

USING PROMPTED SELF-INOCULATION TO INCREASE SUPPORT FOR
CAMPUS RECYCLING

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I dedicate this research to my Mother, Renata Alexandre, and my Father, Cyril Bowers.
Their example and support have opened my eyes to what is possible.

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ABSTRACT

The current study examined whether methods grounded in inoculation theory could combat problematic recycling behavior on a college campus. Participants in the experiment were prompted to rebut none, one, or three of the anti-recycling statements emailed to them by the experimenter (who posed as another participant). Results indicated that, overall, participants' recycling attitudes became more positive over the course of the study, most likely as a result of pro-recycling information provided by the experimenter. Inoculation-specific attitude changes were also observed. Areas for future research on the use of precise inoculation-based manipulations are discussed.

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CHAPTER I: RECYCLING AND INOCULATION THEORY

Recycling Problem

Environmental groups, universities, states, and the U.S. government have used a variety of approaches in an attempt to motivate citizens to recycle. For example, San Francisco has been an exemplar for the rest of the country regarding environmental preservation and recycling, being one of the first U.S. cities to ban all plastic grocery bags (subsequently increasing the number of shoppers who used reusable shopping bags). San Francisco officials have also implemented fines on households, businesses, and organizations that do not compost or recycle (Clarke, 2014). Similarly, there have been many environmentally conscious university campuses that have joined the recycling movement. For example, Pepperdine University recycles or composts 78% of its total waste. They have also reduced cafeteria buffets so that students are less likely to take more food than needed, resulting in a decrease in food waste. Pepperdine University recycles the remaining materials of campus construction projects as well (The Best Colleges, 2016).

Unfortunately, most of these efforts to reduce waste and/or recycle have come from strict legislative action rather than from actual population engagement in the recycling cause. Rules and regulations can easily be created in places such as San Francisco, where the population may be more environmentally aware and relatively affluent. However, in more rural and less affluent areas of the country, such legislation may be impractical due to both financial constraints and/or lack of voter support for such measures. In light of this deficiency, the current study tested whether the use of prompted

argumentation in favor of campus recycling would lead students to adopt stronger pro-recycling attitudes and intentions. Ultimately, the goal of the present experiment was to strengthen campus recycling attitudes, thereby making students more likely to place bottles and cans in proper recycling receptacles rather than in waste bins, which is currently all too common.

Inoculation Theory

The use of persuasive techniques could potentially offset the backlash from, and inefficiency of blunt regulation. One potentially promising persuasive strategy that employs prompted argumentation was created by Papageorgis and McGuire (1961). Much like the more commonly known procedure of disease inoculation, Papageorgis and McGuire attempted to strengthen people's attitudes by arming them with arguments they could use to defend against a (weak) counter-attitudinal message. For instance, everyone generally believes that getting an annual medical checkup is a good health maintenance behavior, but many do not hold this belief strongly enough to actually seek an annual checkup. Papageorgis and McGuire (1961) conducted an experiment in which some participants were given pro-annual checkup arguments (specifically involving chest X-rays to check for tuberculosis) and then warned of the pitfalls that may cause them not to go to said checkup. After this inoculation group was armed with these messages, they were given counterarguments against checkups a week later. The control group was not given the pro-annual checkup arguments, but were exposed to counterarguments against checkups. As they had predicted, Papageorgis and McGuire found that individuals who had been given arguments in favor of an annual checkup had higher agreement levels in

favor of checkups and a higher resistance to counterarguments against checkups than those in the control group. This research provided evidence that giving people preliminary arguments in favor of a topic can create a type of “immunity” to arguments against that topic.

Inoculation theory has been used to fortify attitudes toward a multitude of different beneficial behaviors. For example, Matusitz and Breen (2013) created a theoretical model in which inoculation methods could be used to reduce the chance that former prison inmates recommit crimes and enter the prison system again. Using the theory on a slightly smaller scale, Jackson, Compton, Thornton, and Dimmock (2017) found that when experimenters provided information about myths related to anxiety and public speaking, while subsequently refuting those myths, participants reported less anxiety after engaging in a public speaking task. In a more traditional use of the theory (i.e., medical/health behavior), Wong (2016) demonstrated that when an experimenter rebutted medical complication myths related to the HPV vaccine, participants viewed the HPV vaccine as more safe and effective, and reported a higher willingness to get the HPV vaccine, compared with a control group.

Subsequent research has explored how an inoculation treatment can immunize participants against other counterarguments that are similar to, but not the same as, the target counterargument. This is helpful specifically because such a technique could increase positive recycling attitudes without directly referring to recycling during the persuasive process, making it less obvious to the target audience that they are being persuaded. For example, Parker, Rains, and Ivanov (2016) placed undergraduates in a

control (no message) group or a treatment (inoculation message) group. In the treatment group, each student read a message that warned them that his/her positive belief toward receiving a preventative tuberculosis X-ray may be attacked. That message was followed by a second message proposing ways to defend against the attacks. For example, a hypothetical attack may have involved pointing to the low rate of tuberculosis in the U.S. and arguing that, because of this low rate, an annual checkup was not worthwhile.

In the next phase of the experiment, students were given messages that attacked the target behavior - X-rays - along with three other messages that attacked penicillin use, getting a yearly medical checkup, and brushing one's teeth after eating. All students were asked to counter these attacks and were then given surveys that recorded the relative effort they had expended counter-arguing attacks on all of the behaviors, including the target behavior. The surveys also recorded the magnitude of attitude change toward all of the behaviors between pre-testing and the last phase. The experimenters found that individuals in the treatment group reported expending more effort while counter-arguing in favor of penicillin, yearly checkups, and X-rays, compared to the control group. Furthermore, analyses indicated that participants in the inoculation condition exhibited less change in their attitudes toward penicillin, yearly checkups, and X-rays than did the control group. These findings demonstrate that inoculation against attacks against a specific, pro-health related behavior can grant immunization to attacks against other pro-health related behaviors.

Other researchers have employed the Papageorgis and McGuire model; however, they have used it to immunize participants against the methods of inoculation (i.e.,

metainoculation). This could help increase recycling behavior by inoculating a target against third parties that may try to inoculate them against the merits of recycling. For example, Banas and Miller (2013) placed students from an introductory communications class into one of three main groups: a control group (no inoculation message), an inoculation group (inoculation message only), and a metainoculation group (metainoculation message and inoculation message). All participants completed an initial questionnaire in which they reported their attitudes towards the “9/11 Truth Conspiracy” (i.e., that the U.S. government was complicit in the 9/11 attacks). The experimenters then gave the inoculation participants a message warning them that they may be the target of attacks on their belief that the U.S. had no involvement in the 9/11 attacks, along with ways to refute those attacks. Metainoculation participants were given warnings about the nature of inoculation theory and how to combat its effects, followed by the inoculation treatment. All groups were then shown the documentary film “Loose Change: Final Cut,” which claims that the U.S. was complicit in the 9/11 attacks. Banas et al. anticipated that the inoculation group would exhibit more resistance to the claim that the U.S. was involved in the attacks than the control group. They also predicted that the metainoculation group would exhibit lower levels of resistance to the theory of U.S. involvement in the attacks.

