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The Effect of Vertical Spatial Positioning on the Perceived Strength of an Emotion: a Cross-Cultural Study

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Date:	June 15th, 2018
Document:	IBC Master's Thesis

Abstract

This thesis studied whether the way in which people position themselves in the vertical space in comparison to the other has an influence on how strongly anger as an emotion is perceived. Data was collected through an online survey among Dutch and American respondents. We did not find support for an effect of vertical spatial positioning on the perceived strength of anger. However, this study did provide evidence that nationality has an influence on the perceived strength of an emotion. American respondents perceived the people in the photos to be more angry than how strongly the Dutch perceived them. Additional analyses also suggest that women may be perceived as more angry than men. This study contributes to the field of non-verbal communication because of the fact that the influence of vertical spatial positioning on the perceived strength of an emotion has been unexamined so far. Especially the receiver's point of view in the matter has been given little attention. Our findings that Americans perceive anger as an emotion stronger than the Dutch can be applied to contexts of intercultural communication.

Introduction

Imagine you are in a management position in a big company. Every year, your team members come by your office for a performance evaluation. Now imagine that there is a team member who did not perform all that well in the past year. You could address the issue by simply stating your unhappiness with their work by means of words. However, not all communication cues are necessarily verbal. As the team member is still standing up and you are seated, your discontent and perhaps even anger about their lacking performance may not come across strong enough in this type of spatial positioning. Or maybe you are standing up and the team member is seated? This difference in vertical spatial positioning could have an opposite effect: you could come across angrier than you intended to. Perhaps the above-mentioned type of positioning has similar effects when you are speaking to a co-worker about a project. In this case, there is no difference in actual power, but implied power difference by means of vertical positioning could nonetheless have an effect on the ways in which emotions expressed through facial expressions are perceived. Awareness about the

possible effects of such nonverbal cues is of the essence in situations such as these and many others. However, very little academic research has been conducted on vertical spatial positioning as a mode of nonverbal communication in relationship to the strength of emotions. And what if you are of a different culture than the colleague sitting across from you? Does nationality matter? What is more is that other studies have focused on the effect of the emotion on the sender (e.g. whether the emotion makes one feel more powerful), rather than on how the *receiver* perceives the emotion. The present study combined these factors. Vertical spatial positioning is used as a means to operationalize power, which we used to examine whether this influences how strongly an emotion is perceived. Other scholars have investigated vertical spatial positioning and its effect on power in group-decision making, but did not examine emotional expressions, nor the influence of cultural variation. This train of thought and the gap in the literature is what formed the foundation of this study.

1. Theoretical framework

1.1 Emotions and facial expressions

Emotions, at their core, can be examined from various perspectives; from the purpose they serve to the ways in which to express them. From a social and psychological perspective, emotions can be conceptualized as "multichannel responses that enable the individual to respond adaptively to social problems and take advantage of social opportunities in the context of ongoing interactions" (Keltner & Kring, 1998, p. 321). In other words, emotions help coordinate social interactions between people. They are linked to events, because they are "evolutionary based, information-processing programs that reliably connect with a behavioral response that aids adaptation" (Matsumoto, Hwang, & Yamada, 2012, p. 2). For these interactions to take place the emotions need to be expressed, either verbally or nonverbally. For instance, a person can show "happiness" by verbally "laughing" and/or by nonverbally "smiling". The latter can be categorized as a facial expression of emotion.

Facial expressions are one of many nonverbal modes to communicate a person's emotional state. In addition to conveying cues disclosing race and gender, the face can signal overt emotional states such as "anger", "fear", "happiness", or "sadness" (Richoz, Jack, Garrod, Schyns, & Caldara, 2015). These emotional states

are each connected to a definitive set of neural impulses. These impulses, when an emotion is elicited, in turn transmit to the facial muscles. An emotion like "anger" has its own specific and characteristic way in which the facial muscles are arranged. The arrangement occurs in three subdivisions of the face: in the area of the eyes and lids, around the lower face and mouth, and in the forehead and the brows (LaFrance & Mayo, 1978). Visch, Goudbeek, and Mortillaro (2014) pose that, from an evolutionary perspective, coping with and recognizing threats is crucial to the survival of the organism. Angry expressions in this case can be qualified as a threat as well. What is more is that Visch et al. found that anger not only elicits a heightened visual attention and activation of defense mechanisms on the part of the receiver, but also that these people perceiving the emotion of anger need less visual information to recognize the emotion than for other emotions.

1.2 Verticality, dominance, and power

Evolution theory does not only teach us that organisms have learned to detect threats early on because this is beneficial to their survival, but also that certain qualities in leaders result in greater survival odds for the species and the success of a group. Chapais (2017), for instance, suggests that dominance is a domain of competency and that, in turn, "looking down on" followers is intrinsic to human leadership. Blaker, Rompa, Dessing, Vriend, Herschberg, and Van Vugt (2013) argue that taller individuals are more prone to be selected as leaders because throughout history height is shown to be an important indicator of a person's dominance, fitness, and health. Height was therefore a means to gather information on someone's potential to lead others (see also: Giessner & Schubert, 2007). Other scholars claim that this vertical classification system is a general feature of the development of humans from the experiential perspective: the height and social inequality between child and parent (Giessner & Schubert, 2007; Schwartz, Tesser, & Powell, 1982).

The association between status and height has become an automatic thought process. These thoughts are implicit, as Giessner and Schubert (2007) showed that even an abstract vertical line and its length can have a positive influence on the perception of a person's power position. In addition, dominance has generally been associated with higher physical locations in vertical space, whereas submission, on the other hand, has been associated with the lower vertical spatial locations

(Robinson, Zabelina, Ode, & Moeller, 2008). In other words, the literally lower positioned person is considered also figuratively inferior and the literally higher positioned person is viewed as figuratively superior (Schwartz et al., 1982). This link can also be found in various linguistic metaphors such as having a "high" status when a person has power and influence, or having "low" status when they have little power. Attaining greater levels of power and dominance is often referred to in terms of gaining higher levels of verticality (e.g. "social climber") (Robinson et al., 2008; Schubert, 2005). Thus, as Schwartz et al. (1982) state: "Vertical preeminence symbolized the general concept of social power" (p. 117). What is more is that vertical positioning as an aspect of the body's areal radiation is often exploited for the dramatization of super- and subordination (Schwartz et al., 1982).

