When You Charge Less than a Jackson Greens Best Be Your Nudging Action: Framing Choice Alternatives in the New Age of Voluntary Payments Economy

Abstract

Modern and gig economy businesses collect voluntary contributions (i.e., tips) from consumers via screen-based payment systems (i.e., $1, $2, $3; 10%, 15%, 20%). The use of these systems has been criticized by the popular media for forcing consumers to leave large tips in contexts where they previously would have left small tips or where tips were not required. The authors employ a multi-method approach, including an analysis of secondary data (N = 51,825), a field experiment (N = 1,810), and laboratory experiments (N = 2,321) to show that an absolute dollar frame (vs. percentages) leads to higher tip payments especially for low bill amounts. These effects are attenuated when (1) absolute options are presented in cents (e.g., $0.50), leading consumers to infer that small tip amounts are acceptable and, (2) absolute options start at high levels. Countering conventional wisdom, the authors further show that open-ended formats can lead to higher tip payments compared to closed-ended response formats in specific conditions. Theoretically, these results add to the behavioral pricing, prosocial behavior, and labor economics literatures. Managerially, the results are relevant for decision makers in the multi-billion-dollar digital service industry.

Word count: 188

Keywords: behavioral pricing, nudging, framing, choice architecture, field experiment, voluntary payments

"American consumers are feeling a bit of tip creep…The coffee drink was $4. The cashier swiped the credit card, then whirled the screen of her iPad sales device around to face the customer. 'Add a tip,' the screen commanded, listing three options: $1, $2 or $3, In other words: 25 percent, 50 percent or 75 percent of the bill. There was a 'no tip' and a 'customize tip' button, too, but neither seemed particularly inviting."

New York Times (January 31th, 2015)[1]

"We have no real idea how and when to tip anymore, because those spinning touchscreen registers fudged up the metaphysical playbook we followed for decades."

Philadelphia (January 20th, 2018)[2]

"Don't Let Technology Bully You into Tipping."

Financial avenue (April 10th, 2018)3

"You Want 20% for Handing Me a Muffin? The Awkward Etiquette of iPad Tipping."

The Wall Street Journal (Oct 17th, 2018)[4]

"Point-of-sale systems, with touch screens asking you whether you'd like to tip $1, $2 or $3 for that latte or 15, 20 or 25 percent for a salad, have been spreading like an infectious disease…"

New York Times (September 15th, 2019)[5]

The new age of digital payment collection systems appears to be changing the expectations and etiquette of voluntary gratuities payments, an event that the press argues is bullying consumers into contributing in services where tips were previously prohibited or not required (i.e., ride share [Uber/ Lyft], vendors, fees for collecting charitable donations), or paying more than they had previously been used to (e.g., coffee shops, delivery apps; see "*tip creep*," Stout 2015), or, at most, had contributed nominal cash amounts (e.g., $1 in a tip jar in a self-service establishment). Frequently, these electronic gratuities are requested before any service is provided (e.g., at the time of ordering; Kugel 2019) and/ or when the only service provided is handing over a product (e.g., coffee-shop) or processing a payment (e.g., farmer's market vendors). These so called digital "nudging" systems are challenging

[1] https://www.nytimes.com/2015/02/01/business/dollar3-tip-on-a-dollar4-cup-of-coffee-gratuities-grow-automatically.html
[2] https://www.phillymag.com/foobooz/2018/01/20/philadelphia-coffee-shops-tipping/
[3] https://fa.financialavenue.org/dont-let-technology-bully-tipping/
[4] https://www.wsj.com/articles/you-want-20-for-handing-me-a-muffin-the-awkward-etiquette-of-ipad-tipping-1539790018
[5] https://www.nytimes.com/2019/09/15/travel/ipad-tipping-gratuity.html

and changing the norm of when and how much to tip in service contexts. The new digital payment collection systems frequently default to 15%, 20%, 25%, even going up to more than 100% of bill size (see Figure 1 for examples of ranges and frames of different tip options in the marketplace).

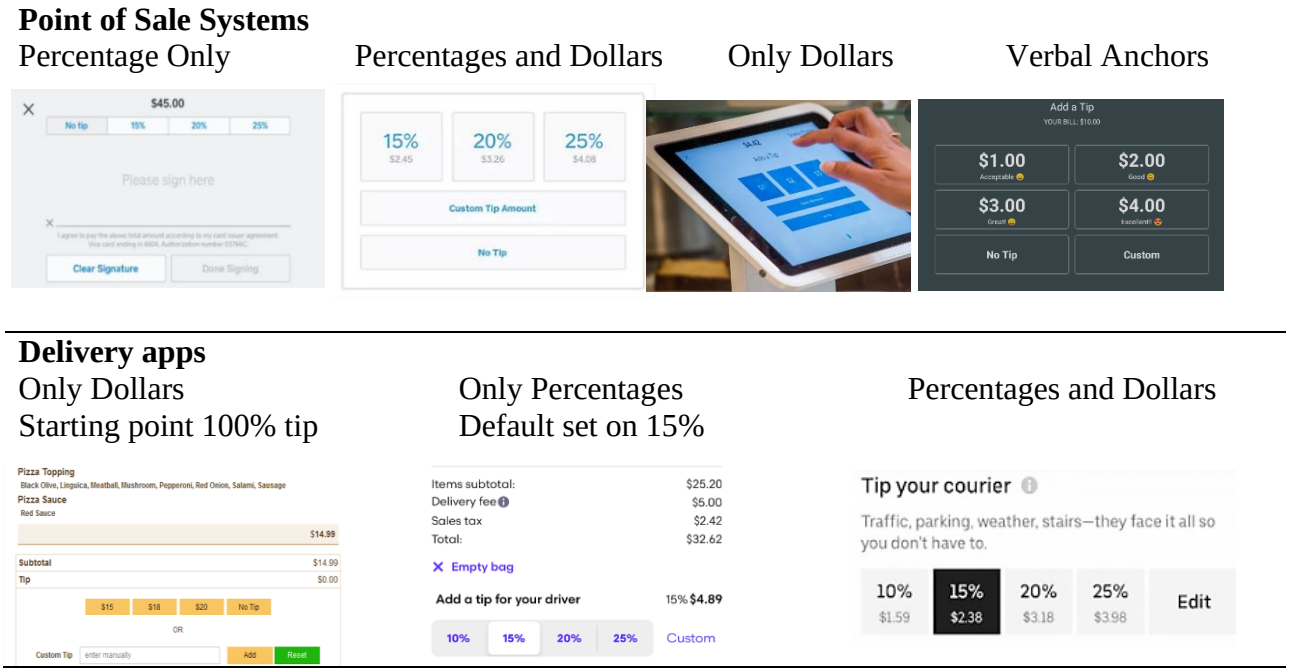

Figure 1: Variety of Default Tipping Options in the Market Place

The popular press reports that these digital numerical nudging options pressure customers to leave a tip, and oblige them to pay more than they would otherwise have preferred (Levitz 2018). But is this true? And is there any effect of the way these options are displayed on consumers' payments decisions? This paper examines customers' tipping decisions as a function of the range of tip alternatives presented to them, if any, and whether these tip alternatives are framed in absolute (i.e., U.S. dollars), or relative terms (i.e., percentages). To do so, we draw on the literatures on participative pricing, framing effects of price promotions examining dollar off vs. percent discounts, and prosocial behavior with voluntary payments.

Theoretically, the paper aims to contribute to the literature on choice architecture (e.g., Johnson et al. 2012, 2013), framing of prices (Darke and Freedman 1993; Darke and Chung 2005; Krishna et

al. 2002), and to the burgeoning literature of voluntary payments. While the consumer psychology literature has shown an increased interest in the psychology of voluntary payments in the form of charitable giving and elective pricing such as Pay-What-You-Want (e.g., Gneezy et al. 2012; Kim, Natter and Spann 2008; Jung et al. 2014, 2017), researchers have only recently begun to examine the psychology of a far more widespread voluntary payment economy: service fees and tipping (Bluvstein Netter and Raghubir 2021; Luangrath, Peck, and Gustafsson 2020).As such, examining the predictions from the elective pricing literature in the broader context of voluntary payments such as tipping could enrich this literature. Aside from being a very large context of consumers' voluntary payments tipping is also an important managerial inquiry. As many consumers tip frequently for services ranging from personal services to dining, and many in the service industry rely on tip income as a substantial part of their compensation, examining consumers reaction to default tipping suggestions has implications for consumer welfare, social welfare, labor economics and even public policy, given the evolving practices and laws around "mandatory" service charges in different countries (e.g., U.K. vs. Israel).

Following an overview of the antecedent of consumers' voluntary payments and a summary of the importance of the new digital nudging economy, we derive our hypotheses. Each study is then described. We end with managerial implications for the service and hospitality sectors, and theoretical contributions to the aforementioned literatures.

FACTORS AFFECTING CONSUMERS' VOLUNTARY PAYMENTS

Both economics and psychology would argue that voluntary payment decisions are complicated. This literature can be arranged in to two factors affecting consumers' behavior: inherent prosocial motives (either altruistic or egoistic oriented) and contextual considerations.

Prosocial Motives. Voluntary payments for tips are considered a prosocial norm (e.g., Greenberg 2014). Prior research has suggested that consumers' prosocial behavior is driven by

people's motivation to be fair, reciprocal, and generous (Andreoni and Miller 2002; Elster 1989, 1998; Falk and Fischbacher 2006; Fehr and Schmidt 1999; Fehr and Gächter 2000; Haws and Bearden 2006; Rabin 1998; Seiter and Weger 2020). Other motives include utility from warm glow (Andreoni 1989), moral satisfaction (Kahneman and Knetsch, 1992), self-image concerns (Akerlof and Kranton, 2000; Azar 2004; Bluvstein Netter and Raghubir 2021; Lynn 2009) and the need to follow social norms (e.g., Azar 2007; Bodvarsson and Gibson 1999; Dana et al. 2006, 2007; White and Peloza 2009). However, in the context of tipping further motives govern consumers including displaying status or power (Faber 1982; Lee, Rafieian, Korschun 2020), compensating for poor wages (Futrell 2015; Holloway 1985), and expressing interpersonal attraction (Guéguen and Jacob 2012; Lynn and Graves 1996).

Contextual Considerations. Among the contextual factors that affecting voluntary payments are mood (e.g., Isen and Levin 1972) and emotions during payment such as guilt, embarrassment, pride, love and sense of rightness (e.g., Azar 2004, 2007; Basil, Ridgway, and Basil 2007; Cavanaugh, Bettman, and Luce 2015; Lynn 2015; Ruffle 1999). Other contextual factors are physical location (Pearl 1985), weather (Cunningham 1979), background music (Jacob, Guéguen, and Boulbry 2010), time of year (Greenberg 2014), whether it is easy to opt out from paying (Andreoni and Miller 2002), payment mode (Feinberg 1986; Garrity and Degelman 1990; but recent studies have found no difference: Bluvstein Netter and Raghubir 2021; Parrett 2006), size of the group (e.g., McCarty et al. 1990), and service quality (e.g., Futrell 2015; Lynn and Graves 1996).

