Bachelor's thesis

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

Candidate number: 10099

Effects of age on impression of healthcare provider nonverbal behavior

Bachelor's thesis in Psychology
Supervisor: Hojjat Daniali
May 2023

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Self-declaration

This is an individual written thesis. Writing has been conducted individually, following the APA Manual seventh edition, with guidance and feedback from the supervisor Hojjat Daniali.

The students were given some articles from the supervisor to start with. I later conducted my own literature search, mainly through Google Scholar and NTNUs search engine Oria.no.

A hard drive with videos of two actresses was shared with the 6 students. The students went through the videos and chose those fitting the survey design. Some of the students edited the videos to fit in the survey. In collaboration, the students designed the online survey. The students also recruited participants through distributing an online link and hanging up flyers on different campuses and downtown.

Another bachelor student and I converted the survey responses into an excel file, and then converted it into an SPSS-file. The file was shared with the other bachelor students.

I have cleaned the data set and done analyses, calculations, and the interpretations myself. All tables have also been created by me. Daniali have been giving feedback throughout the process.

I would like to thank Daniali for the engagement, giving advice and feedback, as well as being available to answer questions regarding this thesis. I would also like to thank my peers for good teamwork, long days at school, and good discussions both at school and in the group chat.

Abstract

Nonverbal behavior (NB) plays an important role in human communication. In healthcare, caregiver NBs are important, but not much is known about how patients age can affect the perception of such NBs. This thesis aims to investigate if age affect how NBs are interpreted. To test this, a two phased study was developed. In phase one a series of videos showing a healthcare provider recommending a pain-relieving cream while displaying different nonverbal characteristics were tested for validity and reliability; the nonverbal characteristics were Competent and professional, Warm and friendly, Enthusiastic and interested, Incompetent and unprofessional, Cold and unfriendly, Unenthusiastic and bored, and Neutral. Seven coders rated videos displaying various NBs using a researcher made NB characteristic rating scale. The results supported the reliability and validity of the NB video conditions and the NB rating scale, rating the NB characteristics of Competent, Warm, Interested, Incompetent, Negative, Bored, Interested, Anxious, and Intimidated and unsure. In the second phase, the validated NB conditions were used in an online survey and 119 participants were asked to watch the videos and rate them. Then the participants were grouped into two age groups of 18-40 and 41-60. The effect of age in perception of NBs were investigated. The results showed that age has an effect on perception of negativity, anxiety, intimidation and interest. Results could have implications for healthcare. Because not every age group interpret NBs the same way, healthcare providers could adjust their NBs based on their patients age to improve healthcare consultations and treatment satisfaction.

Keywords:

Nonverbal behavior

Healthcare

Age

Nonverbal behavior (NB) consists of all the elements included in interaction, except for the words spoken (Blanch-Hartigan et al., 2018). Elements such as gestures, facial expressions, body position and vocal cues is a NB (Blanch-Hartigan et al., 2018). Research indicates that about 60-65% of the social meaning individuals derive from interpersonal interactions is from nonverbal behaviors (Rosenthal-von der Pütten et al., 2019). Absence of NBs, or trying to act neutral, can facilitate negative emotions in many situations (Blanch-Hartigan et al., 2018). In the same way the presence of a smile can facilitate positive emotions, not smiling can facilitate negative emotions (Blanch-Hartigan et al., 2018). NBs can even contradict what one is saying. In these situations, nonverbal signals are often perceived as the most reliable information to interpret (Vogel et al., 2016).

The NB can be measured in both micro and macro level. Micro level NBs includes specific behaviors such as smile or eye contact, body movements, tone of voice, and interpersonal proximity (Blanch-Hartigan et al., 2018). Macro NBs is a collection of micro level behaviors, and they convey a psychological meaning. Examples of macro NB is dominance and anger (Daniali & Flaten, 2019). NBs can also be divided into positive and negative. The positive NBs convey a positive emotion, relationship, or attitude, while the negative NBs convey a negative emotion, relationship, or attitude. Examples of positive NBs are smiling and more eye contact, while negative NBs are no smiling and no eye contact (Daniali & Flaten, 2019).

In healthcare settings and therapeutic relationship, the nonverbal communication between the health care provider and the patient holds vital importance (Hall, et al., 1995). Nonverbal communication is considered a predictor of patient outcomes and clinical effectiveness (e.g., Hall, et al., 1995), and helpful in building a physician-patient relationship (Silverman & Kinnersley, 2010). The clinician`s warmth and empathy are linked to better treatment adherence and higher treatment satisfaction (He et al., 2018). Research also

indicates that positive NBs of health care providers, for example smiling and keeping a closer distance between the patient, contributes to lower reported pain (Daniali & Flaten, 2019). Negative NBs, such as not looking at the patient and keeping a greater distance from them, can contribute to higher pain reporting (Daniali & Flaten, 2019). However, individual differences might affect how patients perceive the NBs.

Aging can potentially play a part in how different NBs are interpreted. A meta-analysis of 28 data sets including 705 older adults and 962 younger adults used four modalities to examine age differences in emotion recognition. The mean ages of the older adults ranged between 56.1 – 76.9 years, while the mean ages of the younger adults ranged between 19.2 – 29.9 years. They used NB channels of voices, faces, bodies/context, and matching faces to voices, and found that older adults had greater difficulty recognizing anger, fear, sadness, surprise, disgust, and happiness in all the modalities (Ruffman et al., 2008).

Studies also indicates that seniors have a greater tendency to misinterpret emotional display through NBs than younger adults (Rosenthal-von der Pütten et al., 2019). The group of young adults were 18-35 years old, while seniors age ranged from 52-91 years. They explored what effects dominant NB shown by virtual agents had on different age groups. More specific, they found that the older participants, generally rated the virtual agent more positively than younger adults (Rosenthal-von der Pütten et al., 2019).

Despite the importance, not much is known about the effects of patients age in perception of healthcare providers NBs. Previous research has focused much on how different emotions are interpreted in different age groups. A gap still open in the field includes how different age groups interpret different NBs, not displayed as different emotions, but showing NB characteristics of a person indicative of his/her psychological state. Examples of this can be dominance, competence, warmth and friendliness and interpersonal enthusiasm. These NB

characteristics can be important in healthcare settings. Warmth is for example found to contribute to higher expectations of treatment effects (He et al., 2018).

