restaurant Tipping

Unpublished Manuscripts by
Michael Lynn



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Tipping is a hot topic right now. Recent advances in digital technology and tipping screens have resulted in an expansion in the number and types of service providers asking for tips (aka, tip-creep) and an escalation in the amounts that traditionally tipped service providers are asking for (aka, tip-flation). Even some self-service kiosks are now asking for tips and some restaurants are now presenting their customers with one-touch tip options starting at the 20% of bill size that has defined the top normative tip for decades. Both tip-creep and tip-flation have received a lot of media attention and fueled negative consumer sentiment toward the practice of tipping (aka, tip-fatigue). For example, the proportion of consumers in my research agreeing that they would like to see tipping abolished grew from 3 out of 10 in 2016 to 5 out of 10 in 2022. More recent research by others suggest that those figures have declined a bit but that they remain higher than the 2016 numbers.

As pressing as these developments are, they really only highlight broader practical concerns raised by tipping since its inception. Consumers must decide whom and how much to tip as well as what business and/or government policies regarding tipping (e.g., lower minimum wages for tipped workers) they should support. Tipped workers must learn (or develop) and use effective strategies and tactics for increasing their tip incomes. Service-industry managers and business owners must make decisions about numerous tipping-related actions and policies that can be expected to impact employee income and morale as well as customer satisfaction and patronage. Accordingly, all of these actors have long stood to benefit from greater knowledge about the causes and consequences of tipping behaviors, practices and policies.

I spent over 45 years (31 at the Cornell Hotel School) studying these issues. Most of that research appeared as articles in academic journals, but a number of my papers on tipping have never been published. Despite their publication status, I believe each of the latter papers has merit. Indeed, most of them have passed some peer review – either for presentation at a conference or for distribution as reports by the Cornell Center for Hospitality Research. While most of these papers are available online, they are not widely known and are buried in places that make them hard to find unless you know where to look. Therefore, I decided to unearth this previously unpublished work and assemble it into the current book in the hopes of bringing that work to a larger pool of readers.

I want to thank my co-authors on these unpublished papers for their contributions to those works and for their permission to include the work in this book. Thanks also to the CHR and its various directors for their support of my tipping research over the years. Special thanks goes to Glenn Withiam, who edited the CHR manuscripts, made them much more accessible to industry audiences, and (in the process) taught me to be a better writer. [Note: In most cases, the only electronic files I had to work with for this book were my original, unedited manuscripts. I have tried to revise those manuscripts to match the final CHR documents (when available), but have probably missed some of Glenn's editing. I have also made a few new editing revisions on my own. Thus, the chapters in this book may not be exactly the same as matching CHR documents, but they come very close.]

For those who find this material helpful or interesting and who want more scientific insights into tipping, I conclude this book with information about additional sources you can consult. One is my 2026 book, *The Psychology of Tipping: Scientific Insights for Services Customers, Workers, and Managers* (Springer), which provides a more comprehensive, up-to-date, and readable summary of what we know about the topic than the current book does. The second is a bibliography of mostly (but not exclusively) academic work on tipping that I have compiled over the years. I am sure that some good papers on the topic have escaped my attention, but this is a reasonably comprehensive guide.

I want to conclude by wishing you the best as you delve into this interesting and practically important topic. It has been the primary focus of my research for my entire professional career, and I hope you find it as captivating as I have.

-Michael Lynn

CHAPTER 1

Beyond Gratitude and Gratuity: A Meta-Analytic Review of the Predictors of Restaurant Tipping

MICHAEL LYNN AND MICHAEL MCCALL†

ABSTRACT

Every year consumers voluntarily give away billions of dollars to service workers in the form of tips. The voluntary nature of tipping raises interesting questions about why people tip and what factors influence their tipping decisions. These questions are addressed in a review of theoretical work on tipping and in a meta-analysis of 22 published and 14 unpublished studies examining the predictors of tip size in restaurant settings. Our findings suggest that tipping is predominantly affected by social expectations, server attractiveness, server friendliness and customer mood. Service quality and cost considerations appear to have only weak effects on tipping. The theoretical, methodological, and practical implications of these findings are discussed along with directions for future research.

INTRODUCTION

Consumers often give payments of money (called "tips") to workers who have performed services for them. In fact, U.S. consumers tip approximately $14 billion a year (based on an inflation adjustment of estimates by Pearl 1985). This behavior is notable, because tips are generally voluntary payments given after services have been rendered. Few consumers aspire to pay more than necessary for goods and services. Consumers' resources are usually more limited than their wants, so consumers generally try to obtain things for the lowest possible price. Tipping represents a billion dollar exception to this general rule. It is an exception that raises interesting questions such as: "Why do rational consumers leave tips?" and "What factors influence consumers' decisions about how much to tip?" These questions are addressed below in a quantitative review of research on restaurant tipping.

Our review is divided into several major sections. First, we analyze tipping from a rational choice perspective and develop propositions and hypotheses about the determinants and predictors of tip size. Then we describe the methods used to meta-analyze empirical tests of the hypothesized relationships. Finally, we discuss the results of our meta-analysis along with their theoretical, methodological and practical implications.

† This is a 2000 SHA Working Paper that is available on Cornell E-Commons at https://ecommons.cornell.edu/entities/publication/57430a62-b47e-479a-9772-9ff7b5c29f9c. A version of this paper was presented at the annual conference of the Society for the Advancement of Behavioral Economics, June 21, 1997.

This review makes new contributions to our understanding of tipping in three ways. First, it brings together and organizes theory and research on tipping from a variety of loosely connected sources across several disciplines. Second, this review statistically combines the results of many studies to provide more accurate and generalizable tests of relationships than are provided by the individual studies alone. Finally, the review adds new data to the published literature on tipping by: (a) making the results of numerous unpublished studies available for the first time, (b) re-analyzing data from several published studies to provide tests of relationships that were not reported by the original investigators, and (c) testing the effects of study characteristics on study outcomes.

LITERATURE REVIEW

Rational choice theory portrays man as a purposive decision maker who maximizes utility under conditions of certainty and expected utility or subjective expected utility under conditions of risk and uncertainty (Edwards 1954). Utility is the perceived value of an outcome. Thus, from a rational choice perspective, tipping makes sense only if desired outcomes are contingent on how much is tipped (Lynn and Grassman 1990). Since tips are usually paid after services have been rendered, immediate service is clearly not contingent on tipping behavior and is not the desired outcome being purchased with tips. This is why many economists view tipping as anomalous behavior that challenges their assumptions about the rationality of economic man (Bodvarsson and Gibson 1987; Frank 1987). However, social approval/esteem, equitable relationships, future service and the well-being of servers are all potentially desirable outcomes that are contingent on tipping. Thus, tipping may be explained as a rational attempt to obtain these outcomes. These potential explanations for tipping and the potentially inhibiting effects on tipping of cost considerations are discussed in the paragraphs below.

Social Approval and Esteem

Humans are social animals with deep-seated needs for the approval and esteem of their fellows (Baumeister and Tice, 1990; Hogan 1982). These needs may underlie tipping. Researchers have argued that consumers leave tips to comply with social norms and expectations (Crespi 1947; Holloway 1985; Lynn and Grassman 1990), to reduce servers' envy of the customers' superior circumstances (Foster 1972; Lynn 1994), and to display wealth, status and power (Lynn 1997; May 1978; Paules 1991; Scott 1916; Shamir 1984). In other words, these researchers have argued that tipping is an attempt to buy the approval, goodwill and esteem of servers and fellow consumers.

Social approval is tied to compliance with social norms and expectations (Deutsch and Gerard 1955; Schacter 1951). In restaurant settings, consumers are expected to tip 15 to 20 percent of their bill amounts (Martin 1988). Thus, the social approval explanation for tipping suggests that consumers' tip amounts will be positively related to their bill sizes. Moreover, to the extent that consumers comply with the 15 to 20 percent tipping norm in order to obtain social approval, then the strength of the relationship between tip amount and bill size should vary with the value of the approval to be obtained. This means that bill size should be a stronger predictor of tip amounts for frequent patrons than for infrequent ones, because frequent patrons are more likely to encounter the server again and, therefore, to value his or her approval. It also means that bill size should be a stronger predictor of tip amounts at more expensive restaurants, because the social-status of servers and other diners is greater at more upscale restaurants and tippers should value the approval of high status sources more than that of low status sources.

PROPOSITION 1: Consumers will comply with the 15 to 20 percent tipping norm to the extent that they value their servers' approval.

- ***Hypothesis 1***: Tip amounts will be positively related to bill size.
- ***Hypothesis 2***: Bill size will be a stronger predictor of tip size for frequent patrons than for infrequent ones.
- ***Hypothesis 3***: Bill size will be a stronger predictor of tip size at expensive restaurants than at inexpensive ones.

Social esteem refers to status and liking. It can be obtained through conspicuous displays of wealth (Veblen 1965) and through the giving of generous gifts (Schwartz 1967). Tipping is a voluntary payment of money that allows consumers to demonstrate both wealth and generosity (Lynn 1997; Paules 1991; Shamir 1984). However, the value of such demonstrations should vary with the patronage frequency of the tipper as well as with the physical attractiveness and sex of the server. Frequent restaurant patrons should value a servers' esteem more than do infrequent patrons because frequent patrons are more likely to encounter the server again (Lynn and Grassman 1990). Restaurant patrons should also value the esteem of physically attractive servers more than that of less attractive servers because attractive people are themselves held in more esteem than are less attractive people (Patzer 1985). Finally, restaurant patrons may value the esteem of opposite sex servers more than that of same sex servers, because opposite sex servers will have greater sexual appeal to heterosexual restaurant patrons. Thus, the social esteem explanation for tipping suggests that restaurant tips will increase with the customers' patronage frequency and with the server's physical attractiveness. It also suggests that restaurant tips may be larger when the server's sex differs from the tipper's sex. This latter expectation further implies that: (a) male customers will tip more on average than female customers, because 81 percent of restaurant servers are female (Segrave 1998), and (b) female servers will receive larger tips on average than male servers, because most tippers are male (Lynn and Latane 1984; Lynn and Mynier 1993).

PROPOSITION 2: Consumers will tip more to the extent that they value their servers' esteem.

- ***Hypothesis 4***: Frequent patrons will leave larger bill-adjusted tips than infrequent patrons.
- ***Hypothesis 5***: Attractive servers will receive larger bill-adjusted tips than less attractive servers.
- ***Hypothesis 6***: Servers will receive larger bill-adjusted tips from opposite-sex customers than from same-sex customers.
- ***Hypothesis 7***: Male consumers will leave larger bill-adjusted tips on average than female customers.
- ***Hypothesis 8***: Female servers will receive larger bill-adjusted tips on average than male servers.

Equitable Relationships

People are taught to value fairness and equity in social relationships (Adams 1965; Walster, Bersherd and Walster 1973). A relationship involving the exchange of positive resources (as in most service encounters) is considered equitable when each of the participant's outcomes (Oa and Ob) from the relationship are proportionate to their inputs (Ia and Ib) – i.e., when Oa/Ia = Ob/Ib. Tips and services are resources that customers and servers respectively give to one another in social exchange relationships, so the desire for equitable relationships may underlie consumers' tipping decisions. This possibility is consistent with economists' belief that tipping exists

because it is the most efficient way to motivate servers to provide good service (Bodvarsson and Gibson 1994; Hemenway 1980; Jacob and Page 1980). If consumers do tip in order to buy equitable relationships with servers, then tip size should be positively related to the quality and quantity of service.

PROPOSITION 3: Consumers will tip more to the extent that they receive more or better service.

- ***Hypothesis 9***: Bill-adjusted tip size will be positively related to ratings of the quality of the service rendered.
- ***Hypothesis 10***: Bill-adjusted tip size will be positively related to the number of server trips to the table.
- ***Hypothesis 11***: Bill adjusted tip size will be positively related to the number of items/dishes the server brings to the table.
- ***Hypothesis 12***: Bill-adjusted tip size will be positively related to the number of courses the server delivers to the table.
- ***Hypothesis 13***: Bill-adjusted tip size will be greater when the server writes separate checks for the table than when the server writes only one check for the table.

Future Service

People value future rewards, though at a discounted rate (Lea, Tarpy and Webley 1987). This means that for a restaurant's regular patrons, tipping could be an attempt to buy good service in the future. Regular patrons can ensure good future service by leaving tip amounts that are contingent on service quality (Lynn and Grassman 1990). Servers who are aware of this contingency and who want to improve their tip incomes will then be motivated to deliver good service. This reasoning is similar to that underlying the tit-for-tat strategy in iterated prisoner's dilemma games (Axelrod 1984) and it suggests that the relationship between service and tipping should be stronger for regular than for non-regular customers.

PROPOSITION 4: Service quality will be a stronger determinant of tip size for frequent patrons of a restaurant than for infrequent patrons.

- ***Hypothesis 14***: Service ratings will predict bill-adjusted tip size more strongly for frequent patrons than for infrequent patrons.
- ***Hypothesis 15***: The number of server trips to the table will predict bill-adjusted tip size more strongly for frequent patrons than for infrequent patrons.

Server Welfare

People often empathize with others in need and take great pains to help them (Hoffman 1981; Krebs 1975). Furthermore, researchers have found that empathy produces a genuinely altruistic concern for the well-being of others (Batson 1991). This raises the possibility that consumers tip in order to insure the well-being of their servers. Many servers receive minimal wages and depend upon tips as a major source of income (Schmidt 1985). Emphatic consumers who are aware of this fact may tip in order to help servers obtain a livable income (Holloway 1985). This explanation for tipping suggests that tip amounts will be positively related to factors that enhance empathy and altruism.

One factor known to increase helping behavior is positive affect (Isen and Levin 1977) and two things that put people in a positive mood are sunshine (Cunningham 1979) and receiving small gifts of candy (Isen, Daubman and Nowicki 1987). This suggests that restaurant patrons will leave larger tips when the day is sunny or when they are given after-dinner mints than otherwise.

PROPOSITION 5: Consumers will tip more when they are in a positive mood than when they are not.

- ***Hypothesis 16***: Consumers will leave larger bill-adjusted tips on sunny days than on cloudy days.
- ***Hypothesis 17***: Consumers will leave larger bill-adjusted tips when given after-dinner candies than when not given candy.

Another factor that increases empathy and helping is interpersonal liking/rapport (Bartal 1976). Servers can increase their rapport with customers by giving their names to customers, touching customers, and squatting down next to customers' tables (Lynn 1996; Lynn and Mynier 1993). Thus, an altruistic explanation for tipping suggests that tip size will be positively affected by all of these server behaviors. Rapport is also affected by interpersonal similarity (Byrne 1971). Since over 85 percent of waiters and waitresses are white (Seagrave 1998), the rapport enhancing effects of similarity suggest that white customers will leave larger tips on average than will non-white customers (see Myers 1990, p. 466, for further support of this hypothesis).

PROPOSITION 6: Consumers will tip more when they feel some personal rapport with the server.

- ***Hypothesis 18***: Consumers will leave larger bill-adjusted tips when the server reveals his/her name than when the server does not reveal his/her name.
- ***Hypothesis 19***: Consumers will leave larger bill-adjusted tips when the server touches them than when the server does not touch them.
- ***Hypotheses 20***: Consumers will leave larger bill-adjusted tips when the server squats next to the table than when the server remains standing throughout the service encounter.
- ***Hypothesis 21***: White consumers will leave larger bill-adjusted tips on average than non-white consumers.

Cost Reduction

Consumers generally try to pay as little as possible for goods and services (Lynn 1990b). Thus, a desire to reduce the costs of eating out should oppose the previously considered motivations for tipping. This expectation suggests that factors associated with the salience and strength of cost concerns will affect consumers' decisions about how much to tip. Payment method (cash vs. credit), the presence of credit card stimuli, evaluations of restaurant prices, alcohol consumption, and bill size should all affect the salience and strength of cost concerns, so they should affect tip amounts in ways described below.

The use of credit cards should decrease consumers' concerns with costs, because credit cards allow consumers to postpone the payment for goods and services and they increase consumers' spending powers. Interestingly, research has found that the mere presence of credit card logos is enough to produce these effects (Feinberg 1986). These considerations and findings suggest that the use of credit cards and the presence of credit card logos should increase tip size.

Consumers' evaluations of a restaurant's prices are also likely to affect their concerns about the cost of the dining experience. When consumers perceive a restaurant's prices as reasonable, they should be less concerned about reducing the cost of eating at that restaurant than when they consider the restaurant's prices as too high. Thus, tip amounts should be positively related to consumers' evaluations of a restaurant's prices.

Alcohol consumption may also decrease consumers' concerns about the cost of tipping, because it reduces people's ability to process information (Steele and Joseph 1990). Alcohol induced myopia tends to make behavior more extreme in situations characterized by strong cues both instigating and inhibiting the behavior. Intoxicated people who process the instigating cues in such situations lack the capacity to also process the inhibitory cues, so their behavior tends to be more extreme than the behavior of non-intoxicated people in the same situation (Steele and Southwick 1985). If consumers experience strong desires to save money that conflict with social pressures to tip, then alcohol consumption should weaken the consumers' inhibitory considerations of costs and should increase tip size.

Finally, bill size should affect consumers' concerns about the cost of tipping, because the cost of complying with the 15 to 20 percent tipping norms goes up with bill size. Consumers may respond to these concerns by leaving smaller percentage tips when they run-up larger bills (Elman 1976). This would mean that dollar tip amounts increase at a marginally decreasing rate as bill size increases. Such an effect would produce a negative quadratic trend as well as a positive linear trend in the relationship between dollar tip amounts and bill size.

PROPOSITION 7: Consumers will leave larger tips when the financial costs of tipping are less salient than when those costs are more salient.

- ***Hypothesis 22***: Consumers will leave larger bill-adjusted tips when paying with credit cards than when paying with cash.
- ***Hypothesis 23***: Consumers will leave larger bill-adjusted tips when the bill is presented on a tip tray embossed with credit card logos than when the bill is presented on a plain tip tray.
- ***Hypothesis 24***: Consumers will leave larger bill-adjusted tips to the extent that they rate the restaurant's prices positively.
- ***Hypothesis 25***: Consumers will leave larger bill-adjusted tips when they have consumed alcohol than when they have not consumed alcohol.
- ***Hypothesis 26***: Tip size will increase with bill size at a marginally decreasing rate.

METHOD

We limited this review to research on the correlates and determinants of tip size in restaurant settings. Studies examining the correlates of tip amounts left to cocktail waitresses (Faber 1982; Tidd and Lockard 1978), hotel bellmen (Rind 1996a) pizza delivery drivers (Seligman, et. al. 1985) and taxicab drivers (Karen 1962; Nida, Jackson and Latane 1980) were excluded, because tipping norms and behaviors differ from one service profession to another and because there were not enough of these studies to make meaningful comparisons of tipping across service professions.

We also limited this review to research providing data about individual service encounters that came from one or more of three sources: (1) restaurant checks, charge receipts and comment cards, (2) records kept each evening by restaurant servers, and/or (3) interviews with restaurant patrons as they departed the restaurant. A

few studies of restaurant tipping using other methods or units of analysis were excluded because they were not methodologically comparable to the included studies (e.g., Davis, et. al. 1998; Fitzsimmons and Maurer 1991; Harris 1995; Lynn and Simons 1998; McCarty, et. al. 1990; McCrohan and Pearl 1991). Finally, one very large unpublished data set collected by one of the authors from exit interviews at over 30 different restaurants was excluded to avoid having it dominate the results of the meta-analysis.

