

Candidate number: 10142

# The Role of Nonverbal Behaviors of Healthcare Providers on Patient Satisfaction

Bachelor's thesis in Psychology, PSY2900

Supervisor: Hojjat Daniali

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## **Preface and self-declaration**

The present thesis was conducted in the Department of Psychology at the Norwegian University of Science and Technology (NTNU) under supervision from PhD-student Hojjat Daniali. The thesis is written in accordance with APA 7<sup>th</sup> guidelines (American Psychological Association, 2020). I thankfully acknowledge the valuable feedback, knowledge and engagement provided by the supervisor continuously throughout the project and for allowing me the freedom to study areas of nonverbal behavior (NB) of my personal interest. I also want to thank student assistants on the project for sharing their experiences and giving feedback. Finally, a big thanks to my fellow students for the support, helpful discussions, and shared laughs throughout the semester.

The research project was conducted in collaboration with five other students. However, all theses were written individually. The group collectively designed the study and online survey with individual scales. The group also selected videos relevant to the study design, conducted sampling of participants and prepared the data set for analyses.

The research project consisted of two main phases. The first phase, coding of videos portraying nonverbal behaviors, was preplanned by the supervisor. This also includes the hypotheses and statistical analyses that were to be conducted. The author formulated an additional hypothesis for the first phase. Preliminary literature was provided by the supervisor. However, literature search was mainly executed by the author through Google Scholar and Oria. All analyses were conducted by the author herself, including writing the results, designing relevant tables, and interpreting the results.

The second phase of the research project was to investigate the effects of nonverbal behaviors on patient satisfaction. The research question and hypotheses investigated were developed by the author. Literature search, finding relevant scales, conducting appropriate analyses, and writing and interpreting the results were also all executed by the author.

## Abstract

Patient satisfaction is an important part of healthcare settings and can be enhanced or attenuated by the nonverbal behavior of healthcare providers (Mast et al., 2008b; Pawlikowska et al., 2012). However, little is known about how specific nonverbal behaviors of healthcare providers influence patient satisfaction. The present thesis aimed to investigate the relationship between patient satisfaction and nonverbal behaviors of healthcare providers. To explore this relationship, two phases were developed.

In the first phase of the study, a series of videos showing a healthcare provider recommending a treatment for pain with different nonverbal characteristics were tested for validity and reliability. Coders ( $N = 7$ ) rated several psychosocial characteristics of the healthcare provider across five nonverbal conditions (competence, warmth, incompetence, coldness, and neutral). Results supported the validity and reliability of the intended nonverbal characteristics and the NB rating scale.

In the second phase, participants ( $N = 66$ ) partook in an online survey where the same videos of healthcare providers were displayed to them. The findings indicated that patient satisfaction was positively related to competence and warmth, and negatively related to incompetence and coldness. Results further indicated that participants of competent healthcare providers were more satisfied than participants of incompetent healthcare providers. These findings can be used for practical purposes in educating of communicative skills in healthcare providers to ensure patient satisfaction. Patient satisfaction can further lead to other positive outcomes such as compliance to and successful treatment (Ware & Hays, 1988).

**Keywords:** nonverbal behavior, patient satisfaction, healthcare, patient-provider relationship

Human beings are innate social creatures who interact and communicate with others on a daily basis. Some of this communication appears verbally, although most communication transpires through nonverbal behavior (shortened NB) (Blanch-Hartigan et al., 2018). When studying physician-patient interactions, most studies focus on verbal communication (Mast, 2007; Mast et al., 2008b), but NB is also highly relevant in medical settings (Blanch-Hartigan et al., 2018).

NBs refer to different ways of communicating without the use of linguistics (Hall et al., 2019). NBs serve different important purposes in communication and can have a variety of functions. Among others, it can be used to manage impressions, reveal external conditions or internal states, such as attitudes, and display affect (Blanch-Hartigan et al., 2018; Daniali & Flaten, 2019; Hall et al., 2019).

When investigating and measuring NBs, it is beneficial to distinguish between micro- and macro-levels of NBs (Blanch-Hartigan et al., 2018). Micro-level NBs are isolated behaviors that may not imply a meaning or convey a message by themselves. Examples of micro-level NBs include tone of voice, body movement, facial expressions, and gaze (Blanch-Hartigan et al., 2018). Macro-level NBs (hereby referred to as NB characteristics) are combinations of micro-NBs that contribute to an overall impression or characteristic that conveys a psychological meaning (Blanch-Hartigan et al., 2018). Examples of NB characteristics include dominance, friendliness, competence, warmth, and enthusiasm. Both micro- and macro-level NBs can have a positive or negative valence, meaning that NBs can portray positive or negative emotions, relationships, or attitudes (Blanch-Hartigan et al., 2018; Daniali & Flaten, 2019).

### **Nonverbal behavior in healthcare settings**

Nonverbal behaviors are assumed to be important in the healthcare system (e.g., Blanch-Hartigan et al., 2018; Kraft-Todd et al., 2017) and numerous documents have shown

that physicians' nonverbal behavior can impact clinically relevant outcomes (Mast, 2007). For instance, a patients' well-being has shown to be strengthened by positive NBs of healthcare providers such as tone of voice and touch (Street et al., 2008). These nonverbal behaviors may increase patient comfort and reduce anxiety (Henricson et al., 2007; Knowlton & Larkin, 2006; Weze et al., 2004, as cited in Street et al., 2008). Other positive effects that have been associated with positive nonverbal behavior of healthcare providers include reduced report of pain and increased pain tolerance (Daniali & Flaten, 2019; Ruben et al., 2017). Negative nonverbal behaviors of healthcare providers, such as lack of eye contact and smiling, have further been associated with increased pain reports and nocebo effects (Daniali & Flaten, 2019).

### **NB characteristics warmth and competence in healthcare**

Two medically important NB characteristics of healthcare providers are warmth and competence. These are two psychosocial impressions that highly impact our evaluation of others and are considered important qualities in healthcare providers (Howe et al., 2019; Kraft-Todd et al., 2017; Nguyen et al., 2015). Levenstein et al. (1986) have stated that “the task of the physician is twofold: to understand the patient and to understand the disease” (p. 24), emphasizing the role of both NB characteristics in healthcare.

Warmth, also known as empathy, can be defined as the ability to both share, understand, and accept emotions (Kim et al., 2004; Kraft-Todd et al., 2017). In healthcare, warmth is further associated with a healthcare provider showing care for the patient and implementing active listening (Howe et al., 2019). Studies show that leaning forward, closer interpersonal proximity, smiling, nodding, eye contact, and open gestures are related to perceptions of warmth (Howe et al., 2019; Nguyen et al., 2015). The lack of these micro-level NBs including orientations directed away from the interaction partner conveys coldness (Nguyen et al., 2015).



