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The Validity of Different Channels of Nonverbal Behavior, and Their Effects on Perceived Trust

Bachelor's thesis in Psychology
Supervisor: Hojjat Daniali

May 2022

NTNU
Norwegian University of
Science and Technology

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Kunnskap for en bedre verden

Preface/ Self-Declaration

The bachelor project is a part of a mother project investigating nonverbal behaviors effect on pain. The project consisted of 15 students under the supervision from doctoral fellow Hojjat Daniali. We were separated into smaller groups based on our selected secondary aims.

The primary aim is supervisor Hojjat Daniali's idea, and he presented the relevant videos for coding, as well as the schema used for coding. We received some training from Hojjat Daniali and Dr. Mollie Ruben, and further coded the videos using the given scheme. Furthermore, we were allowed to choose our own statistical analysis and subsequent post hoc tests, though some were recommended from our supervisor. We performed our own analyses and interpreted the results. Some of the literature was on the reading list provided by our supervisor, but largely I found my own literature for the assignment.

For our secondary aim we were a group of three. We created the idea for the secondary aim ourselves and had it approved by our supervisor. Our group created the experimental design of the study but received some feedback and recommendations from our supervisor. We were given the four videos used in this assignment by our supervisor. We created four different questionnaires, related to each separate condition. We collected participants to digitally fill out the questionnaire. Our group performed all the analyses for the collected data, and the interpretations of the results of said analyses. I have found the literature used in the secondary aim of the assignment myself. Our supervisor has helped with feedback on the written assignments for the different parts of the thesis for both aims. The bachelor thesis is written in accordance with the guidelines of American Psychological Association 7th format (American Psychological Association, 2020).

Abstract

Nonverbal behaviors (NBs) are important in communication and have been linked to having alleviating effects on physical pain. A congruence between the different channels of NBs seems to predict the most positive results in social interaction. The aim of this study was twofold, to validate the videotaped NBs, and to investigate a congruency or incongruency's effect on perceived trust in a physician. In the primary aim, coders ($N = 15$) coded how much the videotaped physicians expressed different micro- and macro-level behaviors in the different NB scenarios. In the secondary aim, respondents ($N = 50$) filled out an online survey with 15 questions about perceived trust. Several one-way ANOVAs and post-hoc tests were used to examine the results. In the primary aim there were significant differences between the groups regarding most items, and the NB channels seem to be valid across the different items. There was however an overlap between the groups positive facial expression (PFE) and positive tone of voice (PTV) regarding the ratings of positive tone of voice. There were also some potential problems with positive body movements (PBM) regarding the ratings of positive impressions. For the secondary aim, the incongruent group PFE rated the highest on trust, compared to the expected congruent group "warm and friendly". This could potentially be due to some effects from PBM or PTV. The results from this study could further supplement the field with more knowledge and could impact how physicians should be trained to improve patient-physician relationships and treatment outcome.

The Validity of Different Channels of Nonverbal Behavior, and Their Effects on Perceived Trust

Humans have an innate ability to express and understand nonverbal behavior (NBs) during communication (Nagy, 2008). Nonverbal behavior are actions that convey an individual's attitude and feeling without using verbal communication (Hall et al., 2005). Nonverbal behavior serves several purposes: It can provide information to other people about the person's identity and affective states (Campanella & Belin et al., 2007), pending on if they can detect and understand the signals. It regulates interactions among people, as well as reveals the degree of intimacy between those present (Burgoon & LePoire, 1999). Nonverbal behaviors are not always deliberately conveyed or understood by other people. This ability has been stated to be at the core of social intellect, and it functions as an important part of preserving social bonds and community (Ambady & Weisbuch, 2010, p. 464). The same authors explain that social intellect involves the abilities to infer others', and express our own intentions, motives, emotions, and character traits. Thus, nonverbal behavior has an evolutionary effect that can increase the chances of survival for both the producer and the receiver (App et al., 2011; Muzard et al., 2017). This study is a part of a larger project which will investigate micro-level nonverbal behaviors effect on experimentally induced pain. This study will ascertain that the different NB scenarios used in the mother project are truly different. The primary aim of this study will therefore be to measure the validity and reliability of the videos used in the project. The projects secondary aim will be to examine whether an incongruence (or mismatch between the perceived information) between the different NB channels will affect the participants experience of trust towards the videotaped physician (e.g., mismatch between tone of voice and body movement). This study aims to expand the field of NB behavior, and further the understanding of the importance of NB behaviors in health care settings.

Nonverbal Behaviors (NBs)

NB is divided into positive and negative categories based on if it conveys a positive or negative emotion, attitude, or relationship (Daniali & Flaten, 2019). The same authors also explain how it can be divided into micro level behavior (e.g., specific behaviors: smiling, eye contact, hand movements, body gestures and tone of voice) and macro level behavior, which are a collection of different micro behaviors that express a psychological meaning (e.g., confidence, warmth, or nervousness). Micro level NBs are also conveyed through multiple channels: tone of voice, facial expressions, and body movements (Daniali & Flaten, 2019). Positive nonverbal behavior has been linked to more positive evaluations of the person

conveying them (Guerrero & Miller, 1998). The same authors found that instructors who are viewed as expressive, warm, and involved are more likely to be judged as highly competent. They also found that when instructors are expressive, warm, involved, and articulate, the information they convey is more likely to be judged favorably, especially when they are not overly composed and fluent.

The Role of Nonverbal Behavior in Alleviating Pain

In addition to having communicative purposes, there is empirical support for positive NBs having alleviating power on physical pain (Ruben et al., 2017; Kállai et al., 2004; Howe et al., 2017). Interactions with a therapist who demonstrates positive nonverbal behaviors is predictive of better physical and cognitive functioning for their patients. This could possibly be explained by facial expressiveness communicating empathy and concern for the patient, which in turn promotes patient satisfaction and health improvements (Ambady et al., 2002). Daniali and Flaten (2019) illustrated that positive nonverbal behavior contributes to lower reported pain and higher placebo effects on medical treatment. Whereas negative nonverbal behaviors, which convey negative attitudes, emotions, or relationships, (e.g., no smiling, no eye contact, monotonous tone of voice and leaning backward) contributed to higher reported pain and nocebo effects. Vase et al. (2002) defines the placebo response as the reduction of a symptom caused by factors related to a subject's perception of the therapeutic intervention. The nocebo effect is the opposite of the placebo effect, where administration of an inert substance or procedure accompanied by suggestions of pain worsening will increase the subjects experienced pain (Aslaksen & Lyby, 2015). Positive nonverbal behavior such as smiling, nodding, making eye contact, leaning forward, gesturing, and using a warm tone of voice can help convey social support (Andersen et al., 1979), which has been found to reduce pain experience (Ruben et al., 2017).

Multimodality in Emotional Perception

Previous studies have found that when infants hear emotional information in human voices, they use the corresponding facial expressions to perceive the situation, thus responding more to potentially threatening (e.g., fearful faces) than non-threatening (e.g., happy faces) stimuli (Otte et al., 2015). Previous research (de Gelder and Vroomen, 2000; de Gelder et al., 2002) has found that emotions in faces modulates recognition and judgment in voices through a process that is both conscious and unconscious for adults. These findings could support that multimodal emotional perception is an important part of interpreting social situations, and possibly an innate ability in humans. This can furthermore suggest that a

congruency between the different NB-channels (e.g., tone of voice, facial expressions, and body movements) is important, since we interpret information expressed through all the channels. Congruency can include conveying a positive impression in all channels, rather than conveying positivity only through one channel, while the others are more neutral. There are not many studies that examine incongruency within NBs, but a study by Gorawara-Bhat et al. (2017) found that medical consultations that are verbally and non-verbally positively congruent are interpreted as more supportive of the patient and improves the relationship with the consultant. Whereas consultations involving incongruent behavior, where the consultant verbally constitutes "distancing" while at the same time being nonverbally "affective", are less clear and show a lot more individual differences when being interpreted. Another study by Jacob et al. (2016) found that mismatch between nonverbal and verbal information is interpreted as irony. They also found that more emotionally intelligent people were faster at rating such stimuli as ironic. This may suggest that a mismatch in this kind of communication is more complex and harder to understand, hence why those who are more emotionally intelligent found it easier to comprehend.

