FLIGHT OR FIGHT? US VERSUS THEM: INTERGROUP DYNAMICS AND THE PROVISION OF PUBLIC GOODS

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Abstract

I use laboratory evidence to analyze the effect of threats and group identity salience on public goods provision. Based on Social Identity Theory (Tajfel & Turner, 1979) and Self-Categorization Theory (Tajfel & Turner, 1979), I hypothesize that (1) Intergroup threat increases provision levels; (2) Intergroup threat decreases free-riding; and (3) Higher group identity salience increases provision levels. Experimental results suggest that group identity has a significant impact on public goods provision in some contexts, but threat does not affect provision levels as strongly as expected. In particular, labeling based on Greek/Independent status dramatically increases free-riding. In general, economic theories provide better predictions regarding subject decision making than those associated with psychological theories of group identity formation.

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1. Introduction

In the wake of September 11th, 2001, the United States changed. The Bush administration expanded its power by waging two expensive wars on terror abroad, while simultaneously curbing its citizens' right to privacy at home. The electorate agreed, often grudgingly, to incur this particularly high cost in the name of national security. Preventing future attacks and limiting the global outreach of terrorist networks is a non-rival and non-excludable public good. The imminent presence of terrorism and the looming images of U.S. vulnerability justified the provision of this costly public good in the context of both experienced and future threat.

As a by-product of the war on terror, the U.S. government began detaining "unlawful enemy combatants"[2] and using highly controversial interrogation techniques. Some of the Guantanamo detainees organized collectively under the presence of a direct threat. The detainees frequently responded to the restricted autonomy, dehumanization, and interrogation techniques by going on hunger strikes.[3] Media attention and improvement in the detention conditions are non-rival and non-excludable public goods for the detainees – some incur the cost of provision, while everyone benefits. In this case, the threat to one's identity and assumed inherent rights results in the actual production of the goods.

Further, two groups can simultaneously and separately provide public goods in the context of intergroup threat. The war in Bosnia and Herzegovina (1992-1995) saw the systematic cleansing of Bosniaks. Ethnic group identities were central to this conflict. Specifically, the Serbs were collectively acting in the role of aggressor, while the Bosniaks responded as a group in defense. The former posed a clear threat to the well-being and survival of the latter. While unpalatable, ethnic cleansing *is* a public good – it bears a private cost for the soldiers and was to be "enjoyed" by all Serbs if ever produced. Simultaneously, Bosniak resistance to the genocide is a non-rival and non-excludable public good in itself. Which group was more successful at organizing? This is a difficult question which requires more scholarly attention.

In 2005, Hurricane Katrina hit New Orleans with a devastating force and left an inextricable mark on American society. It took many lives, caused billions of dollars worth of damage, and was followed by an inadequate response by the current administration. In the wake of this natural disaster and the events that followed, thousands of volunteers selflessly donated both money and their time to help the people of New Orleans restore the life of the region back to normal. While compassion and humanitarian values were at the forefront, both past and predicted threat was, arguably, part of the explanation for this overwhelming response. This included the looming dangers of "refugees," further economic losses, and an ecological disaster. Restricting the impact of these and other negative consequences is another example of a public good provided in the presence of threat – not all "consumers" were involved in its provision.

Finally, political races can be modeled within a public goods framework. Campaigning is costly to the individual as it expends effort and time. Furthermore, if the candidate is successful in securing the desired office, all supporters benefit and cannot be excluded from consuming this public good. Intergroup dynamics, such as tension, competition, and threat are important for the internal provision of the public good (a win in the election), affect individual contribution (campaigning) and, subsequently, provision levels (the outcome of the race). This simplified

[2] Woodward, B. "CIA Told to Do 'Whatever Necessary' to Kill Bin Laden." *Washington Post*. October 21, 2001.
[3] Fletcher, L. and Stover, E. "Guantanamo and Its Aftermath: U.S. Detention and Interrogation Practices and Their Impact on Former Detainees." Human Rights Center and International Human Rights Law Clinic. UC Berkeley, School of Law. November, 2008.

description of the election process is especially applicable to the race between H. Clinton and B. Obama during the Democratic Primaries in the last presidential election.

Rand et al. (2009) suggest that the behavioral differences between supporters of a stronger and a weaker candidate can be explained by the latter's perception of the former as a threat.[4] The authors use a standard Dictator game[5] and observe that members of the "threatened" group (the supporters of the weaker candidate) give less on average to the members of the "threatening" group (the supporters of the stronger candidate) than vice versa. Rand et al. (2009) raise the question of whether threat as related to group identity increases intergroup group prejudice and results in higher levels of discrimination towards outsiders.

As previously described, such political races can be modeled as public goods. The provision of public goods and the associated collective action problems have been extensively examined in the academic literature (see Olson, 1965; Isaac and Walker, 1988; Andreoni, 1990; Kahneman and Knetsch, 1992; Andreoni, 1995; Fehr and Gächter, 1999; Fehr and Gächter, 2000; Fischbacher et al., 2001; Andreoni, 2005). Individuals contribute to the welfare of their group, particularly when this increases their utility. Nevertheless, advancing group welfare is often costly. Groups, as explained by Olson (1965), underproduce welfare-increasing public goods because of free-riding. In this paper, I examine the effects of intergroup threat and group identity on public goods provision and free-riding. I empirically test a set of hypotheses of intra-group dynamics structured around a synthesis of economic, psychological, and behavioral explanations of individual contribution.

Davis (2000: 10) defines 'threat' as a situation in which one agent or group has the capability or intention to inflict a negative consequence on another agent or group. Threats are probabilistic in nature - they may or may not be carried out. I use different framing manipulations to introduce the perception of threat. Fleishman (1988: 164) defines the 'framing' of decisions in experiments as "selecting a particular reference point in terms of which decision options are described."

1.1 Economic theory, group behavior, and threat

Standard economic theory conceptualizes the individual as a rational, self-interested *homo œconomicus* who maximizes utility subject to a budget constraint. There is perfect information. Both individual preferences and constraints are known. Theory predicts that framing in experiments will not affect subjects' choices as long as individual preferences and constraints remain the same. For example, the framing of a task as a "take" versus a "give" decision (negative/positive framing) is irrelevant to how the utility maximizer behaves, according to economic theory. Specifically, under the "free-rider hypothesis," framing in a public goods experiment will not affect behavior. If the payoff structure remains the same, the individual will choose to defect and not contribute to the public good. Standard economic models, then, suggest that framing manipulations introducing threat or varying the level of identity salience would not influence individual behavior.

[4] Rand et al. (2009) specifically focus on the 2008 Democratic Primaries and the intergroup dynamics between supporters of B. Obama and H. Clinton.

[5] In a standard Dictator game, there are two players. One player chooses how to divide a fixed endowment between themselves and the other player who remains passive in the experiment. The results obtained across a variety of Dictator games provide evidence that individual behavior differs from standard game theoretic predictions.

1.2 Psychological explanations of group behavior and threat

Psychologists have examined individual behavior in a group setting by focusing on the strength of group biases (see Brewer, 1979; Tajfel and Turner, 1979; Vaughan et al., 1981). A group of individuals is characterized through a shared collective identity. This collective identity is a set of common values, beliefs, attitudes, norms, and roles that allows for distinguishing between the in-group and the out-group spaces (Rousseau 2006, 12).

Individual behavior aimed at improving group welfare can, then, be explained in the context of group identity formation. Tajfel and Turner (1979) provide two theoretical frameworks for understanding the process of identity construction – Social Identity Theory (SIT), and Self-Categorization Theory (SCT). These predict that individuals naturally sort themselves into categories, and the distinction between the "self" and the "other" elicits behavior more favorable towards members of one's own group than towards outsiders. The result is the emergence of out-group bias, which is expected to occur even when individuals are randomly assigned to groups.

Brewer (1979) identifies group bias as a collection of attitudes and behavior favoring members of one's group over members of another group, where the groups are non-overlapping. Group identity salience is the degree of group belonging exhibited by the individual. The strength of prejudicial attitudes (the out-group bias) varies across the societal context of group identity. In general, the stronger the group identity salience, the more negative bias will be exhibited.

Goette et al. (2006) provide further evidence in support of the hypothesis that mere group membership has a positive effect on cooperation. The authors randomly assign subjects to real social groups. They observe that after a period of three weeks, intra-group ties form, and the level of intra-group cooperation is significantly higher than that at the intergroup level.

Tan and Zizzo (2008) further test the predictions of the described psychological theories of human behavior by comparing the outcomes of two specific framing manipulations - the minimal group and the common fate paradigms. The latter manipulation requires that subjects share a pre-existing "common fate," while the former is satisfied through random assignment of subjects to groups. Both of these are important for the framing of the experiments in my study. Also, Tan and Zizzo (2008) explain increased levels of cooperation and conflict in different game theoretical settings with the game harmony measure, an indicator of how harmonious/disharmonious the interests of individual players are. The authors conclude that the degree of alignment of the interests of group members is a reliable measure of their propensity to cooperate.

The psychological explanations of group identity formation are relevant to the provision of public goods as they suggest that individuals are likely to identify with the other members of their group and exhibit out-group bias towards outsiders. The level of identification and the bias strength of those are conditional on the degree of group identity salience.

1.3 Behavioral explanations of individual attitudes and public goods provision

The experimental literature on anonymous interactions in different games has provided ample evidence that individual behavior, on average, deviates from the payoff-maximizing outcomes predicted by standard economic theory (see Forsythe et al., 1994; Cooper et al., 1996; Eckel and Grossman, 1996; Hoffman et. al., 1996). Kahneman and Tversky (1990; 1991) argue that the standard axioms of Expected Utility Theory (EUT) systematically fail to accurately

predict human behavior. The authors document a behavioral asymmetry between gains and losses – the utility of a gain is not enough to compensate for the disutility of a loss of equal magnitude. Framing, then, affects subject behavior even when the payoff structure does not change.

Fairness and other-regarding behavior influence subjects in the laboratory. Such motivations exist both at the group and at the individual level. The perception of threat in the context of power, resource, or ability asymmetries is another possible motivating factor which has received considerably less attention in the academic literature relative to fairness, for example. Threat is a psychological factor that may manifest itself even in the absence of any strategic considerations in the laboratory environment.

The experimental literature on public goods discusses groups predominantly in isolation, and does not address extensively how intergroup interaction affects provision levels. Niou and Tan (2005) establish that public goods are often provided in the context of intergroup competition or threat. They provide a list of examples in which both are relevant to the provision of public goods. These include military and defense spending decisions by alliances at the supranational level, lobbying efforts by groups of firms, party discipline, voter turnout, negative campaigning in primary elections, group rivalry and competition in civil conflicts, and joint ventures for Research & Development in industrial organization (Niou and Tan, 2005). The example developed by Rand et al. (2009) further identifies threat as a factor relevant to group behavior and can be added to the list provided by Niou and Tan (2005).

1.4 Public goods provision, group identity salience, and threat

In this paper, I conduct an empirical study of the effect of threat and group identity on provision levels and free riding. In order to analyze individual decision making, I utilize the Voluntary Contribution Mechanism (VCM). In the VCM game, subjects allocate their endowment between a group and a private account. Total contributions to the group account are multiplied by an efficiency factor of 1.6 and split evenly among the subjects in a given group. Standard theory predicts that individuals will free ride and seek to profit from the contributions of all other group members. If every group member contributes their entire endowment to the group account, they will all be better off. However, free-riding, a Pareto-inferior outcome, is the dominant strategy in VCM games.

In addition, I use framing and group assignments to vary the degree of group identity salience. Tan and Zizzo (2008) provide a discussion of the effectiveness of framing choices with respect to group identity. They identify several framing options in which cooperation occurs as a result of mere belonging to a group in the absence of strategic considerations. Those include changing the payoff structure of the game, focusing on utility rather than monetary payoffs, assigning higher value to group welfare, and directly eliciting the perception that a given game requires cooperation, rather than conflict. In this study, I test whether group belonging affects subject behavior in the laboratory.

Furthermore, Tan and Zizzo (2008) discuss the importance and real-world implications of self-selection and naturally occurring groups. This is reflected in the framing of my study in the Greek/Independent treatments. Additionally, Riedl and Ule's (2004) work on social network formation reveals that self-selected groups of subjects who choose "cooperation" as their strategy, exhibit a very high propensity (0.93) for further in-group cooperation. Those subjects allowed to select their "social links" within the social network frame developed by the authors

were more prone to cooperate. Thus, Riedl and Ule (2004) provide some evidence that allowing individuals to operate in pre-existing social networks, or groups, in the laboratory can result in more and better cooperation.

In order to achieve a close approximation of actual decision making and ensure that the results of the experiment are externally valid, I use real monetary incentives. I utilize four treatments in a 2x2 between-subjects design. This approach is not as statistically powerful compared to within-subject designs because it does not control for individual differences. However, it allows for statistical independence of the individual observations. I use a negatively-framed Dictator game to introduce threat. Also, I vary the level of group identity salience through group construction.

I use a Dictator exercise similar in purpose to the first stage of the power-to-take game devised by Bosman and van Winden (2002). One of the players is allowed to take away all or part of the survey completion fee of another participant. The objective of using this game is to elicit a psychological condition, or emotion, here – threat. This differs from the standard use of negatively-framed Dictator games as a tool for documenting the importance of negative/positive framing manipulations (Fleishman, 1988; Andreoni, 1995). Scholars typically distinguish between a Dictator who chooses how much to *give* to an anonymous subject and a Dictator who chooses how much to *take away* from an anonymous subject. This "give/take" framing manipulation elicits different behavioral responses in the laboratory (Krupka and Weber, 2008).

The paper is organized in the following manner: the second section introduces the model. The third section discusses the different hypotheses tested. The fourth section describes the methods for varying group identity salience and the introduction of threat. The fifth section summarizes the experimental design, and the sixth section presents the results of the study. Finally, the last section provides some concluding remarks, and suggestions for future research.

2. Model

The treatments do not differ in the payoff structure of the VCM game, but rather in the presence of a probabilistic threat realized at the end of the actual public goods exercise. The payoff function for the VCM game is the same across treatments, and is presented in equation 1.

$$\pi_i = \frac{(x_i + X_i)1.6}{n} + (10 - x_i) \quad (1)$$

Here, π_i is individual payoff from the public goods game of the i^{th} participant in the experiment. Each participant has an initial endowment of \$10 and chooses to contribute x_i to a group account, where $0 \leq x_i \leq 10$. The sum X_i indicates the total amount contributed to the group account by all other group members, and $0 \leq X_i \leq 30$. The \$10 endowment in the VCM game is separate from the survey completion fee of the participants. The payoff equation incorporates the public good through the following: $\frac{(x_i + X_i)1.6}{n}$. Individual payoffs only increase when other members contribute to the group account. The group account, then, represents a non-rival and a non-excludable public good. The participants seek to solve the utility maximization problem presented in equation 2.

$$\max_{0 \leq x_i \leq 10} U\left[\frac{(x_i + X_i)1.6}{n} + (10 - x_i)\right] \quad (2)$$

There are strong free riding incentives, which is Paretto-suboptimal. The introduction of threat does not change the payoff structure of the game. Thus, it does not influence subjects' dominant strategy.

3. Hypotheses

Based on the economic, psychological, and behavioral explanations of public goods provision, I formulate the following hypotheses.

3.1 Intergroup threat increases provision levels.

The framing of the experiment allows me to test whether threatened individuals cooperate better. I hypothesize that threat can serve as an incentive for overcoming the collective action problem associated with public goods provision. My *a priori* expectations are that individuals contribute more to the group account in the context of intergroup threat. This hypothesis will be confirmed by statistically significant differences in the average individual contributions between the Threat and No Threat treatments, with greater contributions exhibited, on average, in the former. The hypothesis will also be supported by a positive and statistically significant coefficient estimate on the threat variable.

3.2 Intergroup threat decreases free riding.

This is related to the previous hypothesis. My *a priori* expectations are that there are fewer absolute free riders in the context of threat. This hypothesis will be confirmed by statistically significant differences in the proportions of absolute free-riders between the Threat and No Threat treatments, with fewer instances of absolute free-riding in the Threat treatments.

3.3 Higher group identity salience increases provision levels.

The psychological work on groups and individual behavior suggests that subjects exhibit in-group favoritism and out-group bias when group identity is introduced (Brewer, 1979; Tajfel and Turner, 1979; Vaughan et al., 1981). My *a priori* expectations are that higher salience of group identity is associated with more cooperation and higher provision levels. This hypothesis will be supported by statistically significant differences between contributions in the Random Assignment and Greek/Independent treatments. In addition, this hypothesis will be supported by a positive and statistically significant coefficient estimate on the salience variable.

4. Variations in Group Identity Salience and Threat

I use group assignments to vary the degree of group identity salience. Two specific types of group assignments were made – Random Draw and Greek/Independent. For each of these, there is a 'threat' and 'no-threat' dimension, for a total of four separate treatments – Random No Threat /random baseline/, Random Threat, Greek/Independent No Threat /Greek/Independent baseline/, and Greek/Independent Threat.

The Random Assignment treatments are associated with lower group identity salience than the Greek/Independent treatments. In the Random Assignment treatments, subjects are either Type 1 or Type 2. They are placed in homogenous groups made up of only one type. Group

assignments based on subjects' identification as 'Greek' or 'Independent' are associated with a higher degree of group identity salience. When signing up to participate in the Greek/Independent treatments, subjects were asked whether they belonged to a fraternity or sorority on campus. Based on this, the subjects are split into homogenous groups of 4. In other words, groups are made up either of Greek or of Independents only.

In the No Threat treatments, subjects complete the following tasks: a short demographic survey and a single round of a VCM game. In the Threat treatments, there is an additional decision-making exercise - a negatively-framed Dictator game. In this context, threat is probabilistic. The amount Dictators keep is unknown and varies across participants. The framing of the treatments changes the balance of power in favor of the threatening group. This mimics real-life situations in which intergroup interaction is marked by power and resource assymetries.

5. Experimental Design

The experimental sessions were conducted using the z-Tree software.[6] Subjects were seated at individual computer terminals and could not observe the choices of any other participant in the experiment. At the beginning of each session, they were presented with a package containing a consent form, a receipt of payments, and a set of instructions for the particular treatment (the Appendix contains all instructions used in the experiment). They were instructed to fill out and read all of the documentation. Subjects signed and dated the consent forms. Those were collected by the experimenter at the beginning of each session. Then, the researcher summarized the instructions with an emphasis on group assignments, task structure, and total payoffs from participation.

Subjects were instructed to log into Z-Tree sequentially. Then, they completed a short demographic survey and provided information regarding their age, gender, graduation year, and whether they are a member of a fraternity or sorority on campus. All subjects were provisionally allocated a $10 fee for the completion of the survey and for preserving the integrity of the experiment.

Next, all subjects were split into groups of 4. Group assignments varied based on treatment type. All groups were homogenous. Subjects proceeded to complete a single round of the described VCM game. They were endowed with $10 and were informed that this amount is separate from their provisionally-allocated survey completion fee. Participants split their endowment between a private and a group account. They were informed that $1 dollar invested in the private account returned $1 at the end of the experimental session, while the same amount invested in the group account returned 40¢ to them and to every other member in their group. In the No Threat treatments, subjects were called in one by one and paid privately the total of their survey completion fee and the amount they earned in the VCM game. In the Threat treatments, the subjects proceeded to play a negatively-framed Dictator game.

This second decision-making exercise was administered only in the Threat treatments. All subjects were split into pairs and were informed that they would be paired with somebody from a different group and of the opposite type as theirs (Type 1 participants were paired only with Type 2 participants; Independent participants were paired only with Greek participants). The Type 1 and the Independent participants were Dictators, while the Type 2 and the Greek subjects were passive and did not make any decisions in this game. The Dictators chose how much of the

[6] Urs Fischbacher (2007): z-Tree: Zurich Toolbox for Ready-made Economic Experiments, *Experimental Economics* 10(2), 171-178.

survey completion fee of the participant they were paired with to take away. At the end of the exercise, subjects were called in one by one and were paid in private. The Type 1 and the Independent participants received the total of their survey completion fee, their payoff from the VCM game and the amount they chose to keep in the negatively-framed Dictator game. The Type 2 and the Greek participants received the total of their payoffs from the VCM game, and the amount they got back from their survey-completion fee in the negatively-framed Dictator game.

Using the data collection methods described above, I construct the following variables and use them in the empirical analysis:

PG Contribution: This variable contains information on individual contribution to the group account. It ranges from 0 to 10, with a mean of 4.23 and a standard deviation of 3.48.
PG Profit: This variable documents individual profit from the group account. It is equal to the sum of all contributions for a given group times an efficiency factor of 1.6 split equally among the four subjects in the group. It ranges from 4 to 20, with a mean of 12.54 and standard deviation of 3.18.
Threat: The threat variable is binary assuming the value of 1 if there is "threat" in the specific treatment, and 0 otherwise.
Random Threat: This is a binary variable assuming the value of 1 if the specific treatment is Random Assignment with Threat, and 0 otherwise. Observations in the No Threat treatments were coded as missing values.
Greek Threat: This is a binary variable assuming the value of 1 if the specific treatment is Greek/Independent with Threat, and 0 otherwise. Observations in the No Threat treatments were coded as missing values.
Salience: This is a binary variable used to identify the two levels of group identity salience in this study. The base value of the variable is 0 and corresponds to the lower level of identity salience achieved through random group assignments. The higher level of identity salience corresponds to a value of 1 and is achieved through group assignments based on Greek/Independent status.
Dictator Status: This is a binary variable assuming the value of 1 if the individual is a Dictator and 0 otherwise. There are 64 observations for this variable because of the setup of the experimental treatments.
Dictator Amount: This variable contains information on how much each Dictator chose to keep. There are 32 observations for this variable. It ranges from 0 to 10, with a mean of 4.09 and a standard deviation of 3.31.

Greek: The binary variable Greek assumes the value of 1 if a participant is identified as "Greek" and 0 if "Independent."
Gender: The Gender variable is dichotomous where 0 is female, and 1 – male.

6. Results

6.1 Subjects

The laboratory experiments were conducted in eight sessions with 16 subjects per session for a total of 128 statistically independent observations. All participants were recruited randomly from the student body at Gettysburg College via email. In the Greek/Independent treatments,

formally recognized fraternities and sororities on campus were specifically targeted via their email aliases. Table 1 provides descriptive statistics broken down by treatment. The percentage of males and females, and Greeks and Independents are presented for each type of treatment.

Table 1: Summary Statistics

Treatment*	Age	Gender**	Greek/Independent***	Avg. Contribution
RNT	19.84	M: 63% F: 37%	G: 34% I: 66%	**4.94**
RT	20.22	M: 44% F: 56%	G: 34% I: 66%	**3.97**
GNT	20.28	M: 47% F: 53%	G: 50% I: 50%	**3.75**
GT	20.03	M: 53% F: 47%	G: 50% I: 50%	**4.25**
Total	20.09	M: 52% F: 48%	G: 42% I: 58%	**4.23**

*RNT: Random No Threat; RT: Random with Threat; GNT: Greek/Independent No Threat; GT: Greek/Independent with Threat; **M: Male; F: Female; *** G: Greek; I: Independent

6.2 VCM game

Table 1 also lists the mean contributions for every type of treatment. While contribution varies from 0 to 10, it is evident that the mean values across treatments are not the same, however, the magnitude of the differences is small. The mean contribution in the Greek No Threat treatments stands out as the lowest. Further, Figure 1 presents the distribution of individual contribution by treatments. It is not apparent that these distributions are significantly different. It should be noted, however, that the "free-rider" hypothesis is not fully supported by the observed frequency distributions. In none of the treatments do all participants free-ride. Also, in all of the treatments, several subjects contribute at the Paretto-optimal level. This is some preliminary evidence to suggest that the direction of the predictions of standard economic theory is correct, however, the predicted magnitude does not match individual behavior in the laboratory. The comparatively high number of absolute free-riders in the Greek No Threat treatments merits attention.

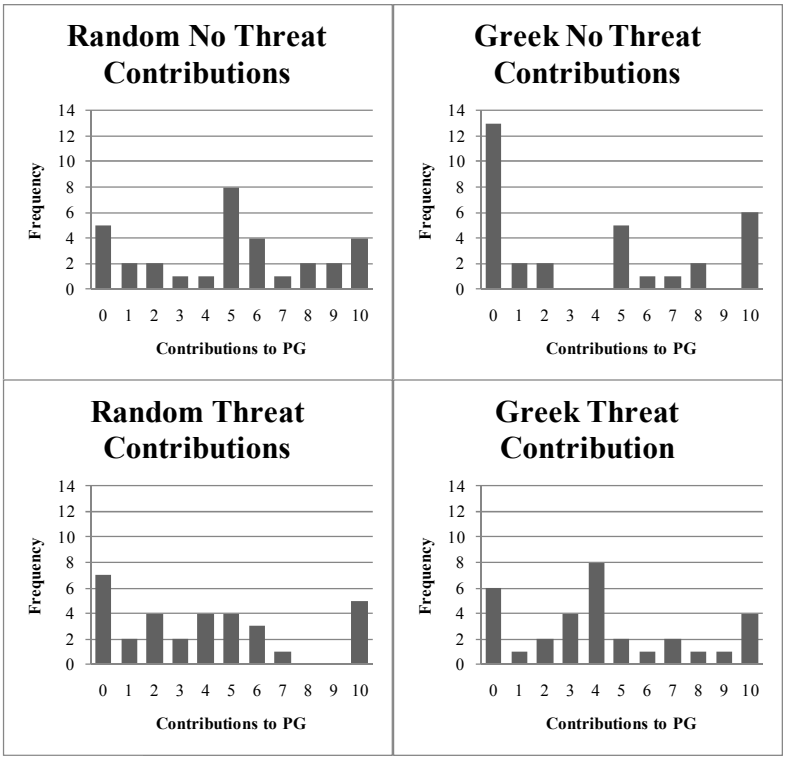


Figure 1.

Some of the reported results are only marginally significant. The small sample size and the homogenous student body significantly limit variation in the data. Increasing the sample size and ensuring a more diverse student population to recruit from may increase the statistical

significance of the results. However, this is ultimately an empirical question. Therefore, the results should be interpreted with caution and consideration of the described limitations.

Table 2: Mann-Whitney Tests of Uniform Distribution

Treatment	Mann-Whitney Test	
	Statistic	p-value
Random No Threat = Random Threat /pooled/	1.261	0.2074
Random No Threat = Random Threat /Type 1; "threatening"/	1.573	0.1157
Random No Threat = Random Threat /Type 2; "threatened"/	0.485	0.6275
Random Threat: Type 1 /"threatening"/ = Type 2 /"threatened"/	0.571	0.5678
Random No Threat = Greek/Independent No Threat /pooled/	-1.395	0.1632
Random No Threat = Greek/Independent No Threat /Greek/	-1.008	0.3135
Random No Threat = Greek/Independent No Threat /Independent/	-1.257	0.2086
Greek/Independent No Threat: Greek = Independent	-0.451	0.6518
Random Threat = Greek/Independent Threat /pooled/	0.305	0.7602
Type 1 = Independent /"threatening"/	0.516	0.6061
Type 2 = Greek /"threatened"/	-0.133	0.894
Greek/Independent No Threat = Greek/Independent Threat /pooled/	-0.717	0.4733
Greek/Independent No Threat = Greek/Independent Threat /Independent/	-0.803	0.4222
Greek/Independent No Threat = Greek/Independent Threat /Greek/	-0.371	0.7108
Greek/Independent Threat: Independent /"threatening"/= Greek /"threatened"/	-0.286	0.7746

6.2.1 H1: Intergroup threat increases provision levels.

Comparing the average contributions in the Threat and No Threat treatments suggests that provision levels were not significantly affected by the presence of intergroup threat. I compared individual contributions across the treatments using Mann-Whitney *U*-tests of statistical independence and present the results of those in Table 2. This specific non-parametric test is particularly attractive as it does not make any assumptions regarding the distribution of the data and is appropriate for small sample sizes.

I can reject the hypothesis that the pooled contributions in the Random No Threat treatments and the contributions of the Type 1 /"threatening"/ in the Random Threat treatments are drawn from the same distribution with 12% confidence. Specifically, I obtain some evidence that the threatening subjects contributed more, on average, to the group account than the subjects in the baseline treatment. Possibly, the threatened subjects experienced "an income effect" as they became aware that, regardless of their profit in the VCM game, they will be able to keep an additional amount of as much as $10 in the negatively-framed Dictator game. It appears that the Dictators in the Random Threat treatments became less risk-averse as they perceived their endowment in the second decision-making exercise as insurance against losses in the public goods game. This is an interesting result that should be investigated further. Similar tendencies were not observed when I compared Independent /"threatening"/ contributions and those in the baseline Greek/Independent treatments. Further, none of the other cross-comparisons were statistically significant using Mann-Whitney *U*-tests.

Decades of experimental research suggest that demographic characteristics such as gender affect individual behavior in the laboratory. In addition, Greek status is incorporated in the treatment structure. Therefore, I sought to further investigate the effects of threat on contribution levels while simultaneously controlling for gender and Greek status. I present all of the regression results in Table 3. The dependent variable of interest is *PG Contribution*. I use OLS regressions to obtain some preliminary results and then perform a number of ordered logistic estimations because of the count nature of the dependent variable. Table 3 presents the results of several different model estimations. The *Gender* and *Greek* variables were used as controls in

each model. Due to the small sample size and the lack of variation in my data, I have been able to detect results with smaller statistical confidence than the typically accepted by academic scholars in the field.

First, I study the relationship between *PG Contribution* and *Threat,* controlling for *Gender* and *Greek*. The coefficient estimate on *Greek* is negative and statistically significant at the 17% significance level. This suggests that being Greek reduces contributions to the group account and is further confirmed by the ordered logit estimation. The coefficient estimate on *Greek* is negative and statistically significant at the 16% significance level – when threat is introduced, the expected ordered log odds decreases by .448 when moving to higher levels of contribution. In other words, Greeks have a lower propensity to contribute at higher levels to the public good in this sample, holding everything else constant.

Table 3: Regression results - PG Contributions

	Model									
Variables	OLS	OLS	OLS	OLS	OLS	OLogit	OLogit	OLogit	OLogit	OLogit
Threat	-.250					-.161				
	(.618)					(.314)				
Random Threat		.509					-.688			
		(.942)					(.451)			
Greek Threat			.502					.346		
			(.927)					(.454)		
Dictator Status				-.888					-.503	
				(.951)					(.527)	
Salience					-.333					-.242
					(.625)					(.318)
Gender	-.245	-.587	-.028	.155	-.247	-.209	-.372	-.118	-.063	-.216
	(.624)	(.856)	(.929)	-.903	(.623)	(.313)	(.448)	(.447)	(.467)	(.313)
Greek	-.872	-1.595*	-.61	-1.571	-.818	-.448	-.963**	.058	-.879	-.390
	(.630)	(.883)	(.927)	-1.038	(.638)	(.318)	(.488)	(.444)	(.568)	(.324)
Obs.	128	64	64	32	128	128	64	64	32	128
R^2	0.019	0.09	0.005	0.0411	0.0199					

Next, I estimate the effect of *Random Threat* on *PG Contribution*. In the ordered logit estimation, the coefficient estimate on *Random Threat* is statistically significant at the 13% significance level and is negative – threat in the Random Assignment treatments decreases that expected ordered log odds of contributing at higher levels by .688. In other words, threat is negatively associated with the participants' tendency to contribute to the public good in the Random Assignment treatments. I further confirm the negative relationship between being Greek and provision levels. The coefficient estimate on *Greek* is negative and statistically significant at the 10% significance level in the OLS regression. In the ordered logit, it is negative and statistically significant at the 5% significance level - being Greek reduces the ordered logged odds of contribution by .963 as you move to higher levels of contribution, holding all other variables in the model constant.

When I estimate the effect of *Greek Threat* on *PG Contribution* controlling for *Gender* and *Greek*, none of the coefficient estimates are statistically significant in difference from zero using both OLS and ordered Logit.

Finally, I investigate the effect of *Dictator Status* on *PG Contribution*. Again, I confirm the negative effect of being Greek on provision levels. In the OLS regression, the coefficient

estimate on *Greek* is negative and statistically significant at the 14% significance level. In the ordered Logit regression, the coefficient estimate is also negative and statistically significant at the 13% significance level. Being Greek decreases the expected ordered log odds by .879 when moving to higher levels of contribution. In other words, this further establishes that Greeks tend to contribute less to the group account.

The comparisons and statistical analyses of the differences in mean contributions between the Threat and No Threat treatments do not suggest that threat affects provision levels in a significant way. This is some evidence that the economic explanations of individual behavior in public goods environments are more acurate than the theories advanced by psychologists. However, considering only changes in the average contribution levels does not provide a complete explanation of individual behavior.

6.2.2 H2: Intergroup threat reduces free-riding.

Figure 2.

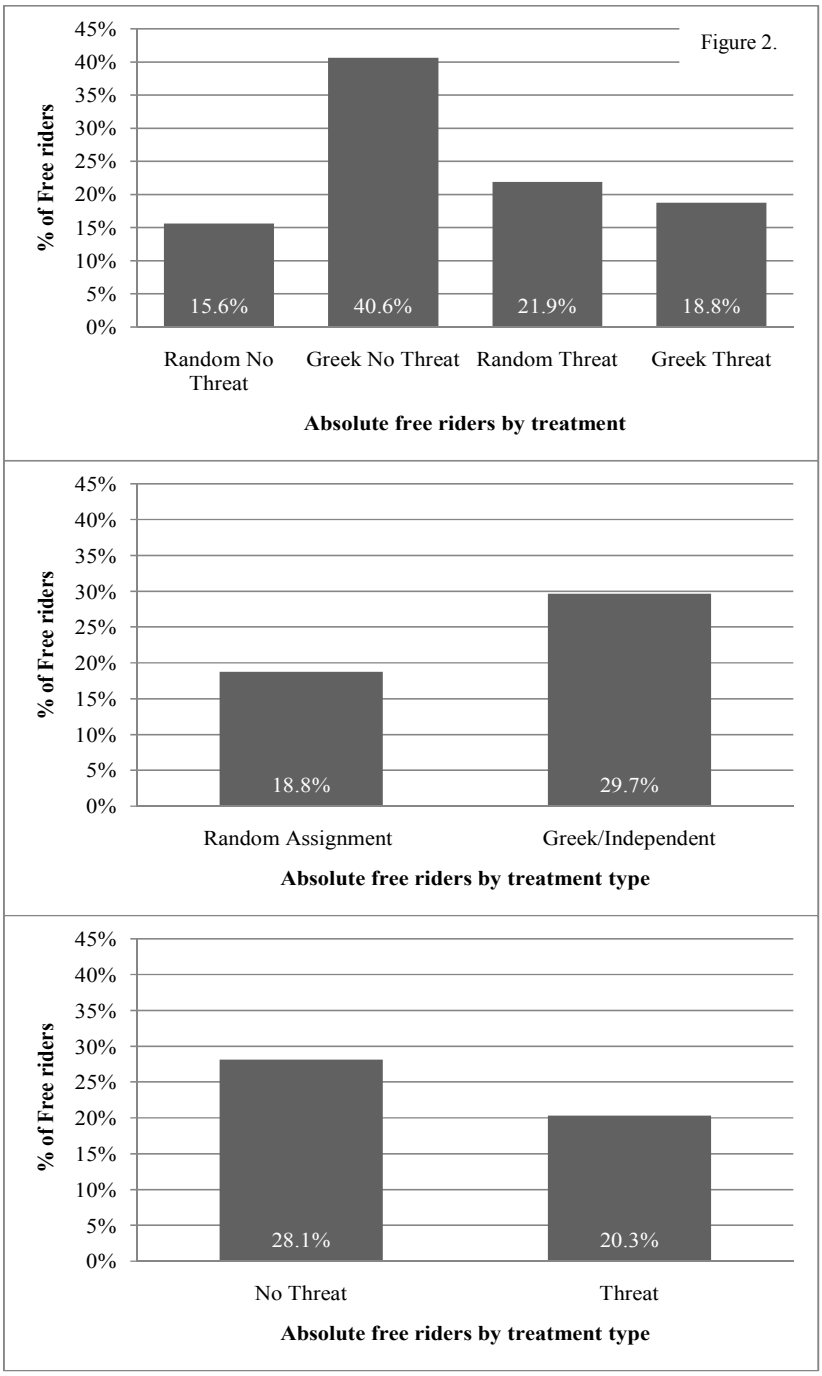


Figure 2 presents the percentages of absolute free-riders across the different treatments. The percentage of absolute free riders is highest in the Greek No Threat treatments and is almost twice as high as the percentage of free riders in any of the other treatments. The low mean contribution in the Greek No Threat treatment can be attributed to the high percentage of absolute free riders. The percentage of absolute free riders is higher in the No Threat than in the Threat treatments. However, the higher percentage of absolute free riders in the Greek/Independent treatments than in the Random Assignment treatments may be responsible for the observed difference between the Threat and No Threat treatments.

A statistical test of proportions provides evidence that the proportion of absolute free riders is significantly higher in the No Threat treatments. This suggests that in the Greek/Independent treatments, the introduction of threat was successful at reducing free-riding more than two-fold. The same is not observed in the Random Assignment treatments. Threat, then, may affect a group's ability to solve a collective action problem within certain environments related to group identiy.

6.2.3 H3: Higher group identity salience increases provision levels.

The breakdown of absolute free riders by treatment shown above draws attention to the Greek No Threat treatment. The proportion of absolute free riders in that treatment is almost twice as high as that in any of the other three treatments. Using a Mann-Whitney test, I reject the hypothesis that contributions in the Random No Threat treatments and the Greek/Independent No Threat treatments are drawn from the same distribution with 16% statistical confidence. Also, I cross-compare Greek and Independent contributions in the Threat and No Threat treatments using Mann-Whitney *U*-Tests. I do not obtain evidence that these are drawn from a different statistical distribution, so I pooled the contributions in the Random Assignment and Greek/Independent treatments and compared them.

It is clear that the proportion of absolute free riders is much higher in the Greek/Independent treatments. Using statistical tests of proportions, I obtain enough evidence to support the claim that the proportion of absolute free riders is significantly higher in the Greek/Independent treatments. The hypothesis that the proportion of absolute free-riders is higher in the Random Threat treatments than in the Greek/Independent treatments can be rejected at the 5% significance level, while the hypothesis of equality of the two can be rejected at the 10% significance level.

In order to control for *Gender* and *Greek* while studying the effects of *Salience* on *PG Contribution,* I estimate an OLS and an ordered logit regression. In both estimations, the coefficient estimate on *Salience* was negative contrary to my *a priori* expectations, however, in agreement with the observations above. Nevertheless, it was not statistically significant.

The evidence on the effects of group identity salience on provision levels suggests that labeling matters and within some contexts can worsen the collective action problem by dramatically increasing free riding. The results discussed in this and the previous section draw attention to the importance of Greek status in the framing of this experimental study. The labeling of subjects as Greek or Independent is polarizing and significantly associated with lower contributions to the group account. Also, labeling individuals as Independent significantly increases the instances of absolute free-riding, as well. Both of these suggest that group identity affects provision levels, however, the direction and magnitude of this effect is conditional on the type of label.

6.2 Dictator results

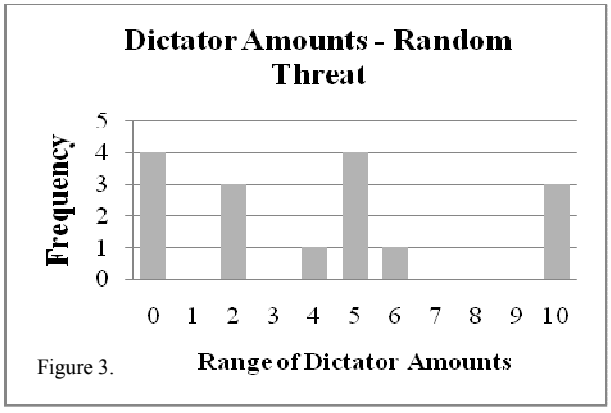
The framing of this experiment seeks to document the effect of threat on provision levels using a negatively-framed Dictator game. Consistent with the experimental literature, women (3.53) on average kept less for themselves than men (4.59). Given the theories advanced by psychologists and the dynamics of Greek/Independent relations on the Gettysburg College campus, I expected that Independent Dictators would, on average, keep more than Type 1

Dictators. However, this was not supported by my data, probably due to the limited number of observations. A comparison of the distributions of Dictator amounts in Figure 3 does not suggest that they are statistically different. This is confirmed by a Mann-Whitney U-test which failed to reject the hypothesis that the pooled Dictator amounts in the Random Assignment treatments and the Greek/Independent treatments are the same with a p-value of .97.

Table 4: Regression results - Dictator Amount

Variables	OLS	OLS	OLogit	OLogit
Profit PG	.108		.099	
	(.200)		(.119)	
Salience		.687		.404
		(1.359)		(.729)
Gender	-1.58	-1.635	-.923	-.973
	(1.265)	(1.275)	(.695)	(.714)
Greek	1.605	2.272	.939	1.341
	(1.661)	(1.855)	(.973)	(1.115)
Obs.	32	32	32	32
R^2	0.077	0.076		

In order to investigate the effects of *PG Profit* and *Salience* on Dictator taking while simultaneously controlling for *Gender* and *Greek*, I estimate several OLS and ordered logistic regressions. The results are presented in Table 4. None of the estimations detected a statistically significant relationship between the explanatory variables of interest and the dependent variable. This is potentially the result of the limited number of observations. The coefficient estimates on *Gender* were negative, contrary to evidence from the experimental literature on gender and Dictator games, however they were not statistically significant in difference from zero.



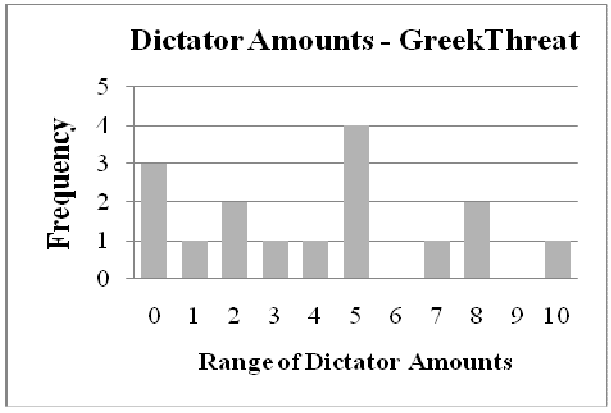


Figure 3.

7. Conclusion

The proportions of absolute free-riders across the different treatments provide evidence that group identity affects contribution levels in some environments. The statistical tests I perform suggest that labeling individuals as Greek and Independent has a statistically significant impact on contribution levels and dramatically increases the instances of absolute free riding. Individuals contributed more, on average, to the group account when randomly assigned to groups than when grouped based on Greek/Independent status. I did not obtain empirical support for the claim that intergroup threat affects contribution levels. However, I found that threat can dramatically reduce free-riding within certain environments. This is an interesting result that

merits further attention. Theory and actual examples of public goods provision under threat suggest that threat is a factor affecting collective action and may even spur provision. The marginally significant results could be due to subjects' failing to perceive threat in the laboratory setting or their experiencing of other negative emotions such as anger or annoyance towards the experimenter.

There are several possible concerns regarding the validity of the results. The small sample size and the homogenous student body at Gettysburg College limit the variation in the data. Accounting for both of these may potentially increase the statistical significance of my results. However, this is ultimately an empirical question. Additionally, the identity salience results suggest the need for introducing a baseline setup with no group identity implied. With the given experimental design, I used the Random Assignment treatments as baseline and the results suggest that this approach may need revision. Finally, from a methodological standpoint, it is difficult to credibly threaten subjects within the laboratory environment. As the experimenter, I could only manipulate the framing with respect to subjects' monetary payoffs from participation. It is possible that the marginal statistical significance of the results is due to the very low salience of the threat factor.

Given the limitations described above, the results I obtain are still interesting and merit further attention. The concept of group identity salience is important for public goods provision, as I provide evidence that labeling can have potentially negative effects. Here, referring to individuals as Greek and Independent dramatically increases free-riding. The subjects labeled as Greek do not respond to the elicitation of this overarching identity by cooperating more, but rather experience a significant polarization. This can be attributed to the internal fractionalization of the Greek community. Similar results were observed for the Independent participants. This particular group is non-associational within the particular identity context assumed in the experimental treatments. In other words, utilizing a general group identity where there exist prominent sub-identities does not solve the collective action problem, but further exacerbates it. This has important implications, for example, in the case of national identities. Grouping nationals of a country such as Bosnia and Herzegovina as "Bosnians" may not result in increased cooperation across ethnic lines. Rather, according to the results of this study, act as a polarizing factor and push individuals to further retreat in their ethnic sub-identities and identify themselves as "Serb," "Bosniak," and "Croat."

The preliminary evidence regarding the relationship between threat, group identity salience, and public goods provision raises several methodological issues and questions I would like to pursue in future research. First, a different methodological approach may be required to achieve salience for the concept of threat in the laboratory. Secondly, I would replicate the experiments and ensure that groups in the Greek/Independent treatments are homogenous in the sense that the Greeks in a given group belong to the same fraternity or sorority, and this is made very salient to them. Finally, the ideal setting for further replication would be a larger educational institution which ensures higher variation in subject behavior.

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Appendix A

Instructions – Random Assignment No Threat:

This is an experiment in decision making. The instructions introduce the design of the experiment, your decisions as a participant, and the results of those decisions. Since the experiment has begun, please remain quiet. Your payoffs from this experiment are conditional on both completing the assigned tasks and preserving the anonymity of each participant's decisions. All of your earnings will be calculated and paid to you at the end of the experiment in private. If you have any questions, please raise your hand and the experimenter will assist you.

I. Survey
The experiment will begin with a short survey. You will be provisionally allocated a $10 survey completion fee for finishing the survey.

II. Decision-making task
You will be randomly and anonymously placed in a group of 4 to complete a decision-making task. Each member of your group will begin this task with an endowment of $10. This endowment is separate from the survey completion fee. You and each member of your group will choose how to divide that endowment between a **private account** and a **group account**. The minimum to be invested in either account is $0, while the maximum is $10.

The private account returns an amount equal to what you invest in it.

The total amount in the group account will be multiplied by 1.6 and will be evenly divided between all members of your group. In other words, for every $1 invested in the group account, you receive 40¢, and so does every other member of your group.

Once all members of the group make their choice, you will be informed of the total amount invested in the group account and your total payoff. No member of your group or any other participant will receive information on the individual investment you made to the group account. In other words, your and all the other participants' decisions will remain anonymous.

Your payoffs from this decision-making exercise will be determined as follows:

$10 – (your contribution to group account) + 1.6*(total contributions to group account)/4

III. Summary
Once the experiment begins, a summary of these instructions will appear on your computer screen, and you may review them again. Your payoffs are conditional on completing the survey and the decision-making task, and preserving the integrity and anonymity of the experiment by remaining silent for its duration. You will be randomly and anonymously assigned to groups of 4, and you will complete a short survey and a decision-making task. For the completion of the survey you will provisionally receive $10.

In the decision-making task, you will allocate your endowment between a private account and a group account given the payoff conditions specified above. Your total payoffs from this experiment will equal the sum of your earnings from completing the short survey and the decision-making task. At the end of the experiment, the experimenter will call you to receive your payoffs in private.

Instructions – Random Assignment Threat (Type 1):

This is an experiment in decision making. The instructions introduce the design of the experiment, your decisions as a participant, and the results of those decisions. Since the experiment has begun, please remain quiet. Your payoffs from this experiment are conditional on both completing the assigned tasks and preserving the anonymity of each participant's decisions. All of your earnings will be calculated and paid to you at the end of the experiment in private. If you have any questions, please raise your hand and the experimenter will assist you.

I. Survey

The experiment will begin with a short survey. You will be provisionally allocated a $10 survey completion fee for finishing the survey.

II. Group assignment

You will be randomly and anonymously placed in a group of 4 to complete two decision-making tasks. You have been assigned as a Type 1 or Type 2 participant. Assignment was made by a radnom draw. All members of your group are the same type as you are.

You are Type 1.

III. Decision-making task 1

Each member of your group will begin this task with an endowment of $10. You and each member of your group will choose how to divide that endowment between a **private account** and a **group account**. The minimum to be invested in either account is $0, while the maximum is $10.

The private account returns an amount equal to what you invest in it.

The total amount in the group account will be multiplied by 1.6 and will be evenly divided between all members of your group. In other words, for every $1 invested in the group account, you receive 40¢, and so does every other member of your group.

Once all members of the group make their choice, you will be informed of the total amount invested in the group account and your total payoff. No member of your group or any other participant will receive information on the individual investment you made to the group account. In other words, your and all the other participants' decisions will remain anonymous.

Your payoffs from this decision-making exercise will be determined as follows:

$10 – (your contribution to group account) + 1.6*(total contributions to group account)/4

IV. Decision-making task 2

In the second decision-making exercise, you will be paired with a participant from another group and of the opposite type. You will not be paired with a member of your own group, or with a participant of the same type as yours.

If you are of Type 1, your endowment will be the survey completion fee of the Type 2 participant provisionally allocated at the beginning of the experiment. This is equal to $10. You must choose how much of it to keep. The rest will be returned to the Type 2 participant.

If you are of Type 2, you will not make any decisions during this task. You will be informed of the decision of the Type 1 participant and the amount your provisionally allocated $10 survey fee you are to keep.

V. Summary

Once the experiment begins, a summary of these instructions will appear on your computer screen, and you may review them again. Your payoffs are conditional on completing the survey and the decision-making task, and preserving the integrity and anonymity of the experiment by remaining silent for its duration. You will be randomly and anonymously assigned to groups of 4. You have been assigned as a Type 1 or Type 2 participant by a random draw. The members of your group all have the same type. You will complete a short survey and two decision-making tasks. For the completion of the survey you will provisionally receive $10.

In the first decision-making task, you will allocate your endowment between a private account and a group account given the payoff conditions specified above.you

In the second decision-making exercise, you will be paired with a participant from a different group and of different type. Your participation will depend on your type. If you are of Type 1, you may keep some of the provisionally allocated survey fee of the Type 1 participant you are paired with. If you are a Type 2 participant you will make no decisions during the second decision-making exercise.

A Type 1 participant will earn in total the sum of the survey fee, the payoffs from the first decision-making exercise, and the amount kept in the second decision-making exercise. A Type 2 participant will earn in total the payoffs from the first decision-making exercise, and the amount received back in the second decision-making exercise. At the end of the experiment, the experimenter will call you to receive your payoffs in private.

Instructions – Greek/Independent No Threat:

This is an experiment in decision making. The instructions introduce the design of the experiment, your decisions as a participant, and the results of those decisions. Since the experiment has begun, please remain quiet. Your payoffs from this experiment are conditional on both completing the assigned tasks and preserving the anonymity of each participant's decisions. All of your earnings will be calculated and paid to you at the end of the experiment in private. If you have any questions, please raise your hand and the experimenter will assist you.

I. Survey
The experiment will begin with a short survey. You will be provisionally allocated a $10 survey completion fee for finishing the survey.

II. Decision-making task
Then, you will be anonymously placed in a group of 4 to complete a decision-making task. Group assignment is based on whether you are 'Greek' or 'Independent.' If you are 'Greek,' you will be placed in a group with others who are 'Greek.' If you are 'Independent,' you will be placed in a group with others who are 'Independent.' In other words, group assignments are such that all members of a group are of one type – either 'Greek' or 'Independent.' Information regarding your group assignment will appear on your computer screen.

Each member of your group will begin this task with an endowment of $10. This endowment is separate from the survey completion fee. You and each member of your group will choose how to divide that endowment between a **private account** and a **group account**. The minimum to be invested in either account is $0, while the maximum is $10.

The private account returns an amount equal to what you invest in it.

The total amount in the group account will be multiplied by 1.6 and will be evenly divided between all members of your group. In other words, for every $1 invested in the group account, you receive 40¢, and so does every other member of your group.

Once all members of the group make their choice, you will be informed of the total amount invested in the group account and your total payoff. No member of your group or any other participant will receive information on the individual investment you made to the group account. In other words, your and all the other participants' decisions will remain anonymous.

Your payoffs from this decision-making exercise will be determined as follows:

$10 – (your contribution to group account) + 1.6*(total contributions to group account)/4

III. Summary
Once the experiment begins, a summary of these instructions will appear on your computer screen, and you may review them again. Your payoffs are conditional on completing the survey and the decision-making task, and preserving the integrity and anonymity of the experiment by remaining silent for its entire duration. You will be anonymously placed in groups of 4 made up of either 'Greek' or 'Independent' participants. Then, you will complete a short survey and a decision-making task. For the completion of the survey you will provisionally receive $10.

In the decision-making task, you will allocate your endowment between a private account and a group account given the payoff conditions specified above. Your total payoffs from this experiment will equal the sum of your earnings from completing the short survey and the decision-making task. At the end of the experiment, the experimenter will call you to receive your payoffs in private.

Instructions – Greek/Independent Threat:

This is an experiment in decision making. The instructions introduce the design of the experiment, your decisions as a participant, and the results of those decisions. Since the experiment has begun, please remain quiet. Your payoffs from this experiment are conditional on both completing the assigned tasks, and preserving the anonymity of each participant's decisions. All of your earnings will be calculated and paid to you at the end of the experiment in private. If you have any questions, please raise your hand and the experimenter will assist you.

I. Survey
The experiment will begin with a short survey. You will be provisionally allocated a $10 survey completion fee for finishing the survey.

II. Group assignment
Then, you will be anonymously placed in a group of 4 to complete two decision-making tasks. Group assignment is based on whether you are 'Greek' or 'Independent.' If you are 'Greek,' you will be placed in a group with others who are 'Greek.' If you are 'Independent,' you will be placed in a group with others who are 'Independent.' In other words, group assignments are such that all members of a group are of one type – either 'Greek' or 'Independent.' Information regarding your group assignment will appear on your computer screen.

III. Decision-making task 1
Each member of your group will begin the first task with an endowment of $10. This endowment is separate from the survey completion fee. You and each member of your group will choose how to divide that endowment between a **private account** and a **group account**. The minimum to be invested in either account is $0, while the maximum is $10.

The private account returns an amount equal to what you invest in it.

The total amount in the group account will be multiplied by 1.6 and will be evenly divided between all members of your group. In other words, for every $1 invested in the group account, you receive 40¢, and so does every other member of your group.

Once all members of the group make their choice, you will be informed of the total amount invested in the group account and your total payoff. No member of your group or any other participant will receive information on the individual investment you made to the group account. In other words, your and all the other participants' decisions will remain anonymous.

Your payoffs from this decision-making exercise will be determined as follows:

$10 – (your contribution to group account) + 1.6*(total contributions to group account)/4

IV. Decision-making task 2
In the second decision-making exercise, you will be paired with a participant from another group and of the opposite type. You will not be paired with a member of your own group, or with a

participant of the same type as yours. For example, if you are 'Greek,' you will be paired with a participant who is 'Independent' and from another group.

If you are 'Independent,' your endowment will be the provisionally allocated survey fee of the 'Greek' participant you are paired with. This endowment is equal to $10. You must choose how much of it to keep. The rest will be returned to the 'Greek' participant.

If you are 'Greek,' you will not make any decisions during this task. You will be informed of the decision of the 'Independent' participant and the amount of your provisionally allocated $10 survey fee you are to keep.

V. Summary

Once the experiment begins, a summary of these instructions will appear on your computer screen, and you may review them again. Your payoffs are conditional on completing the survey and the decision-making tasks, and preserving the integrity and anonymity of the experiment by remaining silent for its duration. You will be anonymously placed in groups of 4 made up of either 'Greek' or 'Independent' participants. Then, you will complete a short survey and two decision-making tasks. For the completion of the survey you will provisionally receive $10.

In the first decision-making task, you will allocate your endowment between a private account and a group account given the payoff conditions specified above.

In the second decision task, you will be paired with a participant from a different group and of different type. Your participation will depend on whether you identified yourself as 'Greek' or 'Independent' when you signed up to participate in the experiment. If you are 'Independent,' you will decide how much of the provisionally allocated survey fee of the 'Greek' participant you are paired with to keep for yourself. If you are a 'Greek' participant you will make no decisions during the second decision-making exercise. An 'Independent' participant will earn in total the sum of the survey fee, the payoffs from the first decision-making exercise, and the amount kept in the second decision-making exercise. A "Greek" participant will earn in total the payoffs from the first-decision making exercise and the amount received in the second decision-making exercise. At the end of the experiment, the experimenter will call you individually to receive your payoffs in private.