Identification of Studies

Published and unpublished studies falling within the domain of this review were identified in several ways. First, computerized searches of ABI Inform, ERIC, Dissertation Abstracts, Psych Abstracts and the Cornell Hospitality Database were conducted. Second, the references of already identified studies were examined for citations of prior studies. Finally, the authors of the published studies were contacted and asked for any additional studies they had conducted. This search strategy turned up 22 published and 14 unpublished studies that were included in the meta-analysis (see Table 1).

Re-analysis of Study-Level Data

We were able to obtain the raw data from 15 of 22 published studies and 10 of 14 unpublished studies by contacting the authors of existing research articles on tipping. These 25 studies represent 69% of the studies and about 85% of the effects included in our meta-analysis. We reanalyzed the raw data from these studies in order to maximize the comparability of analyses and effects across studies as well as to provide tests of relationships that were not reported by the original investigators.

In these re-analysis, the linear effect of bill size was assessed in a simple linear regression using dollar tip amount as the dependent measure. Each of the other main effects was assessed in a separate multiple regression that used dollar tip amount as the dependent measure and that statistically controlled for the linear effect of bill size. Study level interaction effects were assessed by entering cross-product terms into a multiple regression that statistically controlled for the linear effect of bill size and for the main effects of the variables involved in the interaction. For multiple restaurant studies, separate analyses were conducted on the data from each restaurant.

Calculation of Effect Sizes and z-Scores

We meta-analyzed the relationships of tip size to bill size and of bill-adjusted tip size to twenty-three other predictors from the tipping literature (see Table 2). For each of the effects included in this meta-analysis, we calculated two statistics – a correlation coefficient r that reflects the size of the effect and a z-score that reflects the statistical significance of the effect. These effect sizes and z-scores were calculated using formulas specified in Mullen (1989) and Rosenthal (1991). The information used in these calculations was obtained from our re-analysis or from the original study reports depending on the availability of the raw data. Separate effect sizes and z-scores were calculated using the data from each restaurant in multiple restaurant studies. The only exception was a study by Crusco and Wetzel (1984) that combined data across two restaurants – only one set of effect sizes and z-scores was calculated for this study.

TABLE 1: DESCRIPTIONS OF TIPPING STUDIES

Citation	Source	Yr. of data collection	Data avail-able?	Method	Server's sex	Name of restaurant	Location of restaurant	Ave. per-person bill size[a]	Meal	Sample size
Baune (1992)	Unpub.	----	No	Exit Interviews & Server Records	mixed/ unknown	Waldo's Pizza	St. Cloud, MN	---	Dinner	94
Bodvarsson & Gibson (1994)	Journal	1991	Yes	Exit Interviews	mixed/ unknown	Embers	St. Paul, MN	3.82	Other	98
						Chi-Chi's	St. Paul, MN	6.79	Other	99
						Baker's Sq.	St. Cloud, MN	5.16	Other	100
						Alvies	St. Cloud, MN	2.27	Other	100
						Red Lobster	St. Cloud, MN	12.36	Other	100
						Pirates Cove	St. Cloud, MN	15.39	Dinner	100
						Persian	St. Cloud, MN	11.45	Dinner	100
Crusco & Wetzel (1984)	Journal	1984	No	Server Records & Customer Survey	All Female	---	Oxford, MS	---	Other	114
Cunningham (1979)	Journal	1978	No	Server Records	All Female	---	Chicago, IL	---	Other	130
Feinberg (1986)	Journal	----	No	Server Records	mixed/ unknown	---	West Lafayete, IN	---	Other	135
Fisher (1992)	Unpub.	1992	Yes	Server Records	Male	Simeons	Ithaca, NY	---	Dinner	92
Freeman, et. al. (1975)	Journal	1973	No	Server Records	mixed/ unknown	Steak & Ale	Columbus, OH	14.42	Dinner	396
Garrity & Degelman (1990)	Journal	1988	Yes	Server Records	Female	Charley Brown's	Huntington Beach, CA	9.82	Other	42
Hornik (1992)	Journal	----	No	Server Records & Customer Survey	mixed/ unknown	---	---	---	Dinner	248
Kilkelly (1992)	Unpub.	1992	No	Exit Interviews	mixed/ unknown	Perkins	Sauk Rapids, MN	4.19	Other	100
Lynn (1988)	Journal	1984	Yes	Server Records	Male	Mother's	Columbus, OH	6.21	Other	207

Citation	Source	Yr. of data collection	Data available[a]	Method	Server's sex	Name of restaurant	Location of restaurant	Ave. per-person bill size[c]	Meal	Sample size
Lynn (1989)	Unpub.	1989	Yes	Exit Interviews	mixed/ unknown	Bobby Bufford's	Columbia, MO	8.78	Dinner	63
						Garcia's	Columbia, MO	6.89	Dinner	63
						Denny's	Columbia, MO	5.00	Dinner	39
Lynn (1990)	Unpub.	1990	Yes	Server Records	Female	Houston's	Houston, TX	9.52	Dinner	91
					Female	On the Border	Houston, TX	7.23	Dinner	113
					Female	Park Place	Houston, TX	11.61	Dinner	100
					Male	Shang Hai	Houston, TX	7.58	Dinner	97
					Male	Eric's	Houston, TX	6.58	Dinner	44
					Male	Deerfield's	Houston, TX	10.94	Dinner	134
Lynn & Grassman (1990)	Journal	1988	Yes	Exit Interviews	mixed/ unknown	Red Lobster	Columbia, MO	11.65	Dinner	103
Lynn & Graves (1996; Study 1)	Journal	1990	Yes	Exit Interviews	mixed/ unknown	Bennigan's	Houston, TX	6.77	Dinner	109
						Olive Gardens	Houston, TX	8.32	Dinner	69
Lynn & Graves (1996; Study 2)	Journal	1988	Yes	Server Records	Female	Red Lobster[b]	Columbia, MO	11.25	Dinner	175
Lynn & Latane (1984; Study 1)	Journal	1980	Yes	Exit Interviews	Female	I.H.O.P.	Columbus, OH	3.55	Other	169
Lynn & Latane (1984; Study 2)	Journal	----	Yes	Server Records	mixed/ unknown	Smuggler's Inn	Columbus, OH	13.34	Dinner	206
Lynn, Le & Sherwyn (1998)	Journal.	1995	Yes	Server Records	Male	Bennigan's	Houston, TX	6.06	Other	105
Lynn & Lynn (1990)	Unpub.	1984	Yes	Server Records	Female	Jimmy Dean's	Columbus, OH	3.59	Dinner	248
Lynn & Mongan (1996)	Unpub.	1996	Yes	Server Records	Female	John Thomas' Steak House	Ithaca, NY	24.90	Dinner	73
Lynn & Mynier (1993; Study 1)	Journal	1991	Yes	Server Records	Male	Cyclone's Anaya's	Houston, TX	---	Other	270
Lynn & Mynier (1993): Study 2)	Journal	1992	Yes	Server Records	Female	(Chinese)	Houston, TX	5.93	Dinner	148

Citation	Source	Yr. of data collection	Data avail-able?	Method	Server's sex	Name of restaurant	Location of restaurant	Ave. per-person bill size[c]	Meal	Sample size
Lynn & Petrick (1996)	Unpub.	1996	Yes	Restaurant Records & Customer Survey	mixed/ unknown	Coyote Loco	Ithaca, NY	9.76	Dinner	147
Lynn & Strong (1992)	Unpub.	1992	Yes	Server Records	Male	Anti Pasto	Houston, TX	6.72	Other	200
May (1978)	Thesis	----	No	Server/Restaurant Records & Observers	All Female	(Steak & Lobster)	Chicago, IL	16.21	Dinner	600
McCall & Belmont (1996; Study 1)	Journal	1994	Yes	Server Records	mixed/ unknown	---	Turin, NY	4.71	Other	79
McCall & Belmont (1996; Study 2)	Journal	1994	Yes	Server Records	mixed/ unknown	(cafe)	Ithaca, NY	4.88	Other	27
Olia (1991)	Unpub.	----	No	Exit Interviews	mixed/ unknown	Alvies[a]	St. Cloud, MN	2.27	Other	50
						LaCasita	St. Cloud, MN	---	Other	50
						Red Lobster[a]	St. Cloud, MN	12.36	Other	50
						Ember's[a]	St. Cloud, MN	3.82	Other	50
Rind (1996)	Unpub.	1996	Yes	Server Records	mixed/ unknown	---	Philadelphia, PA	5.93	Other	213
Rind & Bordia (1995)	Journal	1992	Yes	Server Records	Female	White Dog Cafe	Philadelphia, PA	9.09	Other	137
Rind & Bordia (1996)	Journal	1994	Yes	Server Records	mixed/ female	Saladally	Philadelphia, PA.	5.26	Other	89
Rind & Lynn (1996)	Unpub.	1996	Yes	Server Records	Female	---	Philadelphia, PA	3.34	Other	98
Rind & Strohmetz (1997)	Unpub.	1997	Yes	Server Records	Female	---	Monmouth, NJ	8.58	Dinner	81
Stephen & Zweigenhaft (1986)	Journal	----	No	Server Records	Female	---	Greensboro, SC	---	Other	112
Stillman & Hensley(1980)	Journal	----	No	Server Records	All Female	---	---	14.17	Dinner	376

[a] same restaurants as in Bodvasson and Gibson (1994)
[b] same restaurant as in Lynn and Grassman (1990)
[c] in 1982-1984 dollars

Coding of Study Characteristics

This meta-analysis used fifty-four sources of data – counting each restaurant in each study as a separate source. Two characteristics of each source of data – the sex of the server and the expensiveness of the restaurant – were coded as potential moderators of tipping effect sizes. The information used to make these coding decisions came from articles and papers reporting the studies and from other information supplied by the studies' investigators.

Sex of the server. The sex of the server or servers in each source of data was coded as being either male or female. In cases where the servers' sexes were mixed or unknown, this characteristic was coded as a missing value. This study characteristic was coded by each of the authors, who agreed on 52 of the 54 sex-of-server coding decisions. The two coding disagreements were easily resolved upon discussion.

Restaurant expensiveness. The expensiveness of each restaurant was assessed (where possible) by obtaining the average per-person bill size at the restaurant and adjusting this figure for inflation using the Consumer Index for Food Prices (Statistical Abstracts of the United States 1996). In the vast majority of cases, the average per-person bill size was obtained from our re-analyses rather than from the original study reports. Therefore, only the senior author coded this characteristic. To make the inflation adjustments, we had to know when the data were collected. In a few cases, the year of data collection was not obtainable from written reports or from authors. In those cases, we assumed the data was collected two years prior to the publication date of journal articles, one year prior to the completion date of master's theses, and the same year as the composition of unpublished manuscripts.[1]

RESULTS AN DISCUSSION

The effect sizes and z-scores in this meta-analysis were analyzed using Mullen's (1989) software program, "Advanced Basic Meta-Analysis," which facilitates the use of procedures and formulas that are explained and advocated by Rosenthal (1991). Our findings are summarized in Tables 2 through 5 and are discussed in the paragraph below.

TABLE 2

SUMMARY OF META-ANALYTIC COMBINATIONS AND DIFFUSE COMPARISONS

Hypothesis: Variable	No. of effects	No. of subjects	Mean r[a]	Combined z	Fail-safe n	Diffuse comparison of effect sizes
Proposition 1: Social Approval						
H1: Bill Size	45	5,016	.83	70.99	83,769.34	$\chi^2(44)=1250.38$, $p<.0001$
H2: PF x Bill	21	2,102	.11	4.92	166.55	$\chi^2(20)=48.14$, $p<.001$
Proposition 2: Social Esteem						
H4: Patronage Freq (PF)	26	2,446	.09	4.68	184.72	$\chi^2(25)=32.55$, n.s.
H5: Server Attractiveness	2	412	.20	3.73	8.28	------
H7: Customer's Sex (M>F)	18	1,839	.06	2.30	17.19	$\chi^2(17)=37.85$, $p<.002$
H8: Server's Sex (F>M)	6	810	.10	2.18	4.52	$\chi^2(5)=18.80$, $p<.001$
Proposition 3: Equity						
H9: Service Quality	26	2,668	.12	5.58	273.10	$\chi^2(25)=31.01$, n.s.
H10: No. Trips to Table	6	614	.10	2.52	8.12	$\chi^2(5)=13.24$, $p<.03$
H11: No. Items Served	13	1,090	.08	2.71	22.17	$\chi^2(12)=25.46$, $p<.02$
H12: No. Courses Served	19	1,794	-.00	-.24	---	$\chi^2(18)=24.55$, n.s.
H13: Separate Checks	9	1,045	-.00	-.12	---	$\chi^2(8)=12.37$, n.s.
Proposition 4: Future Service						
H14: PF x Service Quality	14	1,317	-.01	-.11	---	$\chi^2(13)=14.43$, n.s.
H15: PF x No. of Trips	4	311	.11	2.40	4.50	$\chi^2(3)=8.52$, $p<.04$
Proposition 5: Positive Mood						
H16: Sunshine	2	244	.20	3.05	4.85	------
H17: After Dinner Mints [b]	3	240	.21	3.35	9.42	$\chi^2(2)=4.37$, n.s.
Proposition 6: Rapport						
H18: Giving Name to	3	275	.23	2.20	2.38	$\chi^2(2)=18.62$, $p<.0001$
Customer [b]	4	579	.27	5.97	48.65	$\chi^2(3)=5.70$, n.s.
H19: Touching Customer [b]	2	418	.39	8.26	48.41	-------
H20: Squatting Next to Table [b]	7	638	.21	4.99	57.50	$\chi^2(6)=7.74$, n.s.
H21: Customer's Race (White>Non-White)						
Proposition 7: Cost Considerations						
H22: Cash vs. Credit	16	2,333	.12	5.11	138.64	$\chi^2(15)=68.45$, $p<.0001$
H23: Presence of Credit	2	106	.29	2.79	4.67	-------
Insignia [b]	7	532	.18	3.81	30.53	$\chi^2(6)=8.10$, n.s.
H24: Eval. of Meal Price	19	2,414	.03	1.47	----	$\chi^2(18)=34.79$, $p<.02$
H25: Alcohol Consumption	38	4,226	.05	3.27	112.43	$\chi^2(37)=192.69$, $p<.0001$
H26: Bill Size Squared						

[a] The bill size effects used tip size as the dependent variable. All other effects used bill-adjusted tip size as the dependent variable.
The unweighted mean effect size is reported.

[b] These variables were manipulated with random assignment of subjects to conditions.

Social Approval

Academics and consumers alike have expressed the belief that people tip because it is expected and because violating those expectations risks social disapproval (Crespi 1947; Lynn and Grassman 1990). The results of this meta-analysis support that belief. Consistent with the 15 to 20 percent tipping norms, we found that tip amounts were positively related to bill size (Hypothesis 1: mean r =.83; z = 70.99, p< .001, n = 45). In fact, bill size was the single best predictor of tip amounts – accounting for twice as much variability on average (mean r^2 = .70) as all other factors combined! Moreover, this relationship was stronger under conditions likely to enhance concern with the server's approval. Specifically, bill size was a stronger predictor of tip size for more frequent patrons (Hypothesis 2: mean r = .11; z = 4.92, p < .001; n = 21) and at more expensive restaurants (Hypothesis 3: r = .39; $z_{contrast}$ = 11.21, p < .001; n = 41; see Table 5).

Social Esteem

Tipping may also be attributed to a desire for the respect and liking of servers. Consistent with this possibility, we found that consumers tipped more under conditions likely to enhance the value of a servers' esteem. Specifically, consumers left larger bill-adjusted tips when they were frequent patrons of a restaurant (Hypotheses 4: mean r = .09; z = 4.68, p < .001; n = 26) and when their servers were physically attractive (Hypothesis 5: mean r = .20; z = 3.73, p < .001; n = 2).[2,3] In addition, men tipped more than women when the servers were female, but tipped less than women when the servers were male (Hypothesis 6: mean r = .16 vs. -.07; z – contrast = 3.84, p < .001; see Table 3).[4]

Since most restaurant servers are female and most tippers are male, we expected men to leave larger average tips than women and we expected waitresses to receive larger average tips than waiters. Consistent with the first of these expectations, we found that the average bill-adjusted tips left by men were larger than those left by women (Hypothesis 7: mean r = .06; z = 2.30, p < .05; n = 18).[5] However, waitresses did not receive larger average bill-adjusted tips than waiters (Hypothesis 8: mean r = .02; z = .46, n.s.; n = 5).[6] This failure to support Hypothesis 8 may be due to a weakness in its underlying assumption. We were able to identify the sex of the tipper in four of the studies testing sex-of-server effects. Although male tippers outnumbered female tippers in all those studies, male tippers made up less than 60 percent of the sample in two of the four studies. Thus, the preponderance of male tippers may not have been large enough to produce reliable sex-of-server effects.

Equitable Relations

Tips are supposed to be an equitable reward for services rendered (Lynn and Grassman 1990; Lynn and Graves 1996; Snyder 1976). Consistent with this motive for tipping, bill-adjusted tips increased with evaluations of service quality (Hypothesis 9: mean r = .12; z = 5.58, p < .001; n= 26), the number of server trips to the table (Hypothesis 10: mean r = .10; z = 2.52, p < .02, n = 6), and the number of items servers delivered to the table (Hypothesis 11: mean r = .08; z= 2.71, p < .01; n=13).[7] However, bill-adjusted tips were not related to the number of courses served (Hypothesis 12: mean r = .00; z = .24, n.s.; n = 19) or to whether or not the server wrote separate checks for different members of the dinning party (Hypothesis 13: mean r = .00; z = .12, n.s.; n = 9).[8] Although it is difficult to explain the failure to support all the hypothesis, the most parsimonious explanation for the three hypotheses that were supported is that consumers intentionally rewarded more and better service with larger tips.[9]

TABLE 3

SUMMARY OF META-ANALYTIC COMPARISONS OF HETEROGENIOUS EFFECT SIZES FOR MALE AND FEMALE SERVERS

	Male servers			Female servers			
Effect	No. of effects	Mean r	Combined z	No. of effects	Mean r	Combined z	Z contrast
Hypothesis 6							
Customer's Sex (M > F)	5	-.07	-1.45	7	.16	4.31	3.84 ($p < .001$)
Other Effects							
Bill Size	8	.89	39.96	11	.87	39.13	2.07 ($p < .04$)
PF x Bill Size	3	.19	3.20	5	.08	2.18	1.39 (n.s.)
No. Trips to Table	3	.01	-.04	3	.18	3.61	1.87 ($p < .07$)
No. Items Served	–	—	—	–	–	—	——
PF x No. Trips	2	.04	.79	2	.18	2.60	1.15 (n.s.)
Giving Name	–	—	—	–	–	—	——
Cash vs. Credit	7	.07	2.22	6	.17	4.04	1.67 ($p < .10$)
Alcohol Consumption	5	.22	4.94	6	-.02	-.55	3.90 ($p < .0001$)
Bill Size Squared	8	.09	2.83	11	-.01	-.49	2.09 ($p < .04$)

Table 4: Summary of meta-analytic comparisons of effect sizes for dinner and other mealtimes

	Dinner Time			Other Meal Times			
Effect	# Effects	Mean r	Combined z	# Effects	Mean r	Combined z	z Contrast
Bill Size	23	.86	54.44	22	.80	45.87	6.55 ($p < .0001$)
PF x Bill Size	16	.13	5.04	5	.03	1.06	1.97 ($p < .05$)
No. Trips to Table	—	—	—	—	—	—	——
No. Items Served	3	.07	1.17	10	.08	2.44	.18 (n.s.)
PF x No. Trips	—	—	—	—	—	—	——
Giving Name	—	—	—	—	—	—	——
Bill Size Squared	21	.03	1.61	17	.08	3.10	1.31 (n.s.)
Cash vs. Credit	9	.08	3.59	7	.16	3.66	1.56 (n.s.)
Alcohol Consumption	14	-.00	-.18	5	.11	3.17	2.26 ($p < .03$)
Server's Sex (F > M)	—	—	—	—	—	—	——
Customer's Sex (M > F)	11	.07	2.19	7	.03	.94	.85 (n.s.)
Dining Party Size	22	.01	-.83	17	.03	1.23	.52 (n.s.)

