



Does Automatic Gratuity Help or Hurt Servers? An Examination of a Casual Restaurant's POS Data

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Abstract: Restaurants use automatic gratuities to protect servers from low tips, but these charges may also reduce voluntary tipping. This study examines how selective automatic gratuity is associated with recorded customer payments at a casual dining restaurant in North Carolina. Transaction-level point-of-sale data cover May 14, 2024, to April 30, 2025. Descriptive statistics summarize 14,404 checks, and ordinary least squares models use 14,278 complete observations. The models account for bill size, large-party status, and discounts. Automatic gratuity was associated with a 27-percentage-point lower probability of a recorded voluntary tip and a 5.33-percentage-point lower recorded voluntary-tip percentage. Nevertheless, combined recorded tips and gratuities were 12.69 percentage points of the bill higher on checks with automatic gratuity after adjustment. The restaurant passed all automatic gratuity to servers. A separate zero-tip deletion analysis produced associations in the same direction, although its interpretation depends on assumptions about unrecorded cash tips. The contribution is a comparison of selectively charged and uncharged checks that separates voluntary tips from combined recorded compensation, helping managers evaluate both payment components. Nonrandom application of the charge, incomplete cash-tip measurement, and the single-restaurant setting limit causal interpretations.



Introduction

Tipping, the practice of giving extra money to a service worker, is an important component of restaurant servers' compensation. Research on tipping has examined both its role as a social norm and its place in the economic relationship between restaurants, customers, and workers (Azar, 2011; Wessels, 1997). Because tipping is voluntary, a server may receive a small tip or no tip for a particular check. Restaurants sometimes respond by imposing automatic gratuities, or service charges, selectively on checks with characteristics such as a large party or a high bill. These policies change how part of the payment is determined while often leaving customers free to add a voluntary tip.

An automatic gratuity policy creates a required payment, but it does not necessarily increase the amount of compensation a server receives on a check. Assuming that the charge simply adds to an unchanged voluntary tip may overstate its benefit to servers. Customers may instead reduce or omit the voluntary tip once the charge is included. If that reduction exceeds the charge, the combined payment can be lower; if it is smaller, the combined payment can be higher. Evaluating the policy therefore requires examining both voluntary tips and the combined payment including the tip and gratuity.

Managers also have to decide which checks receive the charge. Party size, bill size, and discount status are readily available in transaction records, but they describe different aspects of a service encounter. A policy that uses these characteristics may reflect concerns about the size or uncertainty of payment rather than a demonstrated ability to identify low tippers.

The unresolved question is how selective application of automatic gratuity relates to voluntary tipping and combined recorded payments. Which observed check characteristics are associated with receiving the charge, and how do affected and unaffected checks differ in their voluntary and combined payments after adjustment for those characteristics? Answering these questions requires separating the restaurant's application of the charge from the recorded payments on each check.

This study examines point-of-sale records from a casual dining restaurant in Steele Creek, North Carolina, that applied an 18% automatic gratuity typically, but not exclusively, to parties of six or more. We analyze a subset of the North Carolina transactions used by Lynn, Modak, and Gurjar (2025), whose study examines weekend differences in tipping and explanations involving restaurant busyness, cost consciousness, and customer selection. Our analysis separates the restaurant's application of automatic gratuity from its associations with voluntary-tip incidence and percentage and total server compensation percentage, adjusting for bill size, large-party status, and discounts.

Literature review and research questions

Automatic gratuity changes the structure of the payment decision facing a restaurant customer. Without the charge, the customer chooses whether to leave a voluntary tip and how much to leave. When a service charge is included, part of the payment is determined by the restaurant, while the customer may still choose to add a voluntary tip. The distinction matters because a lower voluntary tip does not necessarily imply a lower combined payment. An assessment of the policy must examine both the voluntary component and the sum of the voluntary tip and service charge.

Tipping is a social norm that can sustain voluntary payments even when a customer has no expectation of returning for future service (Azar, 2007). The norm gives customers a standard for appropriate payment and may attach feelings of obligation, guilt, or embarrassment to leaving less. Lynn's (2015) Tipping Motives Framework distinguishes

motives for helping servers, expressing gratitude, securing future service, gaining status, and fulfilling a perceived duty to tip, alongside reasons for avoiding tipping. Applied to selective gratuity, these motives allow different responses to a required payment. A customer who regards the charge as satisfying the tipping obligation may reduce or omit an additional voluntary tip, whereas gratitude or a desire to help the server may sustain an additional payment.

