AN EMPIRICAL ANALYSIS OF THE DETERMINANTS OF TIPPING BEHAVIOR

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Abstract:

Using a combination of theoretical, empirical, and experimental analysis, I address both why and how much people tip in restaurants. I also examine a policy issue related to the June 2002 Supreme Court ruling in United States v. Fior d’Italia. I find that the theories of both reciprocity and let-down aversion help to explain why people tip in restaurants, and that tip size falls with table size. Sex differences in tipping exist, but only in the experimental data. Finally, my analysis lends credence to the Supreme Court’s ruling in United States v. Fior d’Italia.

Journal of Economic Literature Classification Codes: C90, Z13, D00

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1. **Introduction**

Restaurant tipping is a significant part of the U.S. economy. In 1999 and 2000, respectively, sales at full service restaurants were approximately $121 billion and $134 billion (U.S. Census Bureau, 2001). If one assumes a tipping norm of 15%, then America’s waiters and waitresses earned roughly $18 billion and $20 billion in tip income, respectively, in 1999 and 2000.

Restaurant tipping is also a puzzling phenomenon. Why do people voluntarily give money to their server after the service has been rendered? Standard neoclassical economic theory can offer no explanation, as it predicts that people will not tip.

In this paper, I use a combination of theoretical, empirical, and experimental analysis to explore several determinants of tipping behavior. First, I examine, at least partially, why people tip in restaurants (i.e. determinants of consumer tipping behavior related to the server). I consider two possible theories, taken from the social norms literature: reciprocity and let-down aversion.

I also examine various aspects of the tipping situation. What factors influence how much people tip in restaurants? I consider two. First, how does tip size vary with table size and, second, do males tip more than females?

Finally, this paper looks at a policy issue related to tipping. Specifically, I examine the June 17, 2002 decision by the United States Supreme Court in *U.S. v. Fior d’Italia*, which allows the Internal Revenue Service to use credit card tips to estimate a server’s total tips, and then bill the server’s restaurant for FICA taxes on the difference between the server’s estimated and reported tips.
This paper is organized as follows. Section 2 motivates each of these issues using a simple model of restaurant tipping, while Section 3 and Section 4, respectively, present results from a tipping experiment and a field study. Section 5 concludes the paper.

2. **Motivating the Issues**

2.1 **A Simple Model of Restaurant Tipping**

In this section, I present a simple model of restaurant tipping. The model’s purpose is to motivate the issues discussed in Section 1.

Consumer i’s utility from dining at a table size of n, at which all n persons pay their own check, is given by

$$U_i = \phi - \beta_i p(1 + T_i) + \gamma_i (T_i - \psi_i(s, t_{i^0})) \omega_i(n) + \gamma_i (\tau - \psi_i(s, t_{i^0}))$$

where:

- $\phi > 0$ is the consumer’s utility from food
- $\beta_i > 0$ is the consumer’s marginal utility of income
- $p > 0$ is the price of the meal (quantity is fixed at 1)
- $T_i > 0$ is the consumer’s percentage tip
- $\gamma_i > 0$ describes consumer i’s utility from tipping
  - $\gamma_i’ > 0$, $\gamma_i’’ < 0$
- $s > 0$ is the service quality that consumer i receives from his server
- $t_{i^0} > 0$ is consumer i’s belief regarding the tip norm in a restaurant
- $\psi_i > 0$ is consumer i’s service-adjusted tip norm function
  - $\partial \psi_i / \partial (s) > 0$ and $\partial \psi_i / \partial (t_{i^0}) > 0$
  - $\psi_i$ is separable in s and $t_{i^0}$
- $\omega_i(n)$ describes consumer i’s concern for status
  - $\omega_i’ > 0$
- $\tau = [(n-1)/n] \Delta + (1/n) T_i$ is the average tip size of the table
- $\Delta$ = average tip of table not including consumer i

Consumer i’s utility function consists of several components, each of which will be discussed in turn. First, while consumer i receives utility from the food that he eats, $\phi$, he receives disutility, equal to $-\beta_i p(1 + T_i)$, from the fact that he must both pay his bill and leave a tip.
Second, consumer i derives utility both from how he tips, and how the table tips. The former, denoted by \( \gamma(T_i - \psi_i(s,t_i^o))\omega_i(n) \), depends on two things: how far consumer i’s tip is from his service-adjusted tip norm, \( \psi_i(s,t_i^o) \), and consumer i’s desire for status, \( \omega_i(n) \), the latter which increases with table size.\(^1\) Consumer i’s service-adjusted tip norm works as follows. Upon entering a restaurant, consumer i has some belief regarding the tip norm. Depending on the type of service that consumer i receives at the restaurant, this belief gets adjusted, either upward or downward. For example, consumer i’s ex ante tip norm might be 20%, but upon receiving horrible service, consumer i might adjust this figure downward to 10%.

Consumer i’s utility is also related to how the table tips. This is expressed by \( \gamma(\tau - \psi_i(s,t_i^o)) \), and is very is similar to the utility that consumer i derives from how he himself tips. The only difference is that, here, consumer i compares the average tip size of the table to his service-adjusted tip norm.

Utility maximization for consumer i with respect to \( T_i \) yields the following first order condition:

\[
\Omega = \frac{\partial U_i}{\partial T_i} = -\beta_ip + \gamma'(T_i - \psi_i(s,t_i^o))\omega_i(n) + \gamma'(\tau - \psi_i(s,t_i^o))(1/n) = 0
\]

The second order condition is given by:

\[
\frac{\partial^2 U_i}{\partial T_i^2} = \gamma''(T_i - \psi_i(s,t_i^o))(\omega_i(n)) + \gamma''(\tau - \psi_i(s,t_i^o))(1/n)^2
\]

Imposing symmetry, so that \( T_i = \Delta \) in equilibrium, the second order condition reduces to:

\[
\Gamma = \frac{\partial^2 U_i}{\partial T_i^2} = \gamma''(T_i - \psi_i(s,t_i^o))(\omega_i(n) + 1/n^2)
\]

While it is necessary that \( \gamma_i'' \leq 0 \) for \( U \) to be concave, I assume that \( \gamma_i'' < 0 \), so that \( U \) is strictly concave. Thus, \( \Gamma < 0 \).

\(^1\) For evidence that status plays a nontrivial role in real-world interactions, see Ball et al. (2001).
Imposing symmetry in equilibrium \((T_i = \Delta)\), and using the Implicit Function Theorem, I obtain the following comparative statics of interest:

\[
\frac{\partial T_i}{\partial \beta_i} = \left(\frac{\partial \Omega}{\partial \beta_i}\right) / -\left(\frac{\partial \Omega}{\partial T_i}\right) = (-p) \Rightarrow \frac{\partial T_i}{\partial \beta_i} < 0
\]

\[
\frac{\partial T_i}{\partial s} = \left(\frac{\partial \Omega}{\partial s}\right) / -\left(\frac{\partial \Omega}{\partial T_i}\right) = \left\{\begin{array}{c}
\gamma_i'(T_i - \psi_i(s, t_i^o)) \left[\partial \psi_i / \partial s\right] \left[\omega_i(n) + 1/n\right] \\
\gamma_i''(\tau - \psi_i(s, t_i^o)) \left[\partial \psi_i / \partial s\right] \left[\omega_i(n) + 1/n\right]
\end{array}\right\} \Rightarrow \frac{\partial T_i}{\partial s} > 0
\]

\[
\frac{\partial T_i}{\partial t_i^o} = \left(\frac{\partial \Omega}{\partial t_i^o}\right) / -\left(\frac{\partial \Omega}{\partial T_i}\right) = \left\{\begin{array}{c}
\gamma_i'(T_i - \psi_i(s, t_i^o)) \left[\partial \psi_i / \partial t_i^o\right] \left[\omega_i(n) + 1/n\right] \\
\gamma_i''(\tau - \psi_i(s, t_i^o)) \left[\partial \psi_i / \partial t_i^o\right] \left[\omega_i(n) + 1/n\right]
\end{array}\right\} \Rightarrow \frac{\partial T_i}{\partial t_i^o} > 0
\]

\[
\frac{\partial T_i}{\partial n} = \left(\frac{\partial \Omega}{\partial n}\right) / -\left(\frac{\partial \Omega}{\partial T_i}\right) = \left\{\begin{array}{c}
\gamma_i'(T_i - \psi_i(s, t_i^o)) \left[\omega_i'(n)\right] + \gamma_i''(\tau - \psi_i(s, t_i^o)) \left[1/n\right] \left[\Delta - T_i\right] - \gamma_i'(\tau - \psi_i(s, t_i^o)) \left[n^{-2}\right] \\
\gamma_i'(T_i - \psi_i(s, t_i^o)) \left[\omega_i(n) - 1/n^2\right]
\end{array}\right\} \Rightarrow \frac{\partial T_i}{\partial n} ? 0
\]

The latter cannot be signed because, as table size increases, consumer \(i\) has an incentive to both increase his tip, because of status considerations, and to decrease his tip, because of free riding considerations. The latter is due to the fact that \(\partial^2 \tau / \partial T_i \partial n < 0\), which says that as table size increases, the impact of consumer \(i\)’s tip on the table’s tip diminishes. Because of this, consumer \(i\) has an incentive to “free ride” on the tips of his fellow diners.

2.2 Why Do People Tip in Restaurants?

I examine two possibilities, each taken from the social norms literature, regarding why people tip in restaurants: reciprocity and let-down aversion. Each will be considered in turn.
2.2.1 Reciprocity

The model in Section 2.1 predicts $\partial T_i/\partial s > 0$, which says that consumer $i$ rewards better service with a better tip. This is consistent with the theory of reciprocity, which refers to the idea that people reward kind actions, and punish unkind actions. According to Fehr and Gachter (2000), there is considerable evidence that suggests a strong role for reciprocity in motivating human behavior.\(^2\)

**Hypothesis #1 – The relationship between tip size and service quality is positive.**

The relationship between tip size and service quality has been oft-addressed in the tipping literature. Ben-Zion and Karni (1976) examine the issue within a theoretical framework by modeling the supply and demand for server effort, assuming repetitive purchase of service by customers. They find that if the server is to provide more than the minimal amount of effort, then the marginal reward for effort must be positive, and that a necessary condition for the existence of a “tip” payment arrangement is a positive response of effort to the size of the tip. Ben-Zion and Karni also examine restaurateur behavior, finding that if the control of service is costly, then a tipping arrangement is likely optimal, in that it is least expensive. This closely resembles the idea that the institution of tipping serves as a buyer monitoring device, whereby it exists because the customer, rather than the manager, has the comparative advantage in monitoring the server (Jacob and Page, 1980).

Customers, servers, and managers all seem to agree that service quality is an important determinant of tip size (Adelman (1985); McCarty et al. (1990); Harris (1995);

\(^2\) Reciprocity closely resembles gift exchange (see Akerlof (1982)), which is defined as an informally enforced agreement to give goods, services, information, or money in exchange for future compensation in-kind. However, according to Kranton (1996), such exchange takes place between people who know each
Speer (1997); Callan and Tyson (2000); Casey (2001)). As well, several authors have empirically examined the tip-service relationship, using a variety of methods.

Using customer-level data, Lynn and Grassman (1990), Bodvarsson and Gibson (1992), Lynn and Graves (1996), Mok and Hansen (1999), and Lynn and Simons (2000) all find a significant, positive relationship between absolute tip and service quality. Also using customer-level data, both Bodvarsson and Gibson (1997) and Conlin et al. (2000) find a positive relationship between percent tip and service quality; however, only Conlin et al. report that their finding is statistically significant. Lynn and McCall (2000a), who perform a meta-analysis of the tip-service relationship, find that the relationship is positive, but tenuous. Finally, there are some customer-level studies that find no relationship between tip size and service quality, using both percent tip (May (1980); Lynn and Latane (1984)) and absolute tip (Bodvarsson and Gibson (1994)) as their dependent variable.

Bodvarsson and Gibson (1999) and Rogelberg et al. (1999) use experimental data to examine the tip-service relationship. Bodvarsson and Gibson (1999) find a significant, positive relationship between percent tip and service quality, while Rogelberg et al. find a significant, positive relationship between absolute tip and service quality.

My work adds to this literature in several ways. First, I explain the relationship between tip size and service quality using a theory taken from the social norms literature, reciprocity. Previous studies have mentioned only the buyer monitoring story (Bodvarsson and Gibson (1992); Lynn and Graves (1996)) and equity theory (Lynn and
Grassman (1990); Lynn and Graves (1996)). Second, similar to Bodvarsson and Gibson (1999) and Rogelberg et al. (1999), I consider the use of experiments in examining the tip-service relationship. However, unlike these authors, I create an environment that both resembles a tipping situation, and provides subjects with incentives. What people say they will do in a given situation is often different from what they actually do (Freedman, 1969). Finally, all of the studies that measure service quality do so on an ordinal scale, which is inappropriate. According to Spanos (1999), the mean, variance, and covariance, all of which are the building blocks of regression analysis, have no obvious interpretation for ordinal variables. In my work, I create a dummy variable for service quality.

2.2.2 Let-Down Aversion

The model in Section 2.1 predicts $\frac{\partial T_i}{\partial t_o} > 0$, which says that consumer i tips positively in relation to his belief about the tipping norm. This is consistent with the theory of let-down aversion, which says that decision-makers do not like to let others down. According to Charness and Dufwenberg (2002), let-down aversion (aka guilt aversion) theory predicts a positive relationship between consumer i’s tip and what consumer i thinks the server thinks consumer i is going to tip. A good proxy for the latter is consumer i’s belief about the tip norm.

**Hypothesis #2 – The relationship between consumer i’s tip and his belief regarding the tip norm is positive.**

My work is the first to empirically examine this issue.

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3 Equity theory says that people consider equity when leaving a tip. A relationship is equitable when the output-input (service-tip) ratio for the server equals the output-input (tip-service) ratio for the tipper. Thus, higher service on the part of the former requires a higher tip on the part of the latter to restore equity.
2.3 Factors Influencing How Much People Tip

I also examine various aspects of the tipping situation. What types of factors influence how much people tip in restaurants? I consider two. First, how does tip size vary with table size and, second, do men tip more than women?

2.3.1 The Effect of Table Size on Tip Size

The model in Section 2.1 predicts an ambiguous effect of table size on tip size. This is because there are two opposing forces at work – status and free riding. If the status effect is stronger than the free riding effect, then tip size will increase with table size. Otherwise, tip size will fall with table size. Real world evidence suggests that the free riding effect is stronger, since many restaurants add an automatic service charge onto bills for large table sizes (usually ≥ 6).

Hypothesis #3 – If the status effect outweighs the free riding effect, tip size will increase with table size. Otherwise, tip size will fall with table size.

Both customers and servers appear to agree that table size is an important determinant of tip size (McCarty et al. (1990); Ineson and Martin (1999)). As well, several studies have empirically tested this relationship, using a variety of methods.

Using customer-level data, Lynn and Grassman (1990) find a significant, positive relationship between absolute tip and group size, while both Boyes et al. (1998) and Conlin et al. (2000) find a significant, positive relationship between percent tip and group size. Also using customer-level data, Freeman et al. (1975), Lynn and Latane (1984), and Bodvarsson and Gibson (1997) all find a negative relationship between percent tip and group size; however, only the latter two report that their finding is statistically significant. Other studies using customer-level data find no relationship between tip size and group size. While some of these studies examined the effect of group size on percent tip (Lynn
and Latane (1984); Rind and Strohmetz (1999, 2001a, 2001b)), others examined the
effect of group size on absolute tip (Lynn and Grassman (1990); Lynn and Graves
(1996)). Finally, May (1980) finds that percent tip is a convex function of group size,
with a minimum at group size equal to five. However, she fails to report whether or not
her finding is statistically significant.

Bodvarsson and Gibson (1999) use experimental data to examine the relationship
between tip size and group size. They find a negative relationship between percent tip
and group size, but fail to report whether or not this result is statistically significant.

My work adds to this literature in that, just like Bodvarsson and Gibson (1999), I also
consider the use of experiments in examining the effect of table size on tip size.
However, unlike Bodvarsson and Gibson, I create an environment that both resembles a
tipping situation, and that provides subjects with incentives. What people say they will
do in a given situation is often different from what they actually do (Freedman, 1969).

2.3.2 The Effect of Table Composition on Tip Size

Do men tip more than women? Eckel and Grossman (1998) point out that, on one
hand, women are more generous than men in dictator-type settings. Such settings
closely resemble restaurant tipping. On the other hand, the fact that men earn roughly
35% more than women (Council of Economic Advisors, 2002) implies that men have a
lower marginal utility of income than women. Combining this with the model in Section
2.1, which predicts $\partial T_i / \partial \beta_i < 0$, implies that men will tip higher than women.

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4 The standard dictator game has to do with the division of a fixed pie among two people by only one
person. Assume a pie size of $x$ and two players, A and B. Suppose A is the dictator and B is the recipient.
A determines an allocation of $x$ between himself and B. Once the allocation is decided upon by A, the
game is over, and both players receive the allocation that A determined. Player B, who makes no decisions
in such a game, is essentially at the mercy of player A.
Hypothesis #4 – If the generosity effect for women outweighs the income effect for men, then women will tip higher than men. If, on the other hand, the income effect for men outweighs the generosity effect for women, then men will tip higher than women.

The literature on sex differences in tipping is sparse. While Cunningham (1979) finds that females leave a significantly larger percent tip than males, Lynn and Latane (1984) arrive at the exact opposite conclusion. Finally, Lynn and McCall (2000b) perform a meta-analysis, and find that males tip significantly more than females. My work adds to this literature in that I am the first to consider the use of experiments in examining sex differences in tipping.

2.4 An Analysis of the Supreme Court’s Decision in United States v. Fior d’Italia

In 1995, the IRS billed Fior d’Italia for taxes on tips that they say employees failed to report in 1991 and 1992. The IRS arrived at this figure by examining Fior d’Italia’s credit card receipts, which revealed that the restaurant’s servers, on average, were receiving tip rates of 14.49% and 14.29%, respectively, in each of the years. Applying these percentages to Fior d’Italia’s total sales in 1991 and 1992, respectively, the IRS arrived at an amount that they say the restaurant’s employees should have claimed in tips in those years. By subtracting from this the amount that Fior d’Italia’s servers actually claimed in tips in those years, and then applying the appropriate FICA tax rate to this difference, the IRS issued Fior d’Italia a tax bill of $23,262.

In its ruling, the Supreme Court stated that the IRS’s method does not fall “outside the bounds of what is reasonable” (National Restaurant Association, 2002). However, a major assumption of the IRS’s methodology is that customers who pay their bill with cash tip the same as those who pay their bill with a credit card. This may, or may not, be true. If the former tip more than the latter, then the IRS’s method understates the amount
actually owed. If the opposite is true, then the IRS is overstating this amount. Thus, I am interested in whether or not customers who pay their bill with cash tip differently than those who pay their bill with a credit card. This evidence might be of interest to the restaurant industry, as the National Restaurant Association is vigorously trying to get the Supreme Court’s ruling overturned.

Theoretically, it appears that those who pay their bill with a credit card tip higher than those who pay with cash. For example, if the former have higher incomes, and thus a lower marginal utility of income, than the latter, then the model in Section 2.1, which predicts $\frac{\partial T_i}{\partial \beta_i} < 0$, implies that they will also tip higher. Furthermore, there is evidence that people spend more when using credit cards (Feinberg, 1986).

**Hypothesis #5 – Customers who pay their bill with a credit card tip higher than those who pay their bill with cash. Thus, the United States Supreme Court’s ruling in *U.S. v. Fior d’Italia* is based on an illegitimate premise.**

Similar to the literature on sex differences in tipping, the literature on the effect of payment method on tip size is also sparse. Both May (1980) and Lynn and Latane (1984) find that customers paying by credit card tip higher than those paying with cash. However, May (1980) fails to report whether or not her result is statistically significant. Lynn and McCall (2000b) perform a meta-analysis and also find that customers paying by credit card tip higher than those paying with cash. Although the findings from these studies are valid, my work is more up-to-date. My work also examines a policy issue that no one else has.

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5 Even though Lynn and McCall published their study in 2000, it is a meta-analysis of several studies, many of which are old.
3. Study 1 – A Tipping Experiment

3.1 Introduction

In this section, I use a tipping experiment to examine the following issues: the reciprocity explanation of why people tip, the effect of table size on tip size, and whether or not males tip more than females. My experimental design is based largely on Ruffle (1998), as his design closely resembles a tipping situation.⁶

3.2 Experimental Design

Subjects in my experiment are first categorized as either Person A (Dictator) or Person B (Recipient), before participating in several dictator games with endogenously-determined pie sizes. In each treatment, Recipients first complete a skills test (a word-search game). Their scores are then ranked according to their performance, with their ranking determining the pie size. Since each session consists only of two Recipients, there are only two possible rankings, high and low. The high-ranking Recipient earns a $28 pie to be split with his Dictator, while the low-ranking Recipient earns a $14 pie. The Recipient’s earning of the pie size is analogous to service, while the Dictator’s subsequent offer is analogous to a tip.

As illustrated in Table 1, I use a within-subjects design that varies three factors (service, table size, and information) in seven treatments. Service in the experiment refers to the fact that Recipients can earn one of two pie sizes. A Recipient earning the $28 pie provides higher “service” to his Dictator than a Recipient earning the $14 pie. Table size is varied by having Dictators make their offers in the presence of different

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⁶ My design is somewhat different from Ruffle (1998) in that my subjects do not first participate in a standard dictator game. In my experiment, “tip” is construed to be the percentage of the pie offered to the Recipient. There are two reasons why I do not completely replicate Ruffle (1998). First, asking subjects to participate in a standard dictator game, in addition to an endogenous dictator game, is difficult to
numbers of other Dictators. Finally, Dictators make their offers both publicly, so that everyone else sees their offer, and privately, so that no one else sees their offer, across each table size. Public tipping provides subjects with the opportunity to display status, if they so desire, which is important in order to adequately examine the effect of table size on tip size.

Table 1 – Treatments

<table>
<thead>
<tr>
<th>Table Size</th>
<th>Private</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>----</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Each session consists of twelve Dictators and two Recipients who participate in all of the treatments illustrated in Table 1. In each treatment, each Dictator is randomly paired with one of the two anonymous Recipients to make an allocation decision. As there are only two Recipients and twelve Dictators, each Recipient is always paired with more than one Dictator. More specifically, each Recipient is always paired with six Dictators in each treatment. Furthermore, Dictators sitting at the same table are always paired with the same Recipient, and the Recipients’ service level is not necessarily constant across all treatments.

In order to make more transparent the mechanics of the experiment, consider the following example. A Dictator making his allocation decision at a private table size of three means that he is sitting at a table with two other Dictators, all of whom are assigned the same Recipient. The Recipient, based on his performance on the word-search, earns

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coordinate, since doing so would require me to have them participate in each of the games on different dates. Second, replication of Ruffle (1998) is more costly, which at the time was a concern.

7 This might, at first, seem problematic – i.e. each Recipient gets to split a pie with each of six Dictators, whereas each Dictator only gets to split a pie with one Recipient. However, this setup is realistic, in that, in the real world, a given server is typically assigned several tables, not just one.
either a $28 or a $14 pie to be split with each of the three Dictators. Each Dictator privately makes his allocation decision on a decision sheet, before folding the decision sheet in half. In the public table size of three treatment, everything works exactly the same, except that in this treatment, there is but a single decision sheet in the center of the table. On it, each dictator writes down, at his own pace, his allocation amount.

A total of 112 subjects, all Virginia Tech students, participated in the experiment in November 2002. Eight sessions, each lasting roughly one hour and forty-five minutes, were conducted at Virginia Tech’s Laboratory for the Study of Human Thought and Action, using the same two experimenters, in the same role, each time. Treatment order was randomized over each of the eight sessions. While there do appear to be order effects, I control for them in my econometric analysis of the data.

Subjects were randomly assigned to either the Recipient or Dictator role upon showing up to the experiment and participated in the experiment only once, and in a single role. At the end of the experiment, subjects completed a post-experiment questionnaire, which collected various demographic data, before being paid, privately, a $5 show-up fee, as well as additional earnings based on their decisions in one of the treatments. The treatment for which they were paid was determined randomly at the end of the experiment. Dictators earned, on average, $23.23, while the average earnings of Recipients were $21.55. Copies of the instructions, decision sheets, and post-experiment questionnaire used in the experiment are available in Appendix A.

3.3 Data

The experiment originally produced 672 observations. However, I ended up dropping one of the sessions because an overwhelming majority of the Dictators in that session
offered zero to their Recipients across all seven treatments, making this session significantly different from all others. This behavior may have been the result of a statement made at the beginning of the experiment by one of the Dictators, to the effect of “Why would you ever give any money at all to them?” I also dropped two outlying observations, in which the Dictator offered 100% of the pie to the Recipient, since the inclusion of these data yielded markedly different results. It is possible that these two Dictators meant to offer nothing to their Recipients but, in a moment of confusion, offered the whole pie instead. After also dropping these observations, I was left with 586 observations. A description of the variables used in my analysis, along with summary statistics, is provided in Table 2.
### Table 2 – Description of Variables and Summary Statistics (N = 586)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>$\bar{X}$</th>
<th>$s$</th>
</tr>
</thead>
<tbody>
<tr>
<td>tip</td>
<td>% of pie offered to Recipient</td>
<td>15.70</td>
<td>16.97</td>
</tr>
<tr>
<td>$\text{$ tip}$</td>
<td>dollar amount of pie offered to Recipient</td>
<td>3.34</td>
<td>3.83</td>
</tr>
<tr>
<td>tip_1</td>
<td>lag of tip</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>tsiz</td>
<td>table size</td>
<td>3.28</td>
<td>1.83</td>
</tr>
<tr>
<td>public</td>
<td>dummy equal to 1 if tip made public, 0 otherwise</td>
<td>.43</td>
<td>.50</td>
</tr>
<tr>
<td>service</td>
<td>dummy equal to 1 if Recipient earned $28 pie, 0 otherwise</td>
<td>.50</td>
<td>.50</td>
</tr>
<tr>
<td>male</td>
<td>dummy equal to 1 if Dictator male, 0 otherwise</td>
<td>.55</td>
<td>.50</td>
</tr>
<tr>
<td>opsex</td>
<td>dummy equal to 1 if Dictator’s table consists of at least 1 member of opposite sex, 0 otherwise</td>
<td>.62</td>
<td>.48</td>
</tr>
<tr>
<td>age</td>
<td>Dictator’s age</td>
<td>19.90</td>
<td>2.64</td>
</tr>
<tr>
<td>border</td>
<td>Dictator’s birth order</td>
<td>1.81</td>
<td>.99</td>
</tr>
<tr>
<td>race</td>
<td>dummy equal to 1 if Dictator white, 0 otherwise</td>
<td>.74</td>
<td>.44</td>
</tr>
<tr>
<td>rel</td>
<td>dummy equal to 1 if Dictator regularly attends religious services, 0 otherwise</td>
<td>.33</td>
<td>.47</td>
</tr>
<tr>
<td>econ</td>
<td>dummy equal to 1 if Dictator has taken at least 1 economics course, 0 otherwise</td>
<td>.98</td>
<td>.15</td>
</tr>
<tr>
<td>brosis</td>
<td>number of Dictator’s brothers and sisters</td>
<td>1.53</td>
<td>1.06</td>
</tr>
<tr>
<td>famserv</td>
<td>dummy equal to 1 if any family or friends of the Dictator have ever been a restaurant server, 0 otherwise</td>
<td>.73</td>
<td>.45</td>
</tr>
<tr>
<td>dicserv</td>
<td>dummy equal to 1 if Dictator has ever been a restaurant server, 0 otherwise</td>
<td>.21</td>
<td>.41</td>
</tr>
<tr>
<td>M2</td>
<td>session dummy equal to 1 for Monday at 2 p.m. session, 0 otherwise</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>M5</td>
<td>session dummy equal to 1 for Monday at 5 p.m. session, 0 otherwise</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Tu2</td>
<td>session dummy equal to 1 for Tuesday at 2 p.m. session, 0 otherwise</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Tu5</td>
<td>session dummy equal to 1 for Tuesday at 5 p.m. session, 0 otherwise</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>W2</td>
<td>session dummy equal to 1 for Wednesday at 2 p.m. session, 0 otherwise</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Th2</td>
<td>session dummy equal to 1 for Thursday at 2 p.m. session, 0 otherwise</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Th5</td>
<td>session dummy equal to 1 for Thursday at 5 p.m. session, 0 otherwise</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

### 3.4 Econometric Specification

The percentage of the pie offered by the Dictator to the Recipient was used as the dependent variable in my analysis. Before analyzing the data, however, two econometric issues had to be addressed. First, as a large portion of the Dictators offered $0 to their Recipients, the data are left-censored at zero. Second, my data set is essentially a panel
that follows Dictators’ allocation decisions across seven treatments. To address these issues, I analyzed the data using a Tobit random effects model.

While my choice of a Tobit model is straightforward, given the left-censored nature of my data, my choice of a random effects model is less clear. Recall that the choice between a fixed and random effects model really comes down to whether or not the covariance between the unobserved effects and the explanatory variables is nonzero. If this covariance is nonzero, then the appropriate model choice is a fixed effects model, which eliminates the unobserved effects. If, however, this covariance is zero, then the appropriate model choice is a random effects model. A random effects model essentially corrects for the serial correlation that results from not eliminating the unobserved effects. With my data, I had to immediately rule out a fixed effects model, because I am interested in certain variables that remain constant over time, like the variable “male”. Such variables get swept away in a fixed effects transformation. However, as it is still possible that there might be covariance between the unobserved effects and the explanatory variables, Wooldridge (2002) suggests that I try and control for as many cross section groupings as possible, via the use of dummies. Doing so will hopefully control for those unobserved effects correlated with the explanatory variables, so that I am essentially left with a situation in which the covariance is zero. This is likely in my case, due to the fact that I incorporate a large number of demographic control variables into my analysis.

---

8 The panel is slightly unbalanced. It contains a total of 84 subjects (Dictators) and consists of 7 observations per subject. However, as I dropped two outliers in which the Dictator allocated 100% of the
3.5 Results

I consider, first, the issue of whether or not the theory of reciprocity helps to explain why people tip in restaurants. If reciprocity is a good explanation of why people tip in restaurants, then the relationship between tip size and service should be positive. This implies that a Recipient’s earning of the higher pie size will result in a higher percentage offer of the pie size from the Dictator. Looking at Table 3, it can be seen that Recipients who earn the $14 pie size receive a 15.01% tip, while those who earn the $28 pie size receive a tip of 16.38%, thus lending some credence to the reciprocity story. However, the multivariate analysis in Table 4 suggests that the relationship between tip size and service is weak at best (p = .149, one-tailed).9

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean Percent Tip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (male = 1)</td>
<td>321</td>
<td>18.73</td>
</tr>
<tr>
<td>Female (male = 0)</td>
<td>265</td>
<td>12.02</td>
</tr>
<tr>
<td>$28 Pie (service = 1)</td>
<td>293</td>
<td>16.38</td>
</tr>
<tr>
<td>$14 Pie (service = 0)</td>
<td>293</td>
<td>15.01</td>
</tr>
<tr>
<td>1-Person Table (tsiz = 1)</td>
<td>84</td>
<td>17.04</td>
</tr>
<tr>
<td>2-Person Table (tsiz = 2)</td>
<td>168</td>
<td>17.13</td>
</tr>
<tr>
<td>3-Person Table (tsiz = 3)</td>
<td>168</td>
<td>15.90</td>
</tr>
<tr>
<td>6-Person Table (tsiz = 6)</td>
<td>166</td>
<td>13.36</td>
</tr>
</tbody>
</table>

Next, I consider the relationship between tip size and table size. Table 3 lends some credence to a negative relationship, with average tip size roughly the same for one- and two-person tables, but 15.90% and 13.36%, respectively, for three- and six-person tables.

---

pie to the Recipient, for two of the Dictators there are only 6 observations.
9 A one-tailed test was performed due to the very strong a priori belief that this relationship should be positive. Both the theoretical model in Section 2 and intuition guide this belief.
The multivariate analysis in Table 4 confirms this (p = .083, two-tailed). A one-person increase in table size results in a decrease in tip size of .6 percentage points.

Finally, I consider sex differences in tipping. According to Table 3, male Dictators tip an average of 18.73%, while female Dictators tip an average of only 12.02%. The multivariate analysis in Table 4 confirms this difference (p = .007, two-tailed).

To summarize, the findings from the tipping experiment are as follows. First, the theory of reciprocity helps to explain, albeit weakly, why people tip. Second, the relationship between tip size and table size is negative. Finally, males are better tippers than females.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient(^a)</th>
<th>Standard Error</th>
<th>P-value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tip</td>
<td>dependent variable</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>tip.1</td>
<td>.15</td>
<td>.077</td>
<td>.002***</td>
</tr>
<tr>
<td>tsiz</td>
<td>-.60</td>
<td>.555</td>
<td>.083*</td>
</tr>
<tr>
<td>public</td>
<td>1.88</td>
<td>1.66</td>
<td>.072*</td>
</tr>
<tr>
<td>service</td>
<td>1.11</td>
<td>1.69</td>
<td>.297</td>
</tr>
<tr>
<td>male</td>
<td>4.83</td>
<td>2.85</td>
<td>.007***</td>
</tr>
<tr>
<td>opsex</td>
<td>-.56</td>
<td>2.08</td>
<td>.671</td>
</tr>
<tr>
<td>age</td>
<td>1.15</td>
<td>.564</td>
<td>.001***</td>
</tr>
<tr>
<td>border</td>
<td>1.09</td>
<td>1.90</td>
<td>.363</td>
</tr>
<tr>
<td>race</td>
<td>-5.19</td>
<td>3.65</td>
<td>.024**</td>
</tr>
<tr>
<td>rel</td>
<td>-.93</td>
<td>3.19</td>
<td>.645</td>
</tr>
<tr>
<td>econ</td>
<td>-2.62</td>
<td>8.92</td>
<td>.641</td>
</tr>
<tr>
<td>brosis</td>
<td>-2.04</td>
<td>1.80</td>
<td>.072*</td>
</tr>
<tr>
<td>famserv</td>
<td>-.13</td>
<td>3.32</td>
<td>.952</td>
</tr>
<tr>
<td>dicserv</td>
<td>-.62</td>
<td>3.62</td>
<td>.787</td>
</tr>
<tr>
<td>M2</td>
<td>7.86</td>
<td>5.65</td>
<td>.027**</td>
</tr>
<tr>
<td>M5</td>
<td>2.43</td>
<td>5.78</td>
<td>.504</td>
</tr>
<tr>
<td>Tu2</td>
<td>.83</td>
<td>5.47</td>
<td>.810</td>
</tr>
<tr>
<td>Tu5</td>
<td>7.86</td>
<td>5.58</td>
<td>.026**</td>
</tr>
<tr>
<td>W2</td>
<td>5.40</td>
<td>5.47</td>
<td>.117</td>
</tr>
<tr>
<td>Th2</td>
<td>3.28</td>
<td>5.59</td>
<td>.352</td>
</tr>
<tr>
<td>constant</td>
<td>-16.97</td>
<td>13.81</td>
<td>&lt;.001***</td>
</tr>
</tbody>
</table>

\(^a\) The coefficients presented here have been adjusted by the Adjustment Factor of .63 listed in this table (see Maddala (1983)).

***Significant at 1%, **Significant at 5%, *Significant at 10%
4. Study 2 – Field Data Analysis

4.1 Introduction

In this section, I examine each of the issues discussed in Section 2 using a survey data set. A copy of the survey is available in Appendix B. The final section of this paper, Section 5, will compare the results of both Study 1 and Study 2 as a test of the external validity of my experimental results.\(^{11}\)

4.2 Procedure

I collected survey data from five Richmond, Virginia restaurants, summarized in Table 5, in Summer 2002.\(^{12}\) At each restaurant, the data were collected over the course of a weekend, on Friday and Saturday evenings, from 6 p.m. until roughly 10 p.m. Customers were approached as they exited the restaurant, and the same two people, both myself and an assistant, administered the surveys at all five of the restaurants. Table 6 summarizes the number of surveys collected at each restaurant.

<table>
<thead>
<tr>
<th>Restaurant</th>
<th>Appetizers</th>
<th>Salads As Meal</th>
<th>Sandwiches</th>
<th>Entrees</th>
<th>Type of Rest.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra Billy’s</td>
<td>$3.25-$5.45</td>
<td>$6.25-$7.25</td>
<td>$5.95-$7.25</td>
<td>$6.75-$14.95</td>
<td>BBQ</td>
</tr>
<tr>
<td>The Grapevine II</td>
<td>$4.95-$9.95</td>
<td>$6.25-$7.25</td>
<td>NA</td>
<td>$7.95-$16.95</td>
<td>Greek/Italian</td>
</tr>
<tr>
<td>Melito’s</td>
<td>$2.35-$4.95</td>
<td>$6.75-$7.95</td>
<td>$4.25-$7.35</td>
<td>$8.15-$17.95</td>
<td>Italian/Amer.</td>
</tr>
<tr>
<td>Shackleford’s</td>
<td>$3.50-$10.90</td>
<td>$8.50-$9.95</td>
<td>$6.95-$11.95</td>
<td>$13.95-$24.95</td>
<td>Amer./Seafood</td>
</tr>
</tbody>
</table>

\(^{11}\) The issue of external validity is rarely investigated in experimental studies, despite its obvious importance. Notable exceptions are the research agendas of James Andreoni and co-authors and Catherine Eckel and co-authors. For example, Andreoni, Brown, and Rischall (2001) use field data to confirm estimates of elasticities of giving from laboratory experiments in Andreoni and Vesterlund (2001). Eckel, Grossman, and Lutz (2001) examine the relationship between laboratory measures of risk preferences and insurance purchase behavior. Finally, Eckel and Grossman are conducting a field experiment with Minnesota Public Radio to test the external validity of the results reported in Eckel and Grossman (2003).

\(^{12}\) The reason I collected data from these five restaurants, as opposed to other restaurants, is because these restaurants were the only ones willing to let me survey their customers. Collecting field data is tough – I asked approximately twenty-five restaurants for permission to survey their customers, and only six obliged.
Table 6 – Number of Surveys Collected at Each Restaurant

<table>
<thead>
<tr>
<th>Restaurant</th>
<th># Surveys Collected</th>
<th># Rejections</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra Billy’s</td>
<td>102</td>
<td>23</td>
<td>81.6%</td>
</tr>
<tr>
<td>Memphis BBQ</td>
<td>83</td>
<td>29</td>
<td>74.1%</td>
</tr>
<tr>
<td>The Grapevine II</td>
<td>81</td>
<td>8</td>
<td>91.0%</td>
</tr>
<tr>
<td>Melito’s</td>
<td>120</td>
<td>18</td>
<td>87.0%</td>
</tr>
<tr>
<td>Shackleford’s</td>
<td>99</td>
<td>12</td>
<td>89.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>485</strong></td>
<td><strong>90</strong></td>
<td><strong>84.3%</strong></td>
</tr>
</tbody>
</table>

The survey data are used to address each of the issues presented in Section 2.

Beginning first with the issue of why people tip, recall that if reciprocity motivates people to tip, then customers should tip positively in response to service quality.

Question 9 on the survey asks respondents to rate the quality of service they received from their waiter or waitress on a seven-point scale. If let-down aversion is an important motivator, then people should tip positively in response to their belief regarding the tip norm. Question 20 on the survey asks respondents what they believe the norm is regarding percent tip in a restaurant.

I am also interested in two factors influencing how much people tip – sex and table size. Question 14 on the survey asks respondents to report their sex, which allows me to examine sex differences in tipping. Questions 1 and 2 on the survey ask respondents to report, respectively, the number of people at their table and the number of checks their table had. These questions allow me to examine the effect of table size on tip size. The latter question is important because someone tipping for an entire nine-person table might tip differently than if he were only tipping for five of the nine persons at the table.

Finally, question 7 on the survey asks how respondents paid for their bill. This question allows me to examine whether or not the Supreme Court’s ruling in *U.S. v. Fior d’Italia* is based on a legitimate premise.
The second parts of questions 4 and 5 are used as filters. They ask, respectively, whether or not the respondent received help both paying the bill and leaving a tip. I do not want to include in my data set customers who paid for the bill, but were assisted by others in paying either the tip or the bill. In either of these cases, the customer’s tip that is recorded on the survey may or may not accurately reflect that customer’s tipping behavior. The remaining questions on the survey are used to create control variables.

4.3 Data

I began my analysis with a total of 485 observations. However, after cleaning the data, I was left with only 216 observations. All observations for which a “yes” response was recorded for the second part of either question 4 or 5 were deleted. The data were further cleaned by deleting those observations for which respondents either did not provide a response, or for which respondents provided an ambiguous response, to the most critical questions on the survey. These questions are 1 - 7, 9 - 18, and 20. A description of the variables used in my analysis, along with summary statistics, is presented in Table 7.

4.4 Econometric Specification

The natural log of the dollar value of the tip is used as the dependent variable in my analysis and all variables measured on an ordinal scale, like service, are made into dummy variables. The latter is done because, according to Spanos (1999), the mean, variance, and covariance, all of which are the building blocks of regression analysis, have no obvious interpretation for ordinal variables.

I also consider the issue of statistical adequacy. Statistical adequacy refers to the notion that the assumptions underlying the model are satisfied, both so that the estimates
retain their desirable properties (i.e. unbiasedness), and so that any inference made using
the model is legitimate. According to Spanos (1986), in order to claim a statistically
adequate OLS model, a crucial requirement is that the error term be NIID (normally
distributed, independent, and identically distributed). This NIID requirement can, and
should, be tested.

I test for normality (N) using both a Shapiro-Wilk and a skewness-kurtosis test. The
null hypothesis for both of these residual-based tests is that the error term is normally
distributed.

Normality also implies a linear conditional mean and a homoskedastic (constant)
variance. To test for linearity, I employ the Ramsey RESET test, which uses an auxiliary
regression of the residuals on both the explanatory variables and the powers of the fitted
values of the original regression. A joint F-test is then performed on the parameters of
the powers of the fitted values, under the null hypothesis of a linear conditional mean. To
test for heteroskedasticity, I employ the Cook-Weisberg test, which uses an auxiliary
regression of the squared residuals on powers of the fitted values of the original
regression. I then perform a joint F-test on the parameters of the powers of the fitted
values, under the null hypothesis that the variance is homoskedastic.

The independence (I) requirement says that Cov(et,et-s) = 0, where e is the error term
and s≠0. Since the data set I use here represents a cross section of restaurant customers,
dependence should not be an issue. Thus, I will assume that the error term is distributed
independently.

---

13 Spanos (1986) refers to a statistically adequate OLS model as the Normal Linear Regression Model (NLRM).
Finally, the identically distributed (ID) requirement says that both the conditional mean and the conditional variance should remain constant over time. Again, since the data set I use here represents a cross section of restaurant customers, this should not be an issue. Thus, I will assume that the error term is identically distributed.

Using the testing procedures described above, I achieved statistical adequacy by estimating a Feasible Generalized Least Squares (FGLS) model. Such a model is essentially a weighted least squares procedure that corrects for heteroskedasticity.
Table 7 – Description of Variables and Summary Statistics (N = 216)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>$\bar{x}$</th>
<th>$s$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$tip$</td>
<td>$ amount of tip</td>
<td>6.26</td>
<td>3.27</td>
</tr>
<tr>
<td>$% tip$</td>
<td>tip as percentage of bill</td>
<td>19.63</td>
<td>10.70</td>
</tr>
<tr>
<td>bill</td>
<td>size of bill</td>
<td>34.48</td>
<td>18.69</td>
</tr>
<tr>
<td>bill2</td>
<td>size of bill squared</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>tablesize</td>
<td>table size</td>
<td>2.72</td>
<td>1.14</td>
</tr>
<tr>
<td>tablesize2</td>
<td>table size squared</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>age</td>
<td>age of tipper</td>
<td>46.56</td>
<td>12.09</td>
</tr>
<tr>
<td>numchecks</td>
<td>number of checks at table</td>
<td>1.21</td>
<td>.60</td>
</tr>
<tr>
<td>service(^{14})</td>
<td>dummy equal to 1 if service high, 0 otherwise</td>
<td>.91</td>
<td>.28</td>
</tr>
<tr>
<td>income(^{15})</td>
<td>dummy equal to 1 if income high, 0 otherwise</td>
<td>.82</td>
<td>.38</td>
</tr>
<tr>
<td>tipnorm(^{16})</td>
<td>tipper’s belief regarding the tip norm</td>
<td>5.63</td>
<td>3.29</td>
</tr>
<tr>
<td>paymethod</td>
<td>dummy equal to 1 if tipper paid by credit card or atm card, 0 otherwise</td>
<td>.63</td>
<td>.48</td>
</tr>
<tr>
<td>male</td>
<td>dummy equal to 1 if tipper male, 0 otherwise</td>
<td>.67</td>
<td>.47</td>
</tr>
<tr>
<td>tipperserv</td>
<td>dummy equal to 1 if tipper was ever a server, 0 otherwise</td>
<td>.25</td>
<td>.43</td>
</tr>
<tr>
<td>eb</td>
<td>restaurant dummy equal to 1 if restaurant Extra Billy’s, 0 otherwise</td>
<td>.16</td>
<td>.36</td>
</tr>
<tr>
<td>melito</td>
<td>restaurant dummy equal to 1 if restaurant Melito’s, 0 otherwise</td>
<td>.26</td>
<td>.44</td>
</tr>
<tr>
<td>memphis</td>
<td>restaurant dummy equal to 1 if restaurant Memphis BBQ, 0 otherwise</td>
<td>.19</td>
<td>.40</td>
</tr>
<tr>
<td>grapevine</td>
<td>restaurant dummy equal to 1 if restaurant Grapevine II, 0 otherwise</td>
<td>.16</td>
<td>.37</td>
</tr>
<tr>
<td>shackle</td>
<td>restaurant dummy equal to 1 if restaurant Shackleford’s, 0 otherwise</td>
<td>.22</td>
<td>.42</td>
</tr>
<tr>
<td>serversex</td>
<td>dummy equal to 1 if server male, 0 otherwise</td>
<td>.31</td>
<td>.46</td>
</tr>
<tr>
<td>religion</td>
<td>dummy equal to 1 if tipper regularly attends religious services, 0 otherwise</td>
<td>.47</td>
<td>.50</td>
</tr>
<tr>
<td>married</td>
<td>dummy equal to 1 if tipper married, 0 otherwise</td>
<td>.76</td>
<td>.43</td>
</tr>
<tr>
<td>friday</td>
<td>dummy equal to 1 if survey data collected on Friday, 0 otherwise</td>
<td>.43</td>
<td>.50</td>
</tr>
<tr>
<td>regular(^{17})</td>
<td>dummy equal to 1 if dining frequency high, 0 otherwise</td>
<td>.32</td>
<td>.47</td>
</tr>
</tbody>
</table>

\(^{14}\) Service, which was measured on a scale from 1 to 7, is considered “high” if in the 5-7 range.

\(^{15}\) Income, which was measured on a scale from 1 to 5, is considered “high” if in the 4-5 range.

\(^{16}\) The variable tipnorm is given in terms of dollars and cents. To calculate tipnorm, I took the tipper’s percentage tip norm and applied it to his bill amount. Let $%\text{tipnorm}$ denote the tipper’s percentage tip norm.
4.5 Results

In Section 2, I offered two explanations of why people tip – reciprocity and let-down aversion. If reciprocity is a good explanation of why people tip in restaurants, then the relationship between tip size and service quality should be positive. Looking at Table 8, it can be seen that respondents who receive good service tip an average of 19.83%, while those who receive bad service tip an average of only 17.51%.\textsuperscript{18,19} The multivariate analysis presented in Table 9 confirms this finding (p = .011, two-tailed).

If let-down aversion motivates people to tip, then the relationship between tip size and respondents’ belief about the tip norm should be positive. The results presented in Table 8 lend credence to this hypothesis, with the multivariate results in Table 9 confirming it (p < .001, two-tailed).

Section 2 also examined two determinants of how much people tip in restaurants. One of these determinants was table size. Table 8 reveals a nonlinear relationship between tip size and table size that is confirmed by the multivariate analysis in Table 9 (p = .012 and p = .004, two-tailed). For table sizes roughly < 3, tip size falls with table size, while for table sizes > 3, tip size increases with table size.

Another determinant discussed in Section 2 was sex. According to Table 8, males tip an average of 20%, compared to females who tip an average of only 18.87%. However, as the multivariate analysis in Table 9 reveals, this difference is not statistically significant (p = .731, two-tailed).

\textsuperscript{17} Dining frequency, which was measured on a scale from 1 to 7, is considered “high” if in the 5-7 range.
\textsuperscript{18} Even though the dependent variable in my econometric analysis is ln $ tip, I use % tip in Table 8 in order to hold constant bill size.
\textsuperscript{19} Performing means tests is a pointless exercise here, as I rely on my econometric model to draw conclusions from the data.
Finally, I considered a policy issue related to tipping in Section 2. Was the June 17, 2002 decision by the United States Supreme Court in *U.S. v. Fior d’Italia*, which allows the Internal Revenue Service to use credit card tips to estimate a server’s total tips, and then bill the server’s restaurant for FICA taxes on the difference between the server’s estimated and reported tips, based on a legitimate premise? If customers paying their bill with cash tip lower than those paying by credit card, then the IRS’ method overestimates servers’ tips. Alternatively, if customers paying their bill with cash tip higher than those paying by credit card, then the IRS’ method underestimates servers’ tips. Table 8 reveals that those respondents who pay their bill using either cash or check tip an average of 20.83%, while those who pay by either credit card or atm card tip only 18.93%. However, the multivariate analysis in Table 9 reveals that this difference is not statistically significant (p = .839, two-tailed).

To summarize, the findings from my field data analysis are as follows. First, the theories of both reciprocity and let-down aversion help to explain why people tip. Second, tip size is a convex function of table size, with a minimum at table size of three. Third, tip size does not depend on the sex of the tipper. Finally, as tip size does not depend on payment method, it appears that the Supreme Court’s ruling in *United States v. Fior d’Italia* is based on a legitimate premise.

5. Conclusion

This paper examined determinants of both why and how much people tip in restaurants, as well as a policy issue related to tipping. Beginning first with the issue of why people tip in restaurants, two possibilities were considered – reciprocity and let-down aversion. Both the experimental and field data lend credence to the former. The
latter possibility, which could only be examined using the field data, is also found to
determine why people tip in restaurants.

Next, I looked at two determinants of how much people tip in restaurants, sex and
table size. While the experimental data reveal a negative relationship between tip size
and table size, the field data reveal a nonlinear relationship. Sex differences are found
only in the experimental data, which show that men tip higher than women.

Using the field data, I examined the Supreme Court’s decision in United States v.
Fior d’Italia, which allows the Internal Revenue Service to use credit card tips to
estimate a server’s total tips, and then bill the server’s restaurant for FICA taxes on the
difference between the server’s estimated and reported tips. My analysis lends credence
to the Supreme Court’s decision in this case, in that customers who pay their bill with
cash or check tip no differently than those who pay with either an atm or credit card.

Finally, by comparing my results from both the experimental and field analyses I am
able to examine the external validity of my tipping experiment. The tipping experiment
initially appears to be externally valid on only one of the three issues for which I am able
to make a comparison – the reciprocity explanation of why people tip in restaurants.
However, looking more closely at the effect of table size on tip size reveals that the
experimental data are externally valid on this issue as well. The experimental data, which
examined table sizes of 1, 2, 3, and 6, reveal a negative relationship between tip size and
table size. The field data reveal a nonlinear relationship, with a minimum tip size at table
size of approximately 3. However, as only 6.47% of the field sample dined at a table size
of 5 or larger, inference should be restricted only to table sizes of 4 or smaller. Thus, just
like the experimental data, the field data reveal a negative relationship between tip size
and table size for table sizes of one through three. The experimental and field data are not comparable for table sizes greater than three.

This research represents one of the few attempts by economists to seriously examine restaurant tipping. Several avenues for future research exist. For example, it might be interesting to examine both customer and server behavior in a repeated version of the tipping game used here. Also, some restaurants place at the bottom of their guest checks absolute tip amounts that correspond to various tip sizes (usually 15% and 20%, but sometimes even 25%). Do these tip suggestions serve as focal points? It would be interesting to see if patrons at these establishments tip differently than patrons at establishments that do not include such information at the bottom of their checks. I’m also interested in various tip remuneration schemes and their effect on server effort. For example does a tip pooling scheme, whereby servers share all of their tips, lead to lower effort on the part of servers, or does it foster teamwork among servers, and lead to higher effort? This could be tested in both an experimental and field setting. Finally, I would like to eventually turn my attention to other professions in which people are tipped (i.e. hotel workers, barbers, taxi drivers). Do the same norms that apply to restaurant tipping also apply to these professions? How did tipping originate in these professions? While theoretical work will no doubt play a role in these, and other, explorations, empirical analyses will most likely pave the way.
### Table 8 – Mean Percent Tip by Treatment

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean Percent Tip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Service (service = 1)</td>
<td>197</td>
<td>19.83</td>
</tr>
<tr>
<td>Bad Service (service = 0)</td>
<td>19</td>
<td>17.51</td>
</tr>
<tr>
<td>10% Norm (%tipnorm = 10%)</td>
<td>12</td>
<td>16.96</td>
</tr>
<tr>
<td>15% Norm (%tipnorm = 15%)</td>
<td>123</td>
<td>18.53</td>
</tr>
<tr>
<td>20% Norm (%tipnorm = 20%)</td>
<td>65</td>
<td>22.42</td>
</tr>
<tr>
<td>One-Person Table (tablesize = 1)</td>
<td>6</td>
<td>28.87</td>
</tr>
<tr>
<td>Two-Person Table (tablesize = 2)</td>
<td>126</td>
<td>20.54</td>
</tr>
<tr>
<td>Three-Person Table (tablesize = 3)</td>
<td>30</td>
<td>16.56</td>
</tr>
<tr>
<td>Four-Person Table (tablesize = 4)</td>
<td>40</td>
<td>17.61</td>
</tr>
<tr>
<td>Five-Person Table (tablesize = 5)</td>
<td>8</td>
<td>19.44</td>
</tr>
<tr>
<td>Six-Person Table (tablesize = 6)</td>
<td>4</td>
<td>18.08</td>
</tr>
<tr>
<td>Seven-Person Table (tablesize = 7)</td>
<td>1</td>
<td>20.00</td>
</tr>
<tr>
<td>Eight-Person Table (tablesize = 8)</td>
<td>1</td>
<td>28.85</td>
</tr>
<tr>
<td>Male (male = 1)</td>
<td>145</td>
<td>20.00</td>
</tr>
<tr>
<td>Female (male = 0)</td>
<td>71</td>
<td>18.87</td>
</tr>
<tr>
<td>Credit Card/ATM (paymethod = 1)</td>
<td>137</td>
<td>18.93</td>
</tr>
<tr>
<td>Cash/Check (paymethod = 0)</td>
<td>79</td>
<td>20.83</td>
</tr>
</tbody>
</table>
Table 9 – Results from FGLS Model (N = 216)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>P-value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln($ tip)</td>
<td>dependent variable</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>constant</td>
<td>.69</td>
<td>.14</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>bill</td>
<td>.03</td>
<td>.004</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>bill2</td>
<td>-.0002</td>
<td>.00003</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>tablesiz2</td>
<td>-.13</td>
<td>.05</td>
<td>.012**</td>
</tr>
<tr>
<td>tablesiz22</td>
<td>.02</td>
<td>.01</td>
<td>.004***</td>
</tr>
<tr>
<td>age</td>
<td>-.004</td>
<td>.001</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>numchecks</td>
<td>.04</td>
<td>.04</td>
<td>.298</td>
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<tr>
<td>service</td>
<td>.15</td>
<td>.06</td>
<td>.011**</td>
</tr>
<tr>
<td>income</td>
<td>.18</td>
<td>.04</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>tipnorm</td>
<td>.04</td>
<td>.01</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>paymethod</td>
<td>.01</td>
<td>.03</td>
<td>.839</td>
</tr>
<tr>
<td>male</td>
<td>.01</td>
<td>.03</td>
<td>.731</td>
</tr>
<tr>
<td>tipperserv</td>
<td>.01</td>
<td>.03</td>
<td>.676</td>
</tr>
<tr>
<td>eb</td>
<td>-.03</td>
<td>.05</td>
<td>.528</td>
</tr>
<tr>
<td>melito</td>
<td>.04</td>
<td>.04</td>
<td>.279</td>
</tr>
<tr>
<td>memphis</td>
<td>.02</td>
<td>.05</td>
<td>.661</td>
</tr>
<tr>
<td>grapevine</td>
<td>.01</td>
<td>.04</td>
<td>.711</td>
</tr>
<tr>
<td>serversex</td>
<td>-.04</td>
<td>.03</td>
<td>.158</td>
</tr>
<tr>
<td>religion</td>
<td>-.002</td>
<td>.03</td>
<td>.940</td>
</tr>
<tr>
<td>married</td>
<td>.01</td>
<td>.03</td>
<td>.704</td>
</tr>
<tr>
<td>friday</td>
<td>-.01</td>
<td>.02</td>
<td>.621</td>
</tr>
<tr>
<td>regular</td>
<td>.02</td>
<td>.03</td>
<td>.436</td>
</tr>
<tr>
<td>R2</td>
<td>.782^20</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>F-Statistic</td>
<td>1218.00</td>
<td>----</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>Shapiro-Wilk Normality Test</td>
<td>----</td>
<td>----</td>
<td>.272</td>
</tr>
<tr>
<td>Skewness-Kurtosis Test for Normality</td>
<td>----</td>
<td>----</td>
<td>.112^</td>
</tr>
<tr>
<td>RESET Linearity Test</td>
<td>----</td>
<td>----</td>
<td>.394</td>
</tr>
<tr>
<td>Cook-Weisberg Heteroskedasticity Test</td>
<td>----</td>
<td>----</td>
<td>.076*</td>
</tr>
</tbody>
</table>

***Significant at 1%, **Significant at 5%, *Significant at 10%, ^Significant at 15%

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20 The R^2 presented here comes from the original, pre-FGLS model. This is because a traditional R^2 is meaningless in an FGLS model.
REFERENCES


Appendix A

Instructions, Decision Sheets, and Post-Experiment Questionnaire from tipping experiment.
This is an experiment in economic decision-making. You will be paid $5 just for arriving on time. As well, you may earn an additional amount of money.

You have been randomly assigned a role (either A or B), according to the card you drew at the counter. Everyone in this room is in role A. You will be paired with different counterparts in the adjacent room to participate in seven decisions. You will not learn the identity of your counterparts, nor will they learn yours. In some decisions, you will also be randomly paired with one or more of your co-participants here in room A. These co-participant pairings have already been determined beforehand, as such, according to player number. However, as you have not yet received your player number, and player numbers will be distributed randomly, these co-participant pairings are random.

The card you are about to receive has several numbers written on it. One of these numbers is your player number, and is labeled as such. Your player number will be used for payment purposes. The other numbers on the card are your decision-maker numbers. You will have a different, and unique, decision-maker number in each of the seven decisions. Keep this card handy at all times, as you will need to refer to it throughout the experiment.

The counterparts in Room B will also have different, and unique, decision-maker numbers for each of the seven decisions. This is so that you will not know the identity of your counterpart in any given decision.

You will be paid, in cash, for one out of seven decisions. Everyone, including the counterparts in Room B, will be paid for the same decision. The decision for which you and everyone else will be paid will be randomly determined at the end of the experiment: Once all of the decisions have been completed, we will ask everyone to complete a short questionnaire, which will be used for research purposes only. Then, everyone will be brought together into one of the two rooms. The monitor will then show everyone the contents of a bag, containing seven poker chips (one for each decision). The chips will be placed back in the bag and the monitor will then ask a volunteer subject to draw a chip from the bag. The chip drawn will correspond to the decision for which you, and everyone else, will get paid. Your best strategy is to take every decision seriously, as that decision might be the one for which you get paid.

Subjects will be dismissed one at a time for payment. When your player number is called, come to the counter at the entrance. You will be paid and then asked to fill out a receipt form. Once you have completed the receipt form, you are done with the experiment and may leave.

In order to keep track of your earnings in each decision, you will be given a record-keeping sheet. On it, you should write down the amount that you earn in each decision.

Throughout the entire experiment, YOU MUST REMAIN QUIET! Failure to do so will result in dismissal from the experiment and forfeiture of payment.

ARE THERE ANY QUESTIONS?
For each of the decisions in which you participate, you will have a counterpart from Room B. Right now, the two counterparts in Room B are completing a skill task. They will then be ranked into one of two groups, according to their performance on the skill task. The top performer on the skill task will be ranked into Group 1, while the bottom performer will be ranked into Group 2. For a given decision, your counterpart’s ranking will determine an amount of money to be divided between you and the counterpart. A Group 1 ranking will always imply a higher division amount than a Group 2 ranking.

The counterparts will complete the skill task a total of 7 times today, once before each decision. Thus, a given counterpart’s ranking may, or may not, be the same in each decision.
DECISION RED – ROOM A (DO NOT WRITE ON)

For this decision, you will be asked to sit at one of the tables. You will be randomly matched with a counterpart in Room B. You will not know who this person is, and this person will not know who you are, either during or after your decision.

Your counterpart’s ranking, as determined by his/her skill, determines an amount of money to be divided between the two of you:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$28</td>
</tr>
<tr>
<td>Group 2</td>
<td>$14</td>
</tr>
</tbody>
</table>

The monitor in the adjacent room will record your counterpart’s rank, your counterpart’s decision-maker number for this decision, and the amount to be divided, as determined by your counterpart’s skill, on a decision sheet. The monitor will then bring the sheet over to this room, where it will be distributed to you. Please make sure to put your decision-maker number for decision RED on the sheet where it asks you to (refer to the card given to you at the beginning of the experiment).

You must then indicate on the decision sheet how much money you wish to allocate to your counterpart, if any, and how much money you wish to keep for yourself. These values must exhaust the division amount shown on the decision sheet. For example, if your counterpart earned a Group 1 rank, then an allocation to your counterpart of $x implies you keep ($28 - $x) for yourself. The decision is totally up to you, and must be in increments of $.25. When you are done, please wait for the monitor to come by and collect your decision sheet. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

The monitor will then take the decision sheet over to the adjacent room, where it will be shown to your counterpart.

**An Example**

Suppose your counterpart, whose decision-maker number for decision RED is 1001, earned a Group 1 rank. This implies an amount to be divided of $28. Suppose your decision-maker number for decision RED is 1002. Further, suppose you wish to allocate $5.75 to your counterpart and keep $22.25 for yourself. You will record these values as illustrated by the monitor, and then wait for the monitor to come by and collect the decision sheet. The decision sheet will then be brought over to Room B, for your counterpart to look at. In this example, you would earn $22.25 and your counterpart would earn $5.75. **This is only an example – the actual decision is totally up to you.**

ARE THERE ANY QUESTIONS?
DECISION YELLOW – ROOM A (DO NOT WRITE ON)

For this decision, you have been randomly matched with a co-participant in this room. You and your randomly matched co-participant will be asked to sit at one of the tables, across from each other. You and your co-participant will then be randomly assigned a counterpart in Room B. Neither you nor your co-participant will know who this person is, and this person will not know who you all are, either during or after the decision.

The counterpart’s ranking, as determined by his/her skill, determines an amount of money to be divided among you, your co-participant, and the counterpart:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$56</td>
</tr>
<tr>
<td>Group 2</td>
<td>$28</td>
</tr>
</tbody>
</table>

The monitor in the adjacent room will record the counterpart’s rank, the counterpart’s decision-maker number for this decision, and the amount to be divided, as determined by the counterpart’s skill, on a decision sheet. The total division amount determined by the counterpart in Room B will be evenly allocated between you and your co-participant here in Room A. For example, if the counterpart’s rank is Group 1, you and your co-participant will each receive $28 to divide with the counterpart.

The monitor will then bring the sheet over to this room, where it will be distributed to you and your co-participant. The sheet will be placed on the clipboard in front of you and your co-participant. The clipboard must remain in its initial position at all times. Please make sure to put your decision-maker number for decision YELLOW on the sheet where it asks you to (refer to the card given to you at the beginning of the experiment).

You must then indicate on the decision sheet how much money you wish to allocate to your counterpart, if any, and how much money you wish to keep for yourself. These values must exhaust the division amount shown on the decision sheet. For example, if your counterpart earned a Group 1 rank, then an allocation to your counterpart of $x implies you keep $(28 - x)$ for yourself. The decision is totally up to you, and must be in increments of $.25. When you are done, leave the decision sheet on the clipboard and wait for the monitor to come by and collect it. We ask that you not discuss your decision with your co-participant. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

The monitor will then take the decision sheet over to the adjacent room, where it will be shown to you and your co-participant’s counterpart.

An Example

Suppose your counterpart, whose decision-maker number for decision YELLOW is 1003, earned a Group 1 rank. This implies an amount to be divided of $56. Thus, you and your co-participant EACH will receive $28 to allocate between yourself and the counterpart in Room B. Suppose you and your co-participant’s decision-maker numbers for decision YELLOW, respectively, are 1004 and 1005. Further, suppose you wish to allocate $2.50 to your counterpart and keep $25.50 for yourself, and your co-participant wishes to allocate $15 to the counterpart and keep $13 for himself/herself. Each of you will record these values as illustrated by the monitor on the decision sheet, and then wait for the monitor to come by and collect it. In this example, you would earn $25.50, your co-participant would earn $13, and your counterpart would earn $2.50 + $15 = $17.50. This is only an example – the actual decision is totally up to you.

ARE THERE ANY QUESTIONS?
DECISION BLACK – ROOM A (DO NOT WRITE ON)

For this decision, you have been randomly matched with a co-participant in this room. You and your randomly matched co-participant will be asked to sit at one of the tables, across from each other. You and your co-participant will then be randomly assigned a counterpart in Room B. Neither you nor your co-participant will know who this person is, and this person will not know who you all are, either during or after the decision.

The counterpart’s ranking, as determined by his/her skill, determines an amount of money to be divided among you, your co-participant, and the counterpart:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$56</td>
</tr>
<tr>
<td>Group 2</td>
<td>$28</td>
</tr>
</tbody>
</table>

The monitor in the adjacent room will record the counterpart’s rank, the counterpart’s decision-maker number for this decision, and the amount to be divided, as determined by the counterpart’s skill, on 2 decision sheets. The total division amount determined by the counterpart in Room B will be evenly allocated between you and your co-participant here in Room A. For example, if the counterpart’s rank is Group 1, you and your co-participant will each receive $28 to divide with the counterpart.

The monitor will then bring the sheets over to this room, where they will be distributed to you and your co-participant. Please make sure to put your decision-maker number for decision BLACK on the sheet where it asks you to (refer to the card given to you at the beginning of the experiment).

You must then indicate on the decision sheet how much money you wish to allocate to your counterpart, if any, and how much money you wish to keep for yourself. These values must exhaust the division amount shown on the decision sheet. For example, if your counterpart earned a Group 1 rank, then an allocation to your counterpart of $x implies you keep ($28 - $x) for yourself. The decision is totally up to you, and must be in increments of $.25. When you are done, fold the decision sheet and then wait for the monitor to come by and collect it. We ask that you not discuss your decision with your co-participant. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

The monitor will then take the decision sheet over to the adjacent room, where it will be shown to you and your co-participant’s counterpart.

An Example

Suppose your counterpart, whose decision-maker number for decision BLACK is 1006, earned a Group 1 rank. This implies an amount to be divided of $56. Thus, you and your co-participant EACH receive $28 to allocate between yourselves and the counterpart in Room B. Suppose your decision-maker number for decision BLACK is 1007. Further, suppose you wish to allocate $18.75 to your counterpart and keep $9.25 for yourself. You will record this allocation as illustrated by the monitor on your decision sheet, fold your decision sheet, and then wait for the monitor to come by and collect it. In this example, you would earn $9.25 and your counterpart would earn $18.75 plus whatever your co-participant decided to allocate to the counterpart. This is only an example – the actual decision is totally up to you.

ARE THERE ANY QUESTIONS?
For this decision, you have been randomly matched with 2 co-participants in this room. You and your randomly matched co-participants will be asked to sit at one of the tables, across from each other. You and your 2 co-participants will then be randomly assigned a counterpart in Room B. Neither you nor your 2 co-participants will know who this person is, and this person will not know who you all are, either during or after the decision.

The counterpart’s ranking, as determined by his/her skill, determines an amount of money to be divided among you, your 2 co-participants, and the counterpart:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$84</td>
</tr>
<tr>
<td>Group 2</td>
<td>$42</td>
</tr>
</tbody>
</table>

The monitor in the adjacent room will record the counterpart’s rank, the counterpart’s decision-maker number for this decision, and the amount to be divided, as determined by the counterpart’s skill, on a decision sheet. The total division amount determined by the counterpart in Room B will be evenly allocated between you and your 2 co-participants here in Room A. For example, if the counterpart’s rank is Group 1, you and your 2 co-participants will each receive $28 to divide with the counterpart.

The monitor will then bring the sheet over to this room, where it will be distributed to you and your 2 co-participants. The sheet will be placed on the clipboard in front of you and your 2 co-participants. The clipboard must remain in its initial position at all times. Please make sure to put your decision-maker number for decision BLUE on the sheet where it asks you to (refer to the card given to you at the beginning of the experiment).

You must then indicate on the decision sheet how much money you wish to allocate to your counterpart, if any, and how much money you wish to keep for yourself. These values must exhaust the division amount shown on the decision sheet. For example, if your counterpart earned a Group 1 rank, then an allocation to your counterpart of $x implies you keep ($28 - $x) for yourself. The decision is totally up to you, and must be in increments of $.25. When you are done, leave the decision sheet on the clipboard and wait for the monitor to come by and collect it. We ask that you not discuss your decision with your 2 co-participants. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

The monitor will then take the decision sheet over to the adjacent room, where it will be shown to you and your co-participants’ counterpart.

**An Example**

Suppose your counterpart, whose decision-maker number for decision BLUE is 1008, earned a Group 1 rank. This implies an amount to be divided of $84. Thus, you and your 2 co-participants EACH will receive $28 to allocate between yourselves and the counterpart in Room B. Suppose you and your 2 co-participants’ decision-maker numbers for decision BLUE are 1009, 1010, and 1011. Further, suppose you wish to allocate $3.25 to your counterpart and keep $24.75 for yourself, one of your co-participants wishes to allocate $8 to the counterpart and keep $20 for himself/herself, and the other co-participant wishes to allocate $15.75 to the counterpart and keep $12.25 for himself/herself. Each of you will record these values as illustrated by the monitor on the decision sheet, and then wait for the monitor to come by and collect it. In this example, you would earn $24.75, one co-participant would earn $20, the other co-participant would earn $12.25, and your counterpart would earn $3.25 + $8 + $15.75 = $27. **This is only an example – the actual decision is totally up to you.**

ARE THERE ANY QUESTIONS?
DECISION GREEN – ROOM A (DO NOT WRITE ON)

For this decision, you have been randomly matched with 2 co-participants in this room. You and your randomly matched co-participants will be asked to sit at one of the tables, across from each other. You and your 2 co-participants will then be randomly assigned a counterpart in Room B. Neither you nor your 2 co-participants will know who this person is, and this person will not know who you all are, either during or after the decision.

The counterpart’s ranking, as determined by his/her skill, determines an amount of money to be divided among you, your 2 co-participants, and the counterpart:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$84</td>
</tr>
<tr>
<td>Group 2</td>
<td>$42</td>
</tr>
</tbody>
</table>

The monitor in the adjacent room will record the counterpart’s rank, the counterpart’s decision-maker number for this decision, and the amount to be divided, as determined by the counterpart’s skill, on 3 decision sheets. The total division amount determined by the counterpart in Room B will be evenly allocated between you and your 2 co-participants here in Room A. For example, if the counterpart’s rank is Group 1, you and your 2 co-participants will each receive $28 to divide with the counterpart.

The monitor will then bring the sheets over to this room, where they will be distributed to you and your 2 co-participants. Please make sure to put your decision-maker number for decision GREEN on the sheet where it asks you to (refer to the card given to you at the beginning of the experiment).

You must then indicate on the decision sheet how much money you wish to allocate to your counterpart, if any, and how much money you wish to keep for yourself. These values must exhaust the division amount shown on the decision sheet. For example, if your counterpart earned a Group 1 rank, then an allocation to your counterpart of $x implies you keep ($28 - $x) for yourself. The decision is totally up to you, and must be in increments of $.25. When you are done, fold the decision sheet and then wait for the monitor to come by and collect it. We ask that you not discuss your decision with your 2 co-participants. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

The monitor will then take the decision sheet over to the adjacent room, where it will be shown to you and your 2 co-participants’ counterpart.

An Example

Suppose your counterpart, whose decision-maker number for decision GREEN is 1012, earned a Group 1 rank. This implies an amount to be divided of $84. Thus, you and your 2 co-participants EACH receive $28 to allocate between yourselves and the counterpart in Room B. Suppose your decision-maker number for decision GREEN is 1013. Further, suppose you wish to allocate $4.25 to your counterpart and keep $23.75 for yourself. You will record this allocation as illustrated by the monitor on your decision sheet, fold your decision sheet, and then wait for the monitor to come by and collect it. In this example, you would earn $23.75 and your counterpart would earn $4.25 plus whatever each of your 2 co-participants decided to allocate to the counterpart. This is only an example – the actual decision is totally up to you.

ARE THERE ANY QUESTIONS?
DETECTION BROWN – ROOM A  (DO NOT WRITE ON)

For this decision, you have been matched with 5 co-participants in this room. You and your co-participants will be asked to sit at one of the tables, across from each other. You and your 5 co-participants will then be randomly assigned a counterpart in Room B. Neither you nor your 5 co-participants will know who this person is, and this person will not know who you all are, either during or after the decision.

The counterpart’s ranking, as determined by his/her skill, determines an amount of money to be divided among you, your 5 co-participants, and the counterpart:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$168</td>
</tr>
<tr>
<td>Group 2</td>
<td>$84</td>
</tr>
</tbody>
</table>

The monitor in the adjacent room will record the counterpart’s rank, the counterpart’s decision-maker number for this decision, and the amount to be divided, as determined by the counterpart’s skill, on a decision sheet. The total division amount determined by the counterpart in Room B will be evenly allocated between you and your 5 co-participants here in Room A. For example, if the counterpart’s rank is Group 1, you and your 5 co-participants will each receive $28 to divide with the counterpart.

The monitor will then bring the sheet over to this room, where it will be distributed to you and your 5 co-participants. The sheet will be placed on the clipboard in front of you and your co-participants. The clipboard must remain in its initial position at all times. Please make sure to put your decision-maker number for decision BROWN on the sheet where it asks you to (refer to the card given to you at the beginning of the experiment).

You must then indicate on the decision sheet how much money you wish to allocate to your counterpart, if any, and how much money you wish to keep for yourself. These values must exhaust the division amount shown on the decision sheet. For example, if your counterpart earned a Group 1 rank, then an allocation to your counterpart of $x implies you keep ($28 - $x) for yourself. The decision is totally up to you, and must be in increments of $.25. When you are done, leave the decision sheet on the clipboard and wait for the monitor to come by and collect it. We ask that you not discuss your decision with your co-participants. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

The monitor will then take the decision sheet over to the adjacent room, where it will be shown to you and your 5 co-participants’ counterpart.

An Example

Suppose your counterpart, whose decision-maker number for decision BROWN is 1014, earned a Group 1 rank. This implies an amount to be divided of $168. Thus, you and your 5 co-participants EACH will receive $28 to allocate between yourselves and the counterpart in Room B. Suppose you and your co-participants’ decision-maker numbers for decision BROWN, respectively, are 1015, 1016, 1017, 1018, 1019, and 1020. Further, suppose you wish to allocate $1.50 to the counterpart and keep $26.50 for yourself, one co-participant wishes to allocate $9 to the counterpart and keep $19 for himself/herself, another wishes to allocate $14.25 to the counterpart and keep $13.75 for himself/herself, another wishes to allocate $17.50 to the counterpart and keep $10.50 for himself/herself, another wishes to allocate $19.25 to the counterpart and keep $8.75 for himself/herself, and another wishes to allocate $12 to the counterpart and keep $16 for himself/herself. Each of you will record these values as illustrated by the monitor on the decision sheet, and then wait for the monitor to come by and collect it. In this example, you would earn $26.50, one co-participant would earn $19, another would earn $13.75, another would earn $10.50, another would earn $8.75, another would earn $16, and your counterpart would earn $1.50 + $9 + $14.25 + $17.50 + $19.25 + $12 = $73.50. This is only an example – the actual decision is totally up to you.

ARE THERE ANY QUESTIONS?
For this decision, you have been randomly matched with 5 co-participants in this room. You and your
randomly matched co-participants will be asked to sit at one of the tables, across from each other. You and
your 5 co-participants will then be randomly assigned a counterpart in Room B. Neither you nor your 5 co-
participants will know who this person is, and this person will not know who you all are, either during or
after the decision.

The counterpart’s ranking, as determined by his/her skill, determines an amount of money to be divided
among you, your 5 co-participants, and the counterpart:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$168</td>
</tr>
<tr>
<td>Group 2</td>
<td>$84</td>
</tr>
</tbody>
</table>

The monitor in the adjacent room will record the counterpart’s rank, the counterpart’s decision-maker
number for this decision, and the amount to be divided, as determined by the counterpart’s skill, on 6
decision sheets. The total division amount determined by the counterpart in Room B will be evenly
allocated between you and your 5 co-participants here in Room A. For example, if the counterpart’s rank is
Group 1, you and your co-participants will each receive $28 to divide with the counterpart.

The monitor will then bring the sheets over to this room, where they will be distributed to you and your 5
cooparticipants. Please make sure to put your decision-maker number for decision ORANGE on the
sheet where it asks you to (refer to the card given to you at the beginning of the experiment).

You must then indicate on the decision sheet how much money you wish to allocate to your counterpart, if
any, and how much money you wish to keep for yourself. These values must exhaust the division amount
shown on the decision sheet. For example, if your counterpart earned a Group 1 rank, then an allocation to
your counterpart of $x implies you keep ($28 - $x) for yourself. The decision is totally up to you, and must
be in increments of $.25. When you are done, fold the decision sheet and then wait for the monitor to come
by and collect it. We ask that you not discuss your decision with your co-participants. Finally, make sure
to record your earnings for this decision on your record-keeping sheet.

The monitor will then take the decision sheet over to the adjacent room, where it will be shown to you and
your 5 co-participants’ counterpart.

An Example

Suppose your counterpart, whose decision-maker number for decision ORANGE is 1021, earned a Group 1
rank. This implies an amount to be divided of $168. Thus, you and your 5 co-participants EACH receive
$28 to allocate between yourselves and the counterpart in Room B. Suppose your decision-maker number
for decision ORANGE is 1022. Further, suppose you wish to allocate $13.50 to your counterpart and keep
$14.50 for yourself. You will record this allocation as illustrated by the monitor on your decision sheet,
fold your decision sheet, and then wait for the monitor to come by and collect it. In this example, you
would earn $14.50 and your counterpart would earn $13.50 plus whatever each of your 5 co-participants
decided to allocate to the counterpart. This is only an example – the actual decision is totally up to you.

ARE THERE ANY QUESTIONS?
This is an experiment in economic decision-making. You will be paid $5 just for arriving on time. As well, you may earn an additional amount of money.

You have been randomly assigned a role (either A or B), according to the card you drew at the counter. Everyone in this room is in role B. You will be paired with different counterparts in the adjacent room to participate in seven decisions. You will not learn the identity of your counterparts, nor will they learn yours.

The card you are about to receive has several numbers written on it. One of these numbers is your player number, and is labeled as such. Your player number will be used for payment purposes. The other numbers on the card are your decision-maker numbers. You will have a different, and unique, decision-maker number in each of the seven decisions.

The counterparts in Room A will also have different, and unique, decision-maker numbers for each of the seven decisions. This is so that you will not know the identity of your counterpart in any given decision.

You will be paid, in cash, for one out of seven decisions. Everyone, including the counterparts in Room A, will be paid for the same decision. The decision for which you and everyone else will be paid will be randomly determined at the end of the experiment: Once all of the decisions have been completed, we will ask everyone to complete a short questionnaire, which will be used for research purposes only. Then, everyone will be brought together into one of the two rooms. The monitor will then show everyone the contents of a bag, containing seven poker chips (one for each decision). The chips will be placed back in the bag and the monitor will then ask a volunteer subject to draw a chip from the bag. The chip drawn will correspond to the decision for which you, and everyone else, will get paid. Your best strategy is to take every decision seriously, as that decision might be the one for which you get paid.

Subjects will be dismissed one at a time for payment. When your player number is called, come to the counter at the entrance. You will be paid and then asked to fill out a receipt form. Once you have completed the receipt form, you are done with the experiment and may leave.

In order to keep track of your earnings in each decision, you will be given a record-keeping sheet. On it, you should write down the amount that you earn in each decision.

Finally, throughout the entire experiment, YOU MUST REMAIN QUIET! Failure to do so will result in dismissal from the experiment and forfeiture of payment.

ARE THERE ANY QUESTIONS?
You will be given 2 minutes to complete a word search puzzle. Once the 2 minutes have expired, your word search will be scored according to the total number of words you found. The more words you find, the higher will be your score. You will then be ranked into one of two groups: Group 1 is the group with the higher score on the word search puzzle and Group 2 is the group with the lower score on the word search puzzle. In the event of a tie, another word search puzzle will be administered to break the tie.

The above word search puzzle process will be completed a total of 7 times today, once before each decision. Thus, your ranking may, or may not, be the same in each decision. Your ranking in a given decision will determine an amount of money to be divided between you and several different counterparts in the adjacent room. A higher ranking (i.e. Group 1) implies a higher division amount.
DECISION RED – ROOM B (DO NOT WRITE ON)

For this decision, you will be randomly matched with a counterpart in Room A. You will not know who this person is, and this person will not know who you are, either during or after this decision.

Your ranking determines an amount of money to be divided between you and your counterpart. For this decision, the amounts are indicated below:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$28</td>
</tr>
<tr>
<td>Group 2</td>
<td>$14</td>
</tr>
</tbody>
</table>

The monitor in this room will record your rank, your decision-maker number for this decision, and the amount to be divided, as determined by your ranking, on a decision sheet. The monitor will then bring the sheet over to Room A, where it will be randomly distributed to a counterpart.

Your counterpart must then indicate on the decision sheet how much money he/she wishes to allocate to you, if any, and how much money he/she wishes to keep for himself/herself. The decision is totally up to your counterpart, and must be in increments of $.25. When your counterpart is done, the monitor in Room A will come by and collect his/her decision sheet. The monitor will then bring the decision sheet over to this room, where it will be shown to you. The monitor will then walk by and collect the decision sheet. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

An Example

Suppose you earned a Group 1 rank, and that your decision-maker number for decision RED is 1023. This implies an amount to be divided of $28 between you and your counterpart. The monitor in this room will record this information on a decision sheet as such, and then bring it over to Room A. Suppose your counterpart, who has a decision-maker number of 1024 for decision RED, wishes to allocate $5.75 to you and keep $22.25 for himself/herself. Your counterpart will record these values as illustrated by the monitor, and then wait for the monitor to come by and collect the decision sheet. The decision sheet will then be brought back over to this room for you to look at. In this example, you would earn $5.75. This is only an example – the actual decision is totally up to your counterpart.

NOTE: AS THERE ARE 12 PERSONS IN ROOM A, AND ONLY 2 HERE IN ROOM B, YOU WILL PARTICIPATE IN 6 DECISION REDS. FOR EACH, YOU WILL HAVE A DIFFERENT COUNTERPART.

ARE THERE ANY QUESTIONS?
DECISION YELLOW – ROOM B (DO NOT WRITE ON)

For this decision, you have been randomly matched with 2 counterparts in Room A. Your 2 counterparts will be asked to sit at a table, across from each other. You will not know who these persons are, and they will not know who you are, either during or after this decision.

Your ranking determines an amount of money to be divided among you and your 2 counterparts. For this decision, the amounts are indicated below:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$56</td>
</tr>
<tr>
<td>Group 2</td>
<td>$28</td>
</tr>
</tbody>
</table>

The monitor in this room will record your rank, your decision-maker number for this decision, and the amount to be divided, as determined by your skill, on a decision sheet. The total division amount determined by your rank will be evenly allocated between your 2 counterparts in Room A. For example, if your rank is Group 1, your 2 counterparts will each receive $28 to divide with you.

The monitor will then bring the sheet over to Room A, where it will be randomly distributed to your 2 counterparts. The sheet will be placed on a clipboard in front of your 2 counterparts. This clipboard will remain stationary at all times.

Each of your counterparts must then independently indicate on the decision sheet how much money each wishes to allocate to you, if any, and how much money each wishes to keep for himself/herself. The decision is totally up to each of them, and must be in increments of $.25. Each of your counterparts will be instructed NOT to discuss their decision with each other. When they are done, they will leave the decision sheet on the clipboard and wait for the monitor to come by and pick it up. The monitor will then bring the decision sheet over to this room, where it will be shown to you. The monitor will then walk by and collect the decision sheet. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

An Example

Suppose you earned a Group 1 rank, and that your decision-maker number for decision YELLOW is 1025. This implies an amount to be divided of $56 between you and your 2 counterparts. Each counterpart will thus receive $28 to divide with you. The monitor in this room will record this information on a decision sheet as such, and then bring it over to Room A. Suppose one counterpart, who has a decision-maker number of 1026 for decision YELLOW, wishes to allocate $2.50 to you and keep $25.50 for himself/herself. The other counterpart, who has a decision-maker number of 1027 for decision YELLOW, wishes to allocate $15 to you and keep $13 for himself/herself. Your 2 counterparts will record these values as illustrated by the monitor, and then wait for the monitor to come by and collect the decision sheet. The decision sheet will then be brought back over to this room for you to look at. In this example, you would earn $2.50 + $15 = $17.50. This is only an example – the actual decision is totally up to each of your 2 counterparts.

NOTE: AS THERE ARE 12 PERSONS IN ROOM A, AND ONLY 2 HERE IN ROOM B, YOU WILL PARTICIPATE IN 3 DECISION YELLOWS. FOR EACH, YOU WILL HAVE DIFFERENT COUNTERPARTS.

ARE THERE ANY QUESTIONS?
DECISION BLACK – ROOM B (DO NOT WRITE ON)

For this decision, you have been randomly matched with 2 counterparts in Room A. Your 2 counterparts will be asked to sit at a table, across from each other. You will not know who these persons are, and they will not know who you are, either during or after this decision.

Your ranking determines an amount of money to be divided among you and your 2 counterparts. For this decision, the amounts are indicated below:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$56</td>
</tr>
<tr>
<td>Group 2</td>
<td>$28</td>
</tr>
</tbody>
</table>

The monitor in this room will record your rank, your decision-maker number for this decision, and the amount to be divided, as determined by your skill, on 2 decision sheets. The total division amount determined by your rank will be evenly allocated between your 2 counterparts in Room A. For example, if your rank is Group 1, your 2 counterparts will each receive $28 to divide with you.

The monitor will then bring the sheets over to Room A, where they will be randomly distributed to your 2 counterparts. Each of your counterparts must then independently indicate on the decision sheet how much money each wishes to allocate to you, if any, and how much money each wishes to keep for himself/herself. The decision is totally up to each of them, and must be in increments of $.25. Each of your counterparts will be instructed NOT to discuss their decision with each other. When they are done, they will fold their decision sheet, and then wait for the monitor to come by and pick it up. The monitor will then bring the decision sheets over to this room, where they will be shown to you. The monitor will then walk by and collect the decision sheets. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

An Example

Suppose you earned a Group 1 rank, and that your decision-maker number for decision BLACK is 1028. This implies an amount to be divided of $56 between you and your 2 counterparts. Each counterpart will thus receive $28 to divide with you. The monitor in this room will record this information on 2 decision sheets, and then bring them over to Room A. Suppose one of the 2 counterparts, who has a decision-maker number of 1029 for decision BLACK, wishes to allocate $2.50 to you and keep $25.50 for himself/herself. The counterpart will record these values as illustrated by the monitor, and then wait for the monitor to come by and collect his/her decision sheet. Both counterparts’ decision sheets will then be brought back over to this room for you to look at. In this example, you would earn $2.50 plus whatever the other counterpart decided to allocate to you. **This is only an example – the actual decision is totally up to each of your 2 counterparts.**

NOTE: AS THERE ARE 12 PERSONS IN ROOM A, AND ONLY 2 HERE IN ROOM B, YOU WILL PARTICIPATE IN 3 DECISION BLACKS. FOR EACH, YOU WILL HAVE DIFFERENT COUNTERPARTS.

ARE THERE ANY QUESTIONS?
DECISION BLUE – ROOM B (DO NOT WRITE ON)

For this decision, you have been randomly matched with 3 counterparts in Room A. Your 3 counterparts will be asked to sit at a table, across from each other. You will not know who these persons are, and they will not know who you are, either during or after this decision.

Your ranking determines an amount of money to be divided among you and your 3 counterparts. For this decision, the amounts are indicated below:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$84</td>
</tr>
<tr>
<td>Group 2</td>
<td>$42</td>
</tr>
</tbody>
</table>

The monitor in this room will record your rank, your decision-maker number for this decision, and the amount to be divided, as determined by your skill, on a decision sheet. The total division amount determined by your rank will be evenly allocated between your 3 counterparts in Room A. For example, if your rank is Group 1, your 3 counterparts will each receive $28 to divide with you.

The monitor will then bring the sheet over to Room A, where it will be randomly distributed to your 3 counterparts. The sheet will be placed on a clipboard in front of your 3 counterparts. This clipboard will remain stationary at all times.

Each of your counterparts must then independently indicate on the decision sheet how much money each wishes to allocate to you, if any, and how much money each wishes to keep for himself/herself. The decision is totally up to each of them, and must be in increments of $.25. Each of your counterparts will be instructed NOT to discuss their decision with each other. When they are done, they will leave the decision sheet on the clipboard and wait for the monitor to come by and pick it up. The monitor will then bring the decision sheet over to this room, where it will be shown to you. The monitor will then walk by and collect the decision sheet. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

**An Example**

Suppose you earned a Group 1 rank, and that your decision-maker number for decision BLUE is 1031. This implies an amount to be divided of $84 between you and your 3 counterparts. Each counterpart will thus receive $28 to divide with you. The monitor in this room will record this information on a decision sheet as such, and then bring it over to Room A. Suppose one counterpart, who has a decision-maker number of 1032 for decision BLUE, wishes to allocate $3.25 to you and keep $24.75 for himself/herself. Another counterpart, who has a decision-maker number of 1033 for decision BLUE, wishes to allocate $8 to you and keep $20 for himself/herself. The other counterpart, who has a decision-maker number of 1034 for decision BLUE, wishes to allocate $15.75 to you and keep $12.25 for himself/herself. Your 3 counterparts will record these values as illustrated by the monitor, and then wait for the monitor to come by and collect the decision sheet. The decision sheet will then be brought back over to this room for you to look at. In this example, you would earn $3.25 + $8 + $15.75 = $27. **This is only an example – the actual decision is totally up to each of your 3 counterparts.**

**NOTE: AS THERE ARE 12 PERSONS IN ROOM A, AND ONLY 2 HERE IN ROOM B, YOU WILL PARTICIPATE IN 2 DECISION BLUES. FOR EACH, YOU WILL HAVE DIFFERENT COUNTERPARTS.**

ARE THERE ANY QUESTIONS?
DECISION GREEN – ROOM B (DO NOT WRITE ON)

For this decision, you have been randomly matched with 3 counterparts in Room A. Your 3 counterparts will be asked to sit at a table, across from each other. You will not know who these persons are, and they will not know who you are, either during or after this decision.

Your ranking determines an amount of money to be divided among you and your 3 counterparts. For this decision, the amounts are indicated below:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$84</td>
</tr>
<tr>
<td>Group 2</td>
<td>$42</td>
</tr>
</tbody>
</table>

The monitor in this room will record your rank, your decision-maker number for this decision, and the amount to be divided, as determined by your skill, on 3 decision sheets. The total division amount determined by your rank will be evenly allocated between your 3 counterparts in Room A. For example, if your rank is Group 1, your 3 counterparts will each receive $28 to divide with you.

The monitor will then bring the sheets over to Room A, where they will be randomly distributed to your 3 counterparts. Each of your counterparts must then independently indicate on the decision sheet how much money each wishes to allocate to you, if any, and how much money each wishes to keep for himself/herself. The decision is totally up to each of them, and must be in increments of $.25. Each of your counterparts will be instructed NOT to discuss their decision with each other. When they are done, they will fold their decision sheet, and then wait for the monitor to come by and pick it up. The monitor will then bring the decision sheets over to this room, where they will be shown to you. The monitor will then walk by and collect the decision sheets. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

An Example

Suppose you earned a Group 1 rank, and that your decision-maker number for decision GREEN is 1035. This implies an amount to be divided of $84 between you and your 3 counterparts. Each counterpart will thus receive $28 to divide with you. The monitor in this room will record this information on 3 decision sheets as such, and then bring them over to Room A. Suppose one counterpart, who has a decision-maker number of 1036 for decision GREEN, wishes to allocate $3.25 to you and keep $24.75 for himself/herself. The counterpart will record these values as illustrated by the monitor, and then wait for the monitor to come by and collect his/her decision sheet. All three counterparts’ decision sheets will then be brought back over to this room for you to look at. In this example, you would earn $3.25 plus whatever the other 2 counterparts decided to allocate to you. This is only an example – the actual decision is totally up to each of your 3 counterparts.

NOTE: AS THERE ARE 12 PERSONS IN ROOM A, AND ONLY 2 HERE IN ROOM B, YOU WILL PARTICIPATE IN 2 DECISION GREENS. FOR EACH, YOU WILL HAVE DIFFERENT COUNTERPARTS.

ARE THERE ANY QUESTIONS?
DECISION BROWN – ROOM B (DO NOT WRITE ON)

For this decision, you have been randomly matched with 6 counterparts in Room A. Your 6 counterparts will be asked to sit at a table, across from each other. You will not know who these persons are, and they will not know who you are, either during or after this decision.

Your ranking determines an amount of money to be divided among you and your 6 counterparts. For this decision, the amounts are indicated below:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$168</td>
</tr>
<tr>
<td>Group 2</td>
<td>$84</td>
</tr>
</tbody>
</table>

The monitor in this room will record your rank, your decision-maker number for this decision, and the amount to be divided, as determined by your skill, on a decision sheet. The total division amount determined by your rank will be evenly allocated between your 6 counterparts in Room A. For example, if your rank is Group 1, your 6 counterparts will each receive $28 to divide with you.

The monitor will then bring the sheet over to Room A, where it will be distributed to your 6 counterparts. The sheet will be placed on a clipboard in front of your 6 counterparts. This clipboard will remain stationary at all times.

Each of your counterparts must then independently indicate on the decision sheet how much money each wishes to allocate to you, if any, and how much money each wishes to keep for himself/herself. The decision is totally up to each of them, and must be in increments of $.25. Each of your counterparts will be instructed NOT to discuss their decision with each other. When they are done, they will leave the decision sheet on the clipboard and wait for the monitor to come by and pick it up. The monitor will then bring the decision sheet over to this room, where it will be shown to you. The monitor will then walk by and collect the decision sheet. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

An Example

Suppose you earned a Group 1 rank, and that your decision-maker number for decision BROWN is 1039. This implies an amount to be divided of $168 between you and your counterparts. Each counterpart will thus receive $28 to divide with you. The monitor in this room will record this information on a decision sheet as such, and then bring it over to Room A. Suppose one counterpart, who has a decision-maker number of 1040 for decision BROWN, wishes to allocate $1.50 to you and keep $26.50 for himself/herself. Another counterpart, who has a decision-maker number of 1041 for decision BROWN, wishes to allocate $9 to you and keep $19 for himself/herself. Another counterpart, who has a decision-maker number of 1042 for decision BROWN, wishes to allocate $14.25 to you and keep $13.75 for himself/herself. Another counterpart, who has a decision-maker number of 1043 for decision BROWN, wishes to allocate $17.50 to you and keep $10.50 for himself/herself. Another counterpart, who has a decision-maker number of 1044 for decision BROWN, wishes to allocate $19.25 to you and keep $8.75 for himself/herself. Another counterpart, who has a decision-maker number of 1045 for decision BROWN, wishes to allocate $12 to you and keep $16 for himself/herself. Your 6 counterparts will record these values as illustrated by the monitor, and then wait for the monitor to come by and collect the decision sheet. The decision sheet will then be brought back over to this room for you to look at. In this example, you would earn $1.50 + $9 + $14.25 + $17.50 + $19.25 + $12 = $73.50. This is only an example – the actual decision is totally up to each of your 6 counterparts.

ARE THERE ANY QUESTIONS?
DECISION ORANGE – ROOM B (DO NOT WRITE ON)

For this decision, you have been randomly matched with 6 counterparts in Room A. Your 6 counterparts will be asked to sit at a table, across from each other. You will not know who these persons are, and they will not know who you are, either during or after this decision.

Your ranking determines an amount of money to be divided among you and your 6 counterparts. For this decision, the amounts are indicated below:

<table>
<thead>
<tr>
<th>RANK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>$168</td>
</tr>
<tr>
<td>Group 2</td>
<td>$84</td>
</tr>
</tbody>
</table>

The monitor in this room will record your rank, your decision-maker number for this decision, and the amount to be divided, as determined by your skill, on 6 decision sheets. The total division amount determined by your rank will be evenly allocated between your 6 counterparts in Room A. For example, if your rank is Group 1, your 6 counterparts will each receive $28 to divide with you.

The monitor will then bring the sheets over to Room A, where they will be randomly distributed to your 6 counterparts. Each of your counterparts must then independently indicate on the decision sheet how much money each wishes to allocate to you, if any, and how much money each wishes to keep for himself/herself. The decision is totally up to each of them, and must be in increments of $.25. Each of your counterparts will be instructed NOT to discuss their decision with each other. When they are done, they will fold their decision sheet, and then wait for the monitor to come by and pick it up. The monitor will then bring the decision sheets over to this room, where they will be shown to you. The monitor will then walk by and collect the decision sheets. Finally, make sure to record your earnings for this decision on your record-keeping sheet.

**An Example**

Suppose you earned a Group 1 rank, and that your decision-maker number for decision ORANGE is 1046. This implies an amount to be divided of $168 between you and your 6 counterparts. Each counterpart will thus receive $28 to divide with you. The monitor in this room will record this information on 6 decision sheets as such, and then bring them over to Room A. Suppose one counterpart, who has a decision-maker number of 1047 for decision ORANGE, wishes to allocate $1.50 to you and keep $26.50 for himself/herself. The counterpart will record these values as illustrated by the monitor, and then wait for the monitor to come by and collect his/her decision sheet. All six counterparts’ decision sheets will then be brought back over to this room for you to look at. In this example, you would earn $1.50 plus whatever the other 5 counterparts decided to allocate to you. **This is only an example – the actual decision is totally up to each of your 6 counterparts.**

ARE THERE ANY QUESTIONS?
DECISION SHEET – DECISION RED

Counterpart decision-maker number for decision RED: _______

Counterpart ranking (Group 1 highest, Group 2 lowest): Group 2

Amount: __$14___

Decision-maker number for decision RED: ______

Amount for you to divide: __$14___

Offer to counterpart: _____________

Amount you keep: _______________
## DECISION SHEET – DECISION YELLOW

Counterpart decision-maker number for decision YELLOW: _________

Counterpart ranking (Group 1 highest, Group 2 lowest): __Group 2____

**Amount:** __$28__ (total)

**Amount:** __$14__ (for each A to divide)

<table>
<thead>
<tr>
<th>Decision-maker number for decision YELLOW:</th>
<th>Decision-maker number for decision YELLOW:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount for you to divide: <strong>$14</strong></td>
<td>Amount for you to divide: <strong>$14</strong></td>
</tr>
<tr>
<td>Offer to counterpart: _____________</td>
<td>Offer to counterpart: _____________</td>
</tr>
<tr>
<td>Amount you keep: _______________</td>
<td>Amount you keep: _______________</td>
</tr>
</tbody>
</table>
DECISION SHEET – DECISION BLACK

Counterpart decision-maker number for decision BLACK: _________

Counterpart ranking (Group 1 highest, Group 2 lowest): Group 2

Amount: $28 (total)

Amount: $14 (for each A to divide)

Decision-maker number for decision BLACK: _______

Amount for you to divide: $14

Offer to counterpart: _____________

Amount you keep: _______________
**DECISION SHEET – DECISION BLUE**

Counterpart decision-maker number for decision BLUE: _________

Counterpart ranking (Group 1 highest, Group 2 lowest): ___Group 2___

**Amount:** ___$42_____ (total)

**Amount:** ___$14_____ (for each A to divide)

<table>
<thead>
<tr>
<th>Decision-maker number for decision BLUE: _____</th>
<th>Decision-maker number for decision BLUE: _____</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount for you to divide: <strong>$14</strong>__</td>
<td>Amount for you to divide: <strong>$14</strong>_</td>
</tr>
<tr>
<td>Offer to counterpart: ____________</td>
<td>Offer to counterpart: ____________</td>
</tr>
<tr>
<td>Amount you keep: _______________</td>
<td>Amount you keep: ______________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decision-maker number for decision BLUE: _____</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount for you to divide: <strong>$14</strong>__</td>
</tr>
<tr>
<td>Offer to counterpart: ____________</td>
</tr>
<tr>
<td>Amount you keep: _______________</td>
</tr>
</tbody>
</table>
DECISION SHEET – DECISION GREEN

Counterpart decision-maker number for decision GREEN: _________

Counterpart ranking (Group 1 highest, Group 2 lowest): __Group 2___

Amount: __$42_____ (total)

Amount: __$14____ (for each A to divide)

Decision-maker number for decision GREEN: ______

Amount for you to divide: __$14____

Offer to counterpart: _____________

Amount you keep: _______________
DECISION SHEET – DECISION ORANGE

Counterpart decision-maker number for decision ORANGE: __________

Counterpart ranking (Group 1 highest, Group 2 lowest): __Group 2____

**Amount:** __$84_____ (total)

**Amount:** __$14_____ (for each A to divide)

Decision-maker number for decision ORANGE: _______

Amount for you to divide: __$14___

Offer to counterpart: _____________

Amount you keep: _______________
**DECISION SHEET – DECISION BROWN**

Counterpart decision-maker number for decision BROWN: 

Counterpart ranking (Group 1 highest, Group 2 lowest): **Group 2**

**Amount:** $84 (total)

**Amount:** $14 (for each A to divide)

<table>
<thead>
<tr>
<th>Decision-maker number for decision BROWN:</th>
<th>Decision-maker number for decision BROWN:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount for you to divide: $14</td>
<td>Amount for you to divide: $14</td>
</tr>
<tr>
<td>Offer to counterpart:</td>
<td>Offer to counterpart:</td>
</tr>
<tr>
<td>Amount you keep:</td>
<td>Amount you keep:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decision-maker number for decision BROWN:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Amount for you to divide: $14</td>
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</tr>
<tr>
<td>Offer to counterpart:</td>
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<th>Decision-maker number for decision BROWN:</th>
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<tbody>
<tr>
<td>Amount for you to divide: $14</td>
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</tr>
<tr>
<td>Offer to counterpart:</td>
<td>Offer to counterpart:</td>
</tr>
<tr>
<td>Amount you keep:</td>
<td>Amount you keep:</td>
</tr>
</tbody>
</table>
POST-EXPERIMENT QUESTIONNAIRE

Subject Survey Sheet  Player #_________

1. Age______

2. What is your sex? (Circle one)
   Male  Female

3. Have you ever been employed as a waiter or waitress? (Circle one)
   Yes  No

4. Have any of your family or close friends ever been employed as a waiter or waitress? (Circle one)
   Yes  No

5. What is your marital status? (Circle one)
   Single  Married  Divorced/Separated  Widowed

6. Do you have children? (Circle one)
   Yes  No

7. Do you regularly attend religious services? (Circle one)
   Yes  No

8. In addition to school, do you (Circle one):
   Work at a full time job  Work at a part time job  Do not have a job

9. Which of the following categories best describes you? (Circle one)
   Asian-American/Oriental  Black/African-American  Middle Eastern
   Hispanic-Black/Spanish-speaking  White/Caucasian
   Hispanic-White/Spanish-speaking white  Native American/American Indian
   Other (Please specify): ________________________________

10. Class (Circle one)
     Freshman  Sophomore  Junior  Senior  Graduate

11. Major (Circle one)
     Economics  Other Business  Psychology  Science/Engineering
     Liberal Arts  Other
12. How many Economics classes have you taken at the university level? (Circle one)
   None  One  Two  Three  Four  Five  Six  More than Six

13. How many brothers and/or sisters do you have?________________

14. What is your place in the birth order (i.e. 1 = eldest, 2 = second born, 3 = third born, 4 = fourth born, etc.)?________

15. What was your combined (verbal plus math) SAT score?___________
Appendix B

Copy of survey.
THIS SHORT SURVEY IS FOR A Ph.D. DISSERTATION. THE INFORMATION YOU PROVIDE IS ANONYMOUS. THANK YOU FOR BOTH YOUR TIME AND COOPERATION.

1. How many people were at your table?_______

2. How many checks did your table have?_______

3. How many people, including yourself, did you pay for?__________

4. What was the total bill for the people, including yourself, who you paid for (NOT INCLUDING TIP)?_____

Are any of the people you paid for going to give you money toward this amount (circle one)?

Yes  No

5. How much money, in dollars and cents, did you tip the server?_______

Of the people you paid for, did anyone other than you leave a tip (circle one)?

Yes  No

6. Was the tip automatically added to your bill? (circle one)

Yes  No

If you answered yes, what was the percent tip automatically added?_____

7. How did you pay for your bill? (circle your response)

Cash  Credit Card/ATM Card  Check  Other: _____________________

8. Did anyone at your table have:
Appetizers? (includes soups, salads) (circle your response) Yes  No
Entrees? (circle your response) Yes  No
Desserts? (circle your response) Yes  No
Alcohol? (circle your response) Yes  No

9. On a scale from 1 to 7, how would you rate the service you received from your waiter/waitress? (circle your response)

Poor

1  2  3  4  5  6  7

Excellent

10. What was your server’s sex?  Male  Female

TURN OVER!! →
11. On a scale from 1 to 7, how would you rate the frequency with which you dine at this particular restaurant? *(circle your response)*

<table>
<thead>
<tr>
<th>Least Frequent</th>
<th>Most Frequent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

12. Have you ever been employed as a waiter or waitress? *(circle your response)* Yes  No

13. For tax purposes, are you a dependent of your parents? *(circle your response)* Yes  No

14. What is your sex? *(circle your response)* Male  Female

15. What is your age? ______

16. What is your marital status? *(circle your response)*

<table>
<thead>
<tr>
<th>Single</th>
<th>Married</th>
<th>Divorced/Separated</th>
<th>Widowed</th>
</tr>
</thead>
</table>

17. Do you regularly attend religious services? *(circle your response)* Yes  No

18. What was your family’s (all of the people in your household) approximate total income last year? *(circle your response)*

- Less than $18,000
- $18,000 - $33,000
- $33,000 - $52,000
- $52,000 - $82,000
- More than $82,000

19. What is the highest degree you have obtained? __________________________

   How many years of post-secondary (beyond high school) education have you completed? ______

20. What do you think the norm is regarding percent tip in a restaurant? __________

21. If you receive terrible service, what percent tip do you normally leave? ______

22. If you receive outstanding service, what percent tip do you normally leave? ______

23. If you receive standard service, what percent tip do you normally leave? ______

THANK YOU!! PLEASE FOLD AND PLACE IN BOX