While much research in the hospitality and economics literatures have examined the effect of various factors on consumers' choices to engage in prosocial payments in the form of tipping, little has focused on the role of how the suggested default payment options are presented to consumers. Research in the realm of charitable giving using various scale donation suggestions has found that the way the suggestions are framed impact the amount of money contributed (Desmet and Feinberg 2003). Specifically in the context of tipping, the range of the displayed showed that higher options are

associated with higher average tips (Hoover 2019), though there is a potential for the pattern to reverse if the options are set too high (Haggag and Paci 2014). These few findings were done in a context where the tip context is familiar and norms are fully established – taxi rides, however, the new age of digital economy is much broader and more versatile in framing the displayed options. New contexts and new services, which consumers have yet to establish norms towards, are adopting these tips collection systems and are using different frames of choices, providing a new playground to broaden our understanding of consumers' reactions to default options.

THE NEW AGE OF THE DIGITAL NUDGING ECONOMY

Voluntary payments were a multi-billion-dollar phenomenon in the United States even prior to the digital revolution: According to the IRS, the estimated individual income from solely tips in tax year 2006 was $44 billion (Treasury Inspector General for tax Administration [TIGA] 2018). The food and beverages businesses alone employ 14.7 million workers, making this industry the second largest private employer in the United States (National Restaurant Association's 2017 Restaurant Industry Outlook). In 2019, 16.78 million of U.S. employees were reported as working in the hospitality and leisure industry alone (Lock 2021). Furthermore, the IRS estimates $23 billion worth of unreported income from tips (Tax Year 2006), accounting for over half of the estimated $44 billion in income (TIGA 2018). Until recent years, this industry was dominated by sit-down restaurants, with a market volume of $889 billion in 2020 (National Restaurant Association).

With the new digital revolution of screen-based payment collection systems, income from voluntary contributions in the United States is expected to rise as other service industries using these systems grow. To mention a few, the ride sharing industry (e.g., Uber, Lyft) is expected to reach market volume of $285 billion by 2030 (Huston 2017), the online food delivery app market is expected to hit $161.74 billion by 2023 (Adroit Market Research 2019), and coffee shop industry sales

are expected to reach $28.7 billion by the end of 2021 (Mintel 2017). Data from gratuity services in the restaurant industry suggest that tip norms range from 16.7% to 20.5%.[6] A conservative estimate is that contributions from voluntary payments in the digital economy will be 10% of sales, implying voluntary payments of almost $50 billion across just three industries.

Service providers in these industries need to make at least three decisions when constructing their digital voluntary default payment options: (1) whether to suggest a tip using an open-ended format or to nudge consumers by providing a range of tipping options to choose from as in typical screen-based systems; (2) if the latter, whether these options will be provided using absolute (USD) amounts, in relative (%) terms, (or both, see Figure 1); and (3) whether their decision of whether to use an absolute or a relative set of response options for tips should be contingent on the overall cost of the service experience. In this paper, we show that the choice of response options (closed-ended vs. open-ended), and frame (absolute vs. relative closed-ended formats) are contingent on bill size. Specifically, we explore how absolute, relative and open-end affect consumers likelihood to tip and their decision of how much to tip. To do so we turn to literatures of choice architecture of default options, survey method and price promotion to examine whether these literatures may assist in predicting how consumers would react to the different framings of digital nudging mechanisms.

THEORETICAL MODEL

The literature on Pay-What-You-Want shows that consumers are motivated to leave an appropriate amount, but they also want their decision to be easy (Gneezy et al. 2012). In line with this, providing consumers with default choices has been found to increase the likelihood that people select one of the provided default options (Johnson 2013), presumably because it is less effortful to choose

[6] https://www.moneypenny.com/us/resources/blog/the-united-states-of-tipping/

(Luce 1998). This is consistent with the finding from survey methods that open-ended questions are less likely to be answered than closed-ended ones, presumably due to respondent difficulty in recalling vs. recognizing an appropriate response (Krosnick 1991). This would imply a lower likelihood of tipping when default choice options are not provided. However, due to the social norm to leave a tip, this may not necessarily be the case.

The way options are presented to consumers is central to the effectiveness of the default options (Johnson et al. 2012). The importance of examining how default options affect consumers' decisions was recently highlighted in a meta-analysis of 58 studies (Jachimowicz et al. 2019). The digital tipping collection systems typically present the consumer with three numerical defaults (in either absolute or relative terms), along with "No tip" and/ or "Custom" options (See Figure 2).

Figure 2. Screen Based Default Tip options presented at a coffee shop

Closed-Ended Options: Relative vs. Absolute Framing: A Behavioral Pricing Perspective

Previous research has found that a change in the unit in which quantitative information is provided affects consumer preferences (Burson, Larrick, and Lynch 2009; Pandelaere, Briers, and Lembregts 2011; Monga and Bagchi 2012; Zhang and Schwarz 2012). Specific to our context, researchers have explored the effect of relative vs. absolute framing in different domains. The framing literature in price promotions has examined when the use of dollar vs. percent discount frames lead to perceptions of greater price promotional savings (Darke and Freedman 1993; Darke, Freedman, and

Chaiken 1995; Darke and Chung 2005; Das 1992; González et al. 2015; Heath, Chatterjee, and France 1995; Krishna et al. 2002).

Berkowitz and Walton (1980) first coined the term "semantic cues" (statements which make a direct reference to price differences, such as dollar reductions or percentages off) to describe the use of absolute and relative (respectively) framing in advertisements that affect the buyer's evaluation of the offer. Della Bitta, Monroe and McGinnis (1981) found that percent-off frames led to perception of lower value for money than did dollar-off frames. Chen, Monroe, and Lou (1998) further framed a price reduction on either a high- or low-priced product in either percentage (relative) or dollar (absolute) terms and found that for the high-priced product, a price reduction framed in dollars was perceived as more significant than the same price reduction framed as a percentage while the inverse was true for the low-priced product. In a set of three studies across price and discount levels, González et al. (2015) showed that a dollar-off frame resulted in higher purchase intentions for high- vs. low-priced products (see their Table 1 for a review of other findings in the price promotion literature examining dollar-off and percent-off frames, p. 1023). They argued that this is because consumers focus on absolute amounts more than on percentages, which are more difficult to calculate or translate into dollar amounts (see also Morwitz, Greenleaf and Johnson 1998 for the same argument in a surcharge presentation context). Notably, all these authors make the argument that such effects are driven by consumers' perceptions of the value of the discount.

In a meta-analysis of the effect of framing on price promotion effectiveness, Krishna et al. (2002) found that framing a deal in percentage terms increased perceptions of savings more than framing a deal in dollar terms. However, Darke and Freedman (1993) found that for a large range of percentages that could be saved, consumers' decisions about whether or not to exert extra effort to save money occurred both in percent-off and in dollar-off frames. Based on their arguments, it is

plausible that as the size of the purchase amount increase consumers will engage in effortful thinking to make a tipping decision, which is likely to attenuate any effects due to frame.

Darke, Freedman and Chaiken (1995) found that consumers use the size of the percentage discount as a heuristic cue to help decide whether a better price is likely to be available elsewhere, but they rely on this cue only when the initial base price of the item is low. For expensive items, they continue to search despite the offer of a large percentage discount because the potential benefits of getting a better price are higher. Mirroring this effect in the domain of tipping, this finding would imply that framing effects would be attenuated for larger bills. This is because, for larger bills, consumers would be motivated to expend the necessary effort to systematically compute how much of a tip they should leave, rather than use information available from the choice alternatives presented to them to make their judgment.

This work overall showed the effects of framing is contingent on the value/ cost of the product or service. As this literature has implicated the moderating role of overall cost-benefit effects for the consumer (e.g., Darke and Freedman 1993; González et al. 2015; Krishna et al., 2002), we examine the moderating role of the size of the bill on the effect of framing tip options on total tip amount.

While the work on price promotion has been conducted in a domain where the consumer has something to gain in terms of the discount, our primary contribution to this literature is to demonstrate that effects translate with some important caveats into a domain where the customer suffers a loss (i.e., a tip payment). As framing a deal (gain) in percentage (vs. dollars) decreases perceptions of savings for lower value purchases but increases perceptions of savings for higher value purchases, we suggest that framing tip payment (loss) in dollars (vs. percentages) will decrease perceptions of spending for lower values but increase perception of spending for higher value payments. As such, for lower value payments, we expect that framing (or eliciting) a tip in dollars will lead to higher tips than framing it as a percentage, as the low value of the dollar amounts will seem minimal.

H1: Default payment options elicited using absolute dollar amounts (vs. relative percentages) will lead to greater tips, with the effect attenuating as bill size increases.

Moderation of the Effect of Absolute versus Relative Tip Response Options

There are two important caveats to H1: (1) when absolute default tip options start at fractional levels (e.g., $0.50), and (2) when the bill is expensive to start with (e.g., $100, $1000) where tip options start at high absolute levels. We expect differences in these scenarios for different reasons. When absolute tip values for low bill amounts are less than $1 (i.e., coins), social norms (in the US) will either dictate leaving the smallest paper bill ($1), or may themselves change by signaling that tipping less than $1 is acceptable. If the social norm of a $1 minimum kicks in, the absolute frame should lead to higher tips than the relative frame; however, if the norm changes, as customers use the absolute values of the options presented to them to infer what is acceptable, then H1 should be attenuated. We argue, based on the survey methods literature that the presence of absolute fractional amounts as absolute tip suggestions will change the norm and reduce the overall tip payments.

The survey methods literature suggests that the range of response alternatives provided to respondents is a source of information and respondents construct their responses to behavioral frequency questions believing the researcher used the range of frequencies in the population to construct the scale (Schwarz et al. 1985). This is especially true if they do not have memory-based information (e.g., frequency rate) to rely on (Menon, Raghubir, and Schwarz 1995, 1997).

Applying this literature to the domain of voluntary payments such as tipping, the range of closed-ended responses may imply that service providers set this range based on appropriate norms. As such, the closed-ended options are at the same time a set of payment options (i.e., choice of how much to tip) as well as a source of information (i.e., about what is appropriate to tip) that the consumer would use to make their decision. Therefore, according to this stream of literature, when the absolute value of the tip options is in fractional dollars that are not the norm (e.g., $0.50, $0.75), this may signal

that tip amounts under $1 are acceptable. This would attenuate H1 and absolute tip options may no longer yield higher tips compared to relative tip options. Indeed, a recent field experiment testing consumers' norm shift as a function of the scale showed that customers paid 27% less when observed a scale with low values (vs. high values) (Feldhaus, Sobotta and Werner 2019), indicating that the norm changed as a function of the values presented.

The literature on anchoring in voluntary payments similarly suggests that providing low anchors license people to give lower payments in the context of PWYW (Jung, Perfecto and Nelson 2016; Soule and Madrigal 2015). In donation contexts it was also showed that giving information of lower anchors of payments led consumers to donate smaller amounts (Croson and Shang 2008).

On the other hand, for very expensive purchases (e.g., tips for a $100 or $1000 self-serving buffet dinner), tip options starting at 10% may be less likely to signal a norm that people tip, as default options in choice sets have been shown to be effective only when they are believable (Jachimowicz et al. 2019). Instead, consumers possibly experience a sticker shock of the high set of the absolute options, leading them to invest cognitive efforts in their tipping decision to avoid spending. This is particularly true due to the high absolute cost associated with the tip which should lead to systematic processing (Darke and Freedman 1993). Thus, in contexts where the purchase value is high to begin with (e.g., $1000), then even a nominal percentage (e.g., 10%) of the value of the service translates to a large value (e.g., $100) in the absolute condition, and the high value of the service ($1000), should encourage consumers to make the appropriate calculation of what a given percentage represents in the relative percentage condition (10% of $1000 = $100; Darke et al., 1995). Thus, the high value of the absolute tip options and total bill amounts together should attenuate the absolute-relative effect. Accordingly, by examining the effect of absolute vs. relative frames in the context of voluntary payments like tipping, a domain where there are also social norms, we can identify boundary conditions of the absolute versus relative framing effect. Given these literatures we predict:

H2: The effect in H1 will be moderated when

a. the absolute default options are fractional.

b. the absolute default options are high.

