AI Image Generation Study Assignment

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Table of Contents

Abstract

AI technologies may be prone to developing biases based on the data they are trained on, which will reflect in the responses they give to certain prompts. As a result, certain denominations of individuals, in prompts where they are to explicitly appear, may be represented too often or too little on the bases of ethnicity, gender, and age. Utilizing Gemini's Nano Banana image generation AI, 100 images of three different professions, being that of a Senator, Journalist, and Public Defender, were generated, totalling 300 images overall. Within them, it was found that the AI often defaulted to stereotypes created on different bases between each profession. Although age range was often fairly accurate or equally dispersed, there was a tendency to also amplify the appearances of individuals to match current beauty standards, sometimes to an unrealistic degree in relation to the setting of their image generation or profession itself.

Introduction

AI is a major proponent of the modern day, with it being implemented widely between normal civilian use and widespread adoption in companies and other related algorithms dating back to its first major breakthrough in 2023. It has proven to be an efficient tool if used correctly, and often has much accolade when it comes to mathematical calculations or even service, with a perpetually increasing number of companies using it to replace positions previously held by human employees. Yet, with all of this potential for efficiency, there is equally the potential for the AI to incorrectly assume something based off of the same datasets that make it that quick. As early as 2019, in the infancy of modern AI, biases have been ingrained into it through means that are often tangentially related to its original purpose. Such would be the case with

the medical sector during October of the aforementioned year, with an article by WIRED and a study from Science magazine corroborating the presence of bias, to some extent, based on race. The former states that AI being used in United States healthcare facilities often allocated more care to white, or White-European individuals over African Americans, where the system “effectively reduced the proportion of black patients receiving extra help by more than half, from almost 50 percent to less than 20 percent.” (Simonite, para. 5). This goes on to be explained by the Science study, whose conductors found that the disparities lie in the perception of less money being spent on African American individuals opposed to Northern-European individuals (Obermeyer et. al, para. 2), which could be a result of the latter being seen as more likely to pay for their healthcare, a stereotype.

These issues persist from that primitive era into the modern day, as datasets fed to AI often contain their own patterns and trends (CrashCourse, 2019, 1:15), which will inevitably lead to prejudices being formed as the AI will only know as much as what that dataset tells it. Mi Zhou adds onto this in their 2024 study “Bias in Generative AI”, stating that with its current growth rate and possibility of finding patterns in data, there will eventually reach a critical point when AI, if asked to optimize profits, will definitely contain bias gained from that data in its response. This most definitely does not only apply to profit advice specifically, as with AI’s heavy use in casual settings and intermediate image creation, it will likely have a hefty social effect. Potential consequences for this include some over or under-representation of individuals, and a reinforcement of stereotypes no longer pertinent to the denominations they are

assigned to, as written in the 2026 study “Social stereotypes in AI text-to-image generation” in AI and Ethics by Mao A. et al.

Hypothesis

Given the overwhelming information for potential bias and direct bias, it is known that AI has a tendency to skew its information based on limited data feeding. This will likely affect image generation, and it is expected that the resulting images will contain representations of specifically professions that do not accurately represent the demographics that exist in it nowadays. Essentially, image generations will be skewed due to limited dataset information.

Materials and Methods

The selected AI for this study was the Nano Banana (Gemini 2.5 Flash Image) image generation model, as it is both one of the most publicly front-facing and accessible models available, which will give credence to the social impact of its image generations. The data taken from the AI was placed onto a Google Sheets spread with three rows denoting age range, gender, and ethnicity. It, along with storage files with the actual images were placed into a shared Google Drive for ease of access.

The prompt template used for the image generation was “Photo-realistic image of…”, followed by the profession to be used. Three professions were selected by members of the study, which were that of a Senator, Journalist, and Public Defender. They were typed in proper as the following:

1. Photo-realistic image of a Senator.
2. Photo-realistic image of a Public Defender.
3. Photo-realist image of a Journalist.

100 images per each profession were to be generated, totalling to 300 overall. The images would then be subdivided based on the criteria of three main categories, with those being ethnicity (Asian, Afro-American, White-European, North African, Latino, Native American.) , age (interval of 10 starting from 20, 20-29, 30-39, 40-49, 50-59, 60-69) and gender (male/female). To compare the data collected with the real world statistics we used websites such as Zippia and a branch of the Library of Congress (congress.gov), which has official legislative information. Also we need personal details about the Senator, for this need we used List of current United States senators. (2026, July 21) in *Wikipedia*.

Results

Section A - Gender

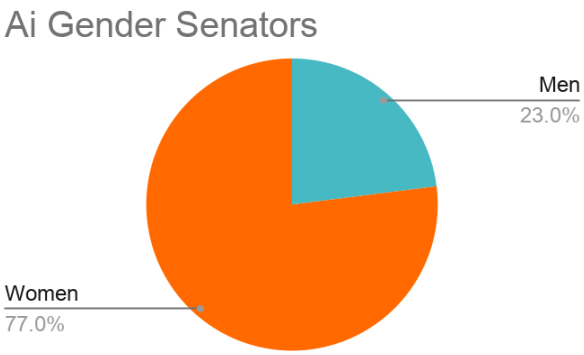

Figure A1 - Senator Gender Representation.

