DOES SCIENCE'S ETHICAL HISTORY MATTER?

GROUP STATUS, RESEARCH ETHICS, AND SUPPORT FOR SCIENCE

An Undergraduate Research Scholars Thesis

by

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ABSTRACT

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This study aims to expand upon research that examined the ethics of the Tuskegee experiment and how knowledge of that study affected African-American's willingness to participate in research (Shavers, Lynch, & Burmeister, 2000). The purpose of this study was to measure participants' willingness to increase or decrease contributions made to scientific research after reading a synopsis of the Tuskegee experiment or other examples of unethical experiments. Participants read a summary of one of three cases that actually took place and impacted historically disadvantaged groups (e.g., Black, Gay, or Women) or was edited to portray the unethical experiment impacting a historically advantaged group (e.g., White, Straight, or Men). Willingness to contribute to scientific research was measured via a survey that included items from prior research on the perception of experimental ethics (Korenman, Berk, Wegner, & Lew, 1998). I hypothesized that learning about unethical research that happened to majority groups would result in decreased support for science compared to when minority groups were the primary victims of unethical research. There were few statistically significant interactions between group and case types on the dependent variables of interest. But, there was a statistically significant main effect of group when the ethics of the experiment were examined. The

participants viewed studies as more ethical when advantaged groups were affected. There is a lack of existing literature concerning the interaction of group status and support for research in respect to ethics and this research hopes to help fill that gap.

CHAPTER I

INTRODUCTION

Scientific research has not always been monitored as closely as it is today, particularly when human participants are involved. In fact, until the 1960s, "there was no conception of research ethics as a formal component of…training" for scientists conducting studies and experiments with people (Kimmel, 2009). As a result, there are an alarming number of cases that are commonly used as examples of unethical research practices even within the past one hundred years. This is significant since a population's perception of research can not only affect willingness to partake in research, but could possibly impact political, social, and monetary support for research as a whole (Freimuth et al., 2001). Freimuth and colleagues' study on African Americans' knowledge of past medical research and specifically the Tuskegee experiment showed that few participants had an accurate understanding of the events that took place in relation to the study. This seems to suggest an increased distrust of researchers and experimenters alike as a result. While we can measure the effect that learning about unethical research can have on research support, it is also worth examining how the particular population that is being mistreated can affect perceptions of the severity of the ethical problems of a study. One study looked again at the Tuskegee Study and the views that African-Americans and whites have of the study and found a significant difference in the percentage of people that trusted scientific researchers after learning about the experiment; while only 17% of white Americans reported less trust of the researchers afterwards, that number was tripled to 51% for African-Americans reacting to the same information and study (Shavers et al., 2000). How people assign punishments to these experimenters involved in unethical research ties into the reactions as well.

One study looked at the perception of scientists in particular when it comes to unethical research (Wenger, 1998). Punishments were more frequently suggested for "behaviors rated more unethical," as well as for repeat offender, more often than for any other group. This suggests that the perceived level of the unethical behavior plays a factor in how much punishment the public believes that researchers guilty of wrongdoing should get.

Minority groups may be at a disadvantage when measuring participants' reactions to unethical research targeted at their population versus those of a majority or dominant population. Less care and attention may be given to these unethical experiments when they arise or less severe punishments doled out in these circumstances than to that of a dominant group. This is a very important issue to address since not much extensive research has been done on this specific topic as it relates to various minority groups and research backing. I am hoping to address some of these concerns in my study and to broaden the different scenarios in which this kind of study may be conducted.

