Bachelor's thesis

NTNU
Norwegian University of Science and Technology
Faculty of Social and Educational Sciences
Department of Psychology

Candidate number: 10009

Attempt to Validate Acted Micro-Level Nonverbal Behaviors and the Potential Effects on Trust

Bachelor's thesis in Psychology, PSY2900
Supervisor: Hojjat Daniali
May 2022

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Preface

This study was conducted in association with a mother project regarding nonverbal behaviors. Our supervisor, Hojjat Daniali, contributed to the primary aim of this study and shared the videos needed to complete the project. In addition, he helped us throughout the course with both feedback on our initial ideas and through written assignments concerning the different sections of the thesis. I did my own literature search, but our supervisor gave us some starting literature in the beginning of the course. We also received feedback concerning our discussion from Stephanie Anne Paoli, and we received training in how to code nonverbal behaviors by Dr. Ruben Mollie. All the students did their own coding of the videos and run their own analyses. In addition to the primary aim, we were given the task of making our own secondary aim. Me and two fellow students gathered and came up with the idea for the secondary aim. We then made an online survey and collected the data material. At last, we transformed the material into an SPSS file and ran our individual analysis. This thesis was written in line with the APA 7th format (American Psychological Association, 2020)

Abstract

The mother project of this study has tried to systematically manipulate micro-level nonverbal behaviors (NBs) by creating different videos that are going to be used to assess the potential effects on pain. The primary aim of this study was to establish validity to the acted NBs by testing the possible similarities and differences between the actors and between the videos. We hypothesized that there would be differences between the conditioning videos containing an enhanced nonverbal channel (facial expression, tone of voice, and body movements) and between these videos and the preconditioning videos that should contain neutral NBs. Fifteen coders filled out a rating form based on their general impressions of each video. The analysis showed that the assumed differences between the videos were present and the actors were similar in terms of their NBs, but not in terms of attractiveness. In addition, a secondary aim was added to investigate the potential effects the enhancement of one nonverbal channel might have on perceived trust. 50 participants filled out an online survey containing an "Individualized trust scale". The analysis showed that the condition "positive facial expression" was perceived as the most trustful and was significantly different from the condition "positive tone of voice". In sum, this study validates the possibility of systematically manipulating micro-level NBs. The results might implicate the training of healthcare providers in terms of enhancing important NBs to ensure positive outcomes.

Attempt to Validate Acted Micro-Level Nonverbal Behaviors and the Potential Effects on Trust

The ability to both understand and use nonverbal behaviors is a crucial part of social interaction and communication. The nonverbal behaviors make it possible to communicate one's own emotions, characteristics, and intentions but also create a fundamental basis for making inferences about others (Ambady & Weisbuch, 2010). One can define nonverbal behavior in terms of behavior, not including a linguistic component that is perceptible and doesn't manipulate the physical state of the world (Ambady & Weisbuch, 2010). Nonverbal behavior can be measured on both macro-level and micro-level aspects. The macro-level consists mostly of inferences made about the psychological state that produces the observed behavior (e.g., dominance, friendly, anger). The micro-level nonverbal behavior includes different channels such as facial expression (e.g., smile, eye contact), tone of voice (e.g., speech rate, pitch, pauses), and body movement (e.g., leaning forward, body postures) (Blanch-Hartigan et al., 2018).

Nonverbal behavior has different implications due to its importance in social interactions, this also applies to the interaction between physicians and patients. Some of the literature in this field of research revolves around pain in different aspects. For instance, when different micro-level channels are used as cues to convey positive or negative nonverbal behaviors there were effects on both reported pain and placebo. In this study, the positive micro-level cues were for example using body movement to lean forward, increased eye contact, smiling and more body gestures, whereas the negative NBs were opposite cues (e.g., no smiling and no eye contact). When the participants were exposed to providers using positive NBs it contributed to higher placebo effects and lower reported pain. In contrast, when the participants were introduced to negative NBs the reported pain was higher (Daniali & Flaten, 2019). Similar effects were found when a physician used nonverbal behaviors such as leaning forward, nodding, smiling, making eye contact, and using a warm tone of voice. This set of behaviors was branded as high nonverbal support in this study. Whereas the low nonverbal support included behaviors such as looking down frequently, folded arms, a cold tone of voice, and distancing themselves (Ruben et al., 2017). The findings indicated that the participants interacting with a physician with high nonverbal support reduced the amount of pain expression and increased the pain tolerance when compared to the participants interacting with a physician with low nonverbal support. The results also indicated that the interaction with a physician with high support increased the participants' satisfaction and had

lasting effects on the memory of pain (Ruben et al., 2017). Some findings also indicate that when interacting with a nonverbally supportive physician the participants displayed more valid and accurate expressions of their pain, which in turn affected how well a judge managed to accurately assess the participant's pain (Ruben & Hall, 2016).

There are several findings indicating that when patients are interacting with a physician engaging in positive or supportive nonverbal behaviors there are effects on reported satisfaction (Griffith et al., 2003; Mast, 2007). In the study conducted by Griffith (2003) the satisfaction reported was regarding the quality of an interview (e.g., communication skills, the information provided and collected). Concerning the patients' satisfaction, gender might be a mediating effect in terms of creating different expectations towards the physicians' nonverbal behaviors (Mast et al., 2008). Results of the study by Mast et al., (2008) showed that patients were more satisfied when a female physician behaved in line with a female gender role (e.g., softer voice, forward-leaning, and more gazing). The effects of gender in relation to pain experiments show a more nuanced picture. There is no reliable tendency in the effects of the experimenters' gender on participants' pain. Although there exists some evidence supporting a possible interactive effect when an experimenter interacts with a participant of the opposite gender (Daniali & Flaten, 2019).