People perceived as warm and competent, often elicit positive emotions in others (Fiske., et al, 2007). At the same time, people lacking warmth and competence, often elicit negative feelings in others (Fiske., et al, 2007). It is also indicated that people high on one dimension (e.g., warmth), and low on the other dimension (e.g., competence), elicit ambivalent affective and behavioral reactions in others (Fiske., et al, 2007). Healthcare professions are stereotypically expected to be warm (Brambilla et al., 2010). Both warmth and competence are associated with both greater trust in healthcare providers and satisfaction with treatment outcomes (Ashton-James et al., 2019). This implies that healthcare providers showing warm and competent traits and NBs can be perceived by the patient to be more successful in treating them, thereby enhance the healthcare consultation. It is therefore suggested that the impression of the healthcare provider could be shaped by their behavior (Brambilla et al., 2010).

The aim of this thesis is to investigate if older and younger adults have a tendency to interpret the impression of macro NBs differently. The focus will be on the characteristics "Warm and friendly", "Competent and professional", "Enthusiastic and interested" as well as their contradictions "Cold and unfriendly", "Incompetent and unprofessional", "Unenthusiastic and bored" and "Neutral".

To investigate this, a two phases study was developed. The first phase including testing the validity and reliability of videos displaying different NB characteristics. The videos included two professional actors playing a script where they played the role of a professional healthcare provider and guided participants through a pain stimulation experiment. The script was played out while displaying seven medically important NB characteristics; warm and friendly, competent and professional, enthusiastic and interested,

cold and unfriendly, incompetent and unprofessional, unenthusiastic and bored, and neutral. These videos were originally designed for another experiment wherein the videotaped healthcare provider guided participants through a pain experiment and introduced a pain-relieving cream to them. Professional actors played the role as healthcare providers. They were using the same script, and in each condition, they displayed specific NB. Participants were divided into different conditions. Every condition got the same verbal information but differed in the healthcare providers expressed macro NB.

Before including the videos in the study, the validity and reliability of the macro characteristics displayed in the videos had to be approved. It is desirable that the videos expressed the wanted macro NBs. Thus, before the online study was launched, a group of undergraduate students received training on how to code the NBs and then rated the videotaped NB characteristics. Because the meaning one ascribe to NBs can be culturally and contextually dependent, there is a lot of factors to consider while coding. There is not yet a set framework for coding NBs (Blanch-Hartigan et al., 2018). In this project, the coders rated 14 different videos on 24 items with a 5-point Likert scale. Afterwards, the coders tested the inter-rater reliability and intra-class correlation. The video conditions and the NB rating scale were then used in an online survey to test the second phase, investigating the role of age on the judgement of the seven NB characteristics.

Several hypotheses were tested. Phase one: a) the coding items held acceptable reliability; b) the coding of NBs was consistent across coders; c) the NBs were consistent across actors; d) the NB conditions expressed the NB characteristics they were intended to (validity testing). Phase two: e) the participant perceived the NB conditions to express the characteristics they were intended to; f) younger adults will perceive more warmth from the NB conditions than older adults.

Phase 1, validation of NB conditions

Methods

Phase one of this study included testing validity and reliability of macro NB. Seven coders rated videos displaying different NBs. To test if the items held acceptable reliability, Cronbach's alpha and intra-class coefficient (ICC) was computed. This tested if the coding of NBs were consistent across coders. In addition, an independent t-test was conducted to check if the NBs were similar across actors. A one-way MANOVA investigated if the NB conditions expressed the characteristics they were intended to.

Coders

The coders of the videos (N = 7) were all females, and students at the department of psychology at NTNU. The age ranged from 21 to 25, M = 22.57, SD = 1.151. All of the students were Norwegian speaking, and fluent in English. The coders received training on coding NB form a NB expert.

Actors

Two professional actors played the role of a professional healthcare provider. This was done to control for the halo effect, which is people's tendency to attribute socially desirable traits to those individuals considered more physically attractive (Batres & Shiramizy, 2022).

Before recording, both of the actresses got training in how to convey the different NBs. They received 10 hours of training from the NB expert Mollie Ruben.

The performances were repeated until a desirable expression was recorded. A nonverbal communication researcher (Hojjat Daniali) and a professional actor were present at the time of filming and provided feedback, based on the general impression of the nonverbal performances.

Both the actresses were Caucasian Norwegian females. They were also slim, in their late twenties and a bit higher than average, wearing a white lab coat and light makeup. This

was done to make them fit a usual health personnel stereotype to increase credibility (Mercer et al., 2008).

Videos

The videos used were created for a study testing the effects of NBs on pain. The verbal script was identical across the videos and only the NB characteristics of the videos differed. These videos included the healthcare provider introducing the experiment, an introduction of the procedure for the pain stimulation and the pain-relieving cream, an instruction to report the stress and alertness scale, and last, an instruction to fill out a scale about satisfaction with the lead experimenter.

The videos used in the survey were selected on the basis of fitting a story presented to the participants.

There were seven conditions of NBs played by two actors which resulted in a total of 14 videos. The videos of one condition were around 3 minutes long.

Measurements

Coding log

A researcher made NB-rating scale was developed for the purpose of the study. The scale was used to rate the expressed macro NBs in the videos. The displayed NBs were tested by measuring the coders general impression of them. This was done by asking the coders to rate 24 statements, about the health care provider, like “How much did the healthcare provider seem interested”, on a Likert scale. They were told to go with their first impression and not overthink it. The Likert scale ranged from 0 to 4, where 0 indicated “not at all”, and 4 indicated “very much”. This was done for all the 14 different videos the coders watched.