Future Service

Game theory suggests that regular customers at a restaurant can ensure good future service by leaving tip amounts that are contingent on service quality (Axelrod 1984; Lynn and Grassman 1990). However, this meta-analysis provided little evidence that regular customers use this strategy. A predicted interaction between patronage frequency and the number of server trips to the table was confirmed (Hypothesis 15: mean r = .11; z = 2.40, p < .02; n = 4), but this meta-analytic result was caused by a single study involving a single server at one restaurant and does not appear to be robust (without that one study: mean r = .03; z = .64, n.s.). Moreover, an interaction between patronage frequency and service evaluations was non-significant (Hypothesis 14: mean r = .01; z = -.11, n.s.; n = 14). With a total sample of 1,317 dining parties from 14 different restaurants, it is difficult to attribute this null result to a lack of statistical power or to unusual characteristics of the studies' settings. Thus, it appears that tippers are either poor game theorists or unmotivated by considerations of future service.

Server Welfare

Tipping may be an altruistic act designed to help servers earn a livable income (Holloway 1985). Our meta-analysis results were consistent with this possibility. Consumers left larger bill-adjusted tips under conditions known to elevate mood and increase helping – when the weather was sunny (Hypothesis 16: mean r = .20; z = 3.05, p < .01; n = 2) and when the consumers received gifts of candy (Hypothesis 17: mean r = .21; z = 3.35, p < .01; n = 3).[10] Furthermore, consumers left larger bill-adjusted tips under conditions likely to enhance their rapport and empathy with servers – when servers gave their names to customers (Hypothesis 18: mean r = .23; z = 2.20, p < .04; n = 3), touched their customers (Hypothesis 19: mean r = .27; z = 5.97, p < .001; n = 4), and squatted next to their customers' tables (Hypothesis 20: mean r = .39; z = 8.26, p < .001; n = 2) as well as when the customers were the same race as the vast majority of servers (Hypothesis 21: mean r = .21; z = 4.99, p

< .001; n = 7).[11] Mood and rapport effects on tipping are not conclusive evidence for altruistic motives, but they are linked to altruism in the existing literature.

TABLE 5

SUMMARY OF META-ANALYTIC COMPARISONS OF HETEROGENIOUS EFFECT SIZES ACROSS RESTAURANT EXPENSIVENESS

Effect	No. of effects	Pearson r	Z contrast
Hypothesis 3			
Bill Size	41	.39	11.21 ($p < .0001$)
Other Effects			
PF x Bill Size	21	.46	3.05 ($p < .01$)
No. Trips to Table	6	.05	.19 (n.s.)
No. Items Served	11	.14	.60 (n.s.)
PF x No. Trips	4	-.13	.34 (n.s.)
Giving Name	—	—	——
Cash vs. Credit	14	.28	2.93 ($p < .005$)
Alcohol Consumption	16	-.12	.84 (n.s.)
Bill Size Squared	36	.45	5.59 ($p < .0001$)
Server's Sex (F > M)	—	—	——
Customer's Sex (M > F)	16	-.34	1.78 ($p < .08$)

Costs

Rational choice models suggest that tipping is constrained by the costs or sacrifices involved (Frank 1987). If cost considerations inhibit tipping, then tip amounts should be affected by variables that increase or decrease the salience of these considerations – variables such as payment method (cash vs. credit), the presence of credit card cues, and evaluations of restaurant prices, alcohol consumption, and bill size. Our meta-analysis provided qualified support for these expectations. Consumers did leave larger bill-adjusted tips when paying with credit (Hypothesis 22: mean r = .12; z = 5.11, p < .001; n = 16), receiving the bill on a tip tray containing credit card logos (Hypothesis 23: mean r = .29; z = 2.79, p < .006; n = 2), and evaluating the restaurant's prices favorably (Hypothesis 24: mean r = .18; z = 3.81, p < .001; n = 7).[12] These effects are consistent with our expectations that each variable would reduce the salience of tipping's costs.

Alcohol consumption was not related to bill-adjusted tips (Hypothesis 25: mean r = .03; z = 1.47, n.s.; n = 19), but the alcohol effects in the literature were significantly heterogeneous (ChiSquare (18) = 34.79, p < .02). Analyses of moderators indicated that alcohol consumption increased bill-adjusted tips when the server was male but not female (r = .22, vs = -.02; z contrast = 3.90, p < .001; n = 5 vs. 6; see Table 3). Alcohol affects behavior more strongly the greater the inhibitory conflict over the behavior (Steele and Josephs 1990), so these findings suggest that tippers may be more cost conscious when tipping males than when tipping females.

Finally, tip size increased with bill size at a marginally increasing rate rather than at the marginally decreasing rate we hypothesized (Hypothesis 26: mean r = .05; z = 3.27, p < .001; n = 38). This positive quadratic effect may be attributable to individual differences in cost consciousness – those consumers with little concern for costs may run up larger bills and leave more generous tips than do more cost conscious consumers. Consistent with this interpretation, we found that the positive quadratic effect of bill size was stronger at more expensive restaurants (r = .43; z = 5.59, p < .001; see Table 5). Taken together the tests of Hypotheses 22 through 26 suggest that cost concerns inhibit tipping, but that such concerns are not universal.

Alternative Explanations

Several of the relationships observed in this meta-analysis have more than one plausible explanation. Although not alone in this regard, four relationships stand out as having particularly plausible rival explanations. First, frequent patrons of a restaurant may tip more than infrequent patrons, because frequent patrons value the server's approval more than infrequent patrons or because frequent patrons like the restaurant's atmosphere, food, service and prices more than infrequent patrons. Second, tip size may be related to service ratings, because evaluations of service quality drive tipping decisions or because the customer's mood drives both evaluations of service quality and tipping decisions. Third, receiving free after-dinner mints may increase tip size, because the candies elevate customers' moods or because the candies obligate customers to reciprocate in some way. Fourth, white consumers may tip more than non-white consumers, because white consumers identify/empathize with a largely white waitstaff more than non-white consumers or because white consumers receive better service from servers (who expect non-white customers to be poor tippers) than do non-white consumers. Our review of the literature does not allow us to definitively rule out these and other alternative explanations for specific relationships between tip size and its predictors. When considered together, however, the observed relationships form patterns that are most plausibly and parsimoniously explained in terms of the propositions outlined in the introduction. Thus, the collective results of this meta-analysis provide support for our propositions (except Proposition 4) even though additional research is needed to rule out alternative explanations for several specific relationships.

CONCLUSIONS

This meta-analysis brought together published and unpublished studies from several disciplines to assess the reliability, strength and generalizability of various predictors of restaurant tip amounts. The results of the meta-analysis indicated that bill size was the single largest predictor of tip size in restaurant settings – accounting for twice as much variability as all other factors combined! The next largest predictors of tip size were variables associated with server attractiveness, server friendliness, and customer mood. Variables related to service quality, server effort, and cost consciousness were reliable, but weak predictors of tip size. Patronage frequency, sex-of-server, and restaurant expensiveness moderated some of the observed relationships between tip size and

its predictors. These findings implicate a variety of cognitive and motivational processes as described in the "Literature Review" and the "Results and Discussion" sections. In addition, they have several methodological and practical implications that are considered below.

Methodological Implications

Academic researchers have used tipping as a way of testing theories about more general phenomena in a naturalistic context. For example, tip size has been used as a measure of interpersonal liking (Hornik 1992), social influence (Freeman, et. al. 1973) and consumer satisfaction (Fitzsimmons and Mauer 1991). The results of our meta-analysis provide evidence about the appropriateness of these uses and interpretations of tip size. Specifically, the effects on tipping of several variables known to increase interpersonal rapport and liking – i.e., physical attractiveness, physical proximity (squatting next to the table), interpersonal touching, and knowing someone's name – suggest that tip size is a valid measure of rapport and liking. In addition, the effects of bill size, along with its interactions with patronage frequency and restaurant expensiveness, support the use of tip size as a measure of social influence. On the other hand, the fact that tip size was very weakly related to evaluations of service quality suggests that tip size is a poor measure of consumer satisfaction with service. Future researchers should keep these findings in mind when considering the use of tip size as a measure of these constructs.

Practical Implications

Approximately 3 million waiters and waitresses in the United States rely upon tips as a major source of income (Schmidt 1985; Statistical Abstracts of the United States 1996). The results of our meta-analysis suggest that servers interested in increasing this income should focus more on raising their customers' bill sizes, elevating their customers' moods and establishing rapport with their customers than on delivering attentive and technically correct service. More specifically, our review suggests that servers can increase their tips by: (1) selling more food and drink (especially alcohol for waiters), (2) giving their names to customers, (3) squatting next to their customers' tables, (4) touching their customers, (5) giving after-dinner mints to their customers, (6) encouraging their customers to pay with credit cards, and (7) using tip trays embossed with credit card logos.

The results of our meta-analysis also have implications for restaurant managers. First, the weak relationship we found between tip amounts and service evaluations suggests that managers should probably not rely upon tips alone to motivate servers (see Lynn and Graves 1996). According to economists, tipping exists because services are difficult for managers to monitor and reward, but relatively easy for customers to monitor and reward (Bodvarsson & Gibson 1994; Hemenway 1984; Jacob and Page 1980). Difficult or not, managers may need to assume a larger, more active role in monitoring and rewarding the efforts of their service employees. Managers could supplement a tipping-based incentive/reward system by directly observing servers' work, by hiring mystery customers to evaluate servers, and/or by soliciting verbal feedback from regular customers.

Second, our meta-analytic results suggest a number of ways that managers can help their servers earn larger tips, which should increase employee morale and reduce turnover (Lynn 1996). We have already discussed techniques that servers can use to increase their own tips. Managers should encourage and facilitate their servers' use of these techniques by providing training in suggestive selling and rapport building, by supplying servers with after-dinner mints for customers, and by supplying servers with tip trays that display credit card logos. In addition, managers can increase their servers' tips by making optimal assignments of servers to custom-

ers. Specifically, our findings suggest that managers should assign servers to wait on members of the opposite sex whenever possible.

Directions for Future Research

Tipping is a behavior we all engage in as consumers, but rarely think about as researchers. As this review demonstrates, however, tipping is a potentially fruitful area of inquiry for consumer researchers. Investigations into an area in which consumers voluntarily add to the costs of service promise to enrich both theory and practice. By bringing together and organizing existing work on this topic, our review can help to guide future investigations. In particular, our review points to two issues that need to be addressed. First, there are no studies relating tip size to direct measures of the tippers' motivational states or dispositions. Such studies are needed to provide more definitive assessments of the motivations underlying tipping. Second, there are very few tests of interactions in the tipping literature. More tests for interactions are needed to explain the heterogeneity in effect-sizes observed for 9 of 21main-effect predictors in our meta-analysis. Tests for interactions would also help assess rival explanations for some of the relationships observed between tip size and its predictors. As researchers address these issues, and as research findings continue to build in this area, we will gain deeper insights into the cognitive and motivational processes underlying tipping. The larger picture to emerge from this body of work is likely to integrate a collage of theoretical viewpoints and to enhance our general understanding of consumer behavior.

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ENDNOTES

[1] In order to keep one outlying value of restaurant expensiveness from biasing our analyses of moderators, we re-coded Lynn and Mongan's (1996) inflation-adjusted, average, per-person bill size to $16.50 from its original value of $24.90. This re-coding eliminated the outlying value while preserving the ordinal position of the restaurant on the expensiveness dimension.

[2] The effects of patronage frequency on tipping do not appear to generalize to taxicabs. Karen (1962) found that regular customers were less likely to tip cab drivers than were non-regular customers.

[3] Lynn and Simon (1998) partially replicated the server attractiveness affect in a study using servers as the units of analysis. They found that attractive waitresses received larger average charge tips than did less attractive waitresses. However, this effect was observed only for evening shifts. In addition, attractiveness had no effect on the average charge tips of waiters in this study.

[4] Four studies in the meta-analysis included measures of both the servers' and the customers' sexes. The sex-of-server by sex-of-customer interactions in these studies had an average effect size r of .06 and a combined z score of 1.19 (one-tailed $p < .12$). Although not significant, the combined interaction was in the hypothesized direction. This analysis was not used to test Hypothesis 6, because modest samples combined with unequal cell sizes meant that the statistical power of these study-level interactions was low. The reported between-study analysis involved more subjects and greater statistical power.

[5] Tidd and Lockard (1978) found a similar effect in cocktail lounges. Men tipped cocktail waitresses more than did women, but only when the waitresses flashed a large smile at her customers. Complicating matters is a sex difference in tipping taxicab drivers. Karen (1962) found that men were more likely to tip a male taxicab driver than were women. While superficially similar to the sex difference in restaurant tipping, Karen's finding is inconsistent with the sex-of-customer by sex-of-server interaction found in restaurants.

[6] One study finding a strong sex-of-server effect consistent with Hypothesis 8 was excluded from this analysis, because each sex was represented by only one server in that study. Consistent with the null effect reported in the main body of the current paper, Lynn and Simons (1998) found no sex-of-server effect on tipping in a restaurant study using servers as the units of analysis. However, Davis, et. al., (1998) found that waitresses received larger tips than did waiters in a study using server work days as the units of analysis. Clearly, this is an issue that needs more research attention.

[7] Tipping service relationships have also been observed at the server and restaurant levels of analysis. Lynn and Simons (1998) found that servers who rated their service abilities highly received larger average evening charge tips than did servers who rated their service abilities less highly. Fitzsimmons and Mauer (1991) found that percentage tips were larger at restaurants providing more attentive service than at restaurants providing less attentive service.

[8] The service-tipping relationship does not appear to generalize to taxicabs. Karen (1962) found that taxicab customers were no more likely to tip the cab driver when he provided special services than when he did not.

[9] Equity motives can also explain Seligman, et. al.'s (1985) finding that pizza delivery drivers received larger tips for faster deliveries only when customers were lead to attribute delivery time to the driver's efforts.

[10] The effects of sunshine on tipping appear quite robust. Rind (1996) found that simply telling customers that the weather was sunny increased the tips given to a hotel bellperson.

[11] Davis et. al. (1998) replicated the effects of squatting in a multi-restaurant study that used server workdays as the units of analysis.

[12] Large scale consumer diary studies have also found that consumers tip more when paying with credit (Pearl 1985).

CHAPTER 2

The Effects on Perceived Restaurant Expensiveness of Tipping and Its Alternatives

SHUO WANG AND MICHAEL LYNN†

EXECUTIVE SUMMARY

Research on behavioral pricing has found that presenting the price of a product or service in separate parts rather than a consolidated whole can reduce consumers' perceptions of the total cost. That principle suggests that restaurants which charge separate fees for their food and service whether by voluntary tipping or an automatic service charge may be perceived as less expensive than those that include service charges in the form of an all-inclusive price. An internet-based test of that idea found that participants rated restaurants with tipping or automatic gratuity policies as being less expensive than restaurants that built the costs of service into menu prices. Furthermore, participants ordered more expensive meals when automatic gratuities were added to the bill than when the costs of service were built into menu prices. While the study was a simulation only (and no money was at stake), the industry's longstanding practice of setting menu prices with service charges extra is supported by these findings.

INTRODUCTION

Although leaving tips at table-service restaurants is a well-entrenched social norm in the United States, various problems with this practice have prompted some restaurant operators to implement service charges or service-inclusive pricing in place of tipping. Whether a restaurant should use tipping or its alternatives to cover the expense of service has long been a controversial and complex issue.[1] Most recently, the media coverage of the decision by New York City restaurant Per Se to replace voluntary tipping with compulsory gratuities of 20 percent has spurred a new round of debate over tipping and alternative policies among industry practitioners.[2]

One of the many considerations in choosing an appropriate tipping or service-charge policy is the policy's effect on guests' perceptions of how expensive a restaurant is.[3] Research on behavioral pricing has suggested that partitioning prices, that is, presenting the price of a product or service in separate parts rather than a consolidated whole, can reduce consumers' perceptions of the total cost and, hence, increase demand. For example, Morwitz, Greenleaf, and Johnson found that auction bidders agreed to pay more in total cost when a 15-percent

† This paper originally appeared as: Wang, S. and Lynn, M. (2007). The Effects on Perceived Restaurant Expensiveness of Tipping and Its Alternatives. *Cornell Hospitality Report*, Vol. 7, No. 3. and is available at https://ecommons.cornell.edu/entities/publication/b395bbcc-eac8-4010-a35a-c91c409f774a

auction fee was charged separately than when it was bundled into the bid price.[4] This and other related findings suggest that restaurants which charge separate fees for their food and service via tipping or automatic service charges may be perceived as less expensive than those using all-inclusive pricing.[5] This is a potentially important effect, especially among price-sensitive clientele.

The purposes of this report are to explain why and under what conditions tipping or service-charge policies may reduce perceptions of expensiveness (compared to a service-inclusive pricing policy), and to provide empirical evidence of those effects through a controlled experiment. In the next sections, we speculate about how consumers interpret menu prices under different tipping and service-charge policies. We then describe an experiment that tests our ideas and present the statistical analyses of our data. Finally, we discuss the implications of our findings for restaurant managers.

LITERATURE REVIEW

How Consumers Perceive Partitioned Prices

When facing partitioned prices, consumers must integrate separate price information to determine the true cost of an offer. Consumers may process the price information in different ways and, hence, they may form different perceptions. Morwitz et al. proposed three major processing strategies, claiming that consumers would choose a particular strategy if the strategy's perceived benefit (in terms of expected accuracy in recognizing total price) outweighed the perceived cost (in terms of the time and cognitive effort required to process the price information).[6] Specifically, consumers are thought to adopt one of the three following processing strategies when interpreting partitioned prices.

Calculate the sum of the base price and the surcharge. This strategy requires the highest cognitive effort but leads to the most accurate total price recognition. With this processing strategy, the presence or absence of price partitioning should have no effect on consumers' perceptions of expensiveness. In general, consumers use this strategy when the surcharges are presented as a simple dollar amount so that calculating the total prices involves only summation.

Resort to simplifying heuristics rather than a precise calculation. If the consumer does not think it worthwhile to calculate the total price precisely, he or she may use heuristic shortcuts to estimate the total by integrating the two separated pieces of price information. The most commonly used heuristics in dealing with multiple pieces of information are anchoring and adjustment.[7] When processing partitioned prices, customers may anchor on the base price (the primary information that is salient and important) and subjectively adjust that anchor upward to account for the surcharge (the secondary information with less availability and importance). Typically, such heuristics result in a combined price that is lower than the actual total price, given that research indicates that such adjustments are often too small.[8]

Simply ignore the surcharge. In some cases, consumers may ignore the surcharge completely, either by failing to notice the surcharge information or by noticing the surcharge but not incorporating it in the total price. The latter case may happen when the surcharge is relatively standard. In this case, incorporating information about additional charges does not lead to a better decision. This strategy uses the least amount of cognitive effort and results in the lowest perceived accuracy of total prices among the three strategies.

Employee Compensation Policies and Partitioned Pricing

Service-inclusive pricing presents consumers with a single price, while tipping and service charges present them with partitioned prices—one for the food and another for the service. When consumers evaluate the expensiveness of restaurants that have policies either of voluntary tipping or service charges, the guests must choose one of the three aforementioned strategies to process the partitioned prices. We believe that consumers are unlikely to choose the calculation strategy because calculating the dollar value of percentage tips or service charges and then adding that amount to the menu prices can be difficult, or, in many cases, guests are not inclined to fiddle with such calculations when they're trying to enjoy themselves. We also believe that it unlikely that guests will ignore the tip or service charge, because at 15 to 20 percent of the bill, the typical tip or service charge is too large to ignore completely. These considerations mean that customers are most likely to make a near estimate of cost using the heuristic strategy.