CHAPTER II

METHODS

219 Texas A&M University students were drawn from the psychology subject pool, 152 women, 59 men, and 8 who identified as other. Our sample consisted of 151 participants identifying as White/Caucasian (70.2%), 36 as Hispanic/Latino (16.8%), 18 as Asian/Pacific Islander (8.4%), 6 as African-American/Black (2.8%), 2 as Arab/Middle Eastern (.9%), and 2 as Native American (.9%). These participants were randomly assigned to either an advantaged or disadvantaged condition for the Tuskegee, Tearoom, or contraceptive studies (see Appendix A for summaries). The Tuskegee Experiment synopsis describes a group of African-American males who had contracted syphilis and were denied treatment for their condition. This case summary was altered for the participants to be either African-American men or white men. The Tearoom Study consisted of researchers recording male homosexual sexual encounters and prying into their family lives without their permission. This case summary was altered for the participants to be either homosexual men or heterosexual men. The San Antonio Contraceptive Study effected women who were given a placebo birth control without being told of the switch. This case summary was altered for the participants to be either women or men who received the contraceptive. This study utilized a 3 (case studies) by 2 (advantaged/disadvantaged) between-subjects design. The participants were given the summary and then asked to complete the survey questions as well as a manipulation check to ensure that the participant read and understood the summary. The survey contained both Likert-style and open-ended questions containing statements such as: “The researchers should be punished for conducting this study,” and

questions like: “Has your perception of scientific research changed as a result of learning about this study?” This study took place on the participants’ own devices on their own time.

Women were examined separately along with the entire sample since there was a larger representation of women in our sample (69.4% Female). Science support was examined using a scale with selected items such as “Science as a whole is beneficial to mankind.” (see Appendix B for comprehensive list of items included). Ethics also had a similar scale for the ethics of the situation with items included in it like the research statement from the previous paragraph, as well as a separate item on its own for the perceived level of ethics for the researchers involved in the study.

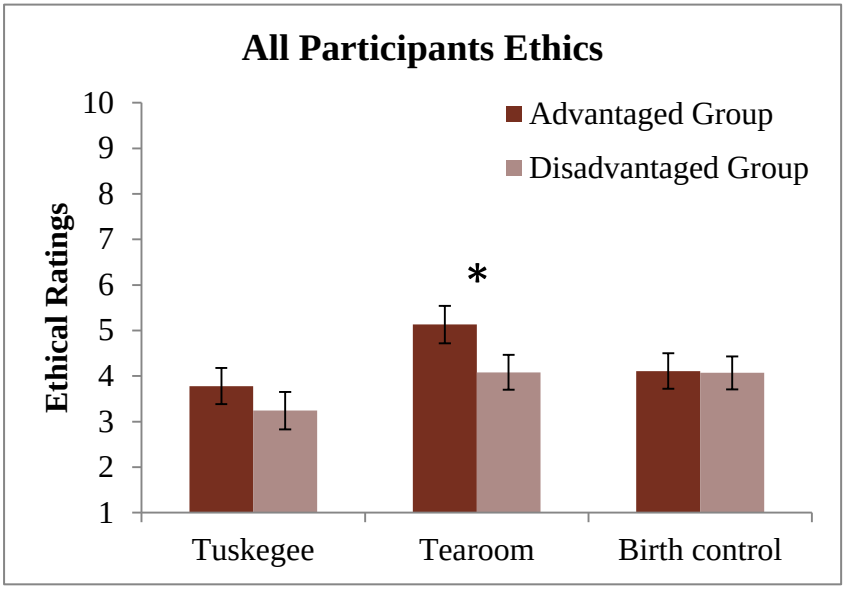
Some exploratory factors were investigated as well along with support for science. Identification with participants was assessed with items such as: “I identify with the research participants.” A trust component was analyzed which included items such as: “Science as a whole beneficial to mankind.” Research and medical interest was also examined with statements such as: “I am interested in STEM fields (science, technology, engineering, and math).”

CHAPTER III

RESULTS

All Participant Results

I conducted a 3 (Case: Syphilis, Tearoom, and Birth control) by 2 (Group Status: advantaged and disadvantaged) between-subjects ANOVA for each outcome measure. See Tables 1, 2, and 3 below for a summary of means (and standard deviations). The analyses below are reported for participants who passed the manipulation check.