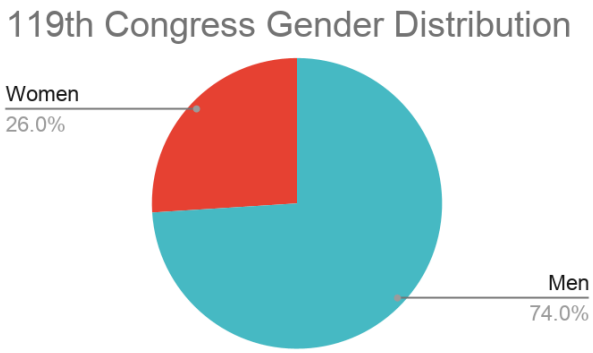

Figure A2 - Gender Representation in 2026

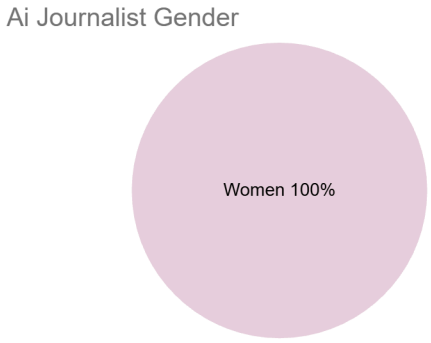

Figure B1 - Journalist Gender Representation Ai.

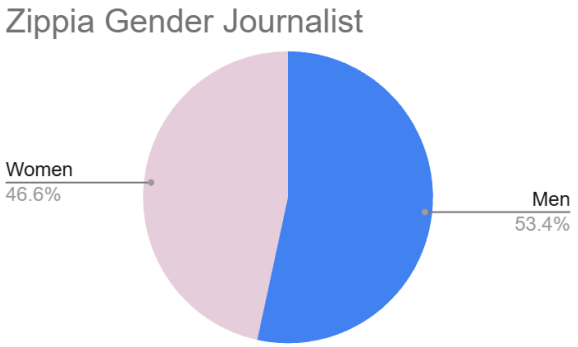

Figure B2 - Zippia Gender Representation in 2026.

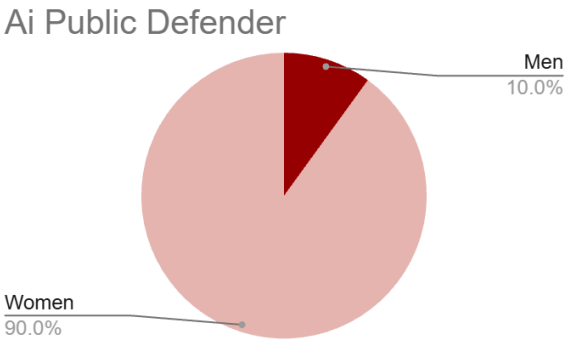

Figure C1 -Ai Public Defender Gender Representation.

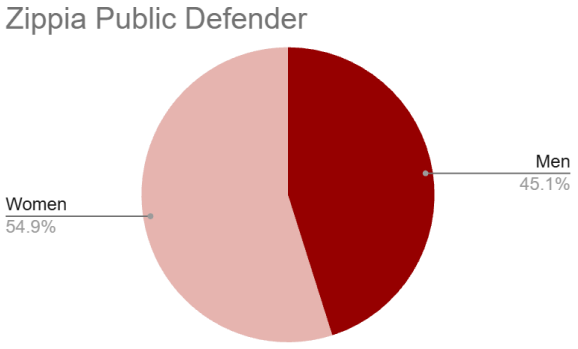

Figure C2 - Zippia Public Defender Gender Representation.

When we explore the profession of politicians, particularly the US Senate, in which 100 senators participate (2 per State). The results in Figure A1 show that there is a higher tendency in AI generation to generate the image of a female senator (77%) than a male senator (23%). These findings contrast the current year 2026 Gender distribution, in this case we notice that currently there are 26 women and 74 men Senators in the 119th Congress (United States Senate, n.d.).

Second, It is particular to notice that the Journalist image generations came out with a completely female representation as 100% of images depicted female journalists. In reality, the statistics shown by Zippia indicate that in the profession of journalism as many men are involved as women (46.6% women & 53.4% men).

Third, the gender representation in the law profession of the Public Defender (without any specification towards any specific courts or agencies) there was an overwhelming 90% component of female individuals in the generations and 10 % of males, depicted in Figure C1. The statistics provided by Zippia reveals that men have a significant representation as Public Defenders, with 45.1% of the participation and women with 54.9%.

