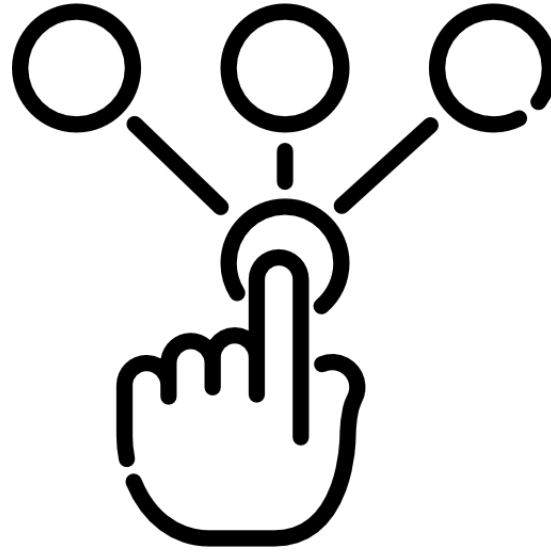




The Impact Of Choice On The Utilization Of AI In Decision-Making

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Algorithm Utilization

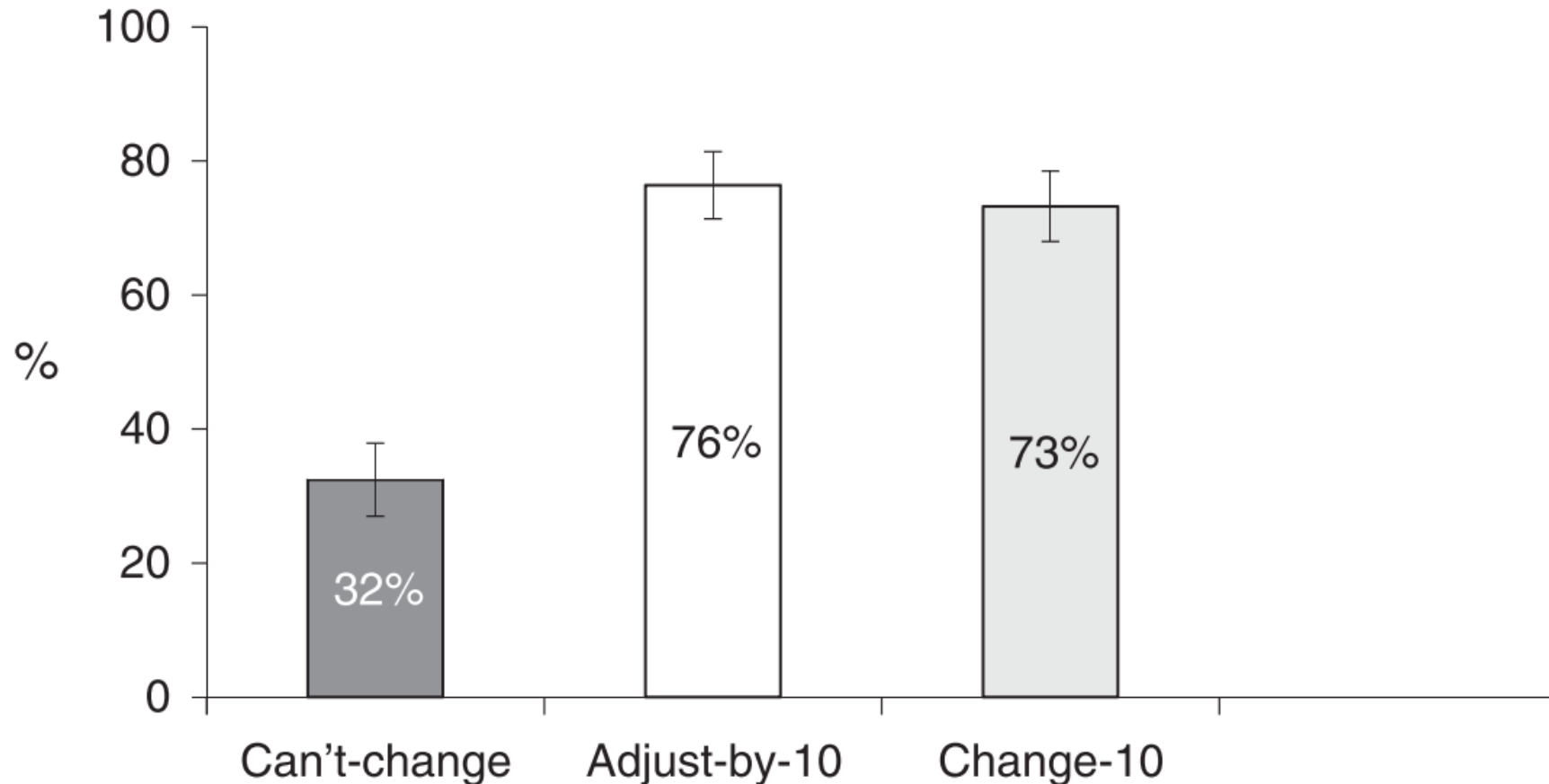
- Utilizing algorithms increases accuracy over using your own decision making (Dawes et al., 1989; Grove et al., 2000; Kuncel et al., 2013; Meehl, 1954) .
- Individuals' are generally overconfident in their own abilities.
 - Individuals regularly discount other people's advice (Yaniv & Kleinberger, 2000).
 - People generally believe that they can outperform their peers (Logg, Haran, & Moore, 2018; Moore & Healy, 2008; Moore, Tenney, & Haran, 2015)

