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RACIAL DISPARITY IN PERCEIVED EFFECTIVENESS AND EQUITY OF ARTIFICIAL INTELLIGENCE

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Abstract

This study introduces perceived effectiveness and equity as key dimensions of public perception of artificial intelligence (AI) and examines racial disparities in these perceptions. Using the American Trends Panel survey by Pew Research Center, this study examines how White, Black, and Asian respondents perceive effectiveness and equity in AI's application overall and in different fields. Findings show that both Black and White respondents have a relatively lower level of overall perceived effectiveness of AI, while Asian respondents have a higher level of effectiveness perception. For specific fields of AI application, Black respondents have a lower level of perceived AI's effectiveness in detecting cancer and producing crop than the other groups, while White respondents have a lower level of perceived effectiveness of AI's application in mental healthcare, detecting protein structure, and writing news, suggesting Black is more cautious about AI's application in fields that are directly related to resources and personal interests, while White is less optimistic about AI's applications in fields that involve more personal components or personalization. In terms of perceived equity, Black respondents report a lower level of perceived equity overall, as well on healthcare and hiring, which goes against previous expectations that AI contributes to mitigating inequity. This study also examines whether and how individual characteristics are associated with such perceptions in these racial groups, as well as find an association between the perceptions and general attitude toward AI. As AI plays an increasingly important role in our society, these findings reveal racial disparity in perceived effectiveness and equity of AI, along with relevant factors. Overall, this study speaks to racial inequity in the context of technology development, contributes to our understanding of different racial groups' preferences and concerns about AI, and calls for a development of AI that benefits different groups more equally.

Keywords

Artificial Intelligence, Racial Disparity, Perceived Effectiveness, Perceived Equity

As artificial intelligence (AI) continues to develop and shape the society, it is critical to assess how the public perceive AI, which reveals the public's thoughts and concerns, reflects the public's experience with AI, and informs AI related development and policy making. So far, empirical studies have shown a mixed public attitude toward AI (Dreksler et al., 2025), with perceptions of AI as a useful tool (Liehner et al., 2023), along with concerns regarding fairness, privacy, safety, and lack of humanistic factor (Ikkatai et al., 2022; Gao et al., 2020). Research also shows individual and group differences in AI related attitudes and perceptions (Dreksler et al., 2025; Novozhilova et al., 2024a), which calls for more understanding about how different groups perceive AI.

Perceived effectiveness and equity may serve as two major aspects when assessing the public's perception about AI. Perceived effectiveness pertains to the extent to which the public perceive AI as bringing benefits and advancements in its application. Previous research uses perceived effectiveness to assess how AI contributes to various fields, including AI enabled e-learning, task effectiveness in human-AI collaboration, and healthcare (e.g., Kashive et al., 2020; Jacobsen et al., 2020; Chew & Achananuparp, 2022; Milne-Ives et al., 2020), suggesting effectiveness as a major perspective in individuals' AI related perception and evaluation.

As the adoption and influence of AI become more widespread, equity emerges as another major aspect when evaluating AI. Perceived equity of AI pertains to how the adoption of AI affects equal allocation of resources and opportunities in the society. Studies have brought up the equity concern of AI in fields such as healthcare and education (d'Elia et al., 2022; Marcinkowski et al., 2020), while also suggesting opportunity for AI to improve

equity (Li et al., 2024). Recent literature in AI related public perception includes relevant constructs of AI's ability and benevolence (Novozhilova et al., 2024b), which further indicate the need to have multi-dimensional assessment of public perception of AI with constructs such as effectiveness and equity.

Perception in effectiveness and equity of AI may differ by racial groups. Research suggests individuals of different characteristics vary by their AI related perceptions and attitudes (Dreksler et al., 2025; Paik et al., 2025), and race is a prominent factor regarding group difference in the U.S. society (Healey & Stepnick, 2019). Previous studies have documented that individuals' perceptions about AI and algorithmic bias differ by racial identity, which reflect their relevant experiences (Kim et al., 2024). The AI related perception will in turn affect individuals' use of AI (Wu et al., 2024), and the extent to which AI benefits different racial groups.

Based these discussions, this study proposes perceived effectiveness and equity as two major aspects of public perception about AI, building on literature both in general performance assessment, and in AI related evaluation and perception (e.g., Hinrichs-Krapels & Grant, 2016; Kashive et al., 2020). Then, this study examines how these perceptions differ across three racial groups with distinct features: White, Black, Asian (e.g., Lew, 2006), which varies in their collective experience both in general and in AI related fields. Results reveal racial difference both in overall perception of AI effectiveness and equity, and in specific fields of AI application.

In addition, as previous studies suggest that individual characteristics including knowledge about AI and risk-taking inclination may affect perception toward AI (Said et al., 2023; Li, 2025), this study examines whether such individual characteristics are associated with perceived effectiveness and equity across all racial groups, or only exert influence on specific group(s). Furthermore, this study shows a positive relationship between perceived effectiveness and equity and general attitude toward AI, further highlighting such perceptions as critical components relevant to AI related attitudes, and suggesting racial disparity in such perceptions raises concerns and calls for intervention.

Perceived effectiveness and equity of AI

Perceived effectiveness and equity are two important components when evaluating a new technology, policy, and context, with the former emphasizing advancing different fields and promoting performance, and the latter concerning allocation of resources. Previous literature has developed a framework "3es" to assess performance, including effectiveness, efficiency, and equity (e.g., Hinrichs-Krapels & Grant, 2016; Aday et al., 1999). Effectiveness refers to outcomes and benefits, efficiency refers to productiveness based on an output/input ratio, and equity pertains to equitable social goals (Hinrichs-Krapels & Grant, 2016). This framework has been applied to analyze various contexts and objects, including public service (Andrews et al., 2017), geographic information system (Tulloch & Epstein, 2002), health promotion (Tones & Tilford, 2001), and hospital performance (Davis et al., 2013). Previous studies involved two of these components, effectiveness and equity, in specific contexts and topics, including healthcare (Starfield, 2009), schooling (Rossmiller,1987), carbon policy (Lu et al., 2012) and electric vehicles policy (Sheldon, 2022).

In the context of public perception of AI, *perceived effectiveness* can be applied to examine to which extent the public perceive AI as effective in terms of bringing in benefit and advancing performance in its application (Tones & Tilford, 2001; Tulloch & Epstein, 2002). This conceptualization of perceived effectiveness of AI relates to the effectiveness component of the 3es in terms of outcome and benefits, and efficiency component regarding the productiveness and efficiency (Hinrichs-Krapels & Grant, 2016).

Besides the 3es, perceived effectiveness is also connected to several other lines of literature and framework. The first relevant framework is the technology acceptance model (TAM), which suggests that two perceptions including perceived usefulness (i.e., to which extent a technology is useful), and perceived ease of use (i.e., to which extent a technology is easy and effortless to use) can predict individuals' acceptance of the technology (Davis, 1989; Kelly et al., 2023). Perceived effectiveness of AI is related to the usefulness component in TAM, as both assesses performance of technology. These two constructs also differ in that while perceived usefulness examines how useful a particular technology is, effectiveness of AI examines how AI is useful and effective in providing benefits and advancing fields in a broader scope. In addition, perceived effectiveness shares similarity to the relative advantage component in the framework of diffusion of innovation. This framework concerns the degree to which an innovation is perceived as better than the idea it supersedes, and perceived relative advantage contributes to predicting adoption of an innovation (Rogers, 2003). Both perceived effectiveness and perceived relative advantage pertain to the perceived benefits a technology could bring, with the former related to benefits and effectiveness overall, and the latter put more emphasis on benefit and advantage when comparing existing options.

