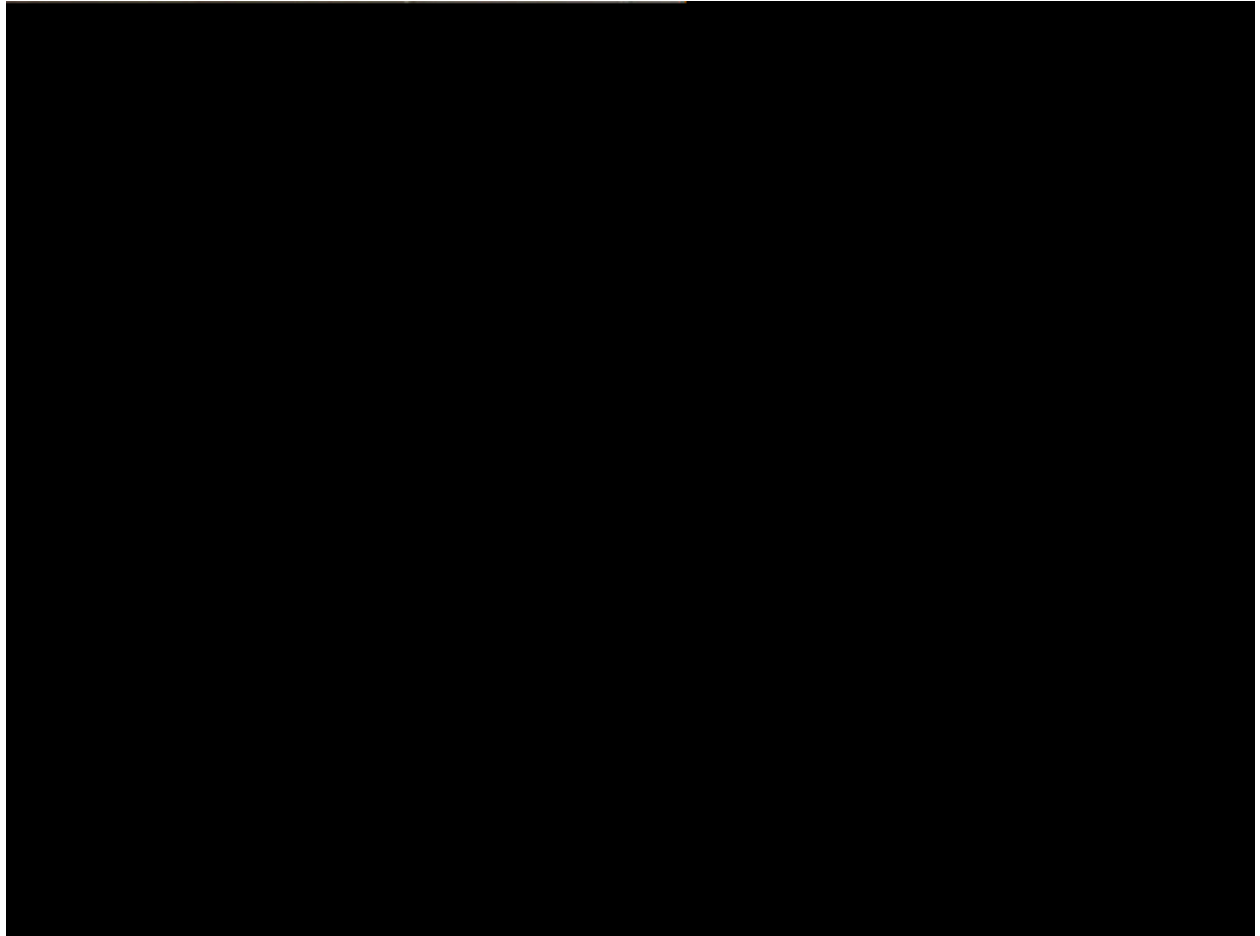


Climate Change Education with Catholic Ideals:

Measuring Knowledge, Attitudes and Behaviors



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Environmental Studies
Senior Capstone Project 2017-2018

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Abstract:

This research sought to bridge the gap between Catholicism and environmentalism. Three lessons were taught to a Catholic fifth grade class: environmental worldviews, the science behind climate change, and environmental empowerment and advocacy. In order to assess both environmental knowledge and attitudes, a pre and post-test were distributed to both the treatment and control groups. Through these test results, interviews, and focus groups, we found that there was a significant increase in knowledge while pro environmental attitudes only slightly improved. The qualitative findings include an increase in environmental issues awareness such as animal agriculture. During our interviews, we qualitatively assessed behavior change, which

Introduction with Literature Review:

78.2 million people or a quarter of the United States population identifies as Catholic (Georgetown University, 2017). Since about 2 million students in the U.S. attend private Catholic schools, it is imperative that educators find ways to incorporate meaningful environmental education adventures into these private, religious settings (Georgetown University, 2017). Contemporary environmental education curriculum now includes efforts to address global climate change. The purpose of this research effort is to evaluate the outcomes of a 5th Grade environmental education curriculum designed to address climate change, while also incorporating Catholic messaging and morals. A secondary purpose of this research works to better understand the relationship of modern Catholicism to its role and responsibility towards addressing Climate Change...is personal pro-environmental behavior change possible using intersectional theology and environmental education? Along with efforts to curb our burgeoning global population, climate change is sometimes looked over within Catholic teaching, or seen as going directly against Catholic beliefs (Labrecque, 2015). By confronting that polarity, we hope to better understand if this dichotomy must exist. Catholic teachings and beliefs actually have proven fruitful for promoting pro-environmental values and behaviors. For instance, the teachings of Pope John Paul II that not only can environmentalism and Catholicism go hand in hand, but that they should. He is quoted reminding Catholics:

(To not) behave like dissident predators where nature is concerned, but to assume responsibility for it, taking all care so that everything stays healthy and integrated, so as to offer a welcoming and friendly environment even to those who succeed us (Pope John Paul II, 1990).