Algorithm Aversion/Appreciation

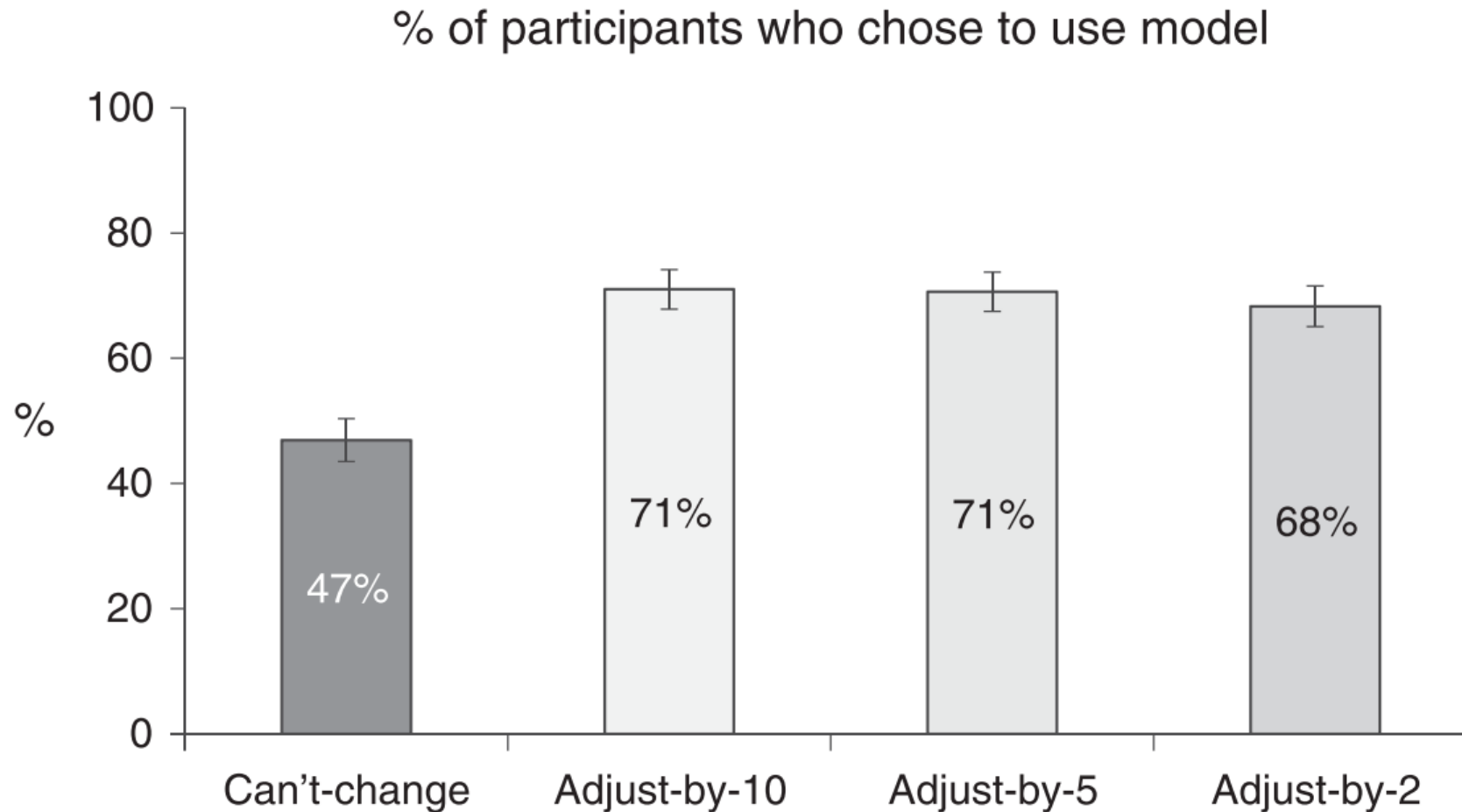
- Whether individuals utilize algorithm's recommendation and decisions depends on the context and discipline of the decision (Logg, Minson, & Moore, 2018).
 - We need to understand how to increase algorithm appreciation in contexts where individuals fail to utilize algorithms.
- Dietvorst et al. (2018) and Cheng & Chouldechova (2023) found that being able to change an algorithm's outcome increases people's willingness to utilize an algorithm decision-maker.

Dietvorst et al., 2018 – Study 1

% of participants who chose to use model



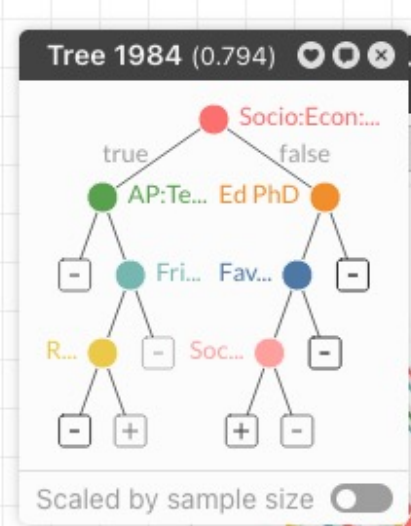
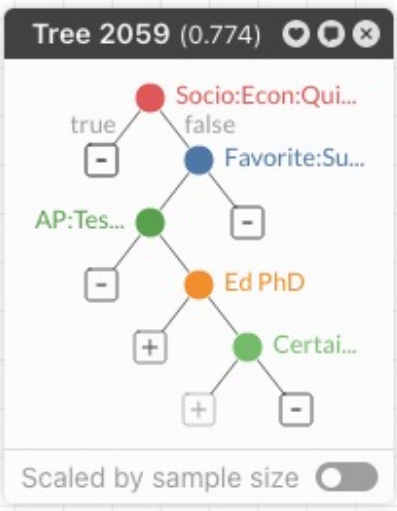
Dietvorst et al., 2018 – Study 2



The Question

- Though Dietvorst and colleagues found adding autonomy to the final decision increases algorithm appreciation
 - However, because participants adjusted the final outcome, participants increased the error for their result.