Group effect: $F(1,194)=3.95$, $p=.048$
Case effect: $F(1,194)=5.17$, $p=.006$
Group*Case: $F(2, 194)=1.17$, $p=.313$

Figure 1. All Participants Ethics

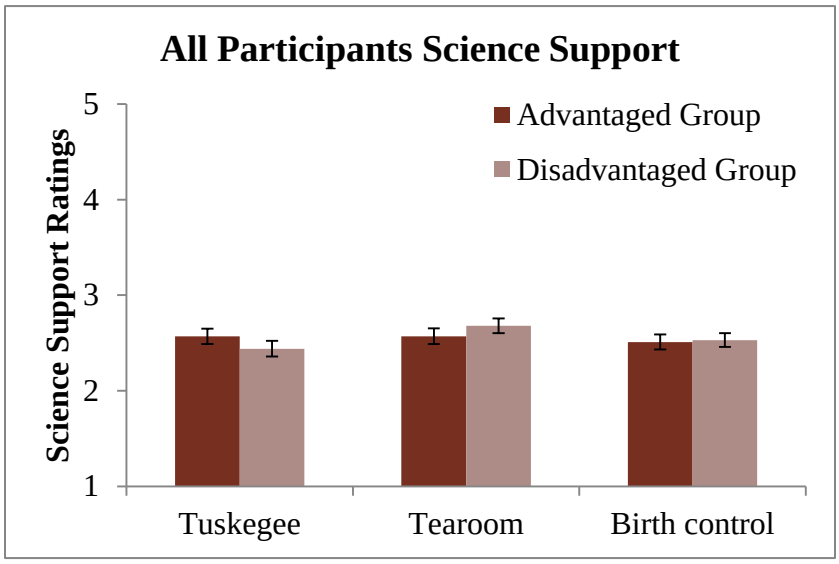
Ethics (2-item measure)

Results indicated that there was main effect of group status for the perceived ethics of the researchers who were connected to the cases in question, $F(1, 194) = 3.951$, $p = .048$. The

descriptions featuring dominant groups (*M* = 4.37, *SD* = 1.82) were rated as more ethical than were the descriptions featuring disadvantaged groups (*M* = 3.80, *SD* = 2.12). There was also a main effect of case, *F*(2, 194) = 5.172, p=.006 (Figure 1). The Syphilis case was deemed least ethical (*M* = 3.50, *SD* = 2.14), followed by the birth control case (*M* = 4.09, *SD* = 2.06), and finally the Tearoom study (*M* = 4.62, *SD* = 1.62).

Ethics (7-item measure)

There was a case effect for the ethics of the cases themselves, *F*(2, 194) =13.901, *p* = .000, but there was no main effect where the 7 items for ethics were concerned *F*(1, 194) =1.787, *p* = .183. The dominant groups (*M* = 2.35, *SD* = .54) and disadvantaged ones (*M* = 2.24, *SD* = .57) were rated as similarly ethical.



Group effect: *F*(1,194)<.01, *p*=.984
Case effect: *F*(1,194)=1.99, *p*=.140
Group*Case: *F*(2, 194)=1.17, *p*=.313

Figure 2. All Participants Science Support

Science support

There failed to be a statistically significant relation between the advantaged and disadvantaged groups when a between-subjects ANOVA was conducted for science support items, $F(1, 194) = .000$, $p = .984$. Only a marginal effect was found when comparing the cases themselves, $F(2, 194) = 1.989$, $p = .140$, with a slightly greater support for science being found for the Syphilis study than the birth control one, which again slightly above that of the tearoom study (Figure 2).

Identification with participants

When looking at whether our participants identified with the participants in the cases, there was a case effect $F(2,194) = 10.078$, $p = .000$. The advantaged groups ($M = 2.86$, $SD = .48$) and disadvantaged ones ($M = 2.84$, $SD = .54$) were rated similarly in terms of identifying with the participants, with more identification occurring for the Tearoom study ($M = 3.04$, $SD = .51$), the Syphilis study next ($M = 2.86$, $SD = .45$), with the birth control study coming lower than the rest for identification with participants ($M = 2.67$, $SD = .50$).

Trust

There failed to be a statistically significant relation between the advantaged and disadvantaged groups when a between-subjects ANOVA was conducted for items related to general perceived trustfulness towards science and research, $F(1,194) = 1.588$, $p = .209$ Similarly, no effect was found when comparing the cases themselves, $F(2, 194) = 1.024$, $p = .361$. The advantaged groups ($M = 1.92$, $SD = .51$) and disadvantaged ones ($M = 2.01$, $SD = .49$) were rated similarly in terms of trust, with trust as related to the Tearoom study ($M = 1.93$, $SD = .50$) and the Syphilis study ($M = 1.92$, $SD = .52$) being almost identical, with the birth control study coming higher than the rest for willingness to trust science ($M = 2.03$, $SD = .49$).