Results showed that the inoculation group did, in fact, report less agreement with the theory that the U.S. was complicit in the attacks, compared to the control group. They also found that the metainoculation group displayed more agreement with the suggested U.S. government’s complicity in the attacks, compared to the inoculation

group. The results imply that not only can the inoculation method be used to help individuals fend off attacks on pro-health related issues, it can also be used to curb the influence of persuasion techniques.

The previous three studies focused solely on the mechanics of inoculation theory, but did not test their real-world effects on specific social issues. Nonetheless, other social scientists have found many practical applications for inoculation theory, such as immunizing vulnerable groups from risky health behaviors. The results of these practical applications could generalize to other social issues, such as recycling behavior. For example, Pfau, Van Brockern, and Kang (1992) used the inoculation procedure created by Papageorgis and McGuire to examine whether attitude inoculation may be used to reduce the likelihood of smoking behavior among adolescents. The experimenters recruited 8th grade students ready to transition from primary to secondary school, a time when teen smoking rates begin to increase. Students were randomly placed into one of three types of class sections. One of the two inoculation sections contained only an inoculation treatment, whereas a second section had an inoculation treatment and a reinforcement session administered a few weeks later. The inoculation-only sections presented the students with an inoculation video that highlighted their vulnerability to smoking and refuted any potential pro-smoking myths. The inoculation-plus-reinforcement sections were shown the same inoculation video, but then also shown a similar inoculation video a few weeks later. Control sections received neither treatment.

All students then completed a survey measuring their smoking attitudes and their current smoking behavior prior to any treatment. The students were then periodically surveyed throughout the year.

Pfau et al. predicted that students who were given the inoculation treatment would have more resistant attitudes toward smoking than those in the control group.

Furthermore, the experimenters predicted that students in the inoculation-plus-reinforcement section would retain even more resistant attitudes to smoking than those simply given the inoculation treatment. As predicted, the experimenters found that those in the inoculation sections retained less favorable attitudes toward smoking, over time, than those in the control group. However, students in the inoculation-plus-reinforcement condition did not exhibit significantly less favorable attitudes toward smoking than the inoculation-only group. This research showed that an inoculation treatment can confer effects on a population vulnerable to attitude change over a long period of time. More importantly, the findings indicate that a single exposure to inoculation is sufficient in retaining long lasting effects.

Other prevention research has incorporated role playing into the standard inoculation method in order to instill risk averse attitudes in vulnerable populations. Role playing acts as a plausible way of inoculating teenagers and young adults in a more surreptitious manner without telegraphing to the participants that the experimenter is trying to alter their attitudes. For example, Duryea (1983) tested whether the inoculation paradigm could prevent risky drinking behavior in high school freshman. Students were placed in either a treatment group or a control group. The treatment group was given a

pretest survey that assessed participants' alcohol related knowledge, attitudes toward risky drinking behavior, and drinking behavior. Participants were then exposed to the treatment, which involved viewing a film about the expected physical effects of alcohol and why it is important to both drink safely and drive safely. This was followed by a question and answer session, during which the participants were quizzed on the principle content points of the film. The treatment ended with a set of role playing exercises that placed students in common social situations where they might be pressured to drink and drive.

Students were prompted to resist peer pressure using their own ad-lib tactics. For example, the experimenter asked students to pretend the experimenter is their friend at a party. The experimenter then started a dialogue with a student, stating, "Don't worry, I have only had a couple of beers, I can drive you home." Responses that a student might provide included, "No I am fine. I already have someone coming to pick me up." Finally, the treatment group was given a posttest survey identical to the pretest survey. The control group was given the pretest and the posttest surveys only.

Duryea predicted and found that those in the role playing inoculation group were more knowledgeable about alcohol, less likely to consent to risky drinking behavior, and less likely to consume alcohol one week later, compared to the control group. Contrary to predictions, there was no significant difference in frequency of alcohol consumption between the treatment and control group. Duryea's research showed that, although the

inoculation effect did not prevent all alcohol related behavior (i.e, frequency of alcohol consumption), it did help prevent the likelihood of students engaging in risky drinking behavior such as drinking and driving or binge drinking.

This present experiment was an attempt to adapt the role playing tactic employed in Duryea's experiment to strengthen students' positive (though weak) pre-existing attitudes toward campus recycling. To this end, participants in this study were prompted to create and report their own counter-argument(s) against one or more anti-recycling statements given to them to determine whether doing would strengthen their support for recycling. More specifically, the study introduced participants to either one or three reasons not to recycle and then asked them to thoroughly rebut the anti-recycling statement(s). The creation of a one argument and three argument group was designed to assess possible effects of rebuttal effort on recycling support. The present investigator expected that those required to expend greater effort toward rebutting anti-recycling statements (i.e., the three argument group) would report having more commitment to the cause of recycling than those led to expend less rebuttal effort (i.e., the one argument group). This hypothesis was based on the findings of Parker, Rains, and Ivanov (2016), who found that the group that received an inoculation message (as opposed to the no-message, control group) a) expended more effort when counterarguing anti-x-ray, penicillin use, and yearly checkup arguments, and b) were less susceptible to attitude change related to these behaviors. The experimenters of the present study wanted to

determine whether creating another level of rebuttal difficulty (i.e., control vs. one rebuttal vs. three rebuttal groups) would create further differences in effort and attitude change.

The experimenters hypothesized that, by increasing the number of anti-recycling statements from one group to the next, there would be a similar increase in effort as the number of required rebuttals increased. The increased effort would then lead to higher levels of commitment and willingness to engage in recycling behavior, compared to the three rebuttal group to the one rebuttal and control groups, and when comparing the one rebuttal group to the control group.

CHAPTER II: METHODS

Participants

Seventy-two students enrolled in psychology classes at Middle Tennessee State University were recruited for participation in the study. Participants ranged in age from 18 to 35 years old ($M=19.49$, $SD=2.77$). There were 56 female participants (77.8%) and 16 male participants (22.2%). Demographically, the sample was relatively diverse, with a majority of the participants identifying as Caucasian (44.4%) or African American (38.9%); the remaining participants described themselves as either Indian-American, Hispanic-American, Asian-American, Mixed Race, Egyptian, or Middle Eastern (16.7%). All participants were recruited through the SONA participant recruiting system and were given class credit for their involvement.

Materials

Participants used either their own personal computer or a campus computer to exchange emails with a “questioner” (i.e., the experimenter). Depending on the condition to which they were randomly assigned, participants received either one anti-recycling argument (one argument group), three anti-recycling arguments (three argument group), or no arguments (the control group). See Appendix C for the standard email.

All participants completed a “Recycling Interest Survey” containing two subscales and five additional questions. The “Recycling Attitude Subscale” of the survey contained the following three questions: “How committed are you to recycling cans and plastic bottles on campus?”, “How important is recycling, compared to the various other

environmental issues our campus faces?”, and “What do you think of the current state of recycling on campus?”. Participants responded to the first two questions using a 7 – point Likert-style response scale (0 = Not At All, 6 = Extremely). They responded to the third question by selecting one of the following answers: “Students do a terrible job of recycling,” “Students do a rather poor job of recycling,” “Students do an okay job of recycling,” “Students do a good job of recycling,” and “Students do a great job of recycling.”

