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It's Simpler than It Seems: An Alternative Explanation for the Magnitude Effect in Tipping

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Abstract
In this paper, we critically review various explanations for the magnitude effect in tipping and offer a simpler explanation for this effect. We also present a simulation that demonstrates the plausibility of our explanation. The practical implications of both the magnitude effect in tipping and our explanation for it are discussed.

Keywords
tipping, magnitude effect, restaurant

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Comments

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ABSTRACT

In this paper, we critically review various explanations for the magnitude effect in tipping and offer a simpler explanation for this effect. We also present a simulation that demonstrates the plausibility of our explanation. The practical implications of both the magnitude effect in tipping and our explanation for it are discussed.

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In the United States, tipping is an inherent part of the service experience. Tips are an important aspect of consumer behavior in service settings (Lynn, Zinkhan & Harris, 1993) and tips are a major component of servers' compensation (Schmidt, 1985). Consequently, research has emerged aimed at understanding the psychological processes that lead to tipping (see Lynn & McCall, 1998, for a review). Once the psychological processes behind tipping are understood, practitioners can use such information to train their servers how to earn larger tips with the hope that better tips lead to better retention, better service, and ultimately better company performance (Lynn, 1996).

One result of tipping research has been the discovery of the "magnitude effect in tipping." This magnitude effect is a tendency for tip percentages to decline as bill size increases. Chapman and Winquist (1998) found this effect using a survey that asked people how much they would tip on various bill sizes. Green, Myerson and Schneider (in press) replicated this effect six times using actual tip and bill size data from two taxicabs, two restaurants and two hair salons. Several explanations have been offered for the effect, but none is satisfactory. The purpose of this paper is to critically review the various explanations for the magnitude effect in tipping and to offer a simpler explanation for this effect.

FOUR EXPLANATIONS FOR THE MAGNITUDE EFFECT IN TIPPING

Presently, the tipping literature offers four different explanations for the magnitude effect in tipping. First, Lynn and McCall (1998) suggested that a negative relationship between percent tip and bill size could result from consumer sensitivity to the costs of tipping (also see Elman, 1976). The cost of tipping 15 to 20 percent of the bill increases as bill size increases, so cost sensitive tippers may leave smaller percentage tips as bill size goes up. This explanation suggests that the positive relationship between dollar tip amount and bill size is marginally decreasing. However, in a meta-analysis of 38 tests of the effects of bill size on dollar tip amounts, Lynn and McCall (1998) found that, on average, tip amounts increase with bill size at a marginally increasing rather than a marginally decreasing rate. Furthermore, we re-analyzed Green, et al.'s (in press) data and found no marginal decrease in the positive relationship between dollar tip amount and bill size in any of their six data sets (see Table 1).

Second, Chapman and Winquist (1998) suggested that the magnitude effect in tipping could result from Prelec and Lowenstein's (1991) principle of increasing proportional sensitivity in utility functions. This principle suggests that any specific ratio of two monetary amounts will seem larger as the absolute magnitude of those amounts increases (Chapman & Winquist, 1998). For example, the ratio of $300 to $900 should seem larger than the ratio of $3 to $9. Chapman and Winquist (1998) reasoned that if 15% of a large bill seems proportionally larger than 15% of a small bill, then people should leave smaller percentage tips as bill size increases. However, this explanation also suggests that the positive relationship between dollar tip amount and bill size will be marginally decreasing and, as discussed above, it is not.

Third, Green et al. (in press) suggested that the magnitude effect in tipping could result from a tendency to pay for the mere presence of the service provider. In other words, people may tip a percentage of the bill to pay for a server's effort plus a small fixed amount to pay for the server's availability. Such a fixed additional payment for the server's presence would produce a positive intercept in the relationship between dollar tip amount and bill size. It can be shown mathematically that a positive intercept in the relationship between dollar tip amount and bill size would result in a negative relationship between percent tip and bill size (see Green et al., in press). Consistent with this explanation, Green et al. found that the relationship between dollar tip amount and bill size had a positive intercept in six separate data sets. They also found that the negative relationship between percent tip and bill size was marginally decreasing as would be expected if that relationship were due to a positive intercept in the relationship between dollar tip amount and bill size. However, these findings support only the idea that the magnitude effect in tipping is due to a positive intercept in the relationship between dollar tip amount and bill size. The data does not support Green et al.'s specific explanation for that intercept – namely that people tip a fixed amount for the presence of the server. Furthermore, the idea of paying a small amount on top of a percentage tip seems inconsistent with how our friends and we tip. Nor is this idea ever mentioned in etiquette books or other tipping guides (see Post, 1984; Schein, Jablonski & Wohlfahrt, 1984; Star, 1988).

