Research Note

Multi-Level Emotions: How to measure individual, in-group, and out-group anger?

Abstract

Emotional explanations are used throughout political psychology, but scholars disagree on how best to elicit or measure emotions. The methodology used to measure emotions is heavily grounded in self-reported and single measures that fail to integrate the multi-level nature of emotions. In this research note, I summarize how anger is currently elicited and measured, argue that current methodologies are incomplete, and propose a novel way to measure group-level emotions. I build upon current emotional measurements and provide a way to measure different targets and anger at different levels.

KEYWORDS: emotions, anger, intergroup emotional theory

Introduction

Many scholars study how emotions impact political behavior (Marcus et. al 2000; Huddy et. al 2005; Lerner and Keltner 2001; Valentino et. al 2011; Banks and Valentino, 2012), but there is not much scholarly progress being made on how emotions are elicited and measured. Standard techniques used to induce emotions rely heavily on a single self-reported measure, and ignore its multi-level nature (Lerner and Keltner 2001; Mackie et al. 2000). In this research note, I present a new method to elicit and measure anger that accounts for the multi-level nature of emotions and controls for individual-level anger, group-level anger towards the out-group, and group-level anger towards the in-group.

Currently the most common method to induce anger is through a recall writing task (Strack et al. 1985; Keltner et al. 1993; Lerner and Keltner 2001; Tiedens and Linton 2001). Although this procedure elevates anger, it is limited to the individual and fails to control for the target of the anger. This misses a key theoretical component of anger: the

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source of the anger. Asking respondents to "recall an event/person/policy that caused them to be angry" or to evaluate angry faces is disconnected from the theory of anger and action. Keltner and Lerner 2001 assert that both the target and level of anger is important to understanding the approach tendency of anger. For example, if an out-group member blocks someone, then the expectation is he or she will become angry towards that specific out-group and take actions against members of the out-group. As a consequence, it is essential to capture the level of anger and who or what the subject reports being angry towards.

In summary, how anger is currently measured fails to incorporate different levels and target of the anger. This research note addresses these shortcomings with a new way to elicit and measure anger.

Review of Current Anger Elicitation Methods

In this section, I provide a summary of the different ways in which anger is induced and measured. There are four mains methods used to elicit anger: (1) elicitation with images, words, film, or music; (2) recall or writing task of event/person/group/thing that made a subject angry in the past; (3) self-reported battery of questions on level of anger; and (4) combination of image and recall task.

[Insert Table 1]

Table 1 summarizes the standard methods used to measure and elicit anger. These methods are successful in elevating an individual's self-reported levels of *general anger*. However, these measures and methods often only account for anger based on

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individual appraisals. This ignores how emotions may be directed towards or interacts with group-level effects. Current methods are incomplete because they (1) lack a target for the anger or target is unclear, (2) ignore the multi-level nature of anger, or (3) suffer from a combination of both. Missing these components potentially misattributes the impact of anger on behavior and may lead to measurement error.

I propose that, when eliciting anger, it is essential to control for what the subject is angry at. For example, a recall task related to a policy, candidate, or issue may elevate general anger in subjects, but it does not control for what exactly the subject is angry towards. Focusing only on general anger misses the directed nature of anger; is the subject angry at some group for the lack of progress, or a specific political party about a policy, or some other target? On top of measuring general anger, I include targeted measures of in-group anger and out-group anger.

Proposed Anger Elicitation Method

Theory

I present an anger treatment built upon on the assumptions and theoretical foundations of Intergroup Emotional Theory (IET) (Mackie et. al 2000). IET's basic assumption is that individuals not only feel emotions at the individual level, but also towards groups. This means that from the perspective of IET, it is critical to measure emotional changes directed at the group level.

In my proposed anger manipulation treatment, subjects are divided into two groups. One group blocks the other group from a goal in order to elicit anger directed towards an out-group. During the treatment, subjects choose one of two tasks for their

group to complete. One of the tasks is easier and results in higher earnings. The other task is more difficult, and results in lower earnings. The assumption is that subjects will choose to perform the easier and higher paying task. There are two groups but only one group is allowed to vote on which task they wish to complete. As a consequence, one group gets to choose the easy-worth-more task, while the other group is assigned the harder-worth-less task. Anger is elicited in this treatment by telling subjects in the non-voting group that *the other group* assigned them the harder-worth-less task. The treatment's objective here is to not elevate anger towards one's own group; the blame should be clearly placed on the voting group, the out-group.

