INTRODUCTION AND BACKGROUND

1: Hello, and thank you all for taking the time to learn about our PSYC 492 research! This is our presentation entitled: The Effects of Gender, Discipline, and Scientist Advocacy on Perceptions of Credibility and Motivations.

2: My name is Rebekah Stone (pictured top left), and I'll be presenting the background to the study. Then Kathryn Arnsten (top right) will be presenting the methods of research; Madeleine McGann (bottom left) will be presenting the results; and Kayln Clinkenbeard (bottom right) the discussion.

3: Moving into the background: a debate common throughout the sciences is whether or not it is appropriate to engage in advocacy.

4: A scientist who advocates is one who takes the information available and turns it into an affirmation of what 'should' be done. Nelson & Vucetich reviewed the literature and found two key arguments.

[Animation]: One maintains that advocacy is integral to science, as science is the active collection of information in order to better society.

[Animation]: The other contends that advocacy is antithetical to science, as science is objective, and to advocate would be biased.

[Animation]: Many scientists believe that advocacy poses a threat to their perceived legitimacy.

5: Two studies of interest to our team explored advocacy's effects on perceptions of scientists. In these studies, participants were shown one randomized post in which scientists advocated for a particular course of action. For Beall, this was done via scientist op-ed, and for Kotcher, a Facebook post by a scientist with a link out to an interview that they participated in. Participants were then asked to record their perception of the scientist's motivations and credibility.

6: These advocacy posts varied in multiple ways; the first being the level of controversy, and the second being the scientific discipline. For example, Beall included a public health scientist whose informative post listed the symptoms of the flu, non-controversial post advised increased handwashing, and controversial post advocated for flu shot mandates.

7: Lastly, the study's pictured scientists were white men, always of 'hard' sciences such as environmental science, or medicine, such as public health.

8: In creating our study, we sought to replicate aspects of the aforementioned studies while also considering factors outside of those observed; this left us with: discipline, gender, and level of controversy.

9: Starting with scientific discipline: As has been mentioned, the studies neglected to include the so-called 'soft' sciences, or sciences that inquire about social phenomena, such as psychology, sociology, etc. Studies have shown that 'soft' sciences are often perceived to be much less credible, as they are considered much less rigid and much more open to interpretation. Therefore, scientists of those disciplines are perceived to be much less credible, and much more open to motives of self-interest.

10: Moving onto gender: Gender really reflects the multidimensionality of credibility; credibility measures encompass perceived competency, goodwill, and trustworthiness, among other things. Gender is known to influence perceived credibility in two ways: persuasiveness and relatability. Studies have shown that women are perceived to be more persuasive than men, and therefore more credible, across gender. These studies often show women to be ranked highly in trustworthiness and goodwill.
Studies have also shown that women are perceived to be less relatable to men, and therefore less credible than men.
[Animation]: However, other studies have shown that gender has no significant effect on perceived credibility either way!

Our team thought it was important to investigate this variable despite the mixed messages under the guise that a woman advocate might be seen as more self-interested, and therefore less credible.

HYPOTHESES

I am going to talk about the simple version of our hypotheses focusing on main effects
- Our first set of hypotheses deals with credibility
  - First, we hypothesized that male scientists will be viewed as more credible than female scientists
  - Our second hypothesis is that psychological scientists will be viewed as less credible than environmental and public health scientists
  - Last, we hypothesized that high controversy Tweets will be viewed as less credible than informational or low controversy Tweets
- Our second set of hypotheses deals with motivations
  - First, we hypothesized that female scientists will be viewed as more motivated by a desire to serve
  - Second, we hypothesized that psychological scientists will be viewed as less scientifically motivated
  - And lastly, we hypothesized that high controversy Tweets will be viewed as more politically motivated

METHOD

Now, I am going to talk about the method for our study

Participants
- We had a total of 855 participants

- However, 283 were removed for failing attention checks which is consistent with other research in this format
- This resulted in 572 participants
- 57% of them came from the UMW Psychology Participant Pool
- 43% came from Prolific, which is a paid, online participant pool
- Of those recruited through the UMW Participant Pool, the mean age was younger than those recruited from Prolific
- Also, there were also more women recruited from participant pool and more men recruited through Prolific

Procedure

- Regardless of the recruitment method, all participants completed the study online through Qualtrics
- In order to take the study, participants were required to be 18 years of age or older and a U.S. citizen

Materials

Twitter Profiles and Tweets
- After giving their consent, participants were shown a randomly selected profile of a scientist, either Michael or Mary Wilson
- They were described as one of three types of scientists: An environmental scientist, public health scientist, or psychological scientist
- They were then shown one of 3 possible tweets for that scientist
- The tweet was either purely informational, engaging in low controversy advocacy, or engaging in high controversy advocacy

Tweets
- The tweets were written for this study on topics that reflected the scientific discipline
- The topic for environmental science was climate change
- The topic for the public health science tweets was the flu shot

- And for psychological science, the topic was family separation at the border

Scientist Credibility
- After viewing the profile and Tweet, participants were asked to assess Dr. Wilson's level of credibility on a 7-point semantic differential scale
- Traits were divided into three sub scales: competence, trustworthiness, and goodwill
- Below is a selection of some of the semantic differentials from the survey that were created by McCroskey and Teven

Motivations
- Participants were then asked to provide their perceptions behind a number of different motives which are listed here
- These questions were adapted from a list used by Beall et al

RESULTS

Today I'm going to discuss two of our analyses which were both MANCOVAs. The first focused on perceived credibility of scientists and the second focused on the perception of motivation behind the scientist's tweet. Our covariates and independent variables remain consistent throughout all of our analyses. The covariates were political orientation and gender of the participants. Our manipulated independent variables were gender of scientist, scientific discipline of the scientist, controversy level of the tweet and our non-manipulated independent variable was recruitment method.