Existing research has examined effectiveness AI in various fields such as healthcare (Milne-Ives et al., 2020) and education (Kashive et al., 2020), but the perceived effectiveness of AI may vary by fields as it becomes widely applied. For example, while the public welcomes certain use of AI such as in screening screen cancer (Eom et al., 2024), there is resistance in using AI for mental healthcare due to concern regarding reduced human connection (Cross et al., 2024). The public and different groups may develop perceived effectiveness in specific

fields of AI application based on how it may affect their most prominent interests and concerns, as self-interest is a major determinant of issue-related attitudes (Weeden & Kurzban, 2017). Perceived effectiveness of AI may hence vary in fields of application, and by social groups with different interests and experience. To capture the variance, this study examines perceived effectiveness in various fields of AI application: detect cancer, mental health support, predict protein structure, produce crops, and write news, reflecting major fields of AI application in healthcare (Milne-Ives et al., 2020), research (Bhardwaj et al., 2024), and journalism (Ismail et al., 2024).

Perceived equity of AI concerns how the public perceive AI in contributing to equal allocation of resources and opportunities in the society. It is related to the equity component of the 3es which emphasizes on achieving equitable goals (Hinrichs-Krapels & Grant, 2016). With the development of new technologies, equity has become a major aspect to assess the technology's impact on a large community (Tulloch & Epstein, 2002; Warschauer & Matuchniak, 2010). The equity perception also relates to literature in digital divide, which emphasizes disparities in access, usage, and outcomes regarding information and communication technology in different groups in a society (Lythreatis et al., 2022). Research shows digital divide and inequity is especially salient in the age of AI (Lutz, 2019), as AI may reinforce existing power hierarchy, and exacerbate marginalization of historically disadvantaged groups (Kim, 2021). For example, AI has been widely applied to healthcare and hiring (Milne-Ives et al., 2020; Li et al., 2021), and while such applications of AI have potential to promote equity in healthcare and hiring (e.g., Li et al., 2024; Kassir et al., 2023), empirical studies pointed out a tendency that AI may actually exacerbate inequity in these fields (Cau et al., 2024; Dalenberg, 2018). Hence, more understanding is needed regarding individuals' perception about perceived equity in AI in fields such as health and hiring, which may reflect their experience and expectations in these fields of AI application.

Racial disparity in perceived effectiveness and equity of AI

Research suggests that the public's attitudes and perceptions of AI may differ across different groups (Dreksler et al., 2025). As race is a salient aspect regarding group identity (Healey & Stepnick, 2019), perception of AI effectiveness and equity can differ across racial groups. Research has shown different AI related experiences and perceptions based on racial identity. Empirical studies reveal AI is not equally effective in providing benefits to different racial groups in fields like healthcare (Cau et al., 2024), and causes unequal opportunities for people from certain racial groups (Intahchomphoo & Gundersen, 2020). Racial identity shapes AI related perceptions, partly due to different lived experiences based on race (Kim et al., 2024).

It is uncertain how different racial groups perceive the effectiveness of AI. One possibility is that more disadvantaged minority groups will perceive a higher level of effectiveness of AI, as AI has the potential to mitigate bias and benefit people of different backgrounds (Li et al., 2024). On the other hand, minority group may perceive less effectiveness and advance brough by AI, due to the existing bias of AI which they may have experienced (Intahchomphoo & Gundersen, 2020), the lack of trust in the application of new technology to fields that are highly relevant to their interests (Lee & Rich, 2021), and unequal opportunities in accessing new technology (Warschauer & Matuchniak, 2010). The White, Black, and Asian groups have different collective experience and characteristics (Lew, 2026), which may breed distinct perceptions about AI. Overall, White individuals might be the least discriminated against, while the Black individuals may be more vulnerable and experience discrimination and inequality (Yearby, 2018). Asian Americans have a good standing in socioeconomic status (Sakamoto et al., 2009), but also experience discrimination as a minority group (McMurtry et al., 2019).

Previous research suggests these racial groups may also have different effectiveness perception of AI. For example, Black people tend to select AI tools less often than White people in healthcare (Robertson et al., 2023). On the other hand though, empirical research also indicated that White people may be more inclined to perceive high risk and low benefit of AI applications and hold a negative attitude (Bao et al., 2022). Asians were found to hold generally positive attitudes toward AI (Funk et al., 2020; Gao et al., 2020). Despite these finidngs, it is not clear how these racial groups are similar or different in their perceived AI effectiveness. In addition, as research suggests different racial groups have different concerns and perceptions about AI tools (Zimmer et al., 2021). How these groups perceive effectiveness in different fields of AI application, such as healthcare, research, and journalism (Milne-Ives et al., 2020; Bhardwaj et al., 2024; Ismail et al., 2024), remains to be examined.

Perceived equity of AI may also vary by racial identity. While AI has the potential to promote equity in healthcare and in the job market (Li et al., 2024; Kassir et al., 2023), research has demonstrated that it may instead exacerbate inequity in both fields. In healthcare, AI models were found to demonstrate different accuracy across radial groups in cardiovascular disease detection (Cau et al., 2024), and algorithmic structure in AI is likely to worsen health inequities with its application (Moore, 2022). In job advertisements, algorithm can be designed in a way that excludes people of a certain racial affinity, which may consequently make people of color in the U.S. become more likely to be discriminated against in employment (Dalenberg, 2018). Such experience may in turn shape different racial groups' perception in AI's contribution to equity. Indeed, study shows that when encountering algorithmic bias, non-White individuals have a less positive view of algorithms (Kim et al., 2024), potentially due to their existing experiences. Considering the bias of AI algorithms and minority groups' less

optimistic view about AI, it is likely that minority groups may have a lower perception of equity brought by AI. Nevertheless, this tendency is uncertain due to the ability of AI to promote equity, as well as differences among minority groups. Taken together, more examination is needed regarding how different racial groups perceive effectiveness and equity of AI, overall and in different fields of application.

RQ1: How do individuals from different racial groups perceive AI's effectiveness (a) overall, and in specific fields pertaining to (b) AI detect skin cancer (c) AI support mental health (d) AI predict protein structure (e) AI produce crops (f) AI write news articles differently?

RQ2: How do individuals from different racial groups perceive AI's equity (a) overall, and in specific fields pertaining to (b) healthcare (c) hiring differently?

Individual differences, perceptions, and general AI attitudes

Individual characteristics cab also shape perception about AI (e.g., Zhang, 2022; Babiker et al., 2024). Specifically, knowledge about AI and risk-taking inclination are two specific individual-level factors that may affect AI related perception. Empirical research shows that knowledge about AI relates to positive attitudes toward AI (Hasan et al., 2024), such that individuals with more AI related knowledge also have a higher level of perceived benefits than risks about AI (Said et al., 2023). In addition, perceived risk about AI use is found to be negatively related to adoption of AI related tools (Li, 2025), indicating people with higher risk-taking inclination may be more acceptable to risks and potentially hold a more positive perception. It is plausible that knowledge and risk-taking inclination is positively related to the perceptions of AI, though it is less clear whether such relationship exists across all racial groups or only for specific group(s).