Restaurants must also decide which checks receive automatic gratuity. Party size, bill size, and discounts are observable characteristics that may inform this decision. Diffusion of responsibility suggests that an individual may feel less personally responsible for rewarding the server when that responsibility is shared with more people. Lynn and Latané (1984) apply this reasoning to tipping, but their evidence is mixed: larger parties left lower percentage tips in one study, while the group-size relationship was not significant in the other. Their results make party size a relevant but context-dependent predictor, rather than a universal marker of low tipping. Discounts raise a separate question about whether customers calculate tips using a recorded bill or a price before the discount. These ideas motivate examining the characteristics of charged checks. However, they do not imply that every large party or discounted check will produce a low voluntary tip. Differences between individual customers and service encounters can remain important even when checks share the same observed characteristics.

Bill size has a different relationship with percentage tipping. Lynn and Sturman (2003) explain the magnitude effect, in which percentage tips decline as bills increase, through a mixture of customers who leave flat amounts and customers who tip a percentage of the bill. A flat tip becomes a smaller percentage as the bill rises, so aggregate percentage tips can decline without a corresponding change in every customer's tipping rule. Their simulations show that this pattern can arise without assuming increasing cost aversion. This competing explanation makes bill size relevant to examining charge application and warns against interpreting a negative association with bill size as direct evidence that customers become less willing to compensate servers.

The restaurant studied here applied an 18% gratuity selectively, typically but not exclusively to parties of six or more. The analysis therefore has two parts. The first concerns the restaurant's observed application of the charge: which check characteristics are associated with automatic gratuity? The second concerns payments: after accounting for those characteristics, how does the presence of the charge relate to recorded voluntary tipping and to total server compensation?

Selective application also limits the interpretation of comparisons. Charged and uncharged checks may differ in customer characteristics, service requirements, timing, or other circumstances that the available covariates do not capture. Controlling for bill size, large-party status, and discounts makes the reported comparison more specific, but it does not make charge assignment random. The analysis cannot identify what each charged customer would have tipped in the absence of the charge. In particular, a coefficient for party size or bill size in a pooled regression does not by itself establish the best targeting rule for a restaurant.

Lynn, Modak, and Gurjar (2025) reexamine weekend tipping using three restaurant transaction datasets. They replicate lower tipping on weekends after adjustment for bill size, and controls for restaurant busyness do not eliminate the pattern. Their analyses offer little support for increased spending-related cost consciousness and partial evidence that customer selection contributes to the weekend difference. These findings show why an

observed tipping pattern should be considered alongside competing explanations involving transaction context and customer composition. Their explanatory variable is weekend timing, and their payment outcome is the dollar tip. The present analysis uses a subset of their North Carolina transactions but examines selective automatic gratuity and separates voluntary payments from the combined tip-and-gratuity payment.

Lynn and Latané's (1984) evidence that tipping relationships vary with check characteristics motivates examining whether the restaurant uses those characteristics to apply its charge. Our first question asks which observed check characteristics are associated with automatic gratuity.

The norm and obligation motives described by Lynn (2015) suggest that including a required payment could alter what remains appropriate to give voluntarily, although the records do not measure that reasoning. Our second question asks how automatic gratuity is associated with recorded voluntary-tip incidence and percentage after adjustment for those characteristics.

Because combined compensation includes both the voluntary tip and the charge, a reduction in the voluntary component may be outweighed by the charge. This payment distinction complements the broader restaurant-policy tradeoffs reviewed by Lynn (2017). Our third question asks whether automatic gratuity is associated with the combined recorded tip-and-gratuity percentage after adjustment for the same characteristics.

Research method

Data and setting

We obtained transaction-level point-of-sale (POS) data from a single casual dining restaurant in Steele Creek, NC, from May 14, 2024, to April 30, 2025. The data are a subset of those used by Lynn et al. (2025), but all the analyses reported here are new. The restaurant added an 18% automatic gratuity to some of its customers' bills—typically but not exclusively to parties of 6 or more. The restaurant passed all automatic gratuity to servers.

