"Nothing Matters":

A "0%" Option Increases Consumers' Voluntary Payments

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Abstract

This research examines how the choice of options used in screen-based payment collection systems affects consumers' voluntary payments in the form of tipping. One field experiment and six lab experiments show that having a numerical zero tip option (i.e., 0%) in the choice set, either replacing the default "No Tip" option as an opt-out option, or included along with the "No Tip" as an additional means of opting out, counterintuitively shifts consumers' choices towards higher tip options, resulting in their giving higher tips compared to when only non-numeric zero tip options are present. When two opt-out options are present, consumers are significantly more likely to choose "No Tip," as compared to "0%" option when they wish to opt out from tipping. This effect is observed for different bill sizes, with different ranges of default options, across service contexts, and when the "0%" option is compared to a nominally small numerical option (e.g., 1%). The effect is mediated through self-image and empathic concerns, indicating that "0%" nudges consumers to tip more due to both impression management as well as social considerations. These results add to the evidence that consumers use contextual information to generate a response, adding to the survey methods literature. They also have theoretical implications for nudging mechanisms, the numerical cognition, prosocial behavior, and the behavioral pricing literatures, as well as practical implications for businesses in the service industry.

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In modern technological society, electronic payments collection systems (e.g., Square), are becoming increasingly widespread. These systems allow businesses to request tip payments by presenting customers with multiple default options (e.g., 20%, 25%, 30%, Custom Tip, No Tip). In some businesses that use these systems, tipping norms are not well established (e.g., coffee shops, delivery apps, ride share services, farmers markets, etc.), making these environments unique for studying how the architecture of tip request options affect people's likelihood to tip and the tip given. Extensive research on default options in contexts ranging from cognitive aspects of survey methodology (e.g., Schwarz et al., 1985), to behavioral economics ($$CITE$$), shows that the manner in which response options are constructed influences consumers' responses. Building on these insights, we apply them to show the effect of the choice of default options on customers tipping decisions. Our focus is on framing the opt-out option.

Specifically, this research examines the effect of framing an opt-out option using a numeric option: 0%, versus other semantically equivalent options (e.g., "No Tip") on consumers' tipping intentions and behavior. One field experiment and six lab experiments show that having a numerical zero tip option (i.e., 0%) in the choice set, either replacing the default "No Tip" option as an opt-out option, or included along with "No Tip" as an additional means of opting out, counterintuitively shifts consumers' choices towards higher tip options. We further show that consumers react differently to "0%" than to other small numbers (e.g., 1%) and to other verbal descriptions of zero.

After a brief summary of changes taking place in the voluntary payment economy, factors affecting voluntary payments, the effect of default options, and properties of the number "0," we describe the studies and conclude with theoretical implications for nudging mechanisms, the

survey methods, numerical cognition, prosocial behavior, and the behavioral pricing literatures, as well as practical implications for businesses in the service industry.

VOLUNTARY PAYMENTS

The New Age of Voluntary Payments

A considerable amount of research in consumer behavior has focused on voluntary market payments in the form of elective and participative pricing, such as pay-what-you-want pricing (e.g., PWYW, Christopher and Machado 2019; Jung et al. 2017; Kim, Natter and Spann 2009; Lee, Baumgartner, and Pieters 2021). However, this literature has largely neglected one of the largest voluntary payment economies: service fees and tipping (but see Bluvstein Netter and Raghubir, 2021, Luangrath, Peck, and Gustafsson 2020). Tipping has been mainly explored in the fields of behavioral economics and hospitality management in the context of the traditional manner of eliciting tips (e.g., Azar 2011; Lynn and McCall 2016; Natter and Kaufmann 2015; Schwartz 1997). The importance of exploring this economy from a consumer behavior perspective is increasing as the service industry continues to undergo a technological transformation. The tipping industry has moved in the last few years towards greater use of electronic payment collection systems (point-of sale [POS] systems, Kugel 2019; Stout 2015). This change has three implications: explicitness of the tip request, its timing, and an increase in contexts in which tips are requested. These are discussed next.

POS Systems. Traditional, older forms of tipping (e.g., tip jars, tip line on a receipt) are relatively implicit in their requests, leaving the decision of whether and how much to tip to the customer's discretion. In contrast, POS systems include requests as part of the transaction, typically providing several numerical options of tip amounts (e.g., 10%, 15%, and 20%). This

transformation, further intensified during the pandemic, is, in part, responsible for increases in tipping in the US. Today the tip economy is a multi-billion dollar market with $47 billion annually in the US food industry alone (Azar 2011).

In addition to the explicitness of POS tip requests, the timing of the tip request itself can be prior to any service being performed, as is the case for customers paying at coffee shops, bakeries, food trucks, and food delivery apps (Kugel 2019). This essentially disconnects the amount tipped from the quality of the service.

Finally, tips today are requested in a wide range of new contexts where the norms of whether and how much to tip are not established. These include contexts where there is little to no service (e.g., self-serve shops, paying for produce at a farmer's market, automated campaign donation), or when the overall cost includes labor and installation (e.g., garage door installation). These changes in the explicit, up-front nature of tips requests in contexts where tips had previously not been solicited (e.g., Uber)—is what the popular media has called "tip creep" (Stout 2015), a reference to how these POS systems pressure customers to leave a tip where they previously would not have, or to leave a larger tip than they otherwise would have (Levitz 2018). To understand how consumers make voluntary payment decisions, we now briefly that literature.

Factors Affecting Voluntary Payments

Voluntary payments exist in both for profit and non-profit contexts. In the for profit domain, voluntary payments are referred to as participative pricing, and in the non-profit domain as charitable donations. The participative pricing literature shows that consumers prefer determining their own prices, as this makes their purchase feel fairer and more satisfying (Haws and Bearden 2006). Further, consumers have higher purchase intentions as a result of the sense of control it provides (Chandran and Morwitz 2005), and are more generous as a result of image concerns (Akerlof and Kranton 2000; Azar 2004; Bluvstein Netter and Raghubir 2021; Cox et al. 2018), ultimately

resulting in their paying or donating more (Gneezy et al. 2010; Kim et al. 2009). Contrary to concerns that people might exploit such systems by underpaying (or not paying), these results show that consumers do still pay—oftentimes even pay more—when allowed to choose for themselves.

Tipping has been recently identified as an example of a participative pricing mechanism (Bluvstein Netter and Raghubir 2021), as the consumer participates in determining the price. Tipping is affected by a multitude of socio-psychological and contextual factors that make it a unique form of participative pricing. Given the role of image concerns in participative pricing, it is unsurprising that factors such as generosity (Shamir 1984) and status or power displays (Faber 1982; Lee et al. 2020; Scott 1916) influence tipping. And, given how tipping is normatively expected to correspond to the quality of the service, it is also unsurprising that it is motivated by wanting to reward staff for good service and/ or compensate them for poor wages (Futrell 2015; Holloway 1985; Lynn and Graves 1996) and by wanting to following social norms (Azar 2007; Bodvarsson and Gibson 1999; Hemenway 1984; McCarty et al. 1990).