Credibility MANCOVA:

Our first MANCOVA which focused on credibility had three dependent variables: perceptions of goodwill, trustworthiness, and competence. And at the multivariate level, we had one significant covariate, two significant main effects, two significant two-way interactions, and one significant three-way interaction. However, our main effects and the first of our two-way interactions,

scientist gender by scientific discipline, were subsumed by higher order interactions and our second two-way interaction was found to be non-significant at the univariate level. Because of this, we only analyzed our three-way interaction further. However, student data was a little bit strange and all over the place and because of this we found it hard to interpret that data. Past research didn't use students for participants, they recruited from the community and from research firms. Because of this, for the sake of time and clarity we'll just be focused on our prolific data for the rest of this presentation.

At the univariate level, we had three significant dependent variables, but we will start with our dependent variable of goodwill. Participants recruited through prolific perceived female public health scientists as having significantly more goodwill that female environmental scientists. They also perceived female public health scientists as having significantly more goodwill than their male counterparts.

Prolific participants did not perceive any differences in the scientist's trustworthiness or competence regardless of scientific discipline or gender but overall, it's important to note that we had very low power and small effect sizes in our data and because of that we want to collect some more data. After we collect more data this will affect our ability to detect differences and perceive significances.

Motivations MANCOVA:

Moving on to our second MANCOVA which focused on motivation. Our dependent variable was the six scientist's motivations. We had two significant covariates, three significant main effects, one significant two-way interaction, and two significant three-way interactions at the multivariate level. Again, our main effects were subsumed by higher order interactions and our two-way interaction was found to be non-significant at the univariate level. Because of this, we just probed our three-way interactions further.

For our first three-way interaction, scientist gender by scientific discipline by recruitment method we had two significant dependent variables of personal gain and desire to serve. Again, we are just focusing on our prolific data for this presentation. We'll start with the dependent variable of personal gain, which prolific participants perceived no differences in. For the dependent variable of desire to serve, prolific participants perceived female public health

scientists as being significantly more motivated by their desire to serve than either female psychological scientists or female environmental scientists.

Moving on to our last three-way interaction, scientist gender by controversy level by recruitment method. We found one significant dependently variable at the univariate level, which was personal gain. Participants recruited through prolific perceived female scientists who provide information as being significantly more motivated by their personal gain than female scientists advocating for high controversy change.

DISCUSSION

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Recruitment method impacted our results more than we had anticipated and as previously stated, the UMW student data is confusing and hard to interpret with no clear patterns.

As we continue to look at our data and look toward publication, we now know student samples are not appropriate for this type of research and we need to focus on non-student samples to move our research forward. This is keeping in line with other studies who used general population participants.

Now, all we have is speculation as to why student samples made the data all over the place. It could be because the entire student sample was currently enrolled in a psychology course at the time of the study. Maybe they were enrolled in another science course and exposed to these types of professors. Maybe it's because UMW doesn't have a public health department. It could be a combination of these things, or honestly, none of them.

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For our key findings, we'll only focus on the prolific data. For gender, we did not show a clear effect of gender on credibility.

In regard to scientific discipline, the finding that public health as more service oriented and credible could be because the Tweet topic, flu shots, was the least politicized topic of the three. It is also worth noting our data was collected before the Covid-19 outbreak in the U.S.

For controversy level, the informational Tweets were seen as motivated by person gain which makes sense because those Tweets were solely self-promoting while the low and high controversy tweets had an additional advocacy element.

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We know our study is underpowered and that once we get back to life pre-lockdown, we can continue to collect data.

And, we know our results are generally consistent with previous research.

For the data not yet looked at, we want to know if the motives are interrelated. We've also considered if the perception of motivation mediates the relationship between scientist advocacy and perceived credibility.

Future research in this area should also consider some additional factors including scientist race and ethnicity, their age younger or older, if advocacy topic matters, and other scientific disciplines such as sociology or anthropology.

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So, why does this matter?

It turns out scientist advocacy doesn't damage credibility in the eyes of the general public. Scientists can advocate for current-event policy changes based on their expertise; and this includes psychological scientists which is great news!

With our general population sample, gender doesn't impact perceived credibility either, which is consistent with some previous research.

So, we encourage you to share your research widely and not solely with peer-reviewed journals that only other scientists will read. Help others to learn as well.

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Thank you, for watching our presentation. We invite you to leave any questions about, or feedback on, our research to do so in the comment section.

Additionally, for a list of full references of our sources from this presentation, you may contact us via any of the emails on this screen.

Thank you again and we look forward to hearing your thoughts on our research.