Methods

Participants

Participants, a minimum of 50 (with each team member recruiting 10 people) were surveyed in this project. We recruited our sample of participants throughout the Arlington and DFW area. The composition of our participant included 51individuals: 39 females and 11 males and 1 non-binary, with a mean of 17 and standard deviation of 16.8. Additionally, the ages ranged from 18-50 for these adults. In this study, participants were non-randomly selected but have unique demographics and fit criteria differently such as race, beliefs, etc. The participants' decision to participate was voluntary, they chose whether they wanted to take the survey or not, therefore, we did not compensate them.

Materials

The participants in this study went through an online survey based on healthcare physicians. The first page of the survey was the consent form, stating their voluntary participation in the study. Each response was anonymous, so no names were gathered but participants initially were asked two demographic questions, their age and gender, which helped us determine any unconscious implicit bias. Then they read a short description of a hypothetical scenario of them requiring health care. Each participant was randomly assigned an image of a physician based on the two levels and four conditions of the study. The two levels were gender and age, which consisted of four conditions: young male, young female, old male, and old female. After viewing the image, they immediately answered a set of questions.

There were different formats and scales utilized for each set of questions, but most

remained interval. When they first viewed the randomly assigned image, they were immediately asked a dichotomous question of whether the experience of the healthcare provider was important to them with a “Yes” or “No” response. Participants were then asked 5-point Likert scale questions to measure their likeability of the physician, with scores of 1, 2, 3, 4, and 5, for example: “Not likely at all”, “Slightly likely”, “Moderately likely”, “Very likely”, “Extremely likely”. We then had them answer questions similar to PQMC (Perceived Quality of Medical Care) since it tests patient comfortability; those questions asked the participants to rate the care of the physician they viewed on a scale of: “High Quality 1 2 3 4 5 Low Quality”. We also added a reverse-worded question that would measure the attention span of the participant in between the survey. After all the questions, we ended by asking them to fill a multiple-choice question (MCQ) which best described the image that they viewed to make sure their response was based on the image. After filling out the main survey, the debrief page was shown which stated the purpose of the survey and explained the study to the participants.

Procedure

Participants were recruited based on a link to a survey sent via social media platforms such as Instagram and direct messaging (DMs), excluding the people who are psychology majors. Psychology courses were excluded from the survey as it hindered our data due to their background in psychology. Through social platforms, we were able to survey more participants to help us collect our data. Once participants received the survey link, they were shown an informed consent page. On that page they were required to click on “I accept” before being redirected to the survey. Participants then followed the prompts and filled out the information requested from there. After the survey was completed, participants received verification that their

responses had been recorded. Once the responses were recorded, we, as the experimenters, collected the data and noted the data onto a spreadsheet.

The sampling procedure we utilized in the experiment was non-random sampling. Due to our focus on the age and gender of the physician and not the participants, we used a scope of participants which was easily accessible to us. This meant that the participants we surveyed were friends, family members, and classmates. Our study focused on implicit bias and the larger sample size allowed us to gain more accurate results. This helped us gain a more open perspective on what participants thought in regard to physicians and who their bias lied with.

The consent form included the main objective of the study, contact information about our research team, and a brief description of what the study entailed. The purpose, procedure, and duration were also included. Additionally, there were no potential risks involved nor compensation, but there were benefits such as their data contributing to the larger conversation.

The participants in the online study were able to view the consent form once they accessed the link. There was clarification provided regarding the confidentiality of the individual participating and their right to consent to the experiment. Following the consent form, participants were shown a screen of demographic questions regarding their age and gender. Then, participants were randomly assigned one of four healthcare providers. There were four conditions total: male physician of age 30 and under, female physician of age 30 and under, male physician of age 50 and above, and female physician of age 50 and above.

Afterwards, there were survey questions including the Likert-scale which inquired about the likelihood of scheduling an appointment with that doctor, from a scale of least likely to extremely likely. Another question asked how comfortable a participant would be with the doctor

provided on a scale of 1-10. Participants were then exposed to Perceived Quality of Medical Care questions. Additionally, the interval scale was used on the question regarding how important the experience a physician provides is, which was asked to be rated from little to extreme importance. Lastly, towards the end, participants were asked what image they received based on age and gender. Once responses were recorded, participants were shown the debriefing page.

The debrief section effectively informed participants about the different levels they were assigned to and how their responses were measured. It also stated the variables we focused on, and the importance of the data collected to aid in our hypothesis research. The study was provided in the debriefing form in case participants wanted to learn more about the study they took part in to emphasize its importance. Putting an emphasis on the study and the effect that a healthcare provider such as a doctor has on patient outcomes allowed us to determine that patients do unconsciously have bias. They also portray forms of behavior that correlated with the patient's desires or decision-making process in regard to quality healthcare.

Data Analysis

After the data collection process, there was an initial screening to determine the quality of the data collected. The screening allowed us to eliminate or reevaluate data that was potentially inaccurate and would affect our results. The means of central tendency were calculated and subsequently used to fill in any missing values based on the skewedness of the data. In cases of severe missing data and to retain the integrity of the data, certain responses were omitted entirely. To identify outliers in the data, the z-score for each feature was calculated and compared against the data. After identification, these outliers were either removed or replaced with more fitting data depending on the surrounding data in that particular response.

To code the two levels of both independent variables, both were coded as numeric variables. Variable 1 is Age and was coded as Old – 1 and Young – 2. Subsequently, Variable 2 is Gender and was coded as Male – 1 and Female – 2. This coding means that there are four possible levels that participants saw, 1.1, 1.2, 2.1, and 2.2. Further, the dependent variables were coded using numeric values based on the scale size (i.e. 5-point), which represent the responses given from participants. The score was based on the total number of possible 'points' that a participant could have earned out of a total of 35. For example, if a participant obtained a score greater than 21, this means they answered questions about comfortability and likelihood of choice more positively than someone who obtained a score below 21.

Hypotheses

The following were our four hypotheses along with statistical evaluations of each:

(H1) Female healthcare practitioners are more likely than males to be picked for care. An independent samples t-test was conducted to analyze this hypothesis. This was the appropriate statistical analysis since there was one nominal independent variable, gender of the doctor, with two levels: male or female. In other words, we compared two independent groups based on an interval (continuous) dependent variable, in this case being the likelihood of choosing a particular doctor, making it the most suitable test.

(H2) Younger doctors will be rated higher on patient comfortability compared to older practitioners. To analyze this hypothesis, an independent samples t-test was conducted. We ran this statistical analysis because there was one nominal independent variable, age of the doctor, with two levels: younger and older practitioners. Additionally, we had an interval dependent variable, comfortability ratings, measured using a questionnaire. Therefore, this test is appropriate since two separate groups were compared and examined at the same time.

(H3) Participants will feel more comfortable with having a female doctor rather than a male physician for care. Similarly, an independent samples t-test was conducted due to the

number of independent and dependent variables studied at once. We had one categorical independent variable, gender of the doctor, with two levels: male or female. This time we compared it to the interval dependent variable of comfortability ratings to find any potential gender biases.

(H4) Older physicians will have higher perceived medical competence ratings compared to younger doctors. This showcases another example of an independent samples t-test that was conducted to compare the two groups and their averages. This test was run since there was one nominal independent variable, age of the doctor, with two levels: younger and older physicians. The dependent variable in this hypothesis was perceived medical competence and its scale of measurement was interval.

Appendix

Questionnaire

Demographic Questions:

1. What is your age group?
   - 18-30
   - 31-50
   - 51 and older
   - Prefer not to say

2. How do you identify your gender?
   - Male
   - Female
   - Non-binary
   - Prefer to self-describe ____
   - Prefer not to say

Hypothetical scenario: You are in need for medical care and go through a website to book an appointment with a physician, you come across this doctor:

3. **Dichotomous Question:** First and foremost, is the experience you receive from your healthcare provider important to you?
   - Yes
   - No

Interval Scale Questions

4. Based on the image, how experienced do you think this doctor would be in diagnosing your medical condition?

1. Not experienced at all
2. Slightly experienced
3. Moderately experienced
4. Very experienced

5. Extremely experienced

5. Would you trust this doctor's medical advice?

1. Not at all
2. Slightly
3. Moderately
4. Very much
5. Completely

6. How comfortable would you feel speaking to this doctor about your health concerns?

1. Not at all comfortable
2. Slightly comfortable
3. Moderately comfortable
4. Very comfortable
5. Extremely comfortable

7. How likely are you to ask this doctor personal/sensitive questions regarding your medical condition?

1. Not likely at all
2. Slightly likely
3. Moderately likely
4. Very likely
5. Extremely likely

8. How approachable does this doctor appear?

1. Not approachable at all
2. Slightly approachable
3. Moderately approachable
4. Very approachable
5. Extremely approachable

Numerical Scale:

9. On a scale of 1-5 how competent do you think this doctor is in providing high-quality medical care?

Slightly competent 1 2 3 4 5 Highly competent

Reverse worded question:

10. Based on the image, how likely do you think this doctor is to **misdiagnose** a patient?

1. Very unlikely
2. Unlikely
3. Neutral
4. Likely
5. Very Likely

Open-ended Recall question:

11. Based on the image, what best describes the age and gender of the doctor that you viewed? (Enter: “YF” for young female, “OM” for old male, etc.)

: YF

Informed Consent

Principal Investigators: Kimberly Rodriguez Torres, Marlenne Luna, Sirjana Yadav, Natalie Pegues, Akasha Yaqub

Title of Project: Perceptions of healthcare providers

Introduction: You are being asked to participate in a research study conducted at the University of Texas at Arlington. Your participation is voluntary. Refusal to participate or discontinuing your participation at any time will involve no penalty or loss of benefits to which you are otherwise entitled. Please ask questions if there is anything you do not understand.

Purpose: As part of our study, we are looking at how patients perceive and act around healthcare providers, measured through perceived competence, patient comfortability, and likelihood of choosing that provider.

Duration and Procedure: A total of 50 individuals from different ages, race, gender, and backgrounds from the University of Texas at Arlington area will participate in this study. Additionally, family members and friends of principal investigators will participate in this study as well. This study will occur over one session. In the session (approximately 10 minutes) you will be answering questions about your past and current feelings and experiences with healthcare providers.

Please note, we will not collect data in regard to your medical or personal history; we are only concerned with research perceptions and healthcare outcomes. Results from the survey responses will be used for research purposes only. No individual participant in this study will ever receive any information pertaining to the response they give.

You will answer a survey about demographics such as age and gender. This survey is a one-time commitment. You only have to fill out the survey once and you won't be contacted again. It is important to study how these factors influence patient outcomes.

Risks: Doing online surveys will cause little or no risk to you. The only potential risk is that some participants might find certain questions to be sensitive. You can skip any questions you do not wish to answer. In addition, you may stop participating in the survey at any point without penalty. The online survey does not include any potentially triggering content.

Compensation: Because your participation is voluntary, there will be no compensation. If you change your mind about completing the survey, you are free to leave the study.

Benefits: There are no direct benefits to you. However, you are contributing to the larger body of knowledge in this field of patient-provider relationships and health.

Voluntary participation: Participation in this study is completely voluntary.

Confidentiality: Your confidentiality will be kept by assigning a unique number to you. Your name will not be linked to individual data. All answers you give will be kept confidential and only researchers working on the study will have access to the data, unless required by law. This is solely a class project and the information within this consent form will be confidential. The confidentiality of those records will be protected.

Contact Information: This research study is a class project. Any questions you have about your rights as a research subject may be directed to erin.austin@uta.edu.

As a representative of this study, I have explained the purpose, the procedures, the benefits, and the risks that are involved in this research study:

_____

Signature and printed name of principal investigator or person obtaining consent **Date**

CONSENT

By signing below, you confirm that you are 18 years of age or older and have read or had this document read to you. You have been informed about this study's purpose, procedures, possible

benefits and risks, and you have received a copy of this form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time.

You voluntarily agree to participate in this study. By signing this form, you are not waiving any of your legal rights. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or loss of benefits, to which you are otherwise entitled. Please sign below after reading all terms.

_____

SIGNATURE OF VOLUNTEER **DATE**

Study Debriefing

This study is concerned with implicit bias in the healthcare field. Previous studies have found that under some conditions people experience unconscious bias when it comes to choosing or being shown a healthcare provider. Implicit bias is a type of bias that we may not be aware of but can influence how others are perceived.

How was this tested?

In this study, you were asked to fill out a survey looking at multiple images of different healthcare providers that varied in age and gender with 2 levels. Participants performed the same tasks but received different images per level whilst receiving all levels, therefore receiving four conditions. One level included a young or old doctor, and the other level included a female or male doctor. Additionally, they responded to 1-2 questions that deviated from the original study's purpose to test the engagement level of the participant and to see if they were paying attention to the questions, also known as a reverse worded question. They performed these tasks for about 10 minutes as they filled out the survey, and they each responded to the questions following the images, reporting their ongoing thoughts about the healthcare providers.

Hypotheses and main questions:

We expected to find that older doctors would be more likely to be rated higher on perceived medical competence in comparison to younger doctors. The main question was to see if patient bias was more inclined towards older doctors as mentioned in the hypothesis for younger doctors as part of the experiment. We also expected to find that female providers were more likely to be rated higher on comfortability levels in comparison to male doctors. The main question was to see if patient bias was more inclined towards female doctors as mentioned in the hypothesis based on quality of care.

When we examine the frequency of doctors who are rated higher according to participants, we expect to find indications of patients who chose a doctor who provided quality care and gave the appropriate diagnosis which helped treat patient needs. Therefore, we are interested in how patient biases influence how they perceive doctors. We suspect when patients take a demographic such as age or gender into account, this may influence who patients return to for care.

Why is this important to study?

Studying implicit bias towards healthcare providers is important as there are patients who unconsciously feel comfortable with different healthcare providers or have a preference based on their healthcare needs. Additionally, these biases and prejudices may affect patient-doctor interactions and even disrupt care. Healthcare outcomes are likely to be impacted such as when a patient refuses treatment from a particular provider, for instance. Therefore, it is important for patients to understand when they are acting this way, even if it is unintentional.

Patients who try to suppress thoughts of bias, for example, might find themselves to be positively influenced by a doctor who is equipped with tools when they request treatment. Unconscious thoughts we hold about establishing a connection and being validated by doctors influence our biases towards receiving quality healthcare. If we rely solely on our biases, it would be difficult to distinguish between the quality of care a doctor can provide versus what others say they provide. Furthermore, questions of how and who patients choose as their healthcare providers are still open to psychological research.

What if I want to know more?

If you are interested in learning more about the biases healthcare providers encounter from patients, you may want to consult:

Kimberly Rodriguez Torres, Marlenne Luna, Sirjana Yadav, Natalie Pegues, or Akasha Yaqub. Perceptions of healthcare providers: Implicit bias through gender and age in healthcare. UTA Experiencing Research in Psych Report. If you would like to receive a report of this research when it is completed (or a summary of the findings), please contact the principal investigators at sxy8945@mavs.uta.edu, Nxp2344@mavs.uta.edu, axy7937@mavs.uta.edu, kxr8526@mavs.uta.edu,mxl1784@mavs.uta.edu.

If you have concerns about your rights as a participant in this experiment, please contact the professor at erin.austin@uta.edu.

Thank you again for your participation.