The pope made the point that:

the Lord. The poor man of Assisi gives us striking witness that when we are at peace with God

This conference was developed by Edwin O'Hara (1881-1956), who was an Oregon activist and Catholic priest. O'Hara's research on American Catholicism led him to find that American Catholics needed a rural philosophy that would bring them back to farmland and their natural landscapes (Guth, et. al., 1995). Beginning in 1991, the American Catholic bishops published "Renewing the Earth," a pastoral declaration on the environment. In 1993, the United States Catholic Conference established an official Environmental Justice Program, placing environmental issues at the forefront of Catholic's minds. The program was a product of the Department of Justice, Peace & Human Development. The program strives to educate and motivate Catholics to consider a deeper reverence for all of God's creations, including the natural world and environment (Environment/Environmental Justice Program, 2017). The Environmental Justice Program has provided over 150 small grants to environmentally friendly community organizations. The various projects have ranged from wetland restoration in coastal Louisiana, to large-scale educational retreats across country land. Although the EJP no longer funds grants, the program still strives to serve to model to communities how they can make an environmentally friendly change (Guhin, 2006). Through these religious motions, Catholics were encouraged to begin to think about how their action

very focused on the protection of human life, while some environmentalists were arguing against the idea of a human-centric world, and promoting measures to limit human population growth (Allit, 1998).

Before the environmental progress Catholicism had made, mentioned above, the church faced great issues pertaining to the integration of the two. One of the issue that Catholicism faced while attempting to integrate environmentalism into its pedagogy, was the notion that Catholics were to be blamed for the environmental disaster that had unfolded. Many environmentalists, such as Lynn White, believed that Catholicism preached that God's message to people on earth was to subdue and have dominion over the natural world. The Catholic Church's opposition to contraceptives also sparked debate, as the population crisis unfolded and contributed to environmental degradation. Environmentalist best-seller, Paul Ehrlich, condemned Catholic disdain for contraceptives as a threat to the future of humanity, stating, "It takes a great deal of patience for a biologist familiar with the miseries of over-population to read through documents that represent the views of even 'enlightened' Catholics." Anti-Catholic rhetoric spread widely among the world, in response to the church's attempt at integration. In the 1960's in response to

Catholicism. Catholic leaders such as Pope John Paul II and members of the U.S. National Conference of Catholic Bishops have widely been speaking out on the importance of the incorporation of Catholicism and environmentalism. The new international Catholic catechism heavily discusses environmental pollution, while Pope Francis has published an entire encyclical on the environment, *Laudato Si'* (Environment/Environmental Justice Program, 2017). *Laudato Si'* (Care for Our Common Home), is Pope Francis's outreach to "every person living on this planet" to help incorporate the Church and the world to recognize the environmental crisis we are facing (Hamlin & McGreevy, 2006). Within the Pope's encyclical he also specifically calls on global leaders to increase their efforts to reduce greenhouse gases. Pope Francis also states that unaddressed climate change will result in severe disruptions to both humans and ecosystems (Hope From the Pope, 2015). Finally, Pope Francis condemned eating endangered sea turtles in Mexico during Lent, proclaiming they fell under the category of meat and therefore, eating them should be evaded (Glatz, 2015). For Catholicism to successfully incorporate environmentalism into its teachings, the preconceived notion that Catholicism and environmentalism are fundamentally different, must be abolished.

Helping to end the discrepancy that is seen among Catholicism and environmentalism is the sole purpose of our study. Throughout our work, we are hoping to end the stigma that goes along with being Catholic, as well as being an environmentalist. Throughout the past several years, we have seen a drastic separation in political parties. As the right and left have both become more extreme in our country, individuals are either titled with the title of a "conservative with strong Christian values who don't believe in anthropogenic climate change" or a "liberal, atheist tree hugger". Throughout the governance of our current presidential cabinet, lines have also been blurred between church and state. We believe that the three pillars that encompass

Catholicism (stewardship/care for creation, the common good, and the poor) can also be found in the core of environmental ethics (Mizzoni, 2014). Our goal is to encourage environmental education that pairs Catholicism and biocentric ideals, in order to promote pro-environmental behaviors and attitudes towards mitigating climate change.

According to one study, when environmental awareness and responsibility are implemented into a Catholic & Environmental Curriculum, the conclusion found that only stewardship could be promoted (Ajali, Egbonyi, et.al, 2016).

Previous studies including, Carmichael, 2017, that have considered the intersectionality of Catholicism and Environmental Education have found that religious day camps and religious education programming serve as efficient avenues to implement environmental education. This study, however, was an exception to what typical Catholic education involves e-0.2 (t) 0.2 (o i) 0.2 (m) 0.2 (p

the spiritual, social and academic development” of themselves (catholiccharitiessf.org, 2018).

and compassionate students (Krebbs, 2011) who abide by the principles of the Catholic faith (Brew, 2008). Similar findings were seen in *A Case Study in the Stewardship of Creation: Project-Based Learning and Catholic Social Teaching in a Climate Change Curriculum* by Peggy Riehl, Nicole Tuttle, Charlene Czerniak and Kevin Czajkowski, which looked at how they could make a school “greener” by implementing year round environmental curriculum. Their curriculum focused on the seven themes (Life and Dignity of the Human Person, Call to Family, Community, and Participation, Rights and Responsibilities, Option for the Poor and Vulnerable, The Dignity of Work and the Rights of Workers, Solidarity and Care for God’s Creation) of teaching about social responsibility in Catholicism and then related those themes to care and responsibility for the environment (Riehl, Tuttle, Czernick, Czajkowski, 2015).

Methods:

Population and Setting:

Treatment Group Setting:

The treatment group was comprised of students attending St.Mary's private school. St.Mary's is

Saratoga Springs, NY:

Saratoga Springs is a city located north of Albany in upstate New York. The city is 28.07 square miles with 947.3 people per square mile. The city is famous for its tourism industry, as well as its famous mineral springs, horse racetrack, and lively downtown shopping. The estimated median household income in Saratoga Springs is \$67,303, with a population of 27,765. The demographics of Saratoga Springs are similar to Ballston Spa, with approximately 92.3% of the population being white, 3.2% Hispanic or Latino, 2.6% African American and 2% Asian (US Census Data, 2015).

Control Group:

The control group for our study was comprised of 20 students from Saratoga Independent School, located in Saratoga Springs, NY. The age of control students ranged from 8-10 in 5th grade.

Quantitative Data Collection and Analysis:

Our methods used purposive sampling. Throughout the study, we worked with a treatment group that consisted of Catholic students who attend St. Mary's elementary school located in Ballston Spa, New York. All of the students that are part of this research were taught an original environmental education curriculum and completed the pre/post environmental knowledge tests. Before we began our education program students completed pre-treatment knowledge tests to get a sense of the baseline knowledge of environmental education, and to determine if a statistical difference exists, at pre-program between control and treatment group knowledge and 2-MEV scores. Once we taught our curriculum to the students we then conducted post curriculum knowledge tests and post 2-MEV tests.