IET expects that individuals placed in groups become angry toward the out-group when they feel that the out-group is blocking the group from a goal. Consequently, one group blocking another group from receiving more payout should then create the context for out-group anger.

Experiment Protocol Overview

Subjects are randomly assigned to one of two groups: Group A or Group B. After group group assignment, subjects complete an emotional inventory. This emotional inventory measures a battery of negative and positive emotions. It asks subjects how much they feel specific emotions at the individual level, towards their in-group, and towards the out-group. After the emotional inventory is compete, subjects are given examples of the performance task and are asked to calculate how much money they would make in each performance task. In addition, subjects take part in two one-minute practice rounds of the easy and hard performance tasks. Number charts are randomly generated with the integers 1-9 and subjects are asked to identify the number of times a random number

appears in the number table. For the easy task, subjects see a 3 by 3 table; for the hard task, subjects see a 6 by 6 table. Each subject has five seconds to enter an answer, and every five seconds a new number table appears. Subjects continue to complete these tasks for five minutes. There are a total of 60 number tables. After completing the performance task for five minutes, earnings are calculated and shown to subjects. Total group earnings are aggregated and then shown to all subjects. Finally, subjects are asked to participate in a second emotional inventory.

[Insert Table 2]

Experiment Protocol – Performance Task

The treatment's performance task is an adaptation of a "real effort task" from Abeler et al. (2009, 2011). Abeler et al. 2009 describe the task as "tedious and repetitive" requiring subjects to count the number of zeros in tables consisting of 150 randomly ordered ones and zeros. I chose to use this as a model because it is simple for the subjects to complete and performance is easy to measure.

Figure 1: Screenshot from Appendix of Abeler, Falk, Gotte and Huffman (2009).

Figure 1 is a screenshot of the Abeler et al. 2009 effort task. The experiment performance task differs from Abeler et al. 2009 real effort task in the following ways. Below is a summary of the key differences.

[Insert Table 3]

These modifications were made in order to more effectively elicit group-level anger. Below are two screenshots of the experiment performance task. The easy task is worth 10 cents per correct answer while the hard task is worth 5 cents per correct answer. The left hand figure is the easy task (3x3 table) and the right hand figure is the hard task (6x6 table). Subjects are given feedback between each number table on how much time is remaining, how many tables are left unsolved, and how much money they have earned in this task.

Figure 2: Easy versus Hard Performance Task
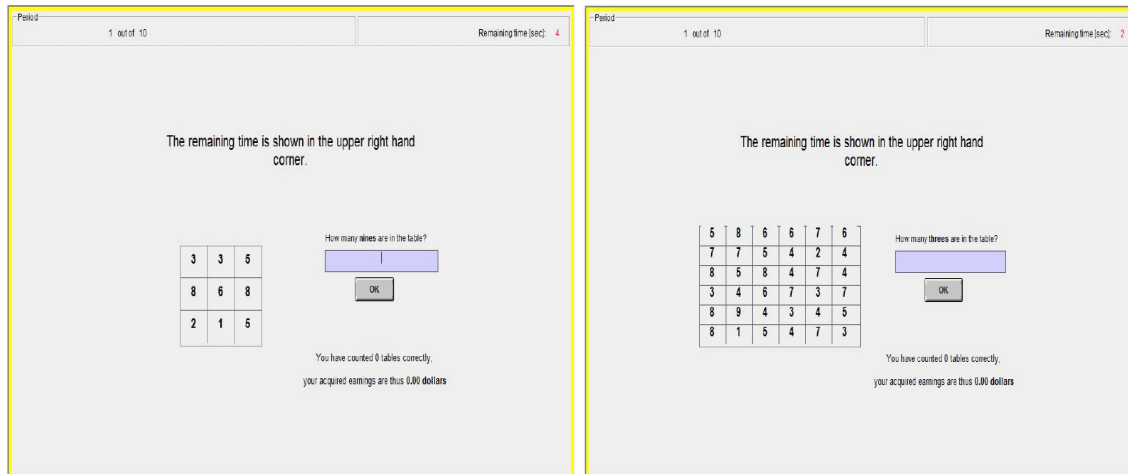
*Treatment Coded on Z-Tree. (Fischbacher 2007).