The “Recycling Behavior Subscale” of the survey contained the following two questions: “How often do you place aluminum cans or plastic bottles in the trash containers on campus?” and “How often do you place non-recyclables (e.g., food wrappers, etc.) in recycling containers on campus?”. Responses to each of these questions ranged from “0” (Never) to “6” (Always). A sixth question included in the survey asked participants, “How many minutes out of your way would you go to recycle on campus, on a 1 to 10 minute scale?” Next, all participants reported their level of agreement with each anti-recycling argument contained in the e-mailed letter (i.e., “Students shouldn’t recycle because it is inconvenient”, “Students shouldn’t recycle because one person’s recycling efforts won’t make a difference”, and “Students shouldn’t recycle because no one gets paid to recycle”). Agreement was indicated using a five-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strong Agree). Finally, participants in the one and three statement groups responded to the following manipulation check item: “How much effort do you feel you put into

your response(s)?" in reference to the specific statements they had to rebut, with response options ranging from "0" (very little effort) to "6" (a great deal of effort). See Appendix D for the full "Recycling Interest Survey."

Procedure

Using the SONA participant pool system, participants were instructed to arrive to a designated classroom in Jones Hall (in groups up to ten). A subset of participants had completed a pre-testing survey that had contained, in part, the first four questions of the "Recycling Interest Survey." These participants were selected because they had answered each of the four questions in a way that indicated they had a neutral attitude toward recycling. For instance, a participant was chosen if he/she answered within one standard deviation from the 2.63 average on the "How committed are you to recycling on campus?" question. The average was obtained using the combined score of all of the pre-testing participants. The remaining subset of participants answered a similar version of the pre-testing survey which also contained the four questions of the "Recycling Interest Survey" in the lab prior to experimental manipulation. These measures were taken in order to ensure all participants entering the lab had a relatively positive, but weak attitude toward the subject matter, as prescribed by the original inoculation study by Papageorgis and McGuire (1961).

Participants were told that they were participating in an experiment on dyadic group brainstorming. Specifically, they were told that the experiment was designed to test whether dyadic computer communication aids in problem solving and that they would be engaging in that form of communication to offer ideas on how to alleviate a

campus issue. Participants were then told that their issue would be randomly selected from a group of issues, though campus waste/recycling was actually the issue for all participants. Participants were told that they would brainstorm on the issue via an email dialogue until noon the next day with another participant, with one individual creating topic statements to which the other would respond. In reality, the experimenter created the statements and all participants were placed in the role of receiving and responding to them. Three statements were created. The three statement group received all three statements, whereas the single statement group received a randomly chosen statement from the three. See Appendix C for the Standard Email.

Participants in the control group were given the same initial pre-testing survey containing the questions from the “Recycling Interest Survey.” Then, the experimenter requested one participant to choose a campus related subject from a box. The control group similarly could only choose “campus recycling” as their subject and they were briefly given a summary on the topic. After the experimenter finished the verbal summary, all participants took the actual “Recycling Interest Survey” with two questions, strength of the anti-recycling questions and rebuttal effort when responding to the anti-recycling questions, excluded.

Participants thought they would be assigned to one of two roles in the dialogue and that they would be made aware of their particular role based on whether they received questions to answer (“answerer” role) or a set of instructions setting guidelines for creating dialogue questions (“questioner” role). In reality, all participants were assigned the “answerer” role and were led to believe they were receiving questions from

another participant. The “questioner” (i.e., experimenter) then sent the “answerers” an email containing either one or three anti-recycling statements. Participants were instructed to email the “questioner” their response(s) to the statement(s) by noon the next day, using their email account of choice. Participants were told that their response(s) should be at least two sentences in length. Participants were also informed that they would receive a second credit if: a) they had all materials (i.e., questions and answers) sent to the experimenter by noon the next day, and b) they fully responded to the subsequent survey provided to them after the materials were received.

After participants sent an email to the experimenter containing their response(s), they were emailed a link to the “Recycling Interest Survey” (from the experimenters’ surveymonkey.com account) that measured their recycling behavior, recycling attitudes, minutes they would go out of their way to recycle, agreement ratings to the 3 anti-recycling statements, and responses to the manipulation check question (see Appendix C). Participants in a control group were simply given the “Recycling Interest Survey” (sans manipulation checks) and presented a summary of the campus recycling problem. After the participants had finished the post-test survey, they were sent one final email containing a printable debriefing statement that they could keep for their records. See Appendix E for the debriefing statement.

Hypotheses

The following hypotheses were tested: At Time 2 (i.e., post-inoculation) but not Time 1 (i.e., pre-inoculation), the three argument group would report greater agreement with the items of the Recycling Attitude Subscale and Recycling Behavior Subscale,

compared to those in the one argument and control groups (Hypothesis 1). In addition, at Time 2 (only), the one argument group would agree more strongly with the items of the Recycling Attitude Subscale and Recycling Behavior Subscale scores than would those in the control group (Hypothesis 2). Further, participants in the 3 rebuttal condition would report a willingness to go significantly more minutes out of their way to recycle on campus than both the one argument group and the control group (Hypothesis 3). Finally, the one argument group would report a willingness to go significantly more minutes out of their way to recycle on campus than the control group (Hypothesis 4).

These hypotheses were tested by performing two-way analyses of variance (ANOVAs) on participants' responses to the Recycling Attitude Subscale items and Recycling Behavior Subscale items. A one-way analysis of variance (ANOVA) was conducted on the "minutes out of one's way to recycle" item.

CHAPTER III: RESULTS

Manipulation Check

A one-way, between-group analysis of variance (ANOVA) was performed on participants' self-reported level of effort they put forth while rebutting the anti-recycling statement(s) given to them. Only the One and Three Statement groups were asked to rate the level of effort they expended, because the Control Group did not rebut any anti-recycling statements. Effort ratings did not significantly differ between the two experimental groups for either the "Students shouldn't recycle because recycling is inconvenient" statement, $F(1, 20) = .59, p = .23, r = .17$, or the "Student's shouldn't recycle because one person's recycling efforts won't make a difference" statement, $F(1, 32) = 1.17, p = .14, r = .19$. However, effort ratings did significantly differ between the two groups for the "Students shouldn't recycle because no one gets paid to recycle" statement. Specifically, the Three Statement Group expressed higher individual effort ratings in rebutting that statement ($M = 4.47, SD = .96$) than did the One Statement Group ($M = 3.18, SD = 1.83$), $t(13.27) = -2.17, p = .05, r = .51$.

Inferential Statistics

The study was a 2 x 3 mixed design with time (pre-measure and post-measure) being the within subjects IV and group (Control, One Statement, and Three Statement) being the between subjects IV. Two measures from the Recycling Attitude Subscale of the Recycling Interest Survey (i.e., "How committed are you to recycling cans and plastic bottles on campus?" and "How important is recycling, compared to the various other

environmental issues our campus faces?") were used in both the pre- and post-manipulation survey. Additionally, two measures from the Recycling Behavior Subscale of the Recycling Interest Survey (i.e., "How often do you place aluminum cans or plastic bottles in the trash containers on campus?" and "How often do you place non-recyclables (e.g., food wrappers, etc.) in recycling containers on campus?") were included in both pre- and post-manipulation surveys as well. It should be noted that the experimenters chose to analyze each of the measures individually because they did not feel there was a coherent, unidimensional underlying construct to consolidate these measures into one score.

