"TO BE MACHO OR NOT TO BE MACHO, THAT IS THE QUESTION": HOW MACHISMO IS RELEVANT TO DISCRIMINATION IN THE ROMANIAN AND SERBIAN HEALTH SECTORS

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Abstract: Health sector workers continuously provide services globally, regardless of their professional challenges. Such as the struggle against discrimination and racism. In this study, the existence of discrimination/racism against healthcare professionals was examined using the examples of Romania and Serbia. In the study, the MetaHuman Artificial Intelligence Program was used. As a result, it has been observed that there is no racism, however discrimination against atheist doctors in every country exists regarding religious beliefs. A further discovery is that survey participants from all countries favored the macho or the most beautiful doctor. Countries' decision-makers in education should ensure that extra information on this subject is added to education programs to prevent discrimination and/or racism. This research will extend to search discrimination view differences in the health sector between the Turkish minority in Germany and Turks living in Türkiye.

Introduction

It is known that people have bounded rationality and do not always make rational decisions as mentioned in traditional economic theory (Kahneman, 2003), (Kong et al., 2018), (Kahneman, 2002). ***Bounded rationality*** is a human decision-making process in which we attempt to satisfice, rather than optimize. As a result, people engage in smoking, alcohol consumption, and driving at speeds that exceed legal limits. The majority of decisions made daily are driven by emotions which leads us to non-rational decisions or bounded rationality. Prejudices are very frequently used in everyday life. When first meeting a doctor or other healthcare professionals, both discrimination and prejudice happen because of the physical appearance, particularly the face. The morphology of the human face can cause various reactions in many parts of life. For example, in terms of male political candidates, those with baby faces are less favored (NbcNews, 2005), whereas those who look macho are preferred. However, individuals with macho appearance may encounter resistance in some professional areas such as banking and tourism (Tufan Ekrem et al., 2017) or similar discriminatory behavior can happen in the hiring process (Stone & Wright, 2013).

Historically, physiognomy, the study of analyzing characters based on facial morphology, originated in ancient China and was later noticed in ancient Rome. Simply put, throughout history humans have always been deeply engaged with reading faces (Gramigna & Leone, 2023). To such an extent that a European priest and writer Johann Caspar Lavater was considered one the most famous people of his time at the time of his death in 1801. His book "Essays on Physiognomy," was widely used by people in Europe and America when

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hiring household servants (John Grahm, 1961). Today, people still believe in the possibility of character analysis through physiognomy. For example, a study conducted in Israel found this belief to be at 75% (Ran Hassin, 2000).

Studies utilizing facial morphology in the literature predominantly focus on gender and race discrimination. Facial morphology research spans a wide range of fields, particularly in psychology and psychiatry(Leppänen et al., 2004), (Fenske et al., 2015), (De Bruin, 2017), (Chan et al., 2020), (Joormann & Gotlib, 2007), (Lazarov et al., 2018), extending to bias research (Gopal et al., 2021). These studies often employ methods such as virtual reality (VR) goggles and functional magnetic resonance imaging (fMRI) (Telzer et al., 2008), (Lui et al., 2020) present the use of virtual reality goggles as an innovative method to uncover the harms of discrimination and racism on public health. However, the same work notes that despite the existence of virtual reality goggles for the past decade, they have not been systematically used to examine the health issues resulting from racism and discrimination.

In Turkish literature, studies on racism and discrimination against healthcare workers or patients have primarily employed literature reviews, surveys, and in-depth interviews (Öztürk & Sondaş, 2020), while virtual reality has been mainly discussed in terms of its therapeutic (Magbül Ahmet Çoban, 2023), (Doğan Yılmaz & Ünlüsoy Dinçer, 2022), (Uçan Gülfem Özlü, Burak Kerem Apaydın, 2022) and educational applications (Demiryürek & Sabri, 2022), (Demirci et al., 2018), (Yüksekdağ Boz, 2021), (Aslan & Erdoğan, 2017).