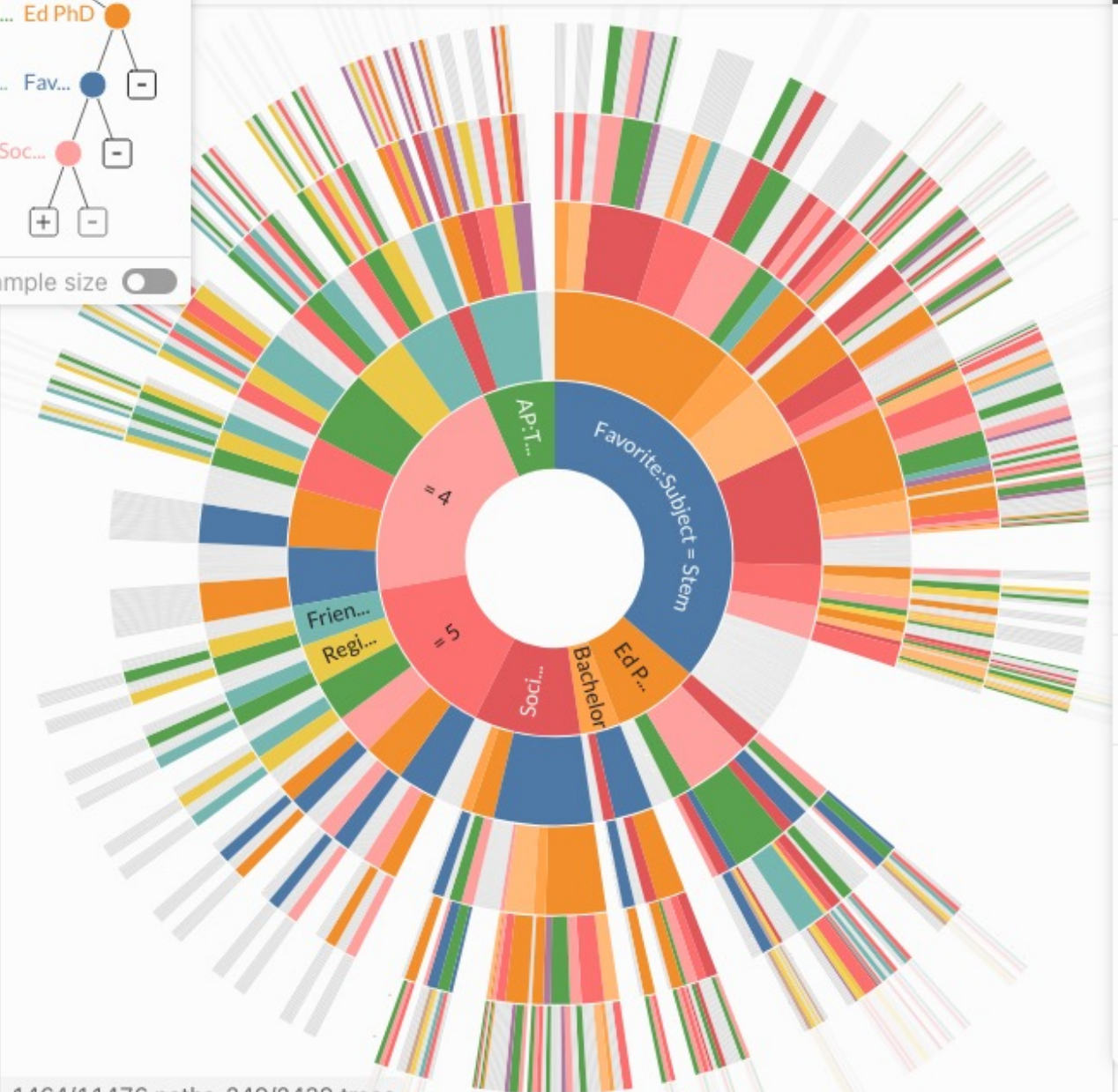
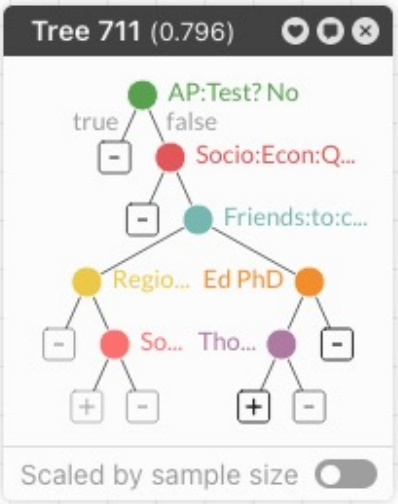
Would we see an appreciation effect from autonomy when autonomy is provided during the initial decision rather than the final output?



rek Curating decision trees that align with human knowledge

1 2 3 4 5 6 7

♥ Favorites 🔍 Search



Search Trees

Accuracy

0.741 0.805

Minimum Leaf Sample

0 102

Height

(0%) (0%) (0%) (0%) (2%)

☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

Features

Include all features

Depth 1

☐ Perc75 Perc75

☐ Certainty:about:occupation:at:30:=Ve
certain

☐ Favorite:Subject = Stem

Ed

☐ PhD ☐ Bachelor ☐ MS

Socio:Econ:Quintile

☐ -2 ☐ -5 ☐ -4 ☐ -3

Timber Trek

Weng et al. 2022

Method

- We recruited 800 participant (48.25% Female; ~200 per condition) to make decisions about high school student achievement.
- The participants were informed that they would judge whether 10 high schooler would be eligible for an advanced placement course by achieving above the 75th percentile on a standardized math test.
 - Participants would be receive a bonus payment for student they correctly determine.
- Before making any decisions participants had to evaluate a sample student.