Besides factors that potentially shape the perceptions, perceived effectiveness and equity may be associated with general AI related attitudes. A review of acceptance of AI finds that perceived usefulness and performance expectancy positively predicts positive AI-related attitudes (Kelly et al., 2023). Studies also show that perceived fairness (i.e., equity) is weaved into AI related attitude and experiences (Lee & Rich, 2021). In addition, the public's attitude toward AI changes (Fast & Horvitz, 2017), and positive perceptions may lead to increased positive attitudes about AI over time. This study hence proposes the following hypotheses.

H1: (a) Knowledge about AI and (b) inclination for risk are positively associated with overall perceived effectiveness in each racial group.
H2: (a) Knowledge about AI and (b) inclination for are positively associated with overall perceived equity in each racial group.
H3: (a) Perceived effectiveness and (b) perceived equity of AI are positively associated with general attitude towards AI.
H4: (a) Perceived effectiveness and (b) perceived equity of AI are positively associated with attitude change toward AI.

Data and Measures

Pew American Trends Panel datasets were used for the analysis. Most of the analysis used Wave 119 which was filed from December 12 to December 18 in 2022 (Pew Research Center, 2022). To observe change of general attitude toward AI, Wave 132 which was filed from July 31 to August 6, 2023 (Pew Research Center, 2023), was also included. According to the American Trends Panel survey methodology, the Wave 119 survey's target population is non-institutionalized persons ages 18 and older, living in the U.S., A total of 11,004 panelists responded out of 12,448 who were sampled, for a response rate of 88%. The survey has two forms that contain different questions, and form 1 was used (N = 5511). Then, the data was filtered to include people who self-identify as either White, Black, or Asian (N = 4523). To observe attitude change about AI, Wave 132 was used for testing a specific hypothesis whereby to observe participants' general attitude change about AI.

Knowledge in AI. Participants were asked six questions regarding their knowledge of AI. For each question, 0 was coded if participants have incorrect answer, and 1 was coded if participants have correct answer (see Appendix for specific questions). The scores for each question were added up to create the measure about knowledge in AI, with the lowest possible score 0 and highest possible score 6 (M = 3.87, SD = 2.09).

Risk-taking inclination. Participants were asked "How well do each of the following phrases describe you?", and a "comfortable taking risks" item was used to measure risk-taking inclination. The answer ranges from "1 extremely well" and "5 not at all well", the item was reverse-coded so that a higher number reflect a higher risk-taking inclination (1 = *not at all well*, 7 = *extremely well*) (M = 3.07, SD = .92).

Race. Participants with three categories of races were included: "White non-Hispanic", "Black non-Hispanic", "Asian non-Hispanic", representing White (*N* = 3618), Black (*N* = 723), and Asian (*N* = 182) respondents. To allow for a comprehensive comparison among the three racial groups, three types of contrast coding were conducted for race using different racial groups as reference group.

***Perceived effectiveness of AI*.** Perceived effectiveness of AI is measured regarding to which extent participants perceive AI's application to different fields is an advance. Participants were asked: "How much of an advance for medical care is artificial intelligence (AI) that can detect skin cancer", "How much of an advance for mental health support are artificial intelligence (AI) chatbots", "How much of an advance for medical research is using artificial intelligence (AI) to predict protein structures in people's cells", "How much of an advance of agriculture is using artificial intelligence (AI) to produce drought and heat-resistant crops", and "How much of an advance for the news media is using artificial intelligence (AI) to write news articles?" Participants choose from "not an advance", "not sure", "a minor advance", and "a major advance". The responses were coded on a 1-3 continuous scale, with higher value indicating participants perceive higher level of advance and thus effectiveness of AI in these sub-fields of application. "Not an advance" and "not sure" were coded as 1, as participants either explicitly or implicitly indicate they don't perceive an advance. "A minor advance" was coded 2, and "a major advance" was coded 3. These five items were analyzed separately and were also merged into one measure for perceived effectiveness of AI for subsequent analysis (*a* = .74, *M* = 1.73, *SD* = 0.57).

Perceived equity of AI. Perceived equity of AI in healthcare and hiring were assessed. Participants were asked "If artificial intelligence (AI) is used more in health and medicine to do things like diagnose disease and recommend treatments, do you think the issue of bias and unfair treatment based on a patient's race or ethnicity would…", and "If artificial intelligence (AI) is used more by employers in the hiring process, do you think the issue of bias and unfair treatment based on job applicants' race or ethnicity would…". Answers were on a five-point scale, with 1 indicating "definitely get better", 5 indicating "definitely get worse", and the answers are reverse-coded so that a higher number indicates participants perceive more equity of AI (1 = *definitely get worse*, 5 = *definitely get better*). These two items were also analyzed separately and then merged for subsequent analysis (*a* = .68, *M* = 3.41, *SD* = 0.78). It is also noticeable that question about equity in hiring process were only asked for participants who think bias and unfair treatment in hiring is a problem, which induces missing values. The items were merged in a way that if a participants answers one of the two questions, the measure would be created by taking the value of the one answer, and if a participant answers both questions, average is used to create the measure.

Attitude towards AI. Participants were asked "Overall, would you say the increased use of artificial intelligence (AI) in daily life makes you feel…", and they chose from "more concerned than excited", "equally concerned and excited", "more excited than concerned". These responses were re-coded to a 1-3 scale, and a higher number means being more excited, indicating having a more positive attitude toward AI in general (*M* = 1.79, *SD* = 0.70). Attitude change was also observed using an additional wave of survey (i.e., Wave 132) which includes the same question. Attitude change was constructed by using the same attitude related variable in Wave 132 subtracted by the variable in the current wave, with a higher number reflecting positive attitude change over time (*M* = -0.24, *SD* = 0.73).

Demographic variables. Education, income, and gender were included. For education, categories include "Less than high school", "High school graduate", "Some college, no degree", "Associate's degree", "College graduate/some post grad", and "Postgraduate, which was coded on a 1-6 scale with higher number indicating higher level of education. Gender was also included (0 = *a man*, 1 = *a women*). Income was assessed with participants' family income and was categorized into "lower income", "middle income", and "upper income" after adjusting for differences in purchasing power by geographic region and for household size in the survey, and it was coded into a 1-3 scale with a higher number indicating a higher income.

Analytical strategy

First, planned orthogonal contrasts were constructed to assess three different racial groups with two contrasts. The first contrast is created using one race as contrast of interest, then the second contrast was created in a way that it is centered, and orthogonal to the first one to represent contrast of the other two groups. For example, Black is in contrast with White and Asian in the first contrast, then White is in contrast with Asian in the second contrast. Three types of contrast were created using three different racial groups as the first contrast of interest, to allow for more comprehensive comparison. These contrasts of race were then used to in a regression analysis to predict the overall as well as specific perceived effectiveness and equity. As these comparisons are unplanned and exploratory in nature, the Scheffé approach which is more conservative in rejecting the null hypothesis was used to calculate the p-value of the results (Klockars & Hancock, 2000; Scheffé, 1953). Specifically, the observed F-statistic for each contrast was divided by (m-1) where m is the number of groups (in this case, m = 3), and the resulting adjusted F-

statistics were then used to compute more conservative *p*-values from the F-distribution. Then, multiple regression was used to examine the relationship between knowledge in AI and risk-taking inclination's relationship with these perceptions in each racial group, as well as the perceptions' relationship with general attitudes toward AI among all participants.