Lynn and Bond (1988) also argued that a positive intercept in the relationship between dollar tip amount and bill size underlies the negative correlation between percent tip and bill size, but they provided a different explanation for this intercept. They argued that a positive intercept in the relationship between dollar tip amount and bill size could result from a minimum acceptable tip size. This explanation is consistent with our own introspections about tipping and the advice of etiquette books (see Martin, 1988). If a minimum tip size does underlie the positive intercept in the relationship between dollar tip amount and bill size, then the intercept should be evident only in data sets with small bill sizes. As long as bill sizes are large enough that a 15 percent tip exceeds the minimum tip, then the minimum tip is irrelevant and cannot affect the relationship between dollar tip amount and bill size. To test this hypothesis, we reanalyzed Green et al.'s (in press) data. Making an overly generous assumption that the minimum tip is $1.50, we dropped all bill sizes less than $10 and examined the intercept in the relationship between dollar tip amount, as well as the correlation between percent tip and bill size, for each of their six data sets. In all six data sets, the intercept in the relationship between dollar tip amount and bill size was significantly greater than zero and the correlation between percent tip and bill size was significantly less than zero (see Table 2). These results are inconsistent with Lynn and Bond's (1988) "minimum tip" explanation.

AN ALTERNATIVE EXPLANATION

Based on the above review, we suggest that all four explanations for the presence of the magnitude effect in tipping are inadequate. In this paper, we offer yet another explanation for the positive intercept in the relationship between dollar tip amount and bill size as well as the magnitude effect in tipping that it produces. Specifically, we suggest that this intercept results from some people's refusal to base tips on bill size as called for by the 15 percent tipping norm. A national telephone survey conducted for

American Demographics magazine found that 23 percent of respondents who tip restaurant servers said they tip a flat amount rather than a percentage of the bill (Paul, 2001; TNS Intersearch, 2001). The percentage of tipping respondents who reported tipping a flat amount was even higher when it came to tipping cabdrivers (58%) and barbers/hairstylists (67%). This tendency for some people to tip a flat amount should produce a positive intercept (reflecting the mean tip) in the relationship between tip amount and bill size for those people. Combining flat tippers (who produce a positive intercept) and percentage tippers (who produce a zero intercept) into one sample should produce an intercept whose value lies between those of the separate samples. Thus, the positive intercept in the relationship between tip amount and bill size may simply be an outgrowth of the fact that some people are percentage tippers while others are flat tippers.

We conducted a simulation to demonstrate the plausibility of our explanation for the positive intercept in the relationship between tip amount and bill size (and for the magnitude effect in tipping that the intercept produces). Our simulation generated: (1) random bill sizes that were representative of the samples reported in Green et al. (in press), (2) individuals that were either flat tippers or percent tippers, in proportion to the results of the American Demographics survey, and (3) random tips based on flat amounts or percentages (as appropriate) that had similar distributions to those reported by Green et al. Using this simulated data, we sought to replicate Green et al.'s findings with regard to both the intercept in the relationship between tip amount and bill size and the magnitude effect in tipping.

