauses and with a higher pitch (La France, Heisel, & Beatty, 2004; Frank, Maroulis, & Griffin, 2013; also Daly, 2011). Introverts and neurotics use more and longer pauses (Argyle, 1988; Hargie, 2011) and neurotics also produce more speech errors/hesitations (Argyle, 1988).

It has been suggested that extraverts and agreeable appear as more attractive to others (Daly, 2011). One possibility is that observer's rate symmetrical faces as attractive and asymmetrical faces as less attractive. The latter is especially related to neuroticism (Oberzaucher & Grammer, 2008). The former is associated with extraversion (Fink et al., 2005). Every personality trait has also common movement patterns that can be detected. Human observers tend to be able to detect movement patterns by extraverted and emotionally stable more easily (Koppensteiner & Grammer, 2011). Artificial neural networks have been able to recognize movement patterns by emotionally stable and conscientiousness with a high accuracy (Oberzaucher & Grammer, 2008). Even if the movement patterns are not described it is obvious that there must be some characteristics that are detectable and common to some degree within a trait.

What has been found so far is most often pointing at the *extraversion – introversion* dimension (La France, Heisel, & Beatty, 2004). Less can be said about the other four dimensions. The present study attempts two contribute to compensate for the general lack of research about the five-factor model and especially find correlations to the four less mentioned dimensions.

1.4 Expected tendencies - some hypotheses

Based on what is known about personality traits so far it is possible to have some expectancy on correlations between some aspect of nonverbal communication and each personality trait. As a consequence of that a set of test hypotheses will be formulated.

The dimension of neuroticism and emotional stability has some facets that might be a clue to how individuals scoring high on neuroticism will behave or react. Due to the temperamental characteristic of neuroticism it might be expected that individuals scoring high on neuroticism will raise their voice to emphasize something, for example when they are not immediately understood. On the other hand, and this might seem like a paradox, it is also expected that individuals that score high on neuroticism will dislike when *others* raise their voice because that will make the neurotic person insecure. This is directly derived from the facets of worrying and being vulnerable.

> **Hypothesis 1a**: *High levels on the neuroticism scale will correlate with a high tendency to raise the voice to emphasize something.*

> **Hypothesis 1b**: *High levels on the neuroticism scale will correlate with a high tendency to feel insecure when others raise their voice.*

In line with previous studies it would be expected to find a correlation between extraversion and a varied voice. It is a sign of expressiveness to change the volume of the voice to be more animated and if something needs to be emphasized the extraverted will raise the voice to achieve this.

> **Hypothesis 1c**: *High levels on the extraversion scale will correlate with a high tendency to raise the voice to emphasize something.*

Agreeableness is generally associated with being soft, trusting, acquiescent and lenient. This will suggest that individuals scoring high on agreeableness will use a soft, mild, tone of voice. The ones scoring low on the agreeableness scale are expected to be antagonistic, critical and irritable. As a consequence of that they will more often use a raised voice.

> *Hypothesis 1d: High levels on the agreeableness scale will correlate with a low tendency to raise the voice to emphasize something.*

An avoiding behavior has previously been associated with neuroticism (Keltner, 2005; also Daly, 2011). A typical nonverbal avoiding cue is to look away or look down to either dodge involvement or not to be too engaged or revealing in a conversation. Goffman (1963) called it an involvement shield.

> *Hypothesis 2a: High levels on the neuroticism scale will correlate with a high tendency to look away when co-communicators look them in the eyes during a conversation.*

As seen in previous studies it is probable that extraverts will both seek eye contact and meet others gaze.

> *Hypothesis 2b: High levels on the extraversion scale will correlate with a high tendency to look back when co-communicators look them in the eyes during a conversation.*

Due to a high level of exercised self-control conscientiousness (Roberts et al., 2005; Keltner, 2005) will not be intimidated by others attempt to make eye contact but rather meet the others eyes.