Nonverbal characteristics

The actors were asked to play the verbal scripts while expressing the desired NBs. In the condition “Warm and friendly”, the actors were asked to express frequent smiling,

enhanced eye contact, welcoming body postures with expressive hand movements, and speak with a warm and friendly voice. For the “Competent and professional” condition the actors showed serious facial expressions, limited smiling, more dominant body gestures and hand movements. They also spoke with an authoritative tone of voice. The “Enthusiastic and interested” condition included excited facial expressions with longer gaze, an enthusiastic and energetic tone of voice, and enhanced body movements and open body gestures. In the “Neutral” condition the actors kept all their NBs neutral throughout the recording. They did not look much at the camera except one straight look in each dialogue. They had a standard distance to the camera (one meter), a flat and plain face, did not move their hands, had no body movement, a straight sitting position (not leaning forward nor backward), and they had a monotonous tone of voice. The “Cold and unfriendly” conditions included almost no smiling, minimal gaze, a cold tone of voice, and a closed and defensive body posture. In the condition “Incompetent and unprofessional” the actors showed anxious facial expressions and tone of voice, had worried eye and lip movements, and agitated body movements. In “Unenthusiastic and bored” the actors showed bored facial expressions, minimal gaze, flat and monotonous tone of voice, and bored body movements.

Procedure

Some of the coders edited the videos for the coding. The coders watched 14 different videos, each being around 3 minutes long.

The coding was conducted for all the coders simultaneously in the same room. Coding was done individually, and the coders did not consult the responses with each other during the process. Video and audio were displayed on a screen simultaneously. The coders first watched and rated the positive conditions for both actors, and then the negative conditions. In the end they watched the neutral conditions.

Data screening

The data had no missing values, and no outliers. The bachelor students converted the data from excel to SPSS.

24 new variables were made, based on the sums of all items. Reliability tests was conducted on all of the items. The items Dominant, Empathic, Passive and submissive and Fake showed low reliability. Therefore, were not included in the analysis.

The assumption of normal distribution was investigated using Shapiro-Wilk and Kolmogorov-Smirnov tests. A Levene's test was used to check for homoscedasticity.

After running the MANOVA analysis a Tukey post-hoc test was chosen to follow up significant Main effects because it is robust (Field, 2018).

Statistical analysis

The data was analyzed by using IBM SPSS 27.0.0, with an alpha level of 0.05. To check the inter reliability of the coder's ratings, a Cronbach's alpha was computed for every item. To test the inter-rater reliability, intra-class coefficient (ICC) was conducted. An independent t-test was also conducted, to test the differences between the two actors (reliability testing).

To test the validity of the NB conditions, a one-way MANOVA was conducted with the factor Condition (Competent and professional, Warm and friendly, Enthusiastic and interested, Incompetent and unprofessional, Cold and unfriendly, Unenthusiastic and bored, and Neutral) on the ratings of Competent, Warm, Enthusiastic, Incompetent, Negative and Bored as the dependent variable. It investigated the differences in NBs between the NB conditions.

Ethics

No ethical approval was needed for phase 1 because no sensitive information was collected.

Results

The descriptives for the coding of the items are provided in table 1.

Table 1

Mean and standard deviation of items rating NB characteristics across conditions (N = *7*)

NB video	Competent	Warm	Interested	Incompetent	Negative	Bored
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
a	3.93 (0.20)	2.36 (0.51)	3.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
b	3.07 (0.10)	3.79 (0.10)	3.86 (0.20)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
c	3.00 (0.00)	2.79 (0.10)	3.71 (0.00)	0.14 (0.00)	0.00 (0.00)	0.00 (0.00)
d	0.14 (0.00)	1.36 (0.30)	0.86 (0.00)	3.93 (0.10)	0.21 (9.10)	0.57 (0.40)
e	2.64 (0.30)	0.36 (0.30)	0.93 (0.10)	0.29 (0.00)	3.86 (0.20)	1.57 (0.40)
f	0.79 (0.30)	0.71 (0.10)	0.00 (0.00)	2.29 (0.00)	3.00 (0.61)	4.00 (0.00)
g	1.57 (0.40)	1.00 (0.40)	0.71 (0.40)	0.29 (0.00)	0.36 (0.51)	0.43 (0.40)
h	2.16 (1.32)	1.67 (1.32)	1.87 (1.54)	0.00 (1.47	0.92 (0.35)	0.94 (1.42)

Note. M = mean, (SD) = standard deviation, a = Competent & unprofessional, b = Warm & friendly, c = Enthusiastic & interested, d = Incompetent & unprofessional, e = Cold and unfriendly, f = Unenthusiastic and bored, g = Neutral, h = total rating

Reliability analysis (Hypothesis a)

Cronbach's alpha was computed for every item. The results of Cronbach`s alpha showed acceptable values for 23 coding items, $\alpha > .70$ (Field, 2018). Fake scored $\alpha = .50$.

Internal consistency of the items (Hypothesis b)

ICC was computed for every item. All items except Dominant, Empathic, Passive and submissive, and Fake had acceptable ICC values over .60. This suggested that all coding items, besides Dominant, Empathic, Passive and submissive and Fake was in acceptable range, suggesting good agreement in rating of the items between the coders for both actors in total.

Potential differences between actors (Hypothesis c)

The differences between the two actors in the ratings of Competent, Warm, Interested, Incompetent, Negative and Bored was not significant, $p > .05$. The ratings of NB characteristics for both actors will be merged in further analysis.

Differences in NBs between videos (Hypothesis d)

A one-way MANOVA was conducted to investigate the differences in NBs between NB conditions.

The main effect of Condition was significant for all dependent variables, $Fs(6,7) = > 39.611$, $p < .001$. Therefore, the post-hoc analyses were followed up.

For Competence the condition "Competent and professional" was significantly rated as more competent than the condition "Incompetent and unprofessional", $\Delta M = 3.79$, $SE = 0.23$, $p < .001$, and the condition "Neutral", $\Delta M = 2.36$, $SE = 0.23$, $p < .001$.

For Warm the condition "Warm and friendly" was significantly rated as warmer than the condition "Unenthusiastic and bored", $\Delta M = 3.71$, $SE = 0.30$, $p < .001$, and the condition "Neutral", $\Delta M = 2.79$, $SE = 0.30$, $p < .001$.

For Interested the condition "Enthusiastic and interested" was significantly rated as more interested than the condition "Unenthusiastic and bored", $\Delta M = 3.71$, $SE = 0.17$, $p < .001$, and the condition "Neutral", $\Delta M = 3.00$, $SE = 0.17$, $p < .001$.