Research and Medical Interest

There failed to be a statistically significant relation between the advantaged and disadvantaged groups when a between-subjects ANOVA was conducted for items related to research and medical interest, $F(1,194) = .126$, $p = .723$. Similarly, no effect was found when comparing the cases themselves, $F(2, 194) = .325$, $p = .723$. The advantaged groups ($M = 2.36$, $SD = .88$) and disadvantaged ones ($M = 2.40$, $SD = .79$) were rated similarly in terms of interest, with the Tearoom study ($M = 2.41$, $SD = .75$) the birth control study ($M = 2.41$, $SD = .85$) showing slightly more interest than from participants who read about the Syphilis study ($M = 2.31$, $SD = .90$).

Table 1. The Tuskegee Experiment

Condition:	**The Tuskegee Experiment**		
	Advantaged Group	Disadvantaged Group	Total
Ethics (2-items)	3.78 (1.96)	3.24 (2.30)	3.50 (2.14)
Ethics (7-items)	2.11 (.54)	2.06 (.63)	2.08 (.58)
Science Support	2.57 (.45)	2.44 (.33)	2.51 (.39)
Identification with participants	2.94 (.46)	2.79 (.44)	2.86 (.45)
Trust	1.89 (.55)	1.94 (.50)	1.92 (.52)
Research/Medical Interest	2.38 (.98)	2.24 (.84)	2.31 (.90)

Table 2. The Tearoom Study

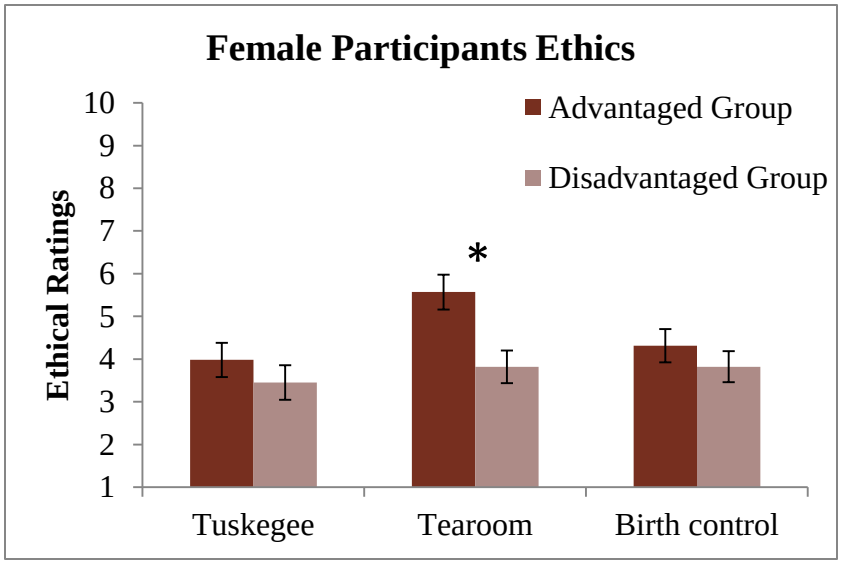
Condition:	**The Tearoom Study**		
	Advantaged Group	Disadvantaged Group	Total
Ethics (2-items)	5.13(1.20)	4.08 (1.83)	4.62 (1.62)
Ethics (7-items)	2.60 (.52)	2.51 (.54)	2.56 (.53)
Science Support	2.57 (.37)	2.68 (.30)	2.62 (.34)
Identification with participants	2.96 (.44)	3.12 (.57)	3.04 (.51)
Trust	1.96 (.48)	2.10 (.49)	2.03 (.49)
Research/Medical Interest	2.30 (.77)	2.53 (.73)	2.41 (.75)