Accordingly, we believe that consumers are likely to anchor their evaluations of restaurant expensiveness on menu prices and to subjectively adjust those evaluations either upward under tipping and service-charge policies or downward under a service-inclusive-pricing policy. In either case, the adjustment is likely to be insufficient, so that equivalent total costs will be perceived as lower under tipping and service charges than under service-inclusive pricing. This possibility means that restaurants with voluntary tipping or 15-percent service charges may be perceived as less expensive than restaurants with comparable levels of employee compensation built into menu prices. It also means that restaurants with 18-percent service charges may be perceived as no more expensive than restaurants with 15-percent-higher service-inclusive menu prices, despite higher actual total costs at the restaurants with the 18-percent surcharge.

Consumers' demand usually increases when the perceived price for a product or service decreases. Thus, if tipping and service charges do lower perceptions of restaurant expensiveness, then they should also increase demand. One aspect of consumer demand is willingness to order the more expensive items from the menu, so any tipping or service-charge effects on perceived expensiveness may be reflected in restaurant patrons' check averages. This reasoning suggests that, after adjusting for differences in menu prices, restaurants that use tipping and automatic 15-percent gratuities should enjoy higher average check totals than would restaurants with comparable service costs built into menu prices. Furthermore, restaurants with automatic 18-percent gratuities may enjoy average adjusted check totals comparable to those of restaurants that have 15-percent-higher service-inclusive menu prices, despite greater total costs at the restaurants with the 18-percent service charge.

To this point, we have assumed that consumers base their evaluations of a restaurant's expensiveness on its menu prices (with insufficient adjustments for expected tips and service charges). That assumption is reasonable when menu prices and service charges (if any) are the only information available to consumers for their decisions. However, once a customer has paid the bill, he or she could evaluate the restaurant's expensiveness according to the actual payment rather than on some estimate based on menu prices. In that case, restaurants with tipping or service charges may be perceived as no less expensive than those with service-inclusive pricing, because the check has already arithmetically combined the separate food and service prices. This possibility means that a restaurant with voluntary tipping, one with a 15-percent service charge, and an establishment with service-inclusive menu prices may be perceived as equally expensive, once the customer has received bills specifying the total costs of eating at each of those restaurants.

METHOD

We conducted an interactive web-based experiment to test our expectations about the effects of tipping, service charges, and service-inclusive pricing on perceived expensiveness and demand. Participants in this study were given information about four hypothetical restaurants, were asked to place a food and beverage order at each restaurant, and then requested to rate the expensiveness of each one(see Appendix). Each restaurant had a different tipping policy (i.e., voluntary tipping, a 15-percent automatic gratuity, an 18-percent automatic gratuity, or no tipping with a 15-percent surcharge built into the menu prices). Participants viewed and rated each restaurant one at a time. They viewed photographs of the exterior and interior of the restaurant and read a menu from the restaurant. In addition to listing the restaurant's food and beverage offerings, the menu contained information about its tipping policy.

Participants were next asked to order one appetizer, one entrée, and one drink from the menu. Based on this order, they received a bill. In half of the cases, the bill was presented and then the participant was asked to rate the expensiveness of the restaurant. The other half rated the expensiveness before they saw the check. After doing this for all four restaurants, participants were given a chance to reconsider their expensiveness ratings for the restaurants, and were asked to provide information about their demographic characteristics, tipping habits, and other traits.

Participants

Although 369 members of a national consumer panel participated in our online experiment, we had to exclude the results of 51 participants who did not complete the experiment. Completing the process entered the participant in a sweepstakes promoted by a marketing research company. Of the participants, 57 percent were women and 87 percent were Caucasian. Their ages ranged from 18 to 80, with the average being 47. Two percent of the participants had some education, 20 percent were high school graduates, 41 percent had some college, 25 percent were college graduates, and 12 percent had done post-graduate work. Twenty percent of the participants earned less than $25,000 a year, 36 percent earned between $25,001 and $50,000, 37 percent earned between $50,001 and $100,000, and 7 percent earned more than $100,000 a year. They reported dining out at full-service restaurants an average of five times per month, with a low response of no dining out and a high response of 80 times per month. Thus, in most regards our sample comprised a diverse set of restaurant patrons.

Stimuli

The four hypothetical restaurants in this study were mid-scale, full-service restaurants. Each of the three menu categories (i.e., appetizer, entrée, and beverage) had five individual items with various prices. The prices on the menus of Restaurant 1 and Restaurant 3 were roughly comparable and mid-price. The menu of Restaurant 2 was comparatively low-price, while Restaurant 4's menu was comparatively high-price. We always presented the four restaurants in the same order, starting with Restaurant 1. Likewise the two pictures and the menu items for each restaurant were always the same.

Things changed at the bottom of each menu, where we tried out the four different tipping policies. The four tipping policies were rotated among the four restaurants in such a way that each policy was associated with each restaurant's menu with equal frequency. We also made sure that the order in which the policies appeared (that is, before or after one of the other policies) also attained equal frequency, a process known as a Latin-square counterbalancing. The reason for this was to control for any effect that the order of presentation of the tipping policies might have on our outcome measures.

Each participant was asked to answer three questions either before or after he or she viewed the check from each restaurant. The first question focused attention on the tipping policy by asking the participant to indicate which of the four tipping or service-charge policies was in effect at that restaurant. The second question was a filler question regarding the participant's liking of the restaurant's décor. Finally, the participant was asked to rate the expensiveness of the restaurant, on a 7-point Likert-type scale, ranging from very cheap (1) to very expensive (7). Again, some participants rated the restaurant before they saw the check and the others did so after they saw the check. The check listed the items ordered and the price for each along with a subtotal, tax amount (which was 7 percent of the subtotal), the automatic gratuity (if any), and a grand total. For the restaurant with voluntary tipping, the check had a place for the participant to type in the tip amount, and the grand total was then automatically calculated.

After rating all four restaurants individually, participants were then asked to complete a final, end-of-experiment survey. This was the point when they could reconsider their expensiveness ratings for each restaurant, again using the seven-point scale. Then they were asked questions about their tipping habits, their attitudes toward different tipping and service-charge policies, their demographics, their familiarity with U.S. tipping customs, and the frequency with which they dine at full-service restaurants.

RESULTS

Immediate Ratings of Restaurant Expensiveness

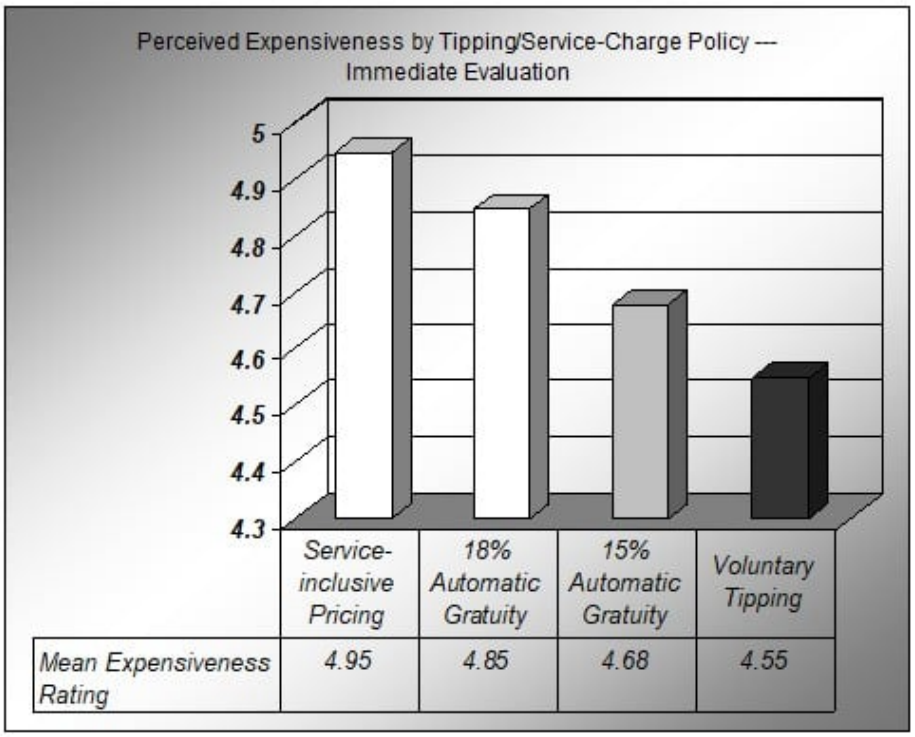
The first round of ratings of restaurant expensiveness under the four tipping policies are presented in Exhibit 1. The restaurants with the policy of no tipping (a mean of 4.95 out of 7) and the policy of an 18-percent service charge (4.85) were perceived as significantly more expensive ($p < .05$) than were the restaurants with voluntary tipping (4.55) or a 15-percent service charge (4.68). Other than the significant difference of these restaurant pairs, we found no other significant differences, though the difference between the 15-percent service charge and the voluntary tipping policies was marginally significant ($p < .07$). These findings support our expectations about the effects of partitioned pricing on perceived restaurant expensiveness.

The order in which the bill and the questions on expensiveness were presented had no significant effect on the ratings. This means that the effects of tipping policies on immediate expensiveness ratings did not differ according to when the bill was presented (see Exhibit 2). This suggests that the effects of the various tipping policies on perceived restaurant expensiveness are fairly robust, and that consumers base evaluations of restaurant expensiveness on menu prices rather than on the bills they receive.

Delayed Ratings of Restaurant Expensiveness

Participants' ratings of expensiveness did not change substantially in the second round of ratings. Once again, the restaurants with the no-tipping policy (mean 4.84) and 18-percent service charge (4.91) were perceived as significantly more expensive ($p < .05$) than were those with voluntary tipping (4.67) or a 15-percent service charge (4.67). Again, we found no other significant differences (see Exhibit 3). These findings, like those above, support our expectations concerning the effects of partitioned pricing on perceptions of expensiveness. Furthermore, since the delayed ratings all occurred after subjects had received their bills, the findings provide additional evidence that partitioned pricing reduces perceived restaurant expensiveness even when consumers are well aware of the total cost of their meal.

Exhibit 1: First-round ratings of restaurant expensiveness



Notes: Those policies whose columns have a different shading significantly or marginally significantly differ from one-another in mean expensiveness rating. The immediate ratings of restaurant expensiveness were analyzed using a full factorial design of the general linear model with tipping policy as a withinsubjects variable and counterbalance order and rating and bill order as between subjects variables. This analysis produced significant effects only for tipping policy ($F(3, 948) = 11.38$, $p < .001$) and the interaction of tipping policy with counterbalance order ($F(9, 948) = 66.79$, $p < .001$). The effects of tipping policy were not significantly moderated by rating and bill order ($F(3,948) = 1.14$, $p > .33$) or the interaction of counterbalance order with rating and bill order ($F(9, 948) = 1.27$, $p > .25$). The non-significant interaction with rating and bill order means that tipping policy effects on perceived restaurant expensiveness occur regardless of whether a person has received a bill integrating the food and service charges for a particular dining occasion. The significant interaction between tipping policy and counterbalance order simply reflects differences in the perceived expensiveness of the four different stimulus restaurants, so the only theoretically interesting effect to achieve significance was that of tipping policy.

Exhibit 2: Expensiveness evaluation before and after checks

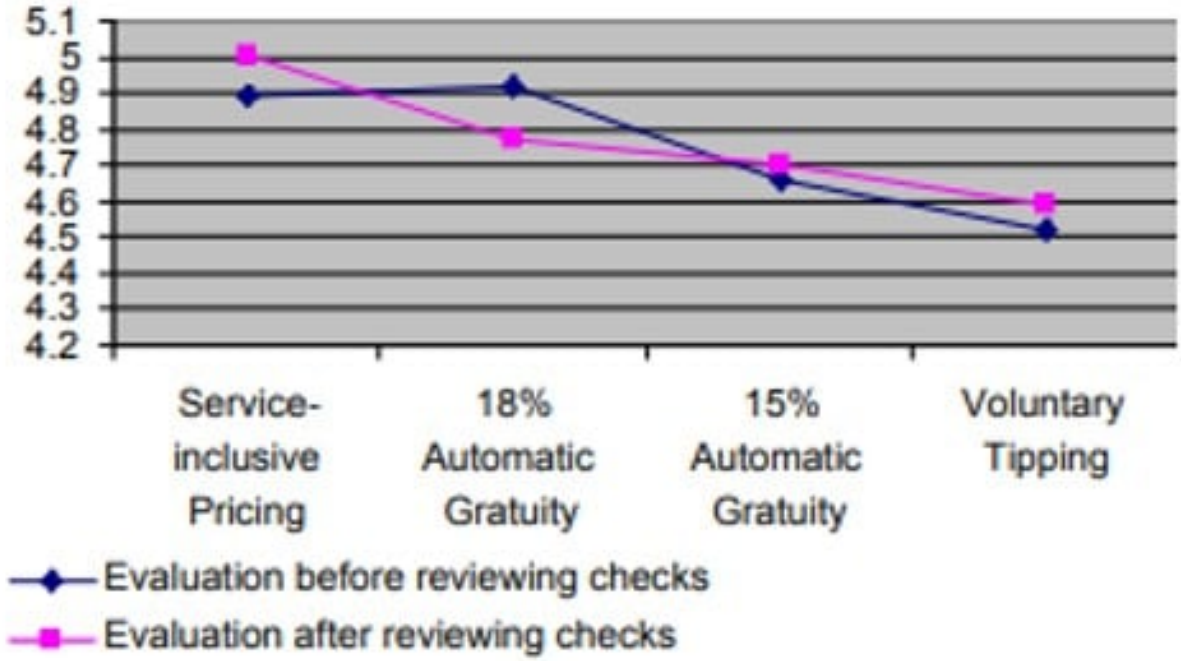
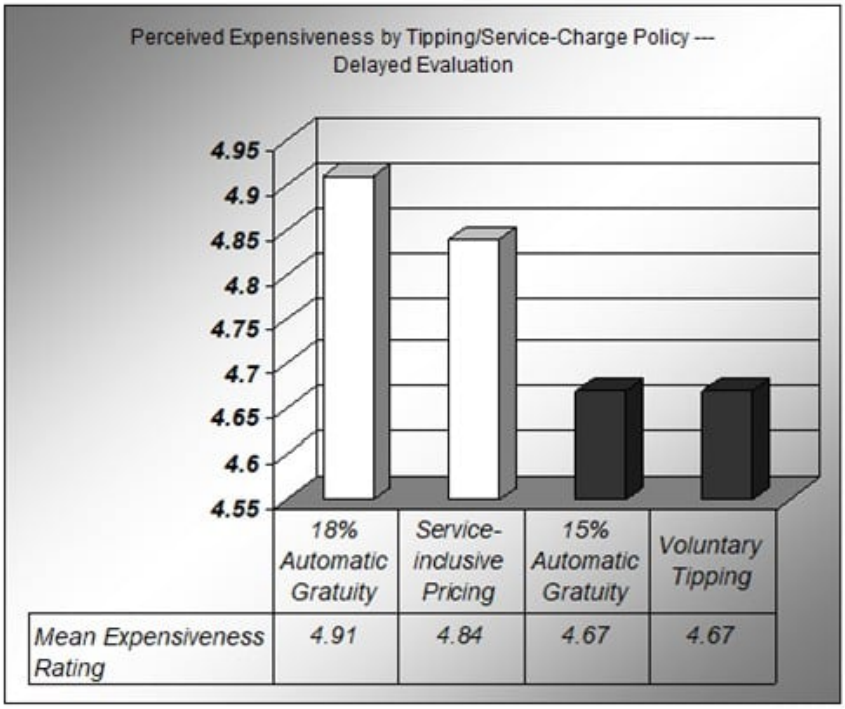


Exhibit 3: Expensiveness ratings after check presentation

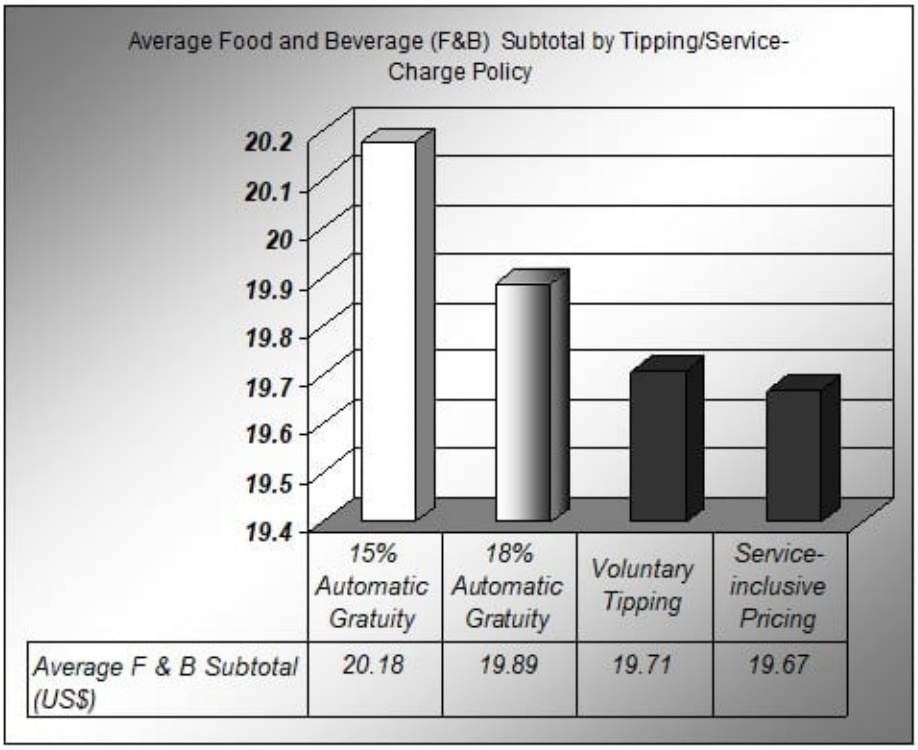


Notes: Those policies whose columns have a different shading significantly differ from one-another in mean expensiveness rating. The delayed ratings of restaurant expensiveness were analyzed using a full factorial design of the general linear model with tipping policy as a within subjects variable and counterbalance order as a between subjects variable. This analysis produced significant effects for tipping policy ($F(3, 942) = 4.45$, $p < .005$) and the interaction of tipping policy with counterbalance order ($F(9, 942) = 45.23$, $p < .001$). As before, the significant interaction simply reflects differences in the perceived expensiveness of the different stimulus restaurants, so only the tipping policy effect is theoretically interesting.

Size of Food Order

We found that the type of tipping policy seemed to affect the size of participants' orders. Although participants were to order one item in each of the three categories, they could select any item in each class, items that differed in price. Thus, the differences in demand for the higher price items are reflected in the subtotals of the participants' bills. (Note: We adjusted for the 15-percent higher menu prices in the no-tipping situation.) The order size for each tipping policy is presented in Exhibit 4. The average order size was significantly higher under the 15-percent-service-charge policy ($20.18) than it was under the no-tipping policy ($19.67) and voluntary-tipping policy ($19.71). The average order under the 18-percent-service-charge policy ($19.89) was not significantly different from that under the other policies. These findings generally support our ideas concerning the effects of partitioned pricing on demand. Only the expectation that the average order size at restaurants with service-inclusive pricing would be smaller than those at restaurants with voluntary tipping was not supported.