The unit of observation is a check. For each transaction, the dataset includes check amount, discount amount, tax amount, order number, time of payment, voluntary tip amount, gratuity amount, number of guests, and server ID. Some servers handled many checks during the study period. These records allow us to compare tipping and service payments on individual checks, but do not provide payroll totals or time spent serving each party.

Sample exclusions and missing observations

Observations involving online orders and/or carryout were dropped so that we could examine the impact of automatic gratuities on regular, dine-in customers. Also dropped from analysis as outliers unlikely to represent normal dine-in service were 904 transactions with check amounts less than \$5 (Lynn et al., 2025) and/or 91 transactions with tip percentages over 100% following Lynn (2021, 2022). In addition, 126 cases where the number of guests equaled 0 and one case where it equaled 541 were judged to be coding errors and re-coded as missing values (in those cases, the variable "large party" was also coded as a missing value).

The descriptive statistics contain 14,404 checks: 14,046 without automatic gratuity and 358 with it. Table 1 reports the sample size for each variable. Guest count and large-party status have fewer observations because some guest counts were coded as missing. Monetary outcomes remain available for checks with missing guest information. The separate counts

show which observations contribute to the descriptive comparisons before the regressions require complete information on their included predictors.

The regression models use complete observations for their included variables. This produces 14,278 observations for the primary regressions and 10,568 for the zero-tip deletion regressions. Table 1 reports the variable-specific descriptive counts so that missing guest information is not mistaken for missing monetary data. The difference between the descriptive and regression samples reflects the requirements of the model variables. No imputation of guest counts or tipping outcomes is used in the reported models.

Measures

Automatic gratuity is an indicator equal to one when a positive gratuity amount is recorded and zero otherwise. Discount status indicates a recorded discount. Large-party status equals one for a valid guest count of six or more and zero for a smaller valid count. Bill size is the recorded check amount in dollars. The regressions use the discount indicator rather than the dollar amount of the discount, while the descriptive table reports both. Guest count and the large-party indicator describe the same underlying party information at different levels of detail; the regression specification uses the indicator.

Three payment outcomes are examined. Tipyn indicates whether the check has a positive recorded voluntary tip. Pcttip expresses the recorded voluntary tip as a percentage of the pre-tax check amount and includes zero recorded tips. Totalpct expresses the sum of the recorded voluntary tip and automatic gratuity as a percentage of the same check amount. The denominator is the recorded pre-tax bill, consistent with the restaurant policy information obtained for the original study. All three outcomes retain the definitions used for the reported tables.

$$Tipyn_i = 1[V_i > 0]$$

$$Pcttip_i = 100 \times V_i / B_i$$

$$Totalpct_i = 100 \times (V_i + G_i) / B_i$$

In these expressions, V is the recorded voluntary-tip amount, G is the recorded gratuity amount, and B is the recorded check amount. The use of a common denominator permits a direct comparison between voluntary and combined payments. Pcttip is not the mean tip percentage only among positive tippers: a zero recorded voluntary tip contributes a zero to this outcome. Totalpct can remain positive on such a check because a gratuity is present.

Total server compensation refers here to the voluntary tip plus automatic gratuity recorded for a check. It excludes base wages and cash tips not entered into the POS system. Because the data do not measure service time, this outcome cannot be used to compare servers' hourly earnings. A percentage of the bill also differs from a dollar payment: a lower percentage on a large check may still represent more money than a higher percentage on a small check.

Models and interpretation

The first ordinary least squares model describes application of automatic gratuity as a function of bill size, discount status, and large-party status, using the linear-model approach described by Wooldridge (2010). The remaining primary models add automatic-gratuity status to those predictors and use each payment outcome in turn. The specification deliberately separates the charge-application question from the payment question. A characteristic associated with application of the charge is not automatically evidence that the same characteristic identifies a customer who would otherwise tip poorly.

$$A_i = \alpha_0 + \alpha_1 B_i + \alpha_2 D_i + \alpha_3 L_i + u_i$$

$$Y_i = \beta_0 + \beta_1 B_i + \beta_2 D_i + \beta_3 L_i + \beta_4 A_i + \varepsilon_i$$

Here, A denotes automatic-gratuity status, D discount status, and L large-party status. Y denotes one of the three payment outcomes. The coefficient on A in the payment models is the adjusted difference associated with automatic gratuity under the stated linear specification. For Tipyn, a coefficient of -0.27 corresponds to a 27-percentage-point difference in the probability of a recorded tip. For Pcttip and Totalpct, the coefficients are percentage points of the recorded check amount.