Table 3. The San Antonio Contraceptive Study

Condition:	**The San Antonio Contraceptive Study**		
	Advantaged Group	Disadvantaged Group	Total
Ethics (2-items)	4.11 (1.99)	4.07 (2.16)	4.09 (2.06)
Ethics (7-items)	2.31 (.48)	2.15 (.44)	2.23 (.46)
Science Support	2.51 (.42)	2.53 (.36)	2.52 (.39)
Identification with participants	2.70 (.49)	2.64 (.50)	2.67 (.50)
Trust	1.90 (.51)	1.98 (.50)	1.93 (.50)
Research/Medical Interest	2.40 (.91)	2.43 (.81)	2.41 (.85)

Female Participant Results

Upon further review, I conducted the same analyses focusing only on the female participants since they were a significant proportion of the sample (152 women to 59 men). A 3 (Case: Syphilis, Tearoom, and Birth control) by 2 (Group Status: advantaged and disadvantaged) between-subjects ANOVA was conducted for each outcome measure. See Tables 4, 5, and 6 below for a summary of means (and standard deviations). The analyses below are reported for participants who passed the manipulation check.



Group effect: $F(1,138)=8.28$, $p=.005$
Case effect: $F(2,138)=3.09$, $p=.049$
Group*Case: $F(2, 194)=1.51$, $p=.224$

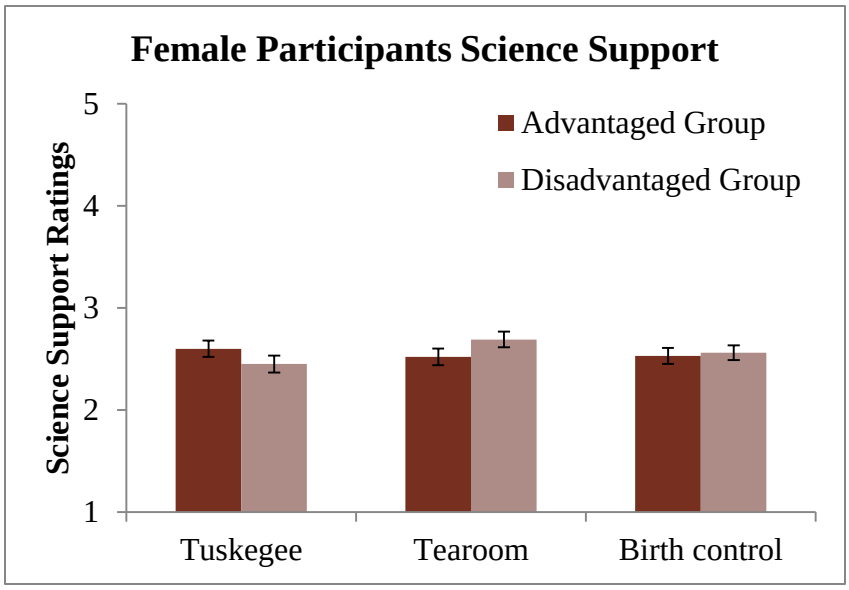
Figure 3. Female Participants Ethics

Ethics (2-item measure)

Results indicated that there was main effect of group status for the perceived ethics of the researchers who were connected to the cases in question, $F(1, 138) = 8.281$, $p = .005$. There was also a smaller main effect of case, $F(2, 138) = 3.093$, p=.049 (Figure 3). The descriptions featuring dominant groups ($M = 4.60$, $SD = 1.76$) were rated as more ethical than were the descriptions featuring disadvantaged groups ($M = 3.71$, $SD = 2.11$). The Syphilis case was deemed least ethical ($M = 3.72$, $SD = 2.18$), followed by the birth control case ($M = 4.04$, $SD = 2.06$), and finally the Tearoom study ($M = 4.64$, $SD = 1.62$), not unlike the trends shown within the entire sample, men and women, as a whole.

Ethics (7-item measure)

There was a case effect for the ethics of the cases themselves, $F(2, 138) = 10.449$, $p = .000$, but there was no main effect where the 7 items for ethics were concerned $F(1, 138) = .579$, $p = .448$. The dominant groups ($M = 2.31$, $SD = .55$) and disadvantaged ones ($M = 2.25$, $SD = .58$) were rated as similarly ethical. The Syphilis study was rated as least ethical ($M = 2.02$, $SD = .58$), followed by the birth control study ($M = 2.27$, $SD = .45$), and finally the tearoom study being rated as most ethical ($M = 2.53$, $SD = .57$).