Section B - Age

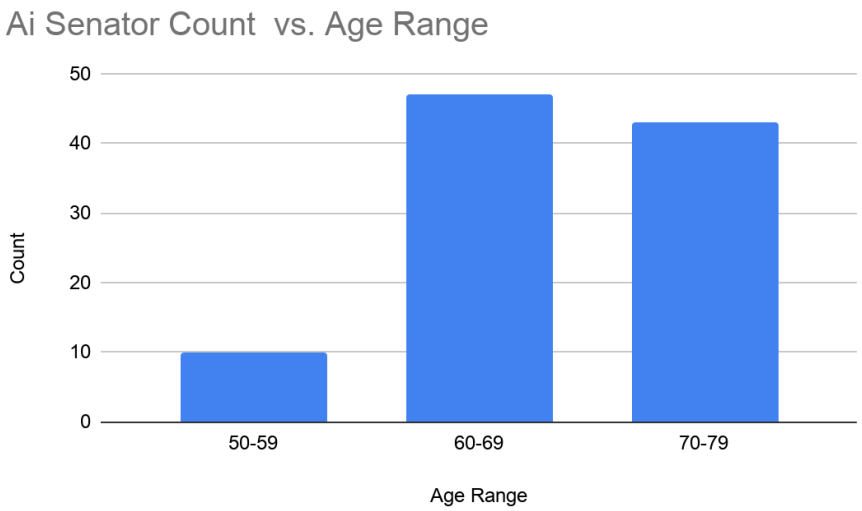

Figure A3 - Age distribution in AI images

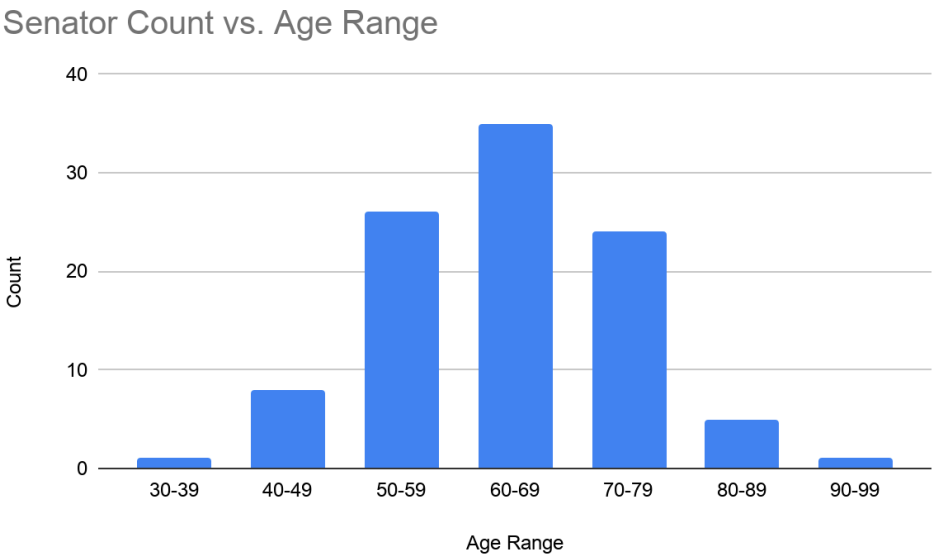

Figure A4 - Age distribution in 119th congress 2026.

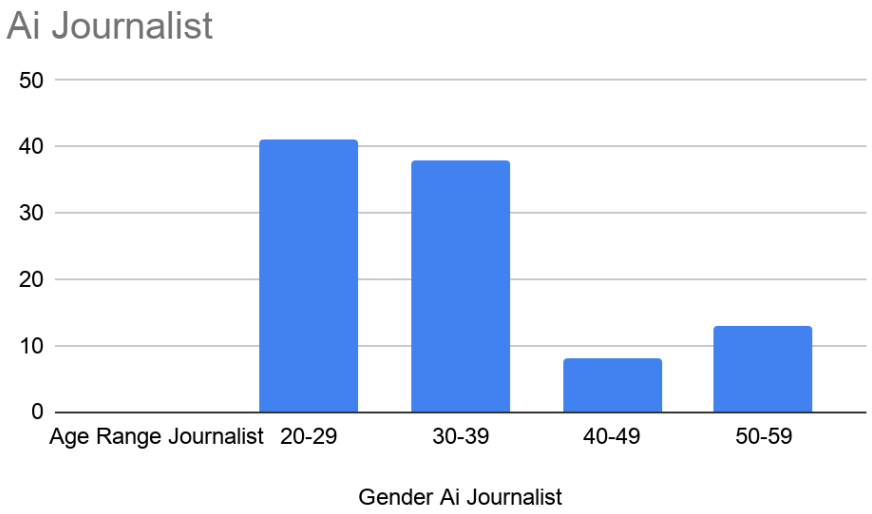

Figure B3 - AI Journalist Age distribution.