As people need to be able to quickly and adequately detect cues of power that point out their place in the social hierarchy it may not come as a surprise that these cues of power often operate unconsciously. One of these cues of power, as stated by Smith and Galinksy (2010), is interpersonal distance. Within the field of nonverbal communication the use of interpersonal distance and spacing relationships is also described as 'proxemics' (Burgoon, Guerrero, & Manusov, 2011). Behavior changes as a result of differences in people's physical arrangement. In an experiment conducted by Huang, Olson, and Olson (2002) camera angles were used to create a setting in which a person could become artificially tall or short. They suggested that if a person is looking up all the time (with the remote person looking down on them), they might feel submissive and the artificially tall person would feel dominant. Low angle shots were used to make the person seem tall, dominant, and powerful, whereas high angle shots were used to create the opposite effect: a 'short', submissive person. This method was then applied to find out what influence being 'tall' or 'short' has on group-decision making. Results showed that 'tall' people are not only significantly more influential than their 'short' counterparts, but they also *think* they are (Huang, Olson, & Olson, 2002). Or as Giessner and Schubert (2007) stated: "The powerful is up and the powerless is down" (p. 42).

1.3 Vertical spatial positioning and emotions

Based on the findings by Huang, Olson, and Olson (2002) discussed above we can conclude that vertical spatial positioning is a key method to generate a sense of

dominance and submission between two people in a conversation. Since perceiving and reading the emotions of other people requires the gathering of information from a multichannel mode of communication, people do not merely base their impression on a facial expression. Other sources provide us with valuable information as well. Albeit unconsciously, factors such as context, body posture, and gestures are all analyzed simultaneously (Elfenbein & Ambady, 2002; Hietanen & Leppänen, 2008). In other words, the larger context in which emotions occur continuously influences the way in which they are perceived (Feldman, Barret, Mesquita, & Gendron, 2011). A part of this larger context is vertical spatial positioning. Body posture, in the sense of being either seated or standing up, also means being either higher or lower in the vertical space than your counterpart. This could in turn have an effect on the way in which the 'receiver' perceives an emotion that is portrayed by a facial expression. The first part of this study therefore aims to answer the following question:

RQ_1: What effect does the vertical spatial positioning of the receiver have on the perceived strength of the emotion of anger portrayed by a facial expression?

Van Kleef, De Dreu, Pietroni, and Manstead (2006) conducted research on the interactive effects of power and emotion in negotiation. Rather than viewing the effects of emotions on an intrapersonal level, they focused on the social aspect of conversation and negotiation: emotions do not only influence the 'sender', but also the 'receiver'. They found that the emotions 'happiness' and 'anger' interact with a person's power to influence negotiating behavior. Participants with low power were strongly affected by their opponent's emotions. Those with high power, on the other hand, were not affected. Thus, "negotiators only act on their opponent's emotions if they have (relatively) low (rather than high) power" (Van Kleef et al., 2006, p. 577). Van Kleef et al. (2006) operationalized the concept of power by means of assigning participants to a powerful or powerless role (either Senior Manager or Junior Trainee). If we connect this to our previous discussion regarding the powerful being higher in vertical space than the powerless, it could be that a receiver who is positioned lower in vertical space than the sender perceives the emotion of anger more strongly. Because, according to findings by Van Kleef et al. (2006), they would be less inclined to take the other person's emotions into account if they were the powerful one (or positioned higher in vertical space). One could argue that one only

takes another person's emotion into account when that emotion has left a strong enough impression. A strong impression would then originate from being positioned lower in the vertical space than the sender *and* perceiving the emotion as strong. Thus, literally and figuratively 'looking up' at the sender results in a stronger perceived emotion by the receiver. Based on this notion, the following hypotheses are formulated:

H_1: When the receiver is positioned lower in the vertical space than the sender (hereby 'looking up at' the sender while the sender is 'looking down on' the receiver), the receiver will perceive the emotion portrayed by a facial expression stronger as compared to when the receiver is positioned at eye level of the sender.

H_2: When the receiver is positioned higher in the vertical space than the sender (hereby 'looking down on' the sender while the sender is 'looking up at' the receiver), the receiver will perceive the emotion portrayed by a facial expression weaker as compared to when the receiver is positioned at eye level of the sender.

1.4 Across cultures: emotion, recognition, and judgment

Ekman and Friesen (1971) showed that certain facial expressions are universally associated with the six 'basic' emotions (happiness, sadness, anger, fear, surprise, disgust). In their work they showed participants a set of three (Western) faces whilst telling them a story. The respondents were then asked to choose which face portrayed the appropriate emotion to the story. To make sure that participants had not been influenced by Western cultures, they also conducted the research among several illiterate and isolated New Guinean tribes that had had no opportunity to be familiar with the Western facial expressions. The results showed that the emotions portrayed were nevertheless comparably judged by both the New Guineans and by the Western, literate respondents. Hence, there seem to be constants across cultures in emotional facial behavior, which can be explained by the notion that they are biologically programmed. Note that these emotions are universally recognized at an above-chance level across-cultures, which still points to some cultural variation in recognition accuracy.

Matsumoto (1989) argued that the process of controlling how to perceive and express these emotions is strongly dependent on cultural factors. For instance, cultural variation in display and decoding rules determine the extent to which it is appropriate to display and judge an emotion in a specific culture (Matsumoto, 1989; Matsumoto, 1992; Matsumoto, Hwang, & Yamada, 2012). This particularly goes for the negative emotions. Elfenbeim and Ambady (2002) add that emotion recognition accuracy increases when emotions are expressed and recognized by members of the same culture or ethnic group, which points to an in-group advantage. However, the extent of the advantage also decreases when members of different groups live in close proximity or if they are exposed to each other in other ways (e.g. through video, internet, or telephone communication). If emotions can be recognized and judged differently based on cultural variation, so can the perceived strength of an emotion. This brings us to the second key question:

RQ_2: To what extent does cultural variation have an influence on the perceived strength of anger as an emotion?

