The Effects of Tip Percentages on Server Job Tenure and Vice Versa: Evidence from a Panel Dataset

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forthcoming in *Compensation and Benefits Review* (2023).

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Abstract

Increasing compensation reduces turnover in other industries, but it is unclear if increasing tip percentages will reduce turnover among tipped service workers. This question was examined using a panel data set on the charge tips of restaurant servers over time from POS systems. The results indicate that tip percentages were generally consistent across servers' running workday counts (in other words, across growing levels of server experience), but were slightly higher overall for those servers who ultimately stayed in the job for more workdays. These findings provide more compelling evidence of a potential tip percentage effect on server tenure than is provided by existing cross-sectional correlational data sets. However, the effect of servers' average tip percentages on their tenure was relatively small -- accounting for only 5 percent of the variance in server tenure, as compared to 14 percent accounted for by servers' average dollar tips per day and 33 percent accounted for by servers' average number of daily checks. Compensation is important, but when it comes to restaurant waitstaff turnover, other things may matter more.

Do Tip Percentages Affect Server Job Tenure or Vice Versa: Evidence from a Panel Dataset

1. Introduction

Hospitality and tourism workers often depend on voluntary gifts of money (called "tips") from their customers as a major portion of their work compensation. Since job tenure has been linked to compensation in other industries (see Sarkar, 2018), Lynn (1996, 2006) has argued that hospitality managers should be able to reduce turnover at their establishments by training their employees to engage in behaviors known to increase the tip percentages customers leave. However, tips differ from other forms of work compensation in ways that may undermine the former's effects on employee turnover. In particular, while wages and salaries come from employers, tips come from customers. Furthermore, unlike most wages or salaries, tips are voluntary payments that are supposed to vary with the employee's performance. In fact, tipped workers believe that they can affect the tip amounts their customers give (Lynn, 2017a). These considerations suggest that workers may feel less tied to high tip jobs than to high wage/salary jobs, because they believe that they can take their high tip earning potential to other establishments. Thus, previous research in other industries provides little confidence about the effects of tip income on employee job tenure. Ultimately, this is an empirical question to be addressed by tipping specific research.

Unfortunately, existing research on the effects of tipping on job tenure is less than dispositive. Some studies have found that servers' claimed tip averages are positively associated with their tenure in the profession (Brewster, 2015; Lynn, Kwortnik, and Sturman, 2011) and are negatively associated with servers' thoughts about quitting their current job (Lynn, 2003). However, other studies have found that higher restaurant-wide charge-tip percentages are

reliably associated with lower turnover among units of a restaurant chain only among restaurants with low sales (Lynn, 2002, 2003) and still other studies have found no reliable relationships of tip percentages with either intended (Lynn, 2017b) or actual (Kim, Nemeschansky and Brandt, 2017) tenure in the workers' current tipped jobs.

Adding to the uncertainty provided by this mixed evidence are a number of problems with the studies. First, the self-report measures of typical tips used in some studies are likely to be inaccurate or at least imprecise. Second, the effects of tips on tenure within the profession that was examined in some studies may not generalize to the effects of tips on tenure in a specific job, because servers may make internal rather than external attributions for their tip incomes as explained earlier. Third, cross-sectional correlations between tips and tenure (or turnover) could easily be attributed to higher server tenure (or lower server turnover) causing better tips, rather than bigger tips increasing tenure (or reducing turnover). Such reverse causality is plausible because: (i) servers may learn over time how to elicit larger tips -- through better service or in in other ways, (ii) managers may give better (higher tip-potential) shifts and/or dining parties to servers with greater experience/tenure, and/or (iii) servers may become more familiar over time to regular customers, who may tip familiar servers more than unfamiliar ones. Indeed, these reverse causal processes are interesting in their own right, because they would suggest that managers can truthfully advise new servers who are dissatisfied with their current tip percentages to be patient and that their tips will grow over time.