Open- vs. Closed-ended Default Options: A Participative Pricing Perspective

Digital payment systems typically use closed-ended options that could nudge the consumer towards an expected tip value, unlike non-electronic formats which elicit tips in an open-ended manner (e.g., a tip jar, a blank line on a receipt for the consumer to fill in the tip amount). The survey methods literature suggests that open-ended questions are more difficult for survey respondents to answer (Krosnick 1991), a finding consistent with that from the choice architecture literature (Johnson et al. 2012, 2013). However, those findings are from contexts where the effects of social norms may be less potent. In line with this argument, findings from the PWYW literature, discussed below, suggest that consumers do pay for services when prices are not provided to them (Gneezy et al. 2012; Jung et al. 2014, 2017; Kim, Natter and Spann 2008).

Voluntary payments, such as tipping, are a form of participative pricing (Bluvstein Netter and Raghubir 2021). The participative pricing literature suggests that consumers prefer open-ended responses, which lead to greater payments. For example, Chandran and Morwitz (2005) found that consumers prefer to actively set the price themselves than to accept posted prices and that their perceived control over the price leads to greater purchase intentions. Haws and Bearden (2006) found that consumers are more satisfied and have greater perceptions of fairness when they participate in the price-setting process than if the price is already set by retailers.

The literature on the PWYW phenomena can assist in making a prediction about whether open-ended formats will lead to higher payments than will closed-ended formats. Whether it is in the form of purchasing a product or making a charitable donation, this literature has found that open-ended

formats are perceived to be fairer and lead to higher prices paid and/ or donations given (Gneezy et al. 2012; Kim et al. 2008). Across three field experiments, Kim et al. (2008) showed that PWYW prices paid are significantly greater than zero and can even be higher than posted prices due to altruistic considerations.

Gneezy et al. (2010) found that shared social responsibility (i.e., PWYW that is partially donated to charity) was the most profitable pricing strategy, leading to greater payments compared to PWYW alone. However, the likelihood to purchase was greater for the PWYW alone strategy, leading the researchers to investigate further, finding that individuals' prosocial behavior is influenced by self-image concerns such that they feel bad when they pay less than the "appropriate" price and might opt out from purchasing at all if their perceived appropriate price is too high (Gneezy et al. 2012). Translating these findings to the realm of tipping, consumers are not likely to opt out from purchasing the goods as a function of the tips presented to them in the moment of payment, thus, a tipping decision is to be made. We predict that because consumers are motivated to be appropriate and to follow the norm, they will give higher payments in an open-end (vs. closed end) format when the total bill is on the lower end in the context of a given price. However, when the total bill is on the higher end consumers' motivations of being appropriate will compete with their motivations to spend less. Building on these findings, we predict that consumers can tip more under open-ended options as compared to closed ended options when they cannot infer what is acceptable from the options (e.g., fractional amounts, or when tip options are high). Accordingly, we hypothesize:

H3: Payment options presented using an open-ended format can lead to greater tips compared to closed-ended formats under certain conditions.

OVERVIEW OF STUDIES

Seven studies in a digital nudging context examine the effect of voluntary payments using a multi-method approach: secondary data analysis (N= 51,825), a field experiment (N = 1810), two within-participant studies (N = 592), and three laboratory experiments identifying process and boundary conditions using between-participant designs (N = 1,729). A summary of the empirical work is provided in Table 1. Our results indicate that presenting closed-ended tip options using a dollar frame leads to higher tips compared to percentage frames for lower bill amounts, with two caveats: when the absolute tip amounts are fractional cents (e.g., $0.50¢ = 10% of $5), or when they start at very high amounts (e.g., $100 = 10% of $1000). Contrary to the assertion of the popular press, we further show that digital nudging, which presents consumers with closed-ended tip suggestions, leads consumers to tip less than an open-ended format.

Study	Sample	Method	Design	Result
1a (Lab)	N =107	$ vs % frame	7 (service contexts) × 2 (frame)	H1
1b (Lab)	N = 485	$ vs. % frame	2 (min vs. max) × 2 (frame) × 3 (bill size)	H1
2 (Lab)	N = 212	$ vs. % frame	2 (frame) × 2 (bill size)	H1
3a (Secondary data)	N = 51,825 transactions	$ vs. % in the marketplace	<$10: $1, $2, $3; ≥$10; 15%, 20%, 25%	H1
3b (Field)	N = 1,810 transactions	$ vs. %	<$10: $1, $2, $3; 15%, 20%, 25%; 10% 15% 20%; 5% 10% 15%	H1
4 (Lab)	N = 881	Open-End vs. $ vs. % vs. % +$	4 (frame) × 2 (bill size)	H2a, H3
5 (Lab)	N = 636	Open-End vs. $ vs. %	3 (frame) × 2 (bill size)	H2b, H3

Table 1: Summary of Empirical Work

Studies 1a and 1b test H1 by examining the differences in dollar and percent frames when consumers set their own price (open-ended format); Study 2 attempts to replicate these effects using a

closed-ended sliding scale format. Studies 3a and 3b use secondary data and a field experiment to test H1 using closed-ended default options from a digital payment collection system in a coffee shop. Studies 4 and 5 test the boundary conditions (H2a and H2b) and H3. All studies analyze the tip rate and the average tip amount across all participants (i.e., including those who indicated no tip) as well as among just the subset who tipped. We excluded tip amounts exceeding ±3 SD when tip distributions were skewed. For analysis, dollar amounts are converted to percentages for directly comparable metrics and results are reported in percentages. Finally, at the end of the manuscript, we report the results of a mini meta-analysis on the effect of dollar vs. percent frames across conditions using a fixed-effects approach (Goh, Hall, & Rosenthal 2016). This shows that the effect is robust ($d = 0.10$, $z = 9.59$, $p < .001$, [.08, .13]).

Studies 1a and 1b: Dollar vs Percentages in Open-End Format

Study 1 tests H1 across different familiar tipping contexts and bill amounts. In Study 1a, we tested how framing options in open end dollars vs. open end percentages by asking respondents for their tip amount both in dollars and percentages across seven service contexts with different bill sizes. We used both familiar contexts where the norms of tipping are established (e.g., restaurant, taxi, nail salon) and contexts which use digital nudging (e.g., delivery app). Examining how the effect of frame affects tipping across service contexts can shed light on to whether the effects might be translated to other areas where tip norms are fully established. In Study 1b, we turn to examine consumers' reactions to the digital payment system in a coffee shop asking them for the minimum and maximum tips they would normally give for different bill amounts.

Study 1a Method

Participants and design. Study participants were 107 mTurkers (51.4% females [7]) who participated for modest monetary compensation. We excluded six participants who did not complete the survey (usable N = 101). We employed a 7 (service context) × 2 (frame: percent, dollar) within-subjects design.

Procedure. Participants were presented with seven familiar service contexts where tipping is common— eating at a restaurant, having alcoholic beverages at a restaurant, getting drinks at a bar, getting food delivered, getting service at a hair salon, getting service at a nail salon, and taking a taxi ride—and informed what their total bill, inclusive of taxes, was (Table 2). For each scenario, participants indicated how much they would tip in terms of a percentage of the bill, and then, again, in USD. Responses were elicited in columns next to each other on the same page, making the task transparent. Subsequently, participants reported whether they owned a credit card (83 [82.2%] reported owning one) and indicated their gender.

Study 1a Results

*Tip percentages for entire sample***.** A 7 × 2 repeated measures ANOVA revealed significant main effects of context ($F(6, 600) = 5.94$, $p < .001$, η^2s = .056) and frame ($F(1, 100) = 6.66$, $p = .011$, η^2s = .062), along with a significant interaction ($F(6, 600) = 6.56$, $p < .001$, $\eta^2 = .062$). Respondents indicated higher tips when they expressed their tips in absolute (vs. relative %) terms for the four lower bill amounts (percent difference between $ and %): $8 taxi ride (87.55%), $22 nail salon service (75.21%), $27 food delivery (67.87%), and $35 alcoholic drinks in a restaurant (36.66%, *p*s < .05). For the next two higher bill amounts the effects were marginal, though substantive and in the expected direction: $50 hair service (25.00%) and $60 drinks at a bar (27.35%, *p*s < .10). However, for the more expensive bill, $95 food in a restaurant, they were attenuated (4.33%, $p = .67$, see Table 2).

[7] Due to a glitch in the survey age was not collected for Studies 1a and 2

Tip percentages for only tippers. Results remain the same when analyzing the data of only those who tipped: main effects of context ($F(6, 378) = 7.33$, $p < .001$, $\eta^2 = .104$), and frame ($F(1, 63) = 5.97$, $p = .017$, $\eta^2 = .087$), and a significant interaction ($F(6, 378) = 6.41$, $p < .001$, $\eta 2 = .092$).

Scenario	**Cost**	**Means (SD) in %**		**% Diff ($-%)/ %**	**Paired t_{100}**	***P***
		Percentage	Dollar			
Food in a restaurant	$95	16.15 (11.54)	16.85 (15.65)	4.33%	-0.42	.67
Drinks at a bar	$60	10.42 (7.37)	13.27 (17.65)	27.35%	-1.94	.056*
Hair Salon	$50	12.36 (8.02)	15.45 (18.33)	25.00%	-1.98	.051*
Alcoholic Beverages	$35	11.43 (7.96)	15.62 (21.82)	36.66%	-2.19	.031**
Food Delivery	$27	11.61 (8.25)	19.49 (29.17)	67.87%	-2.84	.006**
Nail Salon	$22	10.49 (8.73)	18.38 (30.04)	75.21%	-2.64	.010**
Taxi ride	$8	12.37 (13.42)	23.20 (39.19)	87.55%	-2.88	.005**

*p< .10, two-tailed. **p < .05, two-tailed.

Table 2. Tips given in $ and % for different scenarios and total bill amounts: Study 1a

Study 1b Method

Participants and design. Participants were 485 mTurk users ($M_{age} = 37.48$, SD = 11.98; 48.0% female). This study used a 2 (tip norms: minimum vs. maximum) × 2 (frame: percent, dollar) × 3 (purchase amount: $5, $10, $20) within-subjects design. Fifty-nine participants who started the survey but never completed it were excluded from analysis, leaving a usable sample of 426 participants.

Procedure. In the hypothetical context of a self-service coffee shop using digital payment system, participants indicated the minimum and maximum tip they would leave (in percent, and then in dollars). They did this for three purchase amounts: $5, $10 and $20.

Study 1b Results

Tip norms: A three-way repeated measures ANOVA revealed significant main effects of minimum and maximum tip ($F(1, 425) = 189.25$, $p < .001$, $\eta^2 = .30$), such that participants indicated overall higher maximum (M = 16.38%, SD = 14.02) versus minimum (M = 8.72%, SD = 10.61) tips, as expected; frame ($F(1, 425) = 108.73$, $p < .001$, $\eta^2 = .20$): Participants indicated higher tips in USD (M = 16.59%, SD = 17.15) compared to percentages (M = 8.59%, SD = 8.74); and purchase size ($F(2, 850) = 3.175$, $p = .042$, $\eta^2 = .007$), such that higher tips were given in the $5 purchase amount condition (M = 12.95% ; SD = 12.31) and the $10 purchase amount condition (M = 12.74%, SD = 3.98) than in the $20 purchase amount condition (M = 11.97%, SD = 10.02).