Competence refers both to a healthcare provider's medical skills and knowledge, and their skills regarding medical social interactions (Kraft-Todd et al., 2017). Some studies have inferred perceptions of competence through a doctor's "white coat" (e.g., Kraft-Todd et al., 2017), but micro-level NBs such as open gestures, dominant poses and expansive postures also signal competence (Nguyen et al., 2015). Incompetence can be defined as a healthcare provider's lack of knowledge and skills within their profession and can attenuate the quality of care a person receives (Hodges, 2006).

### **Nonverbal behavior and patient satisfaction**

Patient satisfaction, defined as the subjective evaluation of one's experience with a healthcare professional or service (Ware et al., 1983), is an important part of the healthcare system as it can modulate treatment outcome and be indicative of whether a patient returns to the physician, or if they comply to the proposed medical treatment (Boissy et al., 2016; Ware & Hays, 1988). Research suggests that patient satisfaction can be enhanced or attenuated by the ways in which a healthcare provider acts nonverbally (Mast et al., 2008b; Pawlikowska et al., 2012).

A preliminary study on verbal and micro-level nonverbal communication skills, such as physical contact, bodily positioning, and eye contact, found only correlations between physicians' verbal communication skills and patient satisfaction. The study, which used observations of real physician-patient interactions, found no correlations between physicians' nonverbal behavior and patient satisfaction (Comstock et al., 1982). A study contradicting these findings indicated that attentive body orientation and forward body leaning were associated with increased satisfaction. In the same study, lower satisfaction was associated with physicians' touching, leaning backwards, and having relaxed hands (Larsen & Smith, 1981).

Furthermore, Haskard et al. (2007) studied physician-patient interactions and investigated the effects of physicians' content-filtered speech on patient satisfaction. Content-filtered speech refers to a person's tone of voice isolated from the semantic components of communication and was found to be related to higher patient satisfaction when the content-filtered speech was warm/supportive and competent/interested (Haskard et al., 2007). There were no significant correlations between patient satisfaction and the physician's hostile/disrespectful or enthusiastic tone of voice (Haskard et al., 2007).

Henry et al. (2012) conducted a meta-analysis that produced similar results to Haskard et al. (2007). Their findings suggested that physicians' negativity, characterized in the study as acting hostile, argumentative or angry, was not associated with patient satisfaction. It was further indicated that physicians' NB characteristic of warmth was linked to higher patient satisfaction (Henry et al., 2012). Results of a systematic review further found that gazing away from the patient, being assertive, having an angry or anxious tone of voice were positively related to satisfaction with the consultation (Oliveira et al., 2012). Bodily positioning involving the patient and eye contact were further positively correlated with satisfaction. Additionally, illustrative gestures and indirect body orientation were negatively correlated with patient satisfaction (Oliveira et al., 2012).

The presented results indicate relations between different micro-level NBs and patient satisfaction. However, our understanding of the effects of NB characteristics on patient satisfaction remains scarce. In addition, one can question the methodological applications of previous research in the field. Firstly, previous research has primarily used real physician-patient interactions. When using real physician-patient interactions, it is not possible to manipulate the nonverbal behavior of the healthcare provider and ensure that all patients are exposed to the same nonverbal behavior (Hall et al., 2015). Secondly, some research in the field of nonverbal behavior have portrayed the behaviors in question using static photos,

which are not capable of fully illustrating NB characteristics. Using videos rather than static photos may be a more ecologically valid method for illustrating different nonverbal behaviors (Kraft-Todd et al., 2017). It is further of importance to investigate the role of specific NB characteristics on patient satisfaction as healthcare providers rarely express merely one isolated micro-level NB, but rather portray NB characteristics that convey a psychosocial meaning.

### **The present study**

As a result of the methodological limitations of prior research, the present study seeks to further advance our knowledge on the role of healthcare providers' NBs on patient satisfaction. To investigate this research question, two phases were developed. In the first phase, videos of healthcare providers' that were made to portray NB characteristics competence, warmth, incompetence, and coldness underwent a reliability and validity testing (H1-H5). In the second phase, participants watched the same videos, and differences in patient satisfaction between NB characteristics of healthcare providers was investigated (H6-H9). The second phase was a cross-sectional study in which participants were guided through a pain-stimulation experiment by a healthcare provider with manipulated NB characteristics.

Thus, the hypotheses investigated in the first phase were that (H1) NB rating items are coded consistently (i.e., internal consistency), (H2) the rating of NB characteristics is consistent across coders (i.e., interrater reliability), (H3) NB characteristics competence, warmth, incompetence, and coldness have underlying dimensions of psychosocial characteristics, (H4) NB characteristics are rated similarly across actors, and (H5) the conditions convey the intended NB characteristics (i.e., desirable construct validity). For the second phase, the study hypothesizes that (H6) patient satisfaction is positively correlated with ratings of competence and warmth, and negatively correlated with ratings of incompetence and coldness, (H7) patient satisfaction will be higher for participants with

warm healthcare providers compared to participants with competent healthcare providers, (H8) warm healthcare providers will be associated with higher satisfaction than cold healthcare providers, and (H9) competent healthcare providers will be associated with higher satisfaction than incompetent healthcare providers.

### **Phase One; Validity and Reliability of NB characteristics**

To ensure the validity and reliability of the present study, the video conditions conveying the NB characteristics of interest were coded. This entails that a group of coders watched the video conditions and rated them based on a NB characteristic rating scale developed for the purpose of this study.

#### **Methods**

##### ***Coders***

A group of seven coders completed the reliability and validity testing of videos conveying NB characteristics. All coders were female students at NTNU ( $M_{Age} = 22.57$ ,  $SD_{Age} = 1.51$ ); six of whom were enrolled in the bachelor thesis course in psychology (PSY2900), and the remaining coder was a student assistant on the project.

##### ***Materials***

**Videos.** A total of four videos with an overall duration of approximately 3 minutes were coded. The videos were a sampled collection selected from the supervisor's own research project which they were originally designed for (Daniali et al., 2023). The same videos were used both for the coding and in the survey of the second phase.