> *Hypothesis 2c: High levels on the conscientiousness scale will correlate with a high tendency to look back when co-communicators look them in the eyes during a conversation.*

The contact culture dimension[1] suggested by Hall (1969) might also be used to characterize personality traits. The highly expressive style (cf. Matsumoto & Hwang, 2013) and being affectionate (as opposed to being reserved), that is associated with extraversion, will predict that individuals that score high on the extraversion scale like to stand close to other co-communicators while being in a conversation. If others stand unexpectedly close (Burgoon, 1978) the first impulse of an individual that scores high on the extraversion scale is to stay on the same spot rather than taking a step back. The first impulse of an introverted is to take a step back. Everyone can feel a sense of intrusion in the personal or intimate zone but some are more willing to stand their ground for a longer time.

> *Hypothesis 3a: High levels on the extraversion scale will correlate with a high preference to stand close to the co-communicators during a conversation.*

> *Hypothesis 3b: High levels on the extraversion scale will correlate with a high tendency to hold the ground (that is, not take a step back) when the co-communicator is coming up unexpectedly close during a conversation.*

Agreeableness is associated with being polite and friendly (Daly, 2011) and it might be perceived as impolite and unfriendly to take a step back when the co-communicator is getting to close.

> *Hypothesis 3c: High levels on the agreeableness scale will correlate with a high tendency to hold the ground (that is, not take a step back) when the co-communicator is coming up unexpectedly close during a conversation.*

Conscientiousness is associated with a high degree of (self) control (Roberts et al., 2005; Keltner, 2005). If someone is standing too close, individuals that score high on the conscientiousness scale might have a high degree of self-control to stay on the spot. They will probably not show that they are bothered by the intrusion into the personal or intimate zone.

> *Hypothesis 3d: High levels on the conscientiousness scale will correlate with a high tendency to hold the ground (that is, not take a step back) when the co-communicator is coming up unexpectedly close during a conversation.*

The cultural dimension high context versus low context suggested by Hall (1977) means that people living in low context cultures are more direct and probably also more verbal in their communication while people living in high context cultures are more indirect and rely more on nonverbal cues[2]. These two characteristics of high and low context cultures can also be used to find out if these patterns might be related to personality traits.

The openness trait is often associated with verbal abilities. Individuals that score high on the openness scale also score high on language tests and verbal ability tests (Neuenschwander et al., 2013; Lubbers et al., 2010; Spengler et al., 2013; Dollinger, Matyja, & Huber, 2008; Jensen, 2015). This might suggest that openness isn't just associated with good verbal skills but also a preference to rely more on verbal communication and less on nonverbal communication.

> *Hypothesis 4: High levels on the openness scale will correlate with a high preference to use verbal*

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[1] Also called high contact vs. low contact cultures (Ting-Toomey & Chung, 2005)
[2] This dimension is similar to the individualistic vs. collectivistic dimension used by others like for example Hofstede (see Hofstede, Hofstede, & Minkov, 2012). People in individualistic cultures tend to be more direct and rely more on verbal communication.

communication to a higher degree (rely more on verbal than nonverbal communication) during a conversation.

The other side of high and low context communication is to be indirect or direct. Since the agreeableness trait is associated with being soft, acquiescent and lenient (McCrae & Costa, 2006) it is more probable that individuals scoring high on the agreeableness scale will use a soft approach and use a more indirect way to communicate while its counterpart, the low end of the scale, will be expected as more antagonistic and straightforward.

Hypothesis 5a: High levels on the agreeableness scale will correlate with a high tendency to communicate in an indirect way during a conversation.

The spontaneity associated with extraversion will probably make individuals scoring high on the extraversion scale communicate in a more direct way. The same is probable for the openness trait being associated with originality, independence and autonomy (Costa & McCrae, 1992; McCrae & Costa, 2006).

Hypothesis 5b: High levels on the extraversion scale respectively the openness scale will correlate with a high tendency to communicate in a direct way during a conversation.

Since extraversion is associated with sociability and close contact there are other aspects that might be examined in relation to this. People that need a lot of privacy will reduce the possibilities to be involved with others and to be physically close. This is something we can expect from introverted individuals. Being affectionate and passionate might also suggest that extraverted like intimacy to a higher degree than introverted. Finally, the expressiveness that is associated with extraversion will do more justice to the trait if more modalities (both production modalities and sense modalities) are involved. Therefore extraversion is expected to be correlated to face-to-face communication rather than the use of technological devices that reduce the modalities.