Important Factors for Positive Social Outcomes

Tickle-Degnen and Rosenthals (1990) model investigates three factors that are important to ensure positive outcomes during a two-way communication: expressivity, attention, and coordination. Expressivity involves expressive body gestures, facial expressions and body leaning. It contributes to more accurate judgements, foster open communication, and improves expressions of emotions (Barnlund, 1970; Johnston et al., 2019), as well as elicit liking and positive social outcomes between individuals (Boone & Buck, 2003). Attention refers to the shared focus on each other, representing interpersonal interest and engagement. It can be observed and measured by an individual's eye contact and postural attentiveness (Johnson et al., 2019). Coordination refers to the similarity in expression, attention, action, and rhythm of behavior between the interacting individuals. This model is made for two-way communication, and investigates the NB components on a macro level, while the current study examines one-way communication. However, the factors used in this model might still be beneficial when interpreting the results from this study, where participants watch a video of a physician using specific NBs and rate their perceived trust. The model can be used to argue that a lack of these factors will lead to less accurate judgements and counteract open communication, as well as hinder liking and positive outcomes between individuals. The factor of coordination is more directly linked to two-way communication, although, it can be argued that a coordination/congruence within one

individual's nonverbal behavior will be even more important for a positive interaction than coordination between the partners (Campanella & Belin, 2007; Kret et al., 2013).

Primary aim

The present study is part of a larger project where micro-level nonverbal behavior is tested on experimentally induced pain. In the mother project professional actors will play an experimenter who will show different channelized NBs while guiding the participants through a pain experiment. The experimenter shows channelized NBs in which she would only have one positive NB channel while having other channels as neutral as possible. The channels are facial expression, tone of voice and body posture. There are four different NB scenarios with the same script, so the verbal information will be the same in every scenario. The potential differences between groups can therefore be attributed to the NBs. Before the effects of the experimenters NBs can be tested on pain it should be ascertained that the different NB scenarios truly are different. The NB scenarios we use claim to have increased expressions in only one channel at the time, and less in others, and this claim should be tested and approved before the NBs can be used. The primary aim of this study will therefore be to measure the validity and reliability of the acted NBs. This will allow the videos to be used in the mother project and will further supplement the field with more findings and information concerning the importance on nonverbal behavior for the response of medical treatment. The hypothesis for the primary aim is that the videos with different NB channels will be similar across actors, but different across the different NB scenarios.

Secondary aim

A secondary aim will examine whether an incongruence between the different channels of non-verbal behavior will affect the participants perceived trust towards the physician. Mayer et al. (1995) believed that interpersonal trust depends on a mutual judgment on competence, benevolence and integrity, and the authors define trust as a willingness for someone to be vulnerable to the actions of the other. Trust in a health care setting can be defined as the optimistic acceptance of a vulnerable situation, in which patients believes the physician cares for his or her best interests (Hillen et al., 2014). It is therefore heavily based on positive expectations of the other's intentions and behavior. Trust has been shown to improve information-exchange and decision-making, make patients better adhere to medical advice, decrease second opinion seeking and improve satisfaction with the physician, and is therefore important in a patient-physician relationship (Hillen et al., 2011). The experiment will present four different videos of the same woman conveying the same verbal information,

but the nonverbal information will be different. In the congruent version called "warm and friendly", she will elicit positive non-verbal behavior in all three channels. The three remaining videos will be incongruent, where only one channel will be positive at a time: tone of voice, facial expressions, or body movement. This will allow us to examine if there is a difference and preference between the congruent and incongruent videos. As well as to see potential preferences within the incongruent category, to see if some of the channels on their own will be preferred over the others. The outcome of this study could contribute to better understand the effect a congruence or incongruence in the different channels of nonverbal behavior, and potentially see how non-verbal information is conveyed through different non-verbal channels. It could lead to a better understanding of how different non-verbal behavior potentially may lead to unintended inferences about the physician and how the participants interpret the given information. It can therefore expand the understanding of the implications of certain nonverbal behaviors, and the interaction between them. The hypothesis for the secondary aim is that the congruent scenario with all positive NB channels will elicit the participant to have more trust towards the health care provider, compared to the other incongruent NB scenarios.

Methods

Primary aim

Coders

The coders are psychology-students at Norwegian University of Science and Technology (NTNU). There are 15 coders consisting of 11 females and 4 males. The ages range from 21 to 25, with an average age of 22.80 (SD = 1.28), where 3 of the coders have completed a one-year study, while 12 have not yet completed a degree. The coders have participated in multiple lectures on NB behavior as training by Hojjat Daniali. All the coders participated in a digital meeting with Dr. Mollie Ruben, Assistant Professor of Psychology at University of Maine, as training for the coding. The training consisted of discussions of the scale, leading to a joint understanding of the approximate ratings through the use of some examples. The coders were also encouraged to ask questions concerning the coding-process during training.

Measures

Google forms was used to investigate coder ratings. The form included questions about coder name and video name, and a Likert scale from 1 (not at all) to 9 (extremely). The scale investigated the degree of how much the different experimenters express the different

NB behaviors and macro level behaviors for the four different NB scenarios. This entails 8 items: "gesture", "smile", "eye contact", "positive tone of voice", "dominant and in charge", "positive impressions", "expressive", and "attractiveness". The coding's were based on some preliminary training but were subjective and not relying on objective or strict definitions. As a result of this, the ratings of some items may vary across coders, such as attractiveness which is a very subjective item (Nestor et al., 2010).

Procedure

Videotaped Experimenters. For the videotaped experimenters used in both the primary and secondary aim, there were recruited three females to act as experimenters. To increase credibility, they were typecast to fit a usual health personnel stereotype: Caucasian, slim, not too young, heights slightly above average, wearing a white lab coat and light makeup (Mercer et al., 2008). Previous studies have shown that videotaped experimenters have been successful when conveying verbal and non-verbal information to participants (e.g., Ruben et al., 2017). The recruited experimenters were trained to perform a set of neutral NBs (introduction, calibration and pretest), and three sets of specific NBs (tone of voice, facial expressions, and body postures). The mother project will first show the participants the three neutral videos, and then a video with one of the specific NBs, or a control that is also neutral. The experimenters got 10 hours training to act the NB scripts by an expert in the field of NBs. When the training was complete, the experimenters' performances were recorded.

Development of non-Verbal Behavior Scenarios. In the present study, four sets of micro-level behaviors will be investigated. 1) Facial expressions (FE): the videotaped experimenter (VE) nods and smiles frequently and looks straight at the participant, maintaining eye contact (more than 5 minutes throughout the test). She also has more positive eyebrow movements and affirmative blinking. 2) Tone of voice (TV): the VE speaks with a warm, friendly, energetic, expressive, and strong tone of voice. 3) Body postures (BP): The VE leans forward frequently, decreasing the distance to the participant (half a meter), and has elaborate and expressive hand movements (indexing, numerical listing with fingers, showing and simulating sizes and timelines). The VEs expressed each set of NB channels separately and keep the other NB channels as neutral as possible. There will also be a fourth group (group NeB) to act as a control group. Here the VEs will keep their NBs neutral throughout the experiment. This will entail not looking much at the camera in each dialogue, keeping a standard distance with the camera (one meter), maintaining a flat and plain face, not moving the hands or body, sitting up straight, and having a monotonous tone of voice throughout the video. A group of

coders will watch the videos for validity and reliability purposes. The raters will use a "rating system for NBs", that is specifically developed for this study.

Since the full videos from the mother project are about 1 hour long, these would be very difficult and time consuming to code. Therefor a "thin slice method" was chosen to code the videos. Where different parts of the videos would be coded, including about 3 minutes of the introduction, the calibration, the pre-test, the conditioning, and the post-test. Previous studies have shown that brief excerpts of expressive behaviors are enough to provide raters with necessary information to evaluate dimensions of the videotaped behavior (Ambady & Rosenthal, 1992; Murphy et al., 2015).

Statistical Analysis

The data was analyzed using IBM SBSS Statistics 27.0. The first step was examining the descriptives. Secondly, the inter-rater reliability examined through an alpha mode reliability analysis. Furthermore, several one-way ANOVAs were run to examine similarities and differences between the videos and between the actors. To further analyze the differences between the video types a Bonferroni post-hoc test was used, as this test is good for controlling for type 1 error rate (Field, 2018, p. 551). To further examine the differences between the actors a least-significant difference (LSD) post-hoc was used as it has more power (Field, 2018, p. 551). The video "warm and friendly" was excluded from the analysis but was included in the reliability analysis.

Data Screening

There were no missing values. A new variable was composed based on the sum of the ratings for each item. Levene's test was not significant, $p > .05$, indicating equal variance between the groups. Except for the item gesture, where Levene's test was significant. Assumptions of normal distributions was not met for the items, except for the item "positive impressions" where the Shapiro-Wilk, $p = .103$, and the Kolmogorov-Smirnov, $p = .200$, tests showed a normal distribution. The analysis is known for being robust even when the distribution is not normal (Schmider et al., 2010). No outliers were found. The internal consistency was tested using Chronbach alpha. The training was performed in lectures, but the codings were done individually, meeting the assumption of individuality (Field, 2018, p. 239).