In this study, discrimination and/or racism against healthcare workers in Serbia and Romania was investigated. The research was designed as follows: The first section provided examples of the importance of the topic and previous research. The subsequent section discussed the data and methodology employed. Finally, scientific findings were presented and discussed.

Data and Methodology

The data was collected by online questionnaire for Romania and Serbia between 24th April 2024 and 15th June 2024 (Questionnaire: https://forms.gle/NjMLMboUmoVzYNvt9). For Romania, we got 69 responses while Serbia 68. 47,1% of Serbian respondents are women while 52,9% are men. 26,5% of them have undergraduate, 23,5 have master's diplomas, 19% are university students, and last but not least 17,6% of the Serbian respondents have PhD diplomas. Regarding Romanian respondents: 47,8% of them are women while 52,2% of them are men respondents. 26,4% of them have university diplomas (undergraduate) while 17,6% have PhD diplomas, 19,11% of them are university students.

It has been searched answers of these questions which are given below:
1. Which country's respondents choose who is the macho?
2. Which country's respondents choose who is the most beautiful?
3. Is there any correlation between the most macho and the most beautiful chosen photos and doctor preparation?
4. For both countries is there any discrimination and/or racism against health workers regarding the country?
5. For both countries is there any discrimination and/or racism against health workers regarding religiosity?

To search for discrimination and/or racism against health workers we have needed portraits of health workers (medical doctors). This was very difficult so decided to apply an artificial intelligence program, namely MetaHuman.

Unreal Engine's MetaHuman (*MetaHuman Documentation*, 2024)

"…Unreal Engine's MetaHuman Creator is a cutting-edge tool developed by Epic Games that allows users to create highly realistic digital human characters with unprecedented ease and speed. It leverages the power of Unreal Engine, one of the leading game engines, to produce photorealistic characters that can be used in various applications, including video games, virtual production, and film.

Key Features of MetaHuman Creator

Photorealism: Utilizes high-fidelity textures, shaders, and animations to achieve lifelike visual quality.

Ease of Use: Provides an intuitive interface that simplifies the complex process of character creation.

Customization: Offers extensive customization options for facial features, hair, clothing, and more.

Animation Ready: Characters are rigged and ready for animation, compatible with Unreal Engine's animation system.

Cloud-Based Processing: Utilizes cloud computing to handle the intensive processing required for generating high-quality assets.

Human Character Creation Process Using MetaHuman Creator within the scope of the project;

Step 1: Initial Setup

Access the MetaHuman Creator: The tool is accessed via a web browser, requiring an Epic Games account and connection to the internet.

Step 2: Creating the Base Character

Template Selection: Start by selecting a base template from a library of pre-built MetaHumans. These templates provide a foundation for different ethnicities, genders, and ages.

Customization Interface: Use the customization interface to modify the base template. The interface allows adjustments to various parameters:

Facial Features: Modify attributes like the shape of the eyes, nose, mouth, jawline, and more.

Skin and Hair: Choose skin tone, and texture, and add details such as freckles, scars, and blemishes. Select and customize hairstyles and facial hair.

Body Type: Adjust the body proportions, including height, weight, and muscle tone.

Step 3: Detailing

Microdetails: Add fine details to enhance realism. This includes wrinkles, pores, and subtle imperfections that contribute to the character's lifelike appearance.

Clothing and Accessories: Select from a range of clothing and accessories. These assets can be further customized for color, texture, and fit.

Step 4: Rigging and Animation

Automatic Rigging: MetaHuman Creator automatically rigs the character, providing a skeleton and control rig compatible with Unreal Engine's animation system.

Facial Animation Setup: The character includes a facial rig with blend shapes and controls for detailed facial expressions, enabling realistic lip-sync and emotional expression.