We used linear probability models for the binary outcomes, so their coefficients express differences in probability (Wooldridge, 2010). These models are easy to interpret, although fitted probabilities can fall outside the range from zero to one. The percentage-outcome models use linear adjustment for bill size and indicators for the other included characteristics. The tables report the OLS coefficients and standard errors.

Zero-tip deletion sensitivity analysis

We report the raw-data models first and then the cleaned-data models as a sensitivity analysis. The cleaning procedure addresses checks with no recorded voluntary tip. A zero in the POS record may indicate that a customer did not tip, or that a cash tip was left but not entered. The original cleaning procedure was applied separately to checks with and without automatic gratuity.

Cleaned versions of these variables were also created—called Tipyncln, Pcttipcln, and Totalpctcln, respectively. In the no-auto-gratuity condition, all 3675 observations with zero-tips (which is 26.16% of all the observations in this condition) had Tipyn, Pcttip, and Totalpct recoded as missing values. In the auto-gratuity condition, 94 randomly selected observations with zero-tips (which is 26.26% of all the observations in this condition) had Tipyn, Pcttip, and Totalpct recoded as missing values. Analyses of these cleaned variables effectively removed approximately 26% of observations in each condition that had a zero-tip due either to cash tipping or other factors independent of the auto-gratuity.

The cleaned descriptive samples contain 10,371 checks without automatic gratuity and 264 with it. The cleaned regressions use 10,568 complete observations. All retained checks in the no-gratuity condition have a positive recorded voluntary tip, while the gratuity condition still includes some checks with no additional recorded tip. The cleaned percentage outcomes therefore are not restricted to positive tippers in both conditions. The same predictors are used in the raw and cleaned regressions.

The comparison of raw and cleaned results shows whether the reported payment pattern appears in both samples. The raw models use the observed tips, including zeros; the cleaned models apply the procedure described above. We present both sets of results so readers can see their magnitudes separately. The assumption about cash tipping and its implications for the cleaning procedure are discussed with the study limitations.

Organization of the empirical comparison

Figure 1 summarizes the variables used in the analysis. Bill size, discount status, and large-party status are used to describe charge application and to adjust the payment comparisons. The outcomes distinguish recorded voluntary-tip incidence, voluntary-tip percentage, and combined recorded tip-and-gratuity percentage. The connections in the figure organize the regression variables; they do not represent an identified causal pathway.

Figure 1. Organization of the observational analysis

Recorded check characteristics	Regression comparisons	Recorded payment outcomes
Bill size	Charge-application model	Positive voluntary tip
Large-party status	↓	Voluntary-tip percentage
Discount status	Payment models including charge status	Tip-plus-gratuuity percentage

Source: Authors. Connections organize the variables; they do not identify causal effects. Payment-model adjustment uses all three recorded check characteristics.

The analysis proceeds from descriptions to adjusted comparisons. Group means show the observed checks as recorded, including differences in bill size and party composition. The application model shows how the included characteristics relate to the charge when entered together. Payment models then show the charge association conditional on those characteristics. Finally, the deletion models provide a separate comparison under the stated zero-tip assumption.

Results and Discussion

Descriptive statistics

Table 1 presents the original descriptive statistics by automatic-gratuuity condition. Checks with automatic gratuuity had larger mean bills, \$137.73 compared with \$40.73, and larger mean party sizes, 6.86 compared with 1.95 guests. Large parties made up 83% of the charged checks with valid guest information and approximately 1% of the uncharged checks. Discounted checks were also more common in the charged group. These differences describe the selective application of the restaurant's policy and show why an unadjusted comparison is not a comparison of otherwise equivalent checks.

A voluntary tip was recorded on 58% of checks with automatic gratuuity and 74% of checks without it. Mean recorded voluntary-tip percentages were 6.84% and 16.79%, respectively. In contrast, mean combined recorded tips and gratuities were 24.89% with the charge and 16.79% without it. Thus, the charged group had a smaller voluntary component and a larger combined recorded percentage.