Secondary aim

Participants

Data was collected from 63 participants, but after exclusion of 13 participants, it resulted in $N = 50$, including 34 females (68%) and 16 males (32%). The ages ranged from 19-61, and the mode was 22, $M = 27.48$, SD 10.89. There were 13 people in the all-positive NB group, 12 in the positive tone of voice group, 13 in the positive body movement group and 12 in positive facial expressions group. The education levels ranged from "master/Ph.D. or equivalent" ($n = 12$), "bachelor" ($n = 23$), and "10 years of school" ($n = 1$).

Measures

Demographic questions. Participants were asked to state their gender, age, education level and whether they understand English. The participants were also asked to answer a question about consent, which was used as a necessity to fill out the form. After the video, they were also asked to answer a control question about the video, to sort out those who didn't watch the video attentively.

Trustworthiness. A 15-item differential-type scale, the Individualized Trust Scale (ITS) by Wheeless & Grotz (1977) was used to measure the dependent variable of the participants trust of the different videotaped NB-expressive health care providers (see Appendix). The ITS has previously received reliability ratings of .92 (Wheeless & Grotz, 1977), .94 (Chamberlin, 2000) and reliability ratings of .94 from the current study. The scale was developed to assess individualized trust in a specific target person on a macro level. Each of the 15 items used scales from 1-7, where they represent opposing characteristics, and where a scale of 4 will fall in between the two opposing characteristics. The items control for false answers by changing whether 1 or 7 contains the positive or the negative loaded characteristics. Each item of the trust scale investigates different aspects of trust. Wheeless & Grotz (1977) did not clarify the definitions and meanings of the different items. Therefore Cambridge dictionary and Oxford dictionary were used to find the most appropriate definitions for each item, to hinder subjective interpretations of the questions and increase clarity and validity for this study.

Procedure

Sampling. Participants were sampled using a combination of convenience and snowball sampling. Psychology students at NTNU and others outside of NTNU were invited to participate and were asked to invite others to answer the questionnaire. The link was primarily distributed to the participants across two social media platforms: Messenger

(Facebook) and Snapchat from 03.03.22 to 28.03.22. The survey was created on Nettskjema.no. The study did not need ethical approval, or approval from NSD as Nettskjema.no has anonymous participation and no personal information was collected.

The study told the participants that the goal of the study was to examine technological innovations' effect on healthcare, to make sure that the participants did not know that the study investigated the effects of NBs, and thus avoiding biased results.

Inclusion criteria for participation was that participants are over 18 years old, understand English, have access to internet to be able to receive the survey, and can play a video with audio. Anyone who did not meet those criteria, or who didn't consent to participation in the study were excluded. Participants who answered wrong on a control question were excluded. As well as those participants who used less than 3 minutes, because they would not have watched the video attentively. Those who identified as "other sex" were also excluded due to a low sample size.

The survey link had a randomization function, where everyone pressed one link, but were randomly assigned to 1 of 4 conditions, where each condition saw one video with different NBs. This made sure that neither the participants nor we knew who responded to which conditions.

Statistical Analysis

First the descriptives were examined, followed by examining inter-rater reliability using an alpha mode reliability analysis. For the analysis, a one-way ANOVA was used to examine the differences and similarities between the groups. After the ANOVA, a Gabriel's post hoc test was used to analyze where the differences were. Gabriel's post-hoc test was used because it has greater power and is therefore better to use when sample sizes are slightly different (Field, 2018, p. 551).

Data Screening

All items were reversed from negative to positive valence. There was no missing data. Two participants were excluded who identified as other sex, 10 participants answered wrong on the control question, and 1 used less than 3 minutes on the questionnaire. A new variable "trust", was made based on the means of the items. Levene's test was not significant, $p > .05$, indicating equal variance between the groups. The visual interpretations of Q-Q plots showed that normality was met. Box plots showed that there were no outliers. The participants did the questionnaire independently, therefore meeting the assumption of individuality (Field, 2018, p. 239).

Results

Primary aim

Descriptive Statistics

Table 1

Descriptives for Mean and Standard deviations for the sums of coders ratings of the different videos (N = 21)

Video type	Gesture	Smile	Eye contact	Positive tone of voice	Dominance	Positive impressions	Expressiveness	Attractiveness
Introduction M; SD	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	70.67; 17.62
Calibration M; SD	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	70.67; 17.62
Pretest M; SD	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	70.67; 17.62
PTV M; SD	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	70.67; 17.62
PFE M; SD	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	70.67; 17.62
PBM M; SD	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	71.00; 15.10
Neutral M; SD	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	70.67; 17.62

Note. Mean; standard deviation. PTV: positive tone of voice. PFE: Positive facial expressions. PBM: Positive body movements.

Inter-Coder Reliability

Reliability ratings for the 8 different items included in the primary aim had a high reliability rating ($\alpha > .80$), see table 2. This includes the ratings of the video with all positive NBs "warm and friendly" related to the secondary aim.

Table 2

Chronbach's Alpha for the coder's ratings

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

Differences Between Videos

There was significant differences between video type and several of the items ratings: "gesture", $F(6, 14) = 206.09$, $p < .001$, "smile", $F(6, 14) = 16.93$, $p < .001$. "Eye contact", $F(6, 14) = 21.60$, $p < .001$. "Positive tone of voice", $F(6, 14) = 28.16$, $p < .001$. "Dominance", $F(6, 14) = 6.48$, $p = .002$. "Positive impressions", $F(6, 14) = 14.22$, $p < .001$. "Expressiveness", $F(6, 14) = 28.34$, $p < .001$. There was no significant difference between "attractiveness" and video type $F(6, 14) = 0.00$, $p = 1.000$. Means and standard deviation are shown in table 1.

The only significant difference when analyzing "gesture" was related to PBM. The biggest difference $\Delta M = 82.67$, $p < .001$ was between PBM and pretest. The only significant difference within "smile" was related to PFE, where the biggest difference $\Delta M = 72.67$, $p < .001$ was between PFE and neutral. Within "eye contact" there are only significant findings related to PFE, where the biggest difference $\Delta M = 81.33$, $p < .001$ was between PFE and pretest. Within "positive tone of voice" there were several significant differences, $p < .05$ in relation to the video types PTV and PFE. The biggest difference $\Delta M = 58.67$, $p < .001$ was between PTV and neutral. No other significant findings were found related to the other ratings, $p > .05$. Within "dominance" there were several significant differences, $p < .05$ related to PFE and PBM. The biggest difference is between PFE and pretest, $\Delta M = 15.00$, $p = .018$. There were no significant differences between introduction and PTV, $p > .05$. Within "positive impressions" there were several significant differences related to PTV and PFE. The biggest difference was between PFE and neutral, $\Delta M = 47.67$, $p < .001$. There was also a

significant finding between PBM and neutral, $\Delta M = 24.67$, $p = .046$. No other comparisons had any significant differences. Within "expressiveness" there were multiple significant differences regarding PTV, PFE and PBM. The biggest difference $\Delta M = 45.00$, $p < .001$ was between PBM and neutral. There were no other significant differences. Within "attractiveness" there were no significant differences in the coder's ratings, $p > .05$.

Differences Between Actors

There was only a significant difference between actors for the rating of "attractiveness", $F(2, 18) = 3367.39$, $p < .001$. The post-hoc test showed that the biggest difference $\Delta M = 34.29$, $p < .001$ was between actor 1 ($M = 86.71$, $SD = 0.76$) and actor 3 ($M = 52.43$, $SD = 1.13$). The second biggest difference $\Delta M = 20.57$, $p < .001$ was between actor 2 ($M = 73.00$, $SD = 0.00$) and 3. The last significant difference $\Delta M = 13.71$, $p < .001$ was between actor 1 and 2. There were no other significant differences.

Secondary aim

Descriptive statistics

For descriptive statistics for the four NB groups used in the study see table 3, and the means for "warm and friendly" see table 4.

Table 3

Descriptive statistics from the online survey (N = 50)

Conditions	*n*	*M; SD*	95% CI
Warm and friendly	13	4.24; 1.34	[3.43, 5.05]
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. M: mean. SD: standard deviation. CI: confidence interval

Table 4

Means from the coding (N = 1)

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

Differences of trust between groups

There was a significant differences within "trust" between the groups, $F(3, 46) = 3.67$, $p = .019$. The post-hoc test showed that there were significant differences $\Delta M = 1.37$, $p = .016$ between PFE and PTV. There were no other significant differences, $p > .05$, in relation to PBM, or for the congruent group "warm and friendly". See table 3 for descriptive statistics.