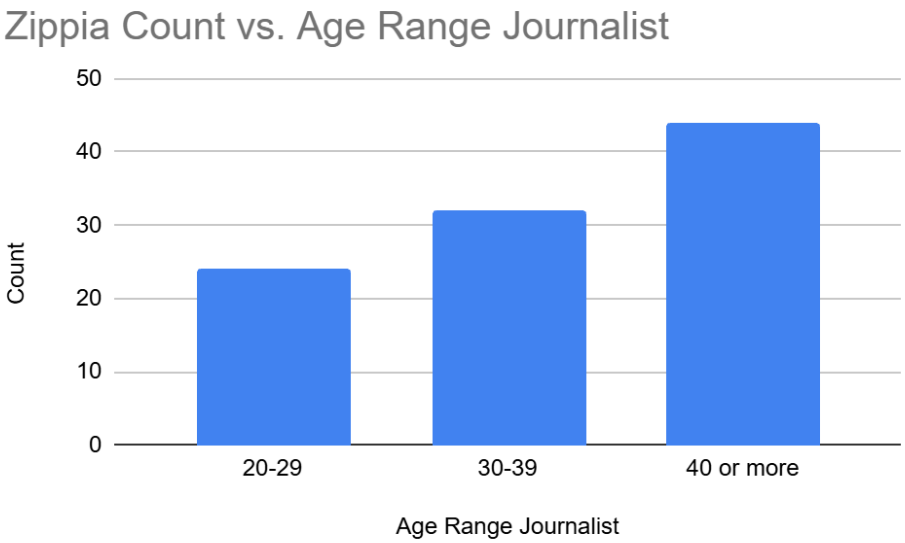

Figure B4 - Zippia Journalist Age distribution 2026.

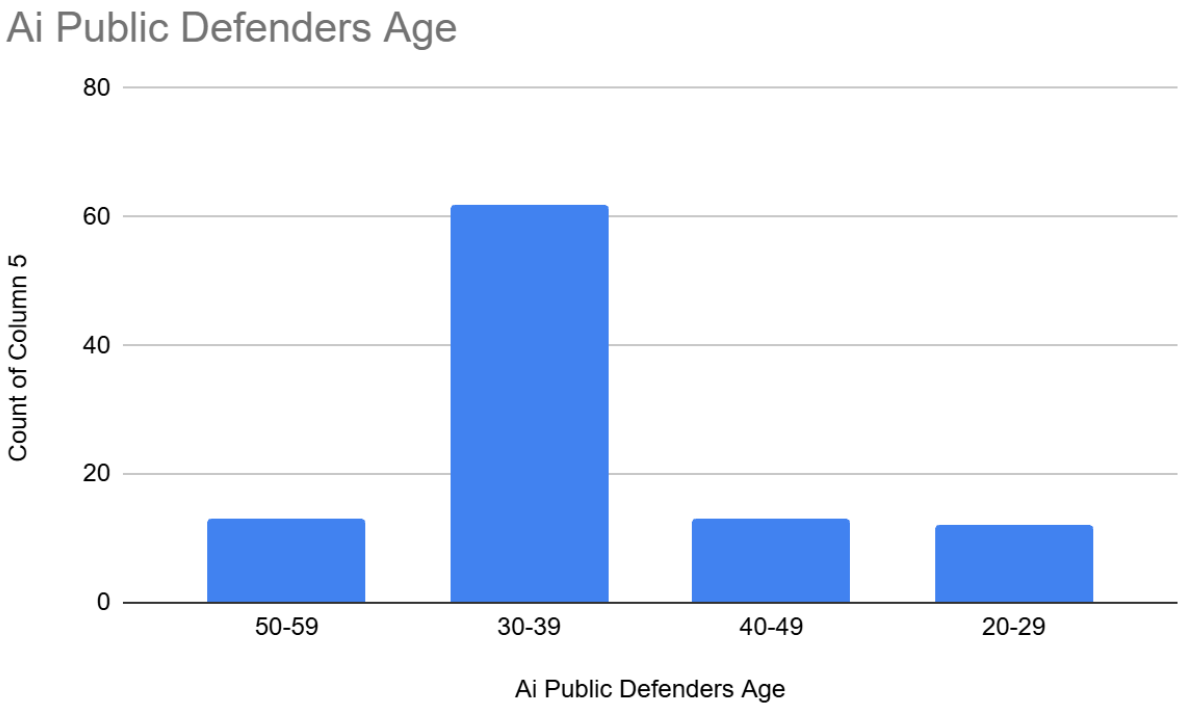

Figure C3 - AI Public Defender Age distribution.