Hypotheses 1 and 2

Contrary to Hypotheses 1 and 2, analyses revealed no Group main effects or Group by Time interactions on participants' responses to items contained in the Recycling Attitude Survey and in the Recycling Behaviors Survey, $F_s < 1.72$, $p_s > .19$, $r_s < .28$ (See Table 1 for the Means). Unexpectedly, there was a main effect of Time on participants' responses to a) the question, "How committed are you to recycling cans and plastic bottles on campus?", $F(1, 69) = 13.55$, $p < .01$, $r = .41$, b) the question, "How important is recycling, compared to the various other environmental issues our campus faces?", $F(1, 69) = 11.20$, $p = .01$, $r = .37$, and c) the question, "How often do you place aluminum cans or plastic bottles in the trash containers on campus?", $F(1, 69) = 11.41$, $p = .01$, $r = .38$. Participants' responses to each of these three questions reflected stronger recycling support *after* the inoculation manipulation than *before* the manipulation (See Table 2).

Table 1.

Recycling Interest Means as a Function of Time and Group.

Measure	Control (n = 24)		One Statement (n = 29)		Three Statement (n = 19)	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
Commitment	2.50 (1.89)	3.17 (1.69)	2.48 (1.81)	2.83 (1.85)	3.16 (1.43)	3.37 (1.38)
Importance	3.17 (1.61)	3.67 (1.71)	3.14 (1.43)	3.66 (1.40)	3.90 (0.94)	4.47 (0.77)
Recycling in Trash	3.79 (1.64)	2.75 (1.80)	3.41 (2.10)	2.38 (1.74)	3.63 (1.71)	3.00 (1.83)
Trash in Recycling	1.13 (1.51)	0.83 (1.17)	0.38 (0.90)	0.62 (1.27)	0.37 (0.96)	0.63 (1.34)

Note. Data in parentheses indicate Standard Deviations. Commitment = “How committed are you to recycling cans and plastic bottles on campus?”, Importance = “How important is recycling, compared to the various other environmental issues our campus faces?”, Recycling in Trash = “How often do you place aluminum cans or plastic bottles in the trash containers on campus?”, Trash in Recycling = “How often do you place non-recyclables (e.g., food wrappers, etc.) in recycling containers on campus?”

Table 2.

Recycling Interest Means as a Function of Time.

Measure	Time			
	Pre-		Post-	
	M	SD	M	SD
How committed are you to recycling cans and plastic bottles on campus? *	2.667	1.744	3.083	1.676
How important is recycling, compared to the various other environmental issues our campus faces? *	3.347	1.406	3.875	1.414
How often do you place aluminum cans or plastic bottles in the trash containers on campus? *	3.597	1.836	2.667	1.776
How often do you place non-recyclables (e.g., food wrappers, etc.) in recycling containers on campus?	0.625	1.192	0.694	1.241

Note. * indicates that the mean difference between pre- and post-measurement for that measure was statistically significant, $ps < .05$.

Hypothesis 3

A one-way, between-group ANOVA was performed on the numeric value participants' gave to the question, "How many minutes out of your way would you go to recycle on campus, from 0 to 10?" Contrary to predictions, no main effect of Group was observed, $F(2, 69) = 1.41, p = .13, r = .20$. See Table 3 for means and standard deviations for Hypothesis 3.

Exploratory Analyses

Similar one-way, between-group ANOVAs were performed on additional survey questions that assessed participants' views on the state of recycling on campus and their level of agreement with, and perceived strength of each of three anti-recycling statements. Participants' evaluative response to the question, "What do you think of the current state of recycling on campus?" did not differ across groups, $F(2, 69) = 0.07, p = .47, r = .05$.

Participants' level of agreement with the first anti-recycling statement, "Students shouldn't recycle because it is inconvenient," significantly differed across groups, $F(2, 69) = 3.50, p = .02$. Independent samples post-hoc t-tests revealed that the Control Group and One Statement Group did not differ in agreement to this statement, $t(51) = -.29, p = .77, r = .04$. However, the Control Group expressed significantly higher agreement than did the Three Statement Group, $t(41) = 2.38, p = .02, r = .36$. Similarly, the One Statement Group expressed significantly higher agreement than did the Three Statement Group, $t(45.70) = 2.83, p = .01, r = .39$.

Following a similar pattern, participants' level of agreement with the second anti-recycling statement (i.e., "one person's recycling efforts don't make a difference.") differed across assigned experimental group, $F(2, 69) = 2.73, p = .04$. Post-hoc, independent samples t-tests revealed that the Control Group and the One Statement Group did not significantly differ in their level of statement agreement, $t(51) = 1.27, p = .21, r = .18$. The Control Group, however, did express significantly higher agreement scores than did the Three Statement Group, $t(41) = 2.52, p = .02, r = .37$. The One Statement and the Three Statement groups did not significantly differ in agreement level, $t(46) = 1.17, p = .25, r = .17$. Agreement on the last anti-recycling statement, "Students shouldn't recycle because no one gets paid to recycle," did not significantly differ across groups, $F(2, 69) = 1.66, p = .10$.

Finally, participants' *perceived strength* of each of the following three anti-recycling statements did not differ across the two manipulation groups: "Students shouldn't recycle because it is inconvenient", $F(1, 20) = 0, p = .50, r = .00$, "Students shouldn't recycle because one person's recycling efforts won't make a difference", $F(1, 32) = .12, p = .37, r = .06$, and "Students shouldn't recycle because no one gets paid to recycle", $F(1, 28) = 1.02, p = .16, r = .19$. Participants did not differ significantly across the two manipulation groups (i.e., one rebuttal and three rebuttal groups) on ratings of effort expended when rebutting two of the anti-recycling statements: "Students shouldn't recycle because it is inconvenient," $F(1,21) = 0.27, p = .61, r = .11$, and "Students shouldn't recycle because one person's recycling efforts don't make a difference," $F(1,33) = 0.89, p = .35, r = .16$. However, participants did significantly differ across the

manipulation groups on effort expended rebutting the statement “Students shouldn’t recycle because no one gets paid to recycle,” $F(1,30) = 6.90, p < .01, r = .43$. The three rebuttal group reported expending significantly more effort than did the one rebuttal group when rebutting the statement, “Students shouldn’t recycle because no one gets paid to recycle,” $t(16.43) = -2.35, p = .02, r = .25$. See Table 3 for the means and standard deviations for all exploratory analyses.

Table 3.

Means and Standard Deviations for Hypothesis 3 and Exploratory Analyses.