For Bored the condition "Unenthusiastic and bored" was significantly rated as more bored than the condition "Warm and friendly", "Competent and professional" and "Enthusiastic and bored", $\Delta M = 4.00$, $SE = 0.27$, $p < .001$, and the condition "Neutral", $\Delta M = 3.57$, $SE = 0.26$, $p < .001$.

For Incompetent the condition "Incompetent and unprofessional" was significantly rated as more incompetent than "Warm and friendly" and "Competent and professional", $\Delta M = 3.93$, $SE = 0.04$, $p < .001$, and the condition "Neutral", $\Delta M = 3.64$, $SE = 0.04$, $p < .001$.

For Negative the condition "Cold and friendly" was significantly rated as more negative than "Warm and friendly", "Competent and professional" and "Enthusiastic and bored", $\Delta M = 2.86$, $SE = 0.31$, $p < .001$, and the condition "Neutral", $\Delta M = 2.50$, $SE = 0.31$, $p < .001$.

Discussion

Results revealed four key findings: a) The coding items held acceptable reliability; b) the coding of NBs was consistent across coders; c) the NBs were similar across actors; d) the NB conditions expressed the characteristics they were intended to.

Cronbach's alpha measured how closely related the coding items were. The internal consistency was high for the NB rating items, showing that the items were rated consistently by the coders, which is a sign of reliability. The only exception was for the item Fake. These results told us that even though the coders did not have an operationalized definition of the coding items, they did have the same understanding of most of them. This meaning for example that when the coders rated Competence in one NB conditions, they all rated Competence equally high or low. Knowing this the same coding items can be given to the survey participants without operationalized definitions.

The ICC showed that the coders were consistent in their ratings of every coding item, except for the items Dominant, Empathic, Passive and submissive and Fake. All other coding items were consistent, indicating that they are rating what they are supposed to. A potential reason for the non-consistent ratings of Dominant, Empathic, Passive and submissive and Fake between coders could be that the videos were not originally made to express such psychosocial impressions. Moreover, the coders did not operationalize a clear definition of the coding items.

The actors did not differ in how their NBs were perceived on any items. This is supporting that the actors were similar in how they presented the NBs and indicates that the results were not due to individual differences between the actors but due to the NBs. It further supports that the manipulation of the NB characteristics was successful for both actors.

The results demonstrated that the coding items Competent, Warm, Interested, Incompetent, Negative and Bored all received significantly higher ratings in their related NB

condition compared to the other NB conditions, including “Neutral”. Competence was for example rated highest in NB condition “Competent and professional”. This is an important finding. It is proof of concept and indicates that that the manipulation of NBs was successful, and that the NB conditions displayed the NBs they were intended to.

Results also shows that the biggest difference between conditions was not always between the counterparts. “Warm & friendly” had a larger different from “Unenthusiastic & interested” compared to “Cold & unfriendly”. Despite this, results shows that the biggest difference in the positive loaded conditions always was with one of the negative, and the biggest difference in the negative loaded conditions was always one of the positive loaded, meaning it was always a consistent difference between positive and negative NBs. This indicates that the coders perceived a greater difference between positive and negative NBs.

An investigation of the “Neutral” condition revealed that the negatively loaded coding items, Incompetent, Negative and Bored, showed low ratings in “Neutral” condition, while the positively loaded coding items, Competent, Warm and Interested showed low to moderate ratings in “Neutral” condition. This indicates that the coders perceived fewer negative NBs in the “Neutral” condition. Conversely, despite the effort of reducing them, the coders perceived some positive NBs in this condition. Still, because all coding items had lower ratings in the “Neutral” condition, it shows that the NBs were sufficiently reduced here. Indicating that “Neutral” can be used as a control group.

Phase two, the role of age in interpretation of nonverbal characteristics

Methods

Phase two of this study investigated if age had an effect on perception of NBs of healthcare providers. Responses from an online survey was first used to further validate the NB videos, and later in two-way ANOVAs to analyze the effect of age and condition on each of the coding items.

Participants

The survey could be completed from 15.03.2023 to 17.04.2023. The total number of participants completing the survey was 139, but only 119 were included due to exclusion criteria (see data screening). In “Competent and professional” condition it was 19 participants, in “Warm and friendly” it was 21, “Enthusiastic and interested” had 18 participants, “Incompetent and unprofessional” had 13, “Cold and unfriendly” had 12, “Unenthusiastic and bored” had 23, and “Neutral” included 13 participants.

The respondents age ranged from age 18 to 60, M = 33,18, SD = 13,837. 79 were females (66,4%), and 40 were male (33,6%). No participants identified as “other” sex (0%).

Measurements

Coding log

The survey asked participants to rate the same coding log as the coders used in phase one to validate the displayed characteristics in the videos used in the survey.

Control question

The survey included a control question asking, “What was the name of the pain-relieving cream introduced by the videotaped experimenter?”. Three different answer options were presented: “Thermoreceptor”, “Embla” and “Emle”. The pain-relieving cream was introduced in the videos as “Embla”, and this was the correct answer. The control question was included to make sure the respondents were attentive while answering the survey. Participants answering this question wrong were excluded.

Conditions

The NB conditions included in this study was “Competent and professional”, “Warm and friendly”, “Enthusiastic and interested”, “Incompetent and unprofessional”, “Cold and unfriendly”, “Unenthusiastic and bored”, and “Neutral”.

Procedures

An online survey was conducted. The participants were told they could participate in a project investigating how different characteristics of a healthcare provider can improve healthcare consultations. They were told researchers had developed an experiment including a videotaped healthcare provider guiding participants through a pain simulation and then introducing a treatment for the pain. The participants were told to imagine as if they were participating in the experiment and then watch the videos and answer questions about the characteristics and communicational quality of the healthcare provider.

The survey was made in nettskjema.no, a site made by the University in Oslo. It was developed 14 different versions of the questionnaire. This was because the surveys included seven different conditions, distributed on 2 actors. The conditions were called “Warm and friendly”, “Competent and professional”, “Enthusiastic and interested”, “Cold and unfriendly”, “Incompetent and unprofessional”, “Unenthusiastic and bored”, and “Neutral”.

Totally 13 questions were included in the survey, and it also consisted of four video chunks. All of the surveys consisted of the same questions, and the videos consisted of the same verbal information. The videos only differed in what NB the actresses displayed. The respondents only answered one of the surveys.