The sensitivity rows in Table 1 describe the selected samples after zero-tip deletion. Mean voluntary-tip percentages were 9.28% with gratuuity and 22.74% without gratuuity; combined recorded percentages were 27.22% and 22.74%. These quantities summarize a different set of retained payment observations from the primary descriptive rows. In particular, deleting all zero-tip observations from the comparison condition raises its mean mechanically. The sensitivity means should therefore be interpreted in conjunction with the selection procedure.

Table 1. Descriptive statistics by automatic-gratuity condition

Measure	No gratuity Mean (SD)	N	Gratuity Mean (SD)	N
Bill amount (\$)	40.73 ^a (25.32 ^a)	14046	137.73 ^b (72.83 ^b)	358
Guest count	1.95 ^a (1.10 ^a)	13921	6.86 ^b (3.82 ^b)	357
Large party (0/1)	0.01 ^a (0.09 ^a)	13921	0.83 ^b (0.38 ^b)	357
Discount amount (\$)	0.57 ^a (2.75 ^a)	14046	1.61 ^b (5.19 ^b)	358
Discount (0/1)	0.07 ^a (0.26 ^a)	14046	0.13 ^b (0.33 ^b)	358
Recorded tip (0/1)	0.74 ^a (0.44 ^a)	14046	0.58 ^b (0.49 ^b)	358
Voluntary tip (%)	16.79 ^a (13.96 ^a)	14046	6.84 ^b (8.46 ^b)	358
Voluntary tip (%), sensitivity	22.74 ^a (11.34)	10371	9.28 ^b (8.63)	264
Combined payment (%)	16.79 ^a (13.96 ^a)	14046	24.89 ^b (8.50 ^b)	358
Combined payment (%), sensitivity	22.74 ^a (11.34)	10371	27.22 ^b (8.77)	264

Source: Authors' analysis. SD = standard deviation. Means and standard deviations with different superscripts are significantly different from one another (all at the 0.002 level or lower). Monetary percentages use pre-tax bill amounts. Large party means six or more guests. The sensitivity rows use the zero-tip deletion sample; all other rows use the primary descriptive sample. The different guest-count Ns reflect missing group information.

Application of automatic gratuity

The first model in Table 2 describes whether an automatic gratuity was added. Bill size and large-party status were positively associated with application of the charge. The large-party coefficient was 0.65, consistent with the restaurant's practice of typically applying the policy to parties of six or more. Discount status was not statistically significant after adjustment for bill size and large-party status, despite its higher unadjusted prevalence among charged checks.

Recorded tipping and combined compensation

The remaining models in Table 2 examine voluntary tipping and total server compensation after controlling for bill size, large-party status, and discount status. Automatic gratuity was associated with a 27-percentage-point lower probability of a recorded voluntary tip and a 5.33-percentage-point lower recorded voluntary-tip percentage. The results for total server compensation are reported alongside these voluntary-tip outcomes.

The final models in Tables 2 and 3 examine total server compensation, defined as the voluntary tip plus the automatic gratuity, expressed as a percentage of the bill. Automatic gratuity was associated with total server compensation that was approximately 13.9 percentage points of the bill higher with the cleaned data and nearly 12.7 percentage points higher with the raw data. Thus, the automatic gratuity more than offset the reduction in voluntary tipping.

Bill size was negatively associated with recorded tip percentages. Large-party status, however, was positively associated with recorded tip percentages after adjustment for the other variables. Discount status was associated with a lower probability of a recorded voluntary tip but was not statistically significant in the primary percentage-outcome models. These patterns show that the observed characteristics associated with charge application were not uniformly associated with lower recorded tip percentages in the pooled models.

Table 2. Primary OLS models: application, voluntary tips, and combined recorded payments

Predictor	Automatic gratuity ^a	Recorded tip indicator ^a	Voluntary-tip percentage	Combined percentage
Intercept	-0.02*** (0.001)	0.70*** (0.007)	19.69*** (0.21)	19.70*** (0.21)
Bill Size	0.001*** (0.000)	0.001*** (0.000)	-0.07*** (0.004)	-0.07*** (0.004)
Discount	0.01 (0.01)	-0.12*** (0.01)	-0.18 (0.45)	-0.16 (0.45)
Large party	0.65*** (0.01)	0.02 (0.04)	2.75* (1.09)	2.82* (1.09)
Auto-Gratuity		-0.27*** (0.04)	-5.33*** (1.16)	12.69*** (1.16)
Total df	14,277	14,277	14,277	14,277
R ²	0.60***	0.01***	0.03***	0.03***

Source: Authors' analysis. Standard errors in parentheses. * $p < .05$; ** $p < .01$; *** $p < .001$. Total df is $N - 1$. Binary-outcome coefficients are on the probability scale; percentage outcomes are in percentage points of the pre-tax bill. The combined outcome is voluntary tip plus automatic gratuity. ^a Binomial logistic regression produced similar results.