After the processes mentioned above, the shoulder plan photos of the male and female MetaHumans designed in the MetaHuman Creator were created…" (https://dev.epicgames.com/documentation/en-us/unreal-engine/unreal-engine-5-5-documentation)

The Model and Findings

In the questionnaire, we have applied Likert-type answers. Regarding machoism, question 1 represents the most macho man while 5 is the less. We have summed up only 1 and 2 numbers of the answers. We have shown 19 different-faced men photos who are bold-curly hair, dark hair, brown hair, fairy hair, mustache beard, and no, blue-hazel eyes combinations. Regarding this for Romanian respondents who are age 18+ is:

Photo 1. The Most Macho Man for Romanian Respondents

The same question was also asked 68 Serbians and they also determined the most macho man as:

Photo 2. The Most Macho Man for Serbian Respondents

There are only two differences between the two photos which are moustache and beard.

On the other hand, we have asked also the same question for women's photos who is the most beautiful one? Except for the mustache and beard, all features were the same and created the same combinations and we have got 11 different women's faces. The photos that were accepted as the most beautiful women are given below:

Photo 3: The Most Beautifull Woman for Romanain Respondents

and,

Photo 4: The Most Beautifull Woman for Serbian Respondents

As can be seen in photos 3 and 4, there is no difference between two countries preferences.

Next phase of the experiment we showed 19 men and 11 women photos one after another and asked which doctor mostly be chosen when the respondent needed a doctor for serious surgery. For Romanians the most preferred doctor is given below:

Photo 5. The Most Preferred Doctor(s) by Romanian Respondents

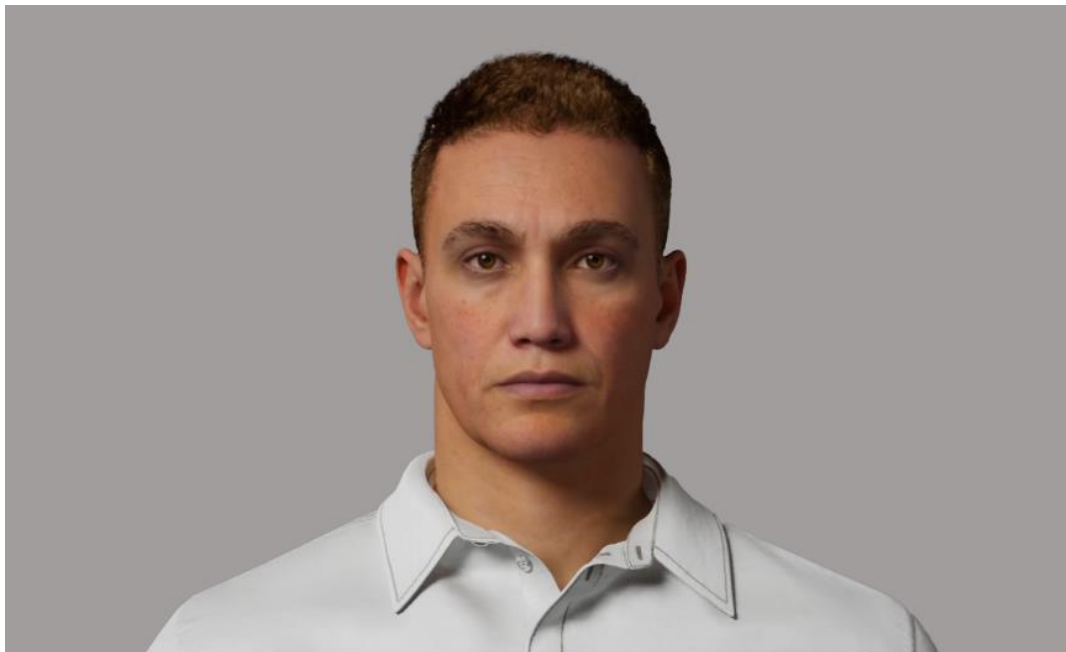*Photo 6. The Most Preferred Doctor(s) by Romanian Respondents*