Results

Black has the lowest mean as well as a significantly lower level compared to the other two groups altogether regarding perceived effectiveness overall (b = -.11, p < .01, t(4512) = -3.87), in AI detect skin cancer (b = -.29, p < .001, t(4500) = -6.20) and AI produce crops (b = -.25, p < .001, t(4500) = -5.21). White has both the lowest mean and a significantly lower level compared to the other two groups in their perceived effectiveness about AI support mental health (b = -.18, p < .001, t(4503) = -6.05), predict protein structure (b = -.19, p < .001, t(4496) = -4.89), and write news articles (b = -.23, p < .001, t(4493) = -8.44). Asian has both the highest mean and a significantly higher level of perceived effectiveness overall (b = .22, p < .001, t(4512) = 5.03), in AI support mental health (b = .18, p < .05, t(4503) = 3.49), predict protein structure (b = .34, p < .001, t(4496) = 5.00), and produce crops (b = .25, p < .01, t(4500) = 3.69). RQ1 is answered. See Table 1(a) and (b) for details such as standard error, see Figure 1 for a visualization of overall perceived effectiveness, and Figure 2 for perceived effectiveness in different fields by racial groups.

With regard to perceived equity of AI, Black consistently have both a lowest mean and a significantly lower level of perception compared with the other groups together regarding equity of AI overall (b = -.25, p < 001, t(4459) = -6.10), in health care (b = -.29, p < .001, t(4448) = -6.31), and hiring (b = -.24, p < .001, t(3580) = -4.70). Asian has the highest mean and significantly higher level of perception for equity overall (b = .26, p < .01, t(4459) = 4.45) and in healthcare (b = .29, p < .01, t(4448) = 4.44). RQ2 is answered. See Table 2(a) and (b) for details. See Figure 3 for a visualization of overall perceived equity, and Figure 4 for perceived effectiveness in different fields by racial group.

Knowledge about AI is consistently a positive significant predictor for both overall perceived effectiveness and equity across the racial groups, with and without taking consideration into demographic variables. Risk-taking inclination though, is only a positive significant predictor for perceived effectiveness overall for White, and it is not significantly related to perceived equity for any of the groups. These results support H1(a) and H2(a), partially support H1(b), and reject H2(b). See Table 3 for details.

Perceived overall effectiveness (b = .32, p < .001, t(2, 5403) = 19.06, η_p^2 = .06) and equity (b = .14, p < .001, t(2, 5403) = 12.02, , η_p^2 = .03) are significantly positively associated with general attitude toward AI, with a medium effect size for the former and small effect size for the latter, based on conventional benchmarks for partial eta square (e.g., Lakens, 2013; Cohen, 1988). This relationship still holds after taking into account of demographic variables, supporting H3. However, perceived overall effectiveness (b = -.09, p < .001, t(2, 4929) = -4.63, η_p^2 = .004) and equity (b = -0.062, p < .001, t(2, 4929) = -4.48, , η_p^2 = .004) are significantly negatively associated with general attitude change toward AI, with a small effect size, and this relationship still holds after taking into account of demographic variables. These results reject H4. See Table 4 for results after taking into account of democratic variables.

Discussion

This study proposes effectiveness and equity as two major aspects in the public's perception of AI, and examines racial disparity in such perceptions among White, Black, and Asian groups. Findings reveal racial groups' difference in perceived effectiveness and equity of AI both overall and in specific fields of application. Moreover, findings show factors associated with these perceptions across racial groups, such as knowledge about AI, is consistently positively related to these two perceptions, while the other predictors' roles vary by the groups. In addition, perceived effectiveness and equity are found to be positively related to general attitude toward AI, while negatively related to change of general attitude toward AI after several months.

Primarily, this study reveals different racial groups' perceptions about AI. In terms of perceived effectiveness of AI overall, both Black and White individuals have a lower level of perception when compared to other groups, while the Black respondents have the lowest average level of such perception. This finding resonates with previous literature regarding these two groups' concern about AI, such as Black people have resistance to algorithmic decisions due to mistrust (Lee & Rich, 2021), which can be barrier to positive perceptions, and White people tend to have lower perceived benefits of AI (Bao et al., 2022). In contrast, Asian respondents have a higher overall perceived effectiveness of AI, which may be relevant to the situation that AI development in Asian countries receives prominent attention and resources (Tiwari, 2022). Indeed, research suggests that Asians are in general more acceptable of AI technology (Funk et al., 2020). These findings speak with previous research that there are critical differences across social groups regarding AI related perceptions and experiences (Kim et al.,

2024; Lee & Rich, 2021), and further adds to our understanding of the differences from the perspective of racial identities.

Besides the overall perceived effectiveness, this study also reveals nuanced differences across these racial groups in their perceived effectiveness in different fields of AI application. Black respondents have lower perceived effectiveness in AI detecting skin cancer and producing crops. These two fields pertain to essential fields for individuals' survival regarding health and material resources, and are directly relevant to personal interest. As previous research shows Black people have a disadvantaged gain of resources (Assari, 2017), their lower perceived effectiveness of AI in these two fields may exemplify their caution about application of new technology in fields that directly affect resources that pertain to material wellbeing and self-interest regarding health and food. In comparison, White people have a lower perceived effectiveness of AI in mental health support, predict protein structure, and news writing. These fields are relatively less essential and pertain to personal components in mental healthcare, research, and journalism. This pattern speaks to literature on individual agency (Hitlin & Long, 2009), and indicate White may have a more cultural expectation on individual agency which focuses on self-centered control and experience. It also resonates with research that calls for personalization and customizability in AI development (Chew & Achananuparp, 2022), and further reveals White as a group that may put more emphasis on these aspects. Asian have a higher perceived effectiveness of AI supporting mental health, predicting protein structure, and producing crops. Their high level of perceived effectiveness in various fields again reflect Asians' relatively high acceptance in AI technology and positive view about AI (Funk et al., 2020; Gao et al., 2020).

In terms of perceived equity of AI, Black has a lower level of perception both overall and in specific fields of healthcare and hiring. This pattern echoes with empirical findings that AI algorithms do not necessarily offer equal opportunities for healthcare and job application (Cau et al., 2024). This tendency is concerning in that while AI offers opportunity to promote equity (Frigerio & Rashidian, 2023; Roshanaei, et al., 2023), the Black people, which is a vulnerable group in this aspect, perceive less equity of AI. In contrast, Asian as another minority group perceive higher equity of AI overall and in healthcare, potentially due to a less disadvantaged experience in their socioeconomic attainments (Sakamoto et al., 2009), as well as their general positive attitude toward AI (Gao et al., 2020).

These findings reveal racial disparity in perception of AI related effectiveness and equity, and yield seveal implications as AI continues to develop. First, more efforts are needed to make AI benefit different groups. While studies show AI has potential to benefit people of different backgrounds and mitigate inequities (Li et al., 2024), the results indicate challenges for realizing such expectation. The Black's low level of these perceptions may reflect their relatively negative experience with AI. As study shows people's perception of AI affects their intention of using AI related tools (Wu et al., 2024), such low perceptions may also make Black less motivated to use AI, and potentially widen the digital gap across racial groups. Second, it will be beneficial to promote informed citizenship and critical thinking when faced with new technology that exert wide influence such as AI. The Asian has a high level perception of effectiveness and equity, which speaks to their emphasis on science and technology (Wong & Halgin, 2006), and collective perspective (Lui & Rollock, 2018). These patterns may make Asians put more emphasis on AI' advancement in technology and AI's contribution overall, while downplay other concerns and implications on individuals. Being over positive about a new technology can also be concerning (Said et al., 2023), and it can be helpful to provide the public with more information and critics about technology development to facilitate critical and rational thinking across different groups. Third, different groups have distinct preferences and concerns about specific fields of AI application. For example, while Black has lower perceived effectiveness of AI's application in fields that are relevant to resources, White has lower perceived effectiveness in AI's application in fields that are related to personal components. These findings indicate the importance of personalization and customizability (Chew & Achananuparp, 2022), and call for awareness of group differences in AI development.