Replicating Study 1a, the interaction of purchase amount and frame was significant ($F(2, 850) = 19.05$, $p < .001$, $\eta^2 = .043$), reflecting a greater effect for frame in the low total purchase amount condition ($5) compared to higher purchase amount conditions ($10 and $20). For the $5 purchase amount, tips were lower in the percent frame (M = 7.92%, SD = 9.48) than in the dollar frame (M = 18.11%, SD = 19.66; Δ[8] = 128.66%; $t(427) = 11.33$, $p < .001$). For the $10 purchase amount, tips were lower in the percent frame (M = 8.58%, SD = 9.09) than the dollar frame (M = 16.99 %, SD = 23.88; Δ = 98.02%; $t(427) = 7.62$, $p < .001$). For the $20 purchase amount, the differences remained significant, but smaller (percent M = 9.27%, SD = 8.50; dollar M = 14.71%, SD = 14.31; Δ = 58.68%; $t(341) = 9.19$, $p < .001$).

The two-way interaction between frame and minimum-maximum tip was also significant ($F(1, 425) = 19.86$, $p < .001$, $\eta^2 = .045$), such that the difference between the minimum dollar (M = 12.04%, SD = 18.38) and minimum percent (M = 5.50%, SD = 6.37, $t(426) = 7.76$, $p < .001$) was smaller than

[8] Δ = (Percentage tipped in Dollar Frame – Percent tipped in percent frame)/ Percent tipped in percent frame.

the difference between the maximum dollar (M = 11.72%, SD = 12.71) and the maximum percent (M = 21.15%, SD = 19.49; t(426) = 11.42, $p < .001$) frames.

Interestingly, the three-way interaction was significant (F(2, 850) = 3.087, $p = .046$, $\eta^2 = .007$). The difference between dollar frame and percent frame was the greatest in the $5 purchase amount, particularly for the maximum tip indicated, followed by the $10, and the $20 purchase amounts. See Table 3 for means, SD, t test results and significance levels. Thus, the effect of frame is largest for the maximum tip amount for the lowest purchase value $5, although it is significant for all conditions.

	Minimum			**Maximum**		
Purchase Amount	Percentage	Dollar	t	Percentage	Dollar	t
$5	4.83 (6.66)	12.73 (18.04)	9.44***	11.04 (14.17)	23.53 (24.15)	11.81***
$10	5.49 (6.59)	12.93 (34.86)	4.49***	11.70 (13.33)	21.03 (20.38)	10.84***
$20	6.16 (6.58)	10.49 (12.33)	8.62***	12.40 (12.4)	18.94 (18.18)	8.84***

*$p < .10$, two-tailed; ** $p < .05$, two-tailed, ***$p < .01$.

Table 3. Percentage tips given in $ and % frames for different total purchase amounts: Study 1b

Discussion

Studies 1a and 1b show that across service contexts consumers indicate paying more if they indicate the tip absolute terms (i.e., dollars), rather than in relative terms (i.e., percent), particularly for smaller purchase amounts. In Study 1a, the separate effects of purchase amount and context could not be separated; thus, Study 1b examined consumers' tipping intentions for different purchase amounts holding context of digital payment constant, using a coffee shop scenario. It also directly examined whether stated tipping norms are a function of the manner in which they are elicited. Studies 1a and 1b used transparent within-participants designs. In Study 2 we manipulated the frame [dollars versus percentages] and purchase amount [smaller vs. larger] between participants, and elicited tips using a different response scale.

STUDY 2: DOLLAR VS. PERCENTAGES USING CLOSED END SLIDER SCALE

As the scale used to elicit responses can affect judgments, with payments elicited on slider scales assimilated toward the end point of the response range (Thomas and Kyung 2019), we used a sliding response format that conceptually lies between open-ended and closed-ended response alternatives, recognizing that it may not be a common practice, however, recognizing that it makes a theoretical contribution by replicating the effect using a different type of response scale.

Method

Participants and design. Study participants were 212 mTurk users (46.2% female) who participated for modest compensation. One participant was excluded for incomplete data. We used a 2 (frame: percent, dollars) × 2 (purchase amount: low [$10], high [$20] between-subjects design.

Procedure. Participants were asked to imagine that they were at a coffee shop, purchasing a few items using their credit card; the cashier swiped their credit card and turned her computer screen towards them to show them a tipping screen. Participants were asked to specify how much they would leave as a tip by moving along a sliding scale from 0% to 50% tip in the two percentage conditions or from $0 to $5 in the $10 absolute condition or from $0 to $10 in the $20 absolute condition. Other exploratory measures not pertinent to this analysis are reported in the Web Appendix. We used an attention check question asking participants how much their total purchase was. Finally, participants indicated their gender, if they owned a credit card (172 [81.1%] reported owning one), and frequency of visiting coffee shops (from 1 - *Not at all] to* 7 - *Very often;* M = 3.73).

Results

*Attention check***.** Among all participants, 92.4% passed the attention check with no difference across conditions. Results remain the same when we analyze the data including or excluding these participants. Thus, results reported below include all participants.

Tip Percentages for full sample. There were no differences in likelihood to tip across conditions. A two-way between-subjects ANOVA on the tip percentage with total purchase amount ($10, $20) and tip frame (percent, dollar) as between-subjects factors revealed a main effect of frame ($F(1, 207) = 14.33$, $p < .001$, $\eta^2 = .07$). Across the purchase amount conditions, participants left almost 50% higher tips when tip options were presented in dollars (M = 15.26%, SD = 9.48) than when presented as a percent (M = 10.39%, SD = 9.23). The main effect of total purchase amount was not significant ($F(1, 207) = 2.50$, $p = .115$, $\eta^2 = .012$), but the interaction term was ($F(1,207) = 4.06$, $p = .045$, $\eta^2 = .019$). In the $10 condition, participants gave roughly 73% more in tips when the tip was framed in dollar terms (M = 17.51%, SD = 10.84) than in percent terms (M = 10.12%, SD = 9.59; $t(105) = 3.72$, $p < .001$, $d = .72$). In the $20 condition, the pattern was in the same direction, but was no longer significant (dollar M = 12.92%, SD = 7.20; percent M = 10.67%, SD = 8.94; $t(102) = 1.42$, $p = .158$, $d = .27$; see Figure 3).

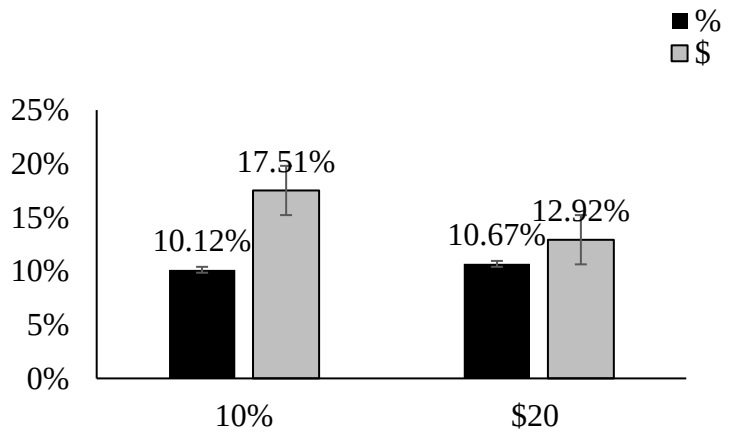

Figure 3: Tipping percentage as a function of total purchase amount and frame – Study 2 Results

Tip percentages for tippers. The same ANOVA on the subset of tippers revealed a main effect of frame ($F(1, 180) = 6.92$, $p = .009$, $\eta^2 = .037$), which reflects higher tip percentages in the dollar frame (M = 16.32%, SD = 8.87) than in the percent frame (M = 12.89%, SD = 8.56). The effect of purchase amount was marginal ($F(1, 180) = 2.99$, $p = .085$, $\eta^2 = .016$), with tips being higher in the low (M =

16.01%, SD = 10.09) vs. the high purchase amount condition (M = 13.50%, SD = 7.26). The interaction was marginal (F(1, 180) = 3.33, p = .070, η^2 = .018), showing that the effect of frame is significant when purchase amounts are low (Ms = 18.52% vs. 12.82%, *SD*s = 10.26 and 9.03 for dollar and percent respectively, t(91) = 2.80, p = .006, d = .58), but not when they are high (Ms = 12.83% vs. 12.95%, SDs = 9.03 and 8.19, F < 1).

Discussion

Study 2 shows that participants give higher tips when tip options are framed as absolute (i.e., dollar) amounts than a relative amount (i.e., percent), with these effects stronger for lower purchase amounts. While Studies 1a and 1b used a transparent within-subjects, open-ended scale, Study 2 used a slider scale, suggesting these effects are robust to the manner of open-ended elicitation.

Studies 3a and 3b: Secondary Data on Digital Default Options And Field Experiment in a Coffee Shop

To examine whether the results are externally valid, we collected actual transactions from a coffee shop in Study 3: analyzing secondary data (Study 3a), and conducting a field experiment (Study 3b).

Study 3a Method

We examined secondary data from a coffee shop in a major city in Pennsylvania. The coffee shop offers drinks, meals, and snacks. Consumers pay in full, including gratuity, at the time of placing the order and can then choose to dine in or take the order to go. The average transaction at the coffee shop is $6.63 (SD = 5.00). The coffee shop uses a dominant electronic payment and tip system for credit and debit card payments (constituting ≈ 56%[9] of their transactions). The details of the system

[9] Approximation based on examining two weeks of transactions during May 2017.

used are detailed in the Web Appendix. For purchases under $10, the system uses absolute dollar amounts ($1, $2, or $3) that are a minimum of 10%, 20%, and 30% of the purchase); for purchases of $10 or more, the system uses relative options (15%, 20%, and 25%). A "No tip" and a "Custom tip" option appear in both frames. Note that at no purchase amount are these options equivalent. For example, for a $9.99 vs. $10 purchase amount, the tip options are roughly 10%, 20% and 30% under one system, but 15%, 20%, and 25% under the other, with the same mean, and scale mid-point, but differential variance.

There were 51,825 credit/ debit card transactions over 16 months, with over half not including a tip (*N* = 29,972 [57.83%]; modal tip= $1). Tip percentages varied widely when a customer tipped (*N* = 21,853; M = 20.59%, Range = 0.4% - 240%). We report the likelihood to tip and the total tip given as a function of presentation of absolute ($1, $2, $3) vs. relative (15%, 20%, 25%) tip options, with and without controlling for size of the purchase as tipping options are related to purchase size.

Study 3a Results

Tip Rate. For purchase amounts ≥ $10 (tip options: 15%, 20%, 25%), 51.1% of the consumers chose to leave a tip (N = 4,456), compared to 40.4% (N = 17,397) when total purchase was < $10 (tip options: $1, $2, $3; $\chi^2(1) = 345.96$, $p < .001$; see discussion).

Percentage tipped for full sample. For higher purchase amounts with relative tip options (≥ $10), consumers tipped an average of 7.71% (SD = 8.06), while they tipped a higher percentage (8.88%, SD = 13.19) for lower purchase amounts with absolute tip options (< $10; $t(51,823) = 7.94$, $p < .001$, d = .10). Including net purchase as a covariate (as higher priced items may take more effort to prepare), the effect of frame remained significant ($F(1, 51,821) = 415.79$, $p < .001$, $\eta^2 = .008$), while the effect of the covariate was also significant ($F(1, 51,821) = 408.44$, $p < .001$, $\eta^2 = .008$).