Some of the gaps remaining in the field are concerning the separate and independent effects that different nonverbal behaviors might have on symptoms. To address this, the mother project of this study tries to test the potential effects of positive micro-level NBs on pain. To do so, the participants are randomized into four different conditions and watch different videos. The videos include three preconditioning phases (introduction, calibration, and pretest) with diminished nonverbal behaviors and four conditioning videos. Three of the conditioning videos contain positive nonverbal behaviors, while one video serves as a control condition and therefore contains neutral NB. The three videos containing positive NBs are related to the different nonverbal channels, facial expressions, tone of voice, and body movements. The project claims that the actors in the videos enhance some specific micro-level nonverbal behaviors related to the conditioning videos while keeping the other channels as neutral as possible. Thus, the video labeled as positive facial expression should have more micro-level nonverbal behaviors such as smiling and enhanced eye contact compared to the other videos. The main aim of this project was therefore to test if these claims are valid, in other words, an attempt to validate the acted nonverbal behaviors. This will be done by testing the potential differences and similarities between the videos and actors in relation to the

nonverbal behaviors. We assume that there will be differences between the conditioning phases, positive body movement (PBM), positive facial expression (PFE), positive tone of voice (PTV), and neutral, and between the conditioning phases and the neutral preconditioning videos (introduction, calibration, and pretest). In terms of similarities, there should be inter-coder reliability which would mean that each coder has interpreted the videos similarly. There should also be similarities between the actors to ensure the training they received was sufficient, and lastly, there should be similarities between the neutral preconditioning videos. We hypothesize that these similarities and differences are present in the videos, therefore confirming their validity. This is an important part of the research because it helps establish trust in the acted videos so that they can be used in further research.

As mentioned earlier, the conditioning videos from the main aim have been intentionally manipulated in a way that one NB channel is enhanced while the other NB channels are diminished simultaneously. This might have caused a level of incongruence between the NB channels. Incongruent communication can be defined as a relationship of contradiction and discrepancy between verbal and nonverbal messages (Grebelsky-Lichtman, 2014). Since the verbal information remains the same throughout the experiment, one might define the incongruency in this study as a contradiction and discrepancy between the different nonverbal channels. To address this incongruency, the secondary aim of this project will investigate whether the incongruent videos opposed to a congruent video affect the participants' trust in the acted healthcare provider. Trust is a macro-level inference that is made highly efficiently (Ma et al., 2015), and it is an important element in the physician-patient interaction. Some findings support that participants make inferences on a macro-level based on micro-level nonverbal behaviors, such as a physician engaging in supporting nonverbal behaviors (e.g., leaning forward, nodding, smiling, making eye contact, and using a warm voice tone) were perceived as warmer, less dominant and more sharing (Mast, 2007). We hypothesize that the same applies to trust and that the incongruency between the nonverbal channels will therefore affect this inference. To test this, the participants are randomized to four different groups and will watch a video from the mother project. In addition to the three incongruent videos (PTV, PFE, and PBM), there was a “warm and friendly” video where the actor keeps all the nonverbal channels positive. Since all the nonverbal channels are positive one can argue that this video was congruent, and we hypothesize that this condition will gain higher levels of trust than the incongruent conditions. The findings might give an insight into what micro-level nonverbal behaviors are related to

the inferences about trust and if incongruency is an important factor when evaluating a healthcare provider. In addition, it might give an insight into how congruency can be important for the physician to convey the intended information. Just as the mismatch between nonverbal and verbal cues seems to create an impression of irony (Jacob et al., 2016). As a consequence, the incongruence might convey non-intended information that affects the participants' trust in the acted healthcare provider. Although this project was experimental, it might have implications for the physician-patient interactions in real life where the patients may be highly emotional and this may impact their decoding skills concerning the physicians' NBs (Ruben & Hall, 2016). In sum, the findings from this project might have implications for future research in this field, both in terms of the possible limitations to enhancing and diminishing specific NB channels and in terms of shedding a light on the importance of context.

Primary aim

Methods

Coders

The coders were all students from the Norwegian University of Science and Technology (N = 15). The age ranged from 21 to 25, M = 22.80, SD = 1.28. Of the fifteen coders, there were 11 females (73%) and 4 males (27%). All the coders attended several lectures about nonverbal behaviors which were conducted by our supervisor, Hojjat Daniali. In addition, the coders received training in how to code nonverbal behaviors by Dr. Ruben Mollie, Assistant Professor of Psychology at the University of Maine. Dr. Ruben introduced the coders to an online rating form and explained the different items. The coders underwent some practice in coding where some of the videos were played, and then the coders discussed their impressions regarding the different items in the rating form. This time was also used to ask questions regarding the coding so that there was no misunderstanding of the tasks at hand.

Procedure

The different videos were coded through a rating form that was disseminated through Microsoft Teams where the coders could access it. Each coder watched each video and rated them independently. The answers were sent to the supervisor through google forms, who then made an excel-file with all the data material.

Ethics

Due to the nature of this study, there was no need for ethical approval from REK or approval from NSD.

Measures

A nine-point rating scale with eight items was used to code the NB videos. The extremities of the scale ranged from 1 (not at all) to 9 (extremely). The rating system concerned the clearance and detectability of each nonverbal behavior, the exclusivity of each set of NBs, and the descriptiveness of NBs. The scores from this scale reflect the coders' opinion of how much the experimenter did or give off each of the different items. The coding was based on general impressions, which is a valid method to code nonverbal behaviors (Blanch-Hartigan et al., 2018). The items in the rating form were, “smile”, “gesture”, “eye contact”, “friendly/positive tone of voice”, “dominant and in charge”, “overall impression of positivity”, “expressive” and “attractiveness”. The coding was based on the coders' subjective impressions of the videos and it will therefore be difficult to define the items. But there were given some general guidelines by Dr. Ruben to ensure a united understanding of the items. The item “attractiveness” was an exception to these guidelines and was not rated in the joint discussion.