One less obvious and less researched factor that can affect consumers' decisions on whether and how much to pay—and one that has become increasingly prevalent with POS systems—is the array of default options with which consumers are presented. Such systems typically present three numerical options (e.g., 10%, 15%, and 20%) with an additional "Custom Tip" option and the opt-out "No Tip" option. These screen-based systems provide a platform to examine the effect of the range and the frame of presented default options on consumers' tipping behavior. We turn to this literature next.

The Effect of Default Options and Gratuity Guidelines

While much research has examined the effect of various psycho-social factors on consumers' choices to tip, scholars have only recently turned their attention to the role of presented tip suggestions. Past studies examining the effect of electronic and non-electronic tip suggestions in contexts where tipping norms are well established (e.g., taxi rides, restaurants), have found that gratuity guidelines increase payments (Seiter, Brownlee and Sabders 2011; Strohmetz and Rind 2001), though this may backfire in terms of tip likelihood if the options are set too high (Haggag and Paci 2014). Recent research on electronic tip suggestions in contexts where norms are not yet established, such as laundry businesses, has found that larger suggested tips (in the 5% - 25% rage), significantly increased amount tipped without affecting customer satisfaction or re-patronage intentions (Damon, Boon and Lynn 2020), while other research has found similar effects in the ride-share market (Chandar et al. 2019). However, this research has not examined the effects of how an opt-out option is framed; an important issue because as many as x% of customers opt-out of tipping in a coffee-shop context, and y% do so for home delivery. We turn to this next.

The Opt-out Option

Previous work examined the suggested options presented to consumers, but a key element of understanding the effect of preset options on consumers' generosity is one that has largely been unexamined: the opt-out options that are available to consumers and how these are construed. Researchers have examined the effect of opt-out options in other domains, such as consumers' likelihood to opt into or out of service subscriptions (e.g., insurance plans, health plans, retirement plans), privacy preferences, and donations, finding that the preset choices have a major role in affecting consumers' decisions (Bellman, Johnson and Lohse 2001; Johnson, Bellman and Lohse 2000; Johnson and Goldstein 2003, 2004; Madrian and Shea 2001; Samuelson and Zeckhauser

1988). For example, Johnson, Bellman, and Lohse (2000) found that framing choices in positive terms increases the likelihood that people will opt into receiving notifications. They further show that a required action (vs. no action) has a significant effect on consumers likelihood to agree to be contacted in the future, such that having to perform an action in order to opt out leads more people to agree to the service compared to having to perform an action in order to opt in. Others have similarly found that participation is lower when it requires opting in as opposed when it requires not opting out (Johnson et al. 1993). Johnson et al. (1993) examined the choices of auto insurance options when consumers were asked to opt into or out of additional coverage, finding that opting in resulted in much lower levels of participation than opting out. Taken together, these findings show that when it comes to opting into or out of various types of participation, people are sensitive to the way the decision is framed, defaulting to the option that requires no action on their part. However, in electronic tipping systems, consumers are either asked to specifically choose the option of their choice; thus, in order to opt out, consumers must actively do so.

Seminal research in probabilistic decision-making shows that preferences are reversed when the frame emphasizes a loss vs. gain and that the cost of a loss looms larger than the pleasure of an identical gain (Kahneman and Tversky 1984; Tversky and Kahneman 1987), suggesting that, when it comes to making voluntary payments, the idea of a loss (e.g., tips) will be salient, potentially leading people to look for an easy way to opt-out. In the prosocial domain, research have showed that people do actively look for opt-out solutions to avoid giving; however, when they cannot escape from being asked to donate, they end up giving more (Andreoni, Rao and Trachtman 2011). Given the above findings, together with the widespread media coverage of consumers' aversion to digital tip collection systems, a particularly valuable question is the effect of the form that opt-out options take.

THE SPECIAL NUMBER ZERO

Recent indication from cognitive science suggests that the representation of the number zero has a unique status (Zaks-Ohayon, Pinhas, and Tzelgov 2021). Namely, the evidence suggests that zero has both a verbal code (i.e., the word zero) and a symbolic code (i.e., the digit 0) and that is not connected to a certain quantity, but rather, to a lack thereof. The authors demonstrated (1) an inherent conflict in processing the digit 0 as a number and (2) the understanding that a so-called "empty set" is represented differently from zero. The authors suggest that people perceive zero not as a quantity in itself, but as an absence of quantity; that is, zero may not be an inherently numerical concept. Other research conducted by the same authors (Zaks-Ohayon, Pinhas, and Tzelgov 2021) demonstrated that other empty sets are also not perceived as zero, as shown by different reaction times between zero and other empty sets. Given that zero does not merely represent an arithmetic value, it makes sense that people would be sensitive to the differences between zero and any other numerical number options and between zero and other descriptions of empty sets (i.e., verbal descriptions of zero).

The way people perceive zero quantities and non-symbolic representations of empty sets, and the effect these perceptions have on consumer decisions, has yet to receive proper attention from the consumer behavior researchers. In the present study, we aim to examine whether the number 0 (presented as 0%) is processed differently from other numbers (e.g., 1%) and from other verbal empty sets (e.g., "No Tip").

Zero in Consumer Behavior Field

In the consumer behavior field, the number zero has been found to be psychologically different from other entities. In the realm of gambling and probabilities, people perceive a zero probability as substantially different than a small probability (Kahneman and Tversky 1979). In

terms of rewards and motivation, zero (i.e., no reward) has a surprisingly counterintuitive effect: Rather than decreasing motivation, people are, in some scenarios, more motivated towards certain behaviors when there is no expectation of reward (Festinger and Carlsmith 1959; Gneezy and Rustichini 2000a, 2000b), and this motivation can become more intrinsic in the presence of no reward (Lepper et al. 1973). For example, Gneezy and Rustichini (2000a) examined the effect of monetary compensation on performance, comparing the effects of rewards of different quantities, including zero, finding that school children collected less donation money when they were given performance incentives vs. when they did not receive incentives. Frey and Lorenz Götte (1999) similarly found that monetary rewards (vs. no rewards) undermine intrinsic motivation of volunteers, suggesting that zero is somewhat special when it comes to behavior and motivation.