Hypothesis 6a: High levels on the extraversion scale will correlate with a low need for privacy.

Hypothesis 6b: High levels on the extraversion scale will correlate with a high need for intimacy.

Hypothesis 6c: High levels on the extraversion scale will correlate with a high preference to communicate face-to-face rather than the use of communication technology.

The extraversion dimension is associated with being talkative. It is therefore likely that individuals scoring high on extraversion will be talkative in most situations they find themselves to be in. This also means that individuals scoring low on extraversion will be quiet in most situations. Besides this rather obvious tendency there might be other traits that also correlate with being talkative in most situations. The openness trait is partly based on being curious and liking intellectual stimulation as well as being verbal and good at language. It might suggest that they will score high on being talkative.

Hypothesis 7a: High levels on the extraversion scale respectively the openness scale will correlate with a high tendency to be talkative in most social situations.

The idea of being talkative implies that it is about talking, thus relying on verbal communication, but there are reasons to believe that it means more than that. It is here suggested that being talkative is a wider sense of being expressive and while talking use a wide range of nonverbal resources/production modalities. A way to test this, or at least get an indication, is to see if there are correlations with other variables like eye contact, proximity, voice variation and a preference for face-to-face communication.

Hypothesis 7b: Being talkative is positively correlated with eye contact, proximity, voice variation and a preference for face-to-face communication but is not correlated to verbal communication (meaning that it has to rely on both verbal and nonverbal communication).

2. Method

2.1 Participants

302 students participated in the study. They were enlisted in international courses and programs at two Swedish universities during the autumn term 2014. More than ten cultures are represented by at least ten individuals and the rest of the participants come from a variety of cultures. The three largest culture groups (Germany, Sweden and China) are represented by 40 to 50 participants each. A little less than one third of the participants are males. The age of the participants range from 18 to 44. The average age is 25 years. The questionnaire was handed out in the middle of a course introduction. Participation was voluntary but only a handful of people didn't accept to participate or aborted their participation.

2.2 Personality trait inventory

There are several personality trait inventories available and in use for research purposes. Some include as much as 300 items (Fletcher & Nusbaum, 2008) while others are based on only ten items (Randler, 2008). In the present study a

personality trait inventory based on 30 items is used. It is designed around the opposites of the six facets of each personality trait (see table 1 above). An example from the neuroticism dimension looks like this:

1. I am…

Calm			In between			**Worrying**
☐	☐	☐	☐	☐	☐	☐
I keep calm in most situations						I have a tendency to worry in many (new) situations

The alternative to the left is given the numeric value 1 and the alternative to the right is given the numeric value 7. The sum of all six facet opposites for each personality trait dimension is divided by six to get a trait average or the trait variable value.

2.3 Nonverbal measurements

To capture possible variances two slightly different designs were used. In some cases statements about opposites were employed to capture the participants' possible tendency towards one end. For example, the first type of design: "When I communicate face-to-face I use…", *Mainly verbal communication* [1] or *Mainly nonverbal communication* [7]. The participants could choose one of the extremes or anything in between on a 7 rating scale. For the second type of design a traditional Likert scale design was used: "I need a lot of intimacy", *I fully agree* [1] or *I fully disagree* [7].

2.1 Statistical analysis

To statistically analyze the data, correlations are used. Since the scales are similar both for the traits and the nonverbal variables it would be beneficial to use a covariance calculation instead. In a comparison between the significant correlations, all outputs from the covariance calculation are distinctly higher. The covariance is not used to make it easier to compare the outcome with other studies.

3. Results

First some descriptive statistics for the personality traits will be presented in table 2.

Table 2. Descriptive statistics for each personality trait.