Knowledge in AI is consistently positively related to perceived overall effectiveness and equity of AI across the racial groups, indicating promoting knowledge and understanding in AI can contribute to positive perception of AI in different racial groups. These results respond to previous calls for examining the role of pre-existing knowledge in AI related attitudes (Kelly et al., 2023), and shows a consistently positive role of knowledge in promoting perceived effectiveness and equity of AI. Inclination for risk does not play a role in predicting these perceptions except for White respondents' perceived effectiveness. When studies examine individual traits' relationship with AI related attitude (e.g., Stein et al., 2024), these results show the role of traits may play different roles in different groups. It is also noticeable that education is positively associated with perceived overall effectiveness of AI in Black respondents, which is the group that has the lower perceived effectiveness. These findings ndicate promoting more education, along with AI related knowledge, is an approach to empower this minority group internally to have a more positive perception of AI in terms of effectiveness, which may affect AI use and narrow the digital divide.

Both perceived effectiveness and equity are positively associated with AI related attitude, showing these two perceptions' important role in constituting general attitude toward AI. However, these two perceptions are negatively related to the attitude change, reflecting the tendency that individuals are concerned about AI as it

continues to develop (e.g., Maphosa, 2024), especially for individuals who originally have a higher expectation on AI related effectiveness and equity.

This study has several limitations. First, it only includes three racial groups, future study should include more. Second, the dimensions examined in fields regarding effectiveness and equity are limited. Specifically for equity, there are two fields of examination including healthcare and hiring, with missing data in the hiring aspect. Future research can incorporate a broader range of fields for examining perceived effectiveness and equity, and further development and validation of such measures are also needed. Third, the range of scales for effectiveness and equity are different, future studies can use more consistent scales for constructs regarding perception. Fourth, this study examines the relationship between individual characteristics and AI related perceptions by each racial group, which impairs statistical power. Fifth, the cross-sectional data does not allow for causal inference for relationships examined such as the association between knowledge about AI and perceptions, and more studies can be conducted to examine relationship with time lag. Lastly, more research is needed to further examine the change of AI related perceptions and attitudes over time.

With the fast-paced development of AI and the formation of public opinion surrounding this new technology, this study proposes perceived effectiveness and equity as two aspects in AI related perceptions, and reveal racial disparity in these perceptions. In addition, this study reveals how such perceptions vary across different fields, individual level characteristics that relate to these perceptions, and the association between these perceptions and AI related attitude. These findings call for more efforts from developers and policymakers to put more emphasis on equity as AI continues to develop, and from communicators and educators to empower different groups to engage with AI in a rational and beneficial manner.

References

Andrews, R., Beynon, M. J., & Genc, E. (2017). Strategy implementation style and public service effectiveness, efficiency, and equity. *Administrative Sciences*, *7*(1), 4.

Aday, L. A., Begley, C. E., Lairson, D. R., Slater, C. H., Richard, A. J., & Montoya, I. D. (1999). A framework for assessing the effectiveness, efficiency, and equity of behavioral healthcare. *Am J Manag Care*, *5*(8), S25-S43.

Assari, S. (2017). Unequal gain of equal resources across racial groups. *International journal of health policy and management*, *7*(1), 1.

Bao, L., Krause, N. M., Calice, M. N., Scheufele, D. A., Wirz, C. D., Brossard, D., ... & Xenos, M. A. (2022). Whose AI? How different publics think about AI and its social impacts. *Computers in Human Behavior*, *130*, 107182.

Babiker, A., Alshakhsi, S., Supti, T. I., & Ali, R. (2024, August). Do Personality Traits Impact the Attitudes Towards Artificial Intelligence?. In *2024 11th International Conference on Behavioural and Social Computing (BESC)* (pp. 1-8). IEEE.

Bhardwaj, A., Kishore, S., & Pandey, D. K. (2022). Artificial intelligence in biological sciences. *Life*, *12*(9), 1430.

Cau, R., Pisu, F., Suri, J. S., & Saba, L. (2024). Addressing hidden risks: Systematic review of artificial intelligence biases across racial and ethnic groups in cardiovascular diseases. *European Journal of Radiology*, 111867.

Cross, S., Bell, I., Nicholas, J., Valentine, L., Mangelsdorf, S., Baker, S., ... & Alvarez-Jimenez, M. (2024). Use of ai in mental health care: Community and mental health professionals survey. *JMIR Mental Health*, *11*(1), e60589.

Chew, H. S. J., & Achananuparp, P. (2022). Perceptions and needs of artificial intelligence in health care to increase adoption: scoping review. *Journal of medical Internet research*, *24*(1), e32939.

Cohen,J.(1988). *Statistical Power Analysis for the Behavioral Sciences.* NewYork, NY: Routledge Academic.

Dreksler, N., Law, H., Ahn, C., Schiff, D., Schiff, K. J., & Peskowitz, Z. (2025). What Does the Public Think About AI? An Overview of the Public's Attitudes Towards AI and a Resource for Future Research. Available at SSRN: https://ssrn.com/abstract=5108572 or http://dx.doi.org/10.2139/ssrn.5108572

Davis, P., Milne, B., Parker, K., Hider, P., Lay-Yee, R., Cumming, J., & Graham, P. (2013). Efficiency, effectiveness, equity (E3). Evaluating hospital performance in three dimensions. *Health Policy*, *112*(1-2), 19-27.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Dalenberg, D. J. (2018). Preventing discrimination in the automated targeting of job advertisements. *Computer law & security review*, *34*(3), 615-627.

d'Elia, A., Gabbay, M., Rodgers, S., Kierans, C., Jones, E., Durrani, I., ... & Frith, L. (2022). Artificial intelligence and health inequities in primary care: a systematic scoping review and framework. *Family Medicine and Community Health*, *10*(Suppl 1), e001670.

Eom, D., Newman, T., Brossard, D., & Scheufele, D. A. (2024). Societal guardrails for AI? Perspectives on what we know about public opinion on artificial intelligence. *Science and Public Policy*, *51*(5), 1004-1013.

Fast, E., & Horvitz, E. (2017, February). Long-term trends in the public perception of artificial intelligence. In *Proceedings of the AAAI conference on artificial intelligence* (Vol. 31, No. 1).

Funk, C., Tyson, A., Kennedy, B., & Johnson, C. (2020). Science and scientists held in high esteem across global publics. *Pew research center*, *29*, 1-133.

Frigerio, I., & Rashidian, N. (2023). Artificial intelligence for equity. *Artificial Intelligence Surgery Editorial Board Study Group on Ethics*, *3*, 160-162.

Gao, S., He, L., Chen, Y., Li, D., & Lai, K. (2020). Public perception of artificial intelligence in medical care: content analysis of social media. *Journal of Medical Internet Research*, *22*(7), e16649.