Exhibit 4: Average check totals by tipping policy



Notes: Those policies whose columns do not share a shading have significantly different average F&B subtotals. The adjusted subtotals of the participants' bills were analyzed using a full factorial design of the general linear model with tipping policy as a within subjects variable and counterbalance order as a between subjects variable. The analysis produced a significant effect for the interaction of tipping policy with counterbalance order ($F(9, 960) = 122.01$, $p < .001$), which reflected differences in the order size at the different stimulus restaurants. The main effect of tipping policy was only marginally significant ($F(3.960) = 1.93$, $p < .13$). However, paired comparisons of the different tip-policy conditions indicated that the average order size was significantly higher under the 15- percent service-charge policy than under the no-tipping and voluntary-tipping policies (means = \$20.18 vs. \$19.67 and \$20.18 vs. \$19.71). The subtotal under the 18-percent service-charge policy (mean = \$19.89) was not significantly different from that under any of the other policies.

DISCUSSION

Previous research on behavioral pricing suggests that price partitioning reduces perceived expensiveness and increases demand.[9] We found that restaurant tipping and service charge policies act in that way. In our study, restaurants with voluntary tipping or 15-percent service charges were, in fact, perceived as less expensive than were restaurants with 15-percent-higher menu prices that included service.[10] Moreover, even though the restaurant with an 18-percent service charge had higher total costs, that restaurant was perceived as being no more expensive than a restaurant with service-inclusive prices. These findings support the idea that partitioned pricing via voluntary tipping or service charges reduces perceptions of restaurant expensiveness. Moreover, these

effects were evident in the summary ratings after all costs were tallied, demonstrating that the effect is robust, and reinforcing our earlier conclusion that customers base evaluations of restaurant expensiveness on menu prices.

We also found that average order sizes at restaurants with 15-percent service charges were larger than were those at restaurants with service-inclusive menu prices. Although we failed to find a significant difference in the average order size between voluntary-tipping and service-inclusive-pricing policies, the means were in the expected direction. Furthermore, an 18-percent automatic service charge did not reduce the order size compared to service-inclusive menus. Again, these findings generally support our ideas concerning the effects of partitioned pricing on demand.

Implications for Restaurant Tipping Policy

Our findings weigh against the use of service-inclusive pricing, particularly in restaurants with a price-sensitive clientele. Even so, we cannot categorically state that restaurants with service-inclusive pricing will always suffer from an unfavorable price perception. Upscale restaurants, for example, with their relatively price-insensitive clientele, should not see effects on their business from adopting service-inclusive pricing. (This is probably the situation for Per Se and restaurants like it.) Furthermore, the advantage that using an automatic gratuity confers on price cognition may disappear when service charges rise too high. In particular, if the amount of the automatic gratuity is higher than certain reference levels (e.g., the upper levels of voluntary tips left by consumers), consumers' perception of restaurant expensiveness may be shaped by what they might consider an outrageous automatic gratuity. If a restaurant operator is determined to levy a large service charge to cover the expense of service, it might be better simply to implement service-inclusive pricing rather than shock guests with a huge automatic gratuity.

Although we endeavored to simulate consumers' dining experience through our computer-based experiment, our study wasn't a real-life dining situation. Our study perforce left out many other, related factors, such as service levels, brand, cuisine style, dining occasion, and even other customers. By isolating tipping from these other factors we may inadvertently have amplified its effect. Furthermore, our questions about tipping policies called participants' attention to the differences in the tipping policies at our hypothetical restaurants in a way that would not occur naturally. Therefore, participants in our study may have been more sensitive to differences in tipping policies than they would have been under normal circumstances. On the other hand, participants in this study did not actually have to pay the bills, and this may have made them less sensitive to differences in tipping policies and prices than they would be in real life.

Ideally, future research would test our hypotheses in real restaurants, but controlled experiments on tipping and service-charge policies is not feasible in the field. Realistically, restaurateurs must decide for themselves whether or not they think our findings generalize to their own circumstances. If they find our reasoning and empirical results compelling, then they can run their own case study by implementing changes in their tipping or service-charge policies to see what kind of reactions those changes bring.

ENDNOTES

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[8] Ibid.

[9] Chakravarti et al., op.cit.; Lee and Han, op.cit.; Morwitz et al., op.cit.; and Xia and Monroe, op.cit.

[10] Sales taxes do create minor differences. The service-inclusive pricing is equivalent to a 23% surcharge on item prices (1.15x1.07=1.2305) assuming a 15% hidden service charge and a 7% sales tax. The 15% automatic gratuity represents a 22% surcharge on item prices (1.15+0.07=1.22) assuming a 7% sales tax. Similarly, a 25% surcharge on item prices could be derived for the 18% automatic gratuity (1.18+0.07=1.25).

CHAPTER 3

How Efficient is Tipping at Pricing Restaurant Services? A State-Level Analysis

MICHAEL LYNN AND MICHAEL DIXON†

ABSTRACT

Tipping has been explained by economists as an efficiency enhancing social norm, but no process by which average tip amounts vary with the supply and demand of restaurant service has been explicated. In this paper, we describe such an equilibrium process and test it by examining the extent to which average tip percentages in the states of the U.S. vary with minimum wages for tipped workers, unemployment rates, sales tax rates, income, and number of restaurants. Although average tip percentages did decrease with increasing minimum wages for tipped employees and increased with increasing average personal incomes as expected, they did not vary with unemployment rates, sales tax rates, and the number of restaurants as would be expected if tipping priced restaurant services in a manner consistent with principles of market pricing. Thus, tipping does not appear to price restaurant services in a fully efficient manner.

INTRODUCTION

Approximately 10 percent of the U.S. population eats at sit-down/family restaurants on an average day and approximately 58 percent do so in an average month (Media Dynamics 200I). After completing their meals, almost all of these restaurant diners leave a voluntary gift of money (or tip) for the server who waited on them (Speer 1997). These tips, which have been estimated to exceed $40 billion a year in the U.S. alone (Azar, 2009), are an important source of income for the nation's two million waiters and waitresses (U.S. Census Bureau, 2007). They are also an expense that consumers are free to avoid. Although called for by social norms, tips are not contractually required. Nor are they necessary to get good service at infrequently patronized establishments, because they are not left until after service is delivered.

The voluntary nature of tipping makes it interesting from an economic perspective. Specifically, it raises questions about why tipping norms and behavior exist. In this paper, we review economic theory that tipping exists as a means of improving economic efficiency, identify an equilibrium process by which tipping might price restaurant services in a globally efficient manner, and empirically test this proposed process by examining the extent to which tip averages are associated with variables that affect the supply and/or demand for restaurant services.

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TIPPING AS AN EFFICIENCY ENHANCING NORM

The dominant economic explanation for tipping is that it promotes economic efficiency (Azar, 2005; Ben-Zion and Kami, 1977; Bodvarsson and Gibson, 1997; Conlin, Lynn and O'Donoghue, 2003; Hemenway, 1993; Jacob and Page, 1980; Kwortnik, Lynn and Ross, 2009; Schotter, 1979). Building on the work of Arrow (1971) and Alchian and Demsetz (1972), this explanation posits that tipping is a form of buyer monitoring that exists because it is the most efficient way to provide service workers with an incentive to deliver good service. The intangible and highly customized nature of services makes it difficult for firms to monitor and reward appropriate server behavior.

For example, some restaurant patrons may want attentive service while others want to be given some privacy and left alone, so it is difficult for restaurant managers to tell whether or not a waiter is visiting one of his tables often enough. Consumers, who know their own service preferences, can evaluate and reward service delivery more efficiently than can firms, so this task is given to consumers via the institution tipping (see Lynn, 2006). This form of buyer monitoring is governed by social norms rather than legal contracts because the number and speed of relevant service episodes coupled with the heterogeneity in consumer preferences and the relatively small service payments involved make the costs of legal contracting prohibitive.

Current research provides some support for the "efficient incentive" explanation of tipping. The most basic requirement of this explanation is that tips be positively related to customer perceptions of service quality and numerous studies have found empirical evidence of just such a relationship in restaurant settings (Conlin, Lynn and O'Donoghue, 2003; Lynn and McCall, 2000). The service-tipping relationship in restaurants is relatively weak and this has raised questions about the incentive value of tipping (Azar, 2009; Lynn and McCall, 2000), but several studies by Kwortnik, Lynn and Ross (2009) have recently found that tipping does motivate servers and improve service - especially service personalization. Thus, tipping does appear to meet the minimum requirements of the efficient incentive explanation.

One unexplored issue raised by the idea that tipping is an efficiency enhancing norm concerns its efficiency as a pricing mechanism. How well do tip amounts conform to the principles of market pricing? Since tips are voluntary payments after services have already been rendered, demand for tipped services cannot drive up the price sellers charge for them as happens with traditional pricing. However, an alternative process might drive tips (plus any accompanying wages) to the market price for services given that (i) people do tip more the more satisfied they are with the service (Lynn and McCall, 2000), (ii) customer satisfaction is affected by customer expectations (Johnson, Anderson and Fornell, 1995; Szmanski and Henard, 2001), and (iii) customer expectations/reference points are shaped by market conditions and customer experiences (Johnson, Anderson and Fornell, 1995; Oliver and Winer, 1987). If tips plus wages exceed (or fall below) market prices for services, then servers will enter (or leave) the profession and service levels will rise (or fall), which will raise (or lower) customer expectations of service and lower (or raise) the tips given for a given objective level of service. The equilibrium point of this process should equate tips (plus wages) with the market price of services under a wage only system.

If tipping is an efficient pricing mechanism, as the preceding analysis suggests, then tip averages should be related to minimum wages for tipped workers, unemployment, sales tax levels, income, and number of restaurants. First, restaurant tip averages should be lower in markets with higher minimum wages for tipped employees, because it is the combination of tips and wages that should match market prices and the higher minimum

wages will compensate for the lower tips. Second, restaurant tip averages should be lower in markets with chronically higher unemployment, because greater numbers of unemployed workers drive down the market price for labor. Third, restaurant tip averages should be lower in markets with higher sales taxes, because sales taxes decrease demand for services. Fourth, restaurant tip averages should be higher in markets with larger per-capita incomes, because higher incomes should increase the demand for restaurant services. Finally, restaurant tip averages should be higher in markets with more restaurants per capita, because more restaurants mean more demand for waiters and waitresses. These expectations are formalized in the following hypotheses:

- ***Hypothesis 1***: Restaurant tip averages will be lower in markets with higher minimum wages for tipped employees.
- ***Hypothesis 2***: Restaurant tip averages will be lower in markets with chronically higher unemployment.
- ***Hypothesis 3***: Restaurant tip averages will be lower in markets with higher sales taxes.
- ***Hypothesis 4***: Restaurant tip averages will be higher in markets with larger per-capita incomes.
- ***Hypothesis 5***: Restaurant tip averages will be higher in markets with more restaurants per-capita.

Of course, research suggests that the service-tipping relationship is relatively weak (Azar, 2009; Lynn and McCall, 2000) and this may undermine the process described above by which tips (plus wages) come to equal market prices. Thus, how efficient tipping is as a pricing mechanism is an empirical question. We address that question by using data from the 50 states of the United States to test hypotheses 1 thru 5 in the study below.

DATA DESCRIPTION

Data on the average restaurant tip size, minimum wages for tipped workers, unemployment levels, sales tax levels, income, and number of restaurants per 100, 000 people in each of the 50 states of the United States was obtained from secondary sources as described below (see Table 1).

Restaurant tip size information was obtained from a major credit card company. The company provided a random sample of 2000 transactions from nine similar casual dinning restaurants (Outback, Chiles, Olive Garden, Ruby Tuesday, Applebees, TOI Fridays, Red Lobster, California Kitchen, and Red Robin) in each of the 50 states of the United States. The data came from transactions from November 1, 2006 to April 30, 2007. Only transactions with some tip amount on the credit card were sampled, because a credit tip of zero probably reflected the fact that many people leave cash tips when paying with credit cards. Only data about tip and bill sizes was provided; no personal information about individual card holders was included. After pulling the random samples for each state, extreme cases with tips less than five cents or greater than eighty dollars and/or bill sizes less than four dollars or greater than four hundred dollars were dropped, resulting in 1989 to 1999 observations per state. The **mean tip as a percentage of the bill** was calculated for each state and used as the dependent measure in this study.

Minimum wages for tipped food service employees were obtained from the U.S. Department of Labor's web-site in October 2008. If a state had different minimum wages depending on the size of the restaurant, then the lower of the two numbers was recorded. For states with no minimum wage laws or minimum wages below the federal minimums, the federal limit of $2.13 per hour was recorded.

Unemployment rates in 2003, 2004, 2005 and 2006 were obtained from two websites (infoplease.com and statemaster.com) that sourced the U.S. Department of Labor, Bureau of Labor Statistics. These rates were averaged to form an index of chronic unemployment that had a coefficient alpha of .95.

State sales tax levels in 2006 were obtained from the Tax Foundation's website (taxfoundation.org).

Personal income per capita (rounded to the nearest thousands) was obtained from a website (statemaster.-com) that sourced the 2005 regional data of the Bureau of Economic-Analysis.

Number of restaurants per 100,000 people in the population was obtained from a website (statemaster.com) that sourced the 2004 estimates of the National Restaurant Association.

Table 1. The data set analyzed in this study.

State	Mean Tip Percentage 2006-2007	Tipped Minimum Wage 2008	Average Unemployment Rate 2003-2006	Sales Tax Rate 2006	Personal Income per capita (rounded to nearest thousands) 2005	Number of Restaurants per 100,000 population 2004
AL	18.32	2.13	4.68	4.00	29	199
AK	17.98	7.15	7.25	.0	36	283
AZ	19.08	3.90	4.88	5.60	30	199
AR	18.51	2.63	5.33.	6.00	27	199
CA	17.96	8.00	5.80	6.25	37	241
CO	19.26	4.00	5.25	2.90	38	265
CT	19.36	5.41	4.98	6.00	48	258
DE	19.71	2.23	3.98	.0	37	225
FL	19.65	3.77	4.25	6.00	33	236
GA	19.26	2.13	4.78	4.00	31	232
HI	18.24	7.00	3.15	4.00	35	298
ID	18.51	3.35	4.25	5.00	28	245
IL	18.98	4.65	5.93	6.25	36	236
IN	18.71	2.13	5.20	6.00	31	217
IA	18.81	4.35	4.40	5.00	32	256
KS	18.69	2.13	5.23	5.30	33	235
KY	19.07	2.13	5.90	6.00	29	194
LA	18.92	2.13	5.98	4.00	21	238
ME	19.55	3.50	4.63	5.00	31	268
MD	19.59	3.28	4.05	5.00	42	230
MA	20.37	2.63	5.15	5.00	44	282
MI	19.33	2.65	6.93	6.00	33	219
MN	19.31	5.25	4.43	6.50	37	214
MS	18.31	2.13	7.10	7.00	26	198
MO	18.67	3.33	5.30	4.23	32	223
MT	18.21	4.00	4.05	.0	29	354
NE	18.52	2.13	3.70	5.50	33	259
NV	19.29	5.30	4.32	6.50	36	219
NH	20.50	2.95	3.83	.0	39	252
NJ	19.40	2.13	4.90	6.00	44	265
NM	19.05	2.13	5.23	5.00	28	210
NY	19.02	4.60	5.48	4.00	40	301
NC	18.87	2.13	5.43	4.50	31	216
ND	18.85	4.39	3.40	5.00	31	293
OH	19.58	3.50	5.80	5.50	33	237
OK	18.52	3.28	4.70	4.50	29	238

OR	18.14	7.95	6.78	.0	32	267
PA	18.90	2.83	5.18	6.00	35	253
RI	20.02	2.89	5.18	7.00	36	304
SC	18.68	2.13	6.70	5.00	28	233
SD	18.23	2.13	3.55	4.00	31	275
TN	19.16	2.13	5.40	7.00	33	221
TX	18.94	2.13	5.78	6.25	28	235
UT	18.98	2.13	4.65	4.75	33	190
VT	19.46	3.72	3.75	6.00	38	303
VA	19.21	2.13	3.60	4.00	36	213
WA	18.05	8.07	5.93	6.50	27	242
WV	18.98	5.24	5.05	6.00	33	214
WI	18.91	2.33	4.98	5.00	36	279
WY	18.57	2.13	3.70	4.00	34	295

RESULTS AND DISCUSSION

The minimums, maximums, means, and standard deviations for all the variables in the study are presented in Table 2 along with the inter-item correlations. The results of a regression analysis predicting the states' average restaurant tip percentages from the states' minimum wages for tipped employees, unemployment rates, sales tax rates, personal incomes per capita, and number of restaurants per 100,000 people in the population are presented in Table 3. Consistent with Hypotheses 1 and 4, states' average tip percentages decreased with higher minimum wages for tipped employees ($B = -.14$, $t(1, 44) = -3.50$, $p < .001$) and increased with higher average personal incomes ($B = .07$, $t(1, 44) = 5.00$, $p < .001$). However, contrary to Hypotheses 2, 3 and 5, states' average tip percentages were unaffected by unemployment rates ($B = -.03$, $t(1, 44) = -0.37$, n.s.), sales tax rates ($B = .01$, $t(1, 44) = .19$, n.s.), or the number ofrestaurants per 100,000 in the population ($B = -.00$, $t(1, 44) = -.79$, n.s.).

Table 2. Descriptive statistics and inter-tern correlations for variables in the study (n=50).

	Minimum	Maximum	Mean	Standard Deviation	2	3	4	5	6
I.Tip	17.96%	20.50%	18.96%	.57%	-.34•	-.22	.09	.50*	-.03
2. Min. Wage	$2.13	$8.07	$3.53	$1.72		.15	-.14	.19	.27
3. Unempl. Rate	3.15%	7.25%	5.00%	.99%			.10	-.23	-.28•
4. Sales Tax Rate	0.00%	7.00%	4.78%	1.87%				-.04	-.35"'
5. Income (OOO's)	$21	$48	$33.38	$5.05					.31"'
6. Restaurants (per 100,000 pop.)	190	354	245.16	35.18					

* $p < .05$

Table 3. Results from a regression analysis predicting restaurant tip averages (n = 50).

	B	Std Error	Beta	p-value
(Constant)	17.692	.824		.000
Min. Wage	-.141	.040	-.421	.001
Unemployment. Rate	-.026	.071	-.045	.711
Safes Tax Rate	.007	.037	.023	.848
Income	.068	.014	.601	.000
Restaurants	-.002	.002	-.103	.436

The failure to support Hypotheses 2, 3 and 5 argues against the efficiency of tipping as a pricing mechanism and the proposed equilibrium process by which tips plus wages might come to equal market wages in the absence of tips. If we reject that equilibrium process, then how and why did tip averages move in the predicted direction with tipped minimum wages and personal income? Answering that question goes beyond the current data and must be regarded as speculative. However, plausible explanations are readily available.

First, it is possible that states' tip averages are negatively correlated with the tipped minimum wage because consumers tip out of an altruistic concern for waiters and waitresses, whose perceived need is lower the greater the tipped minimum wage. Consistent with this possibility, over seventy percent of consumers in one survey reported that helping servers is part of their motivation for tipping (Lynn, 2009). In addition, a study of car guard tipping in South Africa found that people with stronger helping motives tipped more than those with weaker helping motives (Saunders and Lynn, 20 I 0). Finally, a study of why we tip some professions and not others found that service professions are more likely to be tipped the lower the incomes of workers in those professions (Azar, 2005).

Second, it seems likely that states' tip averages increase with the average per-capita incomes of their populations because wealthier people find the costs of tipping easier to bear then do less wealthy people. Consistent with this possibility, several studies at the individual level of analysis have found that wealthy people do report leaving larger tips than less wealthy people (Lynn, 2009; Lynn and Thomas-Haysbert, 2003; McCrohan and Pearl, I 983). Thus, the state level relationships between tipping and minimum wages and personal income may reflect psychological rather than market equilibrium processes.