After a preface, the participants were asked to give consent, before they could fill out the survey. The survey started with demographic questions. Including their age, with a drop-down menu where they could put in their age between 17 and 100 years.

The first video presented in the survey was a healthcare provider introducing the experiment. Then, the healthcare provider introduced the procedure for the pain stimulation and also the pain-relieving cream and asked them to answer a question about expected pain reduction. The next video talked about the participant rating their nervousness and stress level on a scale. The last video asked the participants to rate their satisfaction.

This thesis includes questions regarding age, the NB rating scale and a control question.

Nettskjema.no randomized the respondents to different surveys by using block randomization. This design randomized participants into groups with equal sample size, which ensured a balance in sample size over time.

Data screening

Two of the coders converted the survey data set from an Excel file to an SPSS file. The data had no missing values due to not being able to turn in the survey without answering every questions.

The exclusion criteria were being under 18 years and over 60 years. Those over 60 years old were excluded because they were outliers in the data set. Participants spending under 7 minutes to complete the survey was also excluded due to the assumption that participants need to use a minimum of time when answering a survey (DeSimone et al., 2015). Participants spending more than 1 hour completing the survey was also removed, as this indicated inattentiveness. In addition, participants answering the control question wrong was also excluded, as this also indicated inattentiveness. A total of 20 participants were excluded.

A new variable was made for the participants in the survey. The variable consisted of two groups, based on the participant's age. Group 1 ranged from 18-40 years old, and group 2 ranged from 41-60 years old.

Levene`s test reviled that 2 coding items was significant. Interested, $p = .03$, incompetent, $p < .001$, indicating that 4 out of 6 coding items had equal variance. The Kolmogorov-Smirnov and Shapiro-Wilk tests were significant for all coding items, $p < .05$. This indicated that all the dependent variables in the MANOVA was non-normally distributed. MANOVA is a robust analysis, and the violation of these assumptions is not a concern.

Statistical analysis

As a further validity check for the survey responses, an MANOVA for ratings of items was conducted. The coding items was entered as the dependent variable, and conditions as the independent variable. A Gabriel post-hoc test was chosen because it was not equal group sizes. A Levene`s test was computed to assess the equality of variances. Kolmogorov-Smirnov and Shapiro-Wilk tests was computed to check for normal distribution.

To test the role of age in perception of the NBs, participants were categorized into two groups based on their age: Group 1 including those aged 18-40 years old, and group 2 including those between 41-60 years old. Then the new factor was used in 20 two-way ANOVAs, one for each of the 20 coding items, having Age (two levels; 18-40 as level one, and 41-60 as level two) and Condition (seven levels; Warm and friendly, Competent and professional, Enthusiastic and interested, Cold and unfriendly, Incompetent and unprofessional, Unenthusiastic and bored, and Neutral) as the independent variables, and the coding items as the dependent variable. All significant interaction effects were followed up by Bonferroni post-hoc tests.

Ethics

No ethical approval was needed because no personal data was collected. The study followed common ethical principles for research involving human subjects, such as the Declaration of Helsinki (World Medical Association, 2013).

Results

The descriptives for rating of NB characteristics are provided in table 2.

Table 2

Mean and standard deviation of items rating NB characteristics across conditions (N = *119*)

NB video	Competent *M (SD)*	Warm *M (SD)*	Interested *M (SD)*	Incompetent *M (SD)*	Negative *M (SD)*	Bored *M (SD)*	Anxious *M (SD)*	Intimidated and unsure M (SD)
a	2.95 (0.83)	2.00 (0.92)	2.65 (0.75)	0.20 (0.41)	0.45 (0.61)	0.80 (0.83)	0.45 (0.76)	0.20 (0.41)
b	2.67 (0.80)	2.19 (1.25)	2.38 (1.61)	0.29 (0.64)	0.33 (0.66)	0.81 (1.08)	0.57 (0.87)	0.52 (0.93)
c	2.75 (0.64)	2.25 (0.91)	3.05 (0.69)	0.35 (0.67)	0.33 (0.57)	0.35 (0.745)	0.30 (0.47)	0.30 (0.66)
d	0.77 (0.93)	1.23 (0.93)	0.85 (0.99)	2.54 (1.33)	1.69 (1.03)	2.38 (1.04)	2.23 (1.48)	2.92 (1.12)
e	1.58 (1.00)	0.75 (0.75)	1.42 (1.17)	0.83 (0.72)	1.92 (1.08)	2.25 (1.29)	0.42 (0.79)	0.58 (0.90)
f	1.60 (0.82)	0.48 (0.92	0.48 (0.96)	1.16 (0.94)	2.24 (1.09)	3.24 (1.30)	0.52 (0.71)	0.72 (0.74)
g	2.31 (0.86)	1.31 (1.38)	1.54 (1.20)	0.62 (0.65)	1.00 (0.91)	1.69 (1.11)	0.92 (1.12)	0.69 (0.95)
h	2.27 (1.06)	1.49 (1.22)	1.81 (1.35)	0.78 (1.04)	1.10 (1.16)	1.62 (1.49)	0.69 (1.02)	0.75 (1.10)

Note. M = mean, (SD) = standard deviation. a = Competent & unprofessional, b = Warm & friendly, c = Enthusiastic & interested, d = Incompetent & unprofessional, e = Cold and unfriendly, f = Unenthusiastic and bored, g = Neutral, h = total rating

Differences in NBs between NB conditions (Hypothesis e)

The main effect of Condition was significant for all dependent variables, $Fs(6,117) = 9.61$, $p < .001$. Therefore, the post-hoc analyses were followed up.

For Competence the condition “Competent and professional” was significantly rated as more competent than the condition “Incompetent and unprofessional”, $\Delta M = 2.81$, $SE = 0.293$, $p < .001$, and the condition “Neutral”, $\Delta M = 0{,}624$, $SE = 0.293$, $p < .001$.

For Warmth the condition “Warm and friendly” was significantly rated as warmer than the condition “Unenthusiastic and bored”, $\Delta M = 1.71$, $SE = 0.303$, $p < .001$. It was no significant difference when compared to condition “Neutral”, $\Delta M = 0.88$, $SE = 0.361$, $p = .269$.

