

Implicit Biases Towards Healthcare Providers Based on Age and Gender Demographics

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Abstract

Like other studies, the purpose of this study was to test whether implicit biases are present in healthcare. A total of 86 participants were made to look at images of multiple healthcare providers, who varied in age and gender with 2 levels. They then responded to a questionnaire and reverse worded questions following the images, reporting their impression of the doctors in different contexts. The 4 hypotheses that corresponded with our expected outcomes were that: Female healthcare practitioners are more likely than males to be picked for care (H1). Younger doctors will be rated higher on patient comfortability compared to older practitioners (H2). Participants will feel more comfortable with having a female doctor rather than a male physician for care (H3). Older physicians will have higher perceived medical competence ratings compared to younger doctors (H4). The results supported Hypotheses 1 and Hypotheses 4, where female healthcare providers had higher likelihood ratings ($M = 3.72$, $SD = .84$) than male healthcare providers ($M = 3.23$, $SD = .96$) and participants rated older doctors ($M = 11.83$, $SD = 1.71$) as more competent than younger doctors ($M = 10.48$, $SD = 1.74$). We discuss the implications of our results for patient comfortability and picking providers along with the effects of implicit biases in the context of healthcare.

Keywords: implicit bias, healthcare, patient comfortability, likelihood of choosing a provider, medical competence, ratings, hypothesis

Implicit Biases Towards Healthcare Providers Based on Age and Gender Demographics

When patients are seeking a healthcare provider, factors such as experience and expertise of the healthcare provider come into play. However, implicit biases do occur in potential patients looking to access healthcare in the beginning of the process. Insurance coverage, race, and accessibility add additional barriers of access. In this study, we are focusing on the impacts that race and gender have on both patients and healthcare providers. As mentioned in the source by Wheeler et al. (2019), patients in the last 5 years have demeaned 59% of physicians, which shows how prevalent patient bias is in the healthcare field. Our study focuses on patient bias and how the personality of a medical provider may influence whom a patient chooses for their healthcare needs. Additionally, the article states that social characteristics of physicians shape how patients view healthcare providers in a more disrespectful manner (Wheeler et al., 2019). These factors could impact who a patient chooses based on past experiences due to the social aspects involved.

However, there are a variety of services/platforms designed to help people find healthcare providers. ZocDoc is one example of a platform which is used for finding healthcare providers. On ZocDoc, as described by Sehgal et. al (2024), “patients have easy access to a wealth of information about their health care providers, as well as a relatively straightforward means to express their satisfaction.” Although younger physicians are regarded to provide greater levels of comfort to patients, older physicians are viewed as more experienced in their fields. The social characteristics a healthcare provider has affects how a patient might rate them, and age and gender are among those characteristics (Sehgal et al., 2024). That may influence who a patient is likely to choose. The question here is: do patients showcase implicit bias based on age and gender when deciding on a healthcare provider?

Implicit Bias

For years, the concept of an unconscious mental process has been a highly contentious subject in psychology research (Greenwald and Kreiger, 2006). Implicit bias is defined as a negative attitude that is not consciously held by a person that affects relationships and social interactions. Implicit bias can also be referred to as unconscious bias, as it has been understood that many people are unaware of their bias and do not realize they are expressing bias (Suveren, 2022). It is understood that implicit bias is more likely to have effect when individuals do not have the mental capacity to make an informed and thoughtful decision (Saha and van Ryn, 2011). This idea of an “unconscious bias” has also been studied in a variety of environments, such as in politics, education, and in the medical field (Kinder and Ryan, 2015; Quereshi & Okonofua, 2024; Van Ryn & Saha, 2011). While this bias is not always violent or hateful, it has still been found to affect interpersonal relationships and how individuals interact with the world.

The patient-doctor relationship in healthcare is incredibly important for both the patient seeking care and the doctor providing care. This relationship is defined generally as the combination of communication and interpersonal skills but has more complex factors that also have a substantial impact (Ridd et al, 2009). This relationship can define outcomes of care and determine whether a patient will continue their care with that doctor. Similarly to other relationships, this relation can also be affected by implicit bias from both perspectives. Should a doctor be unconsciously biased toward a demographic, this may affect the quality of care the patient receives (Saha and van Ryn, 2011). Implicit bias has been widely studied from the perspective of the doctor, but not much research has been done from the view of the patient. This study aims to understand whether patient implicit bias plays a role in choice of medical provider for healthcare, and its implications for the patient-doctor relationship.