P-traits	Average	Stdv.	Min	Max	Cronbach's alpha
N	3,94	0,915	1,5	6,67	0,66
E	4,72	1,058	1,0	7,0	0,80
O	5,11	0,938	1,5	7,0	0,71
A	4,91	0,871	1,5	7,0	0,72
C	5,35	0,932	1,33	7,0	0,73

P-traits=Personality traits. **Stdv**. = standard deviation.

It is reasonable that international students with an ambition to get new experiences and pass the courses/programs have a certain profile as a group. Individuals that score high on the neuroticism dimension are less probable to go abroad. Individuals that score high on openness are likely to go abroad to experience a new culture and they have the intelligence to get good results/grades. Individuals that score high on conscientiousness have the discipline and ambition to succeed in an international program with high demands. This group is not a representative sample of any cultural or global population. It is a sample of an international student population. The extraversion trait has the best statistic outcome on all accounts. It probably reflects most cultures distribution on extraversion vs. introversion, it has the highest standard deviation, it has the largest range of trait values and the highest alpha value.

The data analysis correlating traits and nonverbal behavior is presented in table 3 and the correlations are discussed below.

Table 3. Correlations between personality traits and variables relating to nonverbal communication.

P-traits	Talkative	Direct	Verbal	Eye contact	Proximity	Step back	Raise voice	Insecure	Privacy	Intimacy	Techno-logy
N	r=0,06	r=0,03	r=0,06	**r=0,23**	r=0,08	r=-0,05	**r=-0,20**	**r=-0,15**	r=-0,08	r=0,02	r=-0,08
	p=0,32	p=0,59	p=0,26	p<0,001	p=0,16	p=0,40	p<0,001	p<0,01	p=0,17	p=0,76	p=0,18
E	**r=-0,51**	**r=-0,20**	r=-0,03	**r=-0,30**	**r=-0,26**	**r=0,14**	**r=-0,13**	r=0,11	**r=0,33**	**r=-0,17**	**r=0,23**
	p<0,001	p<0,001	p=0,60	p<0,001	p<0,001	p<0,05	p<0,05	p=0,06	p<0,001	p<0,01	p<0,001
O	**r=-0,26**	**r=-0,17**	**r=-0,13**	**r=-0,12**	**r=-0,12**	r=0,07	r=0,01	**r=0,17**	r=0,06	r=0,08	**r=0,13**
	p<0,001	p<0,01	p<0,05	p<0,05	p<0,05	p=0,20	p=0,91	p<0,01	p=0,34	p=0,15	p<0,05
A	r=0,02	**r=0,21**	r=0,03	r=0,06	r=0,09	**r=0,16**	**r=0,16**	r=0,04	**r=0,12**	r=0,04	r=0,00
	p=0,68	p<0,001	p=0,58	p=0,34	p=0,12	p<0,01	p<0,01	p=0,51	p<0,05	p=0,47	p=0,94
C	**r=-0,18**	**r=-0,13**	r=0,05	**r=-0,21**	**r=-0,21**	r=0,10	r=0,04	r=0,06	r=0,08	r=0,04	r=0,02
	p<0,01	p<0,05	p=0,36	p<0,001	p<0,001	p=0,09	p=0,52	p=0,27	p=0,19	p=0,46	p=0,75
Average	2,99	3,52	3,72	2,90	3,95	3,74	3,71	4,12	2,99	3,78	4,81
Stdv.	1,44	1,71	1,56	1,55	1,53	1,66	1,59	1,78	1,40	1,62	1,78

Correlations in **bold** are all significant ($p < 0,05$ but in many cases lower than that). **P-traits**=Personality traits. **Stdv**. = standard deviation.

Table 3 shows that neuroticism is correlated to avoiding gaze behavior. Individuals scoring high on neuroticism will often, according to their own rating, look away when others look them in the eye during a conversation. This supports hypothesis 2a. Neuroticism is also associated with raised or varied voice amplitude. Individuals that score high on neuroticism will have a tendency to raise the voice to emphasize something. This supports hypothesis 1a. Just as expected there is also a significant correlation between neuroticism and being insecure when others raise their voice. The tendency is not as strong as the two previous ones but it supports hypothesis 1b.