Group effect: $F(1,138)=.07$, $p=.791$
Case effect: $F(2,138)=.48$, $p=.617$
Group*Case: $F(2, 194)=1.87$, $p=.158$.

Figure 4. Female Participants Science Support

Science support

There failed to be a statistically significant relation between the advantaged and disadvantaged groups when a between-subjects ANOVA was conducted for science support items, $F(1, 138) = .070$, $p = .791$. There was also no statistically significant effect found when comparing the cases themselves, $F(2, 138) = .485$, $p = .617$ (Figure 4). There was a slightly greater support for science found for the Syphilis study ($M = 2.53$, $SD = .40$) than the birth control one ($M = 2.55$, $SD = .40$), which again was slightly less than that of the tearoom study ($M = 2.61$, $SD = .35$).

Identification with participants

When looking at whether our participants identified with the participants in the cases, there was not a case effect $F(2,138) =.280$, $p = .597$. However there was a statistical significance within the cases, $F(1, 138) = 4.182$, $p = .017$. The advantaged groups ($M = 2.83$, $SD = .47$) and

disadvantaged ones (*M* = 2.87, *SD* = .55) were rated similarly in terms of identifying with the participants, with more identification occurring for the Tearoom study (*M* = 3.00, *SD* = .55), the Syphilis study next (*M* = 2.87, *SD* = .48), with the birth control study coming lower than the rest for identification with participants (*M* = 2.70, *SD* = .48).

Trust

There failed to be a statistically significant relation between the advantaged and disadvantaged groups when a between-subjects ANOVA was conducted for items related to general perceived trustfulness towards science and research, $F(1,138) = .213$, $p = .646$ Similarly, no effect was found when comparing the cases themselves, $F(2, 138) = .613$, $p = .543$. The advantaged groups (*M* =1.94, *SD* =.53) and disadvantaged ones (*M* =1.99, *SD* =.47) were rated similarly in terms of trust, with trust as related to the Tearoom study (*M* = 2.02, *SD* = .49) and the Syphilis study (*M* = 1.90, *SD* = .51) being almost identical and that for the birth control study coming higher than the rest for willingness to trust science as a whole (*M* = 1.97, *SD* = .50).

Research and Medical Interest

There failed to be a statistically significant relation between the advantaged and disadvantaged groups when a between-subjects ANOVA was conducted for items related to research and medical interest, $F(1,138) = .317$, $p = .574$. Similarly, no effect was found when comparing the cases themselves, $F(2, 138) = .392$, $p = .676$. The advantaged groups (*M* =2.35, *SD* =.90) and disadvantaged ones (*M* =2.44, *SD* =.83) were rated similarly in terms of interest, with the Tearoom study (*M* =2.39, *SD* =.80) the birth control study (*M* =2.47, *SD* =.87) showing slightly more interest than from participants who read about the Syphilis study (*M* =2.31, *SD* =.93).

Table 4. Female Participants: The Tuskegee Experiment

Female Participants			
Condition:	**The San Antonio Contraceptive Study**		
	Advantaged Group	Disadvantaged Group	Total
Ethics (2-items)	4.31 (1.99)	3.82 (2.13)	4.05 (2.06)
Ethics (7-items)	2.36 (.45)	2.19 (.44)	2.27 (.45)
Science Support	2.53 (.46)	2.56 (.35)	2.55 (.40)
Identification with participants	2.71 (.50)	2.70 (.47)	2.70 (.48)
Trust	1.90 (.49)	2.03 (.51)	1.97 (.50)
Research/Medical Interest	2.47 (.93)	2.46 (.83)	2.47 (.87)

Table 5. Female Participants: The Tearoom Study

Female Participants			
Condition:	**The Tuskegee Experiment**		
	Advantaged Group	Disadvantaged Group	Total
Ethics (2-items)	3.98 (1.97)	3.45 (2.40)	3.72 (2.18)
Ethics (7-items)	2.01 (.51)	2.02 (.65)	2.02 (.58)
Science Support	2.60 (.46)	2.45 (.31)	2.53 (.40)
Identification with participants	2.97 (.49)	2.77 (.45)	2.87 (.48)
Trust	1.96 (.58)	1.85 (.42)	1.90 (.51)
Research/Medical Interest	2.36 (.99)	2.27 (.89)	2.31 (.93)