Actors

The mother project of this study has recruited three female professional actors to act as healthcare providers. To increase the credibility of the study the recruited actors partially fit a usual health personnel stereotype. All three actors are therefore Caucasian, wearing white lab coats, light makeup, slim, heights slightly above average, and not looking very young (Mercer et al., 2008). These females were then trained to perform four different sets of micro-level nonverbal scenarios. To be able to enhance the correct nonverbal behaviors the actors got 10 hours of training from an expert in this field. When the training period was over the actors were recorded while performing a trained script. This has been successfully done in prior studies, indicating that videotaped experimenters can convey verbal and nonverbal information to the participants (Ruben et al., 2017).

Videos

There were in sum 22 different videos to be coded, and each video lasts about 2-3 minutes. There were three preconditioning videos (introduction, calibration, and pretest) and four conditioning videos (PFE, PTV, PBM, and neutral). All the videos were acted by three

different actors. Due to our secondary aim, there was also a video named “warm and friendly” which was conducted by one of the three actors.

The four conditioning videos are related to their own channels and are assumed to include different levels of micro-level nonverbal behaviors. The video labeled positive facial expression should therefore include nonverbal behaviors such as frequent smiles and nods, more positive eyebrow movements, and affirmative blinking and the experimenter should look at the participant for more than 5 minutes throughout the video. The video labeled positive tone of voice should convey a warm, energetic, friendly, strong, and expressively loud tone of voice. The video labeled positive body movements should include elaborate and expressive hand movements (affirming, showing and simulating sizes and timelines, numerical listing with fingers, and indexing), and the experimenter should lean forward frequently with less distance to the camera (half a meter). The last video was claimed to be a neutral conditioning video and should therefore include an experimenter with a flat and plain face, standard distance with the camera (one meter), no hand movements, no leaning forward or backward, no body movements, a monotonous tone of voice and no eye contact with the participant.

All the videos are shorter segments (“thin slices”) of the video recordings that the participants in the mother project are supposed to watch. Since the coding relies on smaller segments, the time spent coding was decreased, but this implies that the method is as reliable and valid as coding the full-length video. In terms of coding nonverbal behavior, results have indicated that thin slices could be representative of behavior across a longer length of time, and therefore makes it unnecessary to code a full-length video (Murphy, 2005; Murphy et al., 2019). These results are also present within other thin-slice research, both in terms of increasing the predictive validity between specific behavioral outcomes and personality (Borkenau et al., 2004) and concerning mother-child interactions where coding thin slices (10 minutes) was as valid and reliable as coding full-length videos (40 minutes) (Hirschmann et al., 2018).

Statistical Analysis

The data were analyzed with the software IBM SPSS Statistics 28.0. The first step was examining the descriptive statistics. Then the internal consistency of the items from the rating form was investigated with the alpha mode reliability analysis. In the end, several one-way ANOVA was used to examine the possible differences and similarities between the videos

and between the actors. To further examine the significant interactions between the video types a Bonferroni post hoc test was used. This test was used due to the extent of the comparisons and the possibility of a familywise error rate. In addition, it is known to be conservative by controlling for type 1 errors. To further examine the significant interactions between the actors an LSD post hoc test was used. This test has more power but does not control for type 1 errors (Field, 2018, p. 550). The video "warm and friendly" was excluded from the analysis of variance due to only consisting of one group (only actor number 1). But the video was included in terms of reliability.

Data Screening

No missing values or outliers were detected in the data material. To be able to run an analysis of variance there was computed a new variable with the sums of the rating for each item. According to a Levine's test, $p > .05$, there was an equal variance between the groups, except for "gesture", which does not have equal variance, $p = .012$. The assumption of normal distribution was not met for most of the items, except for the item "positive impression" where the Shapiro-Wilk, $p = .103$, and the Kolmogorov-Smirnov, $p = .200$ tests showed a normal distribution. Even though normal distribution is one of the basic assumptions for ANOVA, the analysis is known for being a robust test in terms of non-normal distributions (Daniali & Flaten, 2022).

Results

Descriptive Statistics

The means and standard deviations for the coded videos are shown in Table I.

Table I

*Descriptive statistics of the coded videos (*N = *21)*

Video type	Gesture *M* (*SD*)	Smile *M* (*SD*)	Eye contact *M* (*SD*)	PTV *M* (*SD*)	Dominance *M* (*SD*)	Positive impression *M* (*SD*)	Expressive *M* (*SD*)
Introduction (*n* = 3)	21.67 (2.52)	25.33 (7.02)	55.67 (12.66)	50.33 (7.37)	46.00 (3.61)	42.33 (10.02)	34.00 (7.55)
Calibration (*n* = 3)	20.33 (1.15)	24.00 (6.56)	45.00 (17.44)	49.00 (6.08)	42.33 (1.15)	40.33 (8.08)	27.00 (1.73)
Pretest (*n* = 3)	16.67 (0.58)	22.33 (5.86)	42.33 (9.29)	51.33 (8.39)	42.00 (3.46)	37.33 (7.51)	32.00 (3.46)
PTV (*n* = 3)	17.00 (1.00)	33.33 (13.58)	58.67 (11.02)	99.00 (0.00)	45.33 (1.15)	67.33 (3.21)	53.67 (4.62)
PFE (*n* = 3)	19.33 (1.15)	92.67 (16.86)	123.67 (3.51)	72.67 (7.23)	57.00 (3.61)	79.67 (10.26)	60.67 (3.51)
PBM (*n* = 3)	99.33 (9.07)	29.00 (13.23)	70.67 (6.66)	55.33 (6.66)	56.33 (9.07)	56.67 (9.61)	71.33 (11.15)
Neutral (*n* = 3)	19.67 (1.15)	20.00 (7.00)	47.00 (7.21)	40.33 (6.11)	43.67 (3.21)	32.00 (5.20)	26.33 (3.51)

Note. *M* = means. *SD* = standard deviation. PTV = positive tone of voice. PFE = positive facial expression.