Examining people's evaluation of life-saving decisions, Zhang and Slovic (2019) found that people prefer decisions that could possibly result in no loss of life, even if the overall risk (in terms of total lives lost) may be greater, as this decision is easy to justify (i.e., even though there is a risk that more people might die, lives are valuable and none should be lost, so it's worth taking the risk for the option where no one dies). Moreover, they found that this effect of the unique valuation of zero interacts with gain vs. loss framing: When framed in terms of lives saved, people give similar ratings of support to decisions that save all people as they do to decisions that save only most people (e.g., 90% or 98%); however, when framed in terms of lives lost, people express considerably more support for decisions that lose no lives than they do for decision that lose only a small percentage of lives (e.g., 2% or 10%). In addition to suggesting that people are particularly sensitive to the loss of valuable things, these findings show that deviations from zero are judged as considerably more significant than are equivalent deviations from 100% (or "all"). Indeed, others have found that people are particularly sensitive to zero

endpoints (Hsee et al. 2013). As Palmeira (2011) argues, this is because any positive number is infinitely larger than zero, thereby rendering comparison meaningless. In other words, a zero value makes a poor reference point, because it is nearly impossible to tell what it represents or how good or bad it is.

The special qualities of zero are also shown in terms of consumer economics, namely in how they affect both prosocial behavior and demand for products, even to the point of driving behavior contrary to traditional supply-and-demand economics. Shampanier et al. (2007) found that consumers find free products attractive to the point that a better-value alternative is foregone. In their studies, individuals were more willing to choose a free product than an inexpensive product that offers greater value. The authors argue that free products have extra value in the form of positive affect, which is driven by the perception that free products are also free from costs, meaning that a cost-benefit analysis will always weigh out in favor of benefits; in contrast, any other non-zero price introduces both benefits and costs considerations. However, people are not so narrowly on cost that they forget the social ramifications: Even though more people demand a product when it becomes free, each individual seems to demand a smaller quantity (compared to when the price is very small, but non-zero) out of etiquette concerns (Ariely, Gneezy, and Haruvy 2018). This suggests that, although zero seems to have unique and strong effects on consumer behavior, these effects are not so strong as to override social norms. They are also not so strong as to be impervious to other social conscience and context effects, as evidenced by the finding of similar patterns with pay-what-you-want pricing. When given the option to pay an indicated value (the "anchor") for doughnuts or to pay what they want, people pay considerably more when the anchor is zero than when it is a nominally small value (e.g., $0.01 or $0.25; Jung, Perfecto and

Nelson 2016). That is, people are so sensitive to zero such that values the deviate even minorly from zero are not as powerful.

The findings from Shampanier et al. (2007), Ariely et al. (2018), and Jung et al. (2016) suggest a strong yet socially conscious pull towards paying nothing; however, it must be noted that these findings explored the zero effect when the consumer's experience is framed as a gain (i.e., getting a product for free). Through a series of studies manipulating various opt-out choices, we aim to test whether this effect transfers to situations where the consumer's experience is framed as a loss (i.e., making a voluntary payment). Similar results can be expected with options presented to consumers on a tipping screen: Given the salience of zero itself, the presence of a zero option, but not of a nominal non-zero option, could upwardly skew tips. We suggest that, given the research showing the uniqueness of the number zero and its perception (cf. Zaks-Ohayon et al. 2021) and its role in evoking social norms (Ariely, Gneezy, and Haruvy 2018), people might find a 0% tip option particularly salient and aversive, as they do not want to appear cheap, relative to the functionally equivalent but emotionally different "No Tip" option. Driven by the power of social norms (i.e., avoiding zero because of social consideration and etiquette concerns), we suggest that a zero tip option holds a qualitative characteristic that would evoke social norms to avoid it, making consumers unlikely to choose it, as choosing zero tip would be a more salient refusal than simply choosing "No Tip". Thus, we formed the following predictions:

H1: *The presence of a zero (vs. "No Tip") opt-out option will lead to greater tipping.*

In addition to comparing the numerical zero with the equivalent empty set ("No Tip") on consumers' tipping amount, we will further examine consumers' tipping decisions when both the

numerical zero and "No Tip" options are in the set. If indeed people avoid the zero option, they will show greater likelihood to tip when the 0% options is the opt-out option (vs. when "No Tip" is). However, adding the 0% option in addition to the "No Tip" option will help to shed light on whether the mere presence of zero leads consumers to tip more. Given that consumers are presented with both opt-out options, they can easily opt-out from tipping by choosing "No Tip," and so the likelihood to tip is not expected to change as a function of 0% in the set. However, if the 0% evokes social norms which makes people to give more tips, then the present of zero in itself will lead to greater tips. We form the following prediction:

H2: *Adding a zero opt-out option to the choice set (in addition to the traditional "No Tip" option) will lead to greater tipping.*

Regarding mechanisms that might underlie these effects, it must be considered that people are motivated by norms and self-image concerns (Akerlof and Kranton 2000; Azar 2004; Cox et al. 2018). Tipping, which is both prosocial and motivated by social norms, has been found to be strongly affected by social influences and associated feelings, such as pride, guilt, and a sense of rightness (Azar 2004; Lynn 2009; Lynn 2015; Ruffle 1999). For example, approximately 20% of U.S. consumers report they tip to avoid feelings of guilt, while 50% say they tip to feel satisfaction from doing what is right (Lynn 2009). Importantly, recent work has shown that motivational accounts, such as the need to impress others, affect both the amount of the tip and the choice of the denomination consumers choose to tip with (Bluvstein Netter and Raghubir 2021). Research in other domains has yielded similar findings: Rather than giving from a desire to promote others' welfare, people give in order to not violate others' expectations of them (Dana et

al. 2006), and they give more consideration to situational factors when giving than they do to the value of the outcome (Dana et al. 2007). Thus, motivation to signal one's generosity and to preserve one's self-image can be expected to affect people's tipping decisions. We suggest that the effect of the presence of a zero option will be mediated by self-image concerns, as they are particularly sensitive to how generous they appear.

Specifically, we predict the following:

H3. *Self-image concerns will mediate the effect of presence of zero on tip amount.*

OVERVIEW OF THE STUDIES

The first three studies compare the numerical 0% tip option with the standard "No Tip" option. The three studies that follow examine the effect of numerical 0% tip option when it is added to the choice set together with "No Tip." The last study compares these two choice sets. Study 1 compared the numerical 0% tip options with other verbal representations of zero and show the mediating role of self-image concerns, supporting H1 and H3. Study 2 aimed to replicate this effect across service contexts, further supporting H1. Study 3 further supported H1 by showing that the effect is robust to order. Study 4, conducted in the field, showed the effect of numerical 0% when it replaces a non-zero option and is present together with the "No Tip" option. Study 4 further builds on the choice of response alternative theory (Schwartz et al 1995) and theory of random choice, showing the unique qualities of the number zero on consumers perceptions of choice sets. Study 5 replicated the field experiment in the lab, ruling out alternative explanations. Study 6 examined the uniqueness of the 0% option when it is added to the choice set together with "No Tip" option and compared to a small numerical tip (i.e., 1%). Study 7

examined which choice architecture leads to greater tipping: whether 0% is the sole opt-out option or when it is present with the "No Tip" option, creating a set with multiple opt-out options.