Many of the issues plaguing existing research on tip income effects on server tenure/turnover could be addressed with panel data on the charge tips of servers over time from POS systems. In particular, the direction of causality in the relationship between tips and tenure can be assessed with panel data by comparing the effects of running counts of days worked with

the effects of total days worked. Effects do not precede causes, so if tenure or experience increases tips, then tips should be more strongly related to the experience of the server on the day the tips were given (aka, to running count of days worked) than to the future level of experience the server will eventually attain (aka, to total days worked). However, if tips increase retention, then the reverse should be true. Accordingly, the current study analyzes such panel data in the hopes of providing stronger evidence about the effects of tip percentages on servers' job tenure.

2. Method

Upserve provided data on 296,477 checks written between January 1, 2017 and January 2, 2018 at seven causal-dining restaurants in California. The data about each check provided by Upscale included:

- Random store id,
- Random employee id
- Check open date and time,
- Check close date and time,
- Number of diners on the check,
- Net bill size (without taxes; 6,288 observations with net bill sizes <$5 and >$500 and/or with more than 10 diners and were recoded as missing values to avoid problems with outliers caused by: (i) large parties with multiple servers but one check with only one server's id, (ii) credit card limits necessitating multiple checks where the bill size and tip charges were divided in unknown ways, (iii) customers requesting separate checks where the bill size and tip charges were split in unknown ways, and (iv) other unusual circumstances),

- Total charge tip amount left on the ticket (78,161 values of zero could reflect cash, or other non-credit card, payment of the bill and/or tip, so they were recoded as missing values).

These data were used to calculate the following variables:

- Percent tip (tip amount as a percentage of the net bill size)
- Trimmed percent tip (percent tip after dropping 4,484 extreme values coming from approximately 1 percent of each tail of the distribution - those < 7% and those > 50%),
- Normal percent tip (normal score of percent tip using Blom's formula),
- Cleaned dollar tip (total net tip if percent tip $\geq$ 7% and $\leq$ 50%),
- Server first workday (the day of the study period the server first works – 1 = first, 2 = second, etc…; this variable was used to control for the fact that servers hired later in the year had less opportunity than others to accumulate total workdays during the study period)
- Server day count (aka, server job experience: whether the check was written on the server's 1^{st}, 2^{nd}, 3^{rd}, etc… workday),
- Total server workdays (aka server tenure: total number of days the server who wrote the check worked during the study period),
- Server total dollar tips (sum of server's cleaned dollar tips for the study period),
- Server average dollar tips per day (each server's total dollar tips divided by total workdays),

- Server sales for the day (sum of server's net bill sizes for the day the check was written on),
- Total server sales (sum of server's net bill sizes for the study period),
- Server average sales per day (each server's total sales divided by total workdays),
- Server number of checks for the day (number of checks written by the server during the day the check was written),
- Total server number of checks (number of checks written by the server during the study period),
- Server average number of checks per day (each server's total number of checks divided by total workdays),
- Server average trimmed percent tip (the mean by server of trimmed percent tip).

All variables involving sales or the number of checks were based on the cleaned net bill size measure or on the number of those cleaned bill sizes. The final data set included 216,700 transactions with non-zero tip information and involving a total of 285 servers. However, missing values for some variables created during data cleaning to eliminate outlying cases mean that the sample sizes vary across the analyses reported below.

3. Results and Discussion

Descriptive statistics for the variables in the dataset are presented in Table 1. Note that percent tip had obviously problematic outliers, so analyses involving percent tip will focus on trim percent tip and normal percent tip, which dealt with the outliers in different ways. Trim percent tip deleted the outliers, while normal percent tip retained the outliers, but brought them in toward the mean while preserving their ordinal position (see Figure 1). Despite their different

treatment of outliers, these two measures produced similar results in multi-variate analyses reported later, which supports the robustness of the findings.