The videos showed a female healthcare provider who guided participants through an experiment on pain and introduced a pain-relieving cream. In the first video, the healthcare provider introduced herself and thanked the participants for taking part in the study. The next video explained how the pain-relieving cream, "Embla", worked. Furthermore, the healthcare provider asked the participants to rate their expected efficacy of "Embla". The third video

asked the participants to rate their current stress- and alertness-levels. Finally, the last video asked participants to rate their satisfaction with the healthcare provider.

**NB conditions.** Five conditions of the videos were coded. The conditions only differed in the NB characteristic portrayed by the healthcare provider while the verbal information remained the same for all conditions. Four of the conditions portrayed the NB characteristics of competence, warmth, incompetence, and coldness. These NB characteristics were selected as competence and warmth are considered important in healthcare (Kraft-Todd et al., 2017; Levenstein et al., 1986). One neutral condition was also included as a control group.

In the competent condition, the healthcare provider spoke in an authoritative tone of voice and portrayed dominant body gestures and hand movements to signal competence. The competent healthcare provider further showed limited smiling and serious facial expressions. In the warm condition, the healthcare provider showed enhanced eye contact, frequently smiled, and had open body posture with expressive hand movements. The healthcare provider further spoke in a friendly tone of voice. When acting incompetent, the healthcare provider portrayed agitated body movements with anxious facial expressions and tone of voice. For the cold condition, the healthcare provider showed limited smiling and gaze accompanied by closed and defensive body postures, and a cold tone of voice. When being neutral, the healthcare provider had a plain and flat face with minimal hand and body movements and was positioned straight without leaning forward nor backward.

**Actors.** Each condition was portrayed by two actors. The actors were instructed to portray healthcare providers leading the participants through the mentioned experiment. There were no differences in the verbal information or nonverbal behaviors conveyed by the actors. Both actors were Caucasian females in their late twenties and dressed in a white lab-

coat. Prior to filming the videos, the actors were given training on how to display specific NB characteristics.

### ***Measurements***

**NB ratings scale.** An NB rating scale was developed for the purpose of this study. The scale consisted of 24 psychosocial characteristics of the videotaped healthcare provider which were rated from 0 (*not at all*) to 4 (*very much*). However, the present thesis only investigated 19 of these psychosocial characteristics. These were included based on their hypothesized association with the NB characteristics of interest (competence, warmth, incompetence, and coldness). Table 1 shows the rated items and their hypothesized association. Psychosocial characteristics *competent, confident, and intelligent* (competence) and *warm* and *sincere* (warmth) were included as they are considered reliable and valid indicators of competence and warmth, as noted by Fiske (2018). The remaining psychosocial characteristics were research-made.

**Table 1**

#### *Hypothesized underlying dimensions of NB characteristics*

<b>Competence</b>	<b>Warmth</b>	<b>Incompetence</b>	<b>Coldness</b>
Competent	Warm	Incompetent	Hostile
Confident	Sincere	Dumb	Negative
Independent	Good natured	Anxious	Dominant
Competitive	Tolerant	Passive	Bored
Intelligent		Intimidated	
		Shy	

### ***Procedure***

Prior to coding, all coders were given instructions and preliminary training was acquired through a pre-recorded lecture of Assistant Professor Mollie Ruben at University of

Rhode Island. Coders were not given any strict or operationalized definitions of the different psychosocial characteristics, and, consequently, the meaning behind these characteristics were open for subjective interpretation. This further entails that ratings were based on coders general impressions and not biased toward an agreed definition of the characteristic.

The coding was conducted at NTNU with all coders present. However, all ratings were done individually without consulting one another. Coders were aware of which NB conditions were coded at the time. All positive NB conditions (competent and warm) were coded first for each actor. Then, the negative NB conditions (incompetent and cold) were coded for each actor. Finally, the neutral condition was coded for each actor. Thereby, a total of 10 conditions were coded.

### ***Ethics***

It was not necessary to apply for ethical approval for the first phase as only coders and not participants were used. Additionally, no sensitive or personal information was collected.

### ***Data screening***

Prior to conducting analyses on the coding, all coders examined the data to ensure that no characteristics were rated twice and that there were no missing values. There were found two outliers in each of the items shy, intimidated, passive, negative, incompetent, anxious, hostile, and dumb. The outliers were not removed, and results should, consequently, be interpreted with caution. Items competitive, bored, dominant, and passive were excluded from further analyses as they showed reliability below the designated cut-off point of .70 for ICC values (Koo & Li, 2016). For Cronbach's  $\alpha$  acceptable values were  $> .70$  (Tavakol & Dennick, 2011).

Non-significant Kolmogorov-Smirnov and Shapiro-Wilk tests suggested that NB characteristics competence and warmth were normally distributed. NB characteristics incompetence and coldness did not meet the assumption of normality. The assumption of

equal variances was met for the t-tests. The MANOVA violated the assumption of equal variances, but MANOVA is considered a robust and appropriate measure despite this violation (Field, 2018, p. 535-537).

A total of four variables were computed from the means of the correlated items. These variables will hereby be referred to as NB characteristics. Based on the results from the Pearson's correlation coefficients, items competent, confident, independent, and intelligent were computed to one variable named *competence*. A variable named *warmth* was further computed based on the correlations between items warm, sincere, good natured and tolerant. Items hostile and negative constitute the variable *coldness* based on their correlations. The fourth variable to be computed was based on correlations between items incompetent, dumb, anxious, intimidated, and shy, and was named *incompetence*.

Based on the results of four independent t-tests, the mean ratings from both actors were used in all statistical analyses except for the t-tests. This was completed as a measure to control for halo effects (Feeley et al., 2002), and to ensure that the impressions portrayed by the actors were measured, and not their attractiveness.

### ***Statistical analyses***

All statistical analyses were conducted using IBM SPSS Statistics Version 27. To investigate the internal consistency of the coded items, Cronbach's alpha was conducted (H1). This measure is considered appropriate when investigating the reliability between two or more coders (Blanch-Hartigan et al., 2018). An intraclass correlation coefficient (ICC) was further conducted to investigate whether there was agreement between coders in their ratings of the same item (H2).

To investigate the dimensionality and factorial structure of NB characteristic competence, warmth, incompetence and coldness, multiple Pearson's correlation coefficients were conducted (H3). These correlations were conducted between psychosocial



characteristics for positively loaded NB characteristics (i.e., competence and warmth) and for negatively loaded NB characteristics (i.e., incompetence and coldness).

The mean differences between actors in ratings of competence, warmth, incompetence, and coldness were investigated by conducting four independent t-tests (H4). Welch's t-test was investigated as it is considered a more robust measure for comparing means compared to a Student's t-test (Declare et al., 2022).