CONCLUSIONS

Tipping has been explained by economists as an efficiency enhancing social norm (Azar, 2005, 2007; Conlin, Lynn and O'Donoghue, 2003; Hemenway, 1993; Jacob and Page, I 983: Lynn, 2006), but no process by which average tip amounts vary with the supply and demand of restaurant service had been previously explicated. In this paper, we described such an equilibrium process and tested it by examining the extent to which average tip percentages in the states of the U.S. varied with minimum wages for tipped workers, unemployment rates, sales tax rates, income, and number of restaurants. Although average tip percentages did decrease with increasing minimum wages for tipped employees and increased with increasing average personal incomes as expected, they did not vary with their unemployment rates, sales tax rates, and the number of restaurants as would be expected if tipping priced restaurant services in a manner consistent with principles of market pricing. Thus, tipping does not appear to be a fully efficient pricing mechanism.

Our empirical evidence that tipping dos not price restaurant services in a fully efficient manner joins a previous study also undermining the idea that tipping is an efficiency enhancing norm. Azar (2005) examined the characteristics that differentiate tipped from non-tipped service professions, found that being tipped was unrelated to how easily consumers could monitor the services of a profession, and argued that this finding undermines the idea that tipping is an efficient way to monitor and reward servers. Clearly, two studies are insufficient to definitely discredit the efficient norm explanation of tipping, but they certainly call it into question. We encourage future researchers to further test this explanation as well as to look into more behavioral explanations for tipping behavior and norms. Tipping may not be economically efficient, but it is an economic behavior and it needs to be explained.

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CHAPTER 4

Tips Predict Restaurant Sales

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EXECUTIVE SUMMARY

An analysis of seven years of monthly charge sales and tip data from a multi-regional restaurant chain in the United States found that percent tip predicted related sales in the following month. Thus, restaurant executives, managers and owners are encouraged to add charge percentage tips to their sales forecasting models.

INTRODUCTION

Sales forecasts are a critical tool at all levels of the restaurant industry. Restaurant managers use sales forecasts to better estimate the amounts of food, beverages, and other supplies they must order and to more efficiently schedule employees to cover labor needs. Restaurant owners and restaurant chain executives use sales forecasts to secure loans, to woo potential investors, to inform their own reinvestment decisions, and to set benchmarks against which their unit managers' performances are measured and rewarded. Given the considerable applied interest in restaurant sales forecasts at both the unit and corporate level, many restaurant firms employ sophisticated statistical techniques to generate such forecasts.[1]

A modest body of research has addressed restaurant industry sales forecasting. Several studies have shown that restaurant sales can be predicted from sales in prior periods and/or trends over time.[2] Furthermore, researchers have found that restaurant sales prediction can be improved by adding predictors such as day of week, month of year, holidays, weather, and (for casino restaurants) showroom headcounts to models that include previous period sales and/or temporal trends).[3]

This paper contributes to the restaurant sales forecasting literature by examining the predictive utility of another variable readily available to restaurant managers and executives – i.e., charge tip percentages. Tips may predict future sales for at least two reasons. First, current service levels affect current tips and intentions to return.[4] To the extent that repeat patronage intentions affect future sales, then current tips may predict future sales because they serve as a proxy for (or measure of) current service quality, which drives future sales. Second, as voluntary payments whose amounts are determined by consumers after services have been received, tips are arguably the most discretionary of consumer expenditures. As such, it is plausible that changes in economic con-

† This paper originally appeared as: Lynn, M. & Ukhov, A. (2013). Tips Predict Restaurant Sales. *Cornell Hospitality Report*, Vol. 13, No. 8 and is available at: https://ecommons.cornell.edu/entities/publication/28236689-2978-4612-b4cd-bf2170ced9f3 .

ditions and the resulting consumer sentiment affect tips before they affect other less discretionary expenditures. In other words, it should be easier for consumers to change their tip amounts than to change their other restaurant expenditures as their perceptions and feeling about their economic future changes. If so, then tips may be a leading indicator (or measure) of consumer sentiment. Since consumer sentiment affects future retail sales or sales growth,[5] tip information that reflects consumer sentiment should predict future restaurant sales. These ideas that tip amounts may reflect two drivers of future sales – current service levels and consumer sentiment about the economy -- suggest that adding tips to forecasting models may improve the prediction of restaurant sales. We test this possibility in a novel data set that contains seven years of monthly charge sales and tip data from ten restaurants in a multi-regional chain.

METHOD

A large, multi-regional restaurant chain provided daily sales and tip information for ten of its units scattered across the United States. The data is from February 2005 through January 2012, a time period which includes both the periods of economic expansion and contraction. This chain has substantial non-food revenues that are not customarily accompanied by tipping, so data was provided about the charge tips and sales coming from revenue centers that are typically tipped as well as gross and net revenues across all revenue centers. Our data comprised the following:

(i) TIPS - charge tips from those revenue centers where tips are common (hereafter referred to as "selected revenue centers"),

(ii) TOTAL SALES A - charge sales from selected revenue centers (excluding split checks with more than one payment method and charges with no charge tip),

(iii) TOTAL SALES B - charge sales from selected revenue centers (excluding any charges from split checks with more than one payment method),

(iv) GROSS REVENUE - total sales from all revenue centers and all payment methods minus inclusive taxes, and

(v) NET REVENUE - total sales from all revenue centers and all payment methods minus discounts and inclusive taxes.

We aggregated the data across units and days to get aggregate monthly charge sales and tips from those charge receipts where a tip of some kind was left. Then we divided aggregate tips by aggregate sales to calculate monthly tip percentages (PERCENT TIP). We used only charge receipts with a non-zero tip to generate percent tip because many people leave cash tips even when paying with credit card and including their charge sales in the denominator of percent tip would have biased that measure.

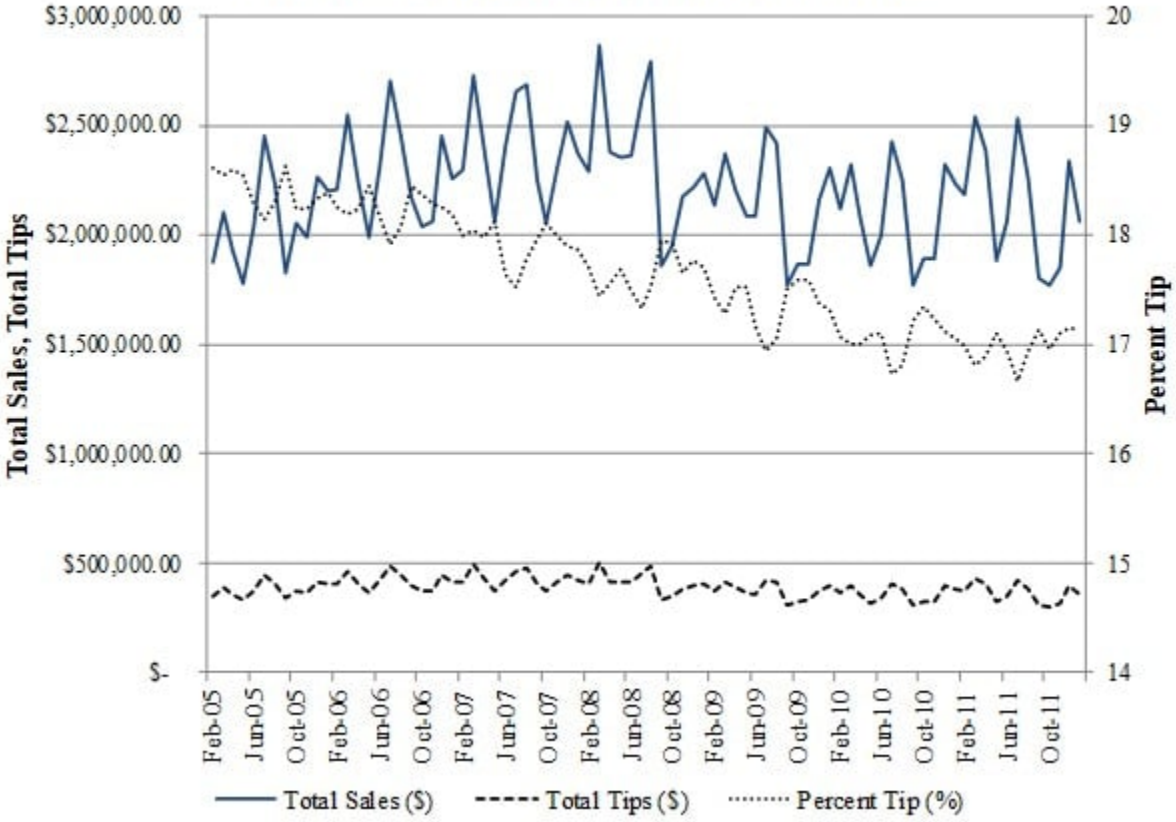
RESULTS AND DISCUSSION

Table 1 lists summary statistics for the data series. All data has been aggregated across units and days to obtain aggregate monthly data. The data spans seven years, from February 2005 through January 2012. This time period includes both the periods of economic expansion and contraction, capturing a variety of economic conditions. The minimum percent tip in our data is 16.65 percent the maximum ix 18.62 percent. We would like to point out that this monthly tip percentages range of about two percent of sales provides enough variability in this variable to justify looking at its predictive power. Figure 1 displays a plot of total sales (TOTAL SALES A), total tips (left vertical axis) and percent tip (right vertical axis) and illustrates variation in the data.

Table 1. Descriptive summaries of the variables show meaningful variability in total sales, gross revenue and tip percentages and indicate that corrections for correlated error terms need to be made in our analyses.

	TOTAL SALES A	TOTAL SALES B	GROSS REVENUE	NET REVENUE	PERCENT TIP
Mean	$2,209,662	$2,928,348	$11,545,457	$10,936,937	17.657%
Median	$2,223,437	$2,922,936	$11,636,143	$11,007,021	17.612%
Standard Deviation	$260,606	$344,357	$1,695,897	$1,678,298	0.545%
Minimum	$1,768,954	$2,306,851	$8,518,506	$8,004,205	16.656%
Maximum	$2,869,594	$3,754,777	$17,117,084	$16,583,584	18.624%
Autocorrelation	0.366	0.345	0.164	0.195	0.935

Figure 1
Total Sales, Total Tips, and Percent Tip Vary Over Time



We assessed the predictive utility of tip information using regression analyses. However, time series data like that we are using typically violates assumptions about the independence of error terms that underlie statistical tests and this can make the p-values from those tests invalid. One way to control for this problem, known as serial correlation in the data, is to control for values of the dependent and independent variables from previous time periods, called lagged values of those variables. Therefore, we included lagged values of the dependent and independent variables in our regression models in order to control for serial correlation in our data. Our regression models also controlled for linear and curvilinear (quadratic) trends in sales over time as well as for monthly differences in sales. Four regression models were run - one for each of the following dependent variables: TOTAL SALES A, TOTAL SALES B, GROSS REVENUE, and NET REVENUE (see Tables 2 and 3).

Table 2. Regression models indicate that monthly credit card sales (from revenue centers where tips are common) can be predicted from the previous month's charge tip percentages.

	TOTAL SALES A	TOTAL SALES B
Constant	-195,048 (-0.07)	-468,833 (-0.13)
Trend	6,884.90 (1.44)	7806 (1.23)
Trend Squared	-73.99 (-2.29)**	-70.42 (-1.71)*
Total Sales A (-1)	0.47 (4.55)***	
Total Sales B (-1)		0.4662 (4.57)***
Percent Tip (-1)	**366,835.49** (2.58)***	**476,866.63** (2.47)**
Percent Tip (-2)	-284,023.20 (-1.93)*	-353,36.95 (-1.78)*
Monthly Dummies	Included	Included
Durbin-Watson	2.22	2.25
R-squared	0.84	0.83

* $p < .10$, ** $p < .05$, *** $p < .01$

In regressions predicting TOTAL SALES A and TOTAL SALES B, the coefficients for percent tip lagged by one month (in other words, for percent tip in the previous month) were positive and statistically significant. This means that when tip percentage last month is higher than tip percentage two months ago, then TOTAL SALES from this month tend to be higher than TOTAL SALES from last month. In this case, a one point increase in per-

cent tip (e.g., from 14 to 15 percent) predicted a $366,835.49 increase in TOTAL SALES A the following month and a $476,866.63 increase in TOTAL SALES B the following month across all ten units studied. Thus, it appears that tips do predict sales from the revenue centers that generated the tips.[6]

Table 3. Regression models indicate that monthly credit card sales (from all revenue centers, including those where tips are uncommon) can be predicted from the previous month's charge tip percentages.

	GROSS REVENUE	NET REVENUE
Constant	20,242,971 (1.21)	19,300,400 (1.20)
Trend	1,756 (0.06)	-40 (-0.00)
Trend Squared	-272.5 (-1.57)	-276.2 (-1.64)
Gross Revenue (-1)	0.2677 (2.33)**	
Net Revenue (-1)		0.2709 (2.36)**
Percent Tip (-1)	**1,366,592.94** (1.58)[a]	**1,201,243.25** (1.44)[b]
Percent Tip (-2)	-1,761,714.86 (-2.00)**	-1,570,952.10 (-1.85)*
Monthly Dummies	Included	Included
Durbin-Watson	2.01	2.02
R-squared	0.86	0.87

* p < .10, ** p < .05, *** p < .01
[a] one-tailed p-value is 0.06
[b] one-tailed p-value is 0.08

In regressions predicting GROSS REVENUE and NET REVENUE, the coefficient for percent tip lagged by one month was positive, but only marginally significant. An increase in tip percentage by one point (e.g., from 14 to 15 percent) predicts a $1,366,592.94 increase in GROSS SALES the following month across the ten units studied and a $1,201,243.25 increase in NET SALES the following month across all ten units studied.[7] These effects did not reach the conventional level of statistical significance, but they would occur by chance only 6 and 8 times out of 100 respectively. Thus, we feel comfortable concluding that tips also predict sales from all revenue centers, but that conclusion should be regarded as tentative pending future replications.[8]

CONCLUSIONS

An analysis of seven years of monthly sales and tip data from a multi-regional restaurant chain in the United States found that tip percentage reliably predicted related sales in the following month. The precise relationship between charge tips and future sales will vary across restaurant chains and even across specific restaurants, so our findings cannot be directly used to forecast your sales. Our results are useful, however, in providing evidence that charge tips can predict sales. Thus, we encourage other restaurants and restaurant chains to add charge tips to their forecasting models.

ENDNOTES

[1] For example, see: Y.N. Green and P.A. Weaver, Approaches, techniques and information technology systems in the restaurants and food-service industry: A qualitative study in sales forecasting. International Journal of Hospitality and Tourism Administration, 9, No. 2 (2008), 164-191)

[2] D. Cranage, Practical time series forecasting for the hospitality manager. International Journal of Contemporary Hospitality Management, 15, No. 2 (2003), 86-93; D.A. Cranage and W.P. Andrew, A comparison of time series and econometric models for forecasting restaurant sales. International Journal of Hospitality Management, 11, No. 2 (1992), 129-142; M.M. Davis and P.D. Berger, Sales forecasting in a retail service environment. Journal of Business Forecasting Methods and Systems, 7, No. 4, (1988/1989), pp. 8-11; F.G. Forst, Forecasting restaurant sales using multiple regression and Box-Jenkins analysis. Journal of Applied Business Research, 8, No. 2 (1992), 15-19; M.S. Morgan and P.K. Chintagunta, Forecasting restaurant sales using self-selectivity models. Journal of Retailing and Consumer Service, 4, No. 2 (1997), 117-128; and E. Suh and J.J. West, Estimating the impact of entertainment on the restaurant revenues of a Las Vegas hotel casino: An exploratory study. International Journal of Hospitality Management, 29 (2010), 570-575.

[3] Davis and Berger, op.cit.; Morgan and Chintagunta, op.cit; and Suh and West, op.cit.

[4] M. Lynn, Tip levels and service: An update, extension, and reconciliation. Cornell Hotel and Restaurant Administration Quarterly, Vol. 44, No. 5–6 (October 2003), pp. 139-148; and S. Jang and Y. Namkung, Perceived quality, emotions, and behavioral intentions: Application of an extended Mehrabian-Russell model to restaurants. Journal of Business Research, 62 (2009), pp. 451-460.

[5] T.A. Garrett, R. Hernandez-Murillo and M.T. Owyang, Does consumer sentiment predict regional consumption? Federal Reserve Bank of St. Louis Review, 87, No. 2, Part 1 (2004), 123-135.

[6] We also estimate a regression model that includes all the other explanatory variables (lagged sales, linear and quadratic time trends, and monthly dummy variables), but does not include lagged tips. The model without tips explains 81% of the variation in TOTAL SALES A, leaving 19% of the variation unexplained, and it explains 79.7% of the variation in TOTAL SALES B, leaving 20.3% of the variation unexplained. When tips are added to the model, the information contained in the tips helps explain 15% of the unexplained variation in the case of TOTAL SALES A, and 15.3% of the unexplained variation in the case of TOTAL SALES B.

In additional tests, we also examine whether the coefficient on percent tip is the same for a tip increase as for a tip decrease. To do this, we define a dummy variable that takes the value of 1 in a month when percent tip is higher relative to the prior month, and takes the value of 0 otherwise. The variable is "Tips Increase". We estimate additional regressions, where we include the variable "Tips Increase" to account for potentially different intercepts between tips increase and tips decrease; we also include the interaction variables, (Tips Increase)*(Percent Tip(-1)), and (Tips Increase)*(Percent Tip(-2)), to account for potentially different effect of Percent Tip on sales for tip increase and tip decrease. First, our main results continue to hold: An increase in Percent Tip (-1), our main variable of interest, remains statistically significant, so an increase in Percent Tip forecasts an increase in sales. Second, the coefficient for the interaction term, (Tips Increase)* Percent Tip(-1), is positive and marginally statistically significant for both the Total Sales A and the Total Sales B regressions (in the Total sales A regression the *t*-statistic is 1.71, and in the Total sales B regression the *t*-statistic is 1.73, both p's $< .10$). This indicates that increasing tips may have a stronger effect on sales, than do decreasing tips.

[7] We also estimate a regression model that includes all the other explanatory variables (lagged revenues, linear and quadratic time trends, and monthly dummy variables), but does not include lagged tips. The model without tips explains 84.8% of the variation in GROSS REVENUE, leaving 15.2% of the variation unexplained, and it explains 85.7% of the variation in NET REVENUE, leaving 14.3% of the variation unexplained. When tips are added to the model, the information contained in the tips helps explain 7.9% of the unexplained variation in the case of GROSS REVENUE, and 7.7% of the unexplained variation in the case of NET REVENUE.

[8] In additional tests, we also examine whether the coefficient on percent tip the same for a tip increase as for a tip decrease. To do this, we define a dummy variable that takes the value of 1 in a month when percent tip is higher relative to the prior month, and takes the value of 0 otherwise. The variable is "Tips Increase". We estimate additional regressions, where we include the variable "Tips Increase" to account for potentially different intercepts between tips increase and tips decrease; we also include the interaction variables, (Tips Increase)*(Percent Tip(-1)), and (Tips Increase)*(Percent Tip(-2)), to account for potentially different effect of Percent Tip on revenues for tip increase and tip decrease. First, our main results continue to hold: An increase in Percent Tip (-1), our main variable of interest, is marginally statistically significant (in the Gross Revenue regression the *t*-statistic is 1.86, and in the Net Revenue regression the *t*-statistic is 1.67) so an increase in Percent Tip forecasts an increase in revenue. Second, the coefficient for the interaction term, (Tips Increase)* Percent Tip(-1), is positive but not statistically significant for both the Gross Revenue and the Net Revenue regressions (in the Gross Revenue regression the *t*-statistic is .89, and in the Net Revenue regression the *t*-statistic is .91, both p's > .10). In our data, we are unable to conclude that increasing tips and decreasing tips have different effects on sales from all revenue centers.