Tip percentage for tippers. For higher purchase amounts, consumers tipped an average of 15.09% (SD = 3.98), while they tipped an average of 22.00% (SD = 11.94) for lower purchase

amounts (t(21,851) = 38.12, $p < .001$, d = .77). Including net sales as a covariate, the effect of frame was significant (F(1, 21,851) = 54.24, $p < .001$, $\eta^2 = .002$), as was the effect of the covariate (F(1, 21,851) = 2009.75, $p < .001$, $\eta^2 = .084$)..

Study 3b Method

The same coffee shop studied in Study 3a was used for the field experiment. In order to examine how the framing of tip options affects customers' tip amount, we designed a field experiment to compare the coffee shop's system ($1, $2, or $3 for low purchases under $10) to three different percent options: 5%-10%-15%, 10%-15%-20%, and 15%-20%-25%. The data include time of sale, total net sale, total gross sale, tax amount, tip amount, credit or debit card type, and a description of the items ordered. The four different systems were presented for two full business days on different days of the week for a total of eight days of data. There were 1810 transactions, of which 1015 were with a credit or debit card (where suggested tip amounts are presented). Of these, 814 were for low purchases (under $10), allowing the comparison of all 4 tip systems (N = 163, for $1-$2-$3; N = 224 for 5%-10%-15%, N =244 for 10%-15%-20%; and N = 183 for 15%-20%-25%).

Study 3b Results

Tip percentage for full sample. We found no difference in the likelihood to tip across conditions. To compare tipping percentage as a function of the four frames, we conducted a one-way ANOVA with system frame as the independent variable and tip amount as the dependent variable, controlling for net sales. There was a significant effect of tipping frame (F(3, 809) = 8.83, $p < .001$, $\eta^2 = .032$), such that consumers tipped significantly more using the dollar frame (M = 11.44%, SD = 14.52) than any of the percentage frames (Ms = 6.35%, 6.59%, 7.32% for the 5%-10%-15%, 10%-15%-20%, and 15%-20%-25% options respectively; SDs = 8.97, 7.68, and 10.80, respectively; ts = 4.24, 4.38, and 3.01; *ps* < .001 for all, ds = 0.42, 10.41, and 0.32).

Tip percentage for only tippers. These results were mirrored for the subset who tipped: Consumers tipped significantly more using the dollar frame (79.5% tipped $1, 11.5% tipped $2, and 9% tipped other amounts; M = 23.91%, SD = 11.90) than any of the percentage frames (Ms = 13.95%, 13.98% and 18.83% for the 5%-10%-15%, 10%-15%-20%, and 15%-20%-25% options respectively; SDs = 8.41, 4.63 and 9.05; ts = 6.57, 8.09, and 2.88; *p*s < .001 for all, ds = 0.96, 1.09, and 0.47; $F(3, 361) = 28.88$, $p < .001$, $\eta^2 = .194$).

Discussion

Analysis of 16 months of secondary data from a coffee shop (Study 3a) shows that consumers are less likely to tip, but that when they do, they tip more for lower (under $10) than higher ($10 and more) purchase amounts. With this presentation system, the lower the purchase amount, the higher the tipping options presented (e.g., for a $3 purchase amount, the tip options of $1, $2, and $3 are equivalent to 33.3%, 66.6% and 100%), while, for higher purchases consumers are presented standard percentages (15%-20%-25%). Thus, it is plausible that this system nudges consumers to choose one of these high options when the purchase amount is low and led to the press outrage we start the manuscript with. However, this presentation system makes it difficult to tease apart the individual effects of presentation frame and total purchase amount.

Accordingly, we designed a field experiment (Study 3b) to disentangle these variables. Consistent with H1, consumers left significantly higher tips when tip options were presented as dollars vs. percent options for low purchase amounts. Note that in the dollar presentation condition, the tip options of $1-$2-$3 represent a fairly standard 10%-20%-30% of the total purchase amount if the total was $9.99, yet they represent a more substantial 15.08%-30.17%-45.25%, for an average purchase amount ($6.63; see Study 3a); thus, if consumers choose to tip, they would be tipping more than a nominal $1. This suggests that the higher dollar options nudge consumers to leave greater tips compared to typical percentage options. The pattern of means in the percentage conditions is also

consistent with the idea that the range of options presented to consumers affects their decisions, as percentages were higher in the 15%-20%-25% condition versus the two lower percentage conditions. Finally, it is also consistent with the idea that consumers are guided by some norms about how much to tip, with tippers tipping significantly over 10% in all conditions. A limitation of this field experiment is that the range of tip options was lower in the percentage condition than in the dollar conditions, which is possibly what led to higher tips. Notwithstanding this critique, the study does demonstrate that the tactic of presenting absolute tip options at lower purchase values is effective for service establishments, indicating external validity of the findings.

Study 4: Comparing Open-ended to Closed-Ended Default Options

Study 3 examined the effect of tipping percentages when tip options are presented as a *fait accompli*; either using absolute dollar amounts or using percentages (H1). However, if the newspaper headlines that motivated this investigation **do not** reflect consumer reality, is it possible that leaving a tipping option open-ended elicits higher tips than in a closed ended frame (whether absolute or relative), especially if the closed end frames are used by consumers to construct tipping norms? Accordingly, in Study 4 we directly examined H2a testing the boundary condition of the ability of absolute frames to elicit higher tips when default options are in cents, and H3 comparing the two closed-ended frames (dollars or percentages) to an open-ended option (a tip jar).

Method

Participants and design. Study participants were 881 mTurkers (M_{age} = 38.11, SD = 12.03; 44.0% female) who participated for modest monetary compensation. We excluded 23 participants who started the study but never finished it (usable N = 858; or ≈ 100 per cell). This study employed a 4

(frame: closed-ended percent, closed-ended dollar, closed-ended dollar and percent and open-end [tip-jar]) × 2 (purchase amount: lower [$5] and higher [$35]) between-subjects design.

Procedure. Participants were asked to imagine that they were purchasing a few items at a coffee shop. Participants in the open-ended condition were asked to imagine that they noticed a jar with a "Tip" sign on it near the cashier. In the closed-ended conditions, participants were asked to imagine that the cashier swiped their credit card and turned her computer screen towards them to show them a tipping screen. In addition to the "Custom tip" and "No tip" options, for the percent frame conditions, the options were 10%-15%-20% across both small ($5) and large ($35) purchases; for the dollar frame conditions, the equivalent options were $0.5-$0.75-$1 ($5), and $3.5-$5.25-$7 ($35). We added another condition where participants saw both dollar and percentages.

In the three closed-ended (percent, dollar, and percent and dollar) conditions, participants chose one of the presented options, whereas in the tip jar condition, participants were asked to indicate (in USD) how much tip, if any, they would like to leave. As exploratory measures (analyzed in the Web Appendix) participants rated the coffee shop on different dimensions. Then they indicated their agreement with four items measuring *norms around leaving less than $1* ("Leaving less than $1 tip could be embarrassing," "There are times when it is better to not leave a tip at all than to leave less than $1 tip," "if I have less than $1 bill then I might not tip at all," and "I believe that $1 is a good tip amount for coffee shop service"), and an attention check item asking them to recall the total purchase amount. Finally, participants were asked if they had a credit card (724 [91.2%] reported that they did), their frequency of visiting coffee shops (M = 4.53), and their gender and age.

Results

Purchase expensiveness. Pretest results (N = 206) showed that a purchase of $35 (M = 6.11, SD = 1.28) is perceived as more expensive than a $5 purchase (M = 2.17, SD = 1.30); t(205) = 35.47, $p < .001$), confirming that $5 and $35 are considered small vs. large expenses in a coffee shop context.

Tip percentage for full sample. The likelihood of tipping was not contingent on the purchase amount or the frame used to elicit tips. For the full sample, the two-way between-subjects ANOVA on tipping percentage revealed a main effect of frame ($F(3, 850) = 13.46$, $p < .001$, $\eta^2 = .045$), with tips being highest in the open-ended (tip jar) condition (M = 27.99%, SD = 40.17) compared to the three closed-ended conditions (percentage M = 14.77%, SD = 19.94; $t(424) = 4.31$, $p < .001$, d =.41; dollar M = 15.12%, SD = 19.93; $t(425) = 4.20$, $p < .001$, d = .40; and dollar and percentage M = 14.77%, SD = 23.18; $t(425) = 4.17$, $p < .001$, d = .40) that did not differ from each other.

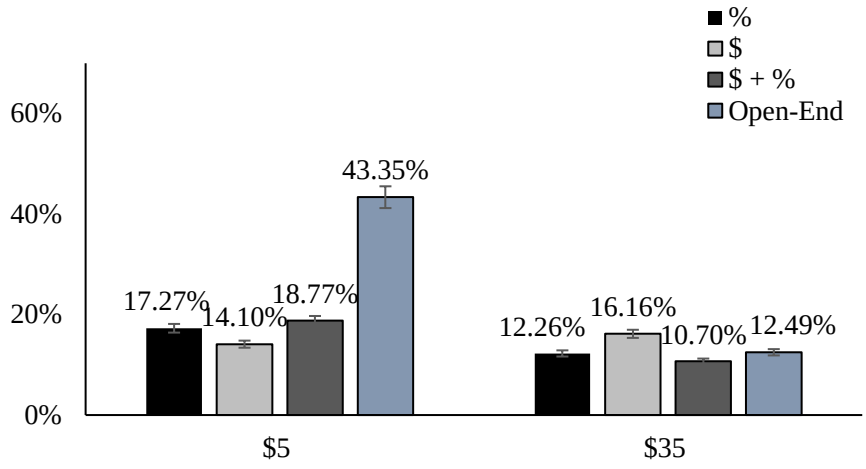

Figure 4. Tip percentage across purchase amount conditions and frame. Study 4

The main effect of total purchase amount was also significant ($F(1, 850) = 35.07$, $p < .001$, $\eta^2 = .040$), with tip percentage decreasing as the total purchase amount increased (Ms = 23.26%, and 12.91% , SDs = 36.27 and 12.21 for $5 and $35, respectively). Supporting H3, the interaction was significant ($F(3, 850) = 16.06$, $p < .001$, $\eta^2 = .054$), and showed that the effect of higher tips in the open-ended option (M = 43.34%, SD = 51.72, indicating a mean tip > $2) compared to the other frames is significant for the lower purchase amount (percent M = 17.26%, SD = 27.26; dollar M = 14.10%, SD = 19.56; percent and dollar M = 18.77%, SD = 31.42; *ps* < .001), but not for the higher

purchase amount (open-ended M = 12.48%, SD = 8.67; percent M = 12.26%, SD = 6.36; dollar M = 16.15%, SD = 20.34; percent and dollar M = 10.70, SD = 10.13; all *p*s vs. tip-jar > .302; figure 4). There were no significant differences between the other framing options.