Discussion

Primary aim

The hypothesis for the primary aim was that the videos with different NB channels would be similar across actors, but different from the other videos across the NB scenarios. The result from the analyses partly supports the hypothesis regarding differences across videos. "Gesture", "smile" and "eye contact" were all rated significantly higher for PBM and PFE from the other videos, indicating support for the hypothesis regarding differences between the video types and validating the videos. The group PTV scored highest for the rating of "positive tone of voice", as expected. However, the group PFE also scored significantly for "positive tone of voice", indicating some potential overlap between these groups regarding this rating. Both PFE and PBM were significantly higher rated on "dominance" than the other videos, with PFE scoring the highest. There were significant differences within all three groups PFE, PTV and PBM for positive impressions, though the results showed some variance across the groups related to how positive they might have been interpreted as. All three groups were significant higher regarding "expressiveness" compared to the other videos, with PBM having the highest rating. The findings give support for the hypothesis that the videos with different NB channels will be similar across actors, as the findings show that the only difference between actors was related to attractiveness. This section will further discuss these findings.

Gesture, smile and eye contact

The ratings of "gesture", "smile" and "eye contact", were all significantly different for their expected groups (PBM and PFE) compared to the other videos. PBM had more gestures than the other videos, while PFE had more smiling and eye contact than the other videos. Haxby et al. (2000) explain the ability to detect changeable aspects of faces such as eye gaze and lip movements to underlie the perception of information that facilitates social communication. The same authors explain perception of faces to be one of the more highly developed visual skills in humans, and that it is mediated by a distributed neural system in

humans that is comprised of multiple bilateral regions. Vangeneugden et al. (2014) illustrate that perception of actions involves at least two parallel pathways that separately contribute to the understanding the behaviors of others. These findings illustrate the complex basis for the abilities that can detect separated NB channels, and these abilities' importance. The findings from the current study indicates that the actors have successfully been able to separate the groups regarding these ratings and included the expected behaviors for both groups. These results support the hypothesis that the videos would be different from each other across and the neutral videos and gives support that these videos are valid and can be used in the mother project regarding these items.

Positive tone of voice

For the rating of "positive tone of voice", the results showed significant differences for PTV, where PTV received the highest rating compared to neutral which received the lowest. This demonstrates that the score for "positive tone of voice" was higher for PTV than the other videos and supports the hypothesis that the videos are different from each other. However, for the rating of "positive tone of voice" there were also significant differences between PFE and the other video types, indicating that the video type PFE also scores high on positive tone of voice compared to the other videos. These results indicate that PTV and PFE are not as different as expected regarding this item, and this might potentially be a problem for the mother project. Campanella and Belin (2007) found a correlation between facial movements and tone of voice. They explain that facial movements involving the mouth region (e.g., smiling) affects the properties of the vocal tract, leading to vocal differences in the voice. They explain that smiling causes a decrease in the vocal tract length, and this further leads to an increase in formant frequencies that often is distinctly noticeable. Higher formant frequencies have been linked to lower potency (dominance), and higher evaluation (emotional valence) (Auracher et al., 2020), supporting that increased formant frequencies can make the sound of the voice more emotional. Summarized, this illustrates a biological basis for how we can hear when someone is smiling. PFE should only include facial expressions such as smiling, but it also seems to involve more positive tone of voice than anticipated. However, based on Campanella and Belin's (2007) findings, it might be difficult to distinctly separate tone of voice and facial expressions. The mother project doesn't state that these channels need to be perfectly separated, only that there needs to be enough of an increase in one channel, followed by a decrease in the other channels. The results from this study does indicate that this difference might not be as big as it may need to be. The mother project could review

these findings and consider if the videos need revising, although Campanella and Belin's (2007) findings indicate that a further separation of the NB-channels might be difficult.

Dominance

For the rating of "dominance", there were significant differences between PFE and the other video types, and between PBM and the other video types. Where PFE was rated the highest and pretest the lowest. This indicate that PFE has scored the highest of all the videos, but that both PFE and PBM have scored higher on "dominance" than the other videos. This finding is further supported by Witkower et al. (2020), who found evidence that higher rank, prestige, and dominance is conveyed though distinct sets of nonverbal behavior, such as different head positions (tilted upwards vs downwards), smiling behavior (presence vs. absence) and bodily expansion (subtle chest expansion vs. more grandiose space-taking). Using more body movements and expanding the physical space one occupies is associated with high rank, which is explained to consist of both prestige and dominance. Note that Witkower et al. (2020) define dominance as using aggression and intimidation to induce fear and forced deference, while prestige in their view involves demonstrating knowledge and expertise to earn respect and this is further associated with more positive consequences. Therefore, Witkower et al. (2020) definition of prestige, rather than their definition of dominance, may be more similar to the interpretation of dominance used in the current study. The authors also explain that those who have an uplifting head tilt are perceived as experiencing greater happiness, which increased interpersonal liking. However, the combination of head posture and eye contact can also affect perceived status related to traits and emotions, such as dominance, strength, and anger (e.g., raised head exert dominance, but bowed head while simultaneously maintaining eye contact with the observer also exert dominance) (Toscano et al., 2018). Tang & Schmeichel (2015) also found that maintaining eye contact with angry faces could exert a causal influence on dominance-related responses, as it resulted in self-perceptions of increased aggression and sometimes more dominant reactions. These findings could illustrate the importance of eye contact for how dominant someone is perceived and illustrates how multimodality can affect emotional perception. PFE involves more smiling, eye contact and upwards tilted head, which according to these perspectives might explain why PFE has been rated as the most dominant (Witkower et al., 2020; Toscano et al., 2018; Tang & Schmeichel, 2015). PBM includes a lot of body movement that expands the physical space that is occupied, thus potentially linking this group to perceived prestige and dominance (Witkower et al., 2020). Future research could further

investigate how the different NB channels affect dominance, especially PTV which here showed little association with dominance.

Positive impressions

Regarding the rating of "positive impressions", there were found significant differences between PFE and the other video types, between PTV and the other video types, as well as between PBM and neutral. This indicates that PFE and PTV both have scored higher on "positive impressions" than the other videos, with PFE being rated as the most positive compared to pretest. PFE involves more smiling than the other videos, and additionally with the previous findings regarding dominance, PFE could from the perspective of Witkower et al. (2020) be associated with more prestige, which have been linked to more perceived warmth, friendliness, compassion, empathy, and helpfulness. This might be one of the explanations as to why PFE have scored higher on "positive impressions". As previously discussed, there could be an overlap between PFE and PTV regarding "positive tone of voice", which might cause PFE to be interpreted more positively. This could explain why PFE scored highly on "positive impressions", as it would consist both of smiling, increased eye contact and other positive facial expressions, as well as positive tone of voice. Based on the biological foundation presented by Campanella and Belin (2007), it can be discussed whether the overlap between PFE and PTV can go both ways, as the authors explain that facial movements like smiling and tone of voice are biologically connected. Because the vocal tracts physically change when one is smiling, it might be reasonable to believe that trying to affect the vocal tracts to achieve the same vocal result, could lead to some muscular movements similar to smiling. Thus, this might also cause some smiling when trying to have a positive tone of voice, which would also increase the positivity related to PTV and possibly explain why it has higher "positive impressions". However, the results from the analysis showed that PTV was not significantly related to smiling, indicating that if there is a connection between PTV and smiling, it does not show in the current results. PBM was only significantly higher rated on positive impressions from neutral, indicating that PBM and introduction were interpreted similarly, which causes some ambiguity. Because PBM is significantly different from neutral it should be positive, however, it is too similar to introduction, which should also be neutral. This result might imply that PBM is somewhere in between neutral and introduction. Meaning it is slightly positive, although not as positive as PTV and PFE, nor as neutral as the video neutral. It might also mean introduction is more positive than it should be, therefore making introduction and PBM to similar. There has however not been a problem with the introduction related to the other conditions, so it might be more probable that the

former is the explanation, rather than the latter. These results might indicate that PBM is positive, but not as positive as PFE and PTV are.