Sample Student

Information

Socio-Economic Status

Student's Predicted Highest Degree

Region

Times Taken PSAT

Friends To College

Favorite Subject STEM?

AP Tests

Thought about Occupation at 30

Certainty about Occupation at 30

Value

40-60th Percentile

MS

Midwest

Less than 2 Times

Greater Than Half

Not STEM

Yes

A Lot

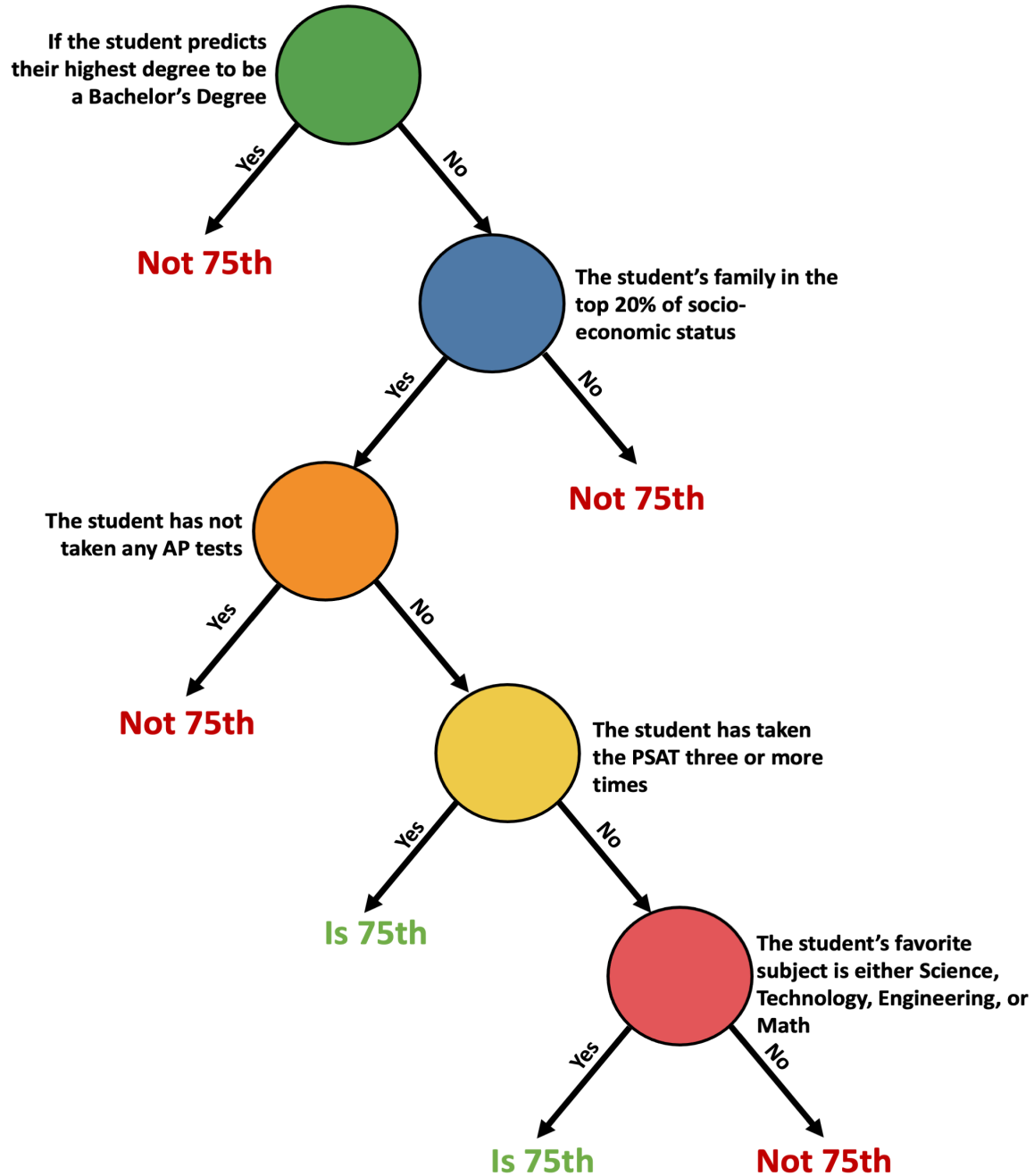
Not Certain

Did this student score above the 75th percentile?