Bogner and Wiseman's Model of Ecological Values (2-MEV) was utilized to gauge changes in students' environmental attitudes (Bogner & Wiseman 2006). We chose to use the 2-MEV as, "the 2-MEV was specifically designed to tap the environmental values of children" (Schneller, Johnson, & Bogner, 2015, p.2). This is a validated tool used to assess students' preferences towards environmental preservation and environmental utilization. Students who show a preference towards environmental preservation have more of a biocentric perspective, "reflects conservation and protection of the environment" whereas students who lean more towards utilization have more of an anthropocentric view and, "reflect the utilization of natural resources" (Bogner & Wiseman 2006). We analyzed both MEV and pre/post knowledge tests using 1. Independent sample t-tests 2. Wilcoxon Signed rank test.

The 2-

Two student focus groups were conducted after the students were taught all of our lessons and completed the pre and post knowledge + 2-MEV tests. The purpose of the focus groups were to evaluate and critique the environmental education curriculum they received. During the focus group the students were asked several questions, similar to the types of interview questions the teacher was asked. This, along with photo documentation will be our form of personal trace analysis and evidence. Additionally, we conducted one parent focus group (n=2) that were also recorded using an iPhone and transcribed by hand. In order to analyze the interview data, we used coding for thematic trends, quote charts, and descriptive narratives. These interviews were recorded by a recording device followed by our transcription by hand.

In order analyze our data, we used representative quote charts, descriptive narratives, pre and post knowledge tests, the 2-MEV model, interview and focus group questions and coded transcriptions that used colors to highlight common themes and deviant cases.

Limitations:

Our research comes with limitations. In terms of our methods, there was a time restriction both when teaching and for our research as a whole. We were limited to the amount of time that St. Mary's allots for each class to be taught. For example, one class period was only 40 minutes long. We were also limited in the sense that all our data had to be collected in the span of two months. This means we were not able to document longitudinal effects of our curriculum. In

(p value .008). The control group showed no significant change in their post-tests increasing from 8.1 to 8.4 (p value .505) (See figure 1). We ran an independent samples t-test to assess the differentiation between the treatment and control group post-test and found that they were not statistically significant (p value .56). After being asked the same question of who can help fight climate change, every St. Mary student answered “everyone” to the question above, which is the correct response.

F P E K S

2-MEV:

Pre-Test

At pre-

Using a Wilcoxon Signed Rank Test on SPSS, we compared the treatment group's pre-preservation score to their post-preservation score and found that there was barely a change in their score, increasing from 3.72 to 3.83 (P value .329). In terms of utilization, St Mary's also stayed about the same: 2.28 to 2.33 (P value .575). For the control group, they mostly stayed the same for both preservation and utilization, with a 3.72 to 3.92 (P value .044) statistically significant increase in preservation, and barely a change, 1.98 to 1.97 (P value .825), for utilization. Using an Independent Samples t-test, comparing the post preservation and utilization scores of the treatment vs. control group, the results were not statistically significant for preservation (p value .763), however they were statistically significant for utilization (p value .007) (Addendum 8).

Student Focus Groups:

Within the two student focus groups conducted (each comprised of 5 students), three themes became apparent: increased environmental issues awareness, altered consumption patterns, and concepts being too advanced for grade-level.

Table 1: Student Quote Chart

Increased Environmental Issues Awareness:

A heightened environmental awareness was observed after focus groups with the students of St. Mary's School. An overall increase in care and concern for the environment's wellbeing was evident in some students within the focus groups. An example of this was seen in a student's comment, "I have been trying not to ride my bike on the grass and animals in the grass". This student expressed how after the curriculum, they recognized the intrinsic value within nature and how important it is to be aware of how human actions impact the environment. Additionally, other students mentioned how they now feel much more conscious of various environmental issues, as one student stated, "[I learned about about] rising sea

although most of them had not yet taken actions to combat these environmental issues, they felt much more aware of the issues at hand. It was obvious that the environmental curriculum “planted a seed” of knowledge in these students, which provides them with the foundation to expand on their environmental knowledge.

Consumption Patterns:

In addition to increased environmental awareness, a change in student consumption patterns was also noted. While talking to the students, many mentioned small changes that they had begun to make in their consumption patterns at school and home. When asked about changes they had made, one student stated, “I told my mom that every time she eats a burger, it’s like standing under the shower for two months straight.” The student discussed efforts they had made during the past several weeks to reduce their meat intake due to the negative environmental effects of meat. Several other students mentioned alternative changes in consumption patterns

Advanced Concepts:

During the focus groups conducted, many students talked about not understanding many of the concepts incorporated throughout the curriculum. Specifically, students talked about not understanding much of the terminology used within the presentations. When asked what terms were specifically hard to comprehend, one student stated, “the worldviews part was boring and hard to understand”. The student mentioned not understanding many of the worldviews discussed in the first lesson, such as Anthropocentrism and Techno-Fix. Another student talked about their struggle to grasp the concept of the Greenhouse Gas Effect, stating, “it was too

anything about their environmental “action plans” or intentions to engage in further environmental activism.

Recommendations and Discussion:

As mentioned in our results, one major finding was a statistically significant increase in the treatment groups’ knowledge scores. The students more than doubled their scores, however on average still failed the overall environmental knowledge test. This shows that they retained quite a bit of knowledge, but that the content was either too excessive or too advanced for them. Although the control group remained consistent throughout pre and post-tests, they started at a much higher raw score than the treatment group. This could be due to the level of prior environmental knowledge the two schools received. Saratoga Independent School is known for

measuring a significant change in the students' worldviews, therefore it is difficult to assess if students' worldviews have shifted. Overall, there is much improvement needed for this curriculum to have a more profound effect on student environmental attitudes, behavior, and knowledge using Catholic ideals.

Addendum 1

Informed consent

SKIDMORE COLLEGE INFORMED CONSENT FORM

!