Measure	Control		One Statement		Three Statement	
	M	SD	M	SD	M	SD
Current State of Recycling	1.46	0.72	1.41	0.73	1.37	0.9
How Many Minutes?	3.10	2.43	3.31	2.70	4.42	3.08
Agreement with Statement #1 *	2.29	1.04	2.38	1.15	1.63	0.68
Agreement with Statement #2 *	2.33	1.01	1.97	1.09	1.63	0.76
Agreement with Statement #3	2.17	1.17	2.48	1.24	1.84	1.17
Strength of Statement #1			2.00	1.63	2.67	1.75
Strength of Statement #2			2.69	1.89	2.89	1.75
Strength of Statement #3			2.25	2.14	3.11	1.97
Effort of Response for Statement #1			4.50	0.58	4.26	0.87
Effort of Response for Statement #2			4.06	1.48	4.42	0.69
Effort of Response for Statement #3 *			3.15	1.86	4.47	0.96

Note. * indicates that there were statistically significant differences between groups, $ps < .05$. Current State of Recycling = “What do you think of the current state of recycling on campus?”, How Many Minutes? = “How many minutes out of your way would you go to recycle on campus, from 0 to 10?”, Statement #1 = “Students shouldn’t recycle because it is inconvenient”, Statement #2 = “One person’s recycling efforts don’t make a difference”, Statement #3 = “Students shouldn’t recycle because no one gets paid to recycle.”

CHAPTER IV: DISCUSSION

Hypotheses

The main hypothesis in the present study was that participants assigned to rebut more anti-recycling statements would subsequently report more positive attitudes toward recycling and recycling behavior. Unexpectedly, *all* participants became, on average, more supportive of recycling over the course of their participation in the study. Specifically, both commitment to recycling and perceived importance of recycling increased for all three groups, and participants' reported intention to place recycling in trash bins decreased from pre- to post-manipulation across all groups.

Perhaps the introductory information provided by the researcher early in the lab session (i.e., prior to condition assignment) contained compelling pro-recycling arguments that successfully altered participants' recycling attitudes. In the "campus recycling summary" portion of the study, the experimenter explained to participants that recycling was relatively easy (i.e., recycling cans were clearly marked; improper recycling behavior put undue stress on the janitorial staff; low recycling creates a drain of University resources). See Appendix F for the full summary.

These statements were made in an attempt to justify why campus recycling was one of the topics participants could have randomly selected in the study. However, in hindsight, those statements explicitly expressed to participants the negative consequences of neglecting recycling on campus. For example, the first three statements highlight that there is a major problem related to students' inability or unwillingness to place recycling

and trash in their allotted receptacles. This provided the premise for the remaining parts of the summary that referred to the extended amount of time janitorial staff spend rectifying the “cross contamination” of recyclables and trash, along with the resulting financial implications for both the university and the students. Taken as a whole, these statements likely provided a persuasive message that heightened participants’ awareness and perceived importance of the problem and desire to take corrective actions (See Facchini, Margalit, & Nakata, 2016).

Unintentionally, the introductory summary also may have led participants to lower how often they reported placing recyclables in trash bins (i.e., in the second survey) because the summary delegitimized excuses one might use to justify such actions. For example, the researcher stated that the recycling and trash bins are clearly marked and in close proximity to one another. An alternative explanation is that the summary induced guilt in participants, especially those who, in the first survey, admitted to their own tendency to place recyclables in trash bins. In response to this guilt, such participants may have either misremembered or felt the need to deny how often they generally place cans and bottles in campus trash containers (See Burnett & Lunsford, 1994).

Unfortunately, the summary probably represented very persuasive information that rendered any additional persuasive device (e.g., rebutting anti-recycling statements) ineffective. That is, participants may have “hit a motivational ceiling” after hearing the summary about recycling on campus and were subsequently resistant to any additional attitude modification, regardless of the number of anti-recycling statements they were

required to rebut. This interpretation is consistent with the fact that all groups reported the same level of increased recycling support. Also consistent with a “motivational limit” explanation, many participants in the one- and three-rebuttal conditions referenced ideas provided in the summary in their own anti-recycling statement rebuttals, rather than create novel responses of their own. For example, of the three participants who rebutted the “recycling is inconvenient” statement in the one rebuttal group, one participant used the fact that the recycling and trash receptacles are clearly marked and highly accessible as counter-reasoning for not recycling. Similarly, nine of the nineteen participants in the three rebuttal group who rebutted the “recycling is inconvenient” statement also gave the same counter-reasoning. Additionally, one participant from each experimental group referenced the point that janitorial staff must work overtime in order to maintain the trash and recycling receptacles.

Despite these unexpected results, participants in the three-rebuttal condition, in particular, agreed significantly less with the first two anti-recycling statements than did participants in the one-rebuttal and the control conditions. This finding is consistent with previous research in which an inoculation technique led to increased resistance to subsequent attack (e.g., Papageorgis & McGuire, 1961). The fact that participants in the three rebuttal condition agreed less with two of the anti-recycling statements is particularly noteworthy in that it is one of the few between-subjects results. Results would have been more consistent with traditional inoculation research had the three-

rebuttal group not only agreed less with the two anti-recycling statements, but had also reported more positive recycling attitudes and stronger commitment to recycling behaviors, compared to the one rebuttal and control groups.

One potential explanation for this very specific inoculation effect is that, when presented with one or three anti-recycling statements by an individual they believed to be a peer, participants felt they were taking on a “recycling advocate” role. The portion of the study in which participants “conversed” with other peers may have been realistic enough for participants to believe that their peer actually espoused these anti-recycling views. Thus, participants in the three-rebuttal group, who rebutted all potential anti-recycling statements, tended to disagree more with the first two anti-recycling statements (i.e., “recycling is inconvenient” and “one person’s recycling efforts won’t make a difference”) because, in rebutting those statements, they came to “own” their self-generated counter-argument(s). It is also worth noting that, anecdotally, participants seemed to respond with a certain level of hostility when rebutting the anti-recycling statements. This suggests that they truly believed they were exchanging emails with an actual “participant,” and that the participant’s anti-recycling statement(s) were sincerely rendered. See Appendix G for samples of participants’ rebuttals.

Finally, why didn’t the act of rebutting general anti-recycling statements lead to predicted changes in participants’ broader support for, and commitment to University campus recycling? Perhaps a greater degree of match between participants’ generated rebuttals and their subsequent attitude was required. Specifically, anti-recycling statements *tailored to our campus* may have led to greater support for campus recycling.

For example, instead of presenting the criticism, “recycling is inconvenient,” we should have presented the statement, “recycling is inconvenient on the campus of Middle Tennessee State University.” Because this possible explanation is speculative, future research is needed to determine how tailored an inoculation statement designed to be rebutted needs to be to affect relevant attitudes.

Strengths

The primary strength of the current study is that participants were prompted to give high quality rebuttals. During the lab session, the experimenter explicitly instructed participants to provide a minimum number of sentences and told participants that their peer would report them if their rebuttal was not of sufficient quality. For instance, the experimenter specifically explained that, “Those of you assigned to be an answerer will generate at least a two sentence answer to each/the question.” Furthermore, the experimenter emphasized the level of scrutiny that answerers would be under when writing their answers:

“Insufficient answers are defined as answers in which there is not enough information to indicate that an idea was actually formed or that the response is grammatically unreadable. This will be judged by the questioner at which time the questioner will be instructed to restate the questions and critique the answers as to make it more clear to the answerer what the questioner was expecting when writing the questions.” (See Appendix F for Self-Inoculation Recycling Script).

These instructions not only reinforced the experimenter's answer quality expectations, but also explained the consequences of submitting a poor quality answer. The instructions forced participants to review the answers prior to submitting them, creating high quality rebuttals.