Expressiveness

There were significant differences in "expressiveness" when comparing both PTV, PFE and PBM with all the other video types. This supports the hypothesis that these three videos are more expressive than the others and indicates that the actors have been able to separate those conditions that are supposed to be expressive from those that aren't (e.g., neutral, introduction, calibration, and pretest). Furthermore, indicating that enhancing only one channel of NB does not seem to have a negative effect on the expressivity, and is a good indication for the validity of the videos. The biggest difference for "expressiveness" was between PBM and neutral, indicating that PBM was the most expressive of the three. This supports the finding that PBM scored high on gesturing, as gesturing is associated with being expressive (Johnston et al., 2019). However, added up with the results from positive impressions, this could imply that although PBM involves a lot of gestures, it isn't necessarily interpreted as positive gestures. A study by Nikoleizig et al. (2021) found that speaking time, physical expressiveness and likability were important factors that affects how someone is rated on performance evaluation and assumed competence level. They do however emphasize that extreme cases that exceeds normal behavior could backfire, and that excessive expressiveness can be perceived as distracting. This is supported by Kajopoulos et al. (2021) who discuss that pointing and gaze direction will not always be congruent during natural social interactions, and the pointing might therefore be irrelevant to the conversation, and thus can the gesturing be a distractor and can be disadvantageous to pay attention to. This could possibly explain why PBM is rated as expressive, but not necessarily positive enough, possibly because the gesturing might be interpreted as too extreme, especially compared to the decrease in the other NB channels. Nikoleizig et al. (2021) findings might however explain why PFE and PTV are associated with both expressiveness as well as positive impressions, as they might be interpreted as having more appropriate levels of expressiveness for a health care provider, and thus being perceived as having increased levels of performance and competence. Future research should further examine the expressiveness of nonverbal behavior, specifically regarding PBM, as there are reasons to believe that too excessive body movements are counteractive in social situations.

Differences across actors

The analyzes showed no differences in NBs across actors. The only significant difference between the actors, was for the ratings of attractiveness. These results give support

to the hypothesis and indicate that the training the 3 actors received was enough to present the NBs in a similar enough order to be used in the mother project. The post-hoc test showed that actor 1 was rated as the most attractive, while actor 3 was rated as the least attractive. This may have an effect for how they were perceived, as previous studies have demonstrated the halo effect regarding attractiveness, which is described as an effect where attractive individuals are ascribed more desirable personality traits than unattractive individuals (Dion et al., 1972). Klebl et al. (2021) found supporting evidence for the halo effect and found this effect to be especially strong for moral traits compared to non-moral traits. Kleisner et al. (2014) found that some face shapes are associated with both higher attractiveness and higher perceived intelligence, as well as perceived friendliness and sense of humor. This might imply that actor 1 who was rated as the most attractive, potentially also could be rated as more intelligent, friendly, and humorous. Kleisner et al. (2014) also found results that indicated sex differences, where there were more accurate estimations of intelligence in men than in women, which they explain potentially could be an indication that females were more susceptible to the halo effect in this setting. The current study has only used female actors to avoid any potential sex differences, but the results from Kleisner et al. (2014) indicates that this potentially could lead to an increased halo effect, compared to the use of men. The current results do not indicate any difference between the actors due to the halo effect as no other results were significant in the present study. However, the halo effect could still have an impact in the current study through other unknown factors, such as perceived intelligence or competence which is not directly measured in this study. Future studies could further investigate the different aspects of the halo effect in terms of different factors such as intelligence and competence, as well as how the physician's sex might affect how they are perceived.

Secondary aim

The hypothesis for the secondary aim was that the congruent scenario with all positive NB channels would elicit more trust towards the health care provider in participants compared with the other incongruent NB scenarios. The findings show a significant result within trust for PFE compared to PTV, where PFE was rated the highest, and PTV the lowest. The results indicate that the incongruent group PFE scored higher on trust compared to the congruent group "warm and friendly", and thus opposes the hypothesis. This might be due to multiple reasons, for example due to the overlap between PFE and PTV, or due to some potential problems with PBM. The congruent "warm and friendly" group consisted of PTV, PFE and

PBM for actor 1 and therefore the results from these four groups will be used to discuss these aspects in further detail.

The Ratings of Trust on Positive Facial Expressions and Warm and Friendly

The hypothesis expected "warm and friendly" to elicit the most trust with the viewer, but PFE scored highest on this factor. However, "Warm and friendly" scored higher than the other three groups on all the ratings (gesture, smile, positive tone of voice, dominance, positive impressions and expressiveness) except eye contact, where it scored pretty similarly as PFE. Therefore, it could be expected that "warm and friendly" would also score highest on trust. However, since PFE scored higher than "warm and friendly" on trust, this might potentially indicate that the ratings on some of these factors possibly should be lower to induce more trust. As previously discussed, PFE overlaps with some aspects of PTV, therefore it can be argued that the biggest difference between PFE and "warm and friendly" is the part consisting of PBM, which as previously discussed, involves some uncertainties. Even though PBM scored highly on gestures and expressivity, it was not rated as positively as either PFE or PTV, potentially indicating that PBM might consist of excessive gestures and body movements, which could be perceived as distracting (Nikoleizig et al., 2021; Kajopoulos et al., 2021). "Warm and friendly" is rated higher than PBM on both gesturing and expressiveness, which might imply that the same effect could be relevant for "warm and friendly", and thus potentially explain why this group have scored lower on trust. (Nikoleizig et al., 2021).

The videos used in the current analysis used actors who learned a script for both verbal and non-verbal information, therefore, a great deal of control is needed to perform these scenarios correctly. Burgoon et al. (2014) found that as an attempt to appear more credible, deceivers will try to control revealing signs of deception and enhance their self-representation. The authors explain that this excessive amount of control leads to a decrease in spontaneity, consequently resulting in deceivers using less diverse and complex body movements than truthtellers. This could indicate that overly controlled movements cause participants to consciously or unconsciously pick up on this altered behavior when making inferences about another person (de Gelder and Vroomen, 2000; de Gelder et al., 2002). Conveyance of honesty, competence, and caring are some of the factors that are important for enhancing patients' trust in physicians (Hillen et al., 2014). If the actor's body movements on some level seems too controlled or artificial, then participants might interpret this as being deceitful, and therefore decrease the amount of trust they have towards the actor. This would be relevant both for PBM and "warm and friendly", as they both include body movements,

thus potentially explaining why "warm and friendly" has been interpreted as less trustworthy than PFE.

The results from the current study's analyses also showed that PTV scored lowest on perceived trust. This could potentially cause the inclusion of PTV in "warm and friendly" to further cause a decrease in the perceived trust for this group. This could possibly be related to prestige by Witkower et al. (2020) where respect is earned based on a demonstration of knowledge and expertise, and is linked to the current study's use of dominance. From this perspective, prestige might be important for patients to see whether their doctors are competent and knowledgeable, which is an important factor in eliciting trust (Hillen et al., 2014). From this perspective, perceived trust could possibly be related to a lowered perceived competence- and dominance level, as PTV was rated the lowest on dominance. These aspects should be further researched, as perceived competence is an important part of trust, and thus an important part of a good patient-physician relationship. Future research should examine how the different channels of nonverbal behavior might affect trust in a health care provider, especially regarding PBM and PTV which potentially could influence the perceived trust negatively.

The Effects of Important Factors on Positive Social Outcomes

Tickle-Degnen and Rosenthals (1990) model emphasizes expressivity, attention, and coordination as important factors to ensure positive outcomes in two-way communication. According to this theory, the congruent group in this study, "warm and friendly", would ensure the most positive results because it is both expressive, ensures attention and is congruent between the different NB channels. "Warm and friendly" rated highest on positive impressions, but PFE rated highest on perceived trust. The hypothesis expected "warm and friendly" to be more congruent, as both face and body usually contains the most relevant information as well as complements each other (Kret et al., 2013). Furthermore, gestures have been shown to be helpful when both conveying and perceiving information (Veld et al., 2014). However, the overlap between the groups PFE and PTV might lessen the interpreted incongruence for PFE, as they both convey positive tone of voice. Furthermore, Burgoon et al. (2021) found that body movements such as leaning forward and having a frontal body posture improved perceived competence. PFE does include frontal forward posture and could potentially increase perceived congruence between body movements and the other NB channels, compared to if the physician would not have been facing the participant. This could potentially fulfil the coordination factor for PFE, making it be perceived as less incongruent. The same authors also found that forward leaning and frontal body posture did not

significantly improve trust, potentially explaining why "warm and friendly" wasn't rated as the most trustworthy even though it involved more of these forms of body movements.

"Warm and friendly" has scored the highest for expressivity and should based on the model by Tickle-Degnen and Rosenthals (1990) therefore have the most positive social outcomes. However as previously discussed, if "warm and friendly" is too expressive and is perceived as distracting (Nikoleizig et al., 2021; Kajopoulos et al., 2021), this could potentially be a problem if patients prefer physicians who are calm and reassuring (see Cloninger, 2011). This might potentially affect how the video is perceived and could explain why it doesn't score as highly as suggested by the hypothesis. Tickle-Degnen and Rosenthals (1990) explain expressivity to also be conveyed through facial expressions, therefore, PFE might also fulfil the model's definition of expressiveness, as this group is rated to involve eye contact, smiling and expressivity. Thus, PFE would still fulfil this factor without the potential problems that may be linked to excessive body movements.