Environmental Education Research Parent Consent Form (Treatment Group)

1. INTRODUCTION

You and your child are invited to participate in a research study evaluating the impact of an environmental education program designed to educate students about the Hudson River ecosystems, pollution, endangered species, and history, and environmental behaviors. Your child was selected as a possible participant because he/she is a part of Laurie Tomita's classroom at St. Mary's School. We ask that you read this document and ask any questions you may have before agreeing to allow your child to participate. The study is being conducted by Dr. Andrew J. Schneller and students, Bryn Sarner and Meaghan Long, in the Skidmore College Environmental Studies and Sciences Program.

2. BACKGROUND

The purpose of this study is to examine how Catholicism and environmentalism can go hand in hand and affect student environmental knowledge and attitudes. During the lesson, students will learn about climate change and causes, as well as various environmental worldviews.

3. DURATION

Participation for your child in this study is expected to include three classes at St. Mary's, from January through March/April of 2018. This will include 2 written assessments (each lasting

approximately 30 minutes). The first assessment (pre-test) will be conducted in the beginning of January. One more assessment (post-test) and either one brief semi-structured interview or a focus group style interview will be completed following this curriculum in March/April of 2018.. The time participants will commit to completing assessments/interviews and participating in the program will total 4 hours.

Your participation in this study as a parent includes participation in a 15-minute semi-structured interview, if you so choose.

4. **PROCEDURES**

If you agree to allow your child to be in this study, we will ask them to do the following things: fill out 2 questionnaires about their environmental knowledge and attitudes (one in January 2018 and one in March/April 2018), and participate in a brief focus group style interview in March/April of 2018. Your student will participate in a Catholic environmental education

transcriptions will be destroyed after a manuscript has been accepted for publication in a peer reviewed academic journal. The only individuals who have access to these data files are Professor Schneller and his students, Bryn Sarner and Meaghan Long. In any publication or presentation, we will not include any information that will make it possible to identify you or your child.

7. **VOLUNTARY NATURE OF THE STUDY**

Your decision whether or not to participate, or to allow your child to participate will not affect

As a Parent participant, I consent to be interviewed and have provided my phone number or email:

Signature _____ Date _____

Phone number or email _____

As a Parent participant, I consenting to be audiotaped during the semi-structured interview.

Signature _____ Date _____

.....

Signature of Person Obtaining Consent

Signature _____ Date _____

**SKIDMORE COLLEGE
CHILD ASSENT FORM (Treatment Group)**

Environmental Education Research

We are doing a study to evaluate environmental education that you will be completing as part of Ms.Tomita’s classroom. We are asking you to participate to help us learn more about environmental education. Your classmates have also been invited to participate in this study.

Your parent has agreed for you to be in this study. If you agree to be in our study, we are going to ask you to complete 2 brief questionnaires at 2 different time-points during class, in January and March/April. These questionnaires will take 30 minutes to complete. You will also participate in a short focus group in March/April that will take about 20 minutes.

!
You can ask questions about the study at any time. If you decide at any time not to finish, you can stop.

The questions we will ask are only about climate change, Catholicism and the environment - you will not receive a grade on this assignment. Your name will not be attached to your questionnaires. This means that your information will be kept private.

If you sign this paper it means that you have read this and you want to be part of our study and learn about climate change, Catholicism and the environment. If you don't want to be in the study, don't sign this paper. Being in the study is up to you and nobody will be upset if you don't sign this paper or if you change your mind later. What you decide won’t make any difference to your grades in school.

Participant signature

Date _____

Your child will complete 2 written assessments (each lasting approximately 30 minutes). These written assessments measure student environmental knowledge and attitudes. Assessments will take place in-class, in January and March/April 2018.

4. PROCEDURES

If you agree to allow your child to be in this study, we will ask them to do the following things: fill out questionnaires about their environmental knowledge and attitudes, on two occasions

If you have questions or concerns regarding this study and would like to speak with someone

Date _____

Signature of Person Obtaining Assent

Your participation in this study is expected to include one semi-structured interview in March/April of 2018. This 15-minute semi-structured interview will include questions about student behavior changes pertaining to our curriculum, as well as any previously incorporated

contact the researchers at aschnell@skidmore.edu or 518.580.8192 (work) or 619.333.9087 (cell)

If you have questions or concerns regarding this study and would like to speak with someone other than the researcher(s), you may contact Mary Hoehn, Institutional Review Board Chair, Skidmore College, 815 N. Broadway, Saratoga Springs, NY 12866, phone 518-580-8052, e-mail mhoehn@skidmore.edu or Dr. Robert Turner, Environmental Studies Program Director, Skidmore College, 815 N. Broadway, Saratoga Springs, NY 12866, phone, 518-580-5251, email btturner@skidmore.edu.

9. STATEMENT OF CONSENT

You will be given a copy of this form to keep for your records.

The procedures of this study have been explained to me and my questions have been addressed. The information that I provide is confidential and will be used for research purposes only. I understand that my participation is voluntary and that I may withdraw anytime without penalty. If I have any concerns about my experience in this study (e.g., that I was treated unfairly or felt threatened), I may contact the Chair of the Institutional Review Board or the Chair of the sponsoring department of this research regarding my concerns.

I consent to be interviewed:

Participant Signature _____ Date _____

I consent to be audiotaped during the interview:

Participant Signature _____ Date _____

I consent to have my name and affiliation used in a future publication or presentations:

Participant Signature _____ Date _____

Signature of Person Obtaining Consent

_____ Date _____

Addendum 2

Environmental knowledge questionnaire

Part I: Circle the best answer to the following questions

!

1. Deep Ecology is defined as...

a. The study of trees and plants

b. An environmental philosophy that regards human life as just one of many equal

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- b. Transportation**
- c. Animal Agriculture**
- d. Landfills**

5. Pope Francis wrote a book about climate change called...

- a. God's Green Earth**
- b. St. Francis and environmentalism**
- c. How to Stop Climate Change**
- d. On Care for our Common Home**

6. What is the name of the lifestyle choice that excludes all animal products (eating meat, dairy, eggs and honey)

- a. Vegan**
- b. Vegetarianism**
- c. Paleo**
- d. Gluten-free**

!

7. Who can help fight climate change?

- a. Only adults**
- b. Only environmentalists**
- c. Only students**
- d. Everyone**

!

8. Why is environmental activism important for everyone to be apart of?

- a. Effects of climate change will impact all forms of life**
- b. Humans do not own the environment**
- c. Not everyone has been taught about climate change, although all should understand it and know what to do to fight climate change**
- d. All of the above.**

!