Photo 7. The Most Preferred Doctor(s) by Romanian Respondents

Photo 8. The Most Preferred Doctor(s) by Romanian Respondents

On the other hand, Serbian respondents voted for:

Photo 9. The Most Preferred Doctor(s) by Serbian Respondents

Romanian and Serbian respondents have chosen a very similar man as the ideal macho. The macho-faced photo chosen by Serbian respondents has a mustache; otherwise, all other features are the same as those chosen by Romanian respondents. Interestingly, the preferences for the most beautiful women between the two countries are almost the same; Serbian respondents also chose women with blue eyes.

The next research question is whether Romanian and Serbian respondents choose the same macho and beautiful faces. Romanian respondents have chosen four doctors two of them are women while Serbian respondents have chosen one woman doctor. Interestingly, Romanian respondents were chosen from the same two people out of four which determined macho and beautiful. On the other hand, Serbian respondents directly have chosen a woman doctor whoever they have chosen as the most beautiful. Even though there is no correlation between doctors' macho and/or beauty features with their medical knowledge, majority of the both countries' respondents seem to be correlated. Next phase, we wonder if there is discrimination and/or racism against doctors. To search this we ask more questions about one related country's origin and other religions. To determine certainty of the discrimination we add medical diploma information to all questions and re-asked.

Q1: Because the doctor that you chose is a Syrian immigrant doctor would you like to change your preference?

Table 1. Romanian Respondents Country Bias

			No	**Yes**	**Total**
Please indicate your gender.	Female	Count	25	8	33
		% of Total	36,2%	11,6%	47,8%
	Male	Count	32	4	36
		% of Total	46,4%	5,8%	52,2%
Total		Count	57	12	69
		% of Total	**82,6%**	**17,4%**	**100,0%**

P.S.: The figures in the table are left as decimal numbers. Small digits on the right side of the numbers have been disregarded. Therefore, minor differences may appear in the figures.

As can be seen in Table 1., 17,4% of Romanian respondents would like to change their doctor preference even if they will get serious surgery when they get new information that the doctor is a Syrian migrant. Romanian female respondents are more affected by this information than male respondents.

Q2: Because the doctor that you chose is a Syrian immigrant but has a German medicine diploma would you like to change your preference?

Table 2. Romanian Respondents Country Bias (with Diploma)

			No	Yes	Total
Please indicate your gender.	Female	Count	31	2	33
		% of Total	44,9%	2,9%	47,8%
	Male	Count	33	3	36
		% of Total	47,8%	4,3%	52,2%
Total		Count	64	5	69
		% of Total	**92,8%**	**7,2%**	**100,0%**

P.S.: The figures in the table are left as decimal numbers. Small digits on the right side of the numbers have been disregarded. Therefore, minor differences may appear in the figures.

Even the Romanian respondents know that the doctor has a medical faculty diploma from Germany and would like to change their doctor preference. This result indicates discrimination and/or racism (7,2%).

Q3: Because the doctor that you chose is a Syrian immigrant doctor would you like to change your preference?

Table 3. Serbian Respondents Country Bias

			No	Yes	Total
Please indicate your gender.	Woman	Count	36	12	48
		% of Total	52,9%	17,6%	70,6%
	Man	Count	16	4	20
		% of Total	23,5%	5,9%	29,4%
Total		Count	52	16	68
		% of Total	**76,5%**	**23,5%**	**100,0%**

P.S.: The figures in the table are left as decimal numbers. Small digits on the right side of the numbers have been disregarded. Therefore, minor differences may appear in the figures.

23,5% of the Serbian respondents intend to change the doctor that they have chosen as a serious surgery doctor. This is 6.1% higher than Romanian respondents' preferences. What about if a Syrian doctor got her/his medical faculty diploma from Germany?