Hinrichs-Krapels, S., & Grant, J. (2016). Exploring the effectiveness, efficiency and equity (3e's) of research and research impact assessment. *Palgrave communications*, *2*(1), 1-9.

Healey, J. F., & Stepnick, A. (2019). *Diversity and society: Race, ethnicity, and gender*. Sage Publications.

Hasan, H. E., Jaber, D., Al Tabbah, S., Lawand, N., Habib, H. A., & Farahat, N. M. (2024). Knowledge, attitude and practice among pharmacy students and faculty members towards artificial intelligence in pharmacy practice: A multinational cross-sectional study. *Plos one*, *19*(3), e0296884.

Hitlin, S., & Long, C. (2009). Agency as a sociological variable: A preliminary model of individuals, situations, and the life course. *Sociology Compass*, *3*(1), 137-160.

Ikkatai, Y., Hartwig, T., Takanashi, N., & Yokoyama, H. M. (2022). Octagon measurement: Public attitudes toward AI ethics. *International Journal of Human–Computer Interaction*, *38*(17), 1589-1606.

Intahchomphoo, C., & Gundersen, O. E. (2020). Artificial intelligence and race: A systematic review. *Legal Information Management*, *20*(2), 74-84.

Ismail, O. D., Surajudeen, O. D., & Olutobi, F. M. (2024). Awareness, Usage and Perception of Artificial Intelligence in Journalism Practice among Journalists in Kwara State. *Covenant Journal of Communication*.

Jacobsen, R. M., Bysted, L. B. L., Johansen, P. S., Papachristos, E., & Skov, M. B. (2020, April). Perceived and measured task effectiveness in human-AI collaboration. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1-9).

Kashive, N., Powale, L., & Kashive, K. (2020). Understanding user perception toward artificial intelligence (AI) enabled e-learning. *The International Journal of Information and Learning Technology*, *38*(1), 1-19.

Kelly, S., Kaye, S. A., & Oviedo-Trespalacios, O. (2023). What factors contribute to the acceptance of artificial intelligence? A systematic review. *Telematics and Informatics*, *77*, 101925.

Kim, P. (2021). AI and Inequality. *Forthcoming in The Cambridge Handbook on Artificial Intelligence & the Law, Kristin Johnson & Carla Reyes, eds.(2022), Washington University in St. Louis Legal Studies Research Paper*, (21-09), 03.

Kim, S., Lee, J., & Oh, P. (2024). Questioning artificial intelligence: how racial identity shapes the perceptions of algorithmic bias. *International Journal of Communication*.

Kassir, S., Baker, L., Dolphin, J., & Polli, F. (2023). AI for hiring in context: a perspective on overcoming the unique challenges of employment research to mitigate disparate impact. *AI and Ethics*, *3*(3), 845-868.

Klockars, A. J., & Hancock, G. R. (2000). Scheffé's more powerful F-protected post hoc procedure. *Journal of Educational and Behavioral Statistics*, *25*(1), 13-19.

Lythreatis, S., Singh, S. K., & El-Kassar, A. N. (2022). The digital divide: A review and future research agenda. *Technological Forecasting and Social Change*, *175*, 121359.

Lutz, C. (2019). Digital inequalities in the age of artificial intelligence and big data. *Human Behavior and Emerging Technologies*, *1*(2), 141-148.

Lew, J. (2006). Burden of acting neither White nor Black: Asian American identities and achievement in urban schools. *The Urban Review*, *38*, 335-352.

Li, W. (2025). A study on factors influencing designers' behavioral intention in using AI-generated content for assisted design: Perceived anxiety, perceived risk, and UTAUT. *International Journal of Human–Computer Interaction*, *41*(2), 1064-1077.

Li, L., Lassiter, T., Oh, J., & Lee, M. K. (2021, July). Algorithmic hiring in practice: Recruiter and HR Professional's perspectives on AI use in hiring. In *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society* (pp. 166-176).

Li, H., Moon, J. T., Shankar, V., Newsome, J., Gichoya, J., & Bercu, Z. (2024). Health inequities, bias, and artificial intelligence. *Techniques in Vascular and Interventional Radiology*, *27*(3), 100990.

Lu, Y., Zhu, X., & Cui, Q. (2012). Effectiveness and equity implications of carbon policies in the United States construction industry. *Building and Environment*, *49*, 259-269.

Liehner, G. L., Biermann, H., Hick, A., Brauner, P., & Ziefle, M. (2023). Perceptions, Attitudes and Trust Towards Artificial Intelligence-An Assessment of the Public Opinion. *Artificial Intelligence and Social Computing*, *782*, 32-41.

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Frontiers in psychology*, *4*, 863.

Lee, M. K., & Rich, K. (2021, May). Who is included in human perceptions of AI?: Trust and perceived fairness around healthcare AI and cultural mistrust. In *Proceedings of the 2021 CHI conference on human factors in computing systems* (pp. 1-14).

Lui, P. P., & Rollock, D. (2018). Greater than the sum of its parts: Development of a measure of collectivism among Asians. *Cultural Diversity & Ethnic Minority Psychology*, *24*(2), 242.

Milne-Ives, M., de Cock, C., Lim, E., Shehadeh, M. H., de Pennington, N., Mole, G., ... & Meinert, E. (2020). The effectiveness of artificial intelligence conversational agents in health care: systematic review. *Journal of medical Internet research*, *22*(10), e20346.

McMurtry, C. L., Findling, M. G., Casey, L. S., Blendon, R. J., Benson, J. M., Sayde, J. M., & Miller, C. (2019). Discrimination in the United States: Experiences of Asian Americans. *Health services research*, *54*, 1419-1430.

Maphosa, V. (2024). The rise of artificial intelligence and emerging ethical and social concerns. *AI, Computer Science and Robotics Technology*.

Marcinkowski, F., Kieslich, K., Starke, C., & Lünich, M. (2020, January). Implications of AI (un-) fairness in higher education admissions: the effects of perceived AI (un-) fairness on exit, voice and organizational reputation. In *Proceedings of the 2020 conference on fairness, accountability, and transparency* (pp. 122-130).

Moore, C. M. (2022). The challenges of health inequities and AI. *Intelligence-Based Medicine*, *6*, 100067.

Novozhilova, E., Mays, K., & Katz, J. E. (2024a). Looking towards an automated future: US attitudes towards future artificial intelligence instantiations and their effect. *Humanities and Social Sciences Communications*, *11*(1), 1-11.

Novozhilova, E., Mays, K., Paik, S., & Katz, J. E. (2024b). More capable, less benevolent: trust perceptions of AI systems across societal contexts. *Machine Learning and Knowledge Extraction*, *6*(1), 342-366.

Paik, S., Novozhilova, E., Mays, K. K., & Katz, J. E. (2025). Who Benefits from AI? Examining Different Demographics' Fairness Perceptions across Personal, Work, and Public Life. *Discover Artificial Intelligence*, *5*(1), 39.

Pew Research Center. (2022). *American Trends Panel Wave, Wave 119*. Retrieved from: https://www.pewresearch.org/dataset/american-trends-panel-wave-119/

Pew Research Center. (2023). *American Trends Panel Wave, Wave 132*. Retrieved from: https://www.pewresearch.org/dataset/american-trends-panel-wave-132/

Rossmiller, R. A. (1987). Achieving equity and effectiveness in schooling. *Journal of Education Finance*, *12*(4), 561-577.