STUDY 1: NUMERICAL 0% VS. EQUIVALENT VERBAL EMPTY SETS

In Study 1, we conducted a lab experiment to compare the likelihood to tip and the total tip amount when the opt-out option presented is 0% vs. when it is the predominantly used "No Tip" option. We further added other verbal descriptions of opt-out options to examine whether the effect is robust to other verbal empty sets.

Methods

Participants. The study included 405 students at a northeastern university (Mage = 21.16, SD = 1.40; 51.7% females) who participated for course credit. We excluded 11 surveys that participants started but never finished, and one survey where the tip amount left was 992%, leaving a usable sample of 393.

Design and Procedure. This study employed a between-subjects design with four conditions. Participants were asked to imagine that they were ordering food delivery using their favorite app for a total bill of $15.10. They were then assigned at random to one of the experimental conditions. Participants were asked to specify how much tip they would like to leave by choosing one of the default options on the screen. The first option was the opt-out option, which was either a numerical zero ("0%"), a verbal zero ("Zero"), or one of two other verbal descriptions of the empty set ("No Tip" and "Not Today"); this was followed by four other options: 15%, 20%, 25% and "Custom Tip." Participants were asked to answer a few items measuring their *empathic concern towards the servers* ($\alpha = .88$), measured on by seven items ("I felt empathy towards the server," "I chose to tip the way I did because I am generous," "I want to help the service workers," "I wanted to say thank you for good service," "I felt that the servers

deserve it," "I wanted to motivate the server," "I wanted to compensate the server;" all rated on a scale from 1, *strongly disagree*, to 7, *strongly agree*). The participants answered an item measuring their *self-image concerns* ("I tipped the way I did because I did not want to look cheap") and their *attitudes towards the tip options* ("I tipped the way I did because I appreciated the tip options provided," "It was easy to choose the option I chose," "The tip options were too high," "the tip options were too low," "I liked the tip options," "I thought that the tip options were fair;" all rated on a scale from 1, *strongly disagree*, to 7, *strongly agree*; $\alpha = .83$). Participants then answered an item asking them to indicate the degree to which they tipped the way they did because they did not want the server to think that there was something wrong with the service. Finally, participants answered an attention check item asking them to recall the total bill amount and were asked to indicate their household income level, gender, and age.

Results

Manipulation Check. Overall, 96.4% of participants passed the manipulation check (97.0% in the No Tip condition, 94.9% in the Not Today condition, 97.9% in the Zero condition and 95.8% in the 0% condition). Results remain the same when including and excluding those who failed the manipulation check; thus, we report results for the full sample.

Tip Rate. Overall, 82.1% of consumers tipped. Logistic regression with opt-out condition on likelihood to tip showed a significant difference in likelihood to tip between the 0% (91.7%) and both the No Tip (74.7%; $b = .27$, $SE = .43$, 95% $CI = (.11, .63)$, $p = .003$) and Not Today conditions (78.8%; $b = .34$, $SE = .44$, 95% $CI = (.14, .80)$, $p = .01$), and a directional effect between the 0% and Zero (83.8%; $b = .47$, $SE = .45$, 95% $CI = (.89, 1.14)$, $p = .10$) conditions. No other comparisons were significant (ps > .12).

Tip Percentage for Full Sample. A one-way ANOVA with opt-out option on total tip amount revealed a marginally significant main effect of opt-out condition ($F(3, 389) = 2.45$, $p = .063$). Importantly, pairwise comparisons showed that tip amount was significantly higher in the 0% condition ($M = 13.47\%$, $SD = 4.93$) compared to both the No Tip condition ($M = 11.13\%$, $SD = 7.09$; $t(193) = 2.66$, $p = .004$, $d = .38$) and the Not Today condition ($M = 11.83\%$, $SD = 6.84$; $t(193) = 1.90$, $p = .03$, $d = .27$), and a directional effect when 0% was compared to Zero ($M = 12.67\%$, $SD = 6.55$; $t(193) = .95$, $p = .17$, $d = .13$). The word zero condition was marginally greater than No Tip condition ($t(196) = .95$, $p = 1.60$, $d = .23$). No other differences were significant ($ps > .18$).

Tip Percentage Among Tippers. Looking at only the sub-sample who tipped, the two-way ANOVA revealed no main effect of opt-out condition ($F(3, 323) = .27$, $p = .85$). None of he pairwise comparisons were significant ($ps > .34$).

Self-Image Concerns. A one-way ANOVA with opt-out condition on self-image concerns revealed a marginally significant effect ($F(3, 388) = 2.31$, $p = .076$). Importantly, pairwise comparisons showed a significant difference between the 0% and the No Tip conditions, such that participants were higher on self-image concerns when the 0% option was the opt-out option ($M = 3.35$, $SD = 1.80$) compared to No Tip ($M = 2.76$, $SD = 1.86$; ($t(193) = 2.26$, $p = .012$, $d = .32$). Interestingly self-image concerns were significantly greater in the Zero condition ($M = 3.34$, $SD = 1.85$) than the No Tip condition ($t(195)= 2.18$, $p = .015$, $d = .31$), and marginally greater in the Not Today condition ($M = 3.09$, $SD = 1.73$) than the No Tip condition ($t(196)= 1.29$, $p = .098$, $d = .17$). No other differences were significant ($ps > .15$). Mediation analysis using 10,000 bootstrap samples (SPSS Macro PROCESS, Model 4) showed that self-image concerns mediated the relationship between 0% and No Tip conditions and total tip amount ($b = -.78$, $SE = .35$, 95% *CI*

= [-1.54, -.10]). Interestingly self-image concerns also mediated the relationship between the Zero and No Tip conditions (*b* = -.81, *SE* = .39, 95% *CI* = [-1.61, -.07]). No other mediation models were significant.

Empathic Concern Towards the Servers. A one-way ANOVA with opt-out condition on empathic concerns revealed a significant effect ($F(3, 383) = 3.67$, $p = .012$). Pairwise comparisons showed a significant difference between 0% and No Tip, such that participants were more empathic towards the server when the 0% option was the opt-out option (*M* = 3.93, *SD* = 1.51) compared to No Tip (*M* = 3.20, *SD* = 1.57; ($t(193) = 3.27$, $p < .001$, $d = .47$). Interestingly, empathic concerns were marginally greater in the Zero condition (*M* = 4.07, *SD* = 3.79) than the No Tip condition ($t(195) = 2.25$, $p = .01$, $d = .32$). No other differences were significant (*p*s > .17). Mediation analysis using 10,000 bootstrap samples (SPSS Macro PROCESS, Model 4) showed that empathic concerns towards the servers mediated the relationship between the 0% and No Tip conditions and total tip amount (*b* = -1.70, *SE* = .52, 95% *CI* = [-2.74, -.66]). Interestingly, empathic concerns towards the servers also mediated the relationship between the Zero condition and the No Tip condition (*b* = -1.30, *SE* = .58, 95% *CI* = [-2.47, -.15]). No other mediation models were significant.