9. One pound of beef requires the same amount of water to produce as it would take to run the shower for how long?

- a. 2 months**
- b. 3 weeks**
- c. 1 year**
- d. 2 days**

!

10. In what ways are we experiencing effects of climate change today?

- a. Flooding**
- b. Irregular weather (Warmer winters/ Colder Summers)**
- c. Natural Disasters**
- d. All of the above**

!

11. Out of these four options, which one is the most effective in fighting climate change?

- 1. Recycling**
- 2. Composting**

- 3. Reducing meat and dairy consumption**
- 4. Using public transportation**

!

How can this Bible verse be related to environmentalism or any topics we have discussed in class?

19. Out of all of the environmental worldviews discussed in class, which one (ones) do you identify with strongest and why? (Deep Ecology, Stewardship, Reform Environmentalism, Ecofeminism, Techno-fix)

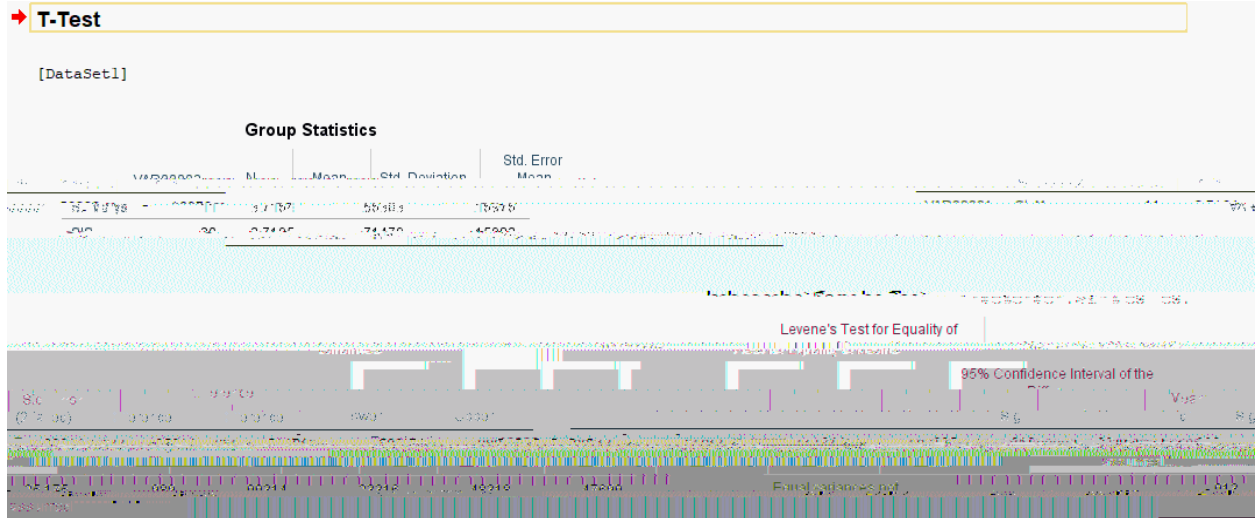
10. Have you tried to get your friends or family members to change any of their environmental behaviors?

Addendum 5

Parent Focus Group Questions

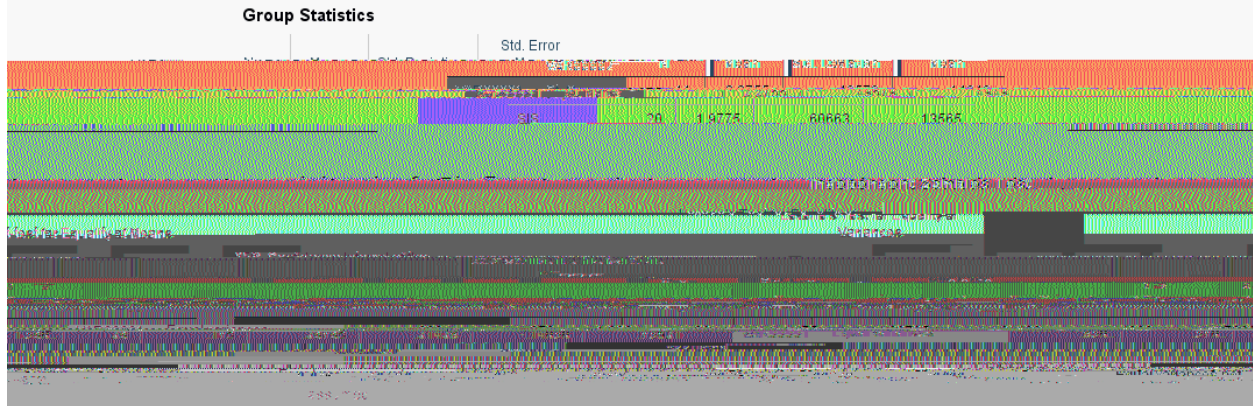
- 1. Has your child expressed any increased interest in relation to the environment/nature?**
- 2. Has your child taught you or any family members or friends anything about**
 - a. Climate change?**
- 2. Has your child shown any increased interest or understanding of**
 - a. environmental issues?**
- 3. Has your child taught you or any family members or friends anything about**
 - a. environmental issues/climate change?**
- 4. In relation to the environmental action component of the class...to what extent did their**
- 5. formed action plans instigate any conversation related to combating climate change.**
- 6. Do you feel your child will remain interested in environmental**
 - a. issues?**
- 7. Have you noticed any behavior changes in your child regarding their relationship with nature?**

Addendum 7
Independent and paired sample t tests:
Student Preservation Pre-Test:

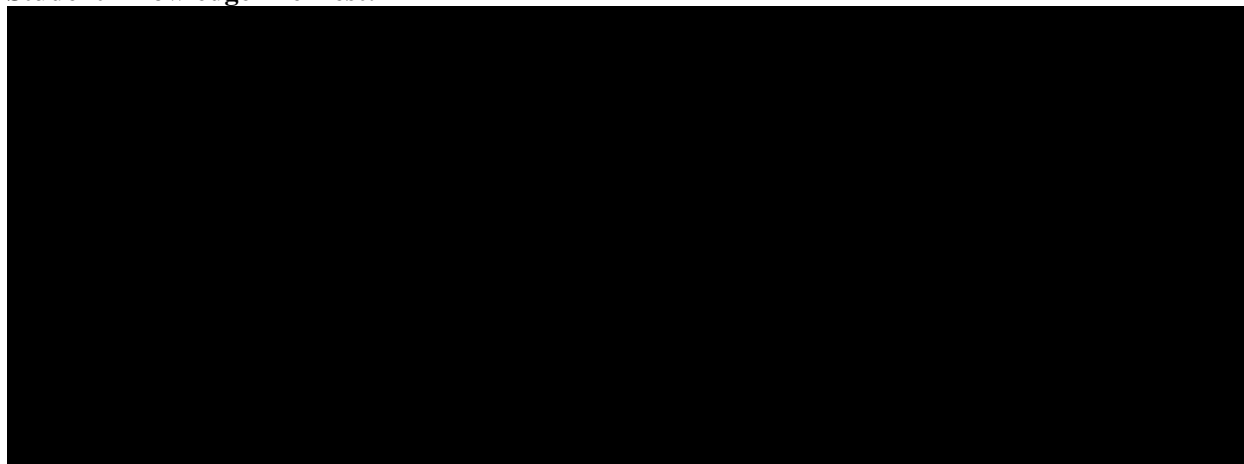


Student Utilization Pre-Test:

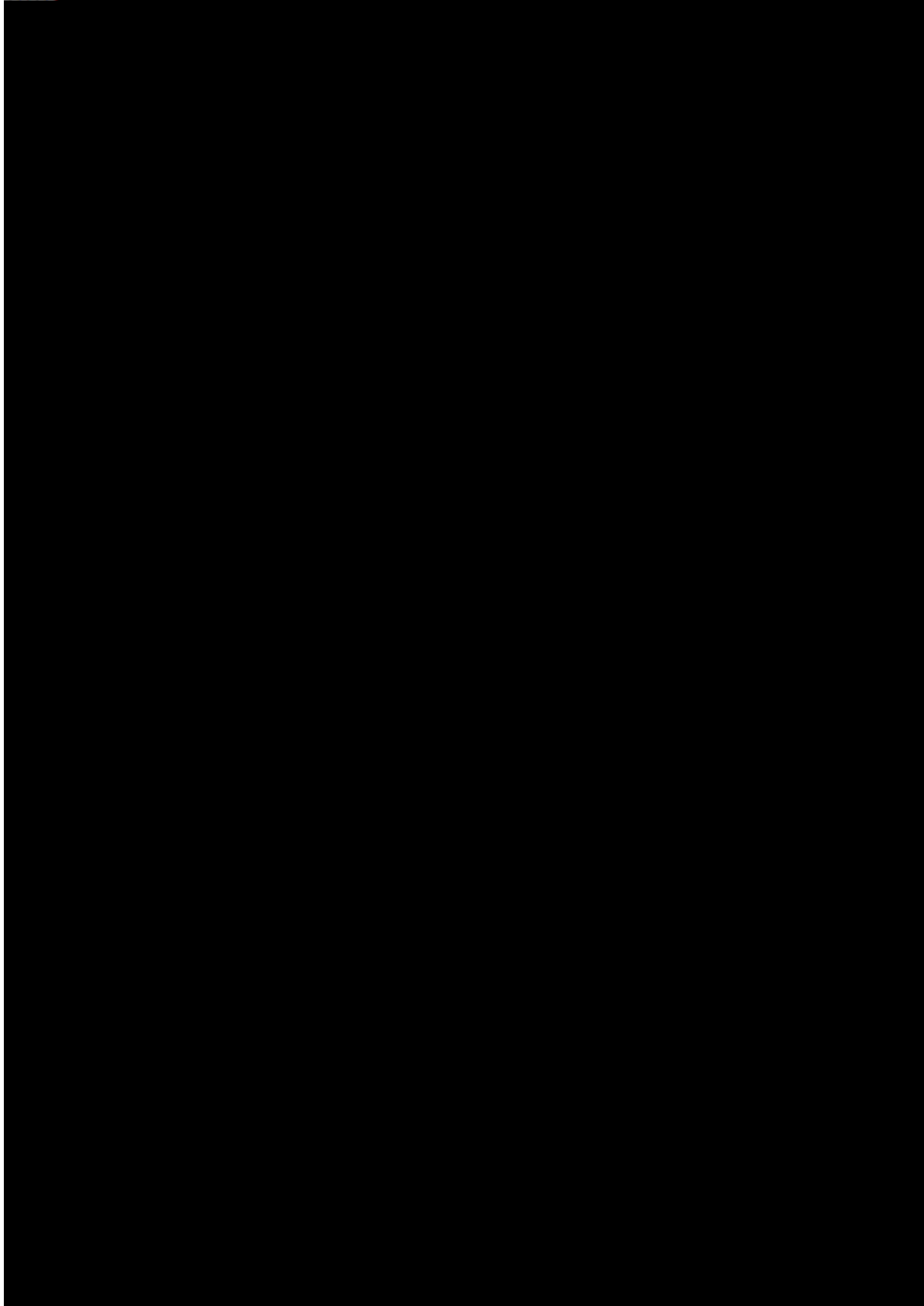
→ T-Test



Student Knowledge Pre-Test:

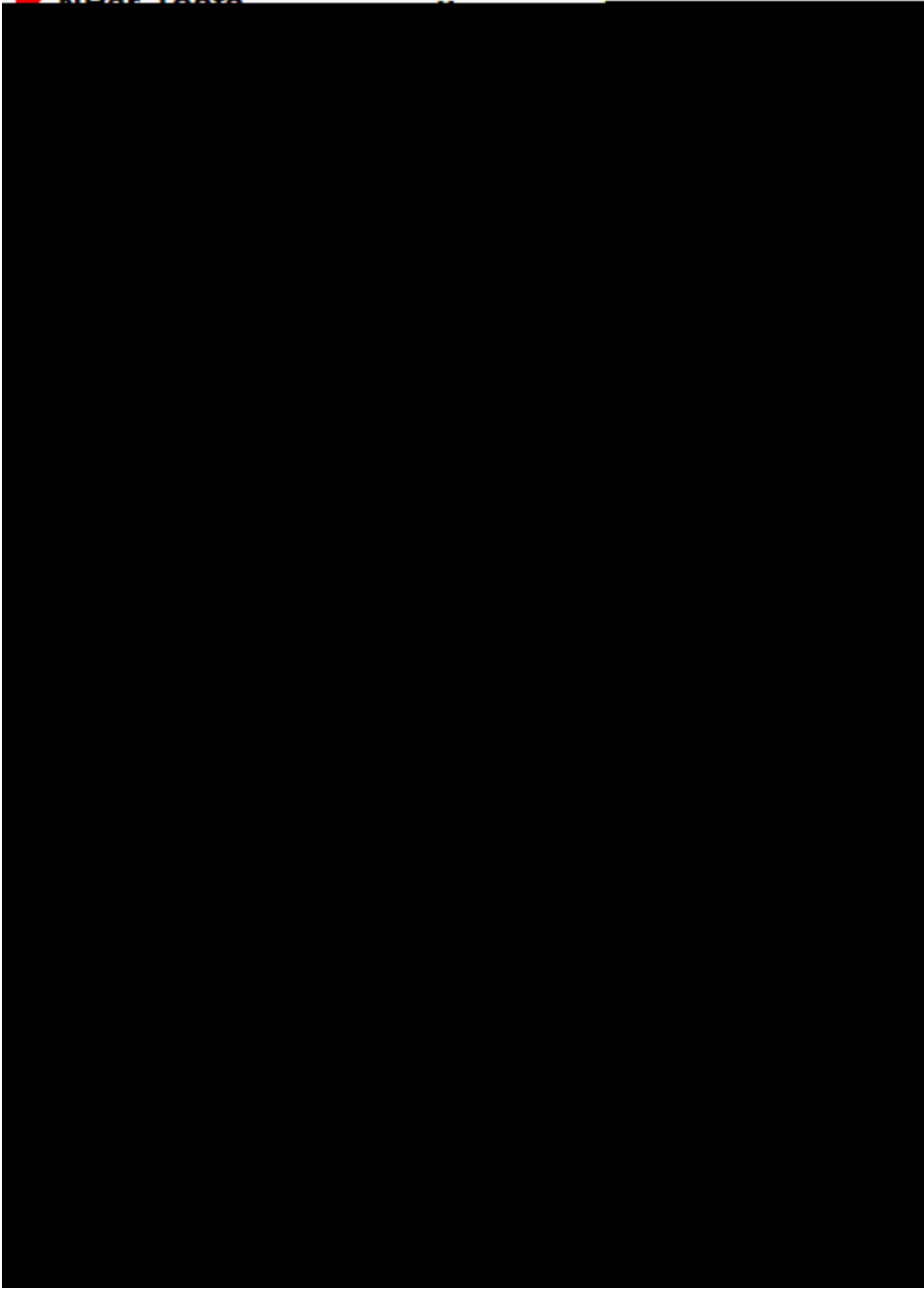


Addendum 8:
Wilcoxon Signed Rank Test
(St. Mary's- Treatment Group):



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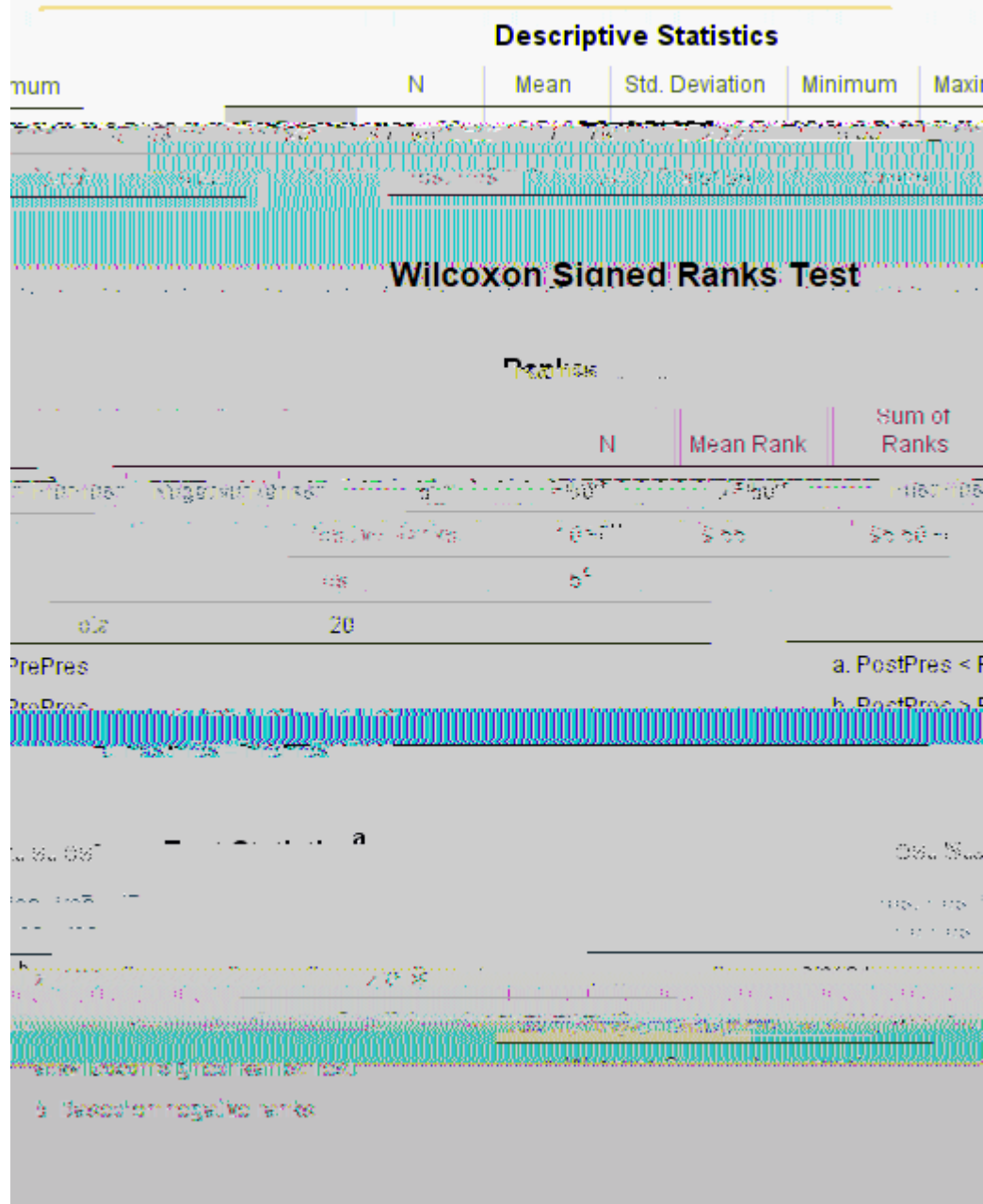