Tip percentage for only tippers. Conditional on tipping, the same ANOVA on tipping percentage revealed a main effect of tip frame ($F(3, 704) = 12.08$, $p < .001$, $\eta^2 = .049$), with tips being highest in the open-ended condition (M = 31.92%, SD = 41.42) compared to the three closed-ended conditions (percentage M = 17.55%, SD = 20.59; $t(364) = 4.18$, $p < .001$, d =.43; dollar M = 18.35%, SD = 20.56; $t(361) = 3.92$, $p < .001$, d = .41; percent and dollar M = 18.99%, SD = 24.72; $t(351) = 3.51$, $p < .001$, d = .37). The main effect of total purchase amount was also significant ($F(1, 704) = 41.94$, $p < .001$, $\eta^2 = .054$), with tip percentage decreasing as the total purchase amount increased (Ms = 28.57%, and 15.27% , SDs = 38.27 and 11.84 for $5 and $35, respectively). As expected the interaction between purchase amount and frame was significant ($F(3, 704) = 16.52$, $p < .001$, $\eta^2 = .066$), showing that the effect of the open-ended option (M = 49.94%, SD = 52.47) compared to other frame conditions is significant for the lower purchase amount (percent M = 15.49%, SD = 5.67; dollar M = 21.43%, SD = 28.88; and percent and dollar M = 24.07%, SD = 33.77, all *p*s <.001); but not for the high purchase amount (open-ended M = 14.10%, SD = 7.88; percent M = 13.95%, SD = 4.77; dollar M = 19.17%, SD = 20.82; percent and dollar M = 13.79%, SD = 4.75; all *p*s vs. tip-jar > .198).

Supporting H2a, the difference between closed-ended percent and dollar frames was attenuated in the low purchase amount condition ($t(172) = 1.03$, $p = .301$ d =.15), but replicated in the high purchase amount condition with absolute frames leading to higher tips than percentage frames ($t(183) = 2.36$, $p = .019$. d =.34; see discussion).

In order to make sure that the results are not driven by outliers we examined them using a ±3 SD exclusion criteria. Results remain the same, showing a significant main effect of frame ($F(3, 687)$

= 16.96, $p < .001$, $\eta^2 = .069$), significant main effect of purchase amount (F(1, 687) = 37.02, $p < .001$, $\eta^2 = .051$) and a significant interaction (F(3, 687) = 22.72, $p < .001$, $\eta^2 = .090$).

Norms around $1 tip. A factor analysis showed that the four items loaded on to two factors: tip norms (*"*Leaving less than $1 tip could be embarrassing," and "There are times when it is better to not leave a tip at all than to leave less than $1 tip") and other ("If I have less than $1 bill then I might not tip at all," and "I believe that $1 is a good tip amount for coffee shop service"). Reliability of the two scales was low ($\alpha = .552, .332$), so we conducted separate two-way ANOVAs for each item. There was only an effect of the manipulations on the beliefs that leaving a tip smaller than $1 could be embarrassing. There was a significant main effect of frame (F(3, 843) = 3.85, $p = .009$, $\eta^2 = .014$), with significantly higher agreement in the percent frame (M = 4.75, SD = 2.09) compared to the dollar frame (M = 4.10, SD = 2.17; t(427) = 3.15, $p = .002$, d = .30) and the dollar and percent frame (M = 4.26, *SD* = 2.10; t(424) = 2.40, $p = .017$, d =.23), but no difference compared to the open-ended frame (M = 4.50, SD = 2.10; t(422) = 1.43, $p = .217$, d =.11), which was also marginally higher than the dollar frame (t(423) = 1.91, $p = .056$, d =.18). No other difference was significant.

These results suggest that when tip options are presented as small cash amounts (i.e., coins), they may shift consumers' norms about how much it is appropriate to tip, suggesting that tips under $1 may be more appropriate. A mediation analysis (PROCESS Macro in SPSS; Model 4) showed that for the dollar and percentages frames in the low purchase amount, embarrassment from leaving a tip under <$1 mediated the effect of frame on total tip amount perception (b = -2.18, SE = .88, 95% confidence interval: [-4.26, -.79]). Thus, presenting tip options in change made participants perceive these options as less embarrassing and more acceptable compared to the percentage frame, which, in turn, decreased total tips, moderating H1 and supporting H2a.

Discussion

Supporting H3, the results of Study 4 showed that tip amounts can be higher when tip options are given in an open-ended format vs. closed ended formats (either dollar or percent). This finding is in opposition to the popular press' accusations that default tip options are forcing consumers to leave higher tips than they would otherwise prefer. Study 4 further demonstrated a boundary condition for H1: Supporting H2a, absolute frames did not lead to higher tips versus percentage frames when they were presented in fractional terms (e.g., $0.50¢). This is because, as argued, and empirically shown, by previous research, the tip options presented are not just a method of eliciting a decision, but also serve as a source of information that consumers use to construct a judgment (Schwarz et al. 1985). In this study we found that the dollar frame condition led to higher tips compared to the percent frame for the purchase amount of $35, which is consistent with Study 1a and Study 1b results, but not Study 2 results where there was no difference for the $20 purchase amount. Accordingly, we replicated this study using 532 students from a northeastern university. Results were similar showing support for H3 and H2a, while the difference between the dollar vs. percent conditions in the higher purchase amount condition was not significant (see General Discussion).

STUDY 5: THE EFFECT OF FRAME ON HIGH EXPENSES

Study 5 aims to test H3 and to examine an additional boundary condition to H1. This study examines H2b using contexts where purchase amounts are high suggesting that consumers would be highly motivated to calculate the value of their tip in the percentage conditions, and assess the appropriateness of the tip suggestions in the absolute tip option conditions.

Method

Participants and design. Study participants were 636 mTurkers (M_{age} = 39.00, *SD* = 11.82; 45.9% female) who participated in exchange for monetary compensation. We excluded six participants

who left between 170% to 1000% tip, leaving a usable sample of 630 participants. This study employed a 3 (frame: open-ended, closed-ended percent, closed-ended dollar) × 2 (purchase amount: lower [$100] and higher [$1000]) between-subjects design.

Procedure. Participants were asked to imagine that they were invited to a gala event, and that tickets prices for the event varied between $70 and $1400 (to provide a reference that their own ticket was lower or higher priced). Participants were then told to imagine they had decided to purchase a ticket which included a self-service buffet dinner and a premium VIP seat at a concert of one of their favorite bands for the price of $100 ($1000). They were offered the option to leave a tip for the staff members at the event (and were told that the tips are prepaid as a safety measure due to COVID19[10]). In addition to "Custom tip" and "No tip" options, for the $100 tip dollar frame condition, the options were: $10, $15, $20, and for the $1000 tip dollar frame condition, they were $100, $150, $200. In the percent frame conditions, the options were 10%, 15%, and 20%, and in the open-ended condition participants indicated how much tip they would like to leave in USD. We recorded participants time spent on the DV page as an indication of decision time as a function of frame and size for the bill. Participants were then asked to indicate their *sticker shock* from the tip options ("The tip options presented to me were extremely high" from 1- completely disagree to 7- completely agree). As exploratory measures (results are reported in the Web Appendix) participants were asked to rate their *anticipated enjoyment* (α = .88) from the event across three measures and were asked about *Prepaid Tip Norms* (α = .72), indicating the degree to which they agree/disagree with the statements ("I think it is wise to ask for the tips in advance", "I do not like to prepay for tips", "The event organizers should not have asked for tips at all" on a scale from 1- completely disagree to 7- completely agree). Finally, participants answered an attention check item asking them to recall the

[10] This study was conducted during the pandemic in November 2020

total purchase amount, to indicate whether they had a credit card (532 [83.6%] did), their gender, age, and economic status (M = 2.53 on a 1 to 5 scale). The Web Appendix reports other measures not pertinent to these analyses.

Results

Purchase expensiveness. Pretest results (N = 206) show that a total purchase of $1000 (M = 6.35, SD = 1.03) is perceived as more expensive than a total purchase of $100 (M = 2.76, SD = 1.49; $t(204) = 33.86$, $p < .001$), confirming that the lower vs. higher expense manipulation was successful.

Tip percentage for full sample. The likelihood of tipping was not contingent on the purchase amount or on the frame used to elicit tips. A two-way between-subjects ANOVA on the tip percentages, revealed a significant main effect of frame ($F(2, 614) = 17.15$ $p < .001$, $\eta^2 = .053$), with tips being higher in the open-ended condition (M = 18.85%, SD = 24.81) than in the dollar frame (M = 11.51%, SD = 6.10; $t(408) = 4.13$, $p < .001$, d = .40) and the percentage frame (M = 11.53%, SD = 6.51; $t(411) = 4.12$, $p < .001$, d = .40), with no difference between the dollar and percentage frame ($t(415) = .043$, $p = .966$, d < .001). The main effect of total purchase amount was significant ($F(1, 614) = 14.87$ $p < .001$, $\eta^2 = .024$), with tips decreasing as the total purchase amount increased (Ms = 16.16% and 11.69%, SDs = 16.40 and 14.17, for small [$100] and large [$1000], respectively). The interaction between purchase amount and frame was significant ($F(2, 614) = 8.09$, $p < .001$, $\eta^2 = .026$), with participants leaving significantly larger tips in the open-ended condition (M = 24.56%, SD = 25.80) than in the dollar frame (M = 12.62%, SD = 5.17; $t(202) = 4.62$, $p < .001$, d = .64) and the percentage frame(M = 11.65%, SD = 6.02; $t(203) = 4.98$, $p < .001$, d = .68) for the lower purchase value of $100; the difference between dollar and percent was not significant ($t(207) = 1.24$, $p = .215$, d = .17). These differences were attenuated for the larger purchase condition in both in the dollar frame (M = 10.38%, SD = 6.75) and percent frame (M = 11.41%, SD = 7.00) compared to the open-

end tip frame condition (M = 13.30%, SD = 22.58), t(204) = 1.25, p = .211, d = .17, and t(206) = .817, p = .415, d = .11, respectively, Figure 5).

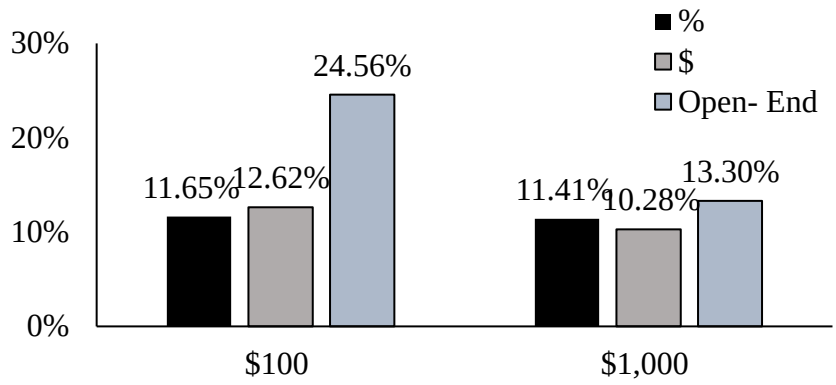

Figure 5. Tip percentages across purchase amount and frame contingent on tipping. Study 5

Tip percentage for only tippers. A similar ANOVA on the tip percentages of just the subset who tipped revealed a main effect of frame ($F(2, 571) = 16.42$ $p < .001$, $\eta^2 = .054$) with larger tips in the open-ended frame (M = 19.72%, SD = 25.04) compared to the dollar frame (M = 12.28%, SD = 5.50; t(386) = 4.04, $p < .001$, d = .41) and percentage frame (M = 12.81%, SD = 5.54; t(381) = 3.70 , $p < .001$, d = .38), with no difference between the dollar and percentage frames (t(381) = .951, p = .342, d < .001). The main effect of total purchase amount was also significant ($F(1, 571) = 18.90$, $p < .001$, $\eta^2 = .032$), with tip values decreasing as the total purchase amount increased (Ms = 17.64% and 12.37%, SDs = 16.36 and 14.28 for total purchases of $100 and $1000, respectively). The interaction between purchase amount and frame was again significant ($F(2, 571) = 9.52$, $p < .001$, $\eta^2 = .032$), with participants leaving significantly larger tips in the open-ended condition (M = 26.41%, SD = 25.82) than in the dollar frame (M = 13.53%, SD = 4.03; t(188) = 4.85, $p < .001$, d = .62) and the percentage frame (M = 13.16%, SD = 4.58; t(184) = 4.87, $p < .001$, d = .71) for the lower purchase value of $100; and the difference between dollar and percent not significant (t(207) = 1.24, p = .215 , d = .17). These differences were attenuated for the higher purchase amount condition in both the dollar (M =

10.38%, SD = 6.75) and percent (M = 11.41%, SD = 7.00) frames compared to the open-ended condition (M = 13.30%, SD = 22.58); t(204) = 1.25, p = .211, d = .17, and t(205) = .817, p = .415, d = .11, respectively.