Correlations among the server-level variables are reported in Table 2. Server tenure (aka total server workdays) was reliably, positively correlated with the servers' average trimmed percent tip. This finding is consistent with larger tip percentages increasing server tenure. However, this analysis weights all servers' equally even though the amount of data varies considerably across servers. There is less tipping data for servers with shorter tenures, which means that chance produces more extreme values of mean trim percent tip at lower levels of tenure (see Figure 2) and weighting these extreme (and therefore consequential) observations the same as more reliable ones from servers with more tenure may inappropriately capitalize on chance. Furthermore, the apparent effects of tip percentages could be due to reverse causality and reflect the effects of server job experience on tip percentages rather than the effects of tips on tenure. These possibilities are examined next.

The problem of heterogeneity in error terms across servers was addressed by regressing total server workdays on check-level tip percentages (trim percept tip or normal percent tip), server's first work date, and restaurant dummies while using robust error terms clustered within server (see Table 3). In these analyses, server tenure increased reliably as percent tip increased after controlling for restaurant and server first workday. Furthermore, the tip effect remained sizably positive (and reliable for normal percent tip) after also controlling for servers' daily sales and daily number of checks. These results provide further support for a positive effect of tip percentages on server job tenure, but do not address the potential problem of reverse causality.

The possibility that tip percentages increase with server experience and that this explains the apparent effect of tip percentages on server tenure was assessed by regressing check-level

percent tip on server workday count (aka server experience), server total workday count (aka server tenure), server first workday, and restaurant dummies (see Table 4). There is a marginally reliable positive effect of servers' running workday count when total server workdays (or tenure) is left out of the model, but this effect becomes smaller and non-reliable when total server workdays are added to the model. A graph of mean trim percent tip by servers' running workday count also suggests at best a weak relationship between these variables (see Figure 3). In addition, the effect of server total workdays (or tenure) is reliably positive in models that contain servers' running workday count. These results suggest that the relationship of tip percentages with server tenure is not attributable to a reverse causal effect of server experience on tipping.

4. Conclusions and Directions for Future Research

The results of this study indicate that tip percentages were generally consistent across servers' workday counts (aka, server experience), but were slightly higher overall for those servers who ultimately stayed in the job for more workdays. The panel data are only correlational and cannot be used to make definitive causal inferences, but these findings provide more compelling evidence of a potential tip percentage effect on server tenure than is provided by existing cross-sectional correlational data sets. To that extent, they support Lynn's (1996, 2006) claim that managers in the hospitality and tourism industries can reduce turnover at their establishments by training their employees to engage in behaviors known to increase tip percentages (also see Fernandez, et al, 2020). However, the effect of servers' average tip percentages on their tenure was relatively small -- accounting for only 5 percent of the variance in server tenure, as compared to 14 percent accounted for by servers' average dollar tips per day and 33 percent accounted for by servers' average number of daily checks (see Table 2). Tip percentages do matter, but, in this context at least, tip dollars matter more, and check counts

matter the most. Thus, it does not appear that managerial attempts to increase servers tip percentages should be the highest priority when seeking to reduce turnover.

Despite the small size of tipping effects on retention in this study, more research on the topic needs to be conducted because it is possible that those effects are stronger in other contexts. The restaurants studied here were all in California, which has a relatively high minimum wage and does not allow employers to credit tips toward the minimum wage (Alli, 2016). Thus, the servers in this study had a much higher base wage than is typical throughout much of the country ($10 vs $2.13 per hour; see Alli, 2016) and this may have reduced the effects of tip percentages on retention. In addition, California law permits tip pooling or sharing of tips among workers (Krook, 2019). It is not known if the restaurants in this study pooled tips or not, but if they did, that too would have likely reduced the effects of individual differences in tip percentages on retention. These and other moderators of tip percentage effects on retention deserve further research.