1.5 The Netherlands versus the United States: masculinity, femininity, and emotional expression

Based on data collected by Hofstede (2001) it can be concluded that the Netherlands can be categorized among the countries with a feminine culture whereas the United States has a much more masculine culture. The masculinity-femininity dimension of a culture refers to the extent to which a culture strives for competitiveness and achievement. Masculine cultures in this context value stereotypical gender behavior, competition, and assertiveness. Feminine cultures, on the other hand, value cooperation, gender equality, and concern for the weaker members. Quality of life is considered of great importance in feminine cultures (Basabe, Paez, Valencia, Gonzalez, Rime, & Diener, 2002; Hofstede, 2001).

The masculinity-femininity dimension might also affect the portrayal of emotions through facial expressions. Frowning is a means for people to express anger. However, in some cultures it is not necessarily appropriate to express certain emotions (Matsumoto, 1989; Matsumoto, 1992; Matsumoto, Hwang, & Yamada, 2012). According to Fernández, Carrera, Sánchez, Paez, and Candia (2000), the most

important cultural dimension that predicts the expressiveness of a country is its level of cultural masculinity. They state the following: "If we have to use country as predictor variable and we do not have data about differences within countries, a good alternative is to use some descriptive cultural indexes in order to explain differences" (p. 83) (see also: Basabe et al., 2002). Feminine cultures generally tend to be more open to expressing emotions freely (apart from the assertive emotions), which can be explained by the fact that high levels of social support are characteristic of feminine societies. In feminine cultures, people can show their emotions without having to be afraid of social rejection. Masculine cultures on the other hand tend to have a 'hard' emotional climate, in which the expression of assertive emotions, such as pride or anger, is reinforced (Fernández et al., 2000).

In this study, we will focus on the United States and the Netherlands. Being part of a masculine culture, people from the United States are expected to be less expressive in general, but more emotionally expressive when it comes to expressing anger. The Netherlands on the other hand, as a nurturing feminine country, is expected to be more expressive on the whole, but not so emotionally expressive when it comes to expressing anger. This has to do with the notion that the emotion of anger often tends to fulfill a more instrumental role in conversation than for instance joy (Fernández et al., 2000). One could argue that people who are angry generally want to see something change after expressing their anger. Instrumentality to achieve a personal goal in this context is more associated with 'hard', masculine cultures, rather than feminine cultures.

It could be that when people from a culture are not used to the expression of anger, they may perceive the emotion more strongly when it is 1) expressed, and 2) expressed by the powerful (the sender being higher in the vertical space). This would be expected for Dutch participants.

H_3: Dutch participants perceive the emotion of anger portrayed by a facial expression to be stronger when they are positioned lower in the vertical space than the sender (hereby 'looking up at' the sender) as compared to when they are positioned at eye level of the sender.

Despite the notion that due to its masculinity the U.S. is a country with lower levels of emotional expression, the expression of the assertive emotions, such as

anger, is stressed nevertheless (Fernández et al., 2000). It could be that, due to the fact that the expression of anger has become 'normal' in the American culture, people have grown used to it and are not as easily impressed anymore by that type of emotional expression. Hence the following hypothesis:

H_4: For U.S. participants, lower vertical spatial positioning does not have an influence on the perceived strength of the emotion anger portrayed by a facial expression (hereby 'looking up at' the sender).

As we discussed in section 1.3, people are generally less inclined to take the sender's emotions into account if the receiver is positioned higher in the vertical space than the sender (Van Kleef et al., 2006). It could be that the expressed emotion would have less of an impact on the receiver, because it is perceived as being weaker. In line with the expectation formulated in Hypothesis 2, but with the addition of the aspect of nationality, the following is therefore to be expected for both the Dutch and the U.S. participants:

H_5: Both Dutch and U.S. participants perceive the emotion of anger portrayed by a facial expression to be weaker when they are positioned higher in the vertical space than the sender (hereby 'looking down on' the sender) as compared to when they are positioned at eye level of the sender.

2. Method

2.1 Materials

For the material, photos of stage actors were taken. Four different people were photographed: two males and two females. To ensure that respondents did not know the actors, photos were taken from people in a theater group located in Arnhem, rather than using students or people from Nijmegen who may be acquainted with participants from Radboud University. To keep the setting as consistent as possible, the photos were all taken at the same time and location. The actors were asked to look angry. It should be noted that even though the angry expressions in the photos were portrayed by actors and are therefore by definition not *natural* expressions, the

expressions do not necessarily fit the characteristics of a stereotypical 'angry look' either (e.g. deep frown by furrowing the brows) as this may come across as *unnatural*. What is more is that Shahid, Krahmer and Smerts (2008) found that acted emotions are perceived as more extreme than non-acted emotions. Hence, there is a difference in how acted and non-acted emotions are perceived. Therefore, the actors were instructed to look angry, but as they would in real life. This resulted in a type of angry stare and slight frowning, rather than a heavy and forced furrowing of the eyebrows like the expressions used in, for instance, the work by Ekman and Friesen (1971).

Different camera angles were used to reconstruct three situations: 1) the receiver is standing up and looking down on the sender (the person being photographed is looking up at the photographer), 2) the receiver (the photographer) is positioned at eyelevel of the sender (the actor), and 3) the receiver is seated and looking up at the sender who is standing up (the person being photographed is then looking down on the photographer) Using these 3 different camera angles created the differences in Vertical Spatial Positioning (VSP). Each actor was photographed from all three angles, as can be seen in Figure 1 below.

[Figure available upon request]

Figure 1. Schematic explanation of camera angles and resulting material. Top: situation 1, or 'higher' VSP condition. Middle: situation 2, or 'eye level' VSP condition. Bottom: situation 3, or 'lower' VSP condition.

The photos were edited in editing software called Aperture so the lighting, contrast, and frame were all as similar as possible. Participants in the experiment were assigned to one VSP condition. In the 'higher' VSP condition they were shown pictures of people looking angrily up at them. Hence, in the 'higher' condition, the participant was placed in a role in which they, as the receiver, were positioned *higher* in the vertical space than the sender (the person in the photograph). In the 'eye level' VSP condition the respondent was positioned at the same eye level as the sender (the person in the photograph was looking straight at the receiver/respondent). Finally, in the 'lower' condition the participant was placed in a role in which they, as the receiver, were positioned *lower* in the vertical space than the sender (the person in the photograph). In this group the participants were shown pictures of people looking

angrily down on them. All photos of the different versions and actors can be found in Appendix 1.