METHOD

Six separate simulations were created, to correspond to the six data sets analyzed in Green et al. (in press) -- i.e., those from taxicabs V and X, restaurants C and F, and salons M and J. For each simulation, we first generated random bill sizes that had the same mean, standard deviation and minimum values as those reported by Green et al. (shown in Table 3). Formulas to do this were derived from Johnson, Kotz and Balakrishnan (1994, see page 156 - 158). After the bill sizes were generated, we coded each simulated individual as either a flat tipper or a percent tipper. The specific percentages of the samples placed in each group were based on the results of the American Demographics survey and are shown in Table 3. For each individual, a tip amount was then generated based on the observed distributions of tip amounts, percent tips, and bill sizes in Green et al.'s (in press) data. If the individual was a flat tipper, tip amounts were randomly drawn from a distribution of tip amounts whose mean, standard deviation and minimum equaled those in the appropriate row of Table 3. If the individual was a percent tipper, a percent tip was randomly drawn from a distribution of percent tips whose mean, standard deviation and minimum equaled those in the appropriate row of Table 3 and that percent value was multiplied by the bill size to generate a tip amount.

RESULTS

With data generated for each of the six samples reported by Green et al. (in press), we then sought to replicate their analyses. This involved conducting two regressions -- one of tip amount on bill size and another of percent tip on bill size. The results of these regressions, in addition to the results originally reported by Green et al., are shown in Table 4.

Our simulation results closely followed the pattern of results reported by Green et al. (in press). We found positive significant intercepts and slopes for all six simulated samples when predicting tip amount, and significant positive intercepts and negative slopes for all six samples when predicting percent tip. Furthermore, we replicated Green et al.'s finding that the negative correlation between percent tip and bill size was larger for cabs and hair salons than for restaurants. [Note: This latter result stems from the fact that the percentage of flat tippers is greater in cabs and hair salons than in restaurants.]

It is critical to recall that our simulation did not explicitly model any price sensitivity effect, increasing proportional sensitivity effect, mere-presence effect, or minimum tip effect. Rather, the positive intercepts in the relationships between dollar tip amounts and bill sizes, and the negative correlations between percent tips and bill sizes, all emerged in our simulation out of the random behaviors of our hypothetical percent tippers and flat tippers.

DISCUSSION

Summary and Conclusions

In this paper, we offer a new explanation for the positive intercept in the relationship between dollar tip amount and bill size as well as the magnitude effect in tipping that it produces. Specifically, we argue that these effects could stem from the existence of flat tippers – i.e., people who do not base tips on bill size. We test this explanation in a simulation using survey data on the proportion of flat vs. percentage tippers along with random tip and bill size data that have distributions similar to those of Green et al.'s (in press) data. Our simulation replicates Green et al.'s findings with regard to both the intercept in the relationship between tip amount and bill size and the magnitude effect in tipping.

Our replication of Green et al.'s (in press) results does not prove that our explanation underlies their findings, but it does prove that our explanation can account for their findings. Our explanation is also consistent with survey data documenting the existence of flat tippers. Parsimony suggests that the presence of these flat tippers is likely to account for Green et al.'s findings. Furthermore, the closeness of our simulation results to those of Green et al. is difficult to explain if the two sets of results are based on different underlying processes. Given these considerations and the previously discussed problems with the available alternative explanations, we conclude that the magnitude effect in tipping probably stems from the existence of flat tippers in addition to percentage tippers.

Practical Implications

The idea that the magnitude effect in tipping is attributable to flat tippers suggest that the effect will become stronger as the proportion of flat tippers among the customer base increases. Indeed, this is why Green et al. (in press) and we found that the magnitude effect was stronger in taxicabs and hair salons than in restaurants. Survey research indicates that flat tippers come disproportionately from among poorly educated and low income people (TNS Intersearch, 2001), so the magnitude effect in tipping should be more prevalent in down-scale establishments than in up-scale ones. In other words, our explanation suggests that it is primarily managers at mid-scale to down-scale establishments who need to be concerned about the attitudinal and motivational consequences of the magnitude effect in tipping. Those consequences and their implications for management are briefly discussed below.

The magnitude effect in tipping means that, from a server's perspective, all sales dollars are not equal. Additional sales bring larger tips when those sales come from new customers than when they come from existing customers who are merely adding to an already established bill. Thus, servers should prefer many small parties to a few large ones. In addition, restaurant servers should prefer to build sales by turning tables than to build sales by suggesting drinks, appetizers and desserts – a strategy that may not fit with managerial goals. Managers should keep these incentives and preferences in mind when assigning groups of customers to servers and when motivating servers' sales efforts. Managers may also want to secure their servers' incomes by adding automatic gratuities to all bills that exceed some pre-determined large amount. In effect, many restaurant managers already do this by adding automatic service charges to groups of six or more. Managers in other service settings may want to do something similar.