The results of this study point to other directions for research as well. As mentioned previously, the effect of check counts on job tenure was nearly 6 times as large as that of tip percentages. Dollar tip income increases with the number of customers served, so the effect of number of daily checks may be partly attributable to its effects on server's dollar tip income. However, the fact that this effect was the strongest of those examined (see Table 2) and that it remained reliable after controlling for servers' average tip percentages and average daily sales (see Table 3) suggests that some other process must also underlie it. Perhaps check counts are a better predictor of server tenure than are average daily sales or tip percentages, because staying busy makes working more enjoyable. Alternatively, check counts may be a source of tip income that servers attribute more to their employer and less to their own skill than is true for sales and

tip percentages. Servers may be more reluctant to switch jobs the more of their income they attribute to a particular employer. These possibilities also deserve investigation in future research.

In summary, the results of this study support the idea that receiving higher tip percentages increases employee retention. The effect was small, but it may be larger in other contexts, so more research needs to examine this effect in the future. Pending additional research, the current findings suggest that training staff to wait on more customers and scheduling them in a way that maximizes their customer counts would more effectively reduce waitstaff turnover than would training servers in tactics than increase tip percentages. Compensation is important, but when it comes to restaurant waitstaff turnover, other things may matter more.

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Table 1. Descriptive statistics for the variables in the dataset.

	N	Minimum	Maximum	Mean	Std. Deviation
Net Bill Size (cleaned)	290189	5.00	500.00	56.97	47.85
Total Charge Tip (zeros omitted)	218316	.01	3501.00	13.35	21.38
Percent Tip[a] (uncleaned)	216700	0	923.08	20.61	10.50
Trimmed Percent Tip	212216	7.00	50.00	20.13	5.25
Normal Percent Tip	216700	-4.53	4.53	-.000001	1.00
Server Day Count (SDC)	296477	1.00	361.00	97.03	72.93
Server Sales for the Day[a]	295917	5.00	4812.40	1130.68	662.89
Server Number of Checks for the Day[a]	296477	0	106	21.53	13.62
Server First Workday	285	1	367	105.11	123.30
Total Server Workdays (TSWD)	285	1.00	361.00	80.46	88.80
Server Total Dollar Tips	253	2.00	86368.85	10570.71	14894.52
Server Total Dollar Tips/Day	253	.23	363.72	86.70	82.59
Server Total Sales[a]	284	5.00	533851.13	58210.35	85068.97
Server Average Sales/Day[a]	284	2.50	1916.86	481.06	449.76
Server Total Number of Checks[a]	285	0	13476	1018.21	1588.23
Server Average Number of Checks/Day[a]	285	0	39.29	8.17	7.07
Server Average Trimmed Percent Tip	253	8.16	31.09	19.09	2.95

Note: Server-level variables are described using servers as the unit of analysis. All other variables are described using checks as the unit of analysis – even if the variable is an average for the server/day.

[a] Based on amount or number of cleaned net bill sizes.

Table 2. Correlations among selected server-level variables.

	Total Server Workdays	Server's Average Sales/Day	Server's Average Number of Checks/Day	Server's Average Trimmed Percent Tip	Server's Average Dollar Tips/Day
Server's First Workday	-.566**	-.347**	-.349**	-.099	-.277**
Total Server Workdays		.487**	.577**	.227**	.373**
Server's Average Sales/Day	.392**		.863**	.314**	.986**
Server's Average Number of Checks/Day	.494**	.868**		.342**	.790**
Server's Average Trimmed Percent Tip	.186**	.249**	.292**		.347**
Server's Average Dollar Tips/Day	.348**	.986**	.823**	.299**	

*p < .05, ** p < .01

Note: Zero-order correlations are above diagonal; partial correlations after controlling for restaurant and server first day are below the diagonal. Similar partial correlations were obtained when all values exceeding 2.5 standard deviations from the mean were dropped for the sales, number of checks, percent tip, and dollar tip variables.

Table 3. Coefficients (and robust standard errors clustered within server) from regressions of total server workdays on check-level tipping as well as server's daily sales and daily number of checks.