Implicit Bias Towards Gender in Healthcare

Firstly, it is important to understand that biases may occur from the patient to the

practitioner as well. Gender has a big influence on the treatment of patients and healthcare providers. Recently, healthcare has made significant efforts to understand the disparities between genders, along with race, age, etc., to try and increase diversity along with a better patient satisfaction approach (Marcelin J., et al. 2019). As of recently, there has been efforts to include transgender and better accommodate cisgender women in clinical care in terms of reproduction as a means of providing better care to patients (Moseson, H., et al. 2020). However, disparities are still seen between the genders, even between physicians.

Medical providers specifically may exhibit attitudes that further increase these disparities. In general, healthcare providers are taught to be neutral in their assessments and may be subject to the Gender Role and Expectations of Pain Questionnaire (GREP), used to account for gender stereotypes in reporting pain, but they still exhibit these behaviors of discrimination and internal prejudices. As an example, female patients have been found to be discriminated against for “exaggerating” pain by their physicians and trainees alike (Wesolowicz D. 2018). These actions and attitudes that may not be made known to either the individual or those around them, known as implicit biases, may further reinforce stereotypes around gender but also bring awareness of how they occur and build interactions between patients and physicians alike (Marcelin J., et al. 2019).

Patient and healthcare physicians may also create more discrepancies and biases through the eyes of the patient. Patient-centered communication, the process of physicians understanding patients through other perspectives and taking responsibility for their actions and treatment, is used in medical training and applied in real life, resulting in helpful and positive effects for patients. However, patients are susceptible to certain levels of competence based on their gender and stereotypes surrounding them. For instance, patients may expect women to be more compassionate of them (Blanch-Hartigan D., et al., 2010). A study relevant to this topic by

Schmid Mast M., et al, (2007) had 167 students, 80 male and 87 females, interacting online with a virtually generated physician with varying genders to test patient contentment (also with varying genders). They found that male patients were not as affected by physician communication styles, for both male and female physicians. In contrast, female patients were more content with a compassionate and caring communication style for female physicians as opposed to non-caring and exhibited higher discontent with male physicians that exhibited a non-caring communication style (with neutral feelings towards a caring communication style). This shows that patients, particularly female, prefer a patient-centered communication style that emphasizes compassion and kindness towards them, further enabling these biases. Therefore, it is important to examine healthcare's gender inequalities to address deeper underlying issues such as biases and discriminations in order to improve patient treatment and physician valued competence.

Implicit Bias Towards Age in Healthcare

Patients often perceive younger doctors as more comfortable and knowledgeable with current technology, whereas the older physicians are considered more competent due to their medical experience and expertise. This might occur to us as just a preference, but when we analyze each patient's decision in depth, we can see the impact of implicit bias in the medical field, not only on the patients but on the physicians as well. Implicit biases operate beneath unconscious awareness, impacting decision-making processes in a manner that traditional self-report measures often fail to capture (FitzGerald and Hurst, 2017). This would demonstrate that in the context of age, patients may unconsciously make a decision based on previous beliefs or preferences regarding age and ability. This is very likely since it is very natural to assume that older doctors would be more experienced because their time in the medical field may have increased their skill set compared to a younger physicians, as evidenced by the results of a study

by Dr. Jena in which surgeons improve with age (Jena, A. B., & Worsham, C., 2023). This does not, however, imply that an older doctor is more capable than a younger physician since the conclusion relies on unconscious prejudice, when in reality it depends solely on the physician's ability and competence.

A study by McKinstry and Yang revealed that “respondents considered older physicians to be kinder, more attentive and more willing to listen” (Couto & Barreto, 2024). The same study also mentions that younger physicians were more up to date, compared to older ones who were considered wiser. In recent years, patients use online platforms to look for well-rated doctor profiles to have excellent care, which helps us directly keep track of their preference in doctors according to the physician's individual characteristics, one of them including age. As discussed earlier, patient reviews on web-based platforms often reflect implicit age-related biases. Additionally, in the article by Couto & Barreto (2024), the Kruskal-Wallis test results revealed that physicians between the ages of 30-40 were rated the highest in openness to doubts and that clinical knowledge was higher in the ages 40-50 and above. This indicates that beyond the competence and performance of the physician, there are unconscious perceptions coming from the patients that are related to a physician's age, which impact the patient's choice.

Hypotheses

Although various studies have touched on the topics of gender and racial biases in healthcare, they tend to focus on the attitudes of medical professionals towards their patients. However, there is not sufficient research in terms of implicit bias regarding patient selection of physicians.