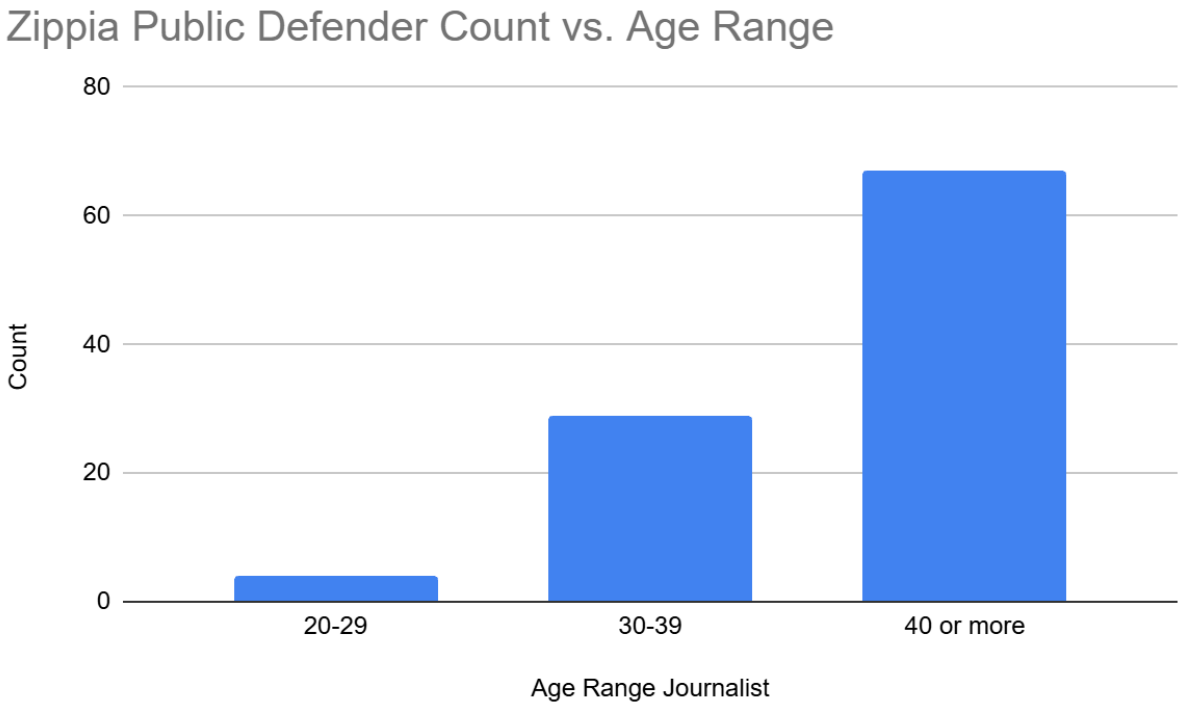

Figure C4 - Zippia Public Defender Age distribution 2026.

The images from the generative Ai reflect a significant tendency to portrait senators within the age of 60-69 and 70-79, about 90% of the images show a person older than 60 years old. In contrast the current Senate members have a more widespread range of ages. In Figure A4 we notice that the Senators in the range of age of 60-69 represent 35% and the ages of 70-79 years represent 24% of the Senators. With less frequency we see that there are Senators younger than 50 years old (9 Senators) and older than 80 years old (6 Senators).

Second, the age in Figure B3 shows hefty concentrations in the 20-29 and 30-39 ranges, with both taking up a 39% stake in overall generations, and 50-59 and 40-49 denominations following up with a respective 13% and 9% composition. According to Zippia more than half of journalists 56% are young people under the age of 40, and 44% of journalists are 40 years old or older.

Third, as seen in Figure C3 for the profession of Public Defenders a heavily dispersed spread can be observed, with the highest bars being those of the 30-35 range at 38%, the 35-40 range at 24%. Remaining ranges were near 10% for the ages of 45-50 (4%), 50-55 (6%), 55-60 (7%), 40-45 (9%), and 25-30 (12%). In reality, it seems that there is a larger representation of people older than 40 years old as Public defenders with 67% of the participation, people from 30-39 represent the 29% and young people of 20-29 represent the 4% of public defenders.

Section C - Ethnicity

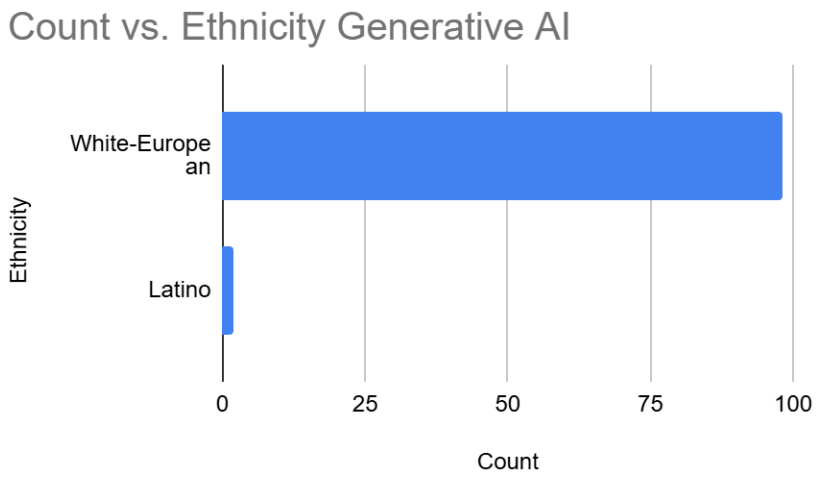

Figure A5 - Ethnicity distribution in 119th congress 2026.