CHAPTER 5

Do Increases in the Regular and Tipped Minimum Wages Hurt the Restaurant Industry? The Evidence Says No!

MICHAEL LYNN AND CHRISTOPHER BOONE†

EXECUTIVE SUMMARY

The restaurant industry has consistently opposed increases in the regular and tipped minimum wages on the grounds that such increases would require restaurants to cut hiring, raise prices, or both. Either reaction is thought to reduce customer satisfaction and demand as well as restaurant profitability and survival. To the contrary, however, the results of this study confirm previous findings, namely, that the relatively modest mandated increases in employees' regular and tipped minimum wages in the past twenty years have not had large or reliable effects on the number of restaurant establishments or restaurant industry employment levels, although those increases have raised restaurant industry wages overall. Even when restaurants have raised prices in response to wage increases, those price increases do not appear to have decreased demand or profitability enough to sizably or reliably decrease either the number of restaurant establishments or the number of their employees. Although minimum wage increases almost certainly necessitate changes in restaurant prices or operations, those changes do not appear to dramatically affect overall demand or industry size. Furthermore, there is strong evidence that increases in the minimum wage reduce turnover, and good reason to believe that it may increase employee productivity as well. While prospective large increases in minimum wage mandates may have more noticeable effects, the evidence suggests that the restaurant industry should accept reasonable, modest increases in the minimum wage.

INTRODUCTION

Federal and state laws in the U.S. specify the minimum wages that are legal in their jurisdictions. Recent years have seen an increased interest among many in raising those minimum wages (Allegretto, 2013; Berman, 2014; Cooper, 2015) and there has been some movement at the local, state and federal levels to do so (Executive Office of the President, 2014; Kasperkevic & Srinivas, 2015; Shah, 2015). Proposals to increase the minimum wage have been opposed by the restaurant industry on the grounds that such increases would require restau-

† This paper originally appeared as: Lynn, M. & Boone, C. (2015). Have Minimum Wage Increases Hurt the Restaurant Industry? The Evidence Says No! *Cornell Hospitality Report*, Vol. 15, No.22 and is available at: https://ecommons.cornell.edu/entities/publication/b00f2cc0-313e-4e49-88cd-1a4dbe52a8c2.

rants to cut hiring, raise prices, or both (Bergman, 2015; Greenhouse, 2014; Rosenfeld, 2014). Either reaction is thought to reduce customer satisfaction and demand as well as restaurant profitability and survival. Although this piece of conventional wisdom seems entirely plausible, we wanted to test whether this is the case, especially in view of studies that have found no such negative outcomes (or tiny outcomes, at worst). Consequently, in this report, we address the question of whether increases in the minimum wages have the negative effects widely expected by the restaurant industry.

We start by briefly describing the complex network of federal and state minimum wage laws currently in effect, and then summarize economic theory addressing the potential effects of raising minimum wages. We outline research on this topic and then present our own study and analysis examining the effects of minimum wage increases on the number of both full- and limited-service restaurant establishments and their employment and wages. We conclude with the implications of our findings regarding the industry's position on potential increases in minimum wages.

MINIMUM WAGE LAWS

The federal minimum wage law and those of many states allow employers to count a portion of tipped employees' tips toward the minimum wage (called a "tip allocation"), resulting in different minimum wages for tipped and non-tipped workers. However, tip allocations are not the same across states and some states do not allow any tip allocation. Thus, the effective minimum wages for tipped and non-tipped workers, as well as the differences between tipped and non-tipped minimum wages, vary considerably from state to state. In 2015, for example, the federal minimum wage was $2.13 for eligible tipped workers and $7.25 for non-tipped workers, the New York state minimum wage was $7.50 for tipped workers and $8.75 for non-tipped workers, and the California state minimum wage was $9.00 for tipped and non-tipped workers alike. Furthermore, changes in minimum wage laws at the federal and state levels need not, and historically have not, affected tipped and non-tipped minimum wages equally. While the federal tipped minimum wage has remained unchanged since 1991, for instance, the federal non-tipped minimum wage was increased five times since then. Similar differences in changes to the tipped and non-tipped minimum wages have occurred at the state level. This diversity in minimum wages has allowed researchers to study the associations between different levels of minimum wage and various employment outcomes. We make use of them in our study as well.

ECONOMIC THEORY

Economic theory is often portrayed as clearly predicting a negative effect of minimum wage increases on the employment of low income workers, but this portrayal is overly simplistic. Neo-classical economic theory, which assumes labor markets are perfectly competitive, does identify reductions in levels of employment as one potential effect of raising the minimum wage, but it also identifies other adjustments by businesses -- like price increases to consumers and/or reductions in non-wage employee benefits -- that can reduce or even eliminate the effects of rising labor costs on employment levels (Schmidt, 2015).

In addition, institutional economists, who view markets as inextricably linked to the political and social environment in which they are embedded and, therefore, as less than perfectly competitive, acknowledge even more potential adjustments to minimum wage increases (Schmidt, 2015). Specifically, institutional economic theory allows for the possibility that wage increases may increase productivity by giving employers new incen-

tives to enhance training or update equipment and by giving employees more incentive to work hard. Institutional economic theory also allows for a stimulus effect of paying workers more and the potential for increased demand to at least partially offset an increase in labor costs associated with raising the minimum wage. Thus, while economic theory does suggest that lower levels of employment are one potential outcome of raising the minimum wage in competitive or near competitive markets, it also allows for other adjustments that reduce or even eliminate this negative employment effect.

Still other economists question even the near competitiveness of labor markets. These economists believe that employers often have market power that permits them to pay less than competitive wages. This demand-side power is called "monopsony," just as supply-side power is called monopoly. In a monopsonistic labor market, powerful employers set the prevailing wage and thereby determine the size of the labor pool. However, assuming that wage-discrimination is not possible and that employers must pay all workers doing the same job the same amount, then hiring an additional worker in a monopsony market by offering enough pay to grow the size of the labor pool by one worker requires paying all existing workers the new higher amount. In such markets, wages may be below the marginal value of labor (i.e., below competitive wages), because even if hiring an additional worker at a slightly higher wage would increase production enough to pay for the wage given to that worker, it may not pay for the slightly higher wage that must then be given to all previously hired workers. By this logic, raising minimum wages that are below the marginal value of labor up to that level would remove this perverse incentive of monopsony employers and actually increase employment. Of course, raising the minimum wages at the marginal value of labor to a point above that would decrease employment even in monopsony markets. Thus, in monopsony labor markets, raising the minimum wage could increase or decrease employment depending on the levels of the original and new wages relative to the marginal value of labor (Aronson, French and MacDonald, 2008; Schmidt, 2015).

Even if labor markets are generally competitive, Wessels (1997) has argued that the market for tipped restaurant servers is likely to be monopsonistic because hiring more servers decreases the tips that each receives (assuming constant restaurant demand and tips that are linked to restaurant bill sizes). In order to compensate for the reduced per-server customer counts and tips, restaurants must pay higher wages to all their servers when hiring new servers. This means that the marginal cost of hiring servers is greater than the average cost of hiring them, which characterizes monopsony markets as explained above. Thus, Wessels argues that regardless of regular (non-tipped) minimum wage effects, increases in the tipped minimum wage are likely to exhibit a curvilinear "monopsony pattern" -- first increasing and then decreasing employment of restaurant servers as the tipped minimum wage increases from below the marginal value of labor to above the marginal value of labor.

In summary, economic theory suggests that raising the minimum wage could decrease employment of low wage workers. However, it also allows for the possibility that minimum wages could be raised with little or no negative effect on employment. It even allows for the possibility that raising the minimum wage (especially the tipped minimum wage) could increase employment. Similar arguments also apply to minimum wage effects on prices. Thus, contrary to common opinion, an answer to the question of what effect raising the minimum wage would have on employment and prices cannot be answered using economic theory alone. Ultimately, these empirical questions that must be answered with research data.

EXISTING EVIDENCE

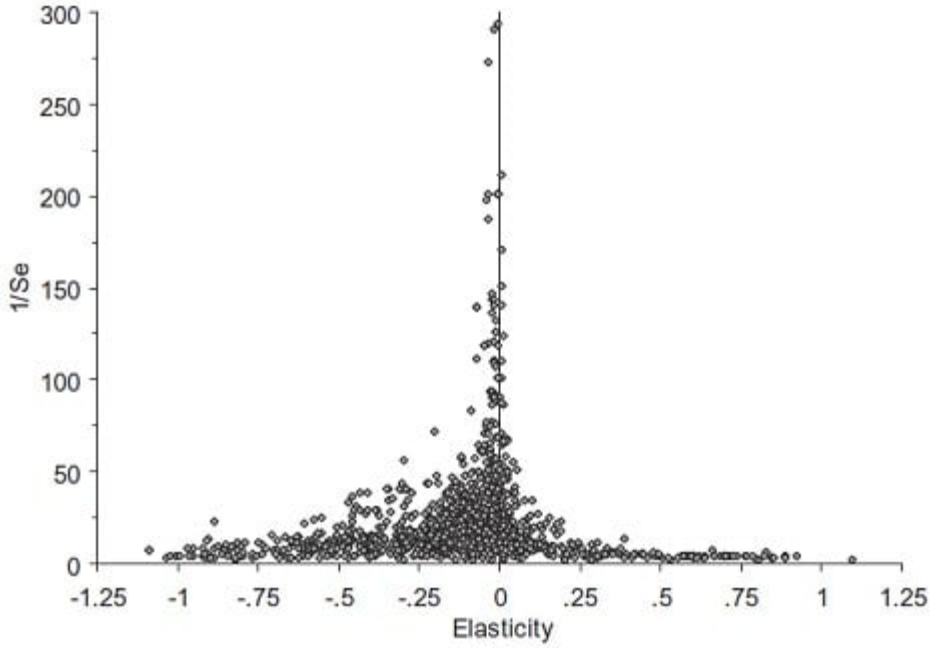
Most studies have examined the effects of raising the minimum wage (for recent reviews, see Schmidt, 2015, and Belman and Wolfson, 2014). Of particular interest in this report are the effects on employment levels and work-hours, worker income, consumer prices, and firm profitability/survival, so we briefly review studies examining those effects in the paragraphs that follow.

Employment Effects of Regular Minimum Wage Increases

Most minimum wage studies have examined the effects of the regular (or non-tipped) minimum wage on employment levels. These studies have produced mixed results with the bulk of the studies finding a negative effect – that is, raising the non-tipped minimum wage appeared to decrease employment among low skill workers in the majority of these studies (for a qualitative review, see Neumark and Wascher, 2006). However, there is evidence that these negative effects are an artifact of chance coupled with publication bias against positive effects (Card and Krueger, 1995; Doucouliagos and Stanley, 2009) and/or confounding by regional differences in economic and political variables that are unlikely to be affected by the minimum wage (Dube, Lester and Reich, 2010; Allegretto, Dube and Reich, 2011).

Evidence of a publication bias favoring negative minimum wage effects on employment is found when plotting those estimated effects against their statistical precision/reliability (see Exhibit 1). The more precise/reliable effects are very close to zero with only the less precise/reliable effects being substantially different from zero. This pattern of results suggests that minimum wage increases have no or very small true effects on employment and that the larger effects in the literature are chance effects with the greater preponderance of negative effects reflecting economists' bias in favor of believing and publishing those findings (Doucouliagos and Stanley, 2009).

Exhibit 1: Trimmed Funnel Graph of 1,424 Estimated Minimum-Wage Effects



Source: Doucouliagos and Stanley, 2009

Evidence that confounding effects of uncontrolled state and regional differences in economic trends and temporary economic shocks are responsible for many of the negative minimum wage effects on employment in the literature comes from Dube and his colleagues. They found that high and low minimum wage states and regions differ on many economic and political variables that are related to employment but unlikely to be caused by the minimum wage. For example, high minimum wage states are more Democratic leaning and are more unionized with smaller declines in unionization than are low minimum wage states (Allegretto, Dube, Reich and Zipperer, 2015). High minimum wage states also experienced sharper growth in upper-half wage inequality and sharper job recessions (Allegretto, Dube, Reich and Zipperer, 2013). These other state differences may affect low-wage employment, thereby creating an artificial negative relationship between minimum wages and employment. In fact, the negative minimum wage effects on employment observed in some studies disappear after statistically controlling for these state and/or regional differences (Dube, Lester and Reich, 2010; Allegretto, Dube and Reich, 2011; Allegretto, Dube, Reich and Zipperer, 2015).[1] Since there is still enough variability in minimum wages after implementing these controls to observe the effects of that variability on wages, the absence of minimum wage effects on employment after implementing these controls argues against causal effects of the minimum wage on employment.

Taking these problems of publication bias and confounding into account, existing research suggests that raising the regular minimum wage has little if any effect on employment among low income workers. However, a recent paper by Meer and West suggests that minimum wage increases may not affect immediate employment

levels as much as rates of employment growth and that existing studies do not adequately test these long-term effects. In particular, studies controlling for state differences in linear trends over time are unlikely to find negative minimum wage effects on rates of employment growth (and therefore, long-run employment levels) even when those effects really exist. Using alternative statistical tests, Meer and West (2015) found that a 10 percent increase in the minimum wage was associated with a 0.7 percent cumulative reduction in employment over the ensuing three years. This paper muddies the waters. The critique of using controls for state differences in linear trends is valid, but not all of the existing studies and/or analyses finding small, non-significant employment effects of increasing the minimum wage have employed these troublesome controls (e.g., Allegretto and Nadler, 2015, and Allegretto, Dube, Reich and Zipperer, 2015). The bulk of the evidence still seems to argue against strong negative employment effects of minimum wage increases, but additional research explicitly testing longer-term effects seems to be needed.

Other Effects of Regular Minimum Wage Increases

Studies of minimum wage effects on workers' incomes, employment flows, consumer prices, and firm profitability and survival are not as numerous as studies of minimum wage effects on employment and their findings are not always consistent. Nevertheless, these studies provide reasonably strong evidence for positive minimum wage effects on employment flows, incomes and prices. First, a recent study found that separations, hires, and turnover rates for restaurant workers and teens all substantially decline following an increase in the minimum wage (Dube, Lester and Reich, 2016). Second, a recent review of minimum wage effects on average wages reported that 26 of 29 studies found positive effects (Belman and Wolfson, 2014). With respect to U.S. restaurant workers, a 10 percent increase in the minimum wage is associated with about a 2 percent increase in total wages (Allegretto and Nadler, 2015; Belman and Wolfson, 2014). That is, in response to an increase in the minimum wage, there is an increase in aggregate earnings of workers in the restaurant sector; thus, if employment declines at all, this means that there must be an even larger increase in the average wage. Finally, a review of research regarding minimum wage effects on prices concluded that most of thirty studies found modest, positive effects (Lemos, 2008, pg. 208). The size and timing of minimum wage effects on restaurant prices appears to vary across nations (Fougere, Gautier and LeBihan, 2010; MacDonald and Aaronson, 2006), but in the United States, a 10 percent increase in the minimum wage leads within a few months to about a 1.5 percent increase in limited-service restaurant prices and a 0.3 percent increase in full-service restaurant prices (Aaronson, French and MacDonald, 2008).

In contrast, a review of minimum wage effects on firms' profitability and survival found less clear results. One U.K. study found that a 10 percent increase in the minimum wage reduced firm profit margins by 15 percent (Draca, Machin and VanReenen2001), but six other studies found weak or inconsistent minimum wage effects on proxies for profitability such as survival rates or share prices.

Employment and Wage Effects of Tipped Minimum Wage Increases

Little research has examined the effects of the tipped minimum wage. Unfortunately, even this small literature is full of contradictory findings (see Exhibit 2). The findings of Even & Macpherson (2014) and Allegretto and Nadler (2015) appear to us to be based on the strongest data and analyses, but even they are contradictory. Moreover, these authors failed to test for the quadratic effects predicted and found by Wessels (1997) so more research is needed on the effects of raising the tipped minimum wage.

Exhibit 2. Summary of study findings about the effects of raising the tipped minimum wage.

	Tipped Minimum Wage Effects on Restaurant Employment	Tipped Minimum Wage Effects on Restaurant Wages
Allegretto & Filion (2011)	--	positive
Allegretto & Nadler (2015)	small, non-significant	positive
Anderson & Bodvarsson (2005)	--	small, non-significant
Even & Macpherson (2014)	negative	positive
Wessels (1993)	negative	--
Wessels (1997)	curvilinear -- increasing then decreasing	--

NEW ANALYSES OF MINIMUM WAGE EFFECTS, 1995-2014

Since it is possible that the effects of minimum wage changes vary between full-service and limited-service restaurants, we analyzed these establishments separately. Our goals in conducting and reporting these analyses are to: (1) make the findings more accessible and credible to non-academicians than are the analyses and findings in the academic literature, (2) explicitly test for long-term (or lagged) minimum wage effects on restaurant employment, (3) test for curvilinear tipped minimum wage effects on restaurant employment, and (4) test regular and tipped minimum wage effects on the number of restaurant establishments.

Data Sources

We obtained yearly data on the effective regular (non-tipped) and tipped minimum wages in each state (including the District of Columbia) from the website of U.S. Department of Labor – Wage and Hour Division. Minimum wage data extended from 1995 to 2014 while data on tipped minimum wages was available only from 2003 to 2014. Both measures had a sufficiently long stream of data to span a variety of economic conditions. On rare occasions when a minimum wage changes are known to have gone into effect mid-year, the minimum wage recorded and analyzed for that year was that in effect for the greatest amount of time in that year. Several states have different levels of minimum wage for different sizes of firms, industry sectors and conditions of employment (e.g., with vs without health insurance). Those minimum wages recorded and used in our analyses were those specifically for (i) restaurant employees, (ii) larger firms, or (iii) firms under the least restrictive qualifying conditions (e.g., those who do not provide health insurance). We also used U.S. Department of Labor data for the number of full-service and limited-service restaurant establishments, for the number of people employed and the total wages in each sector for each state and year from 1995 to 2014.

Analyses and Findings

We calculated the percentage changes in the regular and tipped minimum wages, employment, wages, and number of establishments for each year from the previous year's values (see Exhibit 3), and we analyzed those

changes in regression analyses using error terms clustered within states. To increase confidence that any relationships observed reflect the causal effects of changes in the regular and/or tipped minimum wages on percentage changes in restaurant employment, wages and/or establishments, these analyses statistically controlled for percentage change in total employment, wages or establishments across all industries (selected to match the dependent variable) as well as year, state, and census-division-specific year effects. Importantly, our models did not control for state level trends (in other words, continuous-year by state-dummy interactions), which some authors have argued could inappropriately hide real minimum wage effects (Meer & West, 2015).[2]

Exhibit 3. Descriptive statistics for the data used in our analyses.

	N	Minimum	Maximum	Mean	Std. Deviation
%Δ Minimum Wage	969	-14.63	40.78	3.2103	5.65436
%Δ Tipped Minimum Wage	561	-41.32	79.81	1.7066	7.42091
%Δ Full-service restaurant employment	969	-7.42	17.78	2.2930	2.50599
%Δ Limited-service restaurant employment	969	-18.05	17.77	1.6689	2.84896
%Δ Total employment	969	-10.14	10.24	.9907	2.28826
%Δ Full-service restaurant wages	969	-51.18	19.33	5.5914	3.79611
%Δ Limited-service restaurant wages	969	-11.69	23.33	4.4837	3.19435
%Δ Total wages	969	-30.78	53.83	4.3704	4.47108
%Δ Full-service restaurant establishments	969	-10.48	9.90	1.9874	2.45185
%Δ Limited-service restaurant establishments	969	-12.69	22.08	1.8029	2.94903
%Δ Total establishments	969	-9.51	11.62	1.4390	2.26511
Valid N (listwise)	561				

Exhibit 4. Long- and short-term linear effects of percentage change in the minimum wage and tipped minimum wage on percentage change in full-service restaurants.