Attitudes Towards the Tip Options. A one-way ANOVA with opt-out condition showed no effect on how favorably participants perceived the tip options provided ($F(3, 388) = .29$, $p = .830$). Pairwise comparisons also showed that none of the differences between conditions was significant (*p*s > .39).

Discussion

Supporting H1, the 0% opt-out option, compared to other equivalent verbal descriptions of it, resulted in overall higher tips. Interestingly, the 0% opt-out was directionally leading to greater

tips compared to the equivalent word *Zero*, which also showed a marginal effect compared to the "No Tip" option. The lack of a main effect of opt-out in the sub-sample who tipped suggests that people are avoiding choosing a numerical zero option when they make tipping decisions. Both self-image concerns and empathic concerns mediated the effect of 0% vs. "No Tip" on total tip amount. Interestingly, self-image concerns and empathic concerns also mediated the effect between *Zero* and "No Tip," showing that even using of the verbal (vs. numerical) zero can influence consumers' tipping behavior. Finally, this study ruled out the possibility that any of the presented opt-out choices created more favorable impressions of the options provided.

STUDY 2: 0% VS. NO TIP ACROSS SERVICE CONTEXTS

In Study 2, we continued to examine the effect of the presence of zero compared to the "No Tip". Due to the large media coverage of how tip screens bully consumers to tip in contexts where there is no service or when payment is requested prior to the provision of the service, Service context may serve as a moderator of this effect. In self-serving establishments, consumers may be inferring that tips are not required at all; as a result, they might not be as reluctant to choose a 0% option, compared to when full service is given. To this end, Study 2 examines the effect of a numerical 0% opt-out across different service contexts.

Methods

Participants. The study included 623 mTurk participants (*M*age = 38.69, *SD* = 11.61; 46.4% females) who participated for monetary compensation. Twenty-eight participants were excluded from analyses—15 who did not complete the survey and 13 who left extremely high tips (over 100%)—leaving a usable sample of 595.

Design and Procedure. This study employed a 2 (opt-out: 0% vs. No Tip) × 3 (service context: full service, self-service, control) between subject design. Using a different service

context from the previous study, participants were asked to imagine that they were purchasing a few items at a coffee shop for a total bill of $10. Those in the full-service condition were told that they ordered from the cashier who bagged the items and handed the bag to them. In the self-service condition, participants were told that they had picked up the items from the bar and bagged them themselves. In the control condition, participants were told that they chose items and proceed to pay.

Participants were asked to specify how much tip they would like to leave by choosing one of the options on the screen. In the 0% condition, participants saw the following tip options: 0%, 5%, 10%, 15%, and "Custom Tip." In the No Tip condition, they saw "No Tip," 5%, 10%, 15% and "Custom Tip." Participants then indicated the extent to which their tip reflected the server's effort (from 1, *not at all*, to 7, *very much*). Participants then evaluated the coffee shop (on a scale from 1, *very low quality*, to 7, *very high quality*). As exploratory measures, participants were asked to answer items asking them about their *overall impression goals in tipping* ($\alpha = .88$) using a four-item scale ("To what extent do you tip in coffee shops in order to impress the server?", "To what extent do you tip in coffee shops in order to impress other customers?", "To what extent do you feel obligated to tip in coffee shops?", "To what extent do you feel embarrassed to not tip in coffee shops?"; all rated from 1, *not at all,* to 7, *very much*) and rated the tip options provided ("To what extent did you appreciate the tip options the coffee shop uses?"; rated from 1, *not at all*, to 7, *very much*). We did not find significant results for these exploratory items, so we do not report them here; analyses of these items can be found in the Web Appendix. Participants concluded the survey by answering an attention check item asking them for the total bill amount, by answering a question about how often they usually tip in coffee shops, and by indicating their gender and age.

Results

Tip Rate. Overall, 81.2% of participants tipped. A logistic regression showed a significant effect of 0% vs. No Tip on likelihood to tip, such that the likelihood to tip was greater in the 0% condition (84.6%) than the No Tip condition (77.70%; b = 1.54, SE = .21, 95% CI = (1.00, 2.36), p = .046), no effect of service context (b = 1.04, SE = .12, 95% CI = (.815, 1.35), p = .711), and no interaction effect (b = 2.32, SE = .52, 95% CI = (.82, 6.53), p = .109).

Tip Percentage for Full Sample. Supporting H1, a two-way ANOVA of opt-out and context on total tip amount revealed a significant main effect of opt-out frame, such that overall tip amount was larger in the 0% condition (M = 9.44%, SD = 10.15) compared to the No Tip condition (M = 7.60%, SD = 6.51; F(1, 589) = 6.75, p = .01, η^2 = .01). The main effect of service context was not significant (F(2, 589) = 1.54, p = .21, η^2 = .005). The interaction effect was unexpectedly significant (F(2, 589) = 4.91, p = .01, η^2 = .02) and was driven by significant differences between 0% and No Tip in the full-service condition (0% condition M = 9.13%, SD = 8.02; No Tip M = 6.50%, SD = 5.46; t(199) = 2.75, p = .007, d = .38) and the self-service condition (0% condition M = 11.30%, SD = 14.72; No Tip M = 7.30%, SD = 6.07; t(198) = 2.54, p = .01, d = .35), but not in the control condition (0% condition M = 8.04%, SD = 5.65; No Tip M = 9.24%, SD = 7.76; t(192) = -1.23, p = .218, d = .16). The attenuation of the effect in the control condition was not expected, as the effect was present in both the self-service and full-service conditions and as all conditions represent real-life service experiences consumers encounter.

Tip Percentage Among Tippers. Looking at only the sample who tipped, the results were similar. A two-way ANOVA showed a marginal main effect of opt-out, with tips being higher in the 0% condition (M = 11.16%, SD = 10.13) compared to the No Tip condition (M = 9.79%, SD = 5.75; F(1, 477) = 3.30, p = .07, η^2 = .007). The main effect of service context was not significant

($F(1, 477) = 1.27$, $p = .280$, $\eta^2 = .005$), but the interaction was again significant ($F(1, 477) = 3.03$, $p = .049$, $\eta^2 = .013$): The difference between 0% and No Tip was significant in the full-service condition (0% condition $M = 10.78\%$, $SD = 7.63$; No Tip $M = 8.81\%$, $SD = 4.46$; $t(157) = 1.96$, $p = .05$, $d = .31$) and self-service condition (0% condition $M = 12.91\%$, $SD = 15.07$; No Tip $M = 9.62\%$, $SD = 5.11$; $t(161) = 1.84$, $p = .067$, $d = .42$), but not in the control condition (0% condition $M = 9.82\%$, $SD = 4.63$; No tip $M = 10.96\%$, $SD = 7.24$; $t(159) = 11.20$, $p = .230$, $d = .18$).

Tip Option Chosen. Because the total main effect of opt-out was marginally significant for the sub-sample who tipped, we specifically examined which options participants were nudged towards in the set. To do so we calculated the likelihood to choose each tip option in the choice set as a function of the opt-out frame.