Similarly, the format of the "dialogue" gave participants a realistic environment in which to express their views about recycling. Participants were led to believe they were engaging in an actual email communication with another participant, with little mediation by the experimenter. This allowed participants to submit the most creative rebuttals they could produce. In fact, participants were instructed to apply as much creativity to rebutting as they could (e.g., "We want to emphasize that both the questioner and the answerer are welcome to be as creative as possible when creating their questions and answers, respectively.").

Alternative Methods

One unintended aspect of the current study was that the control group differed from the experimental groups in more than one way. In addition to not having to rebut anti-recycling statements, control participants completed the second survey much sooner than did the experimental participants. Roughly one-third of control group participants (i.e., those who did not participate in pretesting) completed the post-survey within 5-10 minutes of completing the pre-survey, with only listening to the researcher's introductory statement separating the two. In contrast, the control participants obtained via pretesting had at least two weeks between completing the pre- and post-survey. At minimum, they should have been forced to wait 24 hours before completing the post-survey, as was the

case for the experimental groups. Although there is no evidence that this lack of consistency between groups affected the results, it, nonetheless represents a potential confound.

A second, more important distinction was that the current study did not include refutational pre-emption, as is generally included in prior research. Refutational pre-emption generally involves the presentation of several counter-attitudinal messages, which are subsequently rebutted in multiple ways by the experimenter. This classic component of inoculation research is implemented to increase perceived threat in participants, along with vigilance to future argumentative attack. Instead, current participants were given an explanation of the campus recycling problem rather than refutational pre-emption. The latter would have come in the form of presenting participants with common reasons why a student might not recycle on campus, followed by one or more rebuttal(s). Although the summary of the campus recycling problem was the closest analog to refutational pre-emption, it did not provide the argument/counterargument style presented in previous research. It did provide the potential implications of what a lack of recycling behavior could do both to the campus and its constituents, but it did not provide specific reasons as to why a member of campus may choose not to recycle and why that reasoning is flawed.

In the current study, a great deal of effort went into convincing the participants that they were conversing with another participant. This level of deception reasonably calls for a “suspicion measure” that would assess the degree to which participants actually believed they were engaging with another participant. A simple measure asking,

“Do you believe that the questions you received were written earnestly by another participant?” would have given the experimenters a better idea of the true success of the cover story used in the study.

Finally, a third methodological deviation from typical inoculation tactics is that the current experiment did not employ what is known as an explicit “forewarning” of an imminent attack on the participants’ attitudes toward recycling on campus. Forewarning has been used in much of the research that has utilized the classic model of inoculation first proposed by Papageorgis and McGuire (1961) (see also Banas & Miller, 2013; Parker, Rains, & Ivanov, 2016). According to these studies, the use of forewarning is a tool for inducing a feeling of threat and, for the purposes of inoculation, vigilance to counter-attitudinal arguments. The current study lacked a formal forewarning component in which the experimenter explained that participants may be confronted with, and asked to rebut anti-recycling statements. Instead, participants were simply told that they would be having a conversation with a peer about a randomly chosen topic. Presenting a forewarning may be required to induce a level of threat that cannot be achieved by simply giving participants a summary of the topic and how a lack of recycling on campus is detrimental.

Future Research

In the current study, the manipulation check was intuitive and it ultimately allowed the experimenter to verify whether participants’ effort expended actually differed across groups as expected. Unfortunately, effort generally did not. For two of the three anti-recycling statements, three rebuttal group participants did not rate themselves as

expending more effort than those in either the one rebuttal or control groups. Providing measures that detect the perceived *cumulative* effort of each participant in each group may have been more illuminating. In future research, measures of cumulative effort included after participants complete the rebuttal task may help provide a more thorough detection of between group differences related to perceived effort.

Future research should also investigate different ways to manipulate effort during the active rebuttal portion of the methodology. In the present study, results did not indicate that simply requiring participants to rebut more anti-recycling statements equated to more effort being expended by participants. Thus, a better manipulation may involve employing anti-recycling statements that have been determined, through pilot testing, to be differentially difficult to rebut. Specifically, instead of having a one- and three-statement group, one might stratify the groups by level of rebuttal difficulty (i.e., a high difficulty anti-recycling statement group vs. low difficulty anti-recycling statement group). It would be expected that those in the high difficulty statement group would expend more effort during the rebuttal, compared to the low difficulty statement group, subsequently creating more of a differential between groups on effort rating scores, perceived recycling attitude scores, and perceived recycling behavior scores.

Summary and Conclusions

The current study applied, to campus recycling advocacy, the role-playing inoculation methods employed in previous research (e.g., Duryea, 1983). Using a novel communication platform (i.e., email), the present study demonstrated that inoculation effects appeared limited to specific anti-recycling statements and that broader opinion

change appeared to be influenced by researcher-provided information. Further research in this area should identify a way to assess overall (or cumulative) counter-argument efforts. It should also explore the role that rebuttal specificity plays in strengthening specific versus general attitudes and opinions.

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APPENDICES

APPENDIX A: IRB APPROVAL LETTER

IRB
INSTITUTIONAL REVIEW BOARD
 Office of Research
 Compliance, 010A
 Sam Ingram Building,
 2269 Middle
 Tennessee Blvd
 Murfreesboro, TN
 37129

**IRBN001 - EXPEDITED PROTOCOL APPROVAL NOTICE**

Monday, February 06, 2017

Investigator(s): Brandon Bowers (Student PI), and John Pennington (FA) Investigator(s)' Email(s): blb7m@mtmail.mtsu.edu; john.pennington@mtsu.edu Department: Psychology

Study Title: Using Prompted Self-Inoculation to Increase Perceived Recycling Behavior

Protocol ID: **17-2128**

Dear Investigator(s),

The above identified research proposal has been reviewed by the MTSU Institutional Review Board (IRB) through the **EXPEDITED** mechanism under 45 CFR 46.110 and 21 CFR 56.110 within the category (7) *Research on individual or group characteristics or behavior*. A summary of the IRB action and other particulars in regard to this protocol application is tabulated as shown below:

IRB Action	APPROVED for one year from the date of this notification
Date of expiration	2/28/2018
Participant Size	90 (NINETY)
Participant Pool	MTSU Psychology Research Pool
Exceptions	All participants are students enrolled at MTSU.
Restrictions	1. Mandatory signed informed consent 2. 18 years of age or older
Comments	NONE

Amendments	Date N/A	Post-approval Amendments NONE
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This protocol can be continued for up to THREE years (**2/29/2020**) by obtaining a continuation approval prior to **2/28/2018**. Refer to the following schedule to plan your annual project reports and be aware that you may not receive a separate reminder to complete your continuing reviews. Failure in obtaining an approval for continuation will automatically result in cancellation of this protocol. Moreover, the completion of this study **MUST** be notified to the Office of Compliance by filing a final report in order to close-out the protocol.

Continuing Review Schedule:

Reporting Period	Requisition Deadline	IRB Comments
First year report	1/31/2018	<u>INCOMPLETE</u>
Second year report	1/31/2019	<u>INCOMPLETE</u>

IRBN001
03.06.2016

Version 1.3

Revision Date

Final report	1/31/2020	INCOMPLETE
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The investigator(s) indicated in this notification should read and abide by all of the post-approval conditions imposed with this approval. [Refer to the post-approval guidelines posted in the MTSU IRB's website](#). Any unanticipated harms to participants or adverse events must be reported to the Office of Compliance at (615) 494-8918 within 48 hours of the incident. Amendments to this protocol must be approved by the IRB. Inclusion of new researchers must also be approved by the Office of Compliance before they begin to work on the project.