PBM = positive body movement

Reliability Analysis of Items in the Rating Form

All the items from the rating form had internal consistency, see Table II. This analysis includes all the videos, the video “warm and friendly” was included to ensure reliability so that we could use it in our secondary aim.

Table II

Internal consistency of the items in the rating form

Item	α
Gesture	.99
Smile	.99
Eye contact	.99
Positive tone of voice	.97
Dominance	.83
Positive impression	.98
Expressive	.98
Attractiveness	.97

Analysis of Variance Between the Videos

The main effect of "gesture", $F(6, 14) = 206.09$, $p < .001$, was due to the video condition "PBM" having significantly more gesturing than the other preconditioning videos and the conditioning videos, $\Delta M = 82.67$, $p < .001$. The main effect of "smile", $F(6, 14) = 16.93$, $p < .001$, was due to the video condition "PFE" having significantly more smiling than the other preconditioning videos and the conditioning videos, $\Delta M = 72.67$, $p < .001$. The main effect of "eye contact", $F(6, 14) = 21.60$, $p < .001$ was due to the video condition "PFE" having significantly more eye contact than the other preconditioning videos and the conditioning videos, $\Delta M = 81.33$, $p < .001$. The main effect of "positive tone of voice", $F(6, 14) = 28.16$, $p < .001$, was mainly due to the video condition "PTV" having more positive tone of voice than the other preconditioning videos and the conditioning videos, $\Delta M = 58.67$, $p < .001$, and the video condition "PFE" related to the other preconditioning videos and the conditioning videos, except "PBM" $\Delta M = 32.33$, $p < .001$. The main effect of "dominance", $F(6, 14) = 6.48$, $p = .002$, was due to the video condition "PFE" being more dominant than the "calibration", "pretest" and "neutral", $\Delta M = 15.00$, $p = .018$, and the video condition "PBM" being more dominant than the "calibration" and "pretest", $\Delta M = 14.33$, $p = .026$. The main effect of "positive impressions", $F(6, 14) = 14.22$, $p < .001$, was due to the video conditions "PTV", $\Delta M = 35.33$, $p = .002$, and "PFE", $\Delta M = 47.67$, $p < .001$, being more positive than the "introduction", "calibration", "pretest" and "neutral". The main effect of "expressive", $F(6, 14) = 28.34$, $p < .001$, was due to the video conditions "PFE", $\Delta M = 34.33$, $p < .001$. "PBM",

ΔM = 45.00, $p < .001$, and "PTV", ΔM = 27.33, $p = .001$ being more expressive than the preconditioning videos and the video condition "neutral".

Analyses of Variance Between the Actors

There were no significant differences between the actors in relation to the acted nonverbal behaviors, $p > .05$. There was a significant difference between the actors concerning the item "attractiveness", $F(2, 18) = 3367.39$, $p < .001$. An LSD post hoc test showed that the largest difference between the actors, $\Delta M = 34.29$, $p < .001$, was between actor 1, $M = 86.71$, $SD = 0.76$, and actor 3, $M = 52.43$, $SD = 1.13$. The second largest difference between the actors, $\Delta M = 20.57$, $p < .001$, was between actor 2, $M = 73.00$, $SD = 0.00$, and actor 3. Lastly, there were a significant difference, $\Delta M = 13.71$, $p < .001$, between actor 1, and actor 2.

Discussion

The results showed that the conditions with an enhanced nonverbal channel were different in terms of expressing more nonverbal behaviors than the preconditioning videos and the neutral condition. The preconditioning videos are in turn equally neutral, as they are not different in terms of the items concerning nonverbal behaviors. The results also show that the conditioning videos are different in terms of their respective nonverbal channels. Thus the "PTV" has higher ratings for positive tone of voice, the "PFE" has higher ratings for smiles and eye contact, and lastly, the "PBM" has more gesturing than the other conditions. The secondary analysis showed that the actors were similar in terms of their acted nonverbal behaviors but were perceived differently in terms of attractiveness.

The conditions with one enhanced nonverbal channel all had higher ratings of expressiveness when compared to the preconditioning videos and the neutral condition. This validates the actors' ability to enhance their nonverbal behaviors through specific channels and at the same time diminish their nonverbal behaviors in the videos with neutral NBs. The results also show that the videos containing a singular enhanced nonverbal channel have been coded as more positive than the videos containing neutral NB. This is an important finding because it indicates that one can label the conditioning videos as positive. The results from the analysis also indicate that the actors have been able to enhance specific micro-level nonverbal behaviors. This is shown through items like "smile" and "eye contact" which is micro-level nonverbal behavior related to the channel of facial expressions. The video type "PFE" had significantly higher ratings related to these items, which indicates that the video includes

more smiling and enhanced eye contact in contrast to both the other conditions and the preconditioning videos. Similar findings are found related to the video type “PBM”, where there was significantly more gesturing when compared to the other video types. The results also show that the positive tone of voice has been enhanced in the video type “PTV”, therefore validating it. In sum, the results confirm our hypothesis regarding the assumed differences between the conditions, but also between the conditions and the preconditioning videos. This validates the possibility of systematically manipulating the micro-level NBs. Physician training could benefit from this possibility in terms of enhancing specific NBs that are related to positive outcomes such as more accurate pain expression, higher satisfaction, and higher pain tolerance.