Table 6. Female Participants: The San Antonio Contraceptive Study

Female Participants			
Condition:	**The Tearoom Study**		
	Advantaged Group	Disadvantaged Group	Total
Ethics (2-items)	5.57 (.32)	3.82 (1.86)	4.64 (1.62)
Ethics (7-items)	2.55 (.58)	2.51 (.58)	2.53 (.57)
Science Support	2.52 (.38)	2.69 (.31)	2.61 (.35)
Identification with participants	2.82 (.39)	3.16 (.62)	3.00 (.55)
Trust	1.97 (.53)	2.07 (.46)	2.02 (.49)
Research/Medical Interest	2.21 (.79)	2.55 (.79)	2.39 (.80)

CHAPTER IV

DISCUSSION

I hypothesized that learning about unethical research that happened to majority groups would result in decreased support for science compared to when minority groups were the primary victims of unethical research. My study produced little support that learning about unethical scientific studies from the past would decrease scientific support in the future. Contrary to my initial hypotheses, unethical descriptions of past studies featuring advantaged groups were viewed as being *more* ethical than those impacting disadvantaged groups. This is especially apparent where the Tearoom study is concerned when examining all participants. There were few statistically significant interactions between group and case types on the dependent variables of interest. There was, however, a statistically significant main effect of group when the ethics of the experiment were examined. The participants viewed studies as more ethical when advantaged groups were affected.

An interesting result to note is that of the women's reactions to the contraception study. Female participants in particular found the San Antonio birth control study to be significantly more ethical than the general sample from which results were gathered, which gives rise to some questions about the nature of the population from which we were drawing participants from. This may be due to our sample being drawn from a university with a very high percentage of students with religious (specifically Catholic) beliefs that influence their views on issues like abortion, contraception, and intimate relations before marriage. We had a smaller male sample than is needed to examine gender differences, so it may apply to men in our study as well, but further analysis is needed.

There are certain limitations that are to be expected as we are drawing our participants from a narrow pool of students from a large, southern university. The participants are mostly white (70.2%) and female (69.4%), and were students currently enrolled in an Introduction to Psychology course. This can have certain implications for our results that may limit the degree to which generalizations can be from this data to the rest of the university, state, or even country.

There is room for further research on how the ethics of past research is perceived with the groups tested as well as different cases. The cases chosen also seemed to play a large role in what the perceived ethicalness of the study was, as well as the support for science as a result of that. One thing to look into may be whether participants' knowledge of some of the more popular experiments, like the Tuskegee Study, may have influenced their responses. A gender effect may want to be examined in the future in order to determine whether or not male and female participants will respond differently to unethical research as it applies to advantaged and disadvantaged groups. Similar analyses could be done in regards to race and ethnicity, sexual orientation, and religious affiliation, perhaps with a more diverse representation which may involve utilizing resources such as MTurk in the future.

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APPENDIX A

Case summaries

Tuskegee Experiment:

Minority version (African-American men) - In 1932, 399 African-American males who had contracted Syphilis and 201 African-American males who had not contracted the disease were entered into a study to find a cure. The participants did not sign consent forms and were not aware of being a part of an experiment. The experimenters also never told the participants that they had Syphilis, instead referring to ailments as being a result of "bad blood". Though Penicillin became available as a cure for the disease in 1947, the experimenters never informed the men of this development and prevented them from receiving appropriate treatment. This study, originally only meant to last for 6 months, instead stretched on for 40 years ending in 1972, at which point several of the men had died, passed on the disease to a loved one, or had a child that was born with Syphilis.

Majority version (white men) - In 1932, 399 white males who had contracted Syphilis and 201 white males who had not contracted the disease were entered into a study to find a cure. The participants did not sign consent forms and were not aware of being a part of an experiment. The experimenters also never told the participants that they had Syphilis, instead referring to ailments as being a result of "bad blood". Though Penicillin became available as a cure for the disease in 1947, the experimenters never informed the men of this development and prevented them from receiving appropriate treatment. This study, originally only meant to last for 6

months, instead stretched on for 40 years ending in 1972, at which point several of the men had died, passed on the disease to a loved one, or had borne children that were infected with Syphilis.

