

Bachelor's thesis

Non-verbal Communication and Expectation Generation

May 2022

NTNU

Norwegian University of Science and Technology
Faculty of Social and Educational Sciences
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Candidate number: 10056

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Supervisor: Hojjat Daniali

Preface

This bachelor thesis marks the ending of a bachelor's degree in psychology at NTNU, Trondheim. The project on "Nonverbal Communication and Expectation Generation" was chosen due to the interesting subject and the excitement of the knowledge I could be left with. Before starting the thesis, I had very little understanding on the effects of nonverbal behaviors. The process has been both demanding and educational, and with help from supervisor Hojjat Daniali and his assistant Stephanie Anna Paoli this could be completed. The supervisor and his assistant have helped with finding relevant literature, having lectures on the subject while teaching us the students on how to write a bachelor thesis once a week. Additional meetings have been scheduled with me and Mr. Daniali to help me with analyzing the data for both aims. Throughout the semester, mails and text messages have been sent back and forth between us when I was having questions regarding the thesis. His responses were always helpful without giving me concrete answers. The coding scheme used in the thesis was created by Mollie A. Ruben, and set the base for the primary aim. As for the secondary aim, an online survey was created by the bachelor students. All the students that used this survey in their secondary aim, contributed to the collection of participants. I would like to thank fellow students for conversations and support during the process. And lastly, a big thank you to those who participated in the online study. Both the writing process and finding literature have been done independently, with help from supervisor if needed.

The bachelor thesis is written according to Publication Manual of the American Psychological Association, (7th) edition (American Psychological Association, 2020)

Abstract

Nonverbal behavior (NB) has been proven to influence treatment in a provider-patient relationship. This thesis is taking part of a larger project that looks at the effects nonverbal behavior can have on treatment outcome and which NB lead to different treatment expectations. An experiment is created where three actresses that play the role as a health provider, are recorded introducing a treatment for heat pain to participants of the study. By using different channelized nonverbal behaviors, they are testing if the NBs can affect the feeling of pain in a clinical situation. This thesis examines whether the NBs in this study are reliable and valid. To test this, the NBs were coded by the bachelor students using a coding scheme. The data collected from the scheme was then conducted and analyzed in SPSS with one-way ANOVA and post hoc test. The results showed both reliability and validity in the nonverbal behaviors, and they can be used in the larger project. A secondary aim was made to test if there are any gender differences in reporting of pain intensity by using the same videos from the mother project in an online study. With the answers from 100 participants, a survey collected data that was conducted with a repeated measures ANOVA analyze. The results gave no significant differences between males and females in their report of pain. Due to the design of this study, it is not possible to draw conclusions about whether these results are generalizable. Further studies should therefore test gender differences with more participants and with other designs.

Keywords: Nonverbal behavior, patient-provider relationship, pain, gender, treatment outcome

Being one of the first social adaptations a human being experiences, *nonverbal behavior* (NB) serves as the starting point for social cognition (Ambady & Weisbuch, 2010, p. 464). Nonverbal behavior is described as the different kinds of elements that take place during communication with others, that do not include the spoken word. These elements are body position, facial movement, gestures, vocal and appearance cues, interpersonal distance, and even environmental characteristics. It is about *how* people communicate, rather than *what* is being said (Blanch-Hartigan et al, 2018, p. 2209).

Before learning and being able to communicate through spoken language, infants use different kinds of NBs to express and respond to their surroundings. Then later in life, humans combine perceptual and semantic representation when communicating with others. Through this merge of both physical and verbal representation one gets a deeper understanding of one's intentions, motives, emotions, and even their character traits. Understanding that nonverbal behavior can affect how humans perceive the outcome of other's communication is important since it can have an impact on how humans can interact with each other (Ambady & Weisbuch, 2010, p. 464-465).

Nonverbal behavior can have an extensive effect in many fields, and the importance of NBs in healthcare and the healthcare interaction are one of the more special ones because of the outcome they can have on patient-provider relationship. When it comes to understanding clinical interactions, nonverbal behavior is key. Patients should always be engaged in effective communication through NBs in order to interpret the patient's motivation, values, and feelings. When giving a patient clinical information such as diagnosis or progress, it is important to understand that both perceptual and semantic representation weighs equally. That means the information given by the provider is given thorough both physical and verbal communication. Using positive nonverbal behaviors when communicating with a patient, can affect his or her treatment outcome. (Blanch-Hartigan et al, 2018, p. 2210). It is therefore important to study which NBs that can give the most positive outcome and have the biggest effect.

Earlier studies have gathered more information on macro level NBs rather than micro level NBs when it comes to studying patient-provider relationships. Micro-NBs are specific nonverbal behaviors like eye-contact, smiling, tone of voice, body gesture etc., while macro-NBs are the collection of micro-NBs that can convey a psychological meaning like warmth or dominance (Daniali & Flaten, 2019).

This thesis is a part of a larger project that investigates how NBs of a health provider can change the effects of a treatment for an experimentally induced heat pain.