Sensitivity results

Table 3 presents the original zero-tip deletion regressions separately. Automatic gratuity was associated with a 21-percentage-point lower probability of a recorded voluntary tip, a 3.99-percentage-point lower recorded voluntary-tip percentage, and a 13.87-percentage-point higher combined recorded tip-and-gratuity percentage. The signs agree with the primary models. The different magnitudes apply to the selected sensitivity sample and do not replace the primary estimates. The 100% recorded-tip rate in the retained no-gratuity group results from deleting all its zero-tip checks and does not describe tipping in the full sample.

The cleaned models show the same general pattern as the raw models: less voluntary tipping, but greater total server compensation. Reporting them in a separate table makes the comparison explicit. The primary models retain all recorded zero tips; the cleaned models use the reduced samples described in Methods. The main conclusion is unchanged across the two reported analyses.

Table 3. OLS results for the zero-tip deletion sensitivity sample

Predictor	Recorded tip indicator ^b	Voluntary-tip percentage	Combined percentage
Intercept	1.00*** (0.001)	27.68*** (0.19)	27.69*** (0.19)
Bill Size	0.00007** (0.000)	-0.13*** (0.004)	-0.13*** (0.004)
Discount	-0.001 (0.003)	3.89*** (0.44)	3.87*** (0.44)
Large party	-0.004 (0.006)	3.56*** (0.96)	3.67*** (0.96)
Auto-Gratuity	-0.21*** (0.01)	-3.99*** (1.04)	13.87*** (1.04)
Total df	10,567	10,567	10,567
R ²	0.21***	0.13***	0.10***

Source: Authors' analysis. Standard errors in parentheses. * $p < .05$; ** $p < .01$; *** $p < .001$. Total df is $N - 1$. The cleaned sample retains some zero-tip checks in the gratuity group, so these models are not limited to positive tippers. ^b Binomial logistic regression produced no significant effects.

Discussion

Interpretation of the payment components

Both payment measures are useful to restaurant managers. Voluntary tips show what customers choose to add, while total server compensation also includes the automatic gratuity. In this restaurant, the charge more than offset the reduction in voluntary tipping. Because the restaurant passed the charge to servers, the combined payment is the relevant measure when assessing how much they received from these recorded transactions.

The probability and percentage outcomes also answer different questions. The probability model concerns whether the POS record contains a positive voluntary tip. The percentage model concerns the recorded voluntary tip relative to the bill and includes zero recorded tips. Its coefficient therefore combines differences in the occurrence and size of recorded tips. Furthermore, a zero POS tip does not necessarily mean that the customer left no tip, because cash tips were not identified in these records.

The lower recorded voluntary-tip incidence and percentage are consistent with customers treating the required charge as part of their payment to the server. In Lynn's (2015) framework, a sense of obligation could help explain why less remains to be paid voluntarily once a charge is included. This is an interpretation of the association, rather than a measured change in motivation: the POS records contain neither motives nor randomly assigned charges. The positive combined-payment coefficient shows that the smaller voluntary component coexisted with higher recorded tips plus gratuities.

Implications for restaurant managers

Managers can begin by comparing voluntary tips and total service payments across checks with and without automatic gratuity. Bill size, party size, and discount status should be considered alongside those payments because they help explain which checks receive the charge. A restaurant can then examine whether its application criteria match the tipping patterns in its own records.

For restaurant managers, deciding if automatic gratuity increases server compensation is only part of the issue, as they must decide which checks should receive the charge. In this analysis, larger bills and parties of six or more were more likely to receive the charge, whereas discount status was not a significant predictor after bill size and large-party status were controlled. However, the characteristics used to select checks did not necessarily identify customers who would otherwise leave lower percentage tips; for instance, large parties tipped a higher percentage after controlling for the other variables. Managers should therefore examine their own transaction data before assuming that large parties or customers receiving discounts are likely to tip poorly. Of the three criteria examined here, bill size was the only one associated with lower tip percentages.