The extraversion dimension is the one with the highest number of significant correlations. The gazing behavior and proximity behavior is as expected. Individuals that score high on the extraversion scale also state that they will look back a lot when the co-communicator is looking them in the eyes. They also report that they like to stand close to the co-communicator while in a conversation. Both hypothesis 2b and 3a are supported. It is also stated that individuals scoring high on extraversion will tend to hold their ground when the co-communicator unexpectedly invade their private/intimate zone. The correlation is not very high but significant and the hypothesis 3b is therefore supported. Another correlation that is rather low but significant is the correlation between extraversion and raising the voice to emphasize something. This correlation is in line with what is expected from extraversion but is also lower than expected. Anyway hypothesis 1c is supported.

Just as expected the individuals scoring low on the extraversion scale, thus being introverted, report that they need a lot of privacy. Privacy implies not being involved in nonverbal communication. Maybe some verbal, text-based, communication. Individuals scoring high on the extraversion scale do not need privacy but some intimacy. Intimacy involves several sense modalities including touch and smell. To use communication devices like smartphones, chat and e-mail reduces the possibility to use several production modalities as well as activating several sense modalities. Individuals scoring high on extraversion prefer to communicate face-to-face, giving them the possibility to use a wide range of modalities. Introverted on the other hand tend to think that communication technology doesn't invade on their need for privacy. Hypotheses 6a, 6b and 6c are all supported.

As can be seen in table 3 there are several correlations to openness. Some of them were not expected. There are two weak but significant correlations suggesting that individuals scoring high on the openness scale also might look back at the co-communicator and stand close while being in a conversation. Individuals scoring high on the openness scale also prefer to communicate face-to-face rather than via communication devices. The correlation is small but significant. The hypothesized correlation between openness and verbal communication is also small but significant. The result is at least showing that openness is the only trait that is especially associated with verbal ability and thus being less dependent on nonverbal means. Hypothesis 4 is supported. Another unexpected correlation is between openness and a tendency to feel insecure when others raise their voice. Individuals that score high on the openness scale feel comfortable when others raise their voices. It is thus suggested that individuals scoring low on the openness scale will feel insecure.

Hypotheses 5b and 7a include both openness and extraversion. Just as expected, but for different reasons, both extraversion and openness are correlated with a preference for direct communication. The correlation is a bit stronger for extraversion. Hypothesis 5b is supported. Being talkative, since it is a facet of extraversion, is strongly correlated with the extraversion dimension. Understandably this is the highest correlation in the study. Also the openness

dimension is associated with being talkative in most situations. The correlation is of course lower than it is for extraversion but unexpectedly high. Hypothesis 7a is supported.

Being non-confrontative and non-antagonistic should mean avoiding ways to communicate that can lead to a confrontation. This approach would go in line with a smooth communicative style including a soft voice and an indirect way to communicate. Individuals that score high on the agreeableness scale do not, according to their own report, raise their voice to emphasize something. They also tend to communicate in a more indirect way. Hypotheses 1d and 5a are supported. The third hypothesis (3c) related to agreeableness is also supported. Individuals scoring high on the agreeableness scale have a tendency to stay where they are even when the co-communicator is standing too close.

Conscientiousness is related to two hypotheses. Hypothesis 2c, the individuals scoring high on the conscientiousness scale will stand where they are even when the co-communicator is intruding their private zone, is not supported. There is a tendency in that direction but it is not significant (but a covariance value is 0,15). They may have the self-control needed to stand their ground but they might also be offended by the fact that the co-communicator has broken a silent social rule. Rules are important to individuals scoring high on conscientiousness (Keltner, 2005). Hypothesis 3d, to look back when the co-communicator is seeking eye contact, is supported. In this case the self-control is working and no social rules are broken by the co-communicator.