2.2 Respondents

A total of 238 people participated in the survey, of which 220 completed the survey. Out of these 220 people, two people did not meet the nationality requirement. Hence, 218 participants finished the experiment and were either Dutch or American. The data of these 218 participants were used for the analyses. The further distribution of these participants among the VSP conditions can be found in Table 1 below.

Table 1. Distribution of participants based on nationality and VSP condition

VSP	**American**	**Dutch**
Higher	34	41
Eye level	33	38
Lower	34	38
Total	*101*	*117*

Of all 101 American respondents, 72 were female (71%). Among the Dutch respondents, 88 were female (75%) and 29 were male. There was no significant association between nationality and gender (χ^2 (1) = .43, p = .513). However, based on an independent samples t-test, a significant difference was found between the age of American respondents and Dutch respondents (t (216) = - 4.46, p < .001). Dutch participants (M = 42.82, SD = 15.13) were significantly older than American participants (M = 33.77, SD = 14.63). The age of American respondents ranged between 17 and 69 years of age. Dutch respondents were between 16 and 79 years old. The educational level of American respondents ranged between having obtained a high school diploma and a doctorate degree. Most of the U.S. participants had a bachelor's degree (49%). The educational level of Dutch respondents ranged between a 'vmbo' degree and a 'wo' master's degree. 21% had an 'mbo' degree, 22% had an 'hbo' bachelor's degree, and another 22% had a 'wo' master's degree.

2.3 Design

This study consisted of a 2x3 between-subjects design. The two independent variables were Nationality (either American or Dutch) and Vertical Spatial Positioning (VSP) (either higher, eye level, or lower). Participants were assigned to one of the VSP conditions. The dependent variable was Perceived Strength of Emotion (PSE).

2.4 Instruments

Data was collected through a questionnaire created in the online tool Qualtrics. A pre-test was conducted among 14 respondents, who did not take part in the main experiment, to test whether the setup of the questionnaire and instructions were clear. Based on the results of this pretest no changes were made to the main experiment. In addition, forward and backward translations were carried out for the English translation of the survey to maintain equivalence between both the Dutch and the English version of the experiment. In the experiment, questions regarding the participant's opinion on the expressed emotion (testing the dependent variable: Perceived Strength of Emotion) were asked on a seven-point Likert scale. Based on a previous method used by Snel (2018), three questions were asked to measure the PSE: 1) "On a scale of 1 to 7, how angry is this person?", 2) "On a scale of 1 to 7, how strong do you perceive this emotion to be?", and 3) "On a scale of 1 to 7, how sincere is this emotion?". Number 1 on the scale meant "not angry at all", "not strong at all", or "not sincere at all". On the other side of the scale the opposite option was given: "very angry", "very strong", and "very sincere". Reliability for these three questions measuring PSE in the main experiment was deemed sufficient for all six conditions (see Table 2 below).

Table 2. Cronbach's Alpha values for all VSP and Nationality combinations

Nationality	**VSP**	**α**
American	Higher	.88
	Eye level	.84
	Lower	.86
Dutch	Higher	.79
	Eye level	.78
	Lower	.85

2.5 Procedure

Participants in this experiment were approached directly through online channels such as email, Facebook, or Whatsapp. They could take part on a computer, laptop, tablet, or smartphone via an online link. At the beginning of the experiment, they were asked about their nationality/where they are from in order to be sure that they were of the desired background. Options were 'the Netherlands', 'American', or 'Other'. Based on this answer they were redirected randomly to either the 'higher', 'eyelevel', or 'lower' VSP condition of the experiment in either Dutch or English. The respondents that selected 'Other' were redirected to the end of the survey. All respondents saw the same introduction, albeit either in English or in Dutch depending on their nationality. Thereafter they were given the following instructions:

Imagine the following situation: you have been working on a project together with a co-worker. Your co-worker is not at all satisfied with the work you have delivered. They are angry about this and want to talk to you.

You will see 4 photos of angry people. Imagine that the person in the picture is your co-worker. After each photo a couple of questions are asked. Once you have moved on to the questions, you cannot go back, so look at the photo carefully. Your first impression is usually the right one.

Part of the instruction above was also explained in the introductory text of the experiment, as can be seen in Appendix 2 (an example of the survey). However, as participants may sometimes skip the introductory text without reading the content, the most important instructions were added a second time. Participants then had to

indicate that they had "read the above", thus ensuring that the information had been processed/read. Important to note as well is that 'co-worker' suggested equality of power, rather than a difference in position, which could have influenced the results. The proposed situation was to be as neutral as possible, apart from the 'anger component'.

Subsequently, people were shown one photo, after which they had to answer the three questions measuring PSE on a seven-point Likert scale. This process was repeated for all four photos. Finally, participants were asked to provide information on their age, gender, and educational background (see also Appendix 2).

2.6 Statistical treatment

To answer the research questions and to test the hypotheses a two-way univariate analysis of variance was conducted. An additional repeated measures analysis was run with within-subject factor 'item' to see whether the specific person in the photo had an effect on the perceived strength of the emotion.

3. Results

A two-way univariate analysis of variance with as between subject factors Nationality (Dutch or American) and Vertical Spatial Positioning (*higher*, *eye level*, or *lower*) for the Perceived Strength of Emotion showed a significant main effect of Nationality ($F(1,212) = 5.14$, $p = .024$, $\eta^2 = .02$). Irrespective of vertical spatial positioning, Americans perceived the emotion to be stronger ($M = 3.68$, $SD = .97$) than the Dutch did ($M = 3.41$, $SD = .82$). In other words, the people in the pictures came across as more angry to the American participants than to Dutch participants, as can be seen in Figure 2 below.