All of the research-related records, which include signed consent forms, investigator information and other documents related to the study, must be retained by the PI or the faculty advisor (if the PI is a student) at the secure location mentioned in the protocol application. The data storage must be maintained for at least three (3) years after study completion. Subsequently, the researcher may destroy the data in a manner that maintains confidentiality and anonymity. IRB reserves the right to modify, change or cancel the terms of this letter without prior notice. Be advised that IRB also reserves the right to inspect or audit your records if needed.

Sincerely,

Institutional Review Board
Middle Tennessee State University

Quick Links:

[Click here](#) for a detailed list of the post-approval responsibilities. More information on expedited procedures can be found [here](#).

APPENDIX B: CONSENT FORM

INSTRUCTIONS FOR INVESTIGATOR

The following is a template for a complete informed consent document. As a guide, it can be partially revised to fit your study. However, the first two (2) paragraphs and all questions need to be included, as required the by the Office of Human Research Protections.

If you choose to alter or waive consent for your study, you must provide justification to do so. Fill out the appropriate portion of the Request for Waiver or Alteration of Consent and attach it to your IRB application. The form can be accessed at <http://www.mtsu.edu/irb/irbforms.shtml>

If a question is not applicable to your study, simply insert n/a. You should also eliminate suggested language (in brackets and red type) if not pertinent to your study, to enhance participant comprehension. If used for a parent/legal guardian, alter language to refer to child.

Should you have any questions or need additional information, please do not hesitate to contact my office.

Compliance Officer

compliance@mtsu.edu

Box 134

Sam Ingram Building 011B**(615) 494-8918**

Principal Investigator: Brandon Bowers
Study Title: Studying Dyadic Computer Based Communication
Institution: Middle Tennessee State University Psychology Department

Name of participant: _____
Age: _____

The following information is provided to inform you about the research project and your participation in it. Please read this form carefully and feel free to ask any questions you may have about this study and the information given below. You will be given an opportunity to ask questions, and your questions will be answered. Also, you will be given a copy of this consent form.

Your participation in this research study is voluntary. You are also free to withdraw from this study at any time. In the event new information becomes available that may affect the risks or benefits associated with this research study or your willingness to participate in it, you will be notified so that you can make an informed decision whether or not to continue your participation in this study.

For additional information about giving consent or your rights as a participant in this study, please feel free to contact the MTSU Office of Compliance at (615) 494-8918.

1. Purpose of the study:

You are being asked to participate in a research study because we identified you as a candidate for our particular study.

2. Description of procedures to be followed and approximate duration of the study:

At minimum: You will fill out a quick survey and you will then be debriefed. This will take approximately 10 to 15 minutes.

At maximum: You will engage in an email dialogue with one of your peers, picked at random, over a 24 hour period. This will end with a quick survey and a debriefing.

3. Expected costs:

There are little to no expected costs for your participation in this study.

4. Description of the discomforts, inconveniences, and/or risks that can be reasonably expected as a result of participation in this study:

There are little to no expected discomforts, inconveniences, and/or risks that will come from your participation in this study.

5. Compensation in case of study-related injury:

There is little to no anticipated risk of injury due to your participation in this study.

6. Anticipated benefits from this study:

a) The potential benefits to science and humankind that may result from this study are:

- The potential observation of new effects of email and other computer mediated dialogues on communication that will further communication and persuasion science.

b) The potential benefits to you from this study are:

- Course credit (PSY 1410)

7. Alternative treatments available:

N/A

8. Compensation for participation:

You will receive course credit for your participation in the current study (PSY 1410).

9. Circumstances under which the Principal Investigator may withdraw you from study participation:

Your data may be withdrawn from the study in the case that the data you have provided via surveys, email, etc. is not sufficient to draw any meaningful conclusions (i.e., incomplete survey, lack of correspondence with dialogue partner, etc.).

10. What happens if you choose to withdraw from study participation:

If you choose to withdraw at anytime during the study after you have arrived to this initial meeting, your course credit will not be revoked and any data you have submitted to the investigators will be deleted or destroyed as to preserve your anonymity and privacy.

11. Contact Information.

If you should have any questions about this research study or possible injury, please feel free to contact Brandon Bowers at (615) - 513 - 4992 or my Faculty Advisor, Dr. John Pennington at (615) - 898 - 5937.

12. Confidentiality.

All efforts, within reason, will be made to keep the personal information in your research record private but total privacy cannot be promised. Your information may be shared with MTSU or the government, such as the Middle Tennessee State University Institutional Review Board, Federal Government Office for Human Research Protections.

13. STATEMENT BY PERSON AGREEING TO PARTICIPATE IN THIS STUDY

I have read this informed consent document and the material contained in it has been explained to me verbally. I understand each part of the document, all my questions have been answered, and I freely and voluntarily choose to participate in this study.

Date

Signature of patient/volunteer

Consent obtained by:

Date

Signature

Printed Name and Title

APPENDIX C: STANDARD EMAIL

“Dear answerer this is your questioner,

I was asked to provide (either 1 or 3) arguments that oppose recycling and I need you to provide a counter-argument to it(them) within six hours of receiving this email:

1. What counterargument would you make to not recycle because “it is inconvenient”?
2. What counterargument would you make to not recycle because “one person’s recycling efforts won’t make a difference”?
3. What counterargument would you make to not recycle because “no one gets paid to recycle”?

Thank You,

Questioner”

APPENDIX D: RECYCLING INTEREST SURVEY

Recycling Interest Survey

The first four questions were administered in both the pre- and post-measurement.

1. How committed are you to recycling cans and plastic bottles on campus?

Not at all							Extremely
0	1	2	3	4	5	6	6

2. How important is recycling compared to other environmental issues our campus faces?

Not at all							Extremely
0	1	2	3	4	5	6	6

3. How often do you place aluminum cans or plastic bottles **in trash cans** (i.e., rather than recycling bins) on campus?

Never							Always
0	1	2	3	4	5	6	6

4. How often do you place non-recyclables (e.g., trash) **in recycling containers** on campus?

Never							Always
0	1	2	3	4	5	6	6

The three questions below were only administered as post-measures.

5. What do you think of the current state of recycling on campus? (Check one)

- Students do a terrible job of recycling.
- Students do a rather poor job of recycling.
- Students do an okay job of recycling.
- Students do a good job of recycling.
- Students do a great job of recycling.

6. How many minutes out of your way would you go to recycle on campus, from 0 to 10? _____ minutes

7. Below are 3 reasons given for not recycling on campus. Please rate your level of agreement or disagreement with each.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

A. "Recycling is inconvenient."

1	2	3	4	5
---	---	---	---	---

- | | | | | | |
|--|---|---|---|---|---|
| B. "My (recycling) efforts don't make a difference." | 1 | 2 | 3 | 4 | 5 |
| C. "I don't get paid to recycle." | 1 | 2 | 3 | 4 | 5 |

Age_____

Gender_____

Race_____

Questions for Experimental Groups Only. These will appear on the Survey Monkey Survey only:

8. How strong was each anti-recycling argument in the email you received? Mark only the arguments to which you responded.