Tip Percentages excluding outliers. We examined the results excluding outliers using ±3SD exclusion criteria. Results show a non-significant effect of frame (F(1, 556) = 1.52, p = .219, η^2 = .005), and a significant main effect of purchase amount (F(1, 556) = 53.97, p < .001, η^2 = .088), with higher tips in the low (M = 15.04%, SD = 7.81) compared to the high (M = 10.62%, SD = 7.51) purchase amount condition. The interaction was significant and consistent with previous results (F(2, 556) = 23.10, p < .001, η^2 = .077), showing significantly larger tips in the open-ended condition (M = 18.88%, SD = 11.71) compared to the dollar frame (M = 13.53%, SD = 4.03; t(179) = 4.22, p < .001, d = .61) and the percentage frame (M = 13.16%, SD = 4.58; t(175) = 4.36, p < .001, d = .64) for lower purchase amounts; the effect being reversed for the higher purchase amount condition: open-ended (M = 8.33%, SD = 8.97) compared to dollar (M = 11.02%, SD = 6.43; t(190) = 2.38, p = .018, d = .34) and to percent (M = 12.48%, SD = 6.34; t(189) = 3.69, p < .001, d = .53).

Sticker Shock. A two-way Anova comparing the dollar and percentages frame and total purchase amount on people's perceptions of the expensiveness of the tip options revealed a marginal main effect of frame such that people perceived the tip options as more expensive in the dollar condition (M = 4.51, SD = 1.98) compared to percentages (M = 4.16, SD = 2.05; F(1, 400) = 3.04, p = .082, η^2 = .008). The main effect of purchase amount was also significant with greater perceptions of expensive tip options in the higher purchase amount condition (M = 4.76, SD = 1.88) compared to the low purchase amount condition (M = 3.91, SD = 2.07; F(1, 400) = 18.34, p < .001, η^2 = .044). The interaction effect was not significant (F(1, 400) = .001, p = .970, η^2 < .001).

Discussion

Supporting H3, Study 5 shows that the effect of framing options in an open-ended format replicated for lower purchase amounts in contexts of high bills. In Study 5, we further found support for H2b: The purchase amount which was high to begin with led participants to show no differences in tips between the dollar and percentages frames. Participants in the dollar condition perceived the tip options provided to be marginally higher than the percentages condition, suggesting that for high purchase amounts (even if the price is considered the low range in a specific context) people may perceive absolute options as more expensive than percentages.

GENERAL DISCUSSION

Across seven studies, including both field studies and laboratory experiments, our results consistently show that, compared to being framed as percentages, framing a tip as absolute dollar amount leads to larger tip amounts, especially with smaller total purchase amounts. This effect held true both when participants were presented with closed-ended responses (choosing from one of three provided numerical tip options), when presented with a scale of responses and when asked to come up with the tip amount using an open-ended format, suggesting that such absolute vs. relative framing is an important influencer of tip amounts. We identified contexts in which these effects no longer hold, showing that similar to what has been documented by Schwarz et al. (1985), in a norm driven behavior such as tipping, the provided default options serve as a proxy for what is an acceptable price. When the absolute tip options are lower than $1 consumers no longer give greater tips compared to when the options are presented in percent. We show that this is due to a norm shift, with participants believing that tipping less than $1 is more acceptable in the absolute frame vs. the percent frame. Furthermore, in situations where the absolute default options are set very high consumers perceive the absolute dollar options to be higher than the percentages options and their overall tip is no longer greater

compared to when they are presented with percentages. When tips options are framed in an open-ended format consumer tend to give larger tips than when options are framed as closed-ended (i.e., as dollar, as percentages, or both) for low purchase amounts. These findings suggest that consumers' aversion to screen-based tip systems, accusing these systems to bully them to tip more than they wish (the "tip creep" phenomena), does not translate to their actual tipping intentions especially for mundane services such as coffee shops where the prices are lower.

Internal Meta-Analyses

To examine the robustness of our findings, we conducted a series of internal meta-analyses to test the effects of the frame manipulation on tipping percentages. We calculated a Cohen's d for each construct, comparing the simple effects results in the percent condition with results in the dollar condition. We then meta-analyzed our Cohen's ds from our studies using a fixed effects approach (Goh, Hall, and Rosenthal 2016) with Z-scores calculated based on the mean effect size and its standard error. See descriptive statistics in each study and meta-analysis results across all studies in Table 4.

For the dollar vs. percent in all samples, we observed a significant effect of frame on tipping behavior ($d = 0.10$, $z = 9.59$, $p < .001$, 95% confidence interval: [.08, .13]), such that, across studies, people left larger tips when the tips options were framed as dollars than as percentages. When looking at only those who tipped, we observed a similar effect of frame on tipping behavior ($d = 0.65$, $z = 40.22$, $p < .001$, 95% confidence interval: [.61, .68]). Therefore, these meta-analyses supported our hypotheses that dollar frames lead to larger tips compared to percentages frame.

Study	Means (SD) in % Full Sample		Means (SD) in % Only Tippers	
	Percentage	Dollar	Percentages	Dollars
Study 1a	12.18 (7.32)	17.46 (22.51)	15.60 (4.64)	23.34 (25.96)
Study 1B	8.59 (8.74)	16.59 (17.15)	12.26 (3.30)	33.72 (13.11)
Study 2	10.39 (9.23)	15.26 (9.48)	12.89 (8.57)	16.32 (8.87)
Study 3A	7.71 (8.06)	8.80 (13.19)	15.09 (3.98)	22.00 (11.94)
Study 3B	6.76 (9.15)	11.44 (14.52)	15.61 (2.84)	23.91 (11.90)
Study 4	14.77 (19.94)	15.12 (19.93)	17.55 (20.59)	18.35 (24.72)
Study 5	11.53 (6.51)	11.51 (6.10)	12.81 (5.54)	12.28 (5.50)
Effect Size	d = 0.10, z = 9.59, $p < .001$, 95% confidence interval: [.08, .13]		d = 0.65, z = 40.22, p < .001, 95% confidence interval: [.61, .68]	

Table 4. Mini Meta-Analysis: Means and standard deviations across studies

Implications for Survey Methods, Price Promotion, and Participative Pricing

This research shows that the effects of a survey instrument being a source of information used by consumers to construct a judgment, translates well into the domain where consumers are given a set of options to choose from, such as when they are presented with tipping options. As such, merging the literature from survey methods with the literature on voluntary payments promises to be a promising avenue for future research.

This paper also showed some relevant boundary conditions to framing effects that have been demonstrated in the pricing and price promotions literatures. They showed that social norms, that either pre-exist, or are constructed due to the context, can attenuate the effects of framing that have been demonstrated in the past.

Examining digital nudging mechanisms and default options has implications for the growing area of participative pricing, where consumers decide on how much they will pay (Bluvstein Netter and Raghubir 2021; Kim, Natter and Spann 2009), and of behavioral pricing, more generally including

choice architecture and framing of defaults. There are also implications for how new technologies (e.g., electronic payment systems) affect consumer behavior and for understanding consumers' pro-social behavior in a commercial, for-profit domain. Theoretically, this work adds to the literatures of the cognitive aspects of survey methods and price promotions by showing, in the unique context of default tip options, when absolute dollar, relative percentage, and open-ended tipping options should be presented if the goal is to maximize the tip size.

Contribution to the Literature on Tips

Prior research shows that consumers' tip decisions are a function of social norms and social influences that affect their feelings of embarrassment, anxiety, pride, guilt, shame, anger, and indignation, and their motives to impress others and be liked and accepted (Aronson, Wilson and Akert 1999; Azar 2003, 2005, 2007; Bluvstein Netter and Raghubir 2021; Bodvarsson and Gibson 1991; Elster 1989, 1998; Rabin 1998). Lynn (2009) and Azar (2010) found that the motivation to gain approval was stronger than that of avoiding negative feelings from not tipping.

Not surprisingly, bill amount is the largest predictor of tip amount in restaurants, often accounting for more than 50 percent of the variance in tip size (Freeman and King 1975; Lynn and Latane 1984; Lynn and Grassman 1990; Bodvarsson and Gibson 1991; Lynn and Mynier 1993; Lynn, Zinkhan, and Harris 1993). However, in ubiquitous modern contexts that use screen-based tip system (e.g., coffee shops, food delivery apps), norms have yet to be established and understood, so it is unclear how consumers would respond in these contexts.

We add to the literature on tipping by showing how factors intrinsic to the tipping context can affect tip amounts; and by expanding the contexts examined beyond the social economics, hospitality, and tourism industries in which most of the effects have been previously documented (e.g., Azar 2003, 2004; Lynn 1996, 2006). From a consumer welfare perspective, we have increased awareness of how default options can affect consumers' generosity, leading them to leave smaller or larger tips than they

might have desired. The research also has implication for labor welfare as the Economic Policy Institute (EPI) conservatively estimates that annual wages from reported tips are $36.4 billion, referring to this as a conservative estimate (Shierholz et al. 2017).

Managerial Implications

Studying the digital nudging of default options in the service domain also has managerial implications for the profitability of service establishments, as proposed government legislation would allow employers to take tips from tipped employees and choose whether or not to redistribute them to untipped employees (e.g., dishwashers) or to allow them to keep that income. The EPI estimates that if such tip were not redistributed, employers could "steal" as much as $5.8 billion of tip income from their employees. Accordingly, managerially, we spotlight a large source of income to service staff (and potentially the establishment) and recommend how they should construct their tipping options.

The results of the present study provide unique and novel insights into how the choice architecture of default options affects consumers. Results may provide practical suggestions for business managers in the service industry on how to frame the tips they present to their customers: to request tips in an open-ended format if their goal is to receive higher tips. When closed-ended options are required (i.e., such in the point-of sale digital payment collection systems in the market) framing the default options in absolute terms (US $) is more likely to increase tip amounts for low bills. For high bills, services may use either open-end, dollar, percentages or both frames as the total tip amount did not differ across frames for high bills in our studies. Such decisions could impact the potential success of the business, but also the income of its employees, albeit coming at the cost of the customer.

These findings also have implications for other industries, as they show the power of the effects of framing (absolute vs. relative, open- vs closed-ended), bill amount, and, in particular, how these two factors interact. The effects observed in this study are relevant not only to other service

industries with bills that range from small to large (e.g., ride sharing, coffee shops, delivery apps), but for other contexts such as charity events. People's decisions to give, whether a tip or donation, could be substantively influenced not only by how much the amount is, but by how the request is framed enriching the practical implication drawn from other research on default options in a donation context (Desmet and Feinberg 2003).