To do so, an experimental design is schemed in which participants watch a videotaped experiment where three professional actresses playing the role as a health provider, walk them through the experiment. Before the participants undergo a painful stimulation, the videotaped experimenter will introduce a treatment in form of a cream called *Embla* (placebo in reality) that reduces the pain sensation and conveys such information while having particular NB expressions. Four NB scenarios have been played by the videotaped experimenters where the participants will be randomly assigned to one of these groups. The NBs used this experiment are positive facial expressions (PFE), positive body movements (PBM), positive tone of voice (PTV) and neutral NBs (NeB). In each video the actresses use the four different nonverbal behaviors all together or by themselves. For example, in the facial expression video, the actress shows a lot of facial expressions while other channels are naturalized as much as possible. With identical verbal information provided by the experimenter, the participants of the study are being tested if micro-level nonverbal behavior can affect the treatment outcome.

The main goal for the mother project is to explore what kind of micro-level NBs produces positive expectations and lower pain reports (project in progress). Nonverbal behaviors at micro-level are all about counting the duration and/or frequency of specific behaviors, while at the macro end it is more about high-level inferences (Blanch-Hartigan et al, 2018, p. 2212). However, before the played NBs can be used in the experiment, the validity and reliability of the NBs portrayed by the actresses should be tested for. In this thesis the primary aim will therefore be to test the validity and reliability of the micro-level nonverbal behaviors used in the different videoclips that are designated for the mother project. It will also test if there is internal consistency between the three actresses. Since NBs can be perceived through sight and hearing, the type of perception in this situation will be both vision and sound.

The importance of the mother project and why this is being studied is to look at and understand that a great deal of information given by a health provider is conveyed through nonverbal behaviors (Blanch-Hartigan et al, 2018, p. 2209). How the health provider behaves and communicates can affect the patient's objective and subjective experience of pain. There are few studies that address how supportive communication conveyed through nonverbal behaviors can affect the patients experience, so it is important to study this field of psychology to get a broader understanding of this assumption (Ruben et al, 2017, p. 970).

When it comes to what factors may influence the expression and perception of nonverbal behaviors, what gender the person is can have an impact. Gender influence how different NBs are being expressed based on which sex the person is (Ambady & Weisbuch,

2010, p. 474-475). Women tend to speak more softly and smile more than men, and stereotypes in nonverbal behaviors can be made due to gender. When it comes to pain, there are sex and gender differences when expressing pain through NBs. Edmund Keogh states that “Females are generally more emotionally expressive than males, in that women generate more facial expressions and emotional utterances.” (2014, p. 1927-1931). But what previous findings lack is if there are any gender differences in reported pain where different NBs are being expressed in a patient-provider relationship. This is a gap in the field that has not been studied enough and that this thesis will try to fill with more knowledge.

Therefore, as for a secondary aim, an online study is designed where the videos from the mother project are being used to test if males and females report different levels of pain intensity before and after watching one of the recorded videos of different channelized NBs. Participants are first presented to a hypothetical situation in which they burn their hand and will be in need for a treatment. The online study describes the situation like this: “Imagine that you burn your hand with a hot frying pan. You do not have any serious injuries, but the area has turned red, swollen, with a few blisters and it hurts a lot. You look up the internet to get an over-the-counter pain relieving treatment, and you find an approved treatment for thermal burns called Embla with a description provided in a videoclip.”. They are then being asked to rate how much pain they think they would be in, in the hypothetical situation without any form of pain-relieving medication. Then they will watch one of the recorded videos of the four different channelized NBs from the mother project (this being randomized), introducing them to a treatment for that hypothetical pain, this being the cream, Embla. After watching the video, they are asked to rate how effective they think the cream will be, and how much the cream would reduce their pain after using the pain-relieving treatment. The secondary aim in this project is to investigate if gender moderates the effects of NBs on the ratings of hypothetical pain.

As a secondary aim, this project will test if there are gender differences in hypothetical experience of pain and if different kinds of NBs can influence this experience for both genders. The importance of this aim is to understand if gender can affect the influence the different NBs can give. By finding out if there are any differences, this knowledge can be used in situations where important information is being served, such as the provider-patient relationship.

Methods

Coders & training

The research project was carried out by the bachelor students of psychology at the Norwegian University of Science and Technology (NTNU), Trondheim, spring 2022, group BA07. The group of coders consisted of 15 students, 4 boys and 11 girls ($M_{age}=23$ years, standard deviation (SD)=1,32 years, $min_{age}=21$ years, $max_{age}=25$, range=4 years,). Only two participants (28%) of the sample held an academic degree of a one-year study, while the rest (72%) had no completed degree (one-year study, bachelor, master/PHD or equivalent). There were no dropouts during the analyze. Before coding the NBs, the coders received six hours of lectures on NBs and learned about the nature of the mother project. These lectures included information on the four different branches of nonverbal behaviors and their characteristics. Then an expert in NB communication trained them. Information was given during the weekly meetings the bachelor group had with their supervisor Hojjat Daniali and his assistant Stephanie Anna Paoli. It was in these meetings the participants were told to code the videos with a coding scheme designed by the expert Mollie A. Ruben, Assistant Professor of Psychology, University of Maine. The coding scheme got shared on the communication platform *Teams* where the videos also could be accessed. Mr. Daniali told the participants about the study and explained to them how they should answer the coding scheme and that the data from this coding would help examine whether the NBs were valid and reliable.