Yes or No

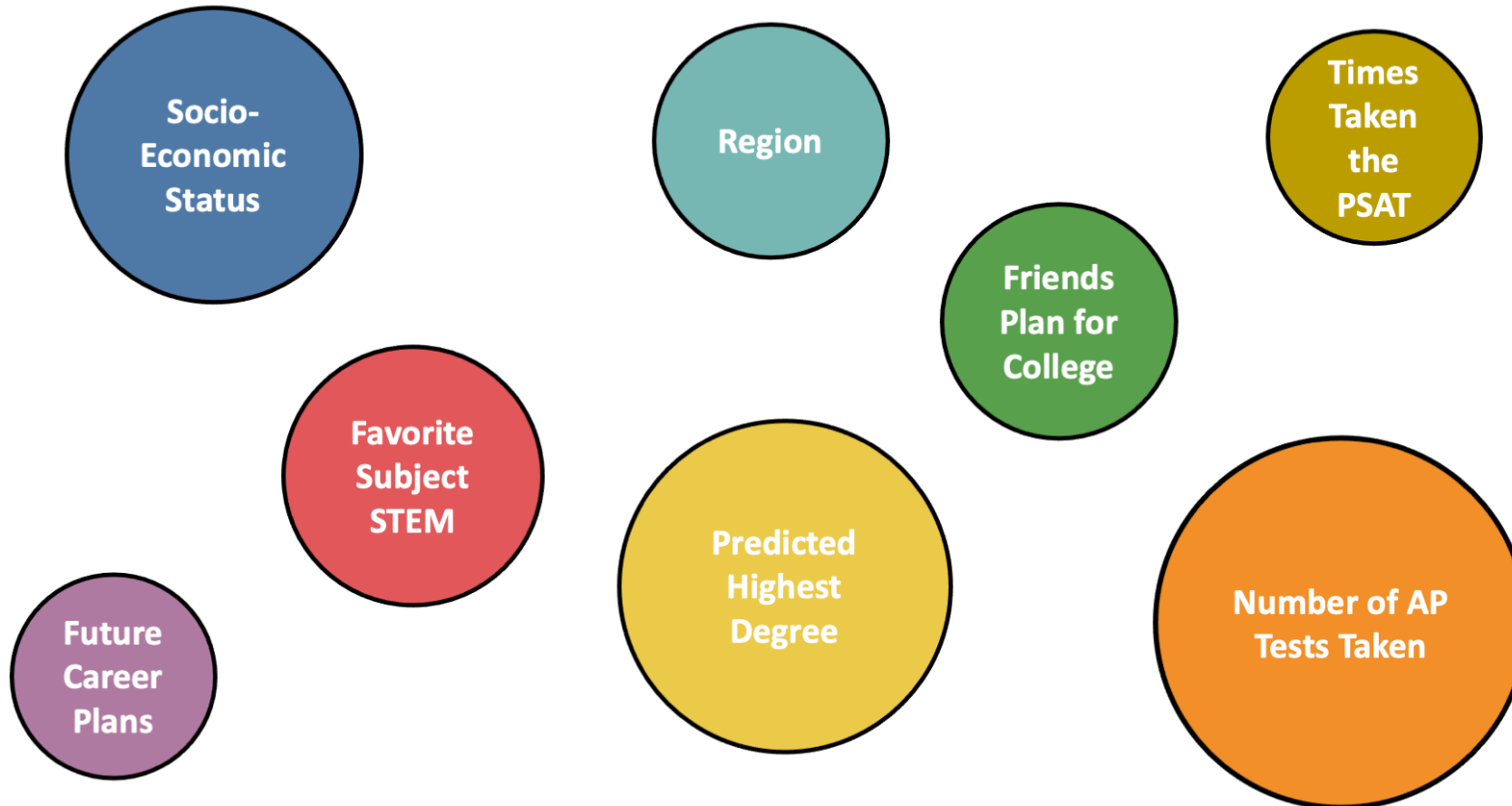
Method

- Participants were then given the chance to use the judgements of an external to be counted towards their bonus instead of their own.
- Participants were then randomly shown one of four conditions
 - A singular algorithm
 - Three algorithms
 - A singular lay group
 - Three lay groups
- Participants were told that each of these groups had an average accuracy of 80%.