The authors explain facial expressions to be the most important part of the attention factor as this is often measured by an individual's eye contact, hence, both PFE and "warm and friendly" would score highly on this factor as both groups had equally high ratings for eye contact.

However, an important consideration is that the model by Tickle-Degnen and Rosenthals (1990) is based on two-way communication, while this study consists of one-way communication, and thus, there is a possibility that the model does not fit well enough for this scenario. It could however be argued that the factors can be used, because expressivity, attention and coordination can be measured on both a micro- and macro-level for the NBs in the videos. Coordination is the factor that might be most directed toward two-way communication, but it can be argued that a congruence of NB channels within the one person will be equally important as a congruence of NBs between both parts (Campanella & Belin, 2007; Kret et al., 2013). To summarize, the results are not as initially expected based on the model by Tickle-Degnen and Rosenthals (1990), but the model might still be useful when interpreting the results. These factors should be further researched, to investigate the potential effects they can have on elicited trust on a health care provider.

Limitations and Future Implications

The present study has a number of limitations. This study used 15 coders for the primary aim, and 50 participants for the secondary aim. A too low sample size might affect the results by increasing false-positive results and inflated effect sizes, as well as failing to

detect meaningful small effects (Schweizer & Furley, 2016). Additionally, there are more females than males among the coders and participants, which could have affected the results. Future studies should try to increase sample sizes to avoid these pitfalls.

The secondary aim used actor 1, who scored highest on attractiveness. Previous research has illustrated that attractiveness is associated with higher perceived intelligence and friendliness, especially for women (Kleisner et al., 2014), possibly causing an increase in ratings for actor 1. The halo effect could therefore possibly lead to a more positive rating of trust compared to if another actor had been used. There was however not used a control for this group, therefore, this effect could not be tested in this study. Future studies should investigate how potential halo effects might affect how physicians are perceived.

We did not have a control for the participants' general trust in doctors compared to their rated trust in the physician used in the video (Richmond et al., 2022). Therefore, if someone has a very high or low general trust in doctors, that might affect the results of the study. This should be investigated further, as it might be an important factor for how the physicians were rated.

This is a laboratory design and may therefore have less ecological validity, as how people respond to pre-recorded videos may not translate to real-life interactions (see also Kajopolous et al., 2020; Hayward et al., 2017). This might hinder the generality of the findings, but the results of this study could still offer insight that could translate to real-life situations. Future studies should further examine these effects with a design associated with more ecological validity.

Online surveys can have certain problems related to them, such as biases in the sampling, dishonest responses, fatigue and loss of interest during respondence (Daniali & Flaten, 2022). To decrease the effect of fatigue were the length of the video (3 min.) and number of questions ($N = 15$) kept short. However, 3 minutes might be too little time to generate a proper perception on trust. Factors such as competence and caring which are important to perceived trust could be investigated in future studies, to get more detailed information of how the videos were received.

Conclusion

The hypothesis for the primary aim was that the videos with different NB channels would be similar across actors, but different from the other videos across the NB scenarios. The findings for the primary aim partly support the hypothesis and validity of the videos. The results indicated some overlap between PFE and PTV, as well as some potential problems

regarding PBM as excessive gesturing might be distracting, and might potentially negatively affect how the individual is perceived (Nikoleizig et al., 2021; Kajopoulos et al., 2021). However, the overall results do offer support for the validity of the different videos. The mother project might need to review the findings from the current study and evaluate whether the groups are different enough to be used, or if they need some revising. However, this study illustrates that NBs can be validated and systematically manipulated, as well as illustrating that it is possible to enhance NBs on a micro-level. The study demonstrates that the training that was used in preparation of the NB scenarios can be used in future studies.

The hypothesis for the secondary aim was that the congruent scenario with all positive NB channels would elicit more trust towards the health care provider in participants compared with the other incongruent NB scenarios. The findings for the secondary aim did not give support for the hypothesis, as the incongruent group PFE scored highest on perceived trust. This study illustrates that we can systematically manipulate NBs so they better serve our aims. Future studies should further examine the factors that might affect a patient's perceived trust toward a physician, as this is an essential part of a patient-physician relationship and improved treatment outcome (Hillen et al., 2015; Hillen et al., 2014).

Literature

Ambady, N., & Rosenthal, R. (1992). Thin slices of expressive behavior as predictors of interpersonal consequences: A meta-analysis. *Psychological Bulletin*, 111, 256–274. http://dx.doi.org/10.1037/0033-2909.111.2.256

Ambady, N., Koo, J., Rosenthal, R., & Winograd, C. H. (2002). Physical therapists' nonverbal communication predicts geriatric patients' health outcomes. *Psychology and Aging*, *17*(3), 443–452. https://doi.org/10.1037/0882-7974.17.3.443

Ambady, N., & Weisbuch, M. (2010). Nonverbal behavior. In Susan T. Fiske, Daniel T. Gilbert, and Gardner Lindzey (Ed.), *Handbook of social psychology* (464-497). John Wiley and Sons, Inc.

American Psychological Association. (2020). Publication manual of the American Psychological Association: The official guide to APA style (7th ed.). American Psychological Association.

Andersen, J. F., Andersen, P. A., & Jensen, A. D. (1979). The measurement of nonverbal immediacy. *Journal of Applied Communication Research*, 7, 153–180. https://doi.org/10.1080/00909887909365204

App, B., McIntosh, D. N., Reed, C. L., & Hertenstein, M. J. (2011). Nonverbal channel use in communication of emotion. *Emotion* (Washington, D.C.), 11(3), 603–617. https://doi.org/10.1037/a0023164

Aslaksen, P. M., & Lyby, P. S. (2015). Fear of pain potentiates nocebo hyperalgesia. Journal of Pain Research, 8, 703–710. https://doi.org/10.2147/JPR.S91923

Auracher, J., Menninghaus, W., & Scharinger, M. (2020). Sound Predicts Meaning: Cross-Modal Associations Between Formant Frequency and Emotional Tone in Stanzas. Cognitive Science, 44(10), e12906–n/a. https://doi.org/10.1111/cogs.12906

Barnlund, D. C. (1970). A transactional model of communication. In K. K. Sereno & C. D. Mortensen (Eds.), *Foundations of communication theory* (pp. 83–92). New York: Harper and Row.

Boone, R. T., & Buck, R. (2003). Emotional expressivity and trustworthiness: The role of nonverbal behavior in the evolution of cooperation. *Journal of Nonverbal Behavior,* 27, 163–182. https://doi.org/10.1023/A:1025341931128.

Burgoon, J. K., & Le Poire, B. A. (1999). Nonverbal cues and interpersonal judgments: Participant and observer perceptions of intimacy, dominance, composure, and formality. *Communication Monographs*, 66(2), 105–124. https://doi.org/10.1080/03637759909376467

Burgoon, J. K., Schuetzler, R., & W. Wilson, D. (2014). Kinesic patterning in deceptive and truthful interactions. *Journal of Nonverbal Behavior*, 39(1), 1–24. https://doi.org/10.1007/s10919-014-0190-4

Burgoon, J. K., Wang, X., Chen, X., Pentland, S. J., & Dunbar, N. E. (2021). Nonverbal behaviors "speak" relational messages of dominance, trust, and composure. *Frontiers in Psychology*, 12, 624177–624177. https://doi.org/10.3389/fpsyg.2021.624177

Campanella, S., & Belin, P. (2007). Integrating face and voice in person perception. *Trends in Cognitive Sciences*, 11(12), 535–543. https://doi.org/10.1016/j.tics.2007.10.001

Chamberlin. C. (2000). Nonverbal behaviors and initial impressions of trustworthiness in teacher-supervisor relationships. *Communication Education*, 49(4), 352–364. https://doi.org/10.1080/03634520009379223

Cloninger. C. R. (2011). Person-centred integrative care. *Journal of Evaluation in Clinical Practice*, 17(2), 371–372. https://doi.org/10.1111/j.1365-2753.2010.01583.x

Daniali, H., & Flaten, M. A. (2019). A qualitative systematic review of effects of provider characteristics and nonverbal behavior on pain, and placebo and nocebo effects. *Frontiers in Psychiatry*, 10, 242–242. https://doi.org/10.3389/fpsyt.2019.00242

Daniali, H., & Flaten, M. A. (2022). Experiencing COVID-19 symptoms without the disease: The role of nocebo in reporting of symptoms. *Scandinavian Journal of Public Health*, 50(1), 61–69. https://doi.org/10.1177/14034948211018385

de Gelder, B., & Vroomen, J. (2000). The perception of emotions by ear and by eye. *Cognition and Emotion*, 14(3), 289–311. https://doi.org/10.1080/026999300378824

de Gelder, B., Pourtois, G. R., & Weiskrantz, L. (2002). Fear recognition in the voice is modulated by unconsciously recognized facial expressions but not by unconsciously recognized affective pictures. *Proceedings of the National Academy of Sciences - PNAS,* 99(6), 4121–4126. https://doi.org/10.1073/pnas.062018499

Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, 24(3), 285–290. https://doi.org/10.1037/h0033731

Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th edition.). SAGE.