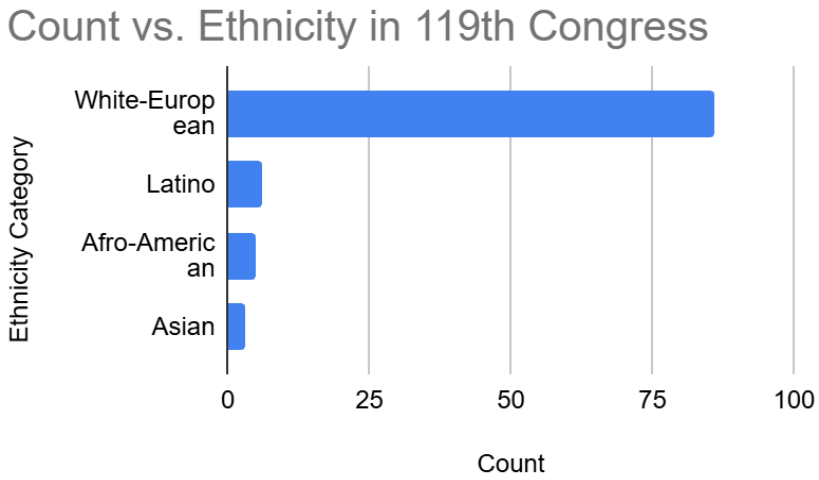

Figure A6- Ethnicity distribution in 119th congress 2026.

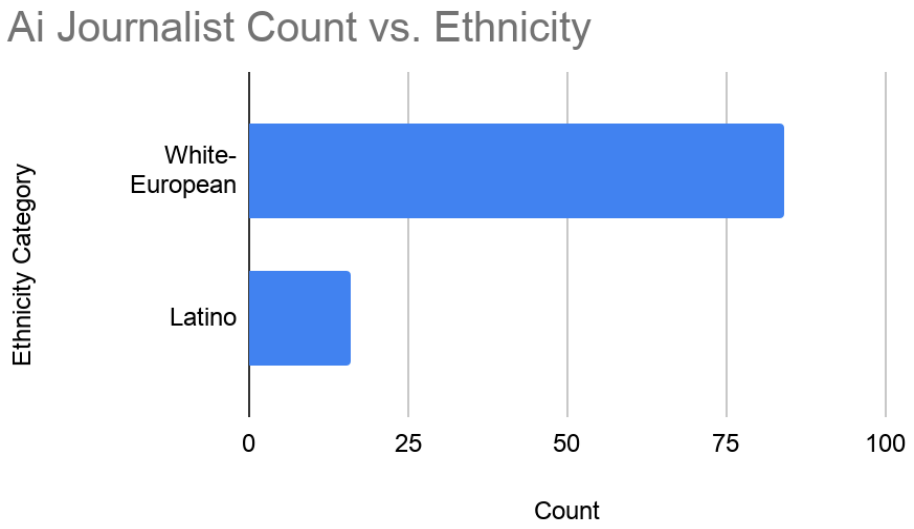

Figure B5 - Ai Journalist Ethnicity distribution.

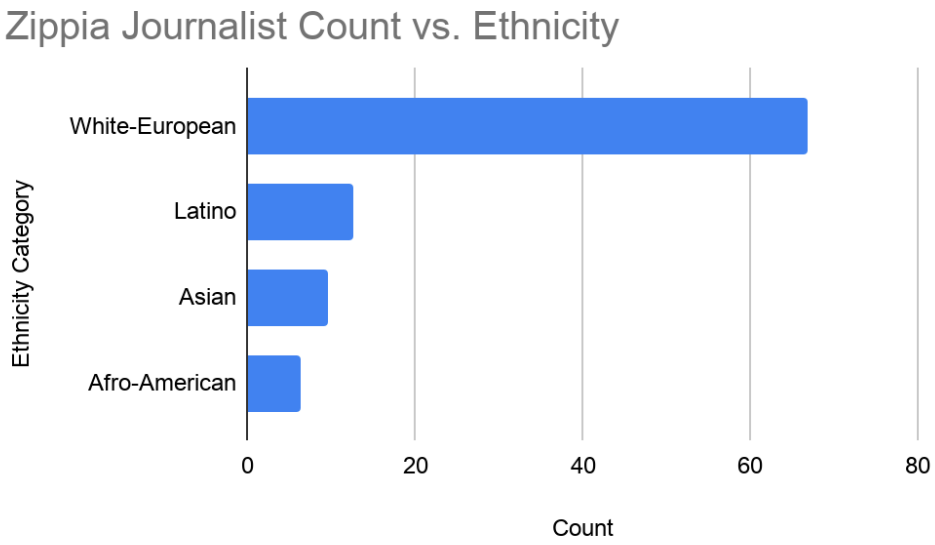

Figure B6 - Zippia Journalist Ethnicity distribution 2026.