To investigate the validity of the videos conveying NB characteristics (H5), a one-way multivariate analysis of variance (MANOVA) was conducted with factor NB condition (competent, warm, incompetent, cold and neutral) on ratings of competence, warmth, incompetence, and coldness. A planned post-hoc test was conducted using Tukey's post-hoc to investigate which conditions were potentially different from each other.

## Results

**Table 2**

*Descriptive statistics for ratings of NB characteristics across conditions*

	<i>M</i>	<i>SD</i>
Competence	2.29	1.41
Warmth	1.95	1.24
Incompetence	0.71	1.35
Coldness	0.56	0.97

### ***Internal consistency (H1) and interrater reliability (H2)***

Cronbach's  $\alpha$  showed high internal consistency between coders for all items ( $\alpha > .86$ ). A high degree of reliability was found for most items with ICC values above .75. The exceptions were for items competitive, dominant, bored, and passive (ICC < .69).

### *Correlations between coded items (H3)*

Results of the Pearson's correlation for items associated with competence and warmth can be seen in table 3. Table 4 shows the results of the Pearson's correlation for items associated with incompetence and coldness.

**Table 3**

*Correlations for coded items associated with competence and warmth (N = 10)*

	1	2	3	4	5	6	7	8
1. Competent	-							
2. Confident	.99***	-						
3. Independent	.98***	.99***	-					
4. Intelligent	.98***	.99***	.99***	-				
5. Warm	.41	.32	.31	.40	-			
6. Sincere	.64*	.60	.56	.64*	.96***	-		
7. Good natured	.37	.32	.26	.35	.97***	.93***	-	
8. Tolerant	.39	.32	.27	.37	.99***	.94***	.98***	-

\* $p < .05$ . \*\*\* $p < .001$

**Table 4**

*Correlations for coded items associated with incompetence and coldness (N = 10)*

	1	2	3	4	5	6	7
1. Incompetent	-						
2. Dumb	.99***	-					
3. Anxious	.98***	.98***	-				
4. Intimidated	.99***	.99***	.99***	-			
5. Shy	.98***	.98***	.99***	.99***	-		
6. Hostile	-.24	-.29	-.30	-.29	-.36	-	
7. Negative	-.16	-.21	-.23	-.22	-.29	.99***	-

\*\*\*  $p < .001$

#### *Differences between actors (H4)*

Results of four independent t-tests indicated that there were no significant differences between actor 1 and actor 2 in ratings of NB characteristics competence, warmth, incompetence, and coldness ( $p > .05$ ).

#### *Differences between conditions (H5)*

The main effect NB condition was significant for all dependent factors  $F_s(4, 5) = > 41.19, p < .001$ . Therefore, post-hoc tests were followed for each dependent variable.

For ratings of Competence, the biggest difference,  $\Delta M = 3.73, SE = 0.21, p < .001$ , was between the conditions competent,  $M = 3.88, SD = 0.05$ , and incompetent,  $M = 0.14, SD = 0.00$ . There were also significant differences,  $\Delta M = 2.41, SE = 0.21, p < .001$ , between conditions competent and neutral,  $M = 1.46, SD = 0.15$ .

For ratings of Warmth,  $\Delta M = 3.21, SE = 0.28, p < .001$ , the warm condition,  $M = 3.77, SD = 0.03$ , was rated higher than cold condition,  $M = 0.55, SD = 0.18$ . The warm condition also had higher ratings of Warmth,  $\Delta M = 2.63, SE = 0.28, p < .001$ , than the neutral condition,  $M = 1.14, SD = 0.40$ .

For ratings of Incompetence,  $\Delta M = 3.24, SE = 0.12, p < .001$ , the incompetent condition,  $M = 3.26, SD = 0.24$ , had higher ratings than the competent condition,  $M = 0.01, SD = 0.02$ . The incompetent condition also had higher ratings of Incompetence,  $\Delta M = 3.10, SE = 0.12, p < .001$ , than the neutral condition,  $M = 0.16, SD = 0.24$ .

For ratings of Coldness,  $\Delta M = 2.36, SE = 0.22, p < .001$ , the cold condition,  $M = 2.36, SD = 0.20$ , had higher ratings than the warm condition,  $M = 0.00, SD = 0.00$ . The cold condition also had higher ratings of Coldness,  $\Delta M = 2.04, SE = 0.22, p < .001$ , than the neutral condition,  $M = 0.32, SD = 0.45$ .

## Discussion

To shortly summarize the findings of the first phase, results indicated that the videos conveying NB characteristics had a high degree of reliability which suggests that the psychosocial characteristics were rated consistently across coders and actors. Further, the NB characteristics had underlying dimensions of psychosocial characteristics and the manipulation of NB characteristics was successful for each condition. This is support for the validity of the NB videos.

The first interesting finding was the observation of high internal consistency as can be argued by the high values of Cronbach's alpha for all items. These findings suggest that the items were measuring the same psychosocial characteristics across coders and support the hypothesis (H1) that items were rated consistently. Results of intraclass correlation coefficients (ICC) indicated high degree of interrater reliability. These findings support the hypothesis (H2) that coders are consistent in their ratings of the same item and suggest that coders agree that the videos portrayed the same psychosocial characteristics. The exceptions were for items competitive, dominant, bored, and passive. Possible reasons for these exceptions are that the coders disagreed whether the videos portrayed these psychosocial characteristics or were unclear of their meaning. Overall, these findings suggest that the psychosocial characteristics were reliable and successfully illustrate the intended NB characteristics conveyed in the videos. This further supports the reliability of the NB rating scale.

Furthermore, all items were correlated with items within their hypothesized association (see tables 3 and 4) when correlations were done for positive NB characteristics (competence and warmth) and for negative NB characteristics (incompetence and coldness) (H3). Items were not correlated with other items outside of the hypothesized associations suggesting that these NB characteristics are distinct from one another. It should, however, be

noted that the item sincere correlated moderately with items competent and intelligent. These findings could be interpreted to suggest that being sincere is also associated with being competent and intelligent.

The hypothesis (H4) that ratings of NB characteristics were similar across actors was supported. This finding suggests that actors conveyed the NB characteristic similarly and supports the reliability of the study. This further suggest that the study's findings are results of the actors' NB characteristics and not their individual differences or coders personal preferences. Additionally, this is support for the manipulation of NB characteristics being successful for both actors.