Gorawara-Bhat, R., Hafskjold, L., Gulbrandsen, P., & Eide, H. (2017). Exploring physicians' verbal and nonverbal responses to cues/concerns: Learning from incongruent communication. *Patient Education and Counseling*, 100(11), 1979–1989. https://doi.org/10.1016/j.pec.2017.06.027

Guerrero, L. K., & Miller, T. A. (1998). Associations between nonverbal behaviors and initial impressions of instructor competence and course content in videotaped distance

education courses. *Communication Education*, 47(1), 30–42.
https://doi.org/10.1080/03634529809379108

Hall, J. A., Coats, E. J., & LeBeau, L. S. (2005). Nonverbal behavior and the vertical
dimension of social relations. *Psychological Bulletin*, 131(6), 898–924.
https://doi.org/10.1037/0033-2909.131.6.898

Haxby, J., Hoffman, E. A., & Gobbini, M. I. (2000). The distributed human neural system for
face perception. *Trends in Cognitive Sciences*, 4(6), 223–233.
https://doi.org/10.1016/S1364-6613(00)01482-0

Hayward, D. A., Voorhies, W., Morris, J. L., Capozzi, F., & Ristic, J. (2017). Staring reality
in the face: A comparison of social attention across laboratory and real world
measures suggests little common ground. *Canadian Journal of Experimental
Psychology*, 71(3), 212–225. https://doi.org/10.1037/cep0000117

Hillen, M. A., de Haes, H. C. J. M., & Smets, E. M. A. (2011). Cancer patients' trust in their
physician-a review. *Psycho-Oncology*, 20(3), 227–241.
https://doi.org/10.1002/pon.1745

Hillen, M. A., de Haes, H. C. J., Stalpers, L. J., Klinkenbijl, J. H., Eddes, E., Butow, P.,
van der Vloodt, J., van Laarhoven, H. W., & Smets, E. M. (2014). How can
communication by oncologists enhance patients' trust? An experimental study. *Annals
of Oncology*, 25(4), 896–901. https://doi.org/10.1093/annonc/mdu027

Hillen, M. A., de Haes, H. C. J. M., van Tienhoven, G., Bijker, N., van Laarhoven, H. W. M.,
Vermeulen, D. M., & Smets, E. M. A. (2015). All eyes on the patient: the influence of
oncologists' nonverbal communication on breast cancer patients' trust. *Breast Cancer
Research and Treatment*, 153(1), 161–171. https://doi.org/10.1007/s10549-015-3486-
0

Howe, L., Goyer, J. P., & Crum, A. J. (2017). Harnessing the placebo effect: Exploring the
influence of physician characteristics on placebo response. *Health Psychology*, 36(11),
1074–1082. https://doi.org/10.1037/hea0000499

Jacob, H., Kreifelts, B., Nizielski, S., Schütz, A., & Wildgruber, D. (2016). Effects of
emotional intelligence on the impression of irony created by the mismatch between
verbal and nonverbal cues. *PloS One*, 11(10), e0163211–e0163211.
https://doi.org/10.1371/journal.pone.0163211

Johnston, V., Brubacher, S. P., Powell, M., & Fuller-Tyszkiewicz, M. (2019). Patterns of

nonverbal rapport behaviors across time in investigative interviews with children. *Journal of Nonverbal Behavior*, *43*(3), 411–434. https://doi.org/10.1007/s10919-019-00306-1

Kajopoulos, J., Cheng, G., Kise, K., Müller, H. J., & Wykowska, A. (2021). Focusing on the face or getting distracted by social signals? The effect of distracting gestures on attentional focus in natural interaction. *Psychological Research*, 85(2), 491–502. https://doi.org/10.1007/s00426-020-01383-4

Kállai, I., Barke, A., & Voss, U. (2004). The effects of experimenter characteristics on pain reports in women and men. *Pain* (Amsterdam), 112(1), 142–147. https://doi.org/10.1016/j.pain.2004.08.008

Klebl, C., Rhee, J. J., Greenaway, K. H., Luo, Y., & Bastian, B. (2021). Beauty goes down to the core: Attractiveness biases moral character attributions. *Journal of Nonverbal Behavior*, 46(1), 83–97. https://doi.org/10.1007/s10919-021-00388-w

Kleisner, K., Chvátalová, V., & Flegr, J. (2014). Perceived intelligence is associated with measured intelligence in men but not women. *PloS One*, 9(3), e81237–e81237. https://doi.org/10.1371/journal.pone.0081237

Kret, M. E., Roelofs, K., Stekelenburg, J., & de Gelder, B. (2013). Emotional signals from faces, bodies and scenes influence observers' face expressions, fixations and pupil-size. *Frontiers in Human Neuroscience*, 7, 810–810. https://doi.org/10.3389/fnhum.2013.00810

Mayer, R. C., Davis, J., & Schoorman, F. (1995). An integrative model of organizational trust. *The Academy of Management Review*, 20(3), 709–734. https://doi.org/10.2307/258792

Mercer, E., Mackay-Lyons, M., Conway, N., Flynn, J., & Mercer, C. (2008). Perceptions of outpatients regarding the attire of physiotherapists. *Physiotherapy Canada*, 60(4), 349–357. https://doi.org/10.3138/physio.60.4.349

Murphy, N. A., Hall, J. A., Mast, M. S., Ruben, M. A., Frauendorfer, D., Blanch-Hartigan, D., & Nguyen, L. (2015). Reliability and validity of nonverbal thin slices in social interactions. *Personality and Social Psychology Bulletin*, 41, 199–213. https://doi.org/10.1177/0146167214559902

Muzard, A., Kwon, A. Y., Espinosa, N., Vallotton, C. D., & Farkas, C. (2017). Infants' emotional expression: Differences in the expression of pleasure and discomfort between infants from Chile and the United States. *Infant and Child Development*, 26(6), e2033–n/a. https://doi.org/10.1002/icd.2033

Nagy. E. (2008). Innate intersubjectivity. *Developmental Psychology*, 44(6), 1779–1784. https://doi.org/10.1037/a0012665

Nestor, M., Stillman, M. A., & Frisina, A. C. (2010). Subjective and objective facial attractiveness ratings and gender differences in objective appraisals of female faces. *The Journal of Clinical and Aesthetic Dermatology*, 3(12), 31–36.

Nikoleizig, L., Schmukle, S. C., Griebenow, M., & Krause, S. (2021). Investigating contributors to performance evaluations in small groups: Task competence, speaking time, physical expressiveness, and likability. *PloS One*, 16(6), e0252980–e0252980. https://doi.org/10.1371/journal.pone.0252980

Otte, R. A., Donkers, F. C., Braeken, M. A. K., & Van den Bergh, B. R. (2015). Multimodal processing of emotional information in 9-month-old infants I: Emotional faces and voices. *Brain and Cognition*, 95, 99–106. https://doi.org/10.1016/j.bandc.2014.09.007

Schmider, E., Ziegler, M., Danay, E., Beyer, L., & Bühner, M. (2010). Is it really robust? *Methodology*, 6(4), 147–151. https://doi.org/10.1027/1614-2241/a000016

Schweizer, G., & Furley, P. (2016). Reproducible research in sport and exercise psychology: The role of sample sizes. *Psychology of Sport and Exercise*, 23, 114–122. https://doi.org/10.1016/j.psychsport.2015.11.005

Richmond, J., Boynton, M. H., Ozawa, S., Muessig, K. E., Cykert, S., & Ribisl, K. M. (2022). Development and validation of the trust in my doctor, trust in doctors in general, and trust in the health care team scales. *Social Science & Medicine* (1982), 298, 114827–114827. https://doi.org/10.1016/j.socscimed.2022.114827

Ruben, M. A., Blanch-Hartigan, D., & Hall, J. A. (2017). Nonverbal communication as a pain reliever: The impact of physician supportive nonverbal behavior on experimentally induced pain. *Health Communication*, *32*(8), 970–976. https://doi.org/10.1080/10410236.2016.1196418

Tang, D., & Schmeichel, B. J. (2015). Look me in the eye: Manipulated eye gaze affects dominance mindsets. *Journal of Nonverbal Behavior*, 39(2), 181–194. https://doi.org/10.1007/s10919-015-0206-8

Tickle-Degnen, L., & Rosenthal, R. (1990). The nature of rapport and its nonverbal correlates. *Psychological Inquiry*, 1(4), 285–293. https://doi.org/10.1207/s1532796p5li0104_1.