Both groups take part in two one-minute practice rounds, and then vote for which task they want to complete for real earnings. Both groups vote for which task they prefer, but only one group's votes are used to assign the tasks. The non-choosing group is told that the choosing group assigned them the harder-worth-less task. In this treatment, one group prevents the other group from a higher payout.

Experiment Protocol - Emotional Treatment

The objective of the treatment is to induce targeted group anger and create anger through task assignment. The non-choosing group should be become angry and blame the choosing group for blocking them from the preferred task. I attempt to limit the amount of anger the non-choosing group has towards other members in their in-group by not showing task preference choices of other in-group members. This ensures that task preference allocation is not associated with their in-group members. It is clear that *the other group* blocked them from the easy performance task and caused them to earn less.

In the experiment, Group A was told, "Your group has been assigned to decide which task your group gets," and "Please make your decision. What tasks do you want for your group?" On the other hand, Group B was told, "The other group is deciding whether your group gets the easy or hard task" and "What task would you like your group to get? Please make your decision, but keep in mind that no one in the other group will know your choice." Immediately after each group is assigned their task, Group A is told, "Your Group chose the Easy task," and Group B is told, "Your group preferred the EASY task. The other group voted to assign you the HARD task."

Experiment Protocol – Emotional Inventory

In order to check for emotional treatment effects, I used three sets of questions to measure the difference in anger levels: general anger, anger towards the out-group, and anger towards the in-group. Measuring these three specific anger levels will then allow me to examine whether I successfully elicited anger in line with IET.

In the emotional inventory, subjects were asked a set of questions related to their emotional state with respect to themselves, their group, and the other group. Subjects were then told to move the slider left or right to indicate the location that shows how they felt. The slider is anchored in the middle with the far left labeled "Strongly Disagree" and the far right labeled "Strongly Agree." There are no numbers on the slider and all sliders start at the midway point. Below is a screenshot of a question in the emotional inventory.

Figure 4: Example question in emotional inventory.

The use of the slider scale follows the measurement protocol of Marcus et al. 2010. They find that the slider scale is a more reliable measure of affect than the LIKERT Scale. The slider bar is also able to measure smaller changes in pre and post emotional treatment.

Data & Results

There were a total of two treatment sessions and a total of 28 subjects. Subjects were recruited from a southern private university. The first session consisted of 4 subjects in the control condition (Group A), and 12 subjects in the treatment condition (Group B). The second session consisted of 3 subjects in the control condition (Group A), and 9 subjects in the treatment condition (Group B). Throughout the two sessions, subjects maintained their group assignment. The treatments were conducted using Z-Tree and lasted about half an hour. Each subject earned a $5.00 show up fee and on average $3.33 for task completion. In order to control for performance task preference, I recorded whether each subject preferred the easy or hard task. In these two sessions, vast majority of subjects preferred to complete the easy task to the more difficult one.

Here, I present the main treatment effects. Again, there are two groups, a treatment (non-choosing) group and a control (choosing) group. I present the pre and post performance task levels of anger for each group. These figures are created from three sets of questions. The first set asks subjects to rate how angry they are in general. The second set of questions asks subjects to rate how angry they feel towards their in-group. The third set asks subjects to rate how angry they feel towards the out-group.

I utilize a within subject design in order to test if there are pre and post performance task differences. I will first present the mean levels of anger between the control and treatment. Then, I will present the results of the Wilcox tests, which will show group differences in anger before and after the performance task.

Figure 5: General Anger
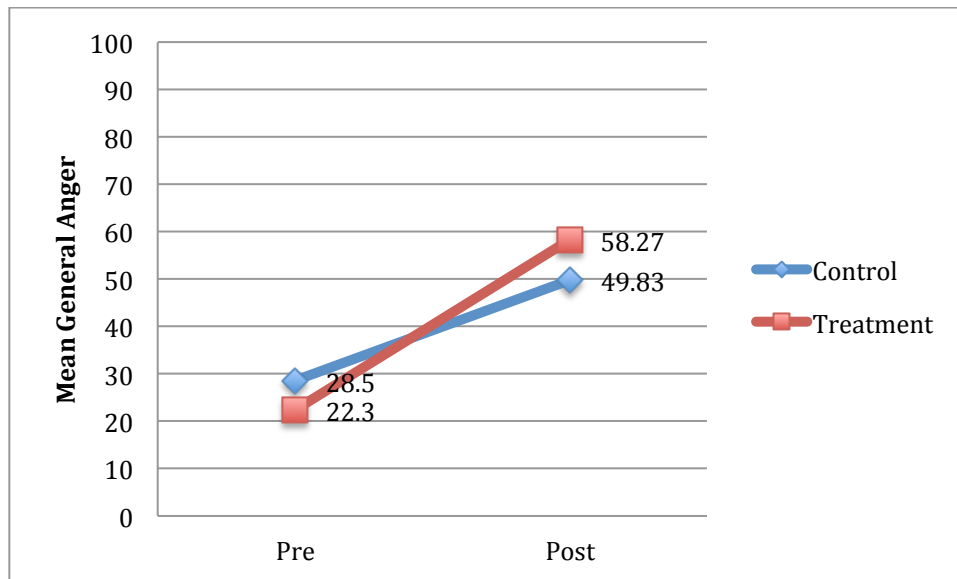
*N=28, control=7 and treatment=21

Figure 5 presents the mean individual level anger between the control and treatment groups. Pre treatment, the two groups start at the same level of general anger (22.3 and 28.5). Post treatment, I find that general anger increased in both groups.

Overall for general anger, there was an increased level of anger for the treatment and control groups. The Wilcox tests below indicate whether the differences pre and post treatment in general anger are statistically significant.

[Insert Table 4]

For general anger, the Wilcox test for pre performance task indicates no difference between the treatment and control groups. Differences emerge post performance task, where the treatment group reports higher levels of anger than the control group (Z=-2.70, p=.00). These differences in the control and treatment groups indicate that I successfully induced general anger. This is expected and where most anger elicitation methods stop. However, my proposed method continues further to account for the exact target of the anger, which I expect to be the out-group.

Figure 6: Anger towards the In-Group
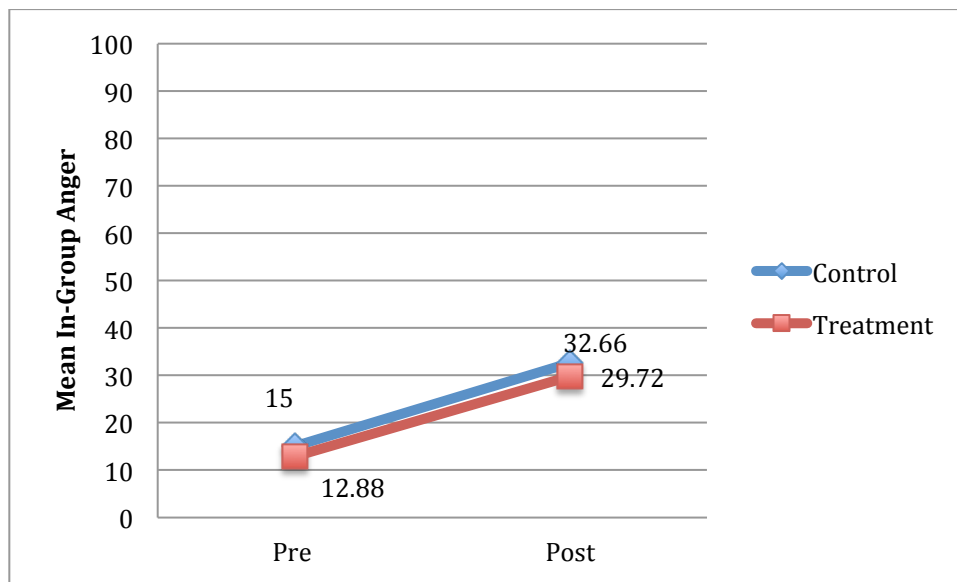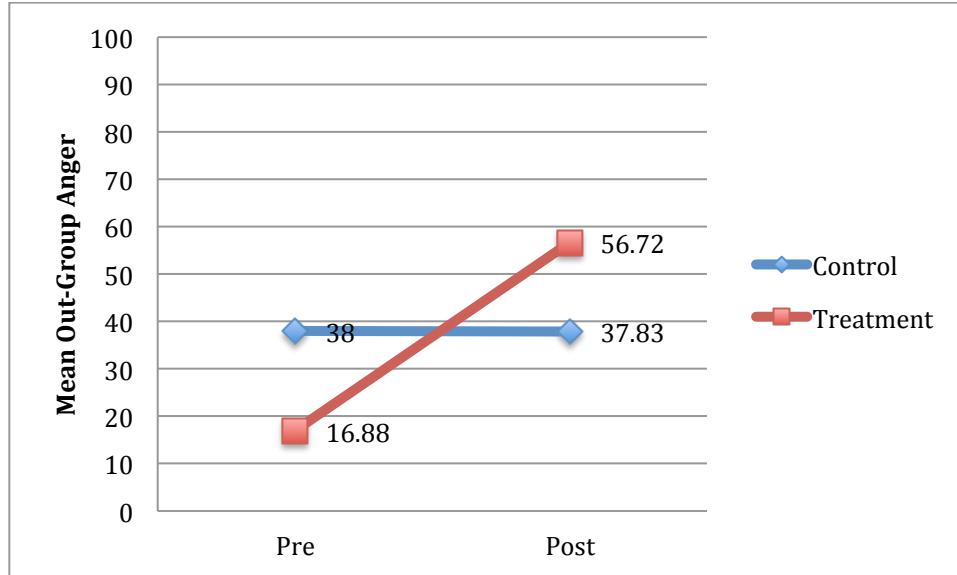

N=28, control=7 and treatment=21

In the experiment, in-group anger increased for the treatment group, and the control group also experienced a nearly identical increase in anger level. Pre treatment,

in-group anger levels were low and similar, at 12.88 for the treatment group and 15 for the control group. Post treatment, there is an increase for both groups in in-group anger. Overall, I find that in-group anger increased and that the control group had a higher level of reported in-group anger. The Wilcox tests below also indicates that the control group post treatment had higher levels of anger towards the in-group. Since the target of the anger is the out-group, this proportional increase in in-group anger for both groups is expected.

[Insert Table 5]

Figure 7 indicates that there were no differences between the angry group and control group pre treatment for the measure in-group anger. However, post performance task, the control group had higher levels of anger towards their in-group than the angry group did towards theirs (z=-1.99, p=.04). This indicates that in the post performance task, the control group was angrier towards their in-group than the treatment group. These post performance task results indicate that the treatment failed to elevate anger levels of the treatment group above the control group and help make the case that the treatment is performing well.

Figure 8: Anger towards the Out-Group

N=28, control=7 and treatment=21

 I expected the treatment group to increase anger toward the out-group and for the control group to exhibit no change in anger toward the out-group. Pre treatment, the control has a mean of 38 for anger towards the out-group while the treatment group had a lower mean of out-group anger at 16.88. Post treatment, the treatment group has a significant increase in anger toward the out-group (mean of 56.72). The control group does not increase their level of anger toward the out-group and even drops slightly to 37.83.

[Insert Table 6]

The Wilcox tests for the pre and post measures of out-group anger confirm that the performance task is working in the expected way. The treatment group and control group means were the same pre performance task. However, the differences in means appear post performance task, as the treatment group became angrier at the out-group ($z=-3.34$, $p=.00$). These tests indicate that the experiment successfully elicited out-group anger in the treatment group.

Discussion and Conclusion

In the experiment, out-group anger was experimentally manipulated through the selection of tasks. The pilot study indicates that this treatment was able to induce out-group anger in the treatment group. The procedure is simple and effective in eliciting out-group through a real-effort task. I was able to measure the different levels of anger and account for the multi-dimensional nature of this emotion.

Unlike current anger treatments, I created anger that has a specific target that aligns with the theoretical expectations of why anger emerges and how it can lead to potential actions. Existing studies that explore anger have always considered it *general anger*, without regard for 1) a target or source of the anger and 2) group level effects (in-group vs out-group). According to Intergroup Emotional Theory, those two attributes provide key theoretical foundation to control for in-group and out-group anger. This is the first experiment to take those two attributes into account.

This treatment successfully elicited anger towards the out-group. Anger is no longer only salient to the individual. I designed the anger treatment to create anger directed at the out-group through carefully planned intergroup interactions that make

anger relevant at the group level. As a result, this research note provides scholars with a new way to experimentally induce anger towards the out-group, which accounts for the multi-dimensional nature of this emotion. Scholars interested in emotions more generally may also potentially be able to use this measurement to account for different targets and levels of emotions.

Table 1. Summary of Anger Treatment and Measures.
1. Elicitation with images, words, film, or music.   • Facial images of a middle-aged white woman from Ekman's archive of emotional expression (Ekman 1993).   • Priming with words such as "rage", "angry", "mad", "quick-tempered", and "irritation" (Boussuyt, Moors, and De Houwer, 2014).   • Watch a film clip or listen to music clip (Westernmann et al 1996; Vastfjll 2002).
2. Recall Task   • "When you think about politics [these events], as a Republican/Democrat/Independent, how does it make you feel? Please take a few minutes to type out your answer." (Van Zomeren et al. 2008; Gronendyk and Banks, 2013).   • "Has (presidential candidate) – because of the kind of person he is or because of something he has done – ever made you feel (angry/afraid/hopeful/proud)?" (Gronendyk and Banks, 2013; Marcus and MacKuen, 1993; Rudolph, Gangl, and Stevens, 2000; Valentino et. al 2011).   • Write about a time when you were angry, think about a time when you were angry (Strack et al. 1985; Keltner et al. 1993; Lerner and Keltner 2001; Harmon-Jones et. al 2009).   • "…we would like to know how you feel towards immigration? How does it make you feel?" (Brader and Valentino, 2007)
3. Self-Reported Measurement   • Positive and Negative Affective Schedule with item mood scales that comprise of negative and positive affect (Watson and Clark, 1994).   • Series of self-reported feelings, where anger is measured by feelings such as anger, hostile, and disgusted (Huddy et al. 2007; Lerner et. al 2003).
4. Combination of Photo and Recall Task   • Autobiographical Emotional Memory Task (AEMT) (Ekman, 1992; Lerner et al. 2003; Banks and Valentino, 2012)   • Photo of Hamas rocket team getting ready to fire rockets. "Subjects were then asked to respond (in writing) to the following: The rocket attacks from Gaza have evoked a lot of emotions in people. We are particularly interested in what makes you most ANGRY about the rocket attacks. Please describe in detail the one thing that makes you most ANGRY about the attacks. Write as detailed a description as possible. If you can, write your descriptions so that someone reading it might even get ANGRY from learning about the situation" (Zeitzoff 2014, p. 316).

Table 2: Experiment Timeline.

	Steps	Details
1.	Setup	Subjects sign consent forms, and are assigned subject identification numbers, and a computer station.
2.	Group Assignment	Subjects are randomly assigned into groups.
3.	Emotional Inventory	Subject fill out an emotional inventory.
4.	Practice Rounds and Earning Explanation	Subjects participate in two practice rounds, one each with the easy and hard performance task.
5.	Group Task Assignment	One group gets to choose which task they will complete for real earnings. As a result, one group is assigned the easy task and the other is assigned the hard task.
6.	Earnings Report	Subjects are given information about their individual earnings, their group earnings, and the other group's earnings.
7.	Emotional Inventory	Subjects fill out an emotional inventory.
8.	Conclusion	Subjects are dismissed one by one, paid in private, and debriefed.

Table 3: Differences between experiment protocol and Abeler protocol.

Experiment Protocol	Abeler Protocol
Two sizes of number tables.	One size of number table.
Table contains values 1-9.	Table contains 0 and 1.
Five seconds to answer.	Four seconds to answer.
Five minutes for 60 tables.	Four minutes for unlimited tables.

Table 4: Wilcox Test for Individual Anger

Individual Anger	N	Rank Sum	Expected
Pre			
Control	7	84.5	101.5
Angry	21	321.5	304.5
Z, p.	-.91, .35		
Post			
Control	7	51	101.5
Angry	21	355	304.5
Z, p.	-2.70, .00		

Table 5: Wilcox Test for In-Group Anger

Individual Anger	N	Rank Sum	Expected
Pre			
Control	7	91.5	101.5
Angry	21	314.5	304.5
Z, p.	-.56, .57		
Post			
Control	7	64.5	101.5
Angry	21	341.5	304.5
Z, p.	-1.99, .04		

Table 6: Wilcox Test for Out-Group Anger

Out-Group Anger	N	Rank Sum	Expected
Pre			
Control	7	81.5	101.5
Angry	21	324.5	304.5
Z, p.	-1.08, .27		
Post			
Control	7	39	101.5
Angry	21	367	304.5
Z, p.	-3.34, .00		

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