There was also support for the hypothesis (H5) that the videos conveyed the intended NB characteristics. These results entail that all NB characteristics were rated significantly higher in their respective condition when compared to the contrary condition. For instance, ratings of NB characteristic competence were higher in the competent condition compared to the incompetent condition. Results of the neutral condition further showed that all NB characteristics were rated significantly higher in the intended conditions compared to the neutral condition. Collectively, these findings strongly imply that actors appeared in line with the intended NB characteristics of each condition. This further suggest that the manipulation of actors' NB characteristics was successful and that the videos were valid in their capability of conveying the intended impressions. These findings justify the use of the same NB videos in the second phase of the study.

### **Phase Two; The Role of Healthcare Providers' NB characteristics on Patient Satisfaction**

As results of the first phase indicated that the NB condition videos were successful in their portrayal of the intended NB characteristics, these videos were included in the second phase of the study. In this phase, an online survey was conducted to investigate the

differences in patient satisfaction between NB characteristics (competence, warmth, incompetence, and coldness) of healthcare providers.

## **Methods**

### ***Participants***

A total of 74 participants completed the survey. Due to exclusion criteria (see data screening), 66 participants were included in the analyses. Participants were between the ages of 18 and 68,  $M = 34.88$ ,  $SD = 14.54$ . There were 48 females (73%) and 18 males (27%). Participants were distributed between the five conditions warmth ( $n = 18$ ), competence ( $n = 17$ ), coldness ( $n = 9$ ), incompetence ( $n = 10$ ) and neutral ( $n = 12$ ).

To participate, participants had to be over the age of 18 and understand English. Participants who answered the control question incorrectly or had a completion time over 1 hour or under 7 minutes were excluded.

### ***Procedure***

The present project was a cross-sectional study conducted online. A survey was designed to resemble a real healthcare consultation in which participants alternated between viewing a video and answering questions. Participants were asked to imagine themselves participating in a pain-experiment which tested a pain-relieving cream. Having participants imagine themselves using a healthcare service is considered a reliable measure for judgments on nonverbal behavior and a valid predictor of real patient satisfaction (Ambady & Rosenthal, 1992; Blanch-Hartigan et al., 2013). The participants were informed that the aim of the study was to investigate possible ways of improving healthcare consultations and were not aware that the focus of this study was on nonverbal behavior in attempt to avoid biased ratings.

When entering the online survey, the study was first introduced, and consent to participate was obtained. Participants were then randomly assigned to one of the five conditions. In each of these conditions, participants were randomly assigned to one of the two

actresses. Participants further alternated between watching videos of the healthcare provider and answering questions. A total of 15 questions were asked from the participants with further subscales within the questions. For the purpose of the present thesis, only the questions related to patient satisfaction and ratings of psychosocial characteristics (see section on NB rating scale) were analyzed.

The survey was designed on the platform *nettskjema.no*. The platform is suitable for conducting online surveys as it ensures the anonymity and data-security of the respondents. It also allows for randomization of respondents to different conditions (UiO, 2018).

Sampling was based on convenience and the snowball method. The survey was distributed on Instagram, Facebook, LinkedIn and Reddit. Furthermore, flyers with a QR-code for the study were distributed on different campuses of NTNU, including cafés and shopping malls in Trondheim.

### ***Measurements***

**Patient satisfaction.** To measure participants satisfaction with their healthcare provider (i.e., patient satisfaction), several items were selected and modified from The Patient Satisfaction Questionnaire (Grogan et al., 2000; Ware et al., 1983), The Consultation Satisfaction Questionnaire (Baker, 1990; Poulton, 1996) and Comstock et al.'s (1982) Satisfaction Questionnaire for patient satisfaction. Both The Patient Satisfaction Questionnaire and The Consultation Questionnaire have been empirically tested and are considered valid methods for assessing patient satisfaction (Grogan et al., 2000; Poulton, 1996; Thayaparan & Mahdi, 2013). The items selected from Comstock et al.'s (1982) Satisfaction Questionnaire for patient satisfaction were developed by using patients from a general medicine clinic (Comstock & Williams, 1980, as cited in Comstock et al., 1982). Table 5 shows the eight statements participants rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). To avoid possible confusion or contaminated answers as a result of

inattention among participants, none of the statements were reversed (van Sonderen et al., 2013).

**Table 5**

*Overview of statements measuring patient satisfaction*

Statement
1. I prefer this healthcare provider compared to others I have seen (Preference)
2. I think the healthcare provider enjoys her work (Enjoyment)
3. I would find it easy to tell this healthcare provider about private things (Share information)
4. I feel confident about the abilities of the healthcare provider who treats me (Ability)
5. The healthcare provider is consistent with my expectations (Expectations)
6. I would be comfortable asking the healthcare provider questions (Asking questions)
7. I would be happy to see this healthcare provider again (Return)
8. I would recommend this healthcare provider to friends and family (Recommend)

*Note.* Names in parentheses are shortened for the purpose of later tables (see table 6).

**Control question.** To control for inattention in participants, a control question was included in the survey. The question asked about the name of the pain-relieving cream which participants were informed of by the healthcare provider in the video. There were three possible options where “Embla” was the correct answer. Those who answered the question incorrectly were excluded from the study.

***Ethics***

Both phases of the present study were conducted in accordance with the Guidelines for Research Ethics in the Social Sciences and the Humanities (National Research Ethics Committees, 2022). As the study was anonymous and did not collect personal, sensitive, or identifiable information from the participants, it was not necessary to apply for ethical approval to conduct the study.



### *Data screening*

A total of 8 participants were excluded from the study as they met the exclusion criteria. Participants who answered the control question incorrectly ( $n = 3$ ) were excluded. As the overall duration of the videos was approximately 3 minutes long, participants with completion time under 7 minutes ( $n = 3$ ) were excluded. Lastly, participants with a completion time of over 1 hour ( $n = 2$ ) were excluded as using this amount of time could be indicative of participants leaving the survey and later returning to complete it. In such cases, the intended induced impressions of the videos could be impaired. No participants violated the inclusion criteria of being over 18 years of age.

Non-significant Kolmogorov-Smirnov and Shapiro-Wilk tests indicated that patient satisfaction was normally distributed. A non-significant Levene's test indicated that the assumption of equal variances was met.

A variable was computed based on participants' mean ratings of the eight statements on patient satisfaction and was used for further analyses in the second phase.

### *Statistical analyses*

All statistical analyses were conducted using IBM SPSS Statistics Version 27. Multiple Pearson's correlation coefficients were conducted to investigate the relationships between patient satisfaction, and the ratings of NB characteristics competence, warmth, incompetence, and coldness (H6).