There are also three unexpected correlations in relation to the conscientiousness trait. Individuals scoring high on the conscientiousness scale rate themselves as rather talkative in most situations. A simple explanation might be that it is expected for them to talk, in most societies the norm is to talk rather than being silent, and conscientious people try to follow the norm (Keltner, 2005). Individuals scoring high on conscientiousness also rate themselves as being rather direct and communicate in a direct way. The correlation is small but significant. Maybe that is in line with an attempt to be effective and efficient (Furnham, 2008). Finally, individuals scoring high on the conscientiousness scale report that they prefer to stand close to the co-communicator while talking. The tendency is rather strong. There are no explanations so far.

Being talkative is correlated with a direct way to communicate (r=0,26; p<0,001), with mutual eye contact (r=0,26; p<0,001), standing close to the co-communicator (r=0,26; p<0,001), using a varied voice (r=0,13; p<0,05) and preferring face-to-face communication (r=0,17; p<0,01). There is no correlation between being talkative and verbal communication (r=0,01; p=0,88). This suggests that being talkative means more than just using words; it depends on a wide variety of multimodal means. Hypothesis 7b is supported.

4. Discussion

The first thing to discuss is the measurement tools used in this study. The rather short and new personality trait inventory based on McCrae and Costas (2006) facet model is straightforward and may have some weaknesses. On the positive side the Cronbach's alpha gave sufficient and acceptable levels. The only trait that is producing alpha levels that are reliable is extraversion. The other traits are just acceptable. With this straightforward way for the participant to choose where on a continuum they are most willing to place themselves may be problematic if they perceive any of the alternatives as negative. Most people will probably give biased responses in these cases (see Block, 2010). On the other hand, this is a problem that most personality trait inventories suffer from. To conclude so far, the short personality trait inventory used in this study is acceptable as such.

The next measurement tool to discuss is the questionnaire design to find out about participants attitudes, preferences and behaviors that they might have some awareness about. One way to find out if it is reliable is to compare with previous studies. It is known from previous studies that individuals scoring high on the extraversion scale often engage in mutual eye contact during conversation and prefer to stand close to the co-communicator. The correlation level in the present study are matching previous statements about the extraversion trait (r=0,30 for the eye contact and r=0,26 for proximity) with a high significance (p<0,001). The levels from a covariance calculation is much higher (0,49 and 0,42 respectively). Previous results for the extraversion dimension are, thus, replicated. Also the avoiding gazing behavior in relation to neuroticism is replicated (r=0,23; p<0,001. In the covariance output the value is 0,32). This is a positive sign and gives some reliability to the tools used. Is it possible to ask participants to share their assessments of own communicative behavior in a questionnaire? The uncertainty related to this way to collect communication data is whether all participants have a relatively high awareness about their own communicative behavior or if this is systematically related to some of the personality traits or other underlying factors. It is for other studies to investigate further. Questions about preferences are less problematic like in the cases of privacy, intimacy and the use of communication technology.

The cultural (nonverbal) dimensions that are used as an influence to the study can be of assistance to conclude communicative nonverbal profiles or communication styles related to each personality trait. The extraversion – introversion dimension can fit rather well with both the contact dimension and the expressive dimension. Ting-Toomey

and Chung (2005) describe high contact style as often looking the co-communicator in the eyes, face the co-communicator, touch the co-communicator and speak with a loud voice. They also describe low contact as seldom engage in touching, prefer indirect gaze (to look at the co-communicator when he/she is looking away) and speak in a lower tone. Lustig and Koester (1993) add that high contact communication involves touching and standing close to each other while low contact communication signals a need for spatial distance and regular need for privacy. Extraverts talk more, talk faster and talk louder (Argyle, 1988, Frank, Maroulis & Griffin, 2013; also Daly, 2011). According to the present study extraverts use a more varied amplitude allowing them to emphasize words or sentences when needed. Previous studies and the present study state that extraverts like to stand close to the co-communicator while talking and to employ mutual gazing behavior. They have a low need for privacy and a high need for intimacy (touch and smell). All this shows a strong association between a high contact style of communication and the personality trait of extraversion. The personality trait of introversion is consequently strongly associated with a low contact style of communication. Introverts dislike touch (McCroskey, Heisel & Richmond, 2001), they avoid eye contact, they stand at a distance, they don't need intimacy and they need a lot of privacy. That also supports the case. No other personality trait dimension fits the description.