5% Tip. Cross-tabulation on the likelihood to choose the 5% tip options showed no effect of opt-out, such that participants were no more or less likely to choose this tip option in the 0% condition (26.1%) compared to the No Tip condition (27.7%; $\chi^2(1, N = 595) = .20$, $p = .362$).

10% Tip. Cross-tabulation on the likelihood to choose the 10% tip options showed a marginal effect of opt-out frame, such that there was a slightly greater likelihood to choose this option in the 0% condition (38.5%) compared to the No Tip condition (32.1%: $\chi^2(1, N = 595) = 2.64$, $p = .06$). Thus, choosing 10% more frequently is driving the marginal effect of opt-out frame on tip amount.

15% Tip. Cross-tabulation on the likelihood to choose the 15% tip options showed a non-significant effect, such that the proportion of those who chose 15% did not differ between the 0% condition (11.4%) and the No Tip condition (12.2%; $\chi^2(1, N = 595) = .09$, $p = .432$)

Custom Tip. The likelihood to choose the custom tip option did not differ as a function of the opt-out option ($\chi^2(1, N = 595) = 1.94$, $p = .109$). An independent-samples *t*-test with opt-out

condition as the independent variable and custom tip amount as the dependent variable showed a directional but non-significant effect of zero ($t(41) = 1.47$, $p = .148$, $d = .48$), with custom tips being directionally larger in the zero condition ($M = 29.80\%$, $SD = 22.99$) compared to the No Tip condition ($M = 20.73\%$, $SD = 12.98$).

Server's Effort. A two-way ANOVA on the extent to which participants' tips reflected the server's effort showed a non-significant main effect of zero ($F(1, 589) = 2.06$, $p = .151$, $\eta^2 < .01$) and of service context ($F(1, 589) = .066$, $p = .936$, $\eta^2 < .01$), as well as a non-significant interaction effect ($F(1, 589) = .79$, $p = .453$, $\eta^2 < .01$).

Overall Rating for the Coffee Shop. A two-way ANOVA on overall rating of the coffee shop showed no main effect of zero condition ($F(1, 589) = .12$, $p = .733$, $\eta^2 < .01$) or service context ($F(1, 589) = .25$, $p = .781$, $\eta^2 < .01$), and no interaction effect ($F(1, 589) = .278$, $p = .757$, $\eta^2 < .01$).

Discussion

Study 2 showed that the effect of 0% is robust across service contexts and is not limited to self- or full-service establishments. We did not expect the significant interaction between opt-out frame and service context, especially since the interaction was driven via an attenuation of the effect in the control condition, where the other service contexts showed a robust effect of opt-out option when presented as 0%. Given the strong effect of 0% in the other contexts (and in a similar context in the subsequent studies), we believe this is a statistical anomaly. As such, and to ensure that subsequent results are as strong and generalizable as possible, in subsequent studies, we do not distinguish between service contexts; that is, studies are presented to consumers in a similar way to the control condition in this study. Supporting H1, the total tip amount given in the 0% condition was greater than the tips given in the No Tip condition, a difference which was driven

by a lower likelihood to choose zero and a marginally greater likelihood to choose the 10% tip option in the set. This study also provides evidence that consumers do not merely choose the first non-zero option provided to them, as the likelihood to choose 5% (first numerical option) in this study was lower than the likelihood to choose the 10% option. Finally, this study showed that the way the opt-out is framed does not affect participants' evaluation of the business.

STUDY 3: RULING OUT ORDER EFFECTS

Previous research shows that people are sensitive to the order of options presented to them, sometimes being biased towards the first one (primacy effect; Mantonakis et al. 2010; Becker 1954; Miller and Krosnick 1998) and sometimes towards the last one (recency effect; cf. Teppan and Zanker, 2015). Study 1 and 2 used an ascending order or presentation such that the opt-out values were always the first (i.e., on the left). In order to rule out such order effects, Study 3 examines whether the effect of zero is replicated when the order of the options is descending vs. ascending, as the former option is becoming increasingly used in the marketplace. This will enable us to shed more light on whether merely the presence of a 0% tip, even when it is not the first option in the set, nudges consumers away from choosing it. Study 3 also manipulated the range of options. It has been found that higher ranges yield higher tips, but that this can potentially backfire when the options are set too high, such that consumers may avoid tipping altogether (Haggag and Paci 2014). It is possible that for higher ranges, consumers will no longer be reluctant to choose the 0% option because they will feel that the options are too high. Thus, in Study 3, we test if the 0% effect will hold across low and high ranges.

Methods

Participants. The study included 401 students at a northeastern university (*M*age = 20.07, *SD* = 1.40; 50.4% females) who participated for course credit. We excluded 59 surveys which

were taken more than once (up to four times) using the same student ID number, and another 34 surveys that participants started but never finished, leaving a usable sample of 308.

Design and Procedure. This study employed a 2 (opt-out: 0% vs. No Tip) × 2 (range: low vs. high) between-subjects design. Similar to Study 2, participants were asked to imagine that they were purchasing a few items at a coffee shop using their credit card for a total bill of $10.15. The cashier swiped their credit card and turned her computer screen towards them to show them a tipping screen. They were assigned at random to one of the four experimental conditions. Participants were asked to specify how much tip they would like to leave by choosing one of the default options on the screen. Participants saw all options in descending order, with the highest option appear first. In the lower range conditions participants saw the following options: 20%, 15% 10%, 0% (or "No Tip"), and "Custom Tip." In the higher range condition, participants saw the following options: 25%, 20%, 15%, 0% (or "No Tip"), and "Custom Tip."

As exploratory measures, participants filled out a comprehensive scale of *perceptions of the coffee-shop* (α = .80) comprising five items ("I hold a positive view of this coffee shop," "This coffee shop treats its customers fairly," "This coffee shop cares about its employees," "This coffee shop pays fair wages," and "I appreciate this coffee shop for the tip options they are using;" all rated on a scale from 1, *strongly disagree*, to 7, *strongly agree*). Then participants answered items measuring their *pro-social motives* (α = .89) ("I wanted to feel generous," "I wanted to be fair," "I wanted to say thank you to the server," and "I wanted to compensate the server for their poor wages;" all rated on a scale from 1, *strongly disagree*, to 7, *strongly agree*), their *impression goals* (α = .90) ("I wanted to avoid feeling guilty," "I wanted to avoid embarrassment," "I wanted to feel good about myself," and "I wanted to impress other customers;" all rated on a scale from 1, *strongly disagree*, to 7, *strongly agree*). The exploratory

measures did not have a significant effect as a function of opt-out option and are not reported here. The full list of items and analyses can be found in the Web Appendix. Finally, participants answered a manipulation check item asking them for the total bill amount, reported whether they considered themselves tippers, and indicated their household income level, gender, and age.