Q4: Because the doctor that you chose is a Syrian immigrant but has a German medicine diploma would you like to change your preference?

Table 4. Serbian Respondents Country Bias (with Diploma)

			No	Yes	Total
Please indicate your gender.	Woman	Count	46	2	48
		% of Total	67,6%	2,9%	70,6%
	Man	Count	20	0	20
		% of Total	29,4%	0,0%	29,4%
Total		Count	66	2	68
		% of Total	**97,1%**	**2,9%**	**100,0%**

P.S.: The figures in the table are left as decimal numbers. Small digits on the right side of the numbers have been disregarded. Therefore, minor differences may appear in the figures.

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When we shared the doctors who got a diploma from Germany information with Serbian respondents, they changed their preferences and changed their minds reducing from 23,5% to 2,9. This result indicates less discrimination than Romanian respondents.

After searching country bias we have also searched if there is religion bias too. Here you can find the results:

Q5: Because the doctor that you chose is a Muslim (Jewish, Atheist, Christian) doctor would you like to change your preference?

Table 5. Serbian Respondents Religion Biases

If the chosen doctor is a Muslim…			No	Yes	Total
Please indicate your gender.	Woman	Count	46	2	48
		% of Total	67,6%	2,9%	70,6%
	Man	Count	20	0	20
		% of Total	29,4%	0,0%	29,4%
Total		Count	66	2	68
		% of Total	**97,1%**	**2,9%**	**100,0%**
If the chosen doctor is a Jewish…			**No**	**Yes**	**Total**
Please indicate your gender.	Woman	Count	46	2	48
		% of Total	67,6%	2,9%	70,6%
	Man	Count	20	0	20
		% of Total	29,4%	0,0%	29,4%
Total		Count	66	2	68
		% of Total	**97,1%**	**2,9%**	**100,0%**
If the chosen doctor is an Atheist…			**No**	**Yes**	**Total**
Please indicate your gender.	Woman	Count	43	5	48
		% of Total	63,2%	7,4%	70,6%
	Man	Count	14	6	20
		% of Total	20,6%	8,8%	29,4%
Total		Count	57	11	68
		% of Total	**83,8%**	**16,2%**	**100,0%**
If the chosen doctor is a Christian…			**No**	**Yes**	**Total**
Please indicate your gender.	Woman	Count	47	1	48
		% of Total	69,1%	1,5%	70,6%
	Man	Count	20	0	20
		% of Total	29,4%	0,0%	29,4%
Total		Count	67	1	68
		% of Total	**98,5%**	**1,5%**	**100,0%**

P.S.: The figures in the table are left as decimal numbers. Small digits on the right side of the numbers have been disregarded. Therefore, minor differences may appear in the figures.

Except for the atheist doctor situation (16,2%) Serbian respondents almost do not care about the doctor's religious belief. Even if they respect other religions, they have a bias against atheist people.

Regarding religion-related questions what do Romanian respondents think?

Q6: Because the doctor that you chose is a Muslim (Jewish, Atheist, Christian) or would you like to change your preference?

Romanian respondents also do not like atheist doctors and would like to change their preferences (14,5%) if they are informed about it. Unlikely Serbian respondents, Romanian respondents change their preferences when the doctor is a Muslim (7,2%) and Jewish (8,7%) respectively.