Rogers, E.M. (2003). Diffusion of innovations (5th ed.). New York: Free Press.

Robertson, C., Woods, A., Bergstrand, K., Findley, J., Balser, C., & Slepian, M. J. (2023). Diverse patients' attitudes towards Artificial Intelligence (AI) in diagnosis. *PLOS Digital Health*, *2*(5), e0000237.

Roshanaei, M., Olivares, H., & Lopez, R. R. (2023). Harnessing AI to foster equity in education: Opportunities, challenges, and emerging strategies. *Journal of Intelligent Learning Systems and Applications*, *15*(4), 123-143.

Said, N., Potinteu, A. E., Brich, I., Buder, J., Schumm, H., & Huff, M. (2023). An artificial intelligence perspective: How knowledge and confidence shape risk and benefit perception. *Computers in human behavior*, *149*, 107855.

Stein, J. P., Messingschlager, T., Gnambs, T., Hutmacher, F., & Appel, M. (2024). Attitudes towards AI: measurement and associations with personality. *Scientific Reports*, *14*(1), 2909.

Sakamoto, A., Goyette, K. A., & Kim, C. (2009). Socioeconomic attainments of Asian Americans. *Annual Review of Sociology*, *35*(1), 255-276.

Starfield, B. (2009). Primary care and equity in health: the importance to effectiveness and equity of responsiveness to peoples' needs. *Humanity & Society*, *33*(1-2), 56-73.

Sheldon, T. L. (2022). Evaluating electric vehicle policy effectiveness and equity. *Annual Review of Resource Economics*, *14*(1), 669-688.

Scheffé, H. (1953). A method for judging all contrasts in the analysis of variance. *Biometrika*, *40*(1-2), 87-110.

Tiwari, S. P. (2022). Re-emergence of Asia in the New Industrial Era. *Technium Soc. Sci. J.*, *29*, 471.

Tulloch, D. L., & Epstein, E. (2002). Benefits of community MPLIS: efficiency, effectiveness, and equity. *Transactions in GIS*, *6*(2), 195-211.

Tones, K., & Tilford, S. (2001). *Health promotion: effectiveness, efficiency and equity*. Nelson Thornes.

Yearby, R. (2018). Racial disparities in health status and access to healthcare: the continuation of inequality in the United States due to structural racism. *American Journal of Economics and Sociology*, *77*(3-4), 1113-1152.

Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of research in education*, *34*(1), 179-225.

Weeden, J., & Kurzban, R. (2017). Self-interest is often a major determinant of issue attitudes. *Political Psychology*, *38*, 67-90.

Wu, W., Huang, Y., & Qian, L. (2024). Social trust and algorithmic equity: The societal perspectives of users' intention to interact with algorithm recommendation systems. *Decision Support Systems*, *178*, 114115.

Wong, F., & Halgin, R. (2006). The "model minority": Bane or blessing for Asian Americans?. *Journal of Multicultural Counseling and Development*, *34*(1), 38-49.

Zhang, B. (2022). Public opinion toward artificial intelligence. In J. B. Bullock, and others (Eds.), *The Oxford Handbook of AI Governance (pp. 553–571)*. Oxford University Press.

Zimmer, M., Franco, Z., Madiraju, P., Echeveste, C., Heindel, K., & Ogle, J. (2021). Public Opinion Research on Artificial Intelligence in Public Health Responses: Results of Focus Groups with Four Communities. *AAAS. Washington, DC: AAAS Center for Public Engagement with Science and Technology*, 2021-09.

Table 1 (a). Descriptives of racial groups and perceived effectiveness of AI

	Overall	AI detect skin cancer	AI support mental health	AI predict protein structure	AI produce crops	AI write news articles
Asian	1.92 (.55)	2.19 (.85)	1.61 (.75)	2.12 (.88)	2.15 (.90)	1.52 (.68)
Black	1.70 (.62)	1.88 (.93)	1.49 (.73)	1.79 (.90)	1.82 (.90)	1.52 (.74)
White	1.71 (.54)	2.15 (.87)	1.37 (.63)	1.76 (.88)	1.98 (.89)	1.29 (.58)

Note: values in the brackets are standard deviation

Table 1 (b). Comparison across racial groups on perceived effectiveness of AI

	Race	Overall	AI detect skin cancer	AI support mental health	AI predict protein structure	AI produce crops	AI write news articles
Contrast 1	Asian and White vs. Black	-0.11*** (.03)	-.29*** (.05)	.001 (.03)	-.15* (.04)	-.25*** (.05)	.12* (.03)
	Asian vs. White	-0.21*** (.04)	-.05 (.07)	-.23*** (.05)	-.36*** (.07)	-.17 (.07)	.23*** (.05)
Contrast 2	Asian and Black vs. White	-.10*** (.02)	.11* (.04)	-0.18*** (.03)	-.19*** (.04)	-.01 (.04)	-.23*** (.03)
	Asian vs. Black	-.22*** (.05)	-.31** (.07)	-.12 (.05)	-.32** (.07)	-.33** (.07)	.001 (.05)
Contrast 3	Black and White vs. Asian	.22*** (.04)	.18 (07)	.18* (.05)	.34*** (.07)	.25** (.07)	.11 (.05)
	Black vs. White	-.01 (.02)	.27*** (.04)	-.12** (.03)	-.03 (.04)	.16** (.04)	-.23*** (.02)
R^2		.006	.013	.009	.006	.006	.020

Note (1): values in the brackets are standard deviation
Note (2): p value is adjusted using the Scheffé approach

Table 2 (a). Descriptives of racial group and perceived equity of AI

	Overall	Healthcare	Job application
Asian	3.61 (.73)	3.62 (.92)	3.60 (.78)
Black	3.27 (.87)	3.23 (1.02)	3.32 (1.00)
White	3.42 (.75)	3.42 (0.82)	3.52 (.86)

Note: values in the brackets are standard deviation

Table 2 (b). Comparison across racial groups on perceived equity of AI

	Race	Overall	Healthcare	Job application
Contrast 1	Asian and White vs. Black	-0.25***	-.29***	-.24***
		(.04)	(.05)	(.05)
	Asian vs. White	-.18*	-.20*	-.09
		(.06)	(.07)	(.07)
Contrast 2	Asian and Black vs. White	-.01	-.005	.05
		(.03)	(.04)	(.04)
	Asian vs. Black	-.34***	-.39***	-.28*
		(.06)	(.07)	(.08)
Contrast 3	Black and White vs. Asian	.26**	.29**	.18
		(.06)	(.07)	(.07)
	Black vs. White	.16***	.19***	.19***
		(.03)	(.04)	(.04)

Note (1): values in the brackets are standard deviation
Note (2): p value is adjusted using the Scheffé approach

Table 3. Association between knowledge about AI, inclination for risk, and perceived effectiveness and equity of AI for each racial group

	Perceived effectiveness			Perceived equity		
	Asian	Black	White	Asian	Black	White
Knowledge about AI	.13***	.08***	.09***	.07*	.07***	.07***
	(.02)	(.01)	(.005)	(.03)	(.02)	(.01)
Risk-taking inclination	.07	.04	.04***	.04	.05	-.01
	(.04)	(.02)	(.01)	(.06)	(.04)	(.01)
Education	-.02	.04*	.01	-.01	.02	.01
	(.04)	(.02)	(.01)	(.05)	(.03)	(.01)
Income	-.07	.04	.03*	.20*	.06	.04
	(.06)	(.04)	(.01)	(.09)	(.06)	(.02)
Gender	-.04	-.17**	-.05**	-.15	.03	.02
	(.08)	(.05)	(.02)	(.12)	(.08)	(.03)
Age	-.05	-.09**	-.02*	-.01	.04	.06***
	(.05)	(.03)	(.01)	(.07)	(.04)	(.01)
R^2	.183	.159	.149	.086	.046	.036