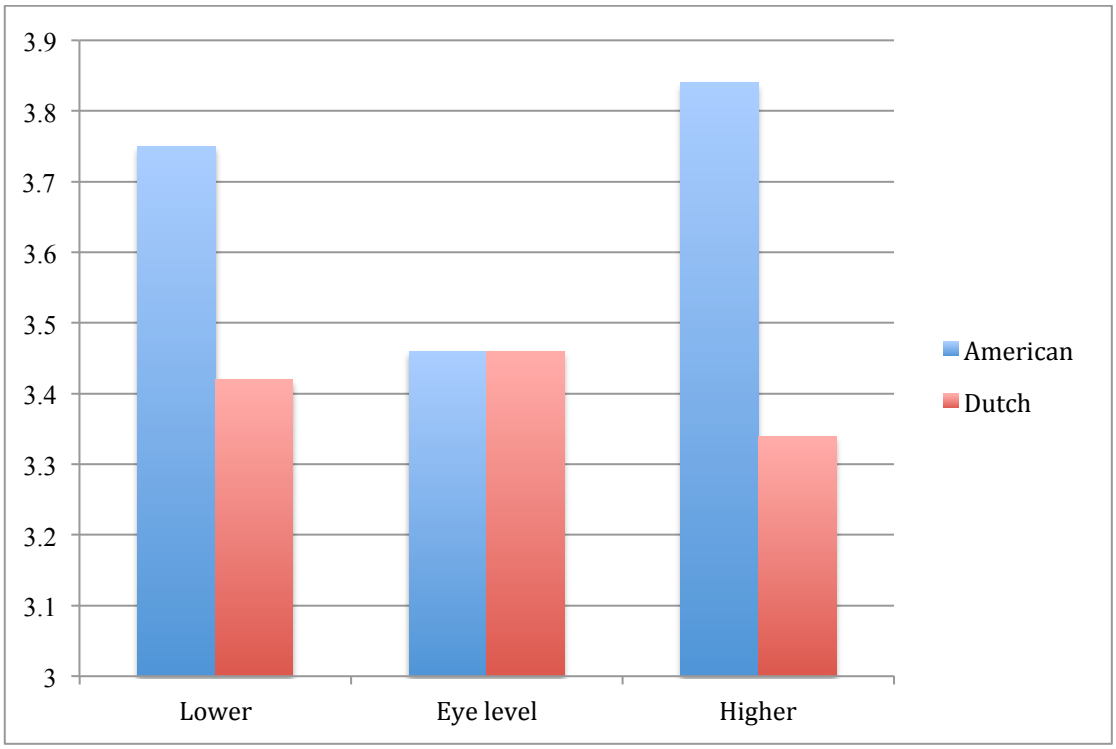

Figure 2. Mean PSE scores (measured on a 7-point scale) based on nationality and VSP condition.

No significant main effect of Vertical Spatial Positioning on the Perceived Strength of the Emotion was found (F (2,212) < 1, p = .622). Hence, it did not make a difference in what way the participants were placed in the vertical space in comparison to the sender. Also, the interaction effect between Vertical Spatial Positioning and Nationality was not statistically significant (F (2,212) = 1.20, p = .222).

An additional repeated measures analysis was carried out in order to determine whether 'item', or the specific person in the photo, had any influence on the results. 'Item' was therefore used as within subject factor. Which Item represents which person can be found in Appendix 1. The repeated measures analysis for Perceived Strength of Emotion with as within subject factor Item and between subject factors Nationality and Vertical Spatial Positioning showed a significant main effect of Item (F (2.95, 626.15) = 19.87, p < .001, η^2 = .09). Due to the fact that the assumption of sphericity was violated, the F-value has been calculated with Huynh-Feldt. Pairwise comparison (with Bonferroni correction) showed that Item 1 (M = 3.84, SD = 1.16) and Item 2 (M = 3.25, SD = 1.20) differed significantly from each other (p < .001).

Item 1 differed significantly from Item 4 as well ($M = 3.30$, $SD = 1.27$, $p < .001$). Item 3 ($M = 3.75$, $SD = 1.39$) differed significantly from Item 2 ($p < .001$) and Item 4 ($p < .001$), but did not differ from Item 1 ($p = 1.000$). Thus, Item 1 and 3 were similar, as well as Item 2 and 4 (see Figure 3 below).