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Table 1

Parameter estimates (and t-values) from regressions of tip amount on bill size and bill size squared using Green, et al.'s (in press) data sets.

Source	Intercept	Bill Size	Bill Size Squared
cab V	1.88	-.003	.001
(n=139)	(5.17***)	(-.06)	(.89)
cab X	1.39	.068	.000
(n=99)	(3.36***)	(1.77)	(.09)
restaurant C	2.32	.043	.001
(n=157)	(4.59***)	(1.27)	(2.47*)
restaurant F	.46	.180	-.000
(n=276)	(.93)	(8.16***)	(-.49)
salon M	2.09	.104	-.000
(n=192)	(1.62)	(1.51)	(-.23)
salon J	4.13	.023	.001
(n=86)	(2.86**)	(.28)	(1.10)

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 2

Re-analyses of Green et al.'s data after dropping observations with bill sizes less than 10 dollars.

Data Set	Amount of Tip			Percent Tip
	Intercept	df	t-value	r
Cabs				
V	1.32	73	4.28***	-0.39**
X	1.42	79	5.26***	-0.45***
Restaurants				
C	0.90	143	2.76**	-0.23**
F	0.68	272	2.84**	-0.20**
Salons				
M	2.35	188	6.22***	-0.47***
J	2.65	84	4.95***	-0.39***

** $p < .01$ *** $p < .001$

Table 3

Distributional characteristics created in simulation samples.

	Minimum[a]	Mean[a]	SD[a]	% of Sample[b]
Cab V				
Fare	3.50	12.94	6.68	
Tip	0.70	2.10	0.99	57.6%
% Tip	5.54	19.47	13.62	42.4%
Cab X				
Fare	4.20	19.18	12.71	
Tip	0.50	2.73	1.49	57.6%
% Tip	5.54	17.91	12.90	42.4%
Restaurant C				
Bill	4.20	25.31	11.88	
Tip	0.40	4.41	2.14	23.0%
% Tip	2.25	19.81	15.02	77.0%
Restaurant F				
Bill	6.70	44.26	21.54	
Tip	1.30	8.16	4.02	23.0%
% Tip	9.27	18.86	4.14	77.0%
Salon M				
Bill	7.00	39.52	20.31	
Tip	1.00	5.85	4.31	66.5%
% Tip	3.66	16.43	9.05	33.5%
Salon J				
Bill	10.00	28.88	14.04	
Tip	2.00	5.81	2.64	66.5%
% Tip	8.00	21.65	8.29	33.5%

[a] Data is from Green et al. (in press)
[b] Data is from TNS Intersearch (2001)

Table 4

Comparison of regression analyses using Green et al.'s data and simulation data.

	Amount of Tip			Percent Tip		
	Intercept	Slope	r	Intercept	Slope	r
Cabs						
V (Green et al.)	1.59	0.04	0.26	31.71	-0.95	-0.46
V (Simulated)	1.58	0.06	0.28	36.23	-1.09	-0.46
X (Green et al.)	1.36	0.07	0.61	26.33	-0.44	-0.43
X (Simulated)	1.62	0.08	0.41	30.92	-0.52	-0.38
Restaurants						
C (Green et al.)	1.30	0.12	0.69	30.66	-0.43	-0.34
C (Simulated)	1.12	0.15	0.40	26.86	-0.25	-0.17
F (Green et al.)	0.67	0.17	0.91	20.66	-0.04	-0.21
F (Simulated)	1.86	0.15	0.70	27.54	-0.16	-0.27
Salons						
M (Green et al.)	2.35	0.08	0.58	24.89	-0.21	-0.48
M (Simulated)	3.75	0.06	0.27	35.76	-0.39	-0.36
J (Green et al.)	2.65	0.11	0.58	28.22	-0.23	-0.39
J (Simulated)	3.90	0.07	0.28	37.25	-0.49	-0.45