	%ΔEmployment		%ΔEstablishments		%ΔWages	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Full Service Restaurants	N = 867	N = 459	N = 867	N = 459	N = 867	N = 459
%Δ Minimum Wage (MW)	-.010	-.015	-.009	-.037	**.086*****	.034
	(.015)	(.022)	(.022)	(.027)	(.021)	(.024)
%Δ MWlag1	-.015	-.015	-.002	.013	-.014	-.017
	(.015)	(.020)	(.017)	(.017)	(.019)	(.027)
%Δ MWlag2	-.017	-.010	.004	-.008	-.020	-.021
	(.016)	(.019)	(.015)	(.021)	(.019)	(.025)
%Δ Tipped Minimum Wage		.002		.025		**.039***
(TMW)		(.015)		(.020)		(.017)
%Δ TMWlag1		-.003		-.018		-.006
		(.014)		(.012)		(.016)
%Δ TMWlag2		-.011		-.021		-.008
		(.014)		(.016)		(.019)
Linear Combinations of Coefficients						
MW+MWlag1+MWlag2	-.041	-.04	-.007	-.032	.052	-.004
	(.029)	(.032)	(.040)	(.050)	(.036)	(.038)
TMW+TMWlag1+TMWlag2		-.012		-.014		.025
		(.027)		(.029)		(.027)

Control variables were: %ΔTotal Employment (or %ΔTotal Establishments or %ΔTotal Wages), state dummies, year dummies, and census division by year dummies. All error terms were clustered within state.
*p < .05, **p < .01, ***p < .001

Effects on Full-Service Restaurants

As summarized in Exhibits 4 and 7, our analyses of regular and tipped minimum wage effects on full-service restaurants indicate that increasing each of these minimum wages increases wages, but leaves employment and the number of establishments unaffected. A ten percent increase in the regular minimum wage increases full-service restaurant wages by a little less than one percent (see Exhibit 4, Model 5) and a ten percent increase in the tipped minimum wage increases full-service restaurant wages by a little less than one-half of a percent (see Exhibit 4, Model 6). Both effects are felt in the same year as the minimum wage increases with no lagged effects in either a positive or negative direction. This means that the increases are not offset by declining growth in wages over the subsequent three years.

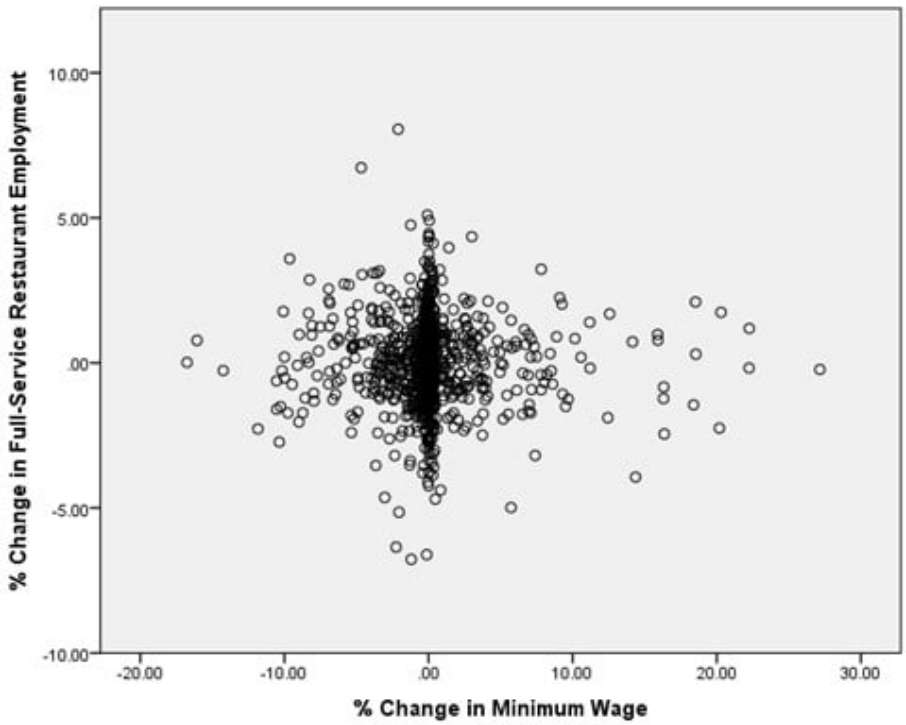
In contrast with their positive effects on wages, increases in the regular and tipped minimum wages had no reliable linear effect on the number of full-service restaurants or on full-service restaurant employment even when looking at long-term cumulative effects over three years (see Exhibit 4, Models 1-4). Overall, these findings support those Allegretto and Nadler (2015). The fact that we used different measures, controls, units of analysis, and years of data support the robustness of their results.[3]

Because of the strength of the conventional wisdom that there must be a (negative) relationship between these variables, we include Exhibits 5 and 6, on the next page, which show the scatter plots of percentage change in full-service restaurant employment by percentage change in minimum wage and tipped minimum wage after

controlling for state, year dummies, census-division-by-year dummies, and percentage change in total employment across all industries. These plots show substantial variability in minimum wages, even after controlling for potential confounds, but no effect of that variability on fullservice employment. Since the variables are re-centered around a mean of zero, it appears that the variables declined as much as they increased. However, the minimum wage declined only one out of 969 times, the tipped minimum wage declined only five out of 561 times, and full-service restaurant employment actually declined only 15.3 percent of the time.

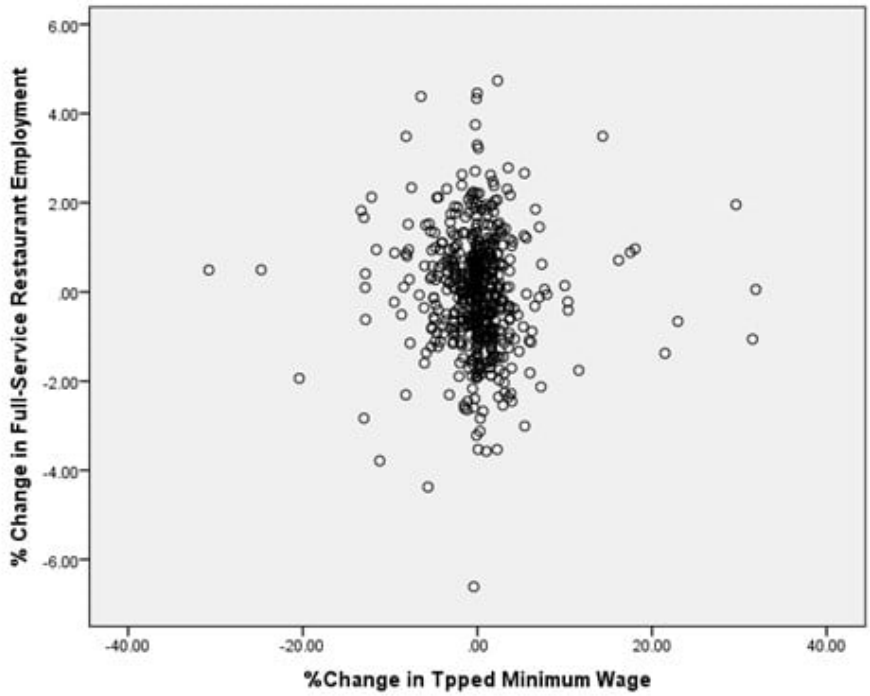
In consideration of Wessel's theory and evidence that the market for tipped workers is monopsonistic, we tested the curvilinear effects of changes in the tipped minimum wage on full-service restaurant employment. Our study found non-significant results (see Exhibit 7).[4] Thus, we were not able to conceptually replicate Wessel's (1997) cross-sectional findings supporting a monopsony theory of tipped minimum wage effects.

Exhibit 5. Scatterplot of percentage change in full-service restaurant employment by percentage change in (regular) minimum wage.



Note: Scatterplot controls both variables for state, year-dummies, census-division by year-dummies, and percentage change in total employment across all industries. Variables are re-centered the variables around a mean of zero.

Exhibit 6. Scatterplot of percentage change in full-service restaurant employment by percentage change in tipped minimum wage.



Note: Scatterplot controls for state, year, census-division by year, percentage change in total employment across all industries, and percentage change in the regular minimum wage. Variables are re-centered around a mean of zero.

Exhibit 7. Quadratic effects of percentage change in the tipped minimum wage on percentage change in employment at full-service restaurants.

	%ΔEmployment
Model 7	N = 459
%Δ Tipped Minimum Wage Squared (TMW^2)	.0001
	(.0003)
%Δ TMW^2lag1	-.0003
	(.0003)
%Δ TMW^2lag2	.0000
	(.0004)
Linear Combination of Coefficients	
$TMW^2+TMW^2lag1+TMW^2lag2$	-.0001
	(.0006)

Control variables were: %ΔTotal Employment, state dummies, year dummies, census division by year dummies, and percentage change in the minimum wage and the tipped minimum wage plus their one and two year lags. All error terms were clustered within state.

Effects on Limited-Service Restaurants

Similar to full-service restaurants, our analyses of regular minimum wage effects on limited-service restaurants indicate that increasing the minimum wage increases wages, but leaves employment and the number of establishments unaffected. A ten percent increase in the regular minimum wage increases limited-service restaurant wages by a little less than one percent (see Exhibit 8, Model 9). This effect is felt in the same year as the minimum wage increase with no lagged effects in either a positive or negative direction.

Also like full-service restaurants, increases in the minimum wage have no reliable effects on number of limited-service establishments or their levels of employment. Moreover, this remains true even when looking at long-term cumulative effects over three years (also shown in Exhibit 8). There was one statistically significant negative effect of changes in the minimum wage on limited-service restaurant employment three years later, but the effect was small.

Exhibit 8. Long- and short-term linear effects of the minimum wage on limited-service restaurants.

	%ΔEmployment	%ΔEstablishments	%ΔWages
	Model 7	Model 8	Model 9
Limited Service Restaurants	N = 867	N = 867	N = 867
%Δ Minimum Wage (MW)	-.022	-.007	**.075****
	(.017)	(.016)	(.021)
%Δ MWlag1	-.017	.001	.017
	(.019)	(.021)	(.024)
%Δ MWlag2	**-.032***	-.019	-.011
	(.015)	(.020)	(.017)
Linear Combination of Coefficients			
MW+MWlag1+MWlag2	-.071	-.026	.081
	(.037)	(.047)	(.048)

Control variables were: %ΔTotal Employment (or %ΔTotal Establishments or %ΔTotal Wages), state dummies, year dummies, and census division by year dummies. All error terms were clustered within state.

GENERAL DISCUSSION AND CONCLUSIONS

Our study essentially replicates the findings of other research, which indicates that increasing the regular and tipped minimum wages does raise restaurant industry wages, but does not have large or reliable effects on full-service and limited-service restaurant employment. The analysis also shows similarly weak effects on the number of full-service and limited-service restaurants. There is no doubt that restaurateurs face higher expenses as a result of minimum wage increases, but if restaurants are raising prices to compensate, those increases do not appear to decrease demand or profitability enough to sizably or reliably decrease either the number of restaurants or the number of employees. Thus, we conclude that the best empirical data available suggest that the industry's objections that minimum wage hikes will cause restaurants to close are largely unfounded. Although minimum wage increases necessitate some changes in restaurant prices or operations, those changes do not appear to dramatically affect overall demand or industry size.

Regarding the effect on employees' income, it is worth emphasizing that other studies found large and robust increases in wages as a result of increases in the minimum wage. Those increases appear relatively small in our analyses, but that is because we examined percentage changes in the aggregate earnings of all workers, not just of minimum wage workers. Therefore, even if there are (small) negative effects on employment, the average restaurant worker can expect to see his or her earnings go up following a minimum wage increase. The argument that minimum wage increases are "bad for workers" does not seem to hold. That argument suggests that these workers are so risk averse that they would forgo a large increase in expected earnings to alleviate a minor risk of job loss—a risk that may not even exist.

We must underscore the limitation that these conclusions apply only to the mostly modest minimum wage increases that were implemented during the study period. Much larger increases, like the $15 minimum wage recently enacted in Los Angeles, San Francisco, and Seattle and contemplated elsewhere (including New York), may have more substantial negative effects on the industry (Springer, 2015). Thus, the industry may be justified in opposing immediate, large hikes in the minimum wages, but data do not support opposition to all minimum wage increases.

To the contrary, we believe the restaurant industry should support reasonable increases in the regular and tipped minimum wages because better compensated employees tend to be happier, more productive, and less likely to quit their jobs (Gardner, VanDyne and Pierce, 2004; Werner and Ward, 2004). Increases in the minimum wage allow restaurant firms to enjoy these benefits of paying workers more without suffering a competitive disadvantage in terms of labor costs. Furthermore, supporting minimum wage hikes demonstrates caring for your workers. Employees are happier, more productive, and less likely to quit their jobs when they perceive their employers as caring for and supporting them (Allen, Shore and Griffeth, 2003; Baruch-Feldman, Schwartz, Brondolo and Ben-Dyan, 2002; Eisenberger, Huntington, Hutcheson and Sowa, 1986).

There is strong evidence that increases in the minimum wage reduce turnover, as mentioned previously (Dube, Lester and Reich, 2016). While no study has tested our belief that increasing the minimum wage will increase employee happiness and productivity as well, our reasoning is theoretically sound and consistent with more general research on compensation effects. Moreover, the research reviewed and reported here suggests that the industry has little to lose by acting on this belief. Thus, we contend that the restaurant industry should support rather than oppose reasonable increases in the minimum wage.

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ENDNOTES

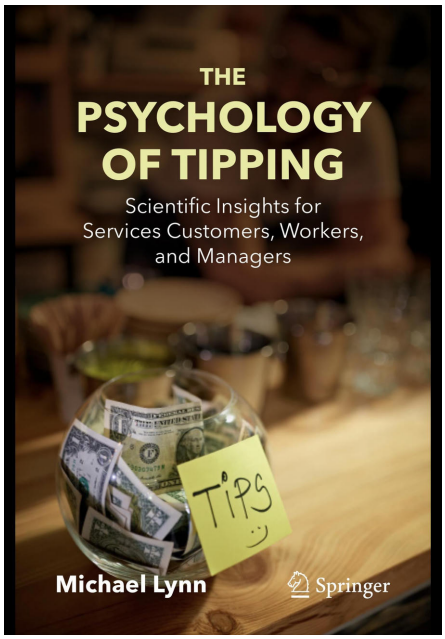
[1] Controls for state trends were continuous-year by state interactions. Controls for regional shocks were census division by year-dummy-variable interactions.

[2] A model regressing percentage change in full service restaurant employment on percentage change in minimum wage and tipped minimum wage and their values the year after, as well as the controls used in all our other analyses, produced non-significant effects of next year's minimum wage (B = .010, S.E. = .025, t(50) =0.41, n.s.) and tipped minimum wage (B = .001, S.E. = .014, t(50) = 0.08, n.s.). This suggests that state level linear trends in are not a problem in this data set.

[3] Allegretto and Nadler (2015) used natural log transformations of employment and minimum wages while we used percentage changes in these variables. They controlled for population while we did not. They analyzed data at the county-quarter level while we analyzed it at the state-year level. Finally, they examined data from 1990 to the first quarter of 2013 while we examined data from 1995 to 2014 for minimum wage effects and from 2003 to 2014 for tipped minimum wage effects.

[4] The analyses in Exhibit 7 tests curvilinear effects of the tipped minimum wage that are tied to the percentage change in its value. However, it is possible that the curvilinear effects of the tipped minimum wage are tied to its absolute value instead. In other words, the change in tipped minimum wage effects from positive to negative may occur at a specific tipped minimum wage rather than at a specific percentage change in tipped minimum wage. To test this possibility, we regressed the natural log of full-service restaurant employment on the minimum wage, tipped minimum wage, tipped minimum wage squared, the natural log of total employment and all the other controls described previously. This analysis produced non-significant effects for minimum wage (B = -.011, S.E. =.011, t (50) = -1,01, n.s.), tipped minimum wage (B = -.027, S.E. = .028, t(50) = -0.95, n.s.), and tipped minimum wage squared (B = .004, S.E. = .004, t(50) = 1.19, n.s.). Thus, our data provide no support for Wessel's (1997) monopsony analysis of tipped minimum wage effects.

The Psychology of Tipping



ABOUT THIS BOOK

Consumers around the world often give voluntary sums of money (called tips) to service providers after those workers have served them. There are no good measures of how much is tipped worldwide, but total tips in the US food and beverage industry alone are estimated to exceed $45 billion a year. Thus, tips represent more than small change and their salience and importance have grown in recent years with the advent of digital tipping, which has expanded both the number and types of services asking for tips and the size of tips they are asking for. Academic psychologists and other scholars have studied this topic for 50 years, but that information is locked away in academic journals and writing that is not easily accessible to the general public. This book brings that work together, along with new previously unpublished analyses, in readable prose that shares what we have learned about the topic – including why people tip, who are the best and worst tippers, why we tip some occupations and not others, why tipping norms vary across countries, and what factors influence the size of tips consumers leave. The insights revealed will benefit consumers struggling to navigate the complex and evolving expectations placed on them, tipped workers seeking to increase their incomes, managers of tipped workers interested in improving employee morale and customer satisfaction, and academics interested in further advancing our understanding of this fascinating behavior.

TABLE OF CONTENTS

1. More than Small Change (Who cares about tipping? Why? What should they know?)

2. Beyond Gratitude & Gratuity (Why do, or don't, people tip?)

3. Big-Tippers & Stiffers (Who gives the best tips, and who gives worst?)

4. A Time for Tips (When do people tip more, and when less?)

5. A Place for Tips (How and why does tipping vary across geographic areas?)

6. Perk of the Job (Why do we tip some service occupations and not others?)

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9. Winners & Losers (Who does tipping benefit and who does it harm? How?)

10. Cornucopia of Controversies (What controversies arise from tipping? What should people know about them?)

1**1. Past as Prologue** (How did tipping get where it is? How might it change going forward?)

BOOK ENDORSEMENTS

"Michael Lynn is a social psychologist at Cornell, and one of the worlds' pre-eminent scholars on tipping. We interviewed him several years ago for a Freakonomics episode called 'Should Tipping Be Banned?' We needed to find someone who could answer all our tipping questions. Now he answers all your questions about this fascinating behavior in his new book, *The Psychology of Tipping.*"

-Stephen J. Dubner, journalist and co-author of *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*

"The Psychology of Tipping remains an important and timely contribution to tipping literature. The book is a groundbreaking one-stop-shop for psychological and consumer-driven research on tipping that deserves a wide readership of academics and industry practitioners alike."

-Eli R. Wilson, Professor of Sociology and author of *Front of the House, Back of the House: Race and Inequality in the Lives of Restaurant Workers,* from book review in *Work & Occupations*

"Drawing on psychology, economics, and social research, Michael Lynn offers powerful insights for anyone interested in learning more about the emotionally-charged topic of tipping. This is a fascinating look at the hidden science of tipping, and why it matters for anyone who gives, receives, or leads in the hospitality and service industries."

-Danny Meyer, restaurateur and author of *Setting the Table: The Transforming Power of Hospitality in Business*

Tipping Bibliography

COMPILED BY MICHAEL LYNN
LAST UPDATED SEPTEMBER 15, 2026

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