Interpreting a lower tip percentage on larger bills also requires care. A smaller percentage need not imply a smaller dollar tip. Lynn (2015) identifies bill size as an important predictor of dollar tip amounts, an outcome distinct from the percentages examined here. The service effort and time associated with a check may also differ across bill sizes, but they are not measured in this study. Managers should therefore avoid interpreting percentage differences alone as a ranking of customers' generosity or of the profitability of serving different tables.

The positive large-party association in the present percentage models is consistent with treating party size as context dependent. Lynn and Latané (1984) found lower percentage tips from larger groups in one setting but no significant group-size relationship in another. The present models additionally account for selective gratuity and use a threshold indicator rather

than a continuous group-size measure. Therefore, they do not directly test for diffusion of responsibility.

Managers should also determine the appropriate rate of automatic gratuity and consider how customers will respond to the charge. The 18% rate used by this restaurant was associated with higher total server compensation, but the study cannot establish whether 18% is the best rate or whether lower rates would also offset reductions in voluntary tipping. Additionally, as described in Lynn and Brewster (2018), automatic gratuities may reduce customer satisfaction. Because the present data did not measure satisfaction or repeat patronage, future studies should examine these outcomes together with server compensation. This would help managers determine whether the additional compensation of an automatic gratuity policy is sufficient to outweigh the costs to the restaurant.

Lynn and Brewster (2018) examined restaurant-wide changes from tipping to other payment systems, including service charges. The selective gratuities studied here differ because they apply to particular checks and allow additional voluntary tips. Their finding of lower online customer ratings after replacing tipping reinforces the need to evaluate compensation and customer response separately.

Conclusion

Larger bills and parties of six or more were associated with application of automatic gratuity, while discount status was not statistically significant after adjustment. Automatic gratuity was associated with less recorded voluntary tipping but greater total server compensation at the restaurant studied. In the primary model, combined recorded tips and gratuities were 12.69 percentage points of the bill higher on checks with the charge after adjustment for bill size, large-party status, and discounts. The original sensitivity results showed the same direction of association under their additional zero-tip assumption. Because all automatic gratuity was passed to servers, the combined payment is relevant to the recorded total compensation received by servers.

Before these managerial implications can be generalized, the findings need to be examined in other settings and with stronger research designs. The data came from one casual-dining restaurant in Steele Creek, North Carolina, so the findings may not apply to other restaurant types, price levels, or geographic areas. Replications across multiple restaurants would establish whether the same relationships occur elsewhere. Automatic gratuity was also not randomly assigned. Although the models controlled for the observed variables associated with its application, unmeasured differences between checks may account for part of the reported relationships. Analyses conducted before and after changes in automatic-gratuity policies would provide stronger evidence about the policy's causal effects.

Also, the POS data did not identify cash tips. Cleaning the data therefore required the assumption that customers' tendency to tip in cash was unrelated to whether automatic gratuity was applied. The raw data models showed the same general pattern as the cleaned models, reducing concern that the cleaning procedure created the findings, but they cannot verify this assumption. Future studies should record both cash and credit-card tips whenever possible.

Finally, the POS data contained no measures of customer satisfaction, so we could not assess how the charge was associated with customers' experiences. Future studies should incorporate customer satisfaction surveys alongside the tipping data.

For managers, the findings support examining voluntary and combined payments together and separating charge-application patterns from evidence about optimal policy. The study's single-restaurant setting, selective application of the charge, and incomplete cash-tip measurement limit generalization and causal interpretation. Future research should compare payment policies across settings while measuring customer response, service time, and employee earnings.

Author Contributions

Conceptualization : Toby Qin, Vrund Gurjar

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Declarations

Data availability

The anonymized raw transaction-level point-of-sale data used in this study are publicly available through openICPSR at <https://doi.org/10.3886/E251384V2>.

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No funding was obtained for this research. The authors declare no conflict of interest.

Ethics statement

Ethics approval was not required for this study because it used secondary point-of-sale transaction data and involved no direct interaction with human participants.

Declaration of generative AI use

The authors used generative AI to assist with language editing and document formatting. The authors take responsibility for the manuscript's content.

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