To test the differences in ratings of patient satisfaction between conditions (H7-H9), a one-way analysis of variance (ANOVA) was conducted with the factor NB condition (Competent, Warm, Incompetent, Cold and Neutral) on patient satisfaction. Due to equal variances and unequal group sizes, a Gabriel's post-hoc test was conducted to investigate which groups were potentially different from each other (Field, 2018, p. 550).

## Results

**Table 6**

*Descriptive statistics of patient satisfaction for each condition*

	Competent		Warm		Incompetent		Cold		Neutral	
	(n = 17)		(n = 18)		(n = 10)		(n = 9)		(n = 12)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Preference	3.12	0.78	2.67	0.97	2.00	1.05	2.22	0.83	2.25	0.62
2. Enjoyment	3.59	1.12	3.22	0.65	2.10	0.74	2.33	1.00	2.50	0.67
3. Share information	3.12	1.17	2.67	1.03	1.70	1.06	2.00	1.00	2.83	1.03
4. Ability	3.88	0.69	3.22	0.65	1.90	0.99	2.78	0.97	2.92	0.79
5. Expectations	3.82	0.64	3.06	0.73	2.20	0.92	2.44	0.88	3.25	0.75
6. Asking questions	3.94	0.83	3.39	0.69	2.80	1.48	3.00	1.12	3.25	0.97
7. Return	3.47	0.87	2.83	0.71	2.10	0.99	2.44	1.13	2.83	0.94
8. Recommend	3.41	0.87	3.11	0.68	1.60	0.69	2.67	0.87	2.58	0.79
Global rating <sup>a</sup>	3.54	0.69	3.02	0.59	2.05	0.79	2.49	0.75	2.80	0.55

<sup>a</sup>Global rating is the mean of all statements.

### *Correlations between patient satisfaction and NB characteristics (competence, warmth, incompetence, and coldness) (H6)*

There were significant positive correlations between patient satisfaction and ratings of NB characteristic competence,  $r(64) = .65, p < .001$ , and between patient satisfaction and ratings of NB characteristic warmth,  $r(64) = .75, p < .001$ . Results further indicated significant negative correlations between patient satisfaction and ratings of NB characteristic incompetence,  $r(64) = -.43, p < .001$ , and between patient satisfaction and ratings of NB characteristic coldness,  $r(64) = -.38, p = .002$ .

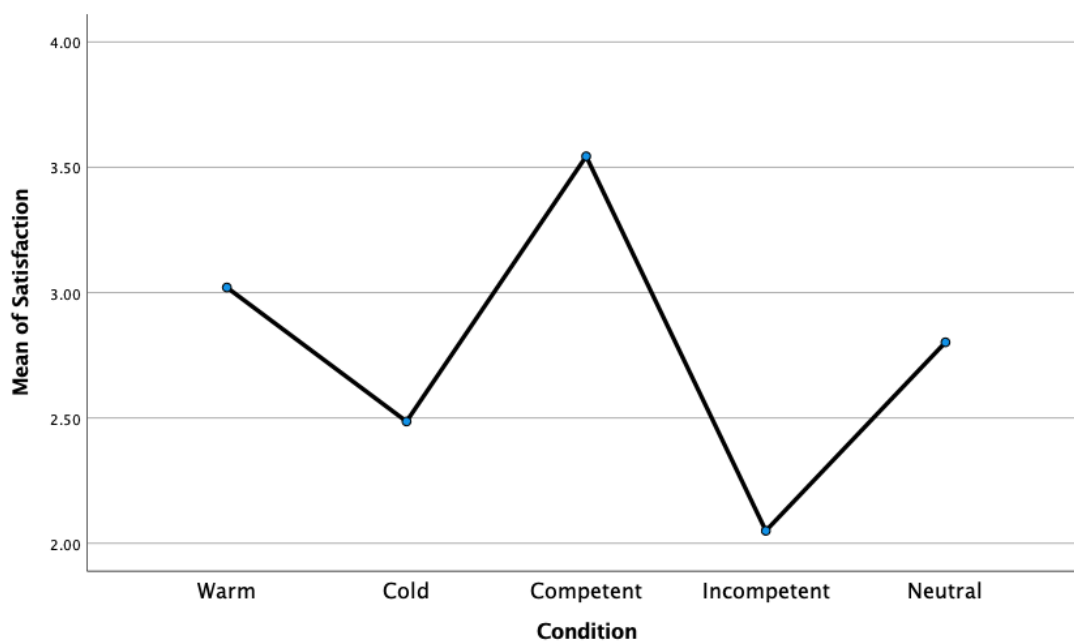
### *Differences in patient satisfaction between conditions (H7-H9)*

There was a significant main effect of NB condition on patient satisfaction,  $F(4, 61) = 9.13, p < .001$ . The biggest difference in ratings of patient satisfaction,  $\Delta M = 1.49, SE = 0.27, p < .001$ , was between the Competent and Incompetent conditions. The Competent condition

also had higher ratings of patient satisfaction compared to the Cold condition,  $\Delta M = 1.06$ ,  $SE = 0.27$ ,  $p = .002$ . The Warm condition was also rated higher in patient satisfaction than the Incompetent condition,  $\Delta M = 0.97$ ,  $SE = 0.26$ ,  $p = .004$ . Ratings of patient satisfaction were further higher,  $\Delta M = 0.74$ ,  $SE = 0.25$ ,  $p = .041$ , in the Competent condition compared to the Neutral condition. There were no significant differences between the other groups ( $p > .05$ ). A means plot for the differences in ratings of patient satisfaction between conditions can be seen in Figure 1.

**Figure 1**

*Means plot showing differences in ratings of patient satisfaction between conditions*



## Discussion

The findings suggested that patient satisfaction was positively related to NB characteristics competence and warmth, and negatively related to NB characteristics incompetence and coldness. It was further observed that there were no differences in patient satisfaction between participants who were guided by the competent or warm healthcare provider, or between warm and cold healthcare providers. The findings further suggested that

participants with the competent healthcare provider experienced higher satisfaction than participants with the incompetent healthcare provider.

### ***Low global ratings of patient satisfaction***

Results indicated that global ratings of patient satisfaction were relatively low despite conditions (see table 6). This was also the case for conditions competent and warm which had global ratings signaling “neutral” satisfaction with the healthcare provider. Research has observed that respondents gave lower ratings when patient satisfaction was one of the last scales in the survey (Ware et al., 1983; Ware & Hays, 1988). In the present study, patient satisfaction was one of the last scales. It is possible that participants gave ratings without reflecting them as they might have become uninterested or frustrated that some questions throughout the survey seemed repetitive. Consequently, it is possible, as noted by Ware & Hays (1988), that participants gave lower global ratings of patient satisfaction due to the placement of the scale.