For Interested the condition “Enthusiastic and interested” was significantly rated as more interested than the condition “Unenthusiastic and bored”, $\Delta M = 2.57$, $SE = 0.294$ $p < .001$, and the condition “Neutral”, $\Delta M = 1.51$, $SE = 0.349$, $p < .001$.

For Bored the condition “Unenthusiastic and bored” was significantly rated as more incompetent than “Enthusiastic and interested”, $\Delta M = 2.89$, $SE = 0.321$ $p < .001$, and the condition “Neutral”, $\Delta M = 1.55$, $SE = 0.365$, $p = .010$.

For Incompetent the condition “Incompetent and unprofessional” was significantly rated as more incompetent than “Competent and professional”, $\Delta M = 2.34$, $SE = 0.282$, $p < .001$, and the condition “Neutral”, $\Delta M = 1.92$, $SE = 0.311$, $p = .003$.

For Negative the condition “Cold and unfriendly” was significantly rated as more negative than “Enthusiastic and interested”, $\Delta M = 1.61$, $SE = 0.313$, $p = .004$. It was not significantly different from the condition “Neutral”, $\Delta M = 0.92$, $SE = 0.343$, $p = .163$.

The effect of age on impressions of NBs (Hypothesis f)

Multiple two-way ANOVAs was performed to analyze the effect of Age and Condition on the different coding items, and only the items where the main or interaction effects of age was significant are reported here.

Results showed that when Interested was used as the dependent variable, the main effect of age became marginally significant, $p = .047$. A post-hoc test showed that age group 41-60 rated higher interest for condition “Warm and friendly” as compared to age group 18-40, $\Delta M = 1.14$, $SE = 0.450$, $p = .013$. It also showed that the age group 41-60 rated Interest higher for the condition “Cold and unfriendly” as compared to age group 18-40, $\Delta M = 1.25$, $SE = 0.596$, $p = .038$.

The main effect of Age had a statistically significant effect on Negative, $p = .030$. A post-hoc test showed that age group 18-40 rated higher negativity for condition "Unenthusiastic and bored" as compared to age group 41-60, $\Delta M = 1.04$, $SE = 0.435$, $p = .018$.

For Anxious, the main effect of Age, $p = .092$, was not significant. However, the interaction of Age by Condition was significant, $F(6,105) = 3.04$, $p = .009$. A post-hoc test showed that age group 18-40 rated highest anxiety in "Incompetent and unprofessional" as compared to the age group 41-60, $\Delta M = 1.357$, $SE = 0.462$, $p = .004$. The post-hoc test also showed that the age group 18-40 rated higher anxiety for condition "Neutral" compared to the age group 41-60, $\Delta M = 1.175$, $SE = 0.473$, $p = .015$.

For Intimidated and unsure as the dependent variable, there was a statistically significant interaction between Age and Condition, $F(6,105) = 3.66$, $p = .002$. A post-hoc test showed that the age group 41-60 rated intimidated and unsure higher for the condition "Cold and unfriendly" as compared to the age group 18-40, $\Delta M = 1.000$, $SE = 0.465$, $p = .034$. The post-hoc test also showed that the age group 18-40 rated Intimidated and unsure higher for the condition "Incompetent and unprofessional" as compared to the age group 41-60, $\Delta M = 1.405$, $SE = 0.423$, $p < .001$.

Discussion

The present study examined the effects of age on perception of NBs. There were two key findings: e) The participants perceived that the NB conditions expressed the intended characteristics; f) younger adults did not perceive more warmth from the NB conditions than older adults.

Several findings from the validity check of the conditions were replicated using online participants, which provides more validity for the conditions. The coding items received significantly higher ratings in their related NB condition compared to other NB conditions.

It is interesting to note however, that the NB condition supposed to be displaying neutral NBs, did receive some high ratings of the coding items when compared to other NB conditions. While the coders perceived the "Neutral" NB conditions as different from all the other conditions, the survey participants, only thought the "Neutral" condition was significantly different from the "Competent and professional", "Warm and friendly" and "Cold and unfriendly" NB condition, also indicating that they thought the neutral condition was just as warm as the NB condition "Warm and friendly", just as competent as "Competent and professional", and just as negative as "Cold and unfriendly". An implication of this finding can be that the NB condition "neutral", not really display neutral NBs. These findings are in line with previous research where evidence suggest that trying to act neutral can facilitate negative emotions because the systems responsible for detecting anger may also be partially activated by a neutral face that resamples anger. (Blanch-Hartigan et al., 2018; Said et al., 2009). This could be a possible explanation for why "Neutral" was not perceived as different in Negative from "Cold and unfriendly". The results that "Neutral" did not differ from "Warm and friendly" and "Competent and professional" can however not be explained by the same research. Further research on the impact of neutral NBs can therefore be beneficial and may lead to greater knowledge.

A two-way ANOVA was conducted 20 coding items. Results indicated that age was found to have an effect on 4 of the NB characteristic items; Interest, Negative, Anxiety, Intimidated and unsure.

A significant finding on the coding item Interest reveals that age group 41-60 perceived the NB conditions "Warm & friendly" and "Cold & unfriendly" as more interested compared with age group 18-40. This could indicate that the older adults may have different perception of what both warm and cold NBs display when compared to the younger adults.

Moreover, for the younger age group, the NB characteristics of being warm and friendly of healthcare providers is perhaps perceived as a sign of being interested to their health seeker.

When looking at results from the coding item Negativity one can see that age group 18-40 rated higher Negativity for the condition “Unenthusiastic and bored” compared to age group 41-60. This means that the younger group perceive the NB characteristics of bored and uninterested as more negative than the older group. Previous research indicates that older adults are doing more decoding errors compared to younger adults, and this is especially regarding negative emotions (Manusov & Patterson, 2006). This could possibly have implications for the finding. Maybe the fact that older adults did not perceive as much Negativity in “Unenthusiastic and bored” is due to a decoding error.