Table 6. Romanian Respondents Religion Biases

If the chosen doctor is a Muslim…			No	Yes	Total
Please indicate your gender.	Female	Count	31	2	33
		% of Total	44,9%	2,9%	47,8%
	Male	Count	33	3	36
		% of Total	47,8%	4,3%	52,2%
Total		Count	64	5	69
		% of Total	**92,8%**	**7,2%**	**100,0%**
If the chosen doctor is a Jewish…			No	Yes	Total
Please indicate your gender.	Female	Count	30	3	33
		% of Total	43,5%	4,3%	47,8%
	Male	Count	33	3	36
		% of Total	47,8%	4,3%	52,2%
Total		Count	63	6	69
		% of Total	**91,3%**	**8,7%**	100,0%
If the chosen doctor is an Atheist…			No	Yes	Total
Please indicate your gender.	Female	Count	29	4	33
		% of Total	42,0%	5,8%	47,8%
	Male	Count	30	6	36
		% of Total	43,5%	8,7%	52,2%
Total		**Count**	**59**	**10**	**69**
		% of Total	**85,5%**	**14,5%**	**100,0%**
If the chosen doctor is a Christian…			No	Yes	Total
Please indicate your gender.	Female	Count	33	0	33
		% of Total	47,8%	0,0%	47,8%
	Male	Count	33	3	36
		% of Total	47,8%	4,3%	52,2%
Total		Count	66	3	69
		% of Total	**95,7%**	**4,3%**	**100,0%**

P.S.: The figures in the table are left as decimal numbers. Small digits on the right side of the numbers have been disregarded. Therefore, minor differences may appear in the figures.

Conclusions

The rapidly increasing racism worldwide is particularly directed towards wealthier countries from poorer nations affected by war and climate change. Due to the impact of wars and other events such as the COVID-19 pandemic that affect economies, the labor markets in migrant-receiving countries are disrupted, leading to a rise in xenophobia. This can be observed in the vote shares of racist parties that have come to power or increased their influence in European Union (EU) member states. One area where racism or discrimination should be minimal, if not nonexistent, is perhaps the healthcare sector. This study investigates the presence of potential discrimination and/or racism.

The first impression is important in human relations and according to (*De Waal, 2009*), the face is the 'emotion highway'. The face of a human can give clues about his/her origin and consequently can create serotypes.

Romanian and Serbian respondents who have similar cultures do not discriminate against health workers if they get their medicine faculty diploma from one of the developed countries such as Germany. On the other hand, majority of the both countries' respondents

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preferred macho and/or beautiful doctor(s) that they determined at first stage questions. However, there is no correlation between the beauty or macho nature of the doctor(s) who is expected to perform a serious surgery and their medical knowledge and skills. We can call it a face bias. Machoism and beauty are very important biases and there is evidence in politics (NbcNews, 2005) but now in the health sector too.

On the other hand, it is seen that participants from both countries respect different religions but are reactive to atheists. The results are very similar for both countries which have similar historical, cultural, and religious backgrounds. This may be because young people have become more distant from religion in recent years than ever before.

Machoism or muscularity symbolizes power so, respondents could think important surgery needs it. Zebrowitz, L. A. (2017) describes faces as:

> Baby-face people: Impressions of childlike and sincere traits, containing high warmth, low power, and low competence, are revealed by faces that look more babyish than average, and these effects take place regardless of face age, gender, or race.
> - Familiar-face: People not only prefer faces they have seen before, but they also tend to prefer novel faces that are similar to previously seen ones, a generalized mere-exposure effect.
> - Unattractive face: Even people who are in normal health, if they have unfit-face people tend to think that they have lower warmth, power, and competence than people with attractive faces have and especially this effect at any rate partly accounts for more positive impressions of more attractive individuals, as the halo effect.
> - Emotional face: As defined by human ratters, much more dominance and lower warmth are understood not only in angry faces, it can be also in neutral-expression faces that show more similarity to angry expressions.

Beauty and muscularity (machoism) have an effect on almost all areas of our life from politics to work. This article gives other evidence from the health sector. The reason could come from the evolution of humans. Decision-makers in education should ensure that additional information on this subject is included in educational programs to prevent discrimination and/or racism. Some cultures create more discrimination or racism than others, as people may not recognize their racist behaviors and accept them as normal. The World Health Organization (WHO) should recommend that governments include topics on discrimination and/or racism in education systems at all levels.