The unexpectedly low ratings of patient satisfaction, especially for conditions competent and warm, are interesting as they contradict the frequent issue of commonly observed high mean ratings in studies on patient satisfaction (Badejo et al., 2022). As noted by Larsen & Smith (1981), one should be wary of high mean ratings on patient satisfaction as participants may underreport their satisfaction as it can be considered an unfriendly or undesirable opinion (i.e., social desirability bias) (Badejo et al., 2022). However, the low ratings of patient satisfaction could indicate that the present study was not affected by social desirability bias.

### ***Patient satisfaction and its relationship with NB characteristics***

The present study found supporting evidence for the hypothesis (H6) that patient satisfaction is correlated with NB characteristics competence, warmth, incompetence, and coldness. Firstly, patient satisfaction was observed to be positively related to NB

characteristic competence. This finding highlights that participants were satisfied when the healthcare provider was perceived as competent. Being perceived as competent could indicate that the healthcare provider has understanding and knowledge of the patient's course of illness. Perceptions of competence could also signal that the healthcare provider has the technical expertise that is crucial for care (Howe et al., 2019). This could further reassure the patient that they are receiving quality care and, consequently, result in satisfaction. Previous research has obtained similar evidence where being assertive was positively related to patient satisfaction (Oliveira et al., 2012). This finding is in line with the present study as the actor was instructed to act assertive. The perceived competence of physicians has also been associated with satisfaction (Lochman, 1983). However, Lochman's (1983) study was not exclusively on nonverbal behavior which could possibly entail that the perception of competence was based on the verbal information provided by the physician. Therefore, the present study adds to the current knowledge on the relationship between patient satisfaction and nonverbal competence. Interestingly, some studies have suggested that appraising the competence of healthcare providers is difficult for patients (Lochman, 1983). However, the present findings challenge this assumption.

In line with previous research (Henry et al., 2012), patient satisfaction was also positively associated with NB characteristic warmth. This suggests that when the healthcare provider was perceived as warm, the participants gave higher ratings of satisfaction. One possible explanation for this relationship is that patients feel that a physician perceived as warm takes their perspective into consideration and could contribute to reduce patient anxiety (Howe et al., 2019). Perceiving the physician as warm can further increase patient comfort which could make the patients more satisfied (Henricson et al., 2007; Knowlton & Larkin, 2006; Weze et al., 2004, as cited in Street et al., 2008).

Patient satisfaction was also negatively related to NB characteristic incompetence suggesting that participants experienced lower satisfaction with their healthcare provider when she was perceived as incompetent. It is possible that participants experienced lower satisfaction as being perceived as incompetent can be indicative of the healthcare provider lacking sufficient expertise necessary for providing the patient with quality care (Hodges, 2006; Howe et al., 2019). There currently exists little research on the relationship between NB characteristic incompetence and patient satisfaction. However, having an anxious tone of voice, which signals incompetence, has been observed to be positively related to patient satisfaction (Oliveira et al., 2012). This is contradictory to the present findings. It is possible that the present study was more successful in inferring the impression of incompetence than what exclusively having an anxious tone of voice was. This could potentially explain why Oliveira et al. (2012) observed that incompetence was positively associated with patient satisfaction.

Furthermore, healthcare providers perceived as cold were associated with participants experiencing lower satisfaction. When the healthcare provider acts cold, it is possible that the patient feels an absence in reassurance and a lack of understanding from the healthcare provider and, consequently, experiences a decrease in satisfaction. This is an interesting finding as previous research has found no relationship between physicians' negativity, defined in the study as acting hostile, argumentative and angry, and patient satisfaction (Henry et al, 2012). However, there exists some research supporting the present finding as micro-level NBs related to NB characteristic coldness, such as leaning backwards and indirect body orientation, have been associated with lower patient satisfaction (Larsen & Smith, 1981; Oliveira et al., 2012).

### *Differences in patient satisfaction between NB characteristics*

Contrary to expected findings (H7), there were no differences in patient satisfaction between participants in the competent and warm conditions. Although research suggests that perceptions of competence and warmth appear opposite of each other when judging social groups (Fiske et al., 2007), it is possible that both NB characteristics are equally valued in healthcare providers when patients evaluate their satisfaction. This could potentially explain why there was observed no differences between the two NB characteristics. The value of both NB characteristics in physicians has previously been emphasized by Levenstein et al. (1986).

A second interesting finding was the rejection of the hypothesis (H8) that participants in the warm condition would experience higher satisfaction compared to participants in the cold condition. Such differences were not observed in the present study. Previous arguments on social desirability bias and placement of the patient satisfaction scale could be justified explanations for these findings. Another possibility could be that participants don't consider warm healthcare providers to be more important than cold healthcare providers when evaluating their satisfaction. Some research suggests that when perceptions of competence increases, the perception of warmth decreases, and the other way around (Fiske et al., 2007). In relation to the present finding, this could entail that participants viewed the healthcare provider as competent when lacking warmth in the cold condition and were, therefore, equally satisfied with the healthcare provider as participants of the warm condition.

The study obtained evidence for the final hypothesis (H9) that patient satisfaction was higher for participants of competent compared to incompetent healthcare providers. This suggests that participants are more satisfied with their healthcare provider when she is competent than when she is incompetent. This finding could potentially be explained by the previous argument that patients value healthcare providers who expresses necessary skills to ensure quality care or treatment (Howe et al. 2019). Although this finding may seem intuitive,

it is important that obvious assumptions are critically evaluated by empirical data (Henry et al., 2012).

### **General discussion**

The first phase of the study obtained support for the reliability of the videos conveying NB characteristics. This is a valuable observation as ensuring reliability is considered an important step in research on nonverbal behavior but tends to be a more challenging task for NB characteristics compared to micro-level NBs (Blanch-Hartigan et al., 2018). It has also been argued by Blanch-Hartigan et al. (2018) that having clear and operationalized definitions is important in establishing the reliability and validity of nonverbal behaviors. However, in the present study, a high level of reliability was found despite coders not having operationalized definitions. It can be argued that this further increases the reliability of the study. The reliability is also strengthened by having seven coders completing the coding as it is argued that the number of coders increases the reliability of nonverbal behavior (Blanch-Hartigan et al., 2018).