In contrast to the finding of age having an effect on Negativity, when investigating if age has an effect of perception of warm NBs, it did not seem like younger adults perceived any of the NB conditions as more or less warm than what the older adults did. As mentioned, some research indicates older adults are more likely to do decoding errors. Other research on the other hand, claims that this does not mean older adults do not have the capacity to interpret successfully. Ambady et la., found that older adults (75 years old and over) decoded positive and negative facial expressions accurately when examining the facial expressions of physical therapists (Ambady et al., 2002). The older adults correctly judged therapists as warm, caring, concerned and empathic when displayed positive expressions. They also correctly perceived the therapist as distant and cold when displaying negative expressions (Ambady et al., 2002). Results like this indicates that older adults do have the ability to interpret and decode facial expressions, even though one can argument from other research that their abilities are somewhat degraded as compared with younger adults. Even though the results are coming from a population at least 15 years older than the oldest participants

included in this thesis, it shows that the decoding abilities do decrease with age, potentially also before the age of 75.

In addition, it is also important to point out that the research referred to here have investigated emotion recognition and not NBs. Emotion recognition and NB are not the same, and one should be careful using evidence from the field of emotion to the field of NB.

Results indicates that the younger adults perceive more anxiety when presented incompetent and neutral NBs compared to what older adults did. Research indicates that there is more anxiety in the population of young adults contrary to older adults. Research examining the impact of the COVID-19 pandemic on psychological distress found that younger people experienced more stressed and had more anxiety than what older adults did (Varma et al., 2021). Other research also states that anxiety has increased among young American adults (Goodwin et al., 2020). Younger adults experiencing more anxiety could be a possible explanation for why younger adults perceived more anxiety in the incompetent and neutral NBs. It may be that those who experience more anxiety also interpret more anxiety in the behavior of others due to heightened sensitivity to cues of potential threat or danger (Yoon & Zinbarg, 2007). At the same time, this is only a possible explanation as there is no basis to claim that the younger respondents in this survey indeed do experience more anxiety. It is also important to note that the research indicating younger adults having more anxiety was conducted during covid-19, which was a state of emergency, and on an American population, which means one should be careful when transferring those results to the sample in this study.

An interesting finding emerged when looking at results on “Intimidated and unsure”. Results indicates that the perception of this item differs between age groups. The older adults perceived more intimidation in the NB condition “Cold & unfriendly”. This suggests that when looking at cold and unfriendly NBs, older adults are also perceiving the person as more intimidated than what younger adults would. Contrary, results also shows that the younger

adults perceived more intimidation in the NB condition “Incompetent and unprofessional”. Suggesting that when younger adults see an incompetent person, they are also perceiving him/her as more intimidated than what older adults would. Despite this difference between age groups, both perceived intimidation high in negative loaded NBs.

General discussion

Results both from the coders and the survey participants showed that the coding items related to each of the NB conditions were given significantly higher ratings. This indicates that the NB conditions indeed do express the characteristics they were intended to.

Overall, some differences were found between the coders and survey participants when it comes to the perception of NB conditions were most different from each other. There was agreement on the perception of Competent, Warmth and Interested, but they differed in their perception of Bored, Incompetent and Negative. In general, the coders identified more differences between the NB conditions when compared to the survey participants. This indicates that the coders thought more of the NB conditions differed from each other compared to what the survey participants did.

In Bored, both coders and survey participants perceived “Enthusiastic and interested” as the most different from “Unenthusiastic and bored”, but coders also perceived “Warm and friendly” as equally different from “Unenthusiastic and bored”. In Incompetent both survey participants and coders thought “Incompetent and unprofessional” and “Competent and professional” differed the most from each other, but coders also thought “Warm and friendly” was equally different. The same is for Negative. They agreed that “Cold and unfriendly” differed the most from “Competent and professional”, but coders also thought “Cold and unfriendly” differed equally much from “Warm and friendly” and “Enthusiastic and interested”.

As mentioned, in this study it is found several age differences in interpretation of NBs. Previous research has found older adults less accurate when identifying negative and neutral facial expressions compared with positive facial expressions (Manusov & Patterson, 2006). The findings from previous research are somewhat in line whit what this study has found. Younger adults perceived more negativity in “Unenthusiastic & bored”, more Anxiety in “Incompetent & professional” and “Neutral”, and more intimidation in “Incompetent & unprofessional”. On the contrary older adults were found to perceive more Interest in both “Warm & friendly” and “Cold & unfriendly”. They also perceived more intimidation in “Cold & unfriendly.

The findings from this study indicates that warmth and competence are important characteristics in the perception of healthcare providers. It is important that the healthcare providers are aware of the impact their behavior can have on patient perceptions of them. Therefore, getting training on how to behave nonverbally based on the patients age, could potentially lead to improved healthcare consultations and higher treatment satisfaction.

Strengths and limitations

There are several limitations associated with this study. The sample size is low, which means the representation of the general public is poor. In addition, because of a convenience sampling method, it is probable that many of the participants are students, which again lower the representation of the general public. One should therefore be careful generalizing the results from this study.

The large difference in group size between the NB conditions can be problematic. Using block randomization, Nettskjema.no was supposed to ensure equal group sizes, but due to a low sample, this was not entirely successful. NB condition “Unenthusiastic and bored” had 23 participants, while “Cold and unfriendly” only had 12. This could potentially lead to reduction of statistical power, which in this case could mean that it is difficult to detect a

significant effect in the condition with smaller group sizes, even if it is one there (O`Brien & Kaiser, 1985).

Dividing the participants in only two groups can also be seen as a limitation of this study. Having multiple groups could potentially give more precise and nuanced comparisons which gives more insight to the differences. When only having participants distributed in two groups, one could potentially loose valuable information.

Because the study was conducted using an online questionnaire, it is impossible to know how attentive the participants were, despite the control question. The participant's surroundings are unknown, and it could be possible that many external factors could have affected how attentive they were, and what they answered. It is even impossible to know if the participants watched the videos included. In further studies it would be recommended doing this experiment in a more controlled environment, for example in a lab where more external factors could be controlled.

The videos included in the survey lasted around three minutes in total. One can argue that this is to short time to get an impression of the expressed NBs.