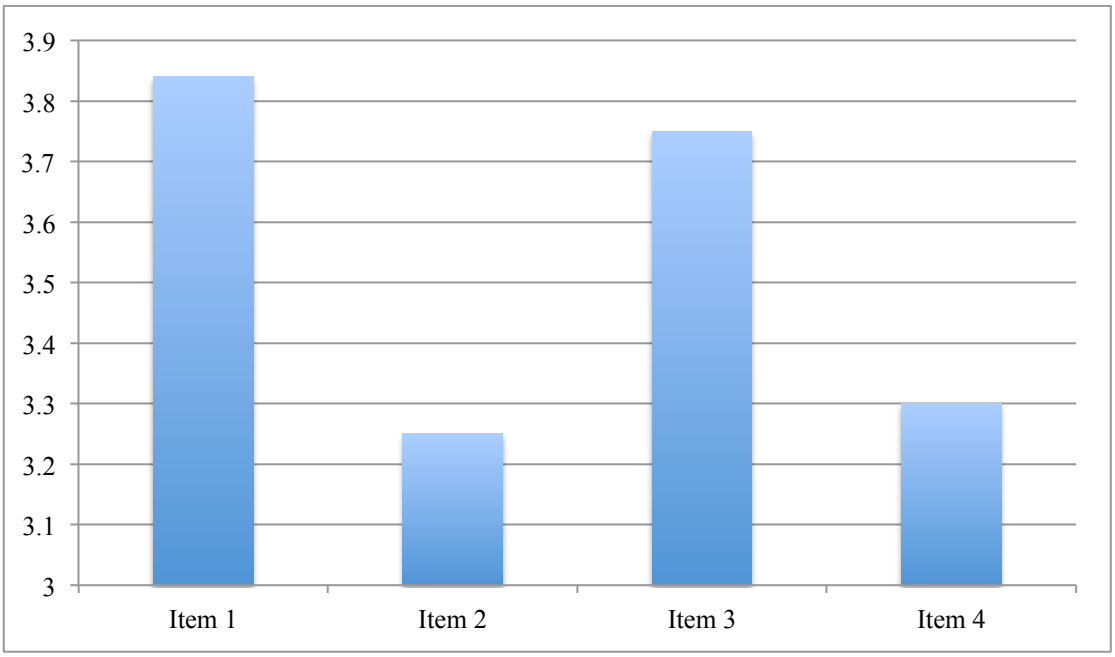

Figure 3. Mean PSE scores (measured on a 7-point scale) per Item

There was no significant interaction effect between Item and Nationality (F (2.95, 626.15) < 1, $p = .589$). However, a significant interaction effect was found between Item and VSP condition (F (5.91, 626.15) = 5.58, $p < .001$, $\eta^2 = .05$). To disentangle the significant interaction, separate repeated measures analyses were run for the three VSP conditions. The repeated measures analysis for Perceived Strength of Emotion for the *lower* VSP data only with as within subject factor Item showed that there was a significant main effect of Item (F (2.69, 190.71) = 6.65, $p < .001$). Due to the fact that the assumption of sphericity was violated, the F-value has been calculated with Huynh-Feldt. In addition, the repeated measures analysis for Perceived Strength of Emotion for the *eye level* VSP data only with as within subject factor Item showed that there was a significant main effect of Item (F (3, 210) = 11.42, $p < .001$). Finally, the repeated measures analysis for Perceived Strength of Emotion for the *higher* VSP data only with as within subject factor Item showed that

there was a significant main effect of Item (F (3, 222) = 12.65, p < .001). Thus, the interaction is because of the fact that Item had an effect on all VSP conditions (see Figure 4 below). The effect on each VSP condition differed, in turn, per Item. It would seem that the items are rated in a similar strength order based on PSE scores for the lower and eye level VSP condition (Item 3 being rated the angriest and Item 2 being rated the least angry). However, the order 'switches' in the higher VSP condition, see Figure 4.

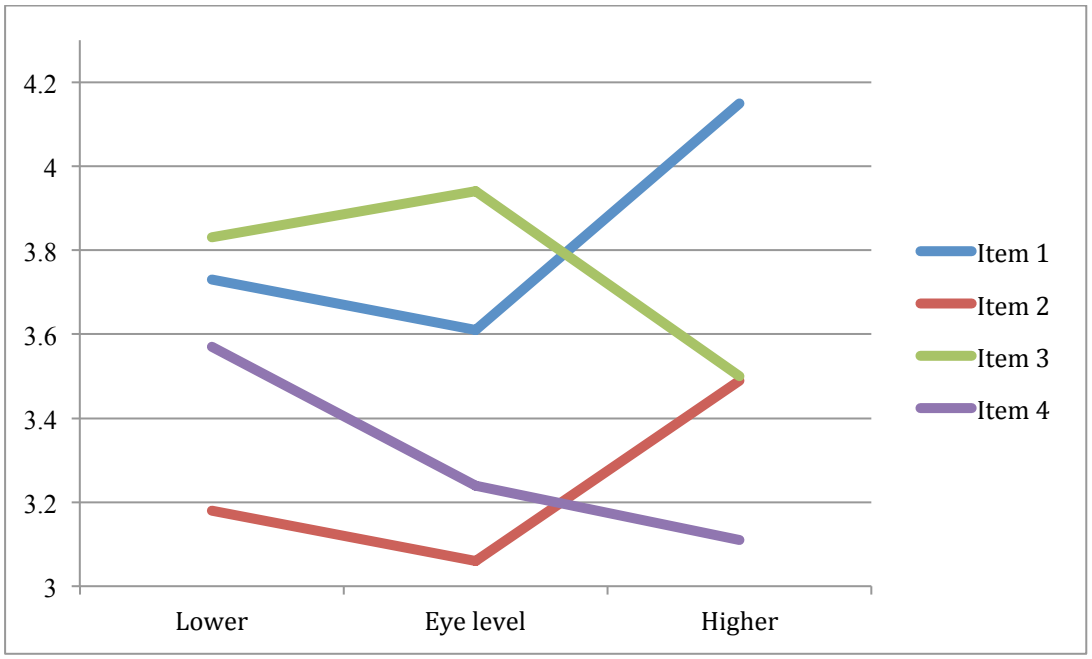

Figure 4. Mean PSE scores (measured on a 7-point scale) per Item and VSP condition

4. Discussion and conclusion

4.1 Findings and possible explanations

The aim of this study was to investigate whether vertical spatial positioning has an effect on the perceived strength of the emotion anger. In addition, the influence of cultural variation on the matter was researched. The study was conducted among both Dutch and American participants and in a business context, in which the 'sender' of the emotion filled the part of angry colleague in a one-on-one conversation about the work the participant supposedly delivered on a project.

No significant effects were found of the influence of vertical spatial positioning on the perceived strength of the emotion of anger. There was also no significant interaction effect between nationality and vertical spatial positioning. These findings indicate that it does not matter how people position themselves in comparison to the other in a conversation when it comes to how strongly the emotion of anger comes across. In other words, positioning yourself higher in the vertical space than your conversation partner does not cause you to come across as more angry, nor does positioning yourself lower in the vertical space than your counterpart make you come across as less angry. There was, however, a significant effect of nationality on the perceived strength of an emotion. Overall, American respondents tended to perceive the people in the photos as more angry than the Dutch participants did. Based on this information, the research questions can be answered and the hypotheses can be tested.

4.1.1 *Research question 1 and following hypotheses*

The first research question posed in this study entailed the following: "What effect does the vertical spatial positioning of the receiver have on the perceived strength of the emotion of anger portrayed by a facial expression?". Based on the findings we can conclude that vertical spatial positioning of the receiver does not have an effect on the perceived strength of an emotion portrayed by a facial expression. Based on the first research question, two hypotheses were formulated. The first hypothesis – "H_1: When the receiver is positioned lower in the vertical space than the sender (hereby 'looking up at' the sender while the sender is 'looking down on' the receiver), the receiver will perceive the emotion portrayed by a facial expression stronger as compared to when the receiver is positioned at eye level of the sender." – was not supported. The results of the experiment show that there is no significant effect of vertical spatial positioning on the perceived strength of an emotion. The second hypothesis – "H_2: When the receiver is positioned higher in the vertical space than the sender (hereby 'looking down on' the sender while the sender is 'looking up at' the receiver), the receiver will perceive the emotion portrayed by a facial expression weaker as compared to when the receiver is positioned at eye level of the sender." - was also not supported, as vertical spatial positioning did not have a significant effect on the strength of the emotion.

Findings by Van Kleef et al. (2006) suggested that the emotion of anger interacts with the power to influence negotiating behavior. They found that people with high power were unaffected by the opponent's emotions, whereas those with low power were strongly affected by the emotions portrayed by the opponent. In this study, the aspect of power was shaped by means of differences in vertical spatial positioning. We did not yield the same results as Van Kleef et al. (2006), due to the fact that we did not find a significant effect of vertical spatial positioning, or 'level of power', at all. Thus, Hypothesis 1 and Hypothesis 2 could not be supported. The difference in findings between our study and the study by Van Kleef et al. (2006) may be caused by the fact that Van Kleef et al. (2006) manipulated the power aspect by varying the participant's position within the company (e.g. some were put in the role of Junior Trainee and others fulfilled the part of Senior Manager). In this study, on the other hand, the power aspect was manipulated by varying the respondent's position in the vertical space in comparison to the sender. This may suggest that vertical spatial positioning as a means to imply differences in power is not always reliable, which contradicts previous findings by other scholars (Giessner & Schubert, 2007; Huang, Olson, & Olson, 2002; Smith & Galinksy, 2010).

Huang, Olson, and Olson (2002) found that 'tall' people are more influential in group decision-making. Similar to this study, they used different camera angles to make a person look tall or short. An artificially tall person would feel dominant, whereas the artificially short person would feel submissive. Even though different camera angles were used in this study to simulate differences in vertical spatial positioning, we were not able to yield significant results on the effect of vertical spatial positioning, like in the work by Huang, Olson, and Olson (2002). Again, there is a difference in methods, which may explain the dissimilarity in the results. In this experiment respondents were presented with photos of people, whereas Huang, Olson, and Olson (2002) placed respondents in a room with a video monitor showing the artificially tall or short person whom they could discuss a problem with in real-time. In addition, Huang, Olson, and Olson (2002) wanted to know what effect being tall and dominant, or short and submissive, had on the level of influence in decision-making, rather than the influence on the perceived strength of an emotion. This may be another reason why our findings differ.

4.1.2 *Research question 2 and following hypotheses*

The second research question posed in this study was the following: "To what extent does cultural variation have an influence on the perceived strength of anger as an emotion?". Results showed that there was a significant effect of nationality on how strongly the emotion of anger was perceived. American participants rated the expressed emotion portrayed by the senders, regardless of their relative vertical spatial positioning, as stronger than the Dutch respondents did. Hence, overall, American respondents thought the people in the photos were angrier than how angry the Dutch perceived them.

Following research question two, an additional three hypotheses were formulated. Hypothesis 3 – "H_3: Dutch participants perceive the emotion of anger portrayed by a facial expression to be stronger when they are positioned lower in the vertical space than the sender (hereby 'looking up at' the sender) as compared to when they are positioned on eye level of the sender." – was not supported, due to the fact that no significant interaction was found between nationality and vertical spatial positioning on the perceived strength of an emotion. Hypothesis 4 – "H_4: For U.S. participants, lower vertical spatial positioning does not have an influence on the perceived strength of the emotion anger portrayed by a facial expression (hereby 'looking up at' the sender)." – was supported, because of the fact that there was no significant effect of vertical spatial positioning on the perceived strength of the emotion, nor was there an interaction effect found between nationality and vertical spatial positioning. In this sense, H_4 is not only true for U.S. participants, but for Dutch participants as well. The final hypothesis – "H_5: Both Dutch and U.S. participants perceive the emotion of anger portrayed by a facial expression to be weaker when they are positioned higher in the vertical space than the sender (hereby 'looking down on' the sender) as compared to when they are positioned on eye level of the sender." – was not supported. Though Hypothesis 2 did not focus on nationality, Hypothesis 2 and 5 are nevertheless closely related. No effect of vertical spatial positioning was found on the perceived strength of the emotion. Apparently, also when taking nationality into account, the way in which people position themselves vertically in relation to the other does not matter when it comes to the perception of the strength of anger. Perhaps in both American and Dutch cultures, business situations with differences in vertical spatial positioning are rare, which could cause people to be less inclined to take such a difference into account.

Fernández et al. (2000) and Basabe et al. (2002) claimed that descriptive cultural indexes could be used to explain differences between countries when there is no data available. Fernández et al. (2000) stated that masculine cultures generally foster a 'hard' emotional climate, in which the expression of assertive emotions like anger is reinforced, as opposed to feminine cultures, which tend to have a 'soft' climate. This means that a feminine culture like the Netherlands is not expected to value the expression of emotions like anger. One would expect that the expression of the emotion of anger is culturally more accepted and 'normal' in masculine countries like the United States, and rejected (and therefore out of the ordinary) in feminine countries like the Netherlands. Hence, one would expect a person to perceive anger as an emotion more strongly in a culture that is not used to its expression (the Netherlands). The results, however, did not support this notion. In fact, the American respondents rated the emotion of anger significantly stronger than the Dutch participants did. Given the fact that the expectation that the Dutch would perceive the emotion more strongly than the Americans was based on previous literature, we can only speculate about a possible explanation as to why we could draw the opposite conclusion. It could be the case that due to the 'soft' cultural climate of the Netherlands, people are less inclined to think negatively of other people. Perhaps another explanation could be that the expression of anger is not frequently used in such a context among colleagues in the Netherlands and was therefore less 'believable' to the Dutch participants. A final explanation could be that Americans could be more alert to angry expressions as the emotion fulfills a more instrumental role in the American culture, which may be why U.S. respondents were more impressed by the emotion and perceived it to be stronger than the Dutch did. Nonetheless, due to the fact that these possible explanations are mere speculations, future research is necessary to further investigate as to why Americans perceived the people in the photos to be significantly angrier than the Dutch did.

4.1.3 *Additional findings*

Based on additional analyses a significant effect of item was found on the perceived strength of the emotion. Results found that Item 1 and 3 were similar, as well as Item 2 and 4. Overall, Item 1 and 3 generated higher ratings on PSE than Item 2 and 4, which can lead to the conclusion that it matters which type of person fulfills the role of the sender (see Figure 3). As Item 1 and 3 were both photos of females, whereas

Item 2 and 4 were photos of males, the findings could point to the notion that females may be perceived as more angry than men. Although the data only allow for speculation, one could imagine that women are less expected to portray assertive emotions such as anger. Assertive emotions are generally more associated with masculinity and power (Fernández et al., 2000). From a historical point of view, women often fulfilled the role of the powerless, rather than the powerful, which could explain why people would view a woman portraying an assertive emotion like anger as unusual. This may have caused respondents to perceive the women in the photos as angrier than the men, due to the notion that respondents may react more extremely to something unexpected.

Also, a significant interaction was found between item and VSP condition. Based on this finding one could argue that it matters which type of person fulfills the role of the sender in a specific vertical spatial positioning context. Based on our data, females are viewed as more angry than men in all VSP contexts. However, when the receiver is placed higher in the vertical space than the sender, other characteristics of these people may come into play as PSE scores among men and women 'switch places' (see Figure 4). In other words, for instance the female who was rated most angry in the *lower* and *eye level* VSP condition, was rated the least angry female in the *higher* VSP condition and vice versa. When we take a look at Appendix 1 and Figure 4, Item 3 and Item 4 are viewed as the least angry woman and the least angry man in the higher VSP condition. In comparison to the other people in the photos in this condition, person 3 tends to lower the brow and pull the chin downwards more than the other three. This causes her to look up from under the brow more strongly as she does not tilt her chin towards the receiver. It could be that participants thought this expression was less believable, or more acted, in comparison to the other photographed female (Item 1). Based on our additional findings, it appears that personal characteristics, such as gender, play a significant role in how (strongly) emotions are perceived.

4.2 Limitations and suggestions for further research

In the present study there are some limitations with regard to the study and the methodology. First of all, one could argue whether the notion of power can be sufficiently manipulated by means of differences in vertical spatial positioning. As

discussed before, scholars such as Huang, Olson, and Olson (2002), Giessner and Schubert (2007), and Smith and Galinksy (2010) suggest that this method is justified. Our findings, however, may indicate otherwise. Further research would be necessary to formulate a definitive conclusion on the matter. In addition, it could be that the differences in vertical spatial positioning between receiver and sender did not come across clearly enough based on the photos. Using videos rather than photographs could possibly solve this, like Huang, Olson, and Olson (2002) used in their method. One could argue that even a different camera lens, like a wide-angle lens, creates a clearer effect. Also, the 'senders', despite being informed to look as naturally angry as possible, were still actors and therefore the facial expressions were in essence acted. This could have had an effect on the PSE ratings, as respondents may not have found the emotions to be believable.

Next, the majority of respondents (approximately 75%) were female. This does not provide us with a realistic representation of society. In further research more emphasis could be put on equal numbers of males and females, as a difference in numbers may have had an influence on the results. Perhaps females, as they tend to be more nurturing in character, are more impressed when someone is angry and therefore perceive the emotion to be stronger than men would. A final limitation of this study is the fact that participants were not put in a controlled environment. They were instructed to only view each photo once and base their answers on their first impression, but there was no way to make sure they actually adhered to these requests as the survey was distributed via online channels. Respondents may have taken the time to analyze each photo, which may have had an influence on their initial opinion about the photo and therefore their PSE rating.

To further explore the notion that vertical spatial positioning has an effect on the perceived strength of an emotion, future work can study other emotions such as happiness or sadness. As mentioned above, it could also be further examined whether vertical spatial positioning is a reliable means to embody the notion of power in the first place. Other cultures can be studied, to continue research based on our findings regarding the influence of nationality. One could imagine that a study including participants from emotionally reserved cultures (e.g. Japanese respondents) would yield other interesting results. Also, a study similar to this one can be conducted with different material such as videos taken with a different lens, a different sample (e.g. a group of respondents that is more representative of the society as a whole with even

numbers of men and women), and in a controlled environment. Also, our additional findings suggest that there may be a difference between how strongly emotions portrayed by men are perceived and how strongly the emotions portrayed by women are perceived. This may also be an interesting focus in future work. One could even imagine that the age of the sender has an influence on the perceived strength of the emotion. Perhaps receivers are more impressed by emotions portrayed by older people than by those portrayed by younger senders. Thus, rather than focusing on the influence of gender, scholars could also choose to examine whether age has an effect on the perceived strength of an emotion.

4.3 Conclusion

The fact that there are so many directions to be taken for additional research is exemplary to the relevance of the subject. Little research has been conducted on factors that influence the perceived strength of emotions, which leaves much room for further investigation. Scholars have researched vertical spatial positioning in the context of power as well as the influence of being tall or short on decision-making processes. Even the ways in which emotions are portrayed across cultures have been extensively examined. However, the combination of the two and how the *receiver perceives* the emotion has received little attention in the academic field until now. We are the first to conclude that vertical spatial positioning does not have an influence on how strongly an emotion is perceived by the receiver. At the same time, we are also the first to find evidence that cultural variation has an influence on how strongly the emotion of anger is perceived. An advice could be provided relating to the situation posed in the introduction: what if your co-worker has a different cultural background than yourself and what if you are angry with them for the lacking work they delivered? One should always keep in mind that nationality matters and an angry emotional expression may come across stronger than you intended to. Thus, it is advisable to adjust the intensity of the expressed emotion to a level that is in accordance with the cultural norms of the person on the other side of the table. These findings contribute to non-verbal communication research, due to the fact that they provide new information on the relationships between vertical spatial positioning, nationality, and the perceived strength of the emotion of anger. Studies like this one have the unique advantage of opening our eyes to new insights regarding non-verbal

communication. A new perspective on common situations is what resulted in this work and what now paves the way for further research.

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Appendices

Appendix 1: Material

[Appendix available upon request]

Appendix 2: Example of main experiment (American, *lower* VSP condition)

[Appendix available upon request]