The results of the present study further yielded several findings that contribute to enhance our understanding of the relationship between patient satisfaction and NB characteristics. Firstly, little or no previous research has investigated the relationship between specifically NB characteristics competence, warmth, incompetence, and coldness, and patient satisfaction. Therefore, the present study represents one of the first direct demonstration of the relationships between these NB characteristics and patient satisfaction. Furthermore, the present study is one of the first to investigate the differences in patient satisfaction between NB characteristics. This allows for the understanding of whether some, and potentially which, NB characteristics are considered more important for patient satisfaction.



## **Strengths, limitations, and future directions**

### **Phase one**

There are some limitations to the first phase of the present study. Despite the study suggesting high reliability for the NB characteristics, it should be noted that coders were aware of the intended NB characteristics portrayed in the videos during the coding process. This is a possible limitation as it could have resulted in biased ratings. Future research should have coders be blinded to the intended NB characteristics and ensure that coders have no prior knowledge of the videos. Furthermore, all conditions and psychosocial characteristics were coded simultaneously. The ratings might, therefore, have been influenced by the coder's previous rating of a different characteristic or condition.

### **Phase two**

When interpreting the results from the second phase, one should be critical of the ecological validity of the patient satisfaction scale. This is due to its low number of items. Patient satisfaction is a complex concept with several underlying dimensions (Ware et al., 1983), and one cannot be sure that the short scale grasps the complexity of the phenomenon. Future research could benefit from measuring patient satisfaction with a higher number of items. Furthermore, as the present study exclusively investigated the relationship between nonverbal behavior of healthcare providers, participants were only asked about their satisfaction with the healthcare provider. Consequently, other dimensions of patient satisfaction were not studied. Such dimensions include continuity of care and whether participants felt understood by the healthcare provider (Ware & Hays, 1988). Therefore, it is important to take into consideration that other aspects of the interaction with a healthcare service could affect real-life patient satisfaction.

When interpreting the results, one should further take notice of the low sample. This is a threat to the validity of the study and increases the possibility of getting inflated effect sizes

or false-positive results (Schweizer & Furley, 2016). Furthermore, sampling was based on convenience, and it is, therefore, possible that most of the sample is representative of university students or other people with relation to universities. Additionally, there are likely individual and cultural differences in people's understandings of and attitudes toward patient satisfaction and nonverbal behavior (Blanch-Hartigan et al., 2018; Larsen & Smith, 1981; Mast et al., 2008b). Therefore, generalizing the present findings should be done with caution. Future research should aim to investigate whether similar findings can be obtained with a larger and more representative sample.

The present study used analogue patients to investigate the role of patient satisfaction on NB characteristics. This means that healthy participants were asked to imagine themselves using a healthcare service and is considered a valid predictor of real patient satisfaction (Blanch-Hartigan et al., 2013; Blanch-Hartigan et al., 2018). However, it should be noted that in their study, Blanch-Hartigan et al. (2013) used videotapes of real consultations and not a hypothetical medical setting when observing that analogue satisfaction can predict real satisfaction. Therefore, one possible limitation of the present study is the use of analogue patients in a hypothetical context as a predictor of real patient satisfaction. This further entails that one should be cautious of generalizing the findings to real-life consultations.

### **Strengths**

Despite the mentioned limitations, the study provides interesting knowledge to the field of nonverbal behavior in healthcare settings and its strengths merit comments. One strength of the present study is the experimental manipulation of the healthcare provider's behavior. This type of manipulation is rare in the field of nonverbal behavior as most research has used real physician-patient interactions (Comstock et al., 1982; He et al., 2018; Henry et al., 2012). When using real interactions, it would be unethical to manipulate the behavior of the healthcare provider as it could potentially interfere with the actual treatment (Blanch-

Hartigan et al., 2013). There are several benefits of having manipulated NBs. Firstly, it provides the study with high experimental control (Mast et al., 2008a). It further allows for interpretation of the findings to the intended NB characteristics and reduces the chances of findings being attributed to individual differences between healthcare providers (He et al., 2018).

The present study further exceeds the methodological applications of previous research on manipulated NBs as most research has used static photos to illustrate the NBs in question (e.g., Kraft-Todd et al., 2017). Having actresses portraying NBs through videos can be more ecologically valid as it may capture subtle cues of nonverbal behavior that disappears in static photos. Furthermore, manipulated videos of NBs contribute to increase the generalizability of the study's findings (Kraft-Todd et al., 2017). Results of the first phase further provided evidence for the possibility of standardizing different NBs to only portray the NBs of interest.

The present study further enhances research on the NB characteristic competence. Some previous research on nonverbal behavior has inferred competence through a "white lab-coat" (e.g., Kraft-Todd et al., 2017). However, in the present study, the healthcare provider used a white lab-coat in all conditions while also having an authoritative tone of voice and dominant body posture in the competent condition. As results of the coding suggest, the healthcare provider was considered significantly more competent in the competent condition compared to the incompetent condition despite wearing a white lab-coat in both conditions. Additionally, the verbal information remained the same for all conditions. This is further an indication of the perception of competence being a result of the nonverbal portrayal of the characteristic.

## Conclusions

The purpose of the present thesis was to investigate the role of healthcare providers' NB characteristics on patient satisfaction and consisted of two phases. In the first phase, the validity and reliability of nonverbal behaviors portrayed in the survey videos was investigated. Results indicated that the videos conveyed the intended NB characteristics supporting the validity and reliability of the study. These findings were further indicative of the manipulation of NB characteristics being successful.

In the second phase, an online study was conducted to investigate whether patient satisfaction differed between participants based on the NB characteristics (competence, warmth, incompetence, coldness, and neutral) portrayed by the healthcare provider. Results indicated that participants were more satisfied with competent than incompetent healthcare providers. No differences in patient satisfaction were observed between competent and warm healthcare providers, nor between warm and cold healthcare providers.

Several practical implications may emerge from these findings. The obtained knowledge can particularly be useful in educating health-related professions on which communicative skills are important in interaction with patients to ensure patient satisfaction. Whether a patient is satisfied or not could further indicate if they comply to the proposed treatment (Larsen & Smith, 1981; Ware & Hays, 1988). Consequently, having knowledge of how the nonverbal behavior of healthcare providers affects patient satisfaction could be important in ensuring compliance to and secure successful treatment. According to results of the present study, acting competent or warm as a healthcare provider could be beneficial to contribute to these outcomes.

The thesis marks one of the first studies to investigate whether NB characteristics of healthcare providers lead to differences in patient satisfaction and to demonstrate the relationship between patient satisfaction and NB characteristics competence, warmth,

incompetence, and coldness. Therefore, despite its limitations, the study yielded interesting findings that merit further investigation.

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