Strong	Very Weak					Very
	1	2	3	4	5	6
A. "Recycling is inconvenient."	1	2	3	4	5	6
B. "My (recycling) efforts don't make a difference."	1	2	3	4	5	6
C. "I don't get paid to recycle."	1	2	3	4	5	6

9. How much effort do you feel you put into each response you sent to your questioner? Mark only the arguments to which you responded.

Deal of Effort	Very Little Effort				A Great	
	1	2	3	4	5	6
A. "Recycling is inconvenient."	1	2	3	4	5	6
B. "My (recycling) efforts don't make a difference."	1	2	3	4	5	6
C. "I don't get paid to recycle."	1	2	3	4	5	6

Age_____

Gender_____

Race_____

APPENDIX E: DEBRIEFING STATEMENTS

Debriefing

You have been a part of an experiment testing whether rebuttals to anti-recycling statements change recycling opinions and behavior. We believe that the more someone rebuts arguments such as those you received via email, the stronger their subsequent recycling attitudes will be. We should point out that there are little to no anticipated risks of participating in this study and no penalties for declining participation.

Although you completed the recycling survey anonymously, we are taking the extra step of securing all experimental materials, including all surveys, in Dr. John Pennington's locked office in Jones Hall so that your information will remain completely secure.

If you have any questions or concerns about the nature of this study, please feel free to contact Dr. John Pennington at (615) 898-5937 (or john.pennington@mtsu.edu) or the Office of Compliance at (615) 494 8918 (or compliance@mtsu.edu).

APPENDIX F: SELF-INOCULATION RECYCLING SCRIPT

Experimenter: First of all, I want to brief you on what we are studying today. This experiment is exploring dyadic (2 person) communication via email. One of you is going to randomly select a topic that relates to an on-campus issue and we are going to have you and another participant discuss that topic via email. Half of you will be assigned the role of a questioner, that is, someone who creates questions related to the campus issue that is chosen. Questioners will be given specific instructions about the appropriate format of the question(s). The questioner will create [1 or 3] questions for the answerer to answer. The other half will be assigned the role of an answerer, that is, someone who answers each question sent by the questioner. Those of you assigned to be an answerer will generate at least a two sentence answer to each/the question. We do expect the questioner to send their email containing the questions to their assigned answerer within, at most, 6 hours of getting their assignment. Once the questioner has sent their [1 or 3] questions to the answerer, there will be a six-hour window for the answerer to respond. We instruct you not to write your name on any of the emails that you send. We want to emphasize that both the questioner and the answerer are welcome to be as creative as possible when creating their questions and answers, respectively.

Now, I will give you each a small piece of paper on which you will write your university email address. Once you are finished writing your email address on the paper, you will fold it up and put it in this container [experimenter holds up container]. I want everyone to know that your email will remain confidential and that we will not be recording any other personal information about you other than what you will provide on the final survey. I also want to add that the questioner will receive instructions about how to handle what they perceive as insufficient answers. Insufficient answers are defined as answers in which there is not enough information to indicate that an idea was actually formed or that the response is grammatically unreadable. This will be judged by the questioner at which time the questioner will be instructed to restate the questions and critique the answers as to make it more clear to the answerer what the questioner was expecting when writing the questions. After the answerer has sufficiently answered the questions, we will collect the emails from the questioner and ask everyone to answer a brief survey that will also be emailed to you via [Survyemonkey.com](https://www.surveymonkey.com). We will expect you to respond to the [Surveymonkey.com](https://www.surveymonkey.com) link within 6 hours of receiving it. Lastly, we ask that you do not write your name on your survey as well.

[The experimenter hands out sheets of paper for participants to write their email addresses on. After participants have written down their email address, they will fold the sheet of paper in half and place it in a container which the experimenter will pass around.]

Experimenter: I would like one of you to pick an issue out of this hat.

[The experimenter picks one participant to pull a topic paper from a hat full of small, tightly folded pieces of paper that will all have “campus recycling” written on them so that there can be no other topic chosen.]

Experimenter: I will give you a quick overview of this issue. There is a major problem on campus with individuals putting recycling in trashcans and putting trash in recycling containers, despite the fact that the recycling and trash bins are clearly marked. These receptacles are also usually near one another, making recycling as easy as disposing trash. This problem of “cross contamination” forces janitorial staff to spend extra hours to recycle the recyclables that are put in the trash and also to clean the recycle bins. Those are hours that they could have spent taking care of other janitorial duties or spending time with family. It also forces the University to spend extra money that they may not normally spend on the janitorial staff’s wages because of the overtime. This also means that the university may have to raise tuition to keep recycle bins on campus and allow janitorial staff to do what is necessary to keep our campus environmentally friendly.

Now you are all free to go. You will get an email later today about whether you are a questioner or an answerer. Answerers should expect an email from the questioner within 6 hours of getting your assignments. Thank you.

[The experimenter will send out emails to all of the participants telling them that they are assigned to the role of answerers and they will receive their questions from the questioners, within at most, six hours. The participants will receive an email with either one or three question(s) within two hours of receiving their assignments. The

experimenter will wait six hours for the participants to respond with either one or three rebuttals. When the experimenter receives the answerers' responses from the questioner, the experimenter will send all participants a "Topic Survey" (i.e., the "Recycling Interest Survey"). This will come in the form of a SurveyMonkey.com email that will offer a link to the online form of the survey. They will be given another six hours to respond to the survey questions. After the answers to the survey questions have been received, the experimenter will send the participants a debriefing statement (see Debriefing).]

APPENDIX G: REBUTTAL EXAMPLES

Three Rebuttal Example

P# 80

1. I would argue that recycling is convenient because there are many factors that can go into recycling goods. Also when you recycle you decrease the amount of pollution in the air because the more we recycle the less landfills get filled with trash, cutting back on the amount of trash getting burned. Recycling is also convenient because a lot of stores now use recycled items when you shop saving you money.
2. I would argue that in reality ONE persons recycling CAN in fact make a big difference and I will state a few reasons how: if one person stopped purchasing disposable water bottles then they would save close to 200 bottles from being in landfills for one consecutive year, and one persons recycling can also increase the amount of electricity they are able to use just because they were being conservative and recycling things such as bottles, cans, and other things.
3. I would argue that there are actually companies who pay you very small amounts for cans, and aluminum. Not only do they pay you, but when you are grocery shopping more stores are going green and offering discounts to people who purchase the recycled shopping bag so there are many perks to recycling and even if you aren't getting paid, you're still paying yourself and as well as others by keeping the community fresh and trash free.

One Rebuttal Example

P# 77

What counterargument would you make to someone who does not recycle because “one person’s recycling efforts won’t make a difference”?

Saying "one person's recycling efforts won't make a difference" conveys an attitude that is itself the problem. If one thousand people think that exact sentiment then not just one

person has excluded themselves from recycling, one thousand people have excluded themselves. Minimizing the impact of your influence or actions is a defense mechanism to escape possible judgement or guilt. The more people that stop thinking like that, the more people would recycle.