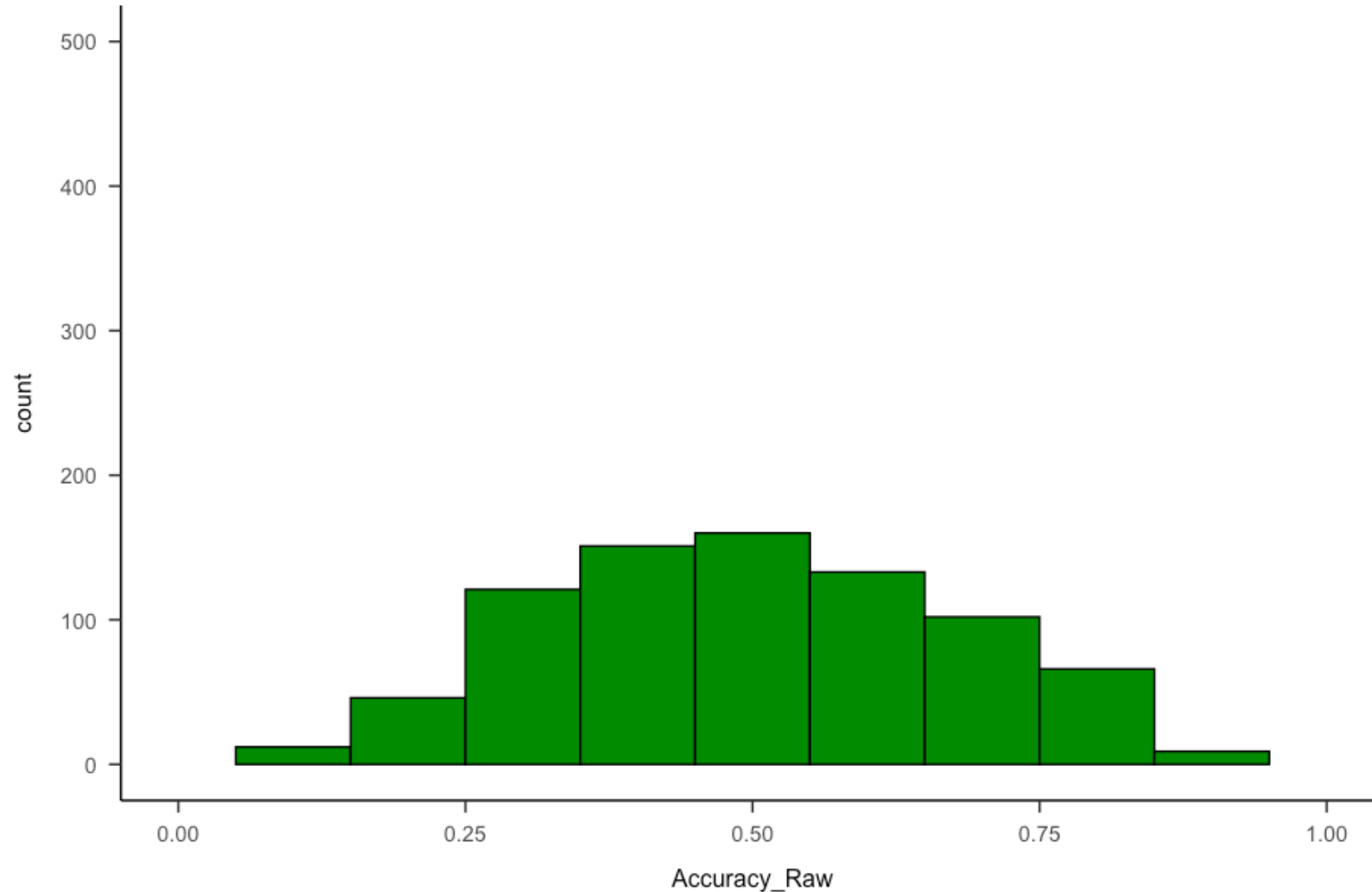


Example Algorithm

Example Lay Group



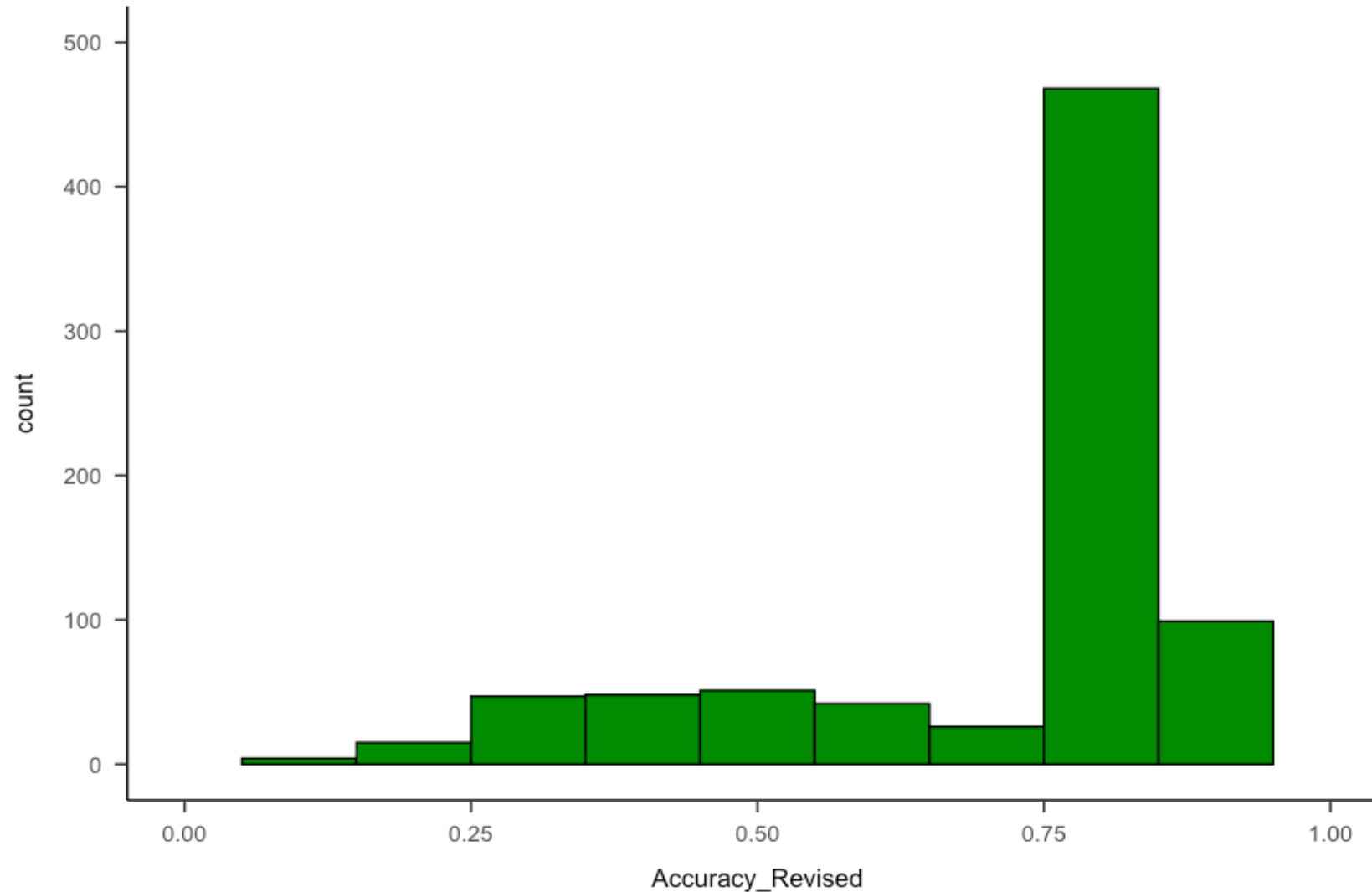
Participant Raw Accuracy



Average Accuracy

50%

Participant Revised Accuracy

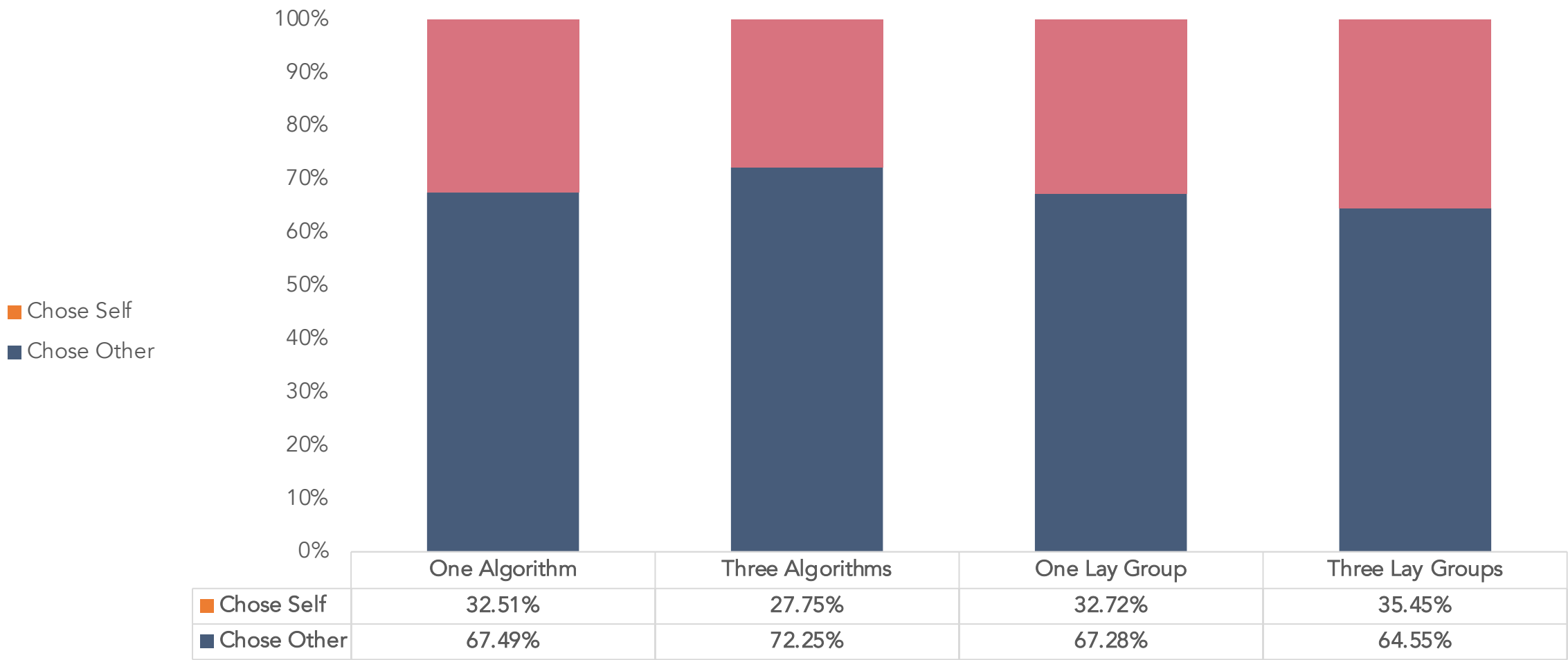


Average Accuracy

71%

Results – Participant Choice

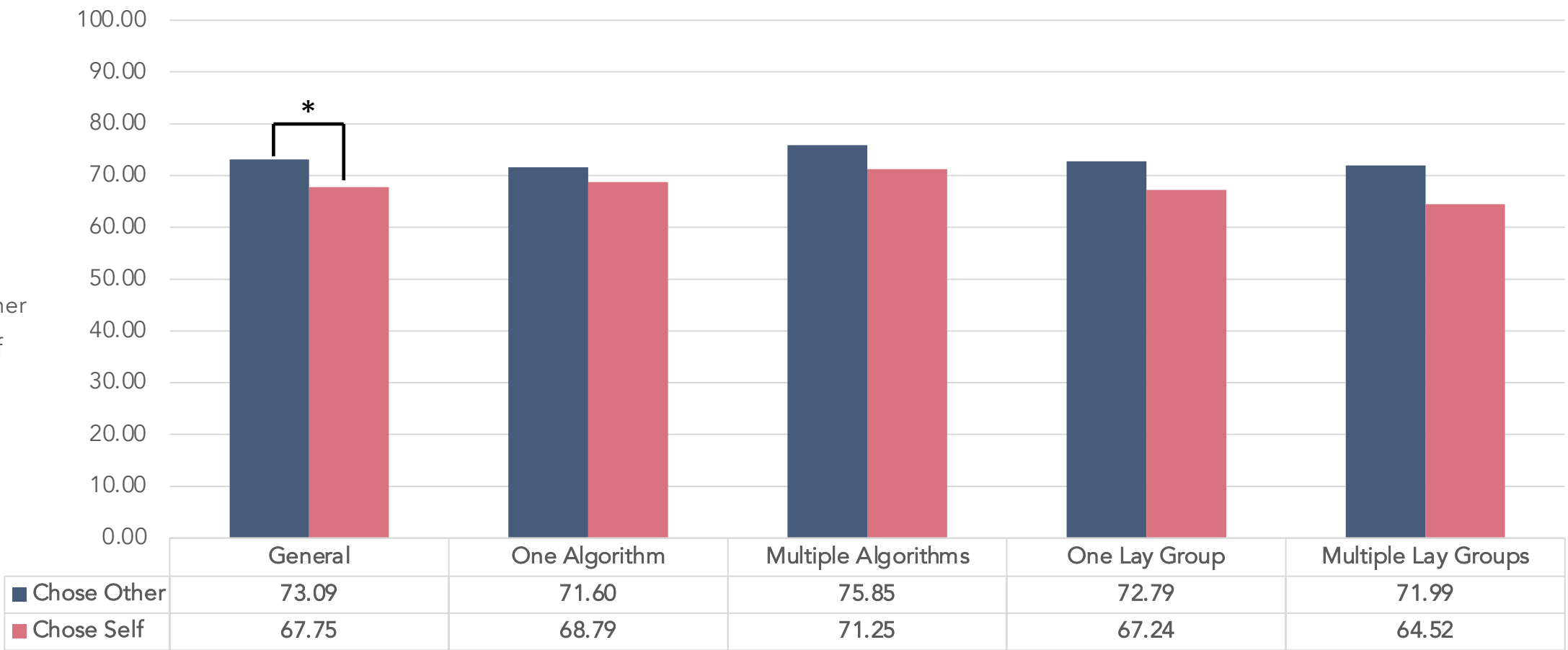
Proportion of Participant Choice



Results - Confidence

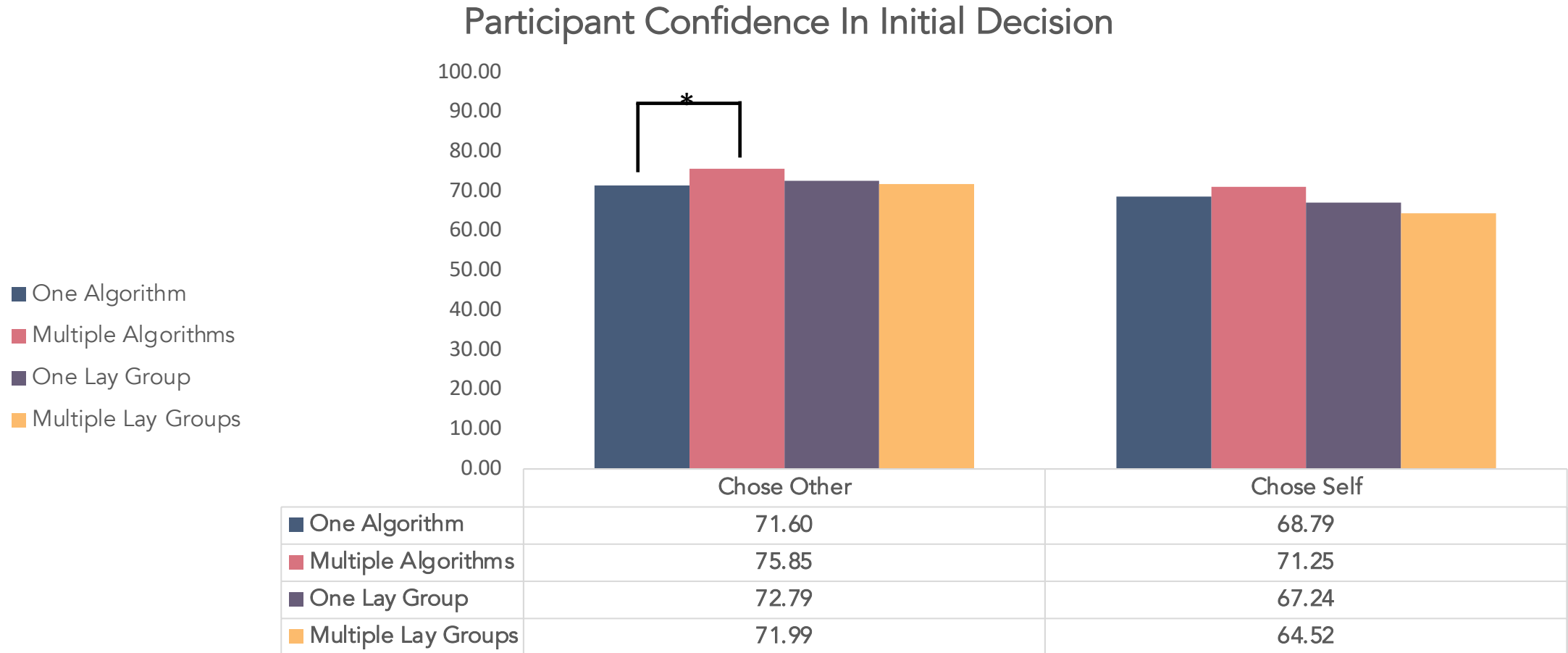
* Indicates significance at $p < .05$

Participant Confidence In Initial Decision



Results - Confidence

* Indicates significance at $p < .05$



Participant Rational

Chose Others

- "I felt like I couldn't beat the accuracy"
- "I felt that they had more expertise than myself"
- "It is able to make judgments without emotional attachments or preferences."

Chose Self

- "I'm more in control of the outcome"
- "I trust my intuition"
- "I feel like I know a lot about the subject."

Discussion



- We did not replicate Dietvorst et al. (2018)
 - Our sample was much more willing to utilize the external decider despite the variation in autonomy we provided.
 - The utilization of their no autonomy algorithm condition was 32%/47%, while the utilization of the our algorithm with no autonomy was 67%.
 - This may be due to a framing issue.
 - This may also be due to people's belief that they did not have sufficient expertise in the topic.
- We did find those who utilized the external judge were more confident than those who didn't.

Conclusion

- The degree of algorithm aversion/appreciation may rely on factors that fall outside the bias towards/against algorithms and lay decision-makers.
- Generally, those who utilized external decision-makers were more confident in their decision than those who chose to utilize their own decision-making, which may ultimately make an impact on people's feelings about the decisions after the final outcome.
- The lack of difference may denote a more idealistic framing, which could be utilized to increase algorithm appreciation as a whole. More research is necessary to understand these framing contexts.

Thank you!

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