Note: values in the brackets are standard deviation

Table 4. Association between perceived effectiveness, perceived equity, and general attitude and change

	General attitude	General attitude change
Perceived effectiveness	.28***	-.11***
	(.02)	(.02)
Perceive equity	.15***	-.05***
	(.01)	(.01)
Education	.03***	-.001
	(.01)	(.01)
Income	.02	-.03
	(.01)	(.02)
Gender	-.13***	.01
	(.02)	(.02)
Age	-.04***	-.05***
	(.01)	(.01)
R^2	.144	.02

Note: values in the brackets are standard deviation

Figure 1. Perceived effectiveness of AI overall by racial groups

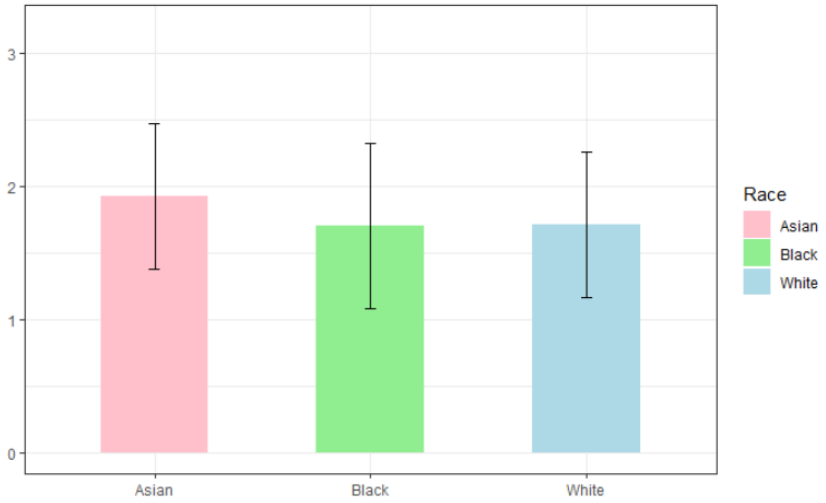

Figure 2. Perceived effectiveness of AI by racial group in (a) AI detect skin cancer (b) AI support mental health (c) AI predict protein structure (d) AI produce crops (e) AI write news articles

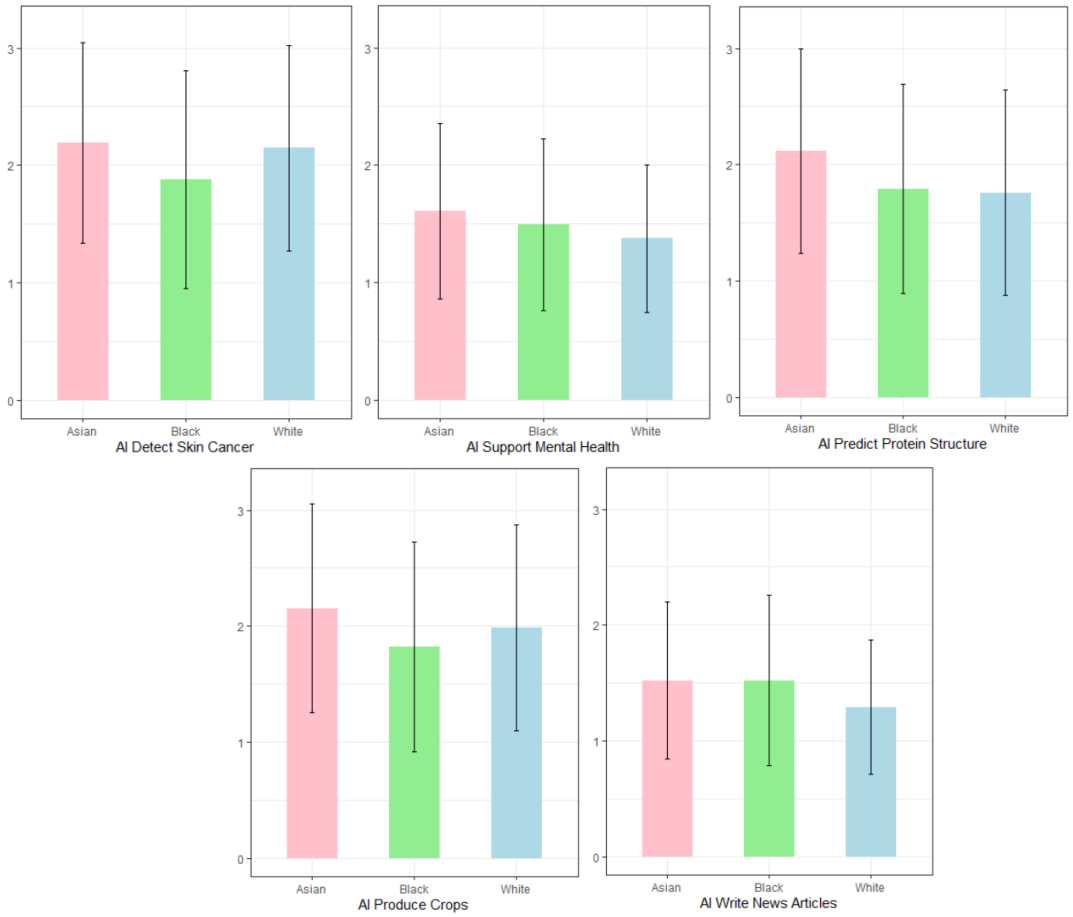

Figure 3. Perceived equity of AI overall by racial group

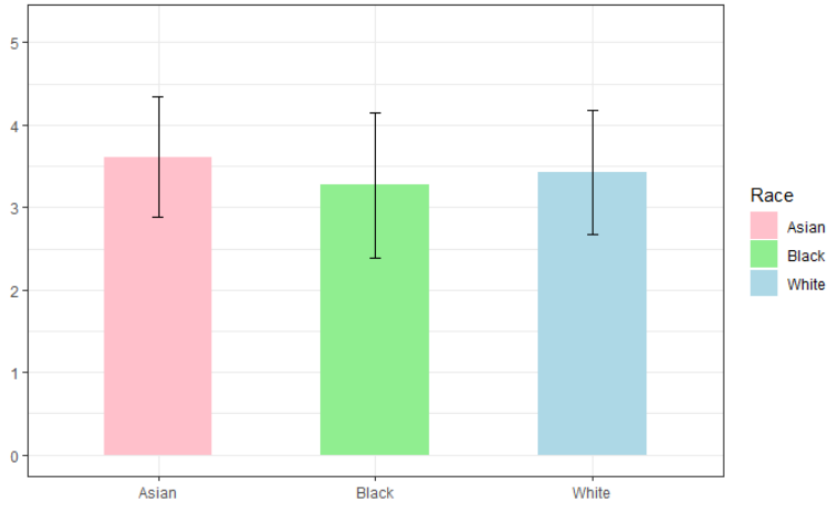

Figure 4. Perceived equity of AI by racial group in (a) healthcare (b) job application