It has already been suggested that extraversion also is associated with an expressive communicative style (Argyle, 1988; de Vries et al., 2013). The present study seems to support that as well. Being talkative is obviously more than just talking when getting the opportunity. It means using several communicative resources to get the message through. Extraverts are physically active and have plenty of energy (Courneya & Hellsten, 1998), so using several modalities would be a natural way to communicate for them, that is, an energetic output. The expressive communicative style according to de Vriers et al. (2013) does not explicitly describe the importance of nonverbal modalities. Matsumoto and Hwangs (2013) expressive – reserved dimension is mainly focusing on multimodal means. It suggests that expressive communicators use several channels/modalities compared to reserved communicators. Expressive communicators also use the modalities in a more energetic way, optimizing the potential of the communicative means we are equipped with. Young (2011) describes an expressive nonverbal communicative style as using frequent eye contact, using appropriate hand and head gestures, a varied tone of voice, and using several facial expressions. He describes an unexpressive nonverbal style as using eye contact sparsely, no or few hand and head gestures, few facial expressions and using a monotone voice. Expressiveness is rather relying on (1) several modalities in a combination and (2) a varied use of the modalities (varied tone of voice, varied hand gestures and varied facial expressions) (also Matsumoto & Hwang, 2013). These factors from the present study are supporting an association between the expressive style and the extraversion dimension:

- Frequent eye contact with the co-communicator (see Matsumoto & Hwang, 2013; Young, 2011).
- A close distance in interaction (see Matsumoto & Hwang, 2013).
- Raise the voice to emphasize (a varied tone of voice) (see Matsumoto & Hwang, 2013; Young, 2011).
- Likely to touch (have a need for intimacy) (Matsumoto & Hwang, 2013).
- Being talkative (de Vriers et al., 2013).
- Prefer face-to-face communication over technology-based communication.

The last statement needs to be developed a bit. It has been suggested that introverts use text-based communication like SMS, E-mail and chat. It has also been suggested that extraverts to a high degree use internet and smartphones to communicate (Butt & Philips, 2008; Ross et al., 2009). How can both tendencies be true? (1) Introverts use internet and other text-based tools to create an online identity that is primary to the individual while the offline identity is secondary. Just as the present study is indicating, introverts *prefer* communication tools over face-to-face interaction. (2) Extraverts have an offline identity that is primary and they use several communicative tools to keep in touch with the vast network they normally have. They prefer, just as the present study is suggesting, face-to-face interaction but use other means as complementary ways to interact (Butt & Philips, 2008; Ross et al., 2009). It is likely that extraverts use communication tools as well as face-to-face opportunities to interact to a high degree. Introverts use a low variety of means, primarily online text-based means. In total, though, introverts communicate less than extraverts independent of channel.

The fact that extraverts prefer face-to-face communication is an important clue to the whole puzzle. It means that they prefer ways to interact that are multimodal and information rich. It means that they freely can express themselves the way they are, and it means that they can observe and receive others expressions the way they like. Extraverts high level of attention on others nonverbal cues (Burgoon, Buller & Woodall, 1996) and their high level of responsiveness (McCroskey et al., 2001) have made them suited for multimodal interactive situations. Not having these opportunities might make them socially under-stimulated. Face-to-face communication is optimal for extraverts in both directions.

Another indication that extraverts like varied and multimodal communication is their need for intimacy, as the present study report. Face-to-face communication normally offers reception with two or three sense modalities (see Allwood, 2014). Intimacy can offer reception with up to four or five sense modalities, even more if the sensors in the skin are

counted as different types of modalities (e.g. pressure, temperature & movement). Extraverts obviously need and/or prefer interactive situations that are high in their potential multimodality. Introverts are just the opposite. Introverts are uncomfortable in situations that are too stimulating. One modality (like text) or a few modalities are enough.

The multimodal qualities of being talkative, the high multimodal potential that lies in face-to-face communication and the highly multimodal potential in intimate interaction are together strong evidence in line with an association between the extraversion dimension and the expressiveness communication style. There is enough support to suggest that this relation is valid.