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	Model 1	Model 2	Model 3	Model 4
	Total Server Workdays	Total Server Workdays	Total Server Workdays	Total Server Workdays
Trim Percent Tip (TPT)	.47* (.21)	.31 (.21)		
Normal Percent Tip (NPT)			2.41** (.76)	1.51* (.74)
Server's Sales that Day		-.02ŧ (.01)		-.02ŧ (.01)
Server's Number of Checks that Day		2.63** (.79)		2.64** (.78)
Servers' First Work Day	included	included	included	included
Restaurant Dummies	included	included	included	included
Constant	included	included	included	included
N observations/servers	212,216/253	212,216/253	216,700/254	216,700/254
R^2	.346	.430	.346	.431

ŧ p < .10, * p < .05, **p < .01, ***p < .001

Table 4. Coefficients (and robust standard errors clustered within server) from regressions of tipping measures on servers' running workday counts and total server workdays.

	Model 5	Model 6	Model 7	Model 8
	Trimmed Percent Tip	Trimmed Percent Tip	Normalized Percent Tip	Normalized Percent Tip
Server Day Count (SDC)	.002ŧ (.001)	.0002 (.0007)	.0003ŧ (.0002)	.0001 (.0002)
Total Server Workdays (TSWD)		.003* (.001)		.001** (.0002)
Servers' First Work Day	included	included	included	included
Restaurant Dummies	included	included	included	included
Constant	included	included	included	included
N observations/servers	212,216/253	212,216/253	216,700/254	216,700/254
R^2	.022	.023	.030	.031