Results

Manipulation Check. Overall, 91.9% of participants passed the manipulation check (91.2% in the 0% condition and 94.9% in the No Tip condition). Results remained the same when including and excluding those who failed the manipulation check; thus, we report results for the full sample.

Tip Rate. Overall, 55.5% of participants tipped. A cross-tabulation procedure showed a significant effect of opt-out, such that the likelihood to tip was significantly greater in the 0% condition (61.1%) compared to the No Tip condition (50.3%; $\chi^2(1, N = 308) = 3.60, p = .037$), supporting H2. There was no effect of range on likelihood to tip ($\chi^2(1, N = 308) = 1.46, p = .1436$), and the interaction term was not significant ($\chi^2(1, N = 308) = .010, p = .506$).

Tip Percentage for Full Sample. A two-way ANOVA with opt-out condition and range on total tip amount revealed a significant main effect of opt-out, such that overall tip amount was larger in the 0% condition ($M = 8.94\%$, $SD = 7.70$) compared to the No Tip condition ($M = 7.15\%$, $SD = 7.53$; $F(1, 304) = 4.28$, $p = .039$, $\eta^2 = .01$). The main effect of range ($F(1, 304) = .50$, $p = .480$, $\eta^2 < .01$) and the interaction ($F(1, 304) = .80$, $p = .373$, $\eta^2 < .01$) were not significant.

Tip Percentage Among Tippers. Looking at only the sub-sample who tipped, the two-way ANOVA showed no main effect of opt-out frame ($F(1, 167) = .20$, $p = .657$, $\eta^2 < .01$). The main effect of range was significant, indicating greater tips in the high range condition ($M = 16.01\%$,

SD = 2.71) compared to the low range condition (*M* = 13.13%, *SD* = 3.62; $F(1, 304) = 33.11$, $p < .001$, $\eta^2 = .17$). The interaction effect was not significant ($F(1, 304) = .217$, $p = .642$, $\eta^2 < .01$).

Discussion

Similar to the previous studies, the presence of a 0% opt-out option resulted in higher tips, largely owing to more people choosing to tip. Importantly, this effect was observed with a descending order of options, suggesting that the results of the previous studies are due to avoiding choosing the 0% rather than to simple order effects. The lack of a main effect of zero in the sub-sample who tipped, along with a presence of a main effect of range, suggests that a 0% opt-out option doesn't necessarily push people towards the larger tip options; rather, it pushes people towards a non-zero option. That is, they're not necessarily looking to give a large tip; they just don't want to leave nothing.

In the next set of studies, we move to examine the effect of the 0% tip option when it is added to the choice set together with the "No Tip" option. So far, we have shown that people are reluctant to choose a 0% tip option, resulting in higher total tip when this option is the sole opt-out option. However, if the mere presence of 0% has an effect on consumers' tipping behavior, then we should observe an effect on total tip amount even when consumers have both opt-out options in the set. If people have the "No Tip" option available, they can choose it to opt-out from tipping; thus, so we do not expect differences in likelihood to tip as a function of the presence of 0%. However, since consumers are avoiding the 0% option, we do expect higher tips.

STUDY 4: ZERO TIP OPTION IN A COFFEE SHOP

We examined the presence of a 0% tip option together with "No Tip" option in a field experiment in a coffee shop using an established electronic payment collection system that presents tips as a preset array of choices. The options are three numerical options together with

"Custom Tip" and "No Tip" options. Thus, we were able to add the 0% tip option only by replacing one of the other numerical options in the set.

This experiment was designed to build on the range of response alternative theory (from survey methods; Schwarz et al. 1995) to examine whether consumers, when forming tipping judgments, rely on the information they receive from the alternatives provided to them. According to this theory, people make inferences about the population's average behavior from the options they are presented with and form their own behavioral judgment accordingly. Therefore, this provides a theoretical lens to explore whether consumers rely on the tip options to form an average tip norms across different ranges. If participants show greater tips with higher ranges (where the arithmetic mean of the options is higher) compared to low ranges, then we can infer that participants rely on the options provided to form tipping judgments. Critically, the theory will also help us understand whether people use the number 0% as a form of information to make the average judgment. If the number 0% is presented in the set and people do include it as a piece of information to form the average norm, then they will average the non-zero options together with the 0% to form a total average. This total average would lower than the average in the non-zero condition (which is the average of three non-zero numerical options) and is expected to lower total tip amount. However, if people avoid the 0% tip option (as seen in our previous studies), then the average of the 0% condition (average of the other two non-zero options) would be greater than the average of the three numerical options in the non-zero set, and thus tip amounts will be higher in the 0% condition.

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. No table service is provided. The average net sale of the coffee shop is $6.63 (*SD* = 5.00).

The predominant POS systems are supported by electronic devices (usually tablets) such that, at the moment of a credit- or debit-card sale, the system presents tipping options to the consumer. The system at the coffee shop allowed for three numerical choices, with the default set of options being 15%, 20%, and 25%, which could be changed manually. In addition to the numerical options, a "No Tip" option and a "Custom Tip" option (which allows the customer to insert a preferred, unique tip amount in US dollars) were presented.

Method

Design and Procedure. We examined people's responses to the presence of a 0% option in a 2 (presence of zero: present vs. absent) × 2 (range: low vs. high) between-subjects design. In the zero present conditions, the first option in the set was 0% in both the low (0%, 10%, 15%, "Custom Tip," and "No Tip") and high (0%, 15%, 20%, "Custom Tip," and "No Tip") ranges; in the zero absent conditions, the first option was a non-zero number in both the low (5%, 10%, 15%, "Custom Tip," and "No Tip") and high (10%, 15%, 20%, "Custom Tip," and "No Tip") ranges. For each condition, we collected transactions over two business days (each condition was randomly assigned to different days of the week) for a total of 8 days. We collected a total of 1796 transactions, of which 1,023 were paid by credit or debit card (the only payment methods for which we could track tip amounts).

Results

Table 1 presents a full description of the data for each method used: how many transactions were made, likelihood of leaving a tip (the percentage of customers using that method who actually left a tip), and total tip amount. The table shows data for both the full sample ("All Customers") and for only those who gave a tip ("Only Tippers").

Table 1*:* Summary Data of Conditions and Responses

			All Customers		Only Tippers	
		Range	***N***	**Tippers**	**Tip (%)**	***N***	**Tip (%)**
Zero Absent	Low	5% 10% 15%	286	49.2%	6.04 %	134	12.90 %
	High	10% 15% 20%	299	42.3%	6.79 %	147	13.82 %
Zero Present	Low	0% 10% 15%	175	49.7%	6.95 %	87	13.99 %
	High	0% 15% 20%	263	46.4%	7.96 %	122	17.16 %

Tip Rate. Overall, 52.1% of consumers tipped. Logistic regression with zero condition and range condition on likelihood to tip showed no effect of presence of zero (b = .71, SE = .42, CI = (.31, 1.62), p = .417), or of range (b = 1.30, SE = .32, 95% CI = (.68, 2.45), p = .460), and no significant interaction (b = .95, SE = .06, 95% CI = (.83, 1.07), p = .378).