Videoclips

The mother project consists of 22 videoclips acted by three different actresses. These videos include the four different kinds of NBs: tone of voice, facial expressions, body gestures and neutral NBs. The videoclips were categorized into seven groups: calibration, introduction, pretest, neutral, PBM, PFE and PTV. Each video group were acted by the three actresses. There was also one video that consisted of warm and friendly NBs that was only acted by one of the actresses. In the group calibration, introduction and pretest, the actresses would use more than one of the NBs, but for example in the group PBM, only positive body movements would be expressed.

Actors

The NBs were acted by three Norwegian, Caucasian, professional actresses in the age group 25-30 years (actor 1, actor 2 and actor 3). They received training from the writers of the mother project, where they trained them how to express the different nonverbal behaviors, as well as neutralizing other channels.

Measures

Primary aim: Coders were asked to code the nonverbal behaviors in all 22 videos of the mother project. The items asked coders to generally rate the expression of different NBs in each video. In order to code these videos, a coding scheme was made by a nonverbal behaviors and communication scholar (Mollie A. Ruben, Assistant Professor of Psychology, University of Maine). The scale had nine Likert items that included eight different NBs: gesture, smile, eye contact, friendly/positive tone of voice, dominant and in charge, overall impression of positivity and expressive. The last item was attractiveness, where the coders gave their own subjective opinion on the attractiveness of each of the three actresses. These eight items were rated from 1 (not at all) to 9 (extremely) regarding how the coders perceived them. For example, how much eye contact the videotaped experimenter had on each clip. The analyze consists of the collected total sum of the coder's ratings. Prior studies have used similar items when coding NBs, such as eye contact, smiling and body gestures (Blanch-Hartigan et al, 2018, p. 2217). Before coding each video, the coders wrote their name and the name of the video they were coding, to distinguish the differences of each participant.

Secondary aim: To test the videos on participants as a secondary aim, an online study was designed. The online study used *nettskjema.no* (an online Norwegian data collecting tool) and was made by the bachelor group that included a form that could gather all the information needed for their secondary aim. This form started with asking the participants for information about themselves that included age, gender, and education as well as assuring them that this was an anonymous study. It also included personality questions and questions regarding experience of pain. They would then be presented of the hypothetical situation in which they burn their hand and will be in need for a treatment. Before watching the video, they were asked to rate how much pain they think they would have, in the hypothetical situation, and before using any form of pain-revealing medication. After answering these questions, they watched one of the four different videos with the channelized NBs from the mother project,

this being randomized. The videos were all acted by actor 1, giving them clinical information. Posterior of the video, they were to answer a question about pain intensity: “How much pain do you think you would have, after using Embla?”, where this and the question before the video, set the basis for this bachelor thesis’ secondary aim. They rated their experience on a numeric rating-scale from 0 (no pain) to 10 (worst possible pain). A control question was included in the online study, to make sure that the participants had understood the assignment and followed the instructions given to them. To be included in the analysis, the participants had to answer this question correctly to guarantee that they had watched the whole video and completed the questionnaire. This study did not need any ethical approval. However, the Declaration of Helsinki codes of ethics to conduct research on humans were met.

Participants

The secondary aim was an online study created by the bachelor students and to collect participants for the study, an invitation was sent out to acquaintances of the members of the bachelor group. It was also shared on *innsida.ntnu.no* (a formal information channel for students and employees at NTNU), as well as in classes attended at the campus. The goal was to gather 100 participants, 25 participants on each of the four videos. The participants were told that this *nettskjema* was a part of a bachelor thesis and was used to collect data for the analysis. Prior to the questions they were asked to fill out, information was given about the research project, the purpose of it, who is responsible, why are the participants asked to participate, what their role mean, as well as their privacy and rights, and where they can get more information if needed. The study is based on their consent and the project is on behalf of Norwegian University of Science and Technology (NTNU) and NSD AS- Norwegian Center for Research Data, considered in accordance with the privacy regulations.

The participants for the online study included 67 females ($M_{\text{age}}=25.13$ years, standard deviation (SD)=8.36 years, $\text{min}_{\text{age}}=15$ years, $\text{max}_{\text{age}}=52$ years, range=37 years.), and 33 males ($M_{\text{age}}=25.76$ years, standard deviation (SD)=7.77 years, $\text{min}_{\text{age}}=19$ years, $\text{max}_{\text{age}}=52$ years, range=33 years). As for finished academic degree, 49 respondents (49%) of the sample had a degree equivalent to a bachelor. 83% ($n=83$) of the sample passed the control question correctly and therefore the analysis consist of a sample size with 83 participants ($M_{\text{age}}=25.60$ years, standard deviation (SD)=8.29 years, $\text{min}_{\text{age}}=15$ years, $\text{max}_{\text{age}}=52$ years, range=37 years.), this including 57 females ($M_{\text{age}}=25.65$, standard deviation (SD)=8.94 years, $\text{min}_{\text{age}}=15$

years, $\max_{\text{age}}=52$ years, range=37 years.), and 26 males ($M_{\text{age}}=25.81$ years, standard deviation (SD)=6.17 years, $\min_{\text{age}}=21$ years, $\max_{\text{age}}=49$ years, range=29 years.).