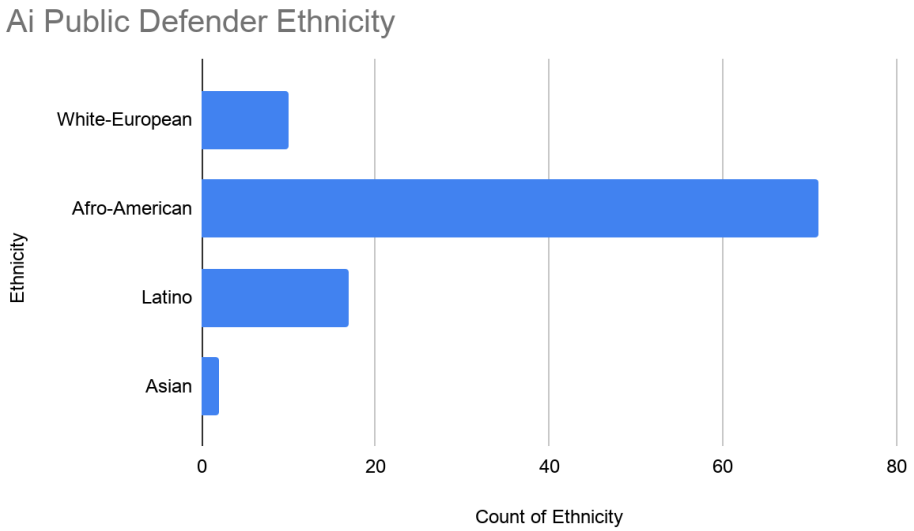

Figure C5 - Ai Public Defender ethnicity distribution 2026.

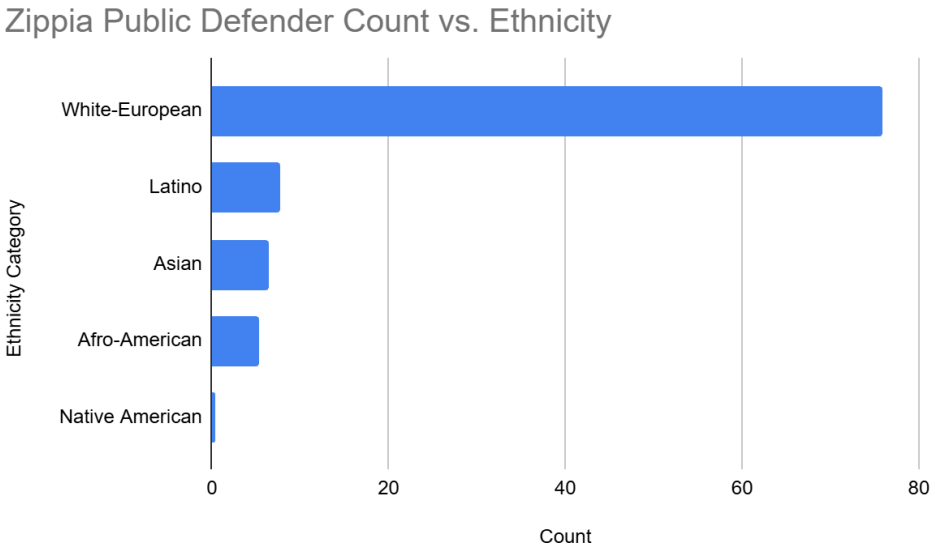

Figure B4 - Zippia Public Defenders ethnicity distribution 2026.

Displayed on Figures A3 and A4 is a hefty demographic shift in relation to the ethnicity of the senators generated. A 98% majority of individuals were of White-European, and the remaining 2% were Latino. On the other hand currently there are about 86 Senators with a White-European ethnicity, 5 Afro-American Senators, 6 Latino Senators and 3 Asian Senators

As seen in Figure B5, there is an overwhelming 83% majority of White-European individuals, with the remaining 17% being Latino. In contrast, according to Zippia Demographics there is a wide variety of ethnicities in the field of journalism with a predominance of White-European with a 66.8% of representation, followed by the Latino ethnicity with 12.6%, Asian 9.6% and Afro-American with 6.4%. A majority of the images take place in a city with protests in the background, or in a presumed warzone. The remaining minority take place in a nondescript European city. Additionally, aside from a few generations, the majority depicted women with features that would adhere to beauty standards.

Third, for the profession of Public Senator ethnicity was heavily skewed towards African-American individuals, who represented 71% of all generations, Latinos following in at 17%, White-Europeans after at 10%, and Asians last with only 2% representation. There is a drastic contrast with real data from Zippia because White-Europeans represent 75.9 % of the public defenders, Afro-Americans 5.4%, Latinos 7.7%, Asian 6.4% and Native Americans 0.3%.