Toscano, H., Schubert, T. W., & Giessner, S. R. (2018). Eye gaze and head posture jointly influence judgments of dominance, physical strength, and anger. *Journal of*

Nonverbal Behavior, 42(3), 285–309. https://doi.org/10.1007/s10919-018-0276-5

Vangeneugden, J., Peelen, M. V., Tadin, D., & Battelli, L. (2014). Distinct neural

mechanisms for body form and body motion discriminations. *The Journal of*

Neuroscience, 34(2), 574–585. https://doi.org/10.1523/JNEUROSCI.4032-13.2014

Vase, L., Riley, J. L., & Price, D. D. (2002). A comparison of placebo effects in clinical

analgesic trials versus studies of placebo analgesia. *Pain* (Amsterdam), 99(3), 443–

452. https://doi.org/10.1016/S0304-3959(02)00205-1

Veld, E. M. J., van Boxtel, G. J., & de Gelder, B. (2014). The body action coding system II:

muscle activations during the perception and expression of emotion. *Frontiers in*

Behavioral Neuroscience, 8, 330–330. https://doi.org/10.3389/fnbeh.2014.00330

Wheeless, L. R., & Grotz, J. (1977). The measurement of trust and its relationship to

self-disclosure. *HumanCommunication* Research, 3,250-257.

Witkower, Z., Tracy, J. L., Cheng, J. T., & Henrich, J. (2020). Two signals of social rank:

Prestige and dominance are associated with distinct nonverbal displays. *Journal of*

Personality and Social Psychology, 118(1), 89–120.

https://doi.org/10.1037/pspi0000181

Appendix

Questionnaire

On the scales below, please indicate your impression of the videotaped health care provider. You will be presented with two opposing characteristics, please mark where on the scale you think is fitting for the health care provider in the video. Please complete all scales.

On a scale from one to seven, how untrustworthy do you think the provider is? *

Trustworthy: Able to be trusted

Untrustworthy: Not able to be trusted

Trustworthy						Untrustworthy
1	2	3	4	5	6	7

Value [ ]
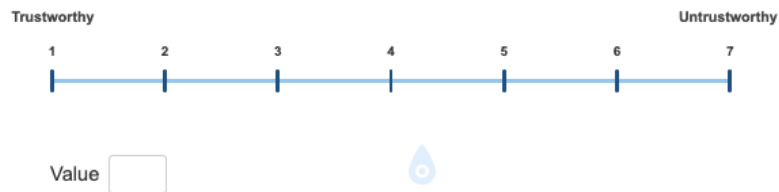
On a scale from one to seven, how trustful would you be of the provider? *

Distrustful: Not trusting someone or something

Trustful: Trusting someone or something

Distrustful of this person						Trustful of this person
1	2	3	4	5	6	7

Value [ ]
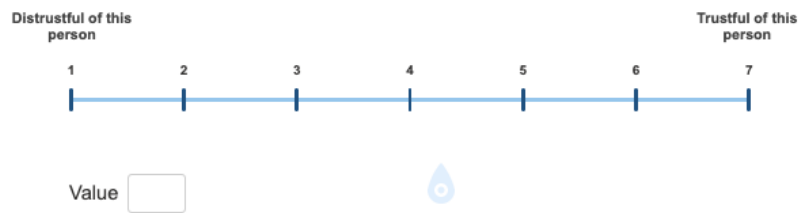
On a scale from one to seven, how divulging do you think the provider is? *

Confidential: To not share secrets

Divulging: To share secret information (such as breaking doctor-patient confidentiality)

Confidential						Divulging
1	2	3	4	5	6	7

Value [ ]
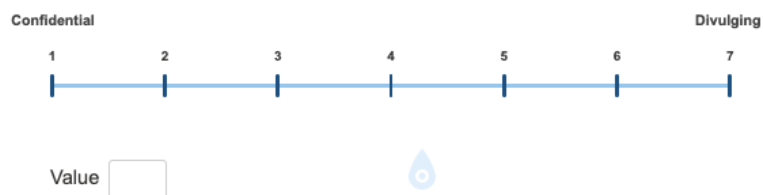
On a scale from one to seven, how benevolent do you think the provider is? *

Exploitative: Using someone unfairly for your own advantage

Benevolent: Kind and helpful

Exploitative						Benevolent
1	2	3	4	5	6	7

On a scale from one to seven, how dangerous do you think the provider is? *

Safe: Not likely to harm you

Dangerous: Could harm you

Safe						Dangerous
1	2	3	4	5	6	7

Value [   ]

On a scale from one to seven, how candid do you think the provider is? *

Deceptive: Making you believe something that is not true

Candid: Honest and telling the truth, especially about something difficult or painful

Deceptive						Candid
1	2	3	4	5	6	7

Value [   ]

On a scale from one to seven, how deceitful do you think the provider is? *

Not deceitful: Honest and telling the truth

Deceitful: Dishonest or hiding the truth

Not deceitful						Deceitful
1	2	3	4	5	6	7

Value [   ]

On a scale from one to seven, how straightforward do you think the provider is? *

Tricky: Difficult to deal with, needs careful attention

Straightforward: Easy to understand

Tricky						Straightforward
1	2	3	4	5	6	7

Value [   ]

Value [ ]

On a scale from one to seven, how disrespectful do you think the provider is? *

Respectful: Showing admiration for someone or something

Disrespectful: Lacking respect

Respectful   Disrespectful

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Value [ ]

On a scale from one to seven, how considerate do you think the provider is? *

Inconsiderate: Not thinking or worrying about other people or their feelings

Considerate: Thinking or worrying about other people or their feelings

Inconsiderate   Considerate

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Value [ ]

On a scale from one to seven, how dishonest do you think the provider is? *

Honest: Always telling the truth and able to be trusted, not likely to cheat or lie

Dishonest: Always not telling the truth and not able to be trusted, more often cheats or lies

Honest   Dishonest

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Value [ ]

On a scale from one to seven, how reliable do you think the provider is? *

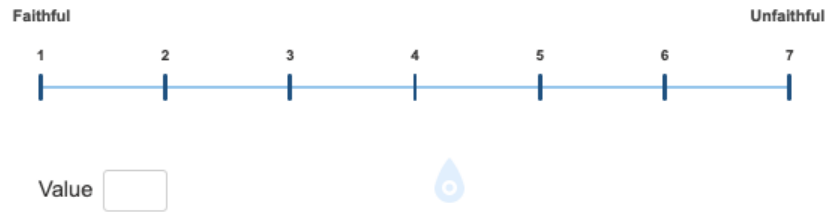Unreliable: Not able to be trusted or believed, behaves unexpectedly

Reliable: Able to be trusted or believed, behaves the way you would expect

Unreliable   Reliable

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Value [ ]

On a scale from one to seven, how unfaithful do you think the provider is? *

Faithful: Loyal to others
Unfaithful: Disloyal to others

Faithful   Unfaithful

1   2   3   4   5   6   7

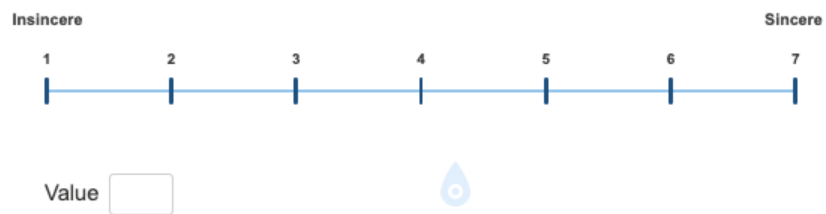Value [   ]

On a scale from one to seven, how sincere do you think the provider is? *

Insincere: Pretending to feel something that you do not feel or not meaning what you say
Sincere: Not pretending or lying

Insincere   Sincere

1   2   3   4   5   6   7

Value [   ]

On a scale from one to seven, how careless do you think the provider is? *

Careful: Giving a lot of attention to what you are doing so that you do not have an accident, make a mistake, or damage something
Careless: Not taking or showing enough care and attention

Careful   Careless

1   2   3   4   5   6   7

Value [   ]