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

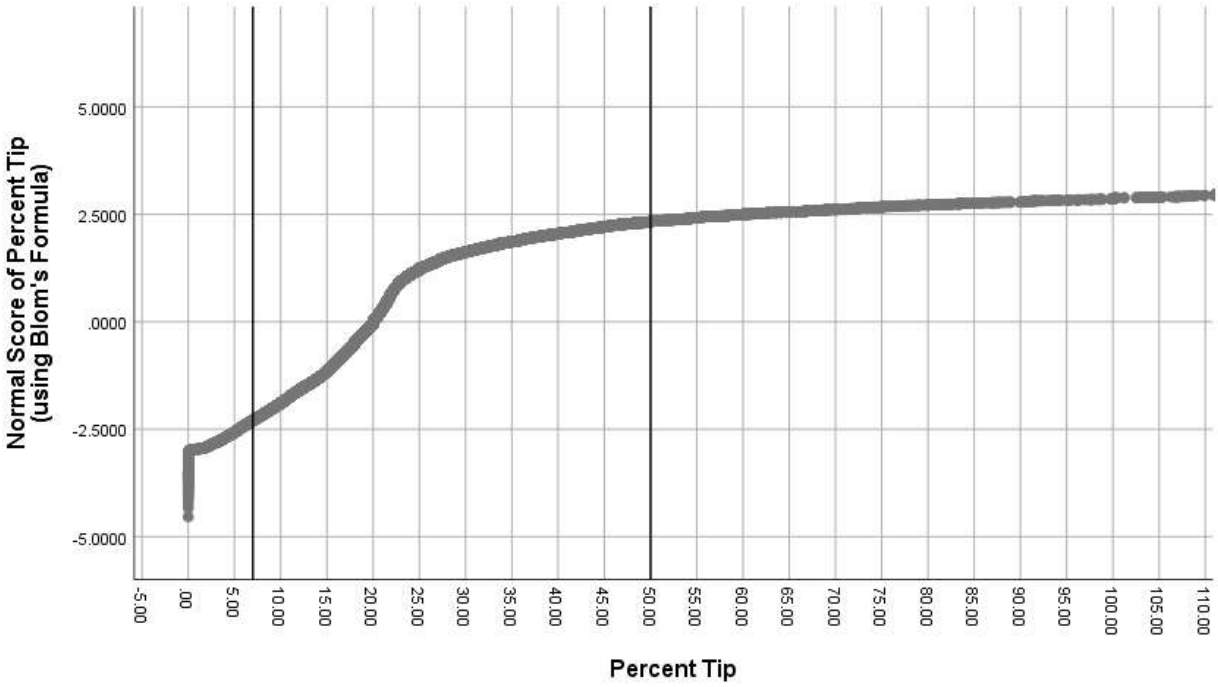

Figure 1. Outliers in percent tip were addressed by (i) trimming values outside the reference lines at 7% and 50% - with the resulting measure called "trimmed percent tip", and (ii) transforming all the data as shown to bring outliers in toward the center while preserving their ordinal positions - with the resulting measure called "normal percent tip". Note that the graph's x-axis was truncated at $105 to enhance readability, but the relationship between normal percent tip and percent tip continued along the shown trajectory.

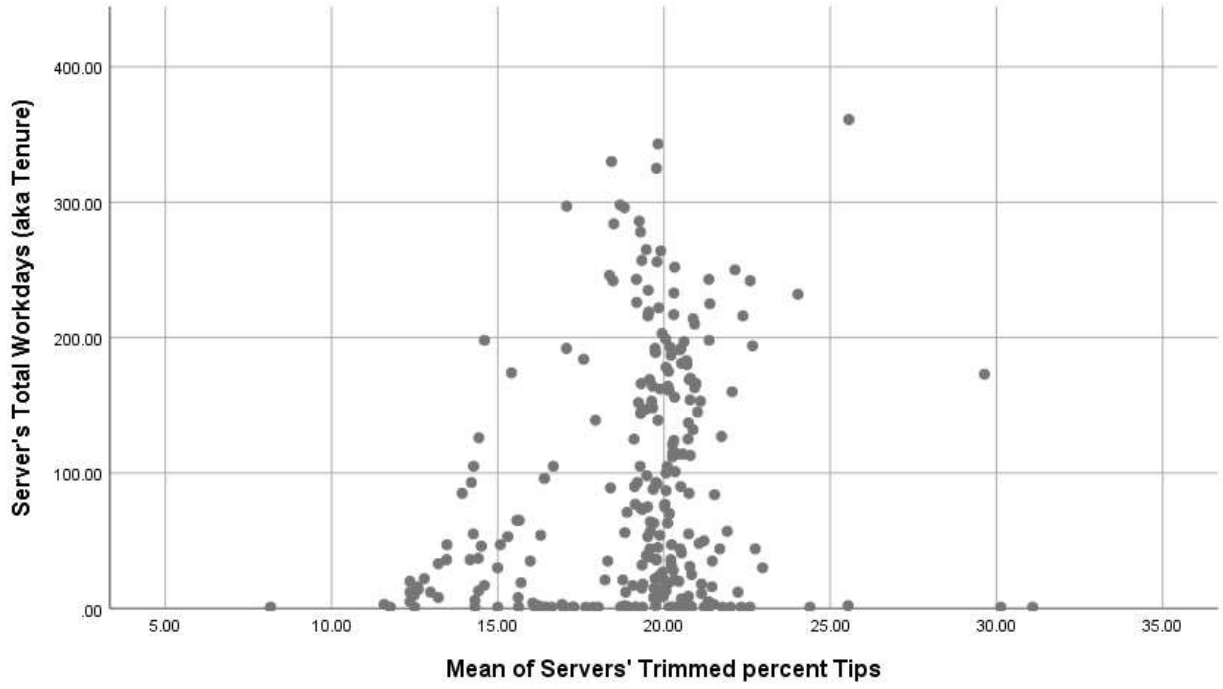

Figure 2. Servers working less than 200 days are more likely to have low than high average tip percentages while those working more than 200 days are more likely to have high than low average tip percentages. Note that the means of trim percent tip becomes less extreme as the number of server workdays and, hence, number of tips included in the mean increase.

Figure 3. Mean trim percent tip varies little with servers' running workday count.