As mentioned, there is evidence that emotion recognition of facial expressions declines with age (Ruffman et al., 2008; Rosenthal-von der Pütten et al., 2019). It is important to underline that emotion expression and processing is not the same as NB. Not much is known about the effects age can have on NB. Therefore, a limitation is that the hypothesis regarding phase 2 of this thesis has been based on research regarding emotion recognition. On the other hand, this also gives this study a strength. The results presented in this thesis is a contribution to the gap currently existing field. In addition, this study not only focuses on facial expressions, which much research before has done (Manusov & Patterson, 2006). Included in this study is facial expressions, tone of voice and body movements.

A second strength is that the current study has used experimental manipulations of the healthcare providers NBs. This method is not common in the literature of NB (He et al., 2018). For example, have other research used still photos, which can contribute to missing subtle cues of NBs (Kraft-Todd et al., 2017). Using videotaped healthcare providers can be a more ecologically valid method (Kraft-Todd et al., 2017). ‘

Conclusion

This study showed that first, NBs of the healthcare providers can be reliability customized, tested and validated, and secondly that age have an effect on the NB characteristic items; Interest, Negative, Anxiety, and Intimidated and unsure.

The first phase of this thesis aimed to test the validity and reliability of enhanced NBs. Building on the results that the coding items received significantly higher ratings in their related NB condition compared to each other and “Neutral”, it seems like the training the actors got was successful in standardizing the behaviors. Validation also demonstrates the possibility of systematically manipulate NBs. Further this can have important implications for the healthcare system because it is now shown that it can be possible to systematically implement enhanced NBs in treatment settings. This can therefore contribute to an improvement of patients experience of healthcare, which further can contribute to beneficial treatment outcomes.

The second phase of this thesis aimed to investigate the effects of age on perception of NBs. Results indicates that there are some differences between age groups in how they perceive NBs. Younger adults perceived more negativity in “Unenthusiastic & bored”, more Anxiety in “Incompetent & professional” and “Neutral”, and more intimidation in “Incompetent & unprofessional”. Older adults were found to perceive more Interest in both “Warm & friendly” and “Cold & unfriendly”. They also perceived more intimidation in “Cold & unfriendly. Despite not finding a difference between the age groups when looking at how

the participants rated the coding item Warm, results suggests that interest plays a bigger part for older adults when they interpret warm and friendly NBs. These findings could have important implications for healthcare. Giving healthcare providers training in how to behave nonverbally based on which age group the patient belongs to can be beneficial because results indicates that not everyone interpret NBs the same way. What could lead to improved healthcare consultation with one patient, may not be as beneficial as when having consultation with another.

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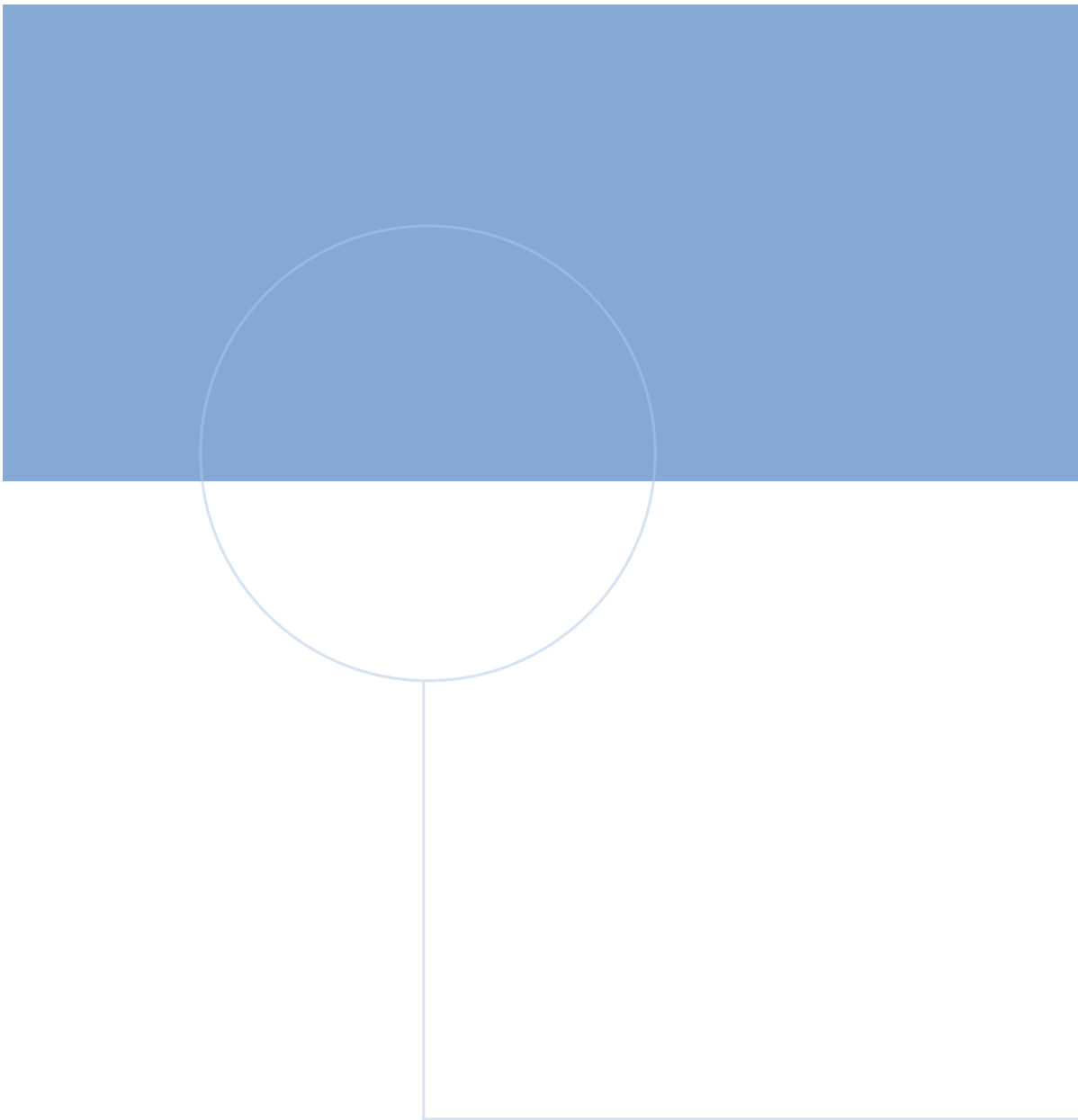

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