Occupational Bias in AI: Demographic Patterns in Image Generation

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Abstract

This lab report explores demographic bias in AI-generated images of professionals. Using Rabbithole, we generated 100 images each for three occupations: pharmacist, babysitter, and mechanical engineer. We categorized images by perceived age, gender, and race. Our analysis reveals consistent visual patterns aligned with stereotypes, such as portraying pharmacists and engineers predominantly as middle-aged white males and babysitters as young white females. These biases suggest that AI generators reflect and reinforce societal assumptions encoded in their training data.

Introduction

Artificial intelligence image generators have grown increasingly influential, especially in shaping perceptions of human roles and occupations. Yet, their outputs often reflect underlying societal biases. This lab investigates how AI tools like Rabbithole represent three professions—pharmacist, babysitter, and mechanical engineer—and whether these representations are influenced by race, gender, or age stereotypes.

Yang (2025) found that AI-generated images disproportionately favored White and East Asian features, demonstrating racial bias through visual outputs. Her study tested image prompts and documented visual patterns of marginalization. Similarly, Yetisgen-Yildiz and Yetisgen (2024) studied medical AI tools and revealed racial disparities caused by biased training data, leading to diagnostic errors. A third study (2024) in *Journal of Family Medicine and Primary Care* confirmed the underrepresentation of Black individuals and women in AI-generated images of surgeons, using prompts like "microsurgeon" to reveal consistent patterns of exclusion.

These studies show that AI's visual outputs are not neutral. Our report adds to this conversation by documenting visual bias in AI portrayals of different job titles.

Materials and Methods

- **Image Generator**: Rabbithole
- **Prompts**: "Pharmacist," "Babysitter," "Mechanical Engineer"
- **Tools**: Google Sheets, Canva

Each group member generated and analyzed 100 images per occupation based on perceived race, gender, and age. We documented recurring visual patterns and synthesized findings using charts and example images.

Results

Occupation	**Gender (Male)**	**Gender (Female)**	**Predominant Race**	**Age Range Dominant**	**Animated (%)**
Pharmacist	82%	18%	White, East Asian	30–50	~10%
Babysitter	~10%	~90%	White	20–30	80%+
Mechanical Engineer	70%	30%	White	30–50	~25%

Here is an image below to show more in dept form each catergory

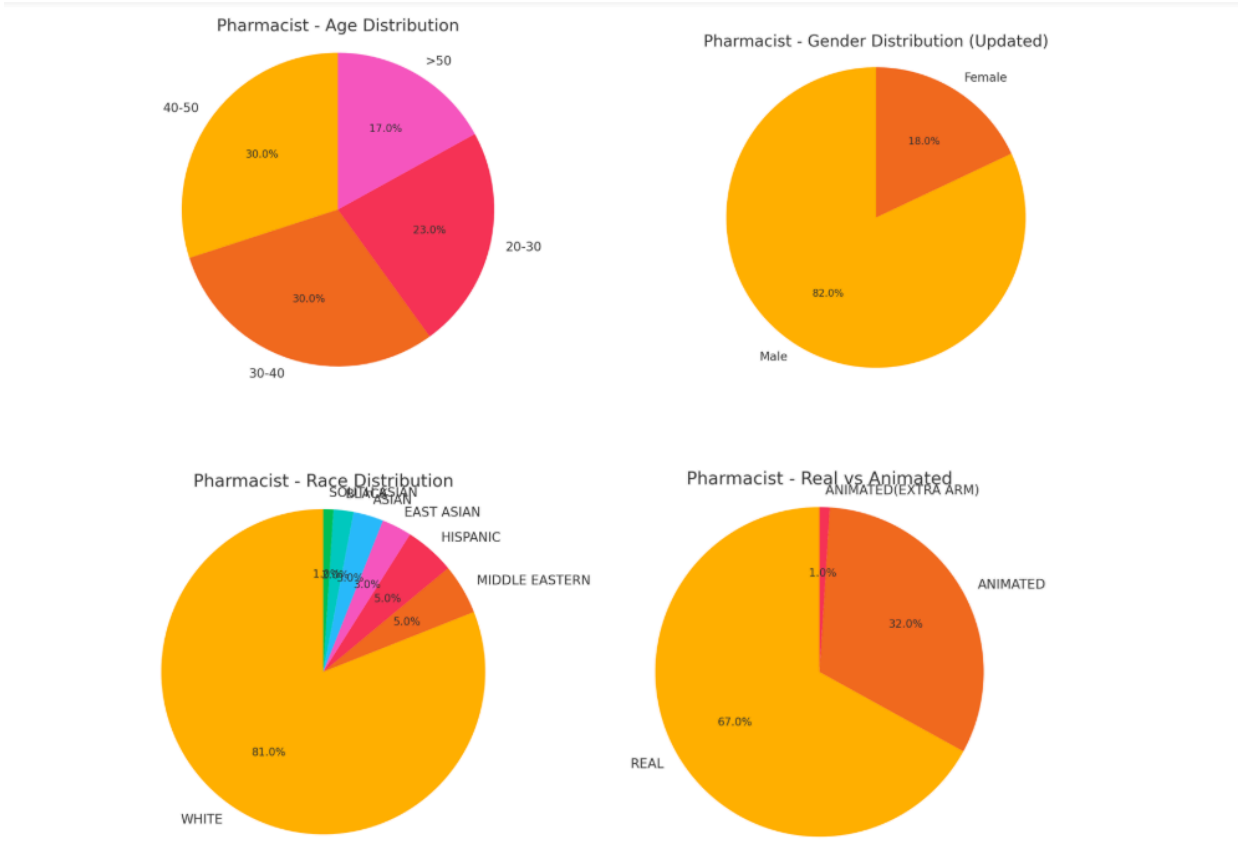

Figure 1. Example AI-generated image for "Pharmacist"

Note: Male, white, middle-aged. Image from Rabbithole.