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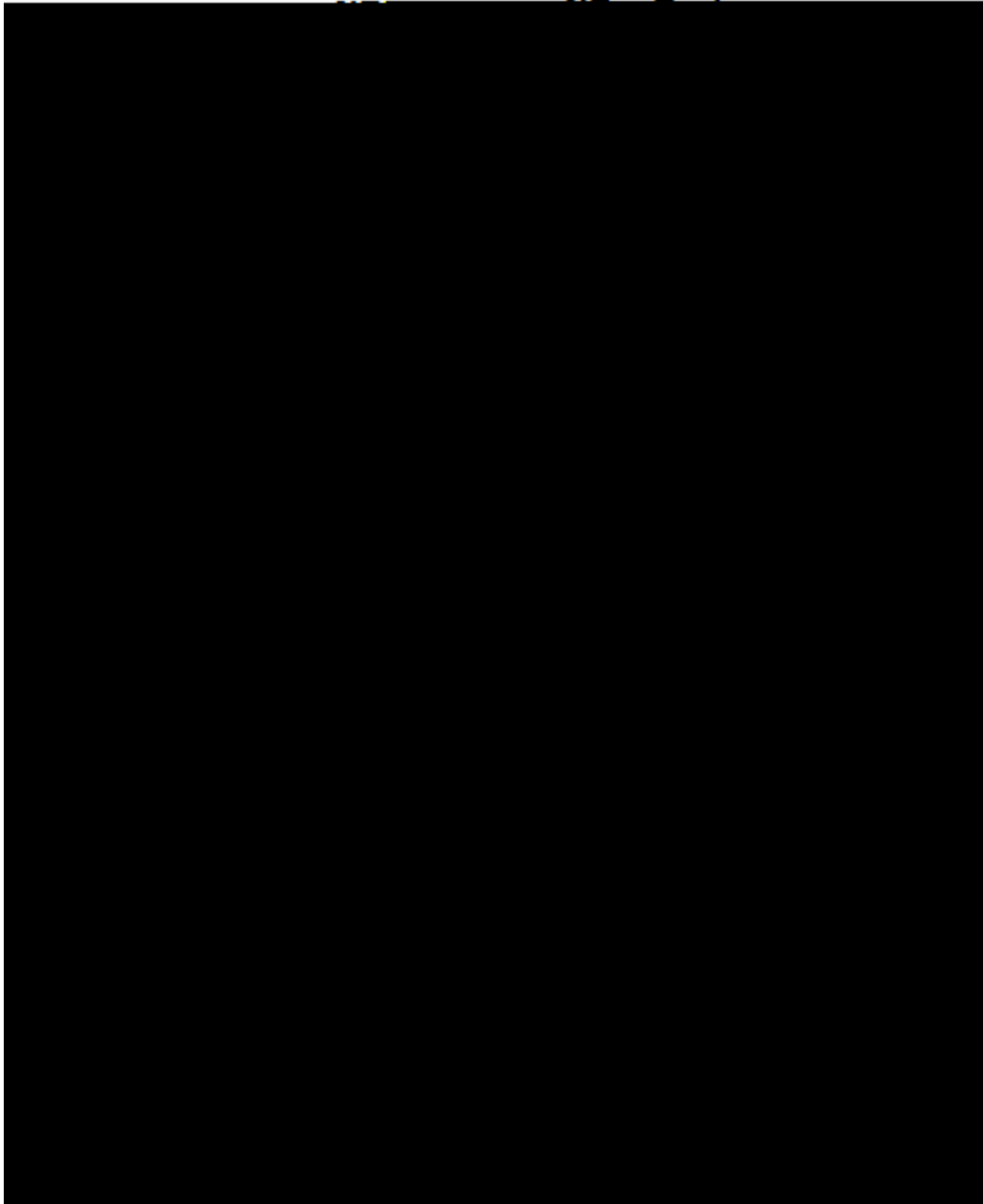
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Addendum 9

Paired Sample T-tests (Post Tests)

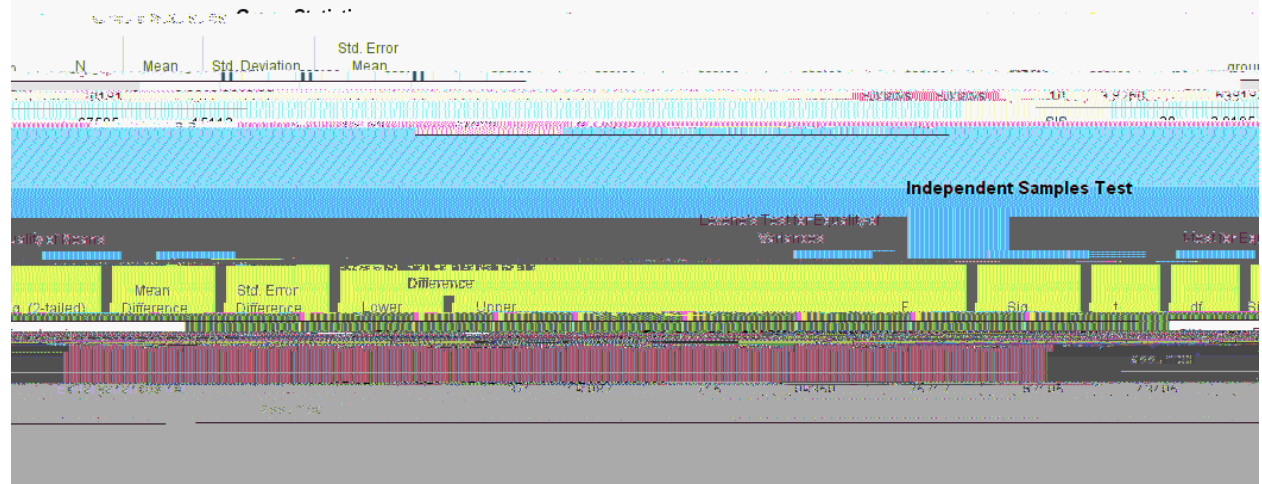
Knowledge:

T-Test



Preservation:

→ T-Test



Utilization:



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