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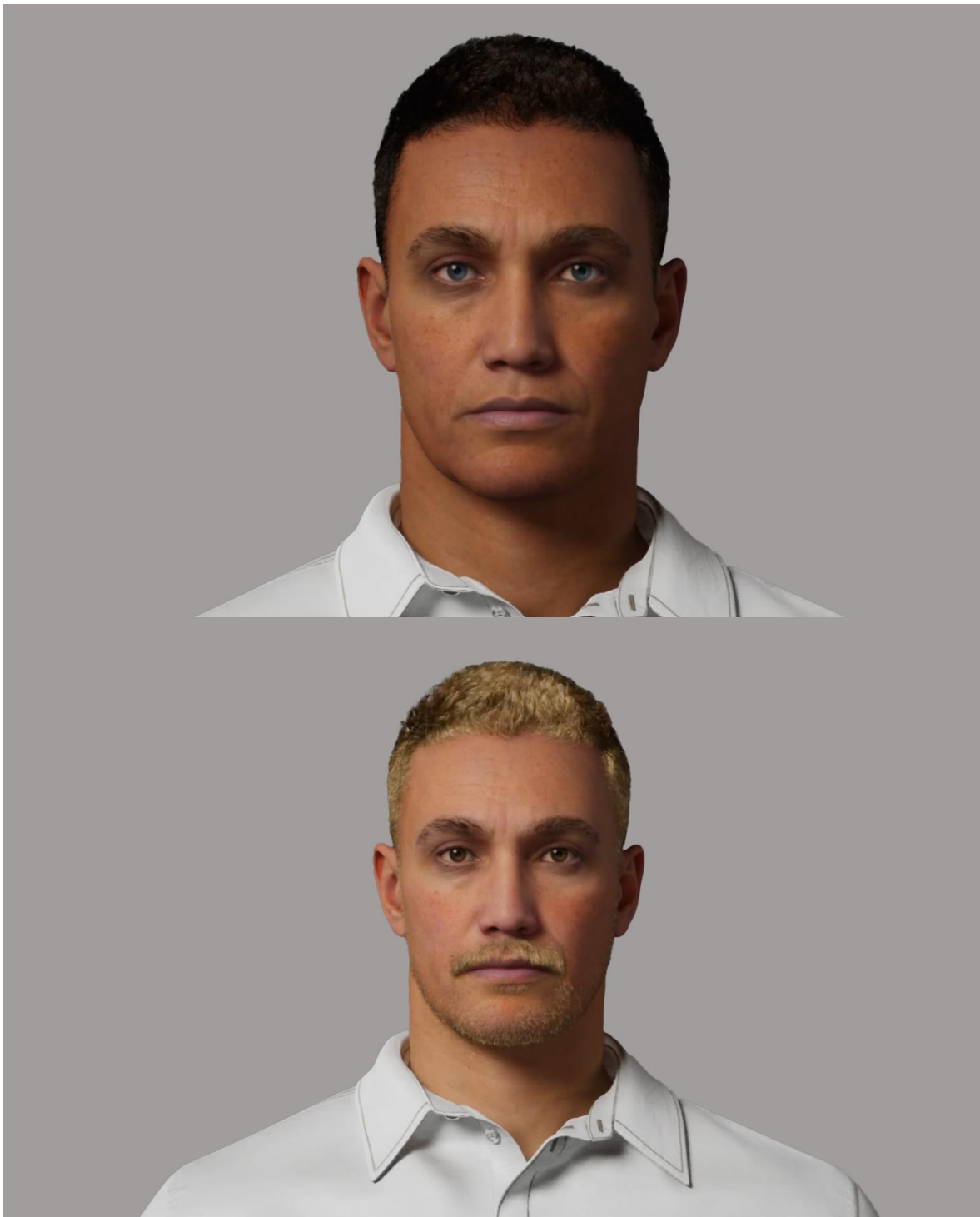
Annexes:

Men photos that created by MetaHUman AI Program

Women photos that created by Metahuman AI Program: