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A Case Study in Tipping: An Economic Anomaly

Abstract

When dining in a restaurant or having a drink at a bar, do you tip? If yes, what do you base the tip amount on? Is it who you are with? Do men tip more than women? Do you tip less when your actions are masked by a larger group? The answers to these questions are something that economists have struggled to explain. The most difficult question being: W*hy do people pay an additional amount when they have absolutely no legal obligation to do so?* This case study explores the variables that lead to higher or lower tip amounts in the service industry. Past research lacks actual data from real-time collection outside of the scrupulous eyes of a lab technician or survey administrator. It is this detail which sets the research outlined in this paper apart from the rest. The case study in tipping provided 3 dominate variables that effect tip amount, the economic concept of *free-riding*—which is defined as a person who chooses to receive the benefits of a public good or service or a positive externality without contributing to paying the cost of producing those benefits, gender differences and generational differences.

Cover Page Footnote

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A Case Study in Tipping: An Economic Anomaly

Megan Nelson

I. Introduction

When dining in a restaurant or having a drink at a bar, do you tip? If yes, what do you base the tip amount on? Is it who you are with? Do men tip more than women? Do you tip less when your actions are masked by a larger group? The answers to these questions are something that economists have struggled to explain. The most difficult question being: W*hy do people pay an additional amount when they have absolutely no legal obligation to do so?* In the US, tipping is an understood necessity of the service industry to balance out the standard server wage of approximately $2.13 an hour. With so many individuals working in the service industry and making a living, it is estimated that billions of dollars are spent on tipping each year.[1] The pervasiveness of tipping merits thorough analysis, but also the complexity and possible implications of tipping makes it an interesting topic of study. The difficulty in predicting the outcome of economic events comes from the need to quantify seemingly unquantifiable human actions.

II. Review of Literature

Economists have implemented both theoretical and empirical models in an attempt to understand the complexities of the service industry. Two of the predominate models in theoretical current literature are game theory models, such as Dictator Game and Prisoner's Dilemma. The goal of both models is to challenge the economic assumption that individuals will act solely out of self-interest, because if an individual were only operating out of self-interest, they would not tip. The current empirical contributions are comprised largely of customer surveys and controlled lab experiments. Current literature on tipping behavior presents three dominating explanations for why tipping occurs. First, tipping has

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[1] Lynn, Michael, and Latané, Bibb. "The psychology of restaurant tipping." *Journal of Applied Psychology* 14, No. 6 (1984), 549-61.

developed into a social norm in which patrons feel obligated to abide by.[2;3] Second, tipping is the result of an incentive for improved future service from the service provider.[4] Third, tipping is the reward patrons give the server based upon the perception of service performance.[5] Due to the limited amount of research on tipping, human behavior in other fields to study are researched in order to grasp a full understanding of the causes and effects of tipping. Psychological analysis into the differences in altruism of males and females as well as the dynamics of individuals in groups, play a vital role in understanding the incentives behind tipping.

One of the dominating hypotheses explaining tipping is that individuals tip as a result of the development of a social norm in the United States. When one encounters the decision to tip or not to tip, it is common to want to conform to what is perceived as socially acceptable. As stated in Azar, when "we disobey the norm of tipping, we suffer an emotional disutility: we feel embarrassed, guilty and unfair, and our self-image is hurt."[6] The concept of guilt is echoed by Parrett: "Decision-makers avoid letting others down…a customer's tip depends positively on what the consumer believes the server thinks the consumer will tip."[7] This is to say that possibly the mere existence of something like the gratuity amount line that comes on your bill is what drives you to tip, the expectation of a tip. While the action of tipping can be explained through social norms, the variation in the amount of money given per tip is not captured solely by these.

Another hypothesis explaining tipping is patrons wanting to insure improved future service. By using customer surveys from over 500 restaurants as well as theoretical models, Azar's study was able to conclude that future service was in fact not a major contributing factor for tipping. When comparing two theoretical models, of repeating and non-repeating patrons, Azar found the subgame-perfect Nash equilibrium, coupled with his analysis of the empirical data, to be inconclusive. "While researchers agree that social norms play a role in motivating people to tip, it is unclear whether repeating customers also tip strategically based on future service considerations."[8] In a survey of 700 patrons in 7 restaurants an analysis showed that regular customers do tip more, however it is not statistically significant.[9] Strategic tipping for improved future service certainly is an interesting hypothesis, however, it does not explain the innumerable amount of tips given

[2] Parrett, Matt. "An Analysis of the Determinants of Tipping Behavior." The Southern Economics Journal 73, No. 2 (2006), 489-514.

[3] Azar, Ofer H. "Do People Tip Strategically, to Improve Future Service? Theory and Evidence." *The Canadian Journal of Economics* 40, No. 2 (2007), 515-27.

[4] Bodvarsson, Örn B. and Gibson, William A. "Economics and Restaurant Gratuities: Determining Tip Rates." *The American Journal of Economics and Sociology* 56, No. 2 (1997),187-203.

[5] Lynn, Michael and Sturman, Michael. "Tipping and Service Quality: A Within-Subjects Analysis." *Journal of Hospitality and Tourism* 34, No. 2 (2010): 269-275.

[6] Azar, "Do People Tip Strategically, to Improve Future Service? Theory and Evidence," 515-27.

[7] Parrett, "An Analysis of the Determinants of Tipping Behavior," 489-514.

[8] Azar, "Do People Tip Strategically, to Improve Future Service? Theory and Evidence," 515-27.

[9] Bodvarsson, "Economics and Restaurant Gratuities: Determining Tip Rates," 187-203.

by individuals who have no intention of returning to an establishment (e.g., when traveling).

An additional hypothesis explaining tipping is that patrons reward the server for good service. In the empirical exploration of 51 individuals at an assortment of different dining situations, the researchers found that "tip sizes are reliably correlated with service ratings after controlling for the identity of the tippers and, therefore, all potential stable dispositional difference confounds."[10] Other researchers have also noted a positive correlation between higher ranked service quality and tip size .[11] Based upon the research a set of techniques that servers may employ to increase their perceived quality and therefore increase their overall pay rate have been made available to the hospitality industry.[12] Aside from research specifically looking at tipping, other fields of study involving human behavior is vital to explore.

The way in which an individual behaves in a group environment plays an important role in understanding decision making. Researchers found that "the existence of free-riding or non-cooperative behavior should be…expected in groups with more than two members." By utilizing the theoretical model, *Prisoner's Dilemma*, the researchers found that non-cooperative strategies correspond to evolutionary stable strategies.[13] The free-rider problem has been identified in the results of Parrett's empirical study of tipping behavior using survey and laboratory experimental data. When analyzing the variable of table size to tip amount, Parrett found that a one person increase in table size results in a .6 percentage point decrease in tip amount. Parrett found evidence of the free-rider problem by employing the use of a *Dictator Game* with 112 Virginia Tech students, assigning each student either the role of Recipient or Dictator.[14] Due to the nature of the server-patron relationship, the service provided is non-excludable and non-rival leading to a pronounced existence of free-riding.

Similarly to the opportunity to observe the free-rider problem, studying tipping behavior also lends a unique view into the differences between male and female patrons. In a theoretical study into gender differences in altruism, researchers Andreoni and Vesterland found that the primary difference stemmed from the price of the gift, or tip, being given. Their analysis of a modified Dictator game found that men are more likely to give more when the price of the gift is low compared to women; likewise women tend to give more when the price of giving is high compared to men.[15] Andreoni and Vesterlund's

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[10] Lynn, "Tipping and Service Quality: A Within-Subjects Analysis," 269-275.

[11] Bodvarsson, "Economics and Restaurant Gratuities: Determining Tip Rates," 187-203.

[12] Lynn, Michael. "Seven Ways to Increase your Servers' Tips." *Cornell Hotel and Restaurant Administration Quarterly* 37 (1996): 24-29.

[13] Molander, Per. "The Prevalence of Free Riding." *The Journal of Conflict Resolution* 36, No. 4 (1992): 756-771.

[14] Parrett, "An Analysis of the Determinants of Tipping Behavior," 489-514.

[15] Andreoni, James and Vesterlund, Lise. "Which is the Fair Sex? Gender Differences in Altruism." *The Quarterly Journal of Economics* 116, No.1 (2001): 293-312.

results appear to suit Parrett's assertion that men tip more than women in his study. In terms of altruistic behavior, a tip given to a server can be deemed as low in terms of charitable giving. Compare, for instance, the opportunity cost of a $3.00 tip given to a server and spending an entire day at a soup kitchen, relatively speaking-- the tip costs you less. Parrett, found that men tipped an average of 18.73 percent, while female tipped an average of only 12.02 percent, a difference of 6.71 percentage points.[16]

III. Introduction to Data

a. *Data Collection*

The researcher collected actual data regarding tipping habits in a contained environment (e.g. same bar and server) in order to isolate and quantify particular variables that alter tip amount. The researcher was also the sole observer in the case study. The design of the data collection process stems from straight forward observation recording. Observations of patrons while they were at the table were conducted. The data recorded on each of the tables was simultaneously collected as drinks were ordered and paid for. All data collection was performed on either a Friday or Saturday night between the hours of 7pm to 2am. The collection cycle encompassed a one year time frame in order to cover all business cycles. The establishment in which the data was collected does not serve food or employ the use of credit card machines. All data collection is in the form of alcoholic drinks ordered and in cash transactions.

b. *Sample Selection*

The sample selection reflects all patrons sitting at tables who chose to order drink from the server and not directly from the bar. No private information from the participants/customers (i.e. name, employer, SSN, DOB) were obtained, assuring complete anonymity. All cash transactions also ensured that no private credit card information was obtained. The treatment of the subjects/customers did not vary based on the data collected. The benefit of personally collecting and analyzing the actual tip data as opposed to utilizing anecdotal data collection methods eliminates what is known as the observer effect. The subjects in this research were not aware that their behavior was being analyzed and therefore behaved naturally. Data based on self-reported actions, such as surveys, may be skewed as subjects may not remember exactly what they tip or may lie. This research protocol was approved by the Human Subjects Research Committee of Kansas University.

c. *Descriptive Statistics*

Each observation was recorded in the following categories in order to create an accurate analysis; number of people at the table, number of men, number of women,

[16] Parrett, "An Analysis of the Determinants of Tipping Behavior," 489-514.

estimated age range, number of drinks ordered and tip amount per total order. Table 1 shows a summary of the data collected.

Recorded Data	# People at Table	#Male	#Female	#Drinks Ordered	Tip Amount	Tip per Drink	Aprox. Age Range
Average	3.08	1.63	1.44	1.84	$1.50	$0.94	31
Maximum	12	7	7	8	$11.00	$8.25	50
Minimum	1	0	0	1	$ -	$0.00	20
Standard Deviation	1.61	1.17	1.22	1.31	$1.19	$0.73	9

IV. Discussion of Results: Free Rider Problem

The economic concept of free-riding—which is defined as a person who chooses to receive the benefits of a public good or service or a positive externality without contributing to paying the cost of producing those benefits—has been identified in many cases when analyzing group behavior. Studying tipping behavior offers an opportunity to observe the free-rider problem in action. The job of a server can be seen as performing a public service for a large table of patrons. When the burden of tipping is left on the shoulders of a few, each individual may feel a greater obligation than when masked by the larger group. In the dynamic of a group of people in a bar, free riding would imply that individuals would either 1.) Consume the same amount but tip less as more people are added to the table and contributing to the total tip; or 2.) Tip the same amount, but drink more/continue drinking longer as more people are added to a table. Evidence of free-riding in tipping behavior is prevalent in the case study. The addition of one patron to any table results on average in a $0.05 decrease in tip per drink. As noted above, the average tip per drink is $0.94, therefore, by one patron joining a table the tip per drink decreases by about 5 percent or $0.05. The free-rider problem has been identified in the results of Parrett's empirical study of tipping behavior using survey and laboratory experimental data. The presence of free-riding also coincides with studies on group behavior and the tendency for increases in group size leading to a greater prevalence of free-riding.[17] The results in Table 2 and Graph 1: Free Riding illustrates the free-rider problem with adjustments to the data to exclude tips over $8.00 to ensure that any findings skewed by outliers are eliminated.

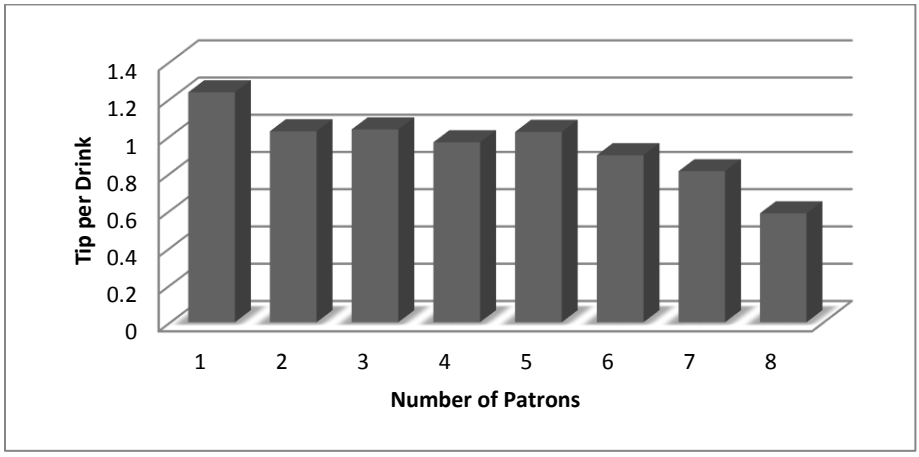
Tip	Robust Coefficient	Standard Error	t	P > t	95% Conf. Interval
Patrons	-0.530	0.0117	-4.54	0.000	-.0759 to -.0301
Constant	1.091	0.0425	25.65	0.000	1.007 to 1.174

Table 2

Linear regression Table 1 Number of observations = 998

[17] Andreoni, "Which is the Fair Sex? Gender Differences in Altruism," 293-312.

F (1,996) = 20.65
Probability > F = 0.0000
R-squared = 0.0173
Root MSE = 0.6463



Graph 1: Free Riding

IV. Discussion of Results: Gender Differences

Similarly to the opportunity to observe the free-rider problem, studying tipping behavior also lends a unique view into the differences between male and female patrons. The difference between the amounts a female versus a male tip provides insight into the way each utilizes money. The action of tipping can also be associated with gift giving due to the lack of a legal requirement to pay a tip. In this effect, an analysis of altruist behavior differences also effect tipping behavior. Interestingly, by adding gender into the equation it is found that the existence of free-riding is heavily prevalent in female patrons and less so in male patrons. The addition of one female to any table results in a $0.07 decrease in tip per drink as opposed to the addition of one male patron is not statistically significant.

Tip	Robust Coefficient	Standard Error	t	P > |t|	95% Conf. Interval
Male	-0.029	0.0182	-1.65	0.099	-0.066 to 0.006
Female	-0.074	0.0157	-4.72	0.000	-0.105 to -.043
Constant	1.084	0.0428	25.29	0.000	0.999 to 1.168

Table 3

Linear regression

Number of observations = 998
F (2, 995) = 12.80
Probability > F = 0.0000
R-squared = 0.0208
Root MSE = 0.64547

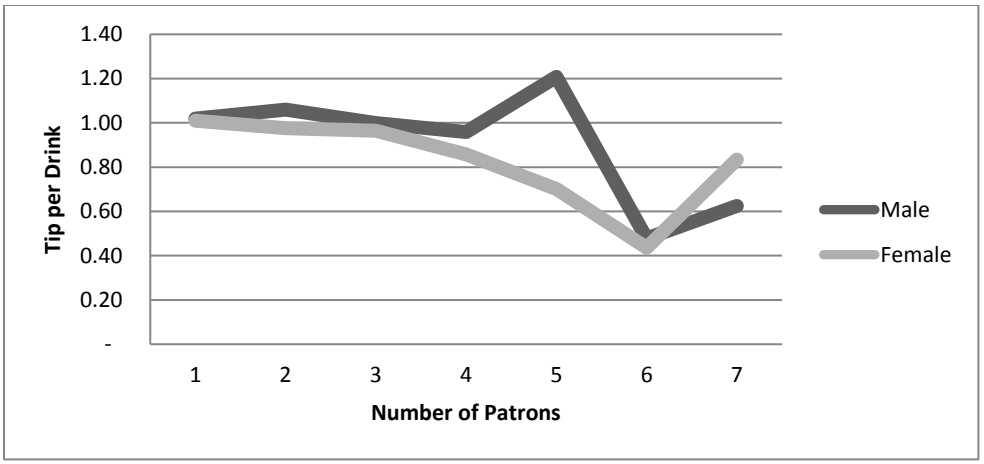
When gender is analyzed on its own, the mean tip per drink of a table of all male patrons is $1.13 as opposed to $0.89 at a table of all female patrons. This $0.24 difference in mean tip per drink significantly supports the hypothesis that male patrons tip more than female patrons. When the gender ratio is even, a 50/50 split, the tip per drink ratio varied little from a table of all female patrons at $0.88 per drink. One explanation for the difference in male and female free-riding could be male predisposition to signal status as a means of monetary value. When analyzing groups of all male tables, one may ascertain that the impulse to free-ride in men is overridden by the impulse to dominate in an all-male social group. This phenomenon may also be pronounced due to the dynamic between an all-male table and a female sever. Being that the establishment in which the data was collected is located in a college town, leading to higher numbers of single young people, the desire for males to dominate or demonstrate their status to their companions as well as to females is amplified. As seen in Table 4, Table 5, and Graph 2, hypothesis tests are used to evaluate the gender variable on its own. A gender ratio, the number of female to male patrons, was employed to accurately measure the differences in tipping attributed to male and female behavior. The variable ratio *f* used is as a percentage of females at a table, when ratio *f* is 0, the table is all male, if ratio *f* is 1, then the table is all female, any percentage value between is measured as the ratio of females to males.

Group	Observations	Mean	Std Error	Std Dev	95% Conf. Interval
0	217	1.133	0.0683	1.006	.998 to 1.267
1	110	0.892	0.0557	0.584	.782 to 1.002
Combined	327	1.052	0.049	0.893	.954 to 1.149
Difference		0.241			

Table 4 (0= all men, 1= all women)

Group	Observations	Mean	Std Error	Std Dev	95% Conf. Interval
5	365	0.888	0.031	0.601	.826 to .949
1	110	0.892	0.056	0.584	.782 to 1.00
Combined	475	0.889	0.027	0.596	.835 to .943

Table 5 (5=50/50 gender split, 1= all women)



Graph 2

V. Limitations and Future Research

In order to stay within the guidelines of the Human Subjects Research Committee and successfully complete the tasks of a cocktail server, there are limitations to the research. One limitation is the lack of detail in the data points. The decision to collect data on only 6 categories is explained by the need for complete autonomy of the patrons in the research and the realistic restraints of data collection while also working as a cocktail server. To collect more comprehensive data, each patron would have needed to sign a consent waiver, which would have made the duties as a server and data collector impossible. In addition, further complications of receiving permission from the establishment's proprietor. The fact that patrons were not aware that their tipping behaviors were being recorded is what sets this research apart. If patrons were aware they could become easily skewed by the observer effect. As with all research there is room for improvement, the unique opportunity for real-time data collection adds a new dimension to tipping research. The implications derived from tipping research can aid to a number of practical hospitality institutions.

Future research in regard to patron's age or age range could greatly expand the collective understanding of tipping. While age range is an exceptionally subjective variable, it is in the authors opinion as an experienced server that someone's tentative age can be a very telling characteristic for how you, as a server, will be treated as well as tipped. Understanding the limitations of the variable is to be noted; however it should not be overlooked. When analyzing age as a variable, one would assume that tip per drink would increase similarly to income distribution. As seen below in Table 6, tip values are bell shaped with the age range of 30's to be the pinnacle. Between age ranges of 25 to 30 and 30 to 40 exists a $0.32 difference in tip per drink. However, due to the subjectivity of age range as a variable, in order to more accurately analyze these findings and others like it, more research would need to be done

VARIABLES	(1) tip	(2) tip	(3) tip	(4) tip
Male	-0.0216		-0.0300*	-0.0216
	(0.0196)		(0.0182)	(0.0196)
Female	-0.0754***		-0.0740***	-0.0754***
	(0.0176)		(0.0157)	(0.0176)
20b.age	0			0
	(0)			(0)
25.age	0.279***			0.279***
	(0.0684)			(0.0684)
30.age	0.598***			0.598***
	(0.0781)			(0.0781)
40.age	0.479***			0.479***
	(0.0893)			(0.0893)
50.age	0.396***			0.396***
	(0.0905)			(0.0905)
Patrons		-0.0530***		
		(0.0117)		
Constant	0.719***	1.091***	1.084***	0.719***
	(0.0756)	(0.0425)	(0.0428)	(0.0756)
Observations	709	998	998	709
R-squared	0.102	0.017	0.021	0.102

Table 6: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

VI. Conclusion

As students of economics we are taught to analyze a theory under the assumption that individuals operate in their own self-interest. Adam Smith used this kind of thinking to develop his famous *invisible hand* metaphor used to describe unintended social benefit that result from individuals' actions. This assumption of self-interest is what makes the study of tipping interesting; w*hy do people pay an additional amount when they have absolutely no legal obligation to do so or clear self-benefit to do so?* It is an economic anomaly. The difficulty in predicting the outcome of economic events comes from seemingly unquantifiable human actions. Tipping is one example of a human action that is challenging to understand. This research adds to the greater body of work related to tipping by exploring the economic anomaly of tipping. By analyzing the variables that lead to higher or lower tip amounts one is able to gain particular insights into human behavior. As shown in the research, evidence of the free rider problem is apparent as well as the existence of gender differences in regards to tipping. With the addition of a single patron to any given table, the tip per drink ratio decreases. Remarkably, the addition of one male

patron decreases the tip per drink ratio much less than the addition of one female patron. The motives behind tipping will continue to be a complex question that economists struggle with.

Works Cited

Albanese, Robert and Van Fleet, David. "Rational Behavior in Groups: The Free-Riding Tendency." *The Academy of Management Review* 10, No. 2 (1985): 244-255.

Andreoni, James and Vesterlund, Lise. "Which is the Fair Sex? Gender Differences in Altruism." *The Quarterly Journal of Economics* 116, No.1 (2001): 293-312.

Azar, Ofer H. "Do People Tip Strategically, to Improve Future Service? Theory and Evidence." *The Canadian Journal of Economics* 40, No. 2 (2007) 515-527.

Azar, Ofer H. "The Implications of Tipping for Economics and Management." *International Journal of Social Economics* 30, No. 10 (2003): 1084-1094.

Azar, Ofer H. and Tobol, Yossi. "Tipping as a Strategic Investment in Service Quality: An Optimal-Control Analysis of Repeated Interactions in the Service Industry." *Southern Economics Journal* 75, No. 1 (2008): 246-260.

Bodvarsson, Örn B. and Gibson, William A. "Economics and Restaurant Gratuities: Determining Tip Rates." *The American Journal of Economics and Sociology* 56, No. 2 (1997): 187-203.

Lynn, Michael. "Seven Ways to Increase your Servers' Tips." *Cornell Hotel and Restaurant Administration Quarterly* 37 (1996): 24-29.

Lynn, Michael and Sturman, Michael. "Tipping and Service Quality: A Within-Subjects Analysis." *Journal of Hospitality and Tourism* 34, No. 2 (2010): 269-275.

Lynn, Michael, and Latané, Bibb. "The psychology of restaurant tipping." *Journal of Applied Psychology* 14, No. 6 (1984): 549-561, accessed 2015, doi:10.1111/j.1559-1816.1984.tb02259.x.

Molander, Per. "The Prevalence of Free Riding." *The Journal of Conflict Resolution* 36, No. 4 (1992): 756-771.

Parrett, Matt. "An Analysis of the Determinants of Tipping Behavior." *The Southern Economics Journal* 73, No. 2 (2006): 489-514.