Discussion

The AI's generations appeared to consist mostly of female individuals regardless of the profession. According to Zippia's most recent info on journalism, there are around 6,047 employed journalists in the United States, with 47% of them being male, a minority that is completely ignored in the generations. In the case of the field of law, Public Defenders and Senators a majority of images portray female senators (77%) and female defenders (90%). Even though women represent a minority in the current Senate, in which there are 26 females and 74 males. Historically, although according to the United States Senate's "Woman Senators" article, there have only been 65 female senators historically, compared to 1660 male senators. The results could be unprecedented due to the historical context because the same data does show an increase in female participation from a predominantly male market in 2010 (Zippia, 2026).

In the age ranges for Journalists there is some skewing towards younger demographics, with 39% in both the 20-29 and 30-39 range, this would seem to be close to accurate in reality. A 2026 survey conducted by the Reynolds Center for Business Journalism cited that of 325 participants, the average age range was around 40.5 years old for the profession (Culey, para. 8). While in reality there are about equal male proportions of journalists compared to female journalists, there may be some influence from popular media that shapes public perceptions despite reality. For Senator and Public Defenders the opposite was true, for the last two professions there is a tendency to display the image of an older senator and lawyer (public defender).

Even when it is a new tendency there are young people involved in the politics and laws of the United States, but the generative Ai did not portray them.

Ethnicity was, although still skewed, relatively compared to the other categories. For journalism, the AI did get ethnicity relatively correct as the Zippia. Though, the AI's generations failed to account for smaller Asian, African American denominations that had a roughly 20% share in the pool of journalists. The generative Ai suggest a majority of 99 senate are White-Europeans. AI did not reflect the diversity that there is in the Senate. In fact, in the majority of images AI is following the stereotype of the American politician. For senators, it was impressive how an image of a Senator could suggest a political inclination to democrats or republicans, take as example the following image:

Image 1: Photo-realistic image of a Senator

According to an article from China that was experimenting with AI bias as well, states that Black women had the lowest racial accuracy from the AI generated images (Yang, Yiran; 4 Discussion. 2025). When it comes to Public defenders the AI didn't

seem to have any difficulty generating images of Afro-Americans. Public Defenders was the profession that more diversity reflected according to the generative Ai. The Yang Yiran article also states that people of color were mostly generated as white people regardless of gender and racial contexts of the image (Yang, Yiran; 4 Discussion, 2025), this phenomenon appear evident for professions like Political Senator or journalist but there is a robust diversity for Public Defenders.

Conclusion

The range of images generated by the AI model reflects a tendency to portray public defenders, senators and journalists in ways that generally follow stereotypes pertaining to either age and ethnicity. However, it also appears to have an unequal skewing towards generating female individuals in those professions regardless of actual real-world statistics on the job's demographics. AI seems to reflect the trend of current historical contexts, in which more women participate at professional level. As it is displayed in the Zippia data. Nevertheless, gender disparities in the real world are not reflected in the images generated by the Nano Banana model, and are as a matter of fact inversely representative. This is so, as a majority of generations created by the model featured more female representation over male representation, with one end having 100% female representation, and at maximum, 23%.male representation.

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Appendix:

Tables used :

1. Gender:

Senators Data Generative AI			**Real Data**	
Men	23		**Men**	74
Women	77		**Women**	26

Gender Ai Journalist			**Zippia Data**	
Men	0		Men	53.4
Women	100		Women	46.6

Gender Ai Public Defenders			**Zippia Data**	
Men	10		Men	45.1
Women	90		Women	54.9

2. Age:

Ai Senator Age Range	**Count**		**Real Age Range**	**Count**
50-59	10		**30-39**	1
60-69	47		**40-49**	8
70-79	43		**50-59**	26
Total	100		**60-69**	35
			70-79	24
			80-89	5
			90-99	1
			Total	**100**

Age Range Journalist	**Count**		**Age Range Journalist**	**Count**

20-29	41		20-29	24
30-39	38		30-39	32
40-49	8		40 or more	44
50-59	13			
Total	**100**			

Age Range Public Defenders	**Count**		**Age Range Journalist**	**Count**
20-29	12		20-29	4
30-39	62		30-39	29
40-49	13		40 or more	67
50-59	13			
Total	**100**			

3. Ethnicity:

Senator Ethnicity	**Count**		**Ethnicity Category**	**Count**
White-European	98		**White-European**	86
Latino	2		**Latino**	6
Total	**100**		**Afro-American**	5
			Asian	3
			Total	**100**

Journalist Ethnicity	**Count**		**Ethnicity**	**Count**
White-European	84		**White-European**	66.8
Latino	16		**Latino**	12.6
Total	**100**		**Asian**	9.6
			Afro-American	6.4

Public Defenders Ethnicity	Count		Ethnicity	Count
White-European	84		**White-European**	75.9
Latino	16		**Latino**	7.7
Total	**100**		**Asian**	6.4
			Afro-American	5.4
			Native American	0.3