On the other hand, the “PBM” video did not have any significant differences in terms of the item “positive impression”, except when compared to the “neutral” video. This might indicate that this condition has not been interpreted as more positive than the preconditioning videos. This was not in line with our assumptions, which would be that the “PBM” condition should get significantly higher ratings of positive impressions both in relation to the neutral condition, and the preconditioning videos. One could question the reason for this finding, perhaps the difference in the verbal information between the “PBM” video and the preconditioning videos has affected the results. The issue with this finding is that if the “PBM” condition does not convey a positive impression, it should not be labeled as it. Even though this was a finding of interest it is important to highlight that there were no significant differences between the conditions, which means they have been coded as almost equally positive.

Another finding of interest was regarding the item “positive tone of voice”. We assumed this was a micro-level NB only associated with the video type “PTV”, but the results indicate otherwise. The video type “PFE” had several significant differences related to the preconditioning videos and the conditioning videos “neutral” and “PTV”. This indicates that the actors have not successfully diminished their positive tone of voice. This might shed a light on how difficult the task given to the actors might be in terms of enhancing some NBs while diminishing others. Despite this, it is important to highlight that the condition “PTV” still has a significantly higher rating for the positive tone of voice than the condition “PFE”. This indicates that the positive tone of voice has been enhanced in the “PFE” condition but has been enhanced significantly more in the “PTV” condition. Similarly, even though the

positive tone of voice has been enhanced in the “PFE” video, it has not been enhanced significantly more than the “PBM” video.

The reason for this finding can be biological, because moving the mouth region will affect the resonant properties of the vocal tract. So by smiling you decrease the length of the vocal tract and therefore increase the format frequencies (Campanella & Belin, 2007). On the other hand, this finding might be an error caused by bias. The coders might have been biased due to watching positive facial expressions and therefore assumed that the tone of voice was more positive. In further research, one can address this possible bias by coding the conditions separately. In sum, this finding might have implications to further use, specifically if the “PFE” condition is interpreted differently than the other conditions due to more than one positive nonverbal channel. This will be further discussed in the section related to the secondary aim.

Some studies indicate that several nonverbal behaviors produce the interpretation of dominance, for example, more expressive facial behavior, more head movement, and a louder voice (Burgoon et al., 2021). This might help understand the findings in this study, where the videos “PBM” and “PFE” had both the highest ratings of dominance and the most significant differences when compared to the other conditions and the preconditioning videos. An interesting finding was that the “introduction” video had no significant differences in relation to the other video types. One would assume that there would be significant differences when comparing it to the videos with an enhanced nonverbal channel. But it seems that this video type has been interpreted as more dominant than the other neutral videos, therefore creating a non-significant result towards the conditions. On the other hand, there were no significant differences between the “introduction” and the other neutral videos, which is positive. Similarly, the video type “PTV” has not been interpreted as statistically different from the other videos. This can be a possible indication thar this video does not include micro-level NBs that contribute to the inferences about dominance. While the facial expressions and body movements might be a part of this macro-level inference. On the other hand, the actor should have used a strong and expressively loud tone of voice in line with the received training. And as mentioned earlier, a louder voice is a part of the nonverbal behaviors creating the interpretations of dominance. It is therefore an interesting finding that this video was not statistically different from the videos with neutral NBs. At the same time, it is important to highlight the fact that “PTV” was neither statistically different from the other conditions.

The findings concerning the actors in this study are in line with our assumptions. All three actors have been coded similarly in terms of their nonverbal behaviors. There were no significant differences between them, which suggests that the results can be attributed to the performed nonverbal behaviors. One can therefore argue that the actors' training has been both similar and adequate in terms of the aim. This might have implications to further research in this field because one might use similar training or be able to create a standardized training method.

Even though the actors differ in physical appearance, there were no significant differences between the actors' NBs. Actor number one was perceived as the most attractive, whereas actor number three was perceived as the least attractive. The big differences might have implications and should therefore be considered when using these videos in further research. One of the most important effects this might have is the “halo effect”. This is a cognitive bias that affects people's attributions towards persons after just observing one specific negative or positive trait (Lammers et al., 2016). The attributions made are often incorrectly (Goffin et al., 2003), for example, attractive people are perceived as well adjusted, more successful, and more intelligent (Palmer & Peterson, 2021). Although these are important biases to be aware of, one can argue that it does not have implications for the primary aim since the coding of the other items was not significantly different. If the results would have been different in terms of other macro-level inferences like “positive impressions” or “dominance”, one would perhaps see these results in relation to the attractiveness. At the same time, this finding might have implications for the secondary aim and will be further explained in the limitations section.

Secondary aim

Methods

Participants

Sixty-three people responded to the online survey, but due to the exclusion criteria, the number of participants used in the analysis was, $N = 50$. These participants were distributed across four groups, “warm and friendly” ($n = 13$), “positive tone of voice” ($n = 12$), “positive body movements” ($n = 13$), and “positive facial expression” ($n = 12$). The age ranged from 19 to 61 and the mode was 22, $M = 27.48$, $SD = 10.89$. Of the 50 participants, 68% were female ($n = 34$), and 32% were male ($n = 16$). Concerning the education level, the mode was

"Bachelor" (*n* = 23), and it ranged from "Master/Ph.D. or equivalent" (*n* = 12), to "10 years of school" (*n* = 1).

Exclusion Criteria

To be able to participate in this study the individuals had to be over 18 years old and understand English. The survey included a video, so the participants had to be able to play this video with audio. To be able to control if the participants watched the video there was included a question regarding the side effects of the cream introduced in the video. If the participants answered something other than the correct answer ("no known side effects") they would be excluded from the study. Other exclusion criteria were set regarding the estimated time one would use to answer the survey. Since the video was around 3 minutes, participants using less than this to conclude the survey were excluded. Due to the small sample, we also had to exclude the participants answering "other" in the gender question.

Procedure

The participants got access to the online survey through a direct link disseminated through social media. In addition to the link, they received some information regarding the study. The participants were told that the study investigated impressions about healthcare providers in digital interactions. Information about the nonverbal behaviors was not included, due to the possible effects, this might have on the results. Before getting access to the questions, the participants provided informed consent to participate. The information given in this section included the purpose of the study, the content of the video, and what the study involves. In addition, the participants were assured that participating was voluntary and anonymous and that no personal information would be required. After giving their consent the participants answered some demographic questions before watching the conditioning video. Next, the participants answered a control question regarding the possible side effects of the cream introduced in the video. The participants were provided four possible answers where only one answer ("no known side effects") was correct. This was done to ensure that the participants had watched the entire video. Lastly, the participants answered the Individualized Trust Scale (Wheeless & Grotz, 1977) with the directions to indicate their impression of the videotaped healthcare provider.

Sampling

The online survey was established through the online platform “nettskjema”, due to its easy access. The participants were sampled for convenience, and social media, such as Snapchat and Messenger were used to distribute the links. Some of the participants were also asked to share the link with their friends and family to increase the number of participants, but with the directions to not share with NTNU students.

Randomization

The link disseminated to the participants was edited in a way to ensure randomization. This means that when a participant clicks on the link it would automatically assign the participant to one of the four different conditions, randomly.

Ethics

None of the questions in the survey was regarding the participants' health or personal information. Due to this, no ethical approval was needed from REK. Since the study only included anonymous information there was no need to report the project to NSD. But the research was done in line with the declaration of Helsinki (World Medical Association, 2013).

Measures

The online survey contained 21 questions. There were demographic questions concerning the participants' age, gender, and education level. A control question, a question about the participants' understanding of English, and a consent question were also included in the survey. To measure the participants' trust in the healthcare provider, the Individualized trust scale was used (Wheeless & Grotz, 1977).

Individualized trust scale (ITS)

The individualized trust scale consists of 15 semantic differential items and includes a scale ranging from 1 to 7. ITS was designed by Wheeless and Grotz (1977) to measure a receiver’s trust in a target. In this study, the ITS was used to measure the dependent variable, participants' impression of trust in a videotaped healthcare provider. Since the scale is semantic differential, each item includes two opposing characteristics. For example one of the items on the scale is safe (1) and the opposing character is dangerous (7). The participants were asked to mark the scale which would best describe their impression of the healthcare provider perceived in the previous video. ITS has been used in different research, for example, TESL Degree candidates' trust in supervisors (Chamberlin, 2000b), teachers' initial impressions of trust toward a supervisor (Chamberlin, 2000a), and how perceived trust differs

in organizational peer relationships (Myers & Johnson, 2004). The ITS appears both reliable and valid in terms of reported analysis. Wheeless and Grotz (1977) estimated the split-half reliability to be .92. Other studies have also reported similar reliability ratings, .72 (Buller et al., 1991), and .95 (Snavely, 1981). In our study, the alpha coefficient for the scale was, $\alpha = .94$. To avoid different interpretations of the items in the scale a brief definition of the opposing characteristics was provided. For example, "exploitative: using someone unfairly for your advantage; benevolent: kind and helpful". These definitions are based on definitions from the Cambridge dictionary and the Oxford English Dictionary. Even though some extra words were added in terms of definitions, the Individualized Trust Scale was not edited.

Statistical Analysis

First, the descriptive statistics were investigated, and then an alpha mode reliability analysis was used to examine the reliability of the ITS. Next, the assumptions for using an ANOVA (normality, homoscedasticity, and independence) were investigated (see data screening section). For the main analysis, a one-way ANOVA was used to investigate the differences in trust between the four groups. A Gabriel's post hoc test was used to further examine the differences between the groups. This test was chosen because the group sizes were not equal. In addition, there was used a multivariate ANOVA to investigate the possible differences between the four videos used in the survey.

Data Screening

The items from the survey were reversed so that all the items had positive value in the data material before analyzing it. There were no missing values in the data, but several participants were excluded due to the exclusion criteria. One participant was excluded due to using less than three minutes to answer the survey. Two participants were excluded due to answering "other" concerning their gender. And due to the control question, ten participants were excluded. A variable, "trust", was computed based on the means of all the ratings from the ITS. The basic assumption of equal variance (homoscedasticity) was met according to a non-significant Levine's test, $p = .232$. Both the visual interpretation of Q-Q plots, Kolmogorov-Smirnov, $p = .200$ and Shapiro-Wilk, $p = .143$ test of normality showed that there was a normal distribution in the data material. Based on boxplots, no outliers were found. Since the data material was collected from different participants separately, the assumption concerning independence is also met.

Results

Descriptive Statistics

The means, standard deviations, and confidence intervals of the reported trust from the online survey are reported in table III. Means of the coded video "warm and friendly" are reported in table IV.

Table III

*Descriptive statistics from the online survey (*N = *50)*

Conditions	*n*	*M* (*SD*)	95% Cl
Warm and friendly	13	4.24 (1.34)	[3.43, 5.04]
Positive tone of voice	12	3.59 (0.82)	[3.07, 4.11]
Positive body movement	13	3.92 (0.96)	[3.34, 4.50]
Positive facial expressions	12	4.96 (1.05)	[4.30, 5.63]

Note. Cl = confidence interval. *M* = mean. *SD* = standard deviation

Table IV

Means of the items from the rating form

Video type	Gesture	Smile	Eye contact	Positive tone of voice	Dominance	Positive impressions	Expressive
Warm and friendly	112.00	108.00	123.00	108.00	79.00	119.00	87.00

Participants Reported Trust in the Healthcare Provider

There was a significant difference in trust between the conditions, $F(3, 46) = 3.67$, $p = .019$. The main effect was due to the condition "PFE" being rated as more trustworthy than the "PTV" condition, $\Delta M = 1.37$, $p = .016$ There were no significant differences between the conditions.

Discussion

The main analysis showed that the "warm and friendly" condition was not perceived as significantly more trustable than the conditions with one enhanced nonverbal channel. The

results, therefore, do not support our hypothesis that there would be a difference in the perceived trust due to the incongruent versus congruent conditions. Instead, the condition "PFE" was perceived as the most trustable and was significantly different from the "PTV" condition.

The results showed that the "PFE" condition gained the highest ratings of trust from the participants. This finding might indicate that micro-level nonverbal behaviors such as enhanced smiling and eye contact are important parts of making inferences about trust. A study investigating perceived trust in an oncologist showed similar findings where consistent eye contact highly influenced trust, whereas body posture (leaning forward) did not influence trust (Hillen et al., 2015). These are interesting findings that could be further investigated to confirm what nonverbal behaviors that lead to the inferences about trust.

A different explanation for the "PFE" condition being perceived as the most trustful is gained from comparing these results to the findings in the main aim. The coding shows that this video type conveys enhanced eye contact and smiling, but also a positive tone of voice. In sum, this might indicate that the "PFE" condition only lacks positive body movements compared to the "warm and friendly" condition. Perhaps this combination does not convey incongruency towards the participants because one might not expect the healthcare provider to use a lot of body movements in general. On the other hand, there might exist some initial expectations towards healthcare providers that affect the results. The participants experience a smiling healthcare provider but at the same time a "serious" tone of voice and calm body movements as in the "PFE" condition. This combination of micro-level NBs might be in line with the participants' expectations, therefore making them trust the actor more. Perhaps some of these expectations are related to potential gender effects. As mentioned in the introduction, patients were the most satisfied when female physicians behaved in line with female gender roles (Mast et al., 2008). The videos used in this study was conducted by a female, perhaps similar effects exist in term of pain. This study could have benefited from including questions about the participants' expectations of healthcare providers' behaviors to assess their potential biases. At the same time, it is important to have in mind that this study can not make causal inferences about the reason for these findings and further research is needed. Perhaps enhancing one specific nonverbal channel does not produce incongruency, and therefore the results are not in line with our hypothesis.

An interesting part of the results was that the "PTV" condition was interpreted as the least trusting. This can be seen in line with the mentioned relationship between nonverbal and

verbal cues that can create an impression of irony (Jacob et al., 2016). One might argue that the "PTV" condition creates a similar incongruency and was therefore interpreted as less trustful. In contrast to the "PFE" condition where one might have expectations related to someone using a positive tone of voice, and therefore question why the other channels are kept neutral. At the same time, it is important to mention that all the means from the analysis were centered around the middle value of the ITS. Since the scale contains opposing characteristics, the middle value would represent something between trustworthy and untrustworthy. None of the healthcare providers has therefore been perceived as untrustworthy, even though some have been trusted more than others. There were also no other significant differences between any of the other conditions.

Limitations

Primary aim

The method of coding used in the primary aim was based on general impressions which means that the coding was based on subjective impressions. Although this is a valid method as discussed earlier, it might have its limitations. Increasing the level of inferences involves at the same time limiting the specificity. The level of measurement one should choose is related to the aim of the coding. In this case, the coding should result in validating the acted micro-level nonverbal behaviors. One could therefore argue that a more specific coding should have been selected. Instead of coding how much the experimenter did or gave off each of the different items one could use methods such as counting the duration and/or the frequency of the specific NBs. On the other hand, neither the macro measurement nor the micro measurement is better than the other. The only difference is in the information they provide in relation to the aim of the project (Blanch-Hartigan et al., 2018). In addition, the coding was done simultaneously and one can therefore not control for the possible spillover effects this might have had.

All the coders were students from the Norwegian University of Science and Technology, and the age ranged from 21 to 25. The results are therefore difficult to generalize because of the small percentage this group represents. The coders are also Norwegian, which limits the project in terms of cultural differences.

Secondary aim

There are several limitations regarding the secondary aim that should be described. Firstly, there was a small sample and this might create an inflated false discovery rate and low statistical power. In addition, the participants were all Norwegian, and one can therefore not control for cultural differences. The nationality might also affect the pragmatic and literal meaning of the questions in the survey since it was in English. Although we tried to mitigate these effects by providing definitions, the differences might have contributed to misunderstandings or difficulties.

Secondly, there are several problems regarding online surveys that should be described. First of all one can't detect if the respondents have responded honestly or if they have truly understood the questions. In addition, the participants might have lost interest during their due to the ITS scale which includes 15 nearly identical questions. Although we tried to keep the questions at a minimum so that the participants could complete the survey in 5-10 minutes. Lastly, there could be biases in the sampling process since the method used was based on convenience. Due to this, there was a bimodal distribution of the age, where the largest portion of the sample was own-age friends or family. One should therefore be cautious when making generalized claims regarding the present findings.

As mentioned in the discussion there is some possible effect of attractiveness that one should consider. The videos used in the secondary aim are conducted by actor number 1, who also was perceived as the most attractive by the coders. This might have affected the results in the secondary aim because some studies indicate that the facial features for attractiveness might overlap with the facial features for trustworthiness (Ma et al., 2015). Similar findings exist regarding people's tendencies to use more universal attractiveness cues to make judgments about trustworthiness when one is without the opportunity to interact extensively (Xu et al., 2012). Some studies also report that attractive people are assumed to have better personality traits, such as trustworthiness and honesty (Eagly et al., 1991; Langlois et al., 2000).

When deciding on the topic of the secondary aim we wanted to test the effects of incongruency through the ITS. One could argue that this is a narrow scale and that a more general scale could yield different results. We did not include any questions regarding the participants' trust in general, which would have worked as a baseline for our study. Since the video contained a healthcare provider, one does not know if the participants have prior personal experience, which in turn can affect their responses.

Another limitation is concerning the videos themselves. The videos were made in relation to the mother project, and therefore in line with their aim. Since we used the same video, but in a different setting, one might argue that the video does not make sense for the participants. A video addressing the participants more naturally would possibly yield different results. In addition, the videos are only a short segment (around 3 minutes), and one might argue that this was not enough time to induce any feelings. At the same time, studies have indicated that trust is an inference made highly efficiently (Ma et al., 2015). The video type "warm and friendly" was not tested against the other video types in terms of its validity. We presumed that this video was a combination of the three different conditions, and there saw it as sufficient that those videos were validated. This should perhaps have been done, to properly examine the possible differences and similarities between the conditions, which could in turn help explain the results.

Due to the extent of the limitations, and the exploratory nature of the secondary aim, not many implications are made. It does nevertheless serve as an idea that others can develop and improve, and in turn discover interesting results.

Conclusion

The results from the analysis made in this study indicated that the acted micro-level nonverbal behaviors are validated. Due to this one can use these videos in further research to assess the possible independent and separate effects of different nonverbal behaviors. In addition, it confirms the possibility to systematically manipulate micro-level nonverbal behaviors by enhancing and diminishing them specifically. These are important findings that might have implications for the physician-patient interaction where the physicians and healthcare personnel can be trained in enhancing important micro-level NBs to ensure decreased level of pain, more accurate expression of pain, and higher satisfaction and pain tolerance.

The result from the secondary aim sheds a light on the importance of context, although not in the way we first anticipated. The "PFE" condition was interpreted as the most trustful by the participants and was significantly different from the "PTV" condition. This might indicate that the nonverbal channel that conveys positive facial expression is the most important in terms of making inferences about trust. On the other hand, the results might have been affected by the findings in the primary aim regarding both the positive tone of voice and positive facial expressions in the "PFE" condition. This shows how the findings in the

primary aim might have implications to further research and are therefore important to address. It also highlights the potential difficulties related to enhancing specific micro-level nonverbal behaviors.

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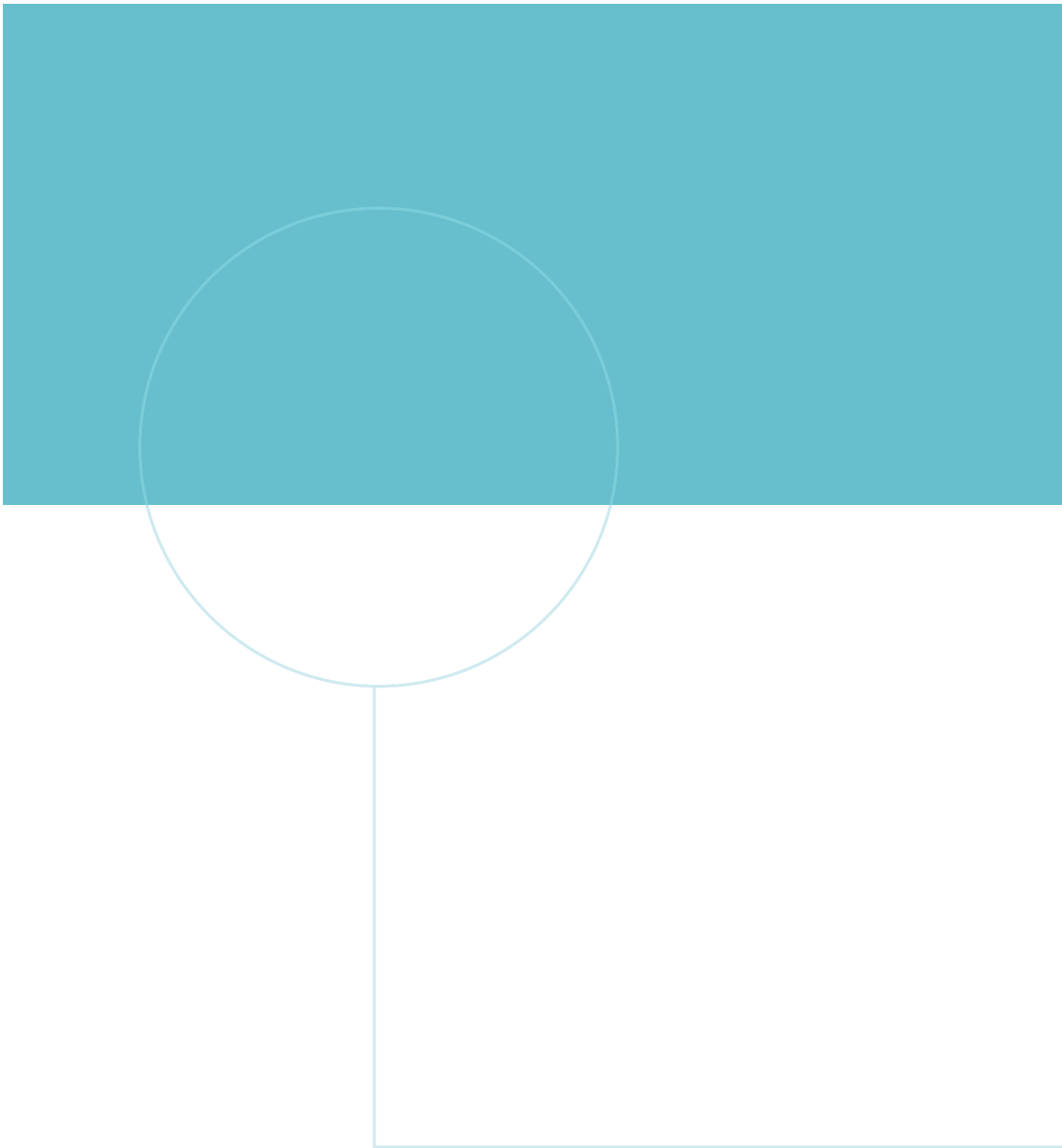

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