This study aims to explore whether implicit bias influences the selection of a primary care physician by assessing how both age and gender impact the likelihood of patients choosing a particular doctor, comfortability levels, and perceived medical competence. Through

manipulation of these demographic variables, our study seeks to understand how these factors shape individuals' decision-making when selecting a healthcare provider.

In line with earlier studies, we inferred that female healthcare providers are overall more likely of being chosen for care compared to males, despite it being a woman dominated field (H1). This will further answer any questions regarding perception and age bias amongst participants. Our next hypothesis mentions how participants will feel more comfortable with female healthcare providers regardless of their age (H2). Thirdly, we hypothesized that younger doctors will be rated higher on patient comfortability compared to older practitioners (H3). This might be due to generational differences or simply preference. Lastly, we inferred that older doctors will be rated higher in perceived medical competence compared to younger ones due to knowledge and skills (H4).

Methods

Participants

Participants, a minimum of 50 (with each team member recruiting 10 people) were surveyed in this project through QuestionPro online. We recruited our sample of participants throughout the Arlington and DFW area. The composition of our participant included 51 individuals: 39 females and 11 males and 1 non-binary, with a mean of 1.33 and standard deviation of 0.53. 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, signifying for example: “Not likely at all”, “Slightly likely”, “Moderately likely”, “Very likely”, and “Extremely likely”. Next, we 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 in 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.

After asking the participants some background and demographics questions, they were instructed to take the rest of the survey, which consisted of ten general questions. These were answered based on the randomly assigned image of a doctor out of the four conditions.

The demographic questions were as follows:

- “What is your age group?”
- “How do you identify your gender?”

The following scenario was provided: “You are in need of medical care and go through a website to book an appointment with a physician. You come across this doctor:”

The dichotomous question was as follows: “Is the experience you receive from your healthcare provider important to you?” (Yes or No)

The interval scale questions were as follows:

- “Based on the image, how experienced do you think this doctor would be in diagnosing your medical condition?” (1 = Not experienced at all; 5 = Extremely experienced)
- “Would you trust this doctor’s medical advice?” (1 = Not at all; 5 = Completely)
- “How comfortable would you feel speaking to this doctor about your health concerns?” (1 = Not at all comfortable; 5 = Extremely comfortable)
- “How likely are you to ask this doctor personal/sensitive questions regarding your medical condition?” (1 = Not likely at all; 5 = Extremely likely)
- “How approachable does this doctor appear?” (1 = Not approachable at all; 5 = Extremely approachable)
- The numerical scale question was as follows:
- “On a scale of 1–5, how competent do you think this doctor is in providing high-quality medical care?” (1 = Slightly competent; 5 = Highly competent)
- The reverse-worded question was as follows:

- “Based on the image, how likely do you think this doctor is to misdiagnose a patient?” (1 = Very unlikely; 5 = Very likely)

The final rating question was as follows: “Based on your previous responses, how likely are you to choose this doctor?” (1 = Very likely; 5 = Very unlikely)

The multiple-choice recall question was as follows, and was intentionally positioned last in the sequence: “Based on the image, what best describes the age and gender of the doctor that you viewed?”

The general questions were assigned in the same order to each participant. Each question measured one of the three dependent variables which were perceived competence, comfortability levels and likelihood of choosing a doctor based on the age and gender in the image that the participants viewed. The background questions regarding UTA were asked so that the participants were led out of the survey if they were a psychology student due to risk of knowledge on the study. It mainly avoided the response from demand characteristics. The demographics of the participants, which were directly related to our hypotheses, were asked to see if there was any implicit bias related to the age and gender of the participant with that of the doctor which also helped us to test the four hypotheses.

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.

Results

Gender of Healthcare Provider vs. Likelihood of Choosing

To test the hypothesis that female healthcare providers would have a higher likelihood of being chosen for care over male healthcare providers, an independent t-test was run. There was a significant difference between the groups, $t(54) = 2.03$, $SE = 0.24$, $p < .05$ (two-tailed), 95% CI [.01, .98], $d = 0.5$. Female healthcare providers had higher likelihood ratings ($M = 3.72$, $SD = .84$) than male healthcare providers ($M = 3.23$, $SD = .96$). These results support the hypothesis that female healthcare providers would be more likely to be chosen for care (see Table 1).

Age of Doctor vs. Patient Comfortability

To test the second hypothesis, younger doctors will be rated higher on patient comfortability compared to older practitioners, an independent t-test was run. There was not a significant statistical difference between the groups, $t(54) = -1.22$, $SE = 0.60$, $p = .23$ (two-tailed), 95% CI [-1.94, .47], $d = 0.33$. While younger doctors ($M = 10.33$, $SD = 2.20$) had slightly lower comfort levels than older doctors ($M = 11.07$, $SD = 2.30$), the difference is not

statistically significant enough. These results do not support the hypothesis that younger doctors will have higher perceived patient comfortability compared to older practitioners.

Comfortability Ratings Amongst Female and Male Providers

The third hypothesis tested was that participants would feel more comfortable with a female provider rather than a male provider. Therefore, an independent samples t-test was conducted. There was not a significant difference statistically between the two groups, $t(54) = 1.97$, $SE = 0.59$, $p = .054$ (two-tailed), 95% CI $[-.02, 2.35]$, $d = 0.53$. According to the data analysis, male provider comfortability levels ($M = 10.19$, $SD = 2.26$) did not differ much from female provider comfortability levels ($M = 11.36$, $SD = 2.14$). These results do not support the hypothesis that participants felt more comfortable with a female healthcare provider instead of a male healthcare provider.

Perceived Competence Based on Age of Doctor

The fourth hypothesis examined whether the age of a particular doctor affected how competent they were perceived to be by patients. An independent-samples t-test was conducted to compare perceived competence ratings between younger and older doctors. Our results showed a significant difference between the two groups, $t(54) = -2.92$, $SE = 0.46$, $p < .05$ (two-tailed), 95% CI $[-2.27, -.42]$, $d = 0.78$. Overall, participants rated older doctors ($M = 11.83$, $SD = 1.71$) as more competent than younger doctors ($M = 10.48$, $SD = 1.74$). These findings support the hypothesis that a doctor's age influences perceived confidence ratings in this study (see Figure 1).

Discussion

This study was conducted to investigate if patients displayed implicit bias towards healthcare providers when presented with characteristics such as their gender and age. Based on prior research, the study team hypothesized that female healthcare providers would have a higher

likelihood of being chosen for care over male healthcare providers, that younger doctors will be rated higher on patient comfortability compared to older practitioners, that participants would feel more comfortable with a female provider rather than a male provider, and that older doctors would be rated higher on perceived medical competence compared to younger practitioners.

The findings of the study confirmed the first hypothesis, which was that female healthcare providers are more likely of being chosen for care compared to males. There was a statistically significant difference in ratings between the two genders, which aligns with similar research. According to Marcelin et al. (2019), patients may unconsciously associate female providers with more patient-centered care since women are seen as the caregivers in society. It is one of the reasons that might fuel gender-related perceptions which influence provider selection.

The second hypothesis mentioned that younger physicians would receive greater ratings for patient comfort. This was not supported by the findings as the difference was not statistically significant enough. Many individuals tend to relate to those closer in age, especially since younger generations are more up to date on technology, therefore making patients more comfortable (Couto & Barreto, 2024). In contrast, older doctors are seen as wise which helps build trust between a patient and a healthcare provider.

The third hypothesis predicted by the research team was that participants would show higher comfortability ratings towards female providers compared to male providers. Although the data showed a trend in that direction, this hypothesis was not significantly supported by the results of the study. Despite this, the hypothesis is consistent with earlier studies showing that patients tend to view female healthcare workers as more compassionate and therefore feel more comfortable talking with them about most health concerns (Blanch-Hartigan D., et al., 2010).

The final hypothesis, that older doctors would be perceived as more competent than

younger ones, was significantly supported by the data results. Participants gave older doctors higher ratings for competence, which aligns with previous research demonstrating that patients associate a doctor's age with clinical experience and skill (Jena & Worsham, 2023; Couto & Barreto, 2024). In other words, regardless of qualifications, people tend to trust those who have been in the field longer.

This study was conducted using a relatively small sample which made it not representative of the general population. Because implicit biases sometimes function subconsciously, the use of self-reported measures may not accurately reflect the depth of participants' prejudices (FitzGerald and Hurst, 2017). The study exclusively looked at age and gender, ignoring other significant variables like race, ethnicity, and culture, which may also influence these stereotypes. Other limitations included recruitment locations, lack of real-world context, and non-use of scientifically validated scales. If this particular study were to be replicated, incorporating a larger sample and a more diverse participant pool would greatly help to acquire better results, as well as providing an incentive.

The implications of this study and existing research show some contrast. While this study suggests that implicit bias does influence healthcare interactions to some degree, especially regarding provider gender and age, prior research presents a more consistent impact of these biases on patient perceptions and treatment outcomes. This difference can mostly be tied to the limitations previously mentioned. In further research, this study can be replicated by investigating how different provider qualities, characteristics, and demographics may further affect patient bias. By utilizing a more representative and varied sample and improving ways to accurately measure these biases in a laboratory setting, all of the drawbacks could be resolved.

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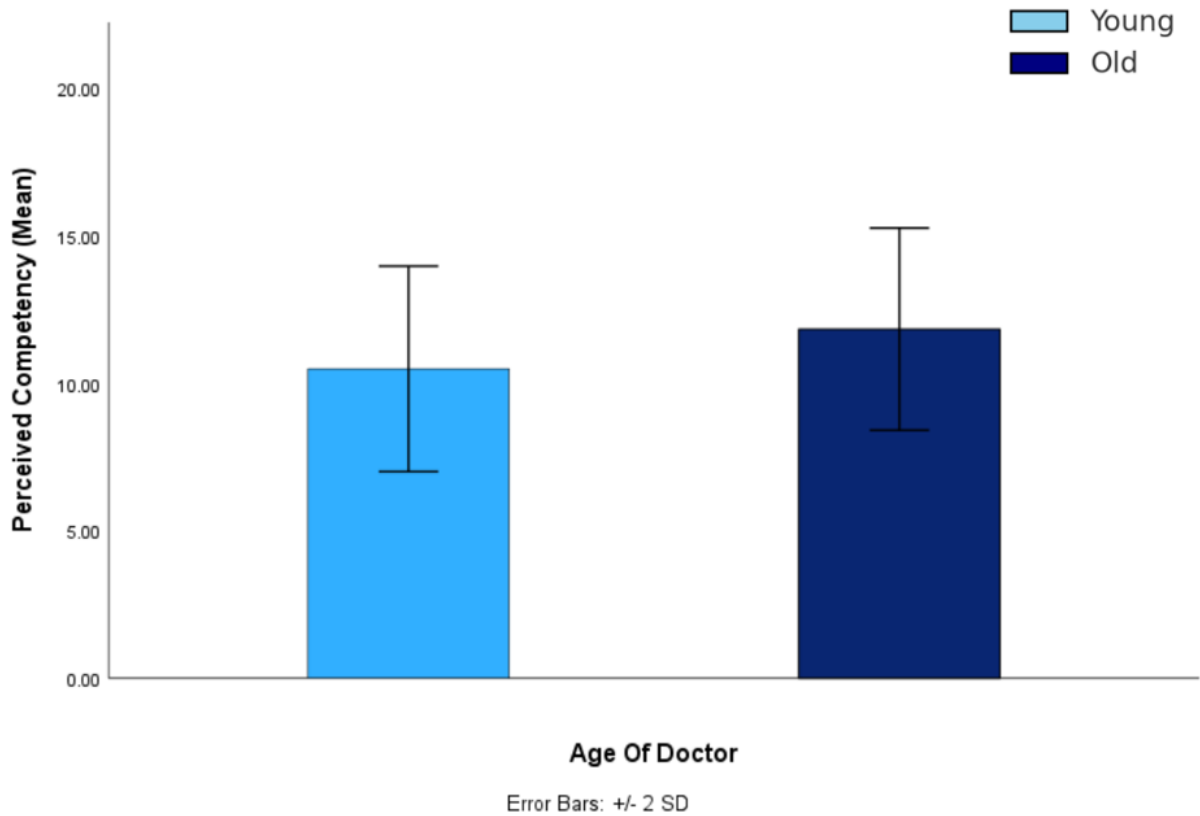
Table and Graph

Table 1

Likelihood of choosing Doctor based on gender

Measure	Group	M	SD
Likelihood of Choosing Doctor	Female	3.72	0.84
	Male	3.23	0.96

Note: *M* = mean; *SD* = standard deviation. The likelihood of choosing a doctor was rated on a 5-point scale (1 = very unlikely, 5 = very likely), with higher scores indicating greater likelihood. Values representing the scores.

Figure 1

Mean Perceived Competence by Doctor Age Group

Note. The graph above represents the competency measure that the participants rated based on age of the doctor. Error bars represent ± 2 SD. “Young” and “Old” panels correspond to the Age of the doctor. Competence (Mean) scale represents; higher scores = greater perceived competence.

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

11. Based on your previous responses, how likely are you to choose this doctor?

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

MCQ - Recall question:

12. Based on the image, what best describes the age and gender of the doctor that you viewed?

- Young and female
- Young and male
- Old and female
- Old and male

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, mxl11784@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.