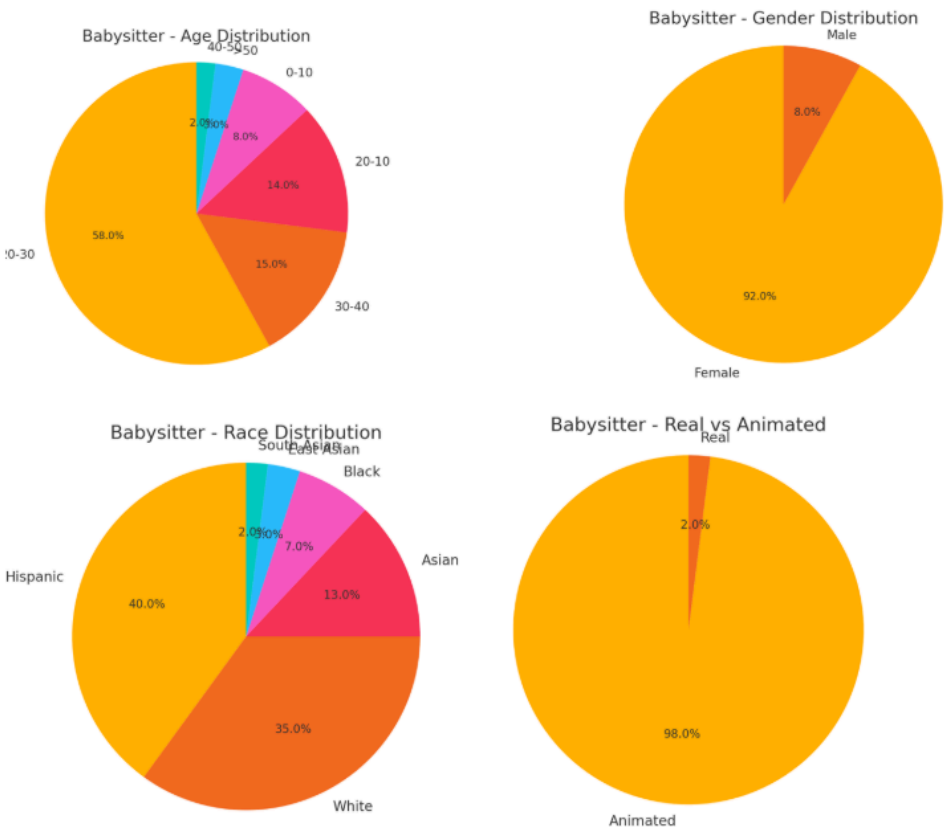

Figure 2. Example AI-generated image for "Babysitter"

Note: Female, young adult, light-skinned. Animated style.

Figure 3. Example AI-generated image for "Mechanical Engineer"

Note: White male, mid-40s, mechanical background. Partially animated.

General Patterns Across Roles

- **Gender Bias**: Pharmacists and engineers mostly male; babysitters overwhelmingly female.
- **Race Bias**: White and East Asian features dominated; Black, Hispanic, and South Asian individuals were rare.

- **Age Bias**: Middle-aged adults favored for professional roles; babysitters depicted as very young.
- **Realism Bias**: Serious roles had realistic visuals; caregiving roles were more likely animated or distorted.

Discussion

AI-generated images from Rabbithole demonstrated clear demographic biases. Gendered roles were reinforced: women were caregivers; men dominated technical roles. Race bias appeared in the repeated portrayal of white individuals in all three jobs. Age diversity was limited, skewing toward young-to-middle-aged adults.

Images of male babysitters were rare and often distorted or animated, suggesting AI's discomfort with visualizing non-stereotypical roles. In contrast, pharmacist and engineer prompts generated serious, realistic depictions—mostly white males. The visual erasure of older adults and complete absence of individuals with disabilities further confirmed our hypothesis.

These results mirror Yang's (2025) and Yetisgen-Yildiz (2024) findings: AI systems reflect biases in their training data. Without intervention, these tools will continue to reinforce social inequalities rather than disrupt them.

Conclusion

Our study confirmed that AI image generators reinforce occupational stereotypes. From gendered caregiving to racially skewed depictions of expertise, Rabbithole's outputs favored

narrow portrayals. This matters because such visuals shape perception—especially in media, education, and marketing. Moving forward, developers must prioritize bias audits and inclusive training datasets to prevent further marginalization.

References

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