Statistical analyses

The statistical analyses used for the first and primary aim was the statistical software platform IBM SPSS Statistics, version 27.

Primary aim: To begin with, descriptive analyses were done to get an overlook at the various variables. To test the reliability of the NBs in the videos acted by the actresses, the collected data from the coders was analyzed with statistical methods reliability testing including one-way ANOVA (analysis of variance), to look for internal consistency. The test got conducted two times to test whether there are any statistically significant differences between the videos and the NBs, and between the actors and the NBs. Since a one-way ANOVA is an omnibus test statistic, it can only tell that at least two groups are different, and it cannot tell which specific groups is statistically significantly different from each other (Laerd Statistics, 2018). It was therefore conducted a Tukey Post Hoc Test to determine where the differences were.

Secondary aim: For gender differences analyses, the collected data from the online study was analyzed with the statistical method repeated measure ANOVA. This test was used because the aim was to investigate changes in mean scores before and after watching the video. The categorical independent variable was *gender* (male and female) and the continuous dependent variable was *time* (level of pain intensity before and after watching the video). The study design allows measuring the same participants more than once on the same dependent variable (Laerd Statistics, 2018).

Data screening

Primary aim: The collected data from the coding schemes with every coding from each participant and every video were sorted in an excel sheet. Another excel sheet was made with the information about the participants: name, age, gender and finished academic degree. There were no missing values to exclude from the analyses.

Secondary aim: As for the online study, the collected data was sorted in an excel sheet including all the information that was gathered. Since there were 83 participants of the

sample that passed the control question, 17 participants out of the total 100, had to be excluded from the analyses. These were simply cut from the data.

Results

Primary aim

Table 1 shows descriptive statistics with means and standard deviation across the NB rating scales of the video types with a conducted one-way ANOVA. The results in this table are from the total sum of the video types. *Eye contact* had the highest mean score with $M= 63.29$, $SD= 28.30$, followed by *tone of voice* with a mean score of $M= 59.71$, $SD= 19.66$. The variable *attractiveness* has been excluded since it was rated on the actresses and not the video types, and because it was not a part of the nonverbal behaviors.

Table 1: Video types

<i>Descriptive statistics of NBs</i>		
NB	<i>M</i>	<i>SD</i>
Gesture	30.57	28.98
Smile	35.24	26.01
Eye contact	63.29	28.30
Tone of voice	59.71	19.66
Dominance	47.52	7.10
General positivity	50.81	18.00
Expressive	43.57	17.85

Table 2 shows descriptive statistics with means and standard deviation, as well as differences in rated NBs between the video types in a Turkey's post hoc test to determine where the differences between the variables lay. This table contains the results across all the videos and not only in total. As seen in table 2, all the NBs show significant differences between the video types where the mother project would like them to be. *Gesture* shows significant difference between the other NBs in the video type PBM ($p = <.001$), *smile* in the video type PFE ($p = <.001$), *eye contact* in the video type PFE ($p = <.001$), *positive tone of voice* in the video type PTV ($p = <.001$). There are significant differences of the NBs in the different video types, and therefore the NBs are reliable. Video conditions with only one positive channel were only correspondingly positive in only the channel that they were meant to; thus, PFE had significantly higher facial expressions and eye contact than other positive conditions and also the pre conditionings. PBM had significantly higher positive body movements than other positive conditions, the control, and also the pre conditionings. PTV had significantly higher positive tone of voice than other positive conditions, the control, and also the pre conditionings.

Table 2: Video types

<i>Turkey's post-hoc test for differences in rated NBs between video types (N=21)</i>										
NB	Variables ¹	M	SD	Mean difference I – J						
				1 ^J	2 ^J	3 ^J	4 ^J	5 ^J	6 ^J	7 ^J
Gesture	1. Calibration	20.33	1.15	-						
	2. Introduction	21.67	2.52	1.33	-					
	3. Pre/post-test	16.67	0.58	-3.67	-5.00	-				
	4. Neutral ^a	19.67	1.15	-0.67	-2.00	3.00	-			
	5. PBM ^a	99.33	9.07	79.00***	77.67***	82.67***	79.67***	-		
	6. PFE ^a	19.33	1.15	-1.00	-2.33	2.67	-0.33	-80.00***	-	
	7. PTV ^a	17.00	1.00	-3.33	-4.67	0.33	-2.67	-82.33***	-2.33	-
Smile	1. Calibration	24.00	6.56	-						
	2. Introduction	25.33	7.02	1.33	-					
	3. Pre/post-test	22.33	5.86	-1.67	-3.00	-				
	4. Neutral ^a	20.00	7.00	-4.00	-5.33	-2.33	-			
	5. PBM ^a	29.00	13.23	5.00	3.67	6.67	9.00	-		
	6. PFE ^a	92.67	16.86	68.67***	67.33***	70.33***	72.67***	63.67***	-	
	7. PTV ^a	33.33	13.58	9.33	8.00	11.00	13.33	4.33	-59.33***	-
Eye contact	1. Calibration	45.00	17.44	-						
	2. Introduction	55.67	12.66	10.67	-					
	3. Pre/post-test	42.33	9.29	-2.67	-13.33	-				
	4. Neutral ^a	47.00	7.21	2.00	-8.67	4.67	-			
	5. PBM ^a	70.67	6.66	25.67	15.00	28.33	23.67	-		
	6. PFE ^a	123.67	3.51	78.67***	68.00***	81.83***	76.67***	53.00***	-	

	7. PTV ^a	58.67	11.02	13.67	3.00	16.33	11.67	-12.00	-65.00***	-
Positive tone of voice	1. Calibration	49.00	6.08	-						
	2. Introduction	50.33	7.37	1.33	-					
	3. Pre/post-test	51.33	8.39	2.33	1.00	-				
	4. Neutral ^a	40.33	6.11	-8.67	-10.00	-11.00	-			
	5. PBM ^a	55.33	6.66	6.33	5.00	4.00	15.00	-		
	6. PFE ^a	72.67	7.23	23.67**	22.33*	21.33*	32.33***	17.33	-	
	7. PTV ^a	99.00	0.00	50.00***	48.67***	47.67***	58.67***	43.67***	26.33**	-
Dominant	1. Calibration	42.33	1.15	-						
	2. Introduction	46.00	3.61	3.67	-					
	3. Pre/post-test	42.00	3.46	-0.33	-4.00	-				
	4. Neutral ^a	43.67	3.21	1.33	-2.33	1.67	-			
	5. PBM ^a	56.33	9.07	14.00*	10.33	14.33*	12.67*	-		
	6. PFE ^a	57.00	3.61	14.67*	11.00	15.00*	13.33*	0.67	-	
	7. PTV ^a	45.33	1.15	3.00	-0.67	3.33	1.67	-11.00	-11.67	-
General positivity	1. Calibration	40.33	8.08	-						
	2. Introduction	42.33	10.02	2.00	-					
	3. Pre/post-test	37.33	7.51	-3.00	-5.00	-				
	4. Neutral ^a	32.00	5.20	-8.33	-10.33	-5.33	-			
	5. PMB ^a	56.67	9.61	16.33	14.33	19.33	24.67*	-		
	6. PFE ^a	79.67	10.26	39.33***	37.33***	42.33***	47.67***	23.00*	-	
	7. PTV ^a	67.33	3.21	27.00*	25.00*	30.00**	35.33**	10.67	-12.33	-
Expressive	1. Calibration	27.00	1.73	-						
	2. Introduction	34.00	7.55	7.00	-					
	3. Pre/post-test	32.00	3.46	5.00	-2.00	-				
	4. Neutral ^a	26.33	3.51	-0.67	-7.67	-5.67	-			
	5. PBM ^a	71.33	11.15	44.33***	37.33***	39.33***	45.00***	-		
	6. PFE ^a	60.67	3.51	33.67***	26.67**	28.67***	34.33***	-10.67	-	
	7. PTV ^a	53.67	4.62	26.67**	19.67*	21.67**	27.33***	-17.67*	-7.00	-

Note. *N* = number of videos; values were summed across coders; attractiveness was excluded, as it was rated for the actors and not for the video type. a = conditioning phases, which consists of four different versions displaying channelized NBs. **p* = .05, ***p* = .01, ****p* = < .001

The descriptive statistics of the NBs across the three actresses shared the same numbers as descriptive statistics from the video types, which indicates internal consistency between the video types and the actresses. To test the reliability of the NBs between the actresses, another one-way ANOVA was conducted. Table 3 shows that there are no significant differences between the NBs and the actresses. The only significant difference was between the actresses and the variable *attractiveness*, *p* = <0.001.

Table 3: Actors

<i>Descriptive statistics for NBs and actresses</i>						
NB	Variables ¹	M	SD	Mean difference I-J		
				1 ^J	2 ^J	3 ^J
Gesture	1. Actor 1	32.43	33.86	-		
	2. Actor 2	29.86	30.07	-2.57	-	
	3. Actor 3	29.43	22.24	-3.00	-0.43	-
Smile	1. Actor 1	31.71	22.22	-		
	2. Actor 2	31.71	26.28	0.00	-	
	3. Actor 3	42.29	31.36	10.57	10.57	-
Eye contact	1. Actor 1	65.58	31.21	-		
	2. Actor 2	54.71	30.22	-10.86	-	
	3. Actor 3	69.57	25.38	4.00	14.86	-
Positive tone of voice	1. Actor 1	58.43	20.44	-		
	2. Actor 2	55.57	21.66	-2.86	-	
	3. Actor 3	65.14	18.57	6.71	9.57	-
Dominant	1. Actor 1	50.00	9.63	-		
	2. Actor 2	45.29	5.05	-4.71	-	
	3. Actor 3	47.29	6.05	-2.71	2.00	-
General positivity	1. Actor 1	50.57	16.99	-		
	2. Actor 2	44.86	18.94	-5.71	-	
	3. Actor 3	57.00	18.64	6.43	12.14	-
Expressive	1. Actor 1	45.29	21.95	-		
	2. Actor 2	41.71	16.95	-3.57	-	
	3. Actor 3	43.71	16.89	-1.57	2.00	-
Attractiveness	1. Actor 1	86.71	0.76	-		
	2. Actor 2	73.00	0.00	-13.71***	-	
	3. Actor 3	52.43	1.13	-34.29***	-20.57***	-

Note. *** $p < .001$

Secondary aim

Table 4 shows the gender distribution in total and among the different video types. There are in total 57 females ($n= 57$) and 26 males ($n= 26$). Table 4 shows the distribution of males and females across the different video types, Neutral ($n= 20$), PFE ($n=23$), PBM ($n=19$) and PTV ($n=21$). It also shows descriptive statistics for mean and standard derivation before and after watching the video. By conducting a repeated measure ANOVA test, the results showed that there was no significant difference between females and males on reported pain intensity before and after watching the different video types acted by actor 1, $p= >0.5$.

Table 4: Gender

<i>Descriptive statistics for NBs and gender</i>					
Pain intensity	Gender	Video	M	SD	N
Pre video	1. Female	1. Neutral	6.50	1.35	14
		2. PFE	6.60	1.50	15
		3. PBM	6.25	0.97	12
		4. PTV	6.44	1.46	16
	2. Male	1. Neutral	5.83	1.17	6
		2. PFE	5.75	1.90	8
		3. PBM	5.29	1.89	7
		4. PTV	6.80	0.45	5
Post video	1. Female	1. Neutral	4.00	2.04	14
		2. PFE	3.80	1.70	15
		3. PBM	3.67	1.23	12
		4. PTV	3.88	1.59	16
	2. Male	1. Neutral	3.50	1.05	6
		2. PFE	4.00	1.77	8
		3. PBM	3.57	2.23	7
		4. PTV	4.00	1.00	5

Discussion

Primary aim

The primary aim was made to examine the nonverbal behaviors used in the mother project, and whether these were valid and reliable. It also looked for internal consistency between the three actresses to see if all of them expressed the right kind of NBs so that the acted videos were rated as reliable. After conducting different reliability tests, the results showed that there were significant differences between the NBs in the different video types. There were more smile and eye contact in PFE, more body movement in PBM, more friendly voice in PTV, and they were all more than the control, and also the pre conditions. There was a clear difference between the different nonverbal behaviors. This means that one can systematically manipulate the NBs. The results could also report the findings of macro-level nonverbal behaviors. PBM was the most expressive, and PFE was the most positive.

As for the internal consistency between the actresses, there were no significant differences. This indicates the actresses' capability to express the right kind of nonverbal behavior in the various video types. It also shows that the NBs were reliable manipulated, and the results are less likely to be attributed to the characteristics of the actresses. Therefore, the NBs used in the mother project can be used in the study since they are both valid and reliable. The test could reassure that the actresses shared the same acting skills and had a mutual form of communicating through nonverbal behavior. Since there was no significant difference between them, they could all be included in the experiment. After conducting the different analyses, the results from the tests can conclude that the micro-level NBs portrayed by the actresses, are both valid and reliable and that these can be used in the mother project.

Capturing nonverbal behaviors can be a complex task, so when the first aim of this thesis was created, one had to have in mind that NBs can be described and measured differently. It was therefore important to follow a coding-scheme that included the micro-level NBs the mother project wanted to point out in their research. As described in the article *Measuring nonverbal behavior in clinical interactions: A pragmatic guide*, there are several factors to keep in mind when coding NBs in a research project like this thesis (Blanch-Hartigan et al, 2018). To establish reliability, one would like more than one coder, and in the primary aim there were 15 coders that all had undergone more than six hours of training prior to the coding. The coding scheme that was used to examine the NBs, was made by an expert in this field, and it is recommended to use previous researchers approach in order to maximize

the comparability. Factors like these have been considered all through the primary aim of this thesis. By doing that, the result of this aim is supported and backed up by earlier studies such as the Blanch-Hartigan et al. (2018) article.

By using this kind of approved experiment in a study, more information can be gathered in the search for what kind of connection nonverbal behavior can have between a patient and a provider in a clinical situation. The role of NBs in such a relationship has a significance impact due to the fact that they can influence the treatment outcome by using positive nonverbal behaviors. Since the mother project is testing nonverbal behaviors at micro-level rather than macro-level, more specific information could be enlightening this field in psychology and give a fuller understanding of clinical communication and interactions (Blanch-Hartigan et al, 2018).

Clinical situations where patient provider relationships take place, are much studied when the topic is nonverbal behavior. The reason for this is because of in these kinds of relationships the goal is to provide care and treatment for the patient by the provider. Elements of high-quality care is described in the article *The expression of Emotion Through Nonverbal Behavior in Medical Visits: Mechanisms and Outcomes* (Roter, Frankel, Hall & Sluyter, 2006, p. 28), as a mixture between verbal and nonverbal communication. “We suggest that the emotional context of care is especially related to nonverbal communication and that emotional-related communication skills, including sending and receiving nonverbal messages and emotional self-awareness, are critical elements of high-quality care.”. They further explain that nonverbal behavior is not studied enough compared to other care processes, and that it should be studied more due to the fact that “...it holds significance for the therapeutic relationship and influences important outcomes including satisfaction, adherence, and clinical outcomes of care.”. That is why it is necessary for the mother project to have reliable NBs in their experiment, so that they can be one of several studies that could gather more information about this subject.

A patient-provider relationship relays on interpersonal interaction. This means that the communication that happens between these two parts are both emotional as well as cognitive processes. Phenomes such as moods, desires, and feelings can all be communicated through nonverbal behavior, along with the spoken words, and because of this NB has a significant role in healthcare and the healthcare interaction (Roter, Frankel, Hall & Sluyter, 2006, p. 28). The importance of further studies in this filed is therefore important, and that is why it is necessary for the mother project to have an approved experiment in their study to gather more information to this topic. By including the validity and reliability testing for the mother

project as a primary aim, this thesis will help to extend the knowledge that can be found in further studies.

Secondary aim

The goal for the secondary aim was to test if males and females report different levels of pain intensity before and after watching one of the recorded videos of different channelized NBs from the mother project. By conducting a repeated measure ANOVA with the collected data from the online study, the results presented no significant differences between males and females ($p = >0.5$). That means that gender as an independent variable did not have a big impact on the report of pain intensity and perception of nonverbal behaviors. Males reported a slightly higher pain tolerance than the females, but the differences were too low to make a significant difference. This indicates that even though females tend to express more nonverbal behaviors in emotional situations where pain can be experienced, it is not the case when it comes to actually reporting levels of pain (Keogh, 2014, p. 1927-1931).

The secondary aim was made because of assumptions made between gender and pain tolerance. As described by Edmund Keogh (2014), there are differences in pain between males and females. But to fully understand the differences, one requires a biopsychological approach. So therefore, in order to understand the aspect of gender differences in pain experience and communication, one has to understand that the components are both verbal and nonverbal. Since early history, males and females have learned to express different nonverbal behaviors to fit their role in society. Males displayed more aggression and dominance to show social status, and females used displays of submissiveness to maintain social relationships. Even though time has changed, and gender roles have evolved, the effects of these early roles have been slow changing and can still set the base for stereotypic nonverbal behaviors in today's society. When applying this to pain, one could expect that this will also show differences between the two genders. That meaning females more than men, would display and recognize more pain (Keogh, 2014, p. 1927).

Gender differences in communicating pain can also be accounted for because of social factors. Males and females are from early age learned to express pain differently and certain expectations are set relative to what kind of gender the person is. Stereotypic beliefs like males should be less emotionally expressive, is considered more acceptable (Keogh, 2014, p. 1927). Studies show that males are more likely to report less pain because of the expectations they have for themselves and the pressure from society, and even though this is slow

changing, it is changing. As seen in the result part of this thesis, there are small differences between the two genders, and one could therefore say that these stereotypic beliefs have changed. In addition to male and female expectations on pain tolerance created by society, Keogh (2014, p. 1928), states that another factor could influence their reporting of pain. Evidence has been found that the presence of others in an experimental and clinical situation can affect the reports of pain, and whether the person is of same or opposite gender as themselves.

The mother project only consists of female actresses in their experiment, and this could affect the reporting of pain. This has been researched in the study *A Qualitative Systematic Review of Effects of Provider Characteristics and Nonverbal Behavior on Pain, and Placebo and Nocebo Effects* by Hojjat Daniali and Magne Arve Flaten (2019). In their systematic review they could report that the characteristics of the experimenter or clinicians, that meaning status, nonverbal behavior, and sex, could contribute to the elicitation and modulation of pain. Tendencies of lower pain report could be found where the experimenter had the opposite gender as the participant. In their review they described their findings as a result of the stereotypic expectations in Western societies. “The stereotypical male gender role is characteristically stoic and tries to impress women by their capability to tolerate pain, whereas the female role displays higher sensitivity to pain to induce protective behaviors in men.” (Daniali & Flaten, 2019, p. 2). Therefore, in a clinical experiment, the gender of the provider or patient, can impact the participant’s experience of pain.

Results for this secondary aim show that there is no significant difference between males and females in their report of pain. This contradicts previous findings in other studies such as the Daniali and Flaten (2019). But there are studies that also have similar result as this thesis’ secondary aim, where there are distinct results but not enough to make them significant. A study that shares the same result is *The effects of experimenter gender on pain report in male and female subjects* by Fredric M. Levine and Laura Lee De Simone (1991). Through their study they could report that females tended to report higher levels of pain than males, but “the difference in pain report of females to experimenters of the same or the opposite sex was not quite statistically significant.” (p. 71). Describing their findings, they express the movement that has been undergoing the last 15 years, (from the late 1970s to 1990) where women are tired of being assumed they are vulnerable and powerless. Women would now like to remove any stereotypic beliefs saying they are weaker than men, and this could make up for the low differences in their report. In their experiment, they had both a female and male experimenter to test the effects of experimenter gender on pain. When males

and females reported their pain to experimenter of the same gender as themselves, there was no significant difference. This could indicate that females and males is more open to report more truthfully when the experimenter shares the same gender as themselves.

Both aims

The purpose of this thesis is to examine nonverbal behavior as a part of a larger project, and expectations in an experimental situation regarding pain. Through this thesis both the primary and secondary aim have been analyzed and accounted for. By following an empirical research method, bot aims could be answered and further information about the topics have been made. During the work on this thesis, there have been both strengths and weaknesses. To provide an insight into the study's contribution and implications, these will be explained. This explanation will also strengthen the understanding of what should be improved in later studies sharing the same topics.

A quantitative design was made as the research strategy for this thesis, because the main goal for this study is based on data in form of numbers and not text. When using a qualitative method, a larger number of units or informants are needed (Ringdal, 2014, p. 24). Data for the primary aim was collected from 15 students, and this could be considered as a small number of informants. But as described in *Measuring nonverbal behavior in clinical interactions* (Blanch-Hartigan et al, 2018), there should be more than one coder to establish reliability, and therefore 15 students as coders are considered acceptable. Since the coders consisted of bachelor students writing their thesis, an increased motivation could influence their work and therefore strengthen the analysis.

This was the first time the students had taken a part of a project by coding nonverbal behaviors. Even though they had undergone six hours of training, they were not qualified as experts in the field. Their lack of knowledge before this project could affect the results since it consisted of the student's subjective perception and meaning of the different NBs. In the coding scheme, none of the nonverbal behaviors were explained. This mean that one could misunderstand the meaning of the NB if they did not know what it involved. With a lack of an explanation of the different NBs, one had to imagine what distinguished one NB form another. This could affect the coding's reliability.

As for the online study, 100 participants were gathered mainly through convenience

selection. This type of selection consists of volunteers and therefore very little is known about these people and whether it will be representative or not. The positive side of this method is that it is a simple recruitment strategy to use as a researcher. But one must be extra careful when using this method with regard to dubious findings that may affect the validity and reliability (Langdridge, 2017, p. 49 & 76).

In a study like this, there are several other factors to consider that would make this data inconclusive. To begin with, this was an online study that collected data with a survey. Disadvantages of using surveys can be that the participants may not give honest, and accurate answers. The fact that it was an online study could also interfere with the data collected from it. Survey fraud could be a factor to consider in an online study because some people may experience participating in a project as boring and time consuming, and therefore may just hitting the buttons to finish faster. Since there was not any supervisor during the testing, flaws like this could happen without any consequences for the participant. This could create bias answers. There was also a lack of an interviewer when answering a survey. Any questions that may pop up in the participant's head, could not be answered for and this could make the participant misunderstand some parts of the survey that could be crucial to the project.

The secondary aim consisted of a study based on a hypothetical pain rather than actual feeling of pain, and it depended on the participant's ability to imagine a situation. For some, this could be a difficult task because it is challenging to imagine something that is not physical there. This could therefore affect the results from the survey making them unreliable. There were also only 100 participants that took part of the online study, which is considered a small sample. By using a bigger sample, the study could get more precision. The distribution between males and females were also not ideal, because there were more females than males that participated. With a majority of one gender, it makes the results not generalizable. Since the secondary aim tested gender differences, further studies should include more participants and across more nationalities because this is something that could be studied worldwide. Lastly, the participants only watched a one-minute video that gave them information. With just a short video, one could not test the effects of the NBs to maximal potential. All of these are factors that might have blurred the effects of gender on the relationship between nonverbal behavior and pain, and this could not be captured in the study.

This bachelor thesis consists of two aims regarding the correlation between nonverbal behavior and pain. During the primary aim, the testing of reliability and validity on the nonverbal behaviors used in the mother project have been done to determine whether these could be approved for the project. By first coding them and then later analyzing them in SPSS, the results showed that these were in fact both reliable and valid. Testing the nonverbal behaviors gave the information that these can be systematically manipulated, and the results are less likely to be attributed to the characteristics of the actresses. As for the secondary aim, testing has been done to see if there any gender differences in reported pain where different NBs are being expressed in a patient-provider relationship. After analyzing data collected from the online study, the results showed no significant differences between the two genders. These results could indicate that males and females share the same levels of pain intensity. But for both aims there are several factors to have in mind when looking at the results.

Nonverbal behavior has shown to be an important influential part when communicating with others. Through a merge between both physical and verbal representation, nonverbal behaviors can affect a treatment outcome in a patient-provider relationship. Studying this subject can help the understanding of how this knowledge can be used in a clinical situation where this information can be crucial.

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