A direct communication style is derived from the low context communication style. It means that the communicator reveals his/her true intentions, needs and desires. An indirect communication style is derived from the high context communication style. This in turn means that the communicator is camouflaging the true intentions, needs and desires (Martin & Nakayama, 2010). The latter doesn't have to mean that the indirect communicator is trying to lie or deceive. It is primarily a way to avoid confrontation. It is a way to be smooth. Low context communication style is typically explicit. As much as possible is spelled out. This is especially important when the speaker or the listeners are seen as more or less different compared to others or each other. In a homogenous group all individuals think in a similar way. In a heterogeneous group individuals have less in common to rely on and therefore have to be explicit (Samovar, Porter, & McDaniel, 2007). Finally, the low context communication style is primarily relying on verbal communication while the high context communication style primarily is relying on nonverbal communication and the context (Spencer-Oatey & Franklin, 2009). In sum, low context communication style is based on:

- Direct communication
- Explicit communication
- Verbal communication

High context communication style is based on:

- Indirect communication
- Implicit communication
- Nonverbal communication and context.

In the present study *openness to experience* is correlated both to direct communication and verbal communication. The trait is also, we find it in one of the facets, original, autonomous and independent (McCrae & Costa, 2006; Costa & McCrae, 1992). This means that they themselves see the need to be explicit to help others fully understand their goal of communication. Individuals high in openness might also see a need to be explicit and clear with their friends that are a bit different from the norm. An additional aspect of openness is their curiosity and *direct* ways to ask questions (de Vriers et al., 2013). Based on the correlation between others use a raised voice and something that looks like liking of others expressive and direct ways to communicate, it seems that others direct way to communicate might be stimulating. Being talkative, a correlation that the present study supports, can also be associated with an explicit way to communicate. Several signs are pointing in a direction towards an association between openness and a low context communication style.

The agreeableness trait is associated with a non-confrontative way. First of all the agreeableness trait is correlated to indirect communication. The correlation is stronger than it is for extraversion and openness. To stand still and not take a step back is an implicit way to say "I feel uncomfortable that you are in my intimate zone but I don't want to offend you or make you feel disliked". To never or seldom raise the voice is a way to seem calm and smooth and in a way camouflage the own needs. On the other hand, individuals scoring high on agreeableness laugh a lot (Keltner, 2005). Laughter can be used to share a positive emotion with others and respond to humor (Frank & Ekman, 1993) as well as mask negative emotions and neutralize social tension (cf. Martin & Lefcourt, 1983). This is all in line with a non-confrontative, friendly and rather accommodative style. They don't want to take too much space and attention from others. They want to support others. The low need for privacy can also be a tendency towards a supportive style (don't need much time for myself, I am here for you). This is in a way a relationship oriented personality dimension in the agreeable end and much less so in the self-centered end. The correlations in the present study (and other characteristics) are in line with a high context communication style and even if the evidence isn't strong there is a tendency that might be better supported in other studies.

The neuroticism trait is correlated to some nonverbal factors but the whole picture does not seem to fit any special nonverbal dimension or communication style. The trait can be seen as a little expressive, a little reserved/low contact and a little indirect and implicit (high context). The conscientiousness trait is also a mix between high contact/expressive and a direct (low context) style. There are probably other nonverbal dimensions or communication styles that better match the neuroticism and the conscientiousness traits.

5. Conclusions

To sum it up there are both hypothesized and non-hypothesized correlations between all five personality traits and some nonverbal factors that are included in this study. The strongest tendencies are that the *extraversion – introversion* dimension is associated both with the contact dimension and the expressiveness dimension and that the *openness* dimension is associated with the context dimension (direct, explicit and verbal communication style). There is also some support for an association between the *agreeableness* dimension and the context dimension (indirect, implicit and nonverbal communication style). A lot more can be done to find better support for nonverbal communication styles attached to personality traits. Especially the neuroticism and conscientiousness traits that still aren't connected to any specific ways to communicate nonverbally. More research is needed. This study is just a first small step in the right direction.

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