One of the practical applications of these findings is that coffee shops and other places that tend to have smaller bills would do well to frame their tip screens with dollar amounts, whereas restaurants and other places where the bill is greater would benefit from framing their tip options as percentages. We hope this work will promote future work in the field of digital nudging, an area which, according to researchers, will soon extend to other application areas as people will use digital devices to make decisions in more situations and sectors (Weinmann, Schneider & Vom Brocke 2016).

Limitations and Areas for Future Research

This paper examined a focused question of framing of tips options in the intrinsic context of tipping. However, those in the service industry have to make a number of decisions as to how to construct their tipping options: Should they be in ascending order or descending order if they are closed-ended? Should they include verbal anchors or not, and, of so, what should those verbal anchors say? Should they make explicit the option that a tip is not required to reduce reactance and increase tipping likelihood? Should they include "Recommended" or "Suggested" tip amounts or percentages or both? These unanswered questions, and the psychology behind them, we hope will inspire more research into the psychology of a consumer's tipping decision. As tipping is prosocial norm driven behavior different from other participating pricing mechanisms, other factors may influence consumers tipping decisions as a function of the scale used. Future research may examine how these effects evolve in time as consumers become familiar with these systems and establish norms toward

these new payment contexts. By better understanding these effects and how translatable they are, we can better understand the technology dominant reality and how it affects consumers, better harness the buying power of people to better sustain employees, better support charities, and better improve our world.

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Web Appendix

When You Charge Less than a Jackson Greens Best Be Your Nudging Action:

Framing Choice Alternatives in the New Age of Voluntary Payments Economy

This PDF file includes:

Supplementary Results and Analyses for Studies 2, 3a, 4 and 5.

STUDY 2: DOLLAR VS. PERCENTAGES USING CLOSED END SLIDER SCALE

Exploratory measures not reported in manuscript:

Perceptions of Generosity and Impacts. An ANOVA on the four-item generosity and impact scale revealed a significant main effect of framing ($F(1, 207) = 4.80$, $p = .03$, $\eta^2 = .023$), with generosity and impact ratings being higher in the dollar framing condition ($M = 3.99$, $SD = 1.41$) than the percent framing condition ($M = 3.53$, $SD = 1.63$). The main effect of total purchase amount was not significant ($F(1, 207) = .08$, $p = .772$, $\eta^2 < .001$), but the interaction was marginal ($F(1, 189) = 3.53$, $p = .062$, $\eta^2 = .017$). The interaction showed that the difference in ratings between dollar and percent framing was significant in the low purchase amount condition ($Ms = 4.16$ versus 3.31 for dollar and percent, respectively; $t(105) = 2.750$, $p = .006$, $d = .53$), but not in the high purchase amount condition ($Ms = 3.83$ versus 3.76 for dollar and percent, respectively; $F < 1$).

Mediation analyses. In order to test whether the framing manipulation increased participants' self-reported generosity due to their tip amount, we conducted a moderated mediation analysis with 10,000 bootstrap samples (SPSS Macro PROCESS, Model 7). We defined the framing manipulation as the independent variable, total tip amount as the mediator, the total bill amount as the moderator and reported generosity as the dependent variable. As expected, tip amount mediated the relationship between the framing manipulation and participants' perceptions of self-generosity, indicating that framing of tip options as dollar (vs. percentages) led to higher tips, which in turn increased participants' generosity and impact perceptions and that this effect was moderated by total bill amount, occurring only for lower total bills ($b = .44$, $SE = .22$, 95% CI = [.02, .91]).

Satisfaction. There were no effects of the independent variables on how satisfied customers were with their tips ($F < 1$).

Calculation Difficulty. We examined the robustness of our results to calculation and math difficulty to test whether the results can be explained by people's difficulty in calculating the absolute value of the tip in the percent condition across different bill amounts. We conducted an analysis of covariance (ANCOVA) controlling for calculation difficulty and participants' overall report of their ability in math.

Studies 3a: Secondary Data on Digital Default Options

Additional information on data and system

Method

The System. The system is programmed on tablet devices such that, at the moment of a credit or debit card sale, the system presents tipping options to the consumer. The point-of-sale system at this coffee shop shows tip options in one of two ways: The first is to show percentage only, whereby the business owner decides what tip percentages to present. The system allows for exactly three numerical choices, with default tipping options of 15%, 20%, and 25%, although those options can be changed, if desired. Additionally, a "No tip" and a "Custom tip" option (where a customer can include a preferred USD tip amount) are typically presented. This system uses relative framing (percentages) with a predominantly closed-ended response set.

The second tipping method is the "smart" tipping system which is their in-use system. In this method, for total bill under $10, the system presents tip options in absolute dollar amounts ($1, $2, or $3), and for total bill amounts that are over $10, tip options in percentage form, specifically 15%, 20%, and 25%, along with a "No tip" and a "Custom tip" option. Note that at no bill amount are these options equivalent. For example, for a $10 bill, the absolute bill amounts are 10%, 20% and 30%, with the same mean, but a higher range than the relative tip options of 15%, 20%, and 25%.

The Coffee Shop. The coffee shop offers drinks, meals, and snacks. Although consumers can dine in or take the order to go, the payment—including tip—is made at the time of placing the order.

The coffee shop uses the smart as its default tipping method for customer paying with a credit or debit card which account for roughly 56%[11] of the transaction in the coffee shop.

The Data. The data contain 51,825 observations of transactions that were made using credit or debit cards over 16 months, from January 1, 2016 to April 31, 2017. For every transaction, the data provide the date, time, net sale, gross sale, tax amount, tip amount, credit card brand (Visa = 74.1% or 38,412), and a description of the items ordered. Over half the transactions did not include a tip (N = 29, 972 or 57.83%). Of those transactions that included a tip, the tip ranged from a dime to $15.14, with the modal tip amount $1 (M = $1.37; Distribution: 0.10¢-.99¢ = 996; $1 = 14,758; $1-$1.99 = 1747; $2 = 1,583; >$2 = 2,769). The tip percentage was calculated on the basis of the tip amount divided by gross sale (including tax). Tip percentages varied widely for the 21,853 transactions where a tip was collected (M = 20.59%, *Range* = 0.4%-240%).

The average net sale of the coffee shop was $6.63 (SD = 5.00; *Range* = $1.00-$188.96; Distribution: <$3=8,883; $3-$4.99 = 15,573, $5-$9.99 = 18,656; $10.00-$14.99 = 5,777; ≥$15 = 2,936). We coded approximately half of the observations (N = 27,596, or 53.2%) in terms of what was ordered. Hot and cold beverages (coffee/ tea: 22,124 or 80.17%), an over-the-counter (OTC) item (e.g., bagel, croissant, or muffin: 1,579 or 5.70%); or their combination: (1,674 or 6.10%), accounted for over 90% of all purchases. Thus, these low cost and low service requirement purchases accounted for the majority of transactions (under $10 =43,112). These are the transactions where tip options are presented in absolute USD amounts. If we find, as expected, that tip percentages are higher for lower bill amounts, it is unlikely that these tips would reflect service effort. Irrespective, for our examination we control for total bill amount.

[11] Approximation based on examining two weeks of transactions during May 2017.

Dependent variables. We looked at the likelihood to tip and the total tip percentage given as a function of presentation of absolute ($1, $2, $3) vs. relative (15%, 20%, 25%) tipping options. To examine the effect of bill size, we conducted an ANCOVA controlling for net bill size in the analysis of tip percentage, as well as examined tip likelihood and tip percent as a function of three sizes of a bill for customers whose bill was $\leq$ $10; over 80% of the data set.

Additional Results Not Reported in the Main Paper

Tip Rate. To get a better understanding of the customers whose total purchase was under $10 (tip options: $1, $2, $3), we divided the sample into three spending groups: under or equal $3, $3.01-$4.99, and $5-$9.99 (Ns = 8,883, 15,573 and 18,656, respectively) and examined their likelihood to tip. Mirroring the results of the above analyses, as purchase size grew, so did the likelihood of tipping from 28.7% (N = 2,553) to 36.6% (N = 5,702), to 49.0% (N = 9142; $\chi^2(2) = 1168.06$, $p < .001$). These results are understandable, as the lowest tipping option ($1) is ≥33.3% for a bill size under $3, 20%-33.33% for bills between $3.01- $4.99, and 10%-20% for bills between $5-$9.99.

We also analyzed tips for the subset of customers whose bill was within a 0.25¢, 0.50¢ and $1 of the $10 inflexion point where tipping response formats change from absolute dollar levels to relative percentages and find preliminary effect of framing controlling for bill size.

STUDY 4: COMPARING OPEN-ENDED TO CLOSED-ENDED DEFAULT OPTIONS

Exploratory Measures not Reported in Manuscript

Rating of the Coffee shop. A 4 (frame) x 2 (purchase amounts) ANOVA on respondents rating of the coffee shop revealed a non-significant main effect of frame ($F(3, 847) = 1.76$, $p = .152$, $\eta^2 = .006$), or purchase amount ($F(1, 847) = 1.00$, $p = .316$, $\eta^2 < .001$). The interaction term was not significant ($F(3, 847) = 1.95$, $p = .120$, $\eta^2 = .007$).

STUDY 5: THE EFFECT OF FRAME ON HIGH EXPENSES

Exploratory Measures not Reported in Manuscript

Participants answered *Prepaid Tip Norms* scale (α = .72), indicating the degree to which they agree/disagree with the statements: a. *I think it is wise to ask for the tips in advance* b. *The tip options presented to me were extremely high* c. *I do not like to prepay for tips*. d. *The event organizers should not have asked for tips at all* on a scale from 1*(completely disagree)* to 7 *(completely agree)*. Then participants answered questions about their *anticipated experience at the event* (α = .88) a. *To what extent do you believe that you will enjoy the gala event?* b. *To what extent do you believe that you will have a good time at the event?* c. *To what extent do you believe that the event will meet your expectations?* d. *To what extent do you think it was a good decision to buy the ticket for the gala event?*

Results

Prepaid Tip Norms Scale. A 3 (frame) x 2 (purchase amounts) ANOVA on respondents perceptions of prepaid tips revealed a non-significant main effect of frame ($F(2, 574) = .189$, $p = .152$, $\eta^2 = .007$), a significant effect of purchase amount ($F(1, 574) = 13.41$, $p < .001$, $\eta^2 = .023$), with lower perceptions of prepaid tips in the high purchase amount condition (M = 4.60, SD = 1.55) compared to the lower purchase amount (M = 4.13, SD = 1.57). The interaction term was not significant ($F(2, 574) = .128$, $p = .880$, $\eta^2 < .001$).

Anticipated experience at the event. A 3 (frame) x 2 (purchase amounts) ANOVA on respondents ratings of their anticipated experience a significant effect of frame ($F(2, 573) = 4.13$, $p = .016$, $\eta^2 = .014$), such that ratings were highest in the closed end dollar condition (M = 5.65, SD = .98), followed by the closed-end percentages condition (M = 5.40, SD = 1.14), and the open-end frame condition (M = 5.37, SD = 1.09). Pairwise comparison revealed that both the differences between the closed end dollar condition and the relative percentage condition ($t(402) = -2.40$, $p = .017$, d = .23) as

well as the open end condition were significant ($t(376) = 2.61$, $p = .009$, $d = .27$), whereas the difference between the percent and open-ended frames was not ($t < 1$). The main effect of total bill amount was not significant ($F(1, 573) = .394$, $p = .531$, $\eta^2 = .001$), nor was the interaction ($F(2, 573) = .856$, $p = .557$, $\eta^2 = .002$).