The Tearoom Study:

Minority version (Homosexual) - In 1970, experimenters recorded observations made of male homosexual sexual encounters, known as “tea-rooming”, in public restrooms in order to gain a better representation of the population in which these encounters were happening. A researcher would pose as a lookout for the men while they were engaged in sexual acts and recorded information such as a physical description of the participants as well as license plate numbers, a description of the vehicle, and a description of the encounters that took place. Their behavior was observed without their knowledge or permission and the information that was recorded was linked to the participants in the study in order to follow up with survey questions at their homes. Many of these men lived with family or friends who were unaware of the participant’s sexual orientation or preference until this survey was conducted.

Majority version (Heterosexual) - In 1970, experimenters recorded observations made of male heterosexual sexual encounters, known as “tea-rooming”, in public restrooms in order to gain a better representation of the population in which these encounters were happening. A researcher would pose as a lookout for the men and women while they were engaged in sexual acts and recorded information such as a physical description of the participants as well as license plate numbers, a description of the vehicle, and a description of the encounters that took place. Their behavior was observed without their knowledge or permission and the information that was recorded was linked to the participants in the study in order to follow up with survey

questions at their homes. Many of these men lived with family or friends who were unaware of the participant's outside sexual activities until this survey was conducted.

The San Antonio Contraceptive Study:

Minority version (Women) - In the 1970's, a clinic in San Antonio, Texas conducted an experiment concerning the effectiveness of various forms of birth control. A group of women were either given a birth control pill or a placebo sugar pill. Halfway through the experiment, the two groups were switched so that those who received the placebo now received actual birth control and those who were on birth control received a placebo. These women did not know that they were a part of an experiment and signed no consent forms. They believed that they were receiving viable methods of birth control when in fact half of them were not. Of the 76 participants in the study, 10 women became pregnant as a direct result of a placebo.

Majority version (Men) - In the 1970's, a clinic in San Antonio, Texas conducted an experiment concerning the effectiveness of various forms of male birth control. A group of men were either given a birth control pill or a placebo sugar pill. Halfway through the experiment, the two groups were switched so that those who received the placebo now received actual birth control and those who were on birth control received a placebo. These men did not know that they were a part of an experiment and signed no consent forms. They believed that they were receiving viable methods of birth control when in fact half of them were not. Of the 76 participants in the study, 10 resulted in pregnancies as a direct result of a placebo.

APPENDIX B

Ethics 2-item measure:

- "On a scale from 1 to 10, where 1 is "barely unethical" and 10 is "extremely unethical," how would you rate the investigators' behavior?" (reverse coded)
- "On a scale from 1 to 10, where 1 is "barely ethical" and 10 is "extremely ethical," how would you rate the experiment you just read about?"

Ethics 7-item measure (Likert scale):

- "The researchers should be punished for conducting this study."
- "It is possible for an experiment like this to happen in the United States today."
- "It is possible for an experiment like this to happen somewhere outside of the United States today."
- "If I knew about behavior like this, I would inform the researcher's funding agencies."
- "If I knew about behavior like this, I would contact a reporter for Science, Nature, or another professional journal."
- "If I knew about behavior like this, I would contact a representative (i.e. congressman).

Science support measure (Likert scale):

- "Public spending should be increased for scientific research."
- "Public spending for scientific research should remain the same." (reverse coded)

- “Science as a whole is beneficial to mankind.”
- “Human participants are necessary in some scientific experiments.”

Identification with participants measure (Likert scale):

- “I identify with the research participants.”
- “I feel a sense of community with the research participants.”
- “I identify with the researchers in this experiment.” (reverse coded)

Trust measure (Likert scale):

- “Science as a whole is beneficial to mankind.”
- “Human participants are necessary in some scientific experiments.”
- “The general public views research favorably.”

Research/medical interest measure (Likert scale):

- “I am interested in science.”
- “I am interested in research.”
- “I am interested in medicine.”
- “I am interested in STEM fields (science, technology, engineering, and math).”
- “I am interested in medical research.”
- “Science is specifically important to my life.”