Tip Percentages for All Customers. A two-way between-subjects ANOVA on tipping percentage revealed a marginal main effect of presence of zero (F(1, 1019) = 3.37, p = .067, η^2 < .01), with tips being higher in the zero condition (M = 7.56%, SD = 9.88) compared to the no-zero condition (M = 6.42%, SD = 7.98). The main effect of range was not significant (F(1, 1019) = 2.41, p = .121, η^2 < .01), and neither was the interaction (F(1, 1019) = .05, p = .821, η^2 < .01). See Figure 1 for a presentation of these results.

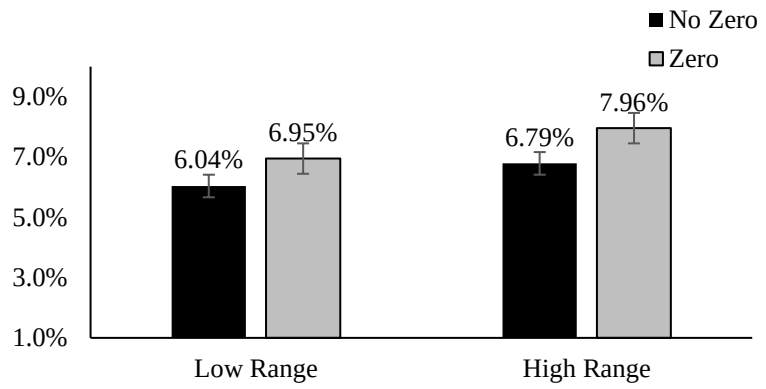

Figure 1. Tip amount presented as % as a function of presence of zero and range.

Tip Percentages Among Tippers. A two-way ANOVA on the subset of the sample who tipped revealed a significant main effect of the presence of zero ($F(1, 486) = 10.90$, $p < .001$, $\eta^2 = .02$), with tips being higher in the zero present condition ($M = 15.84\%$, $SD = 8.57$) compared to the zero absent condition ($M = 13.38\%$, $SD = 6.28$). The main effect of range was also significant ($F(1, 486) = 9.30$, $p = .002$, $\eta^2 = .019$), reflecting greater tips in the high range condition ($M = 15.33\%$, $SD = 7.53$) compared to the low range condition ($M = 13.33\%$, $SD = 7.18$). The interaction was marginally significant ($F(1, 486) = 2.81$, $p = .094$, $\eta^2 = .01$). Post hoc tests showed that the interaction was driven by a larger difference between the zero present condition ($M = 17.16\%$, $SD = 9.77$) and the zero absent condition ($M = 13.82\%$, $SD = 4.47$) in the high range ($t(1, 267) = 3.70$, $p < .001$, $d = 0.43$), which was directional but not significant in the low range condition ($Ms = 13.99\%, 12.90\%$, $SDs = 6.11, 7.79$ for 0% and no zero, respectively; $t(1, 219) = 1.10$, $p = .272$, $d = 0.15$).

Discussion

Supporting H2, Study 4 showed that although likelihood to tip does not change based on the presence or absence of a 0% option, tip amount does. When both opt-out options (0% and "No Tip") were present in the choice set, consumers who tipped were nudged toward higher options in the set, leading them to leave higher tips. Importantly the field experiment confirmed that consumers do rely on the provided tip options to guide their tipping decisions, as the tips were greater in the high range condition. Critically this study also confirmed that the number 0% is special in the sense that consumers probably exclude it as an information piece when forming the tip average, as supported by the fact that tips were higher in the zero condition. This led to the counter-intuitive effect of an additional opt-out option (i.e., 0%) leading to greater tips. This study also provides explicit evidence that consumers do not choose tip options at random. An additional opt-out option in a set (of five options in total) doubles the chances that consumers would opt-out from tipping (from 20% [one opt-outs of five options] to 40% [two opt-outs of five options]), if they indeed choose their tip amount at random. The fact that there was no effect on likelihood to tip indicates that the number of opt-out choices does not make participants more likely to choose to opt out.

The POS system in the coffee shop does not provide specific information on the exact tip option consumers chose (it merely provides the total tip amount) and thus neither allows us to distinguish between those who chose the zero option and those who chose the "No Tip" option, nor to identify whether customers selected one of the provided tip options or used the custom tip option. In Study 5 we address these issues, replicating the field experiment in the lab to examine the likelihood of choosing each of the options in the set.

STUDY 5: 0% VS. NO TIP

We designed Study 5 to further support H2 by replicating the previous field experiment (Study 4) in the lab, and to specifically examine whether there is a further qualitative difference between the two opt-out options (i.e., 0% and "No Tip"), as measured by people's likelihood to choose each of these options when deciding to opt-out from tipping. Study 5 further examines how exactly the 0% option nudges consumers by looking at which tip options in the choice set they are more likely to choose when it is present. Finally, Study 5 also tests H3 (whether image concerns mediated the effect of 0%) and three competing, alternative explanations: feelings of cheapness, signaling bad service quality, and negative affect. It is possible that choosing the zero option may make one feel cheap; thus, in order to feel generous, consumers avoid choosing the zero option in favor of higher options in the set. Another possibility for the effect of zero is that choosing the 0% option may signal to the service provider that there was something wrong with the service quality, leading consumers to avoid this option and to further choose higher options to signal their satisfaction from the service. Finally, choosing 0% may make someone feel more negative than choosing the "No Tip" option, so consumers avoid it, leaving larger tips so as to increase positive affect. The design of Study 5 allows us to compare these alternative explanations.

Methods

Participants. The study included 250 mTurk participants (*M*age = 35.48, *SD* = 12.23; 46.8% females) who participated for monetary compensation. We excluded three participants who left extremely high tips [970%, 492%, and 197%], leaving a usable sample of 249.

Design and Procedure. This study employed a 2 (presence of zero: present vs. absent) × 2 (total bill: low [$5.15] vs. high [$10.15]) between-subjects design. Participants were asked to imagine that they were purchasing a few items at a coffee shop using their credit card; the cashier

swiped their credit card and turned her computer screen towards them to show them a tipping screen. They were assigned at random to one of the four experimental conditions. Participants were asked to specify how much would they leave as a tip by choosing one of the default options on the screen. We used the high range set from Study 4, as this set elicited a stronger effect. In the zero absent condition, participants saw 10%, 15%, 20%, "Custom Tip," and "No Tip;" in the zero present condition they saw 0%, 15%, 20%, "Custom Tip," and "No Tip." If the "Custom Tip" option was chosen, participants then were asked to indicate the tip amount (in USD) that they would like to leave. See Figure 2 for a presentation of the stimuli.

Participants were asked to indicate the degree to which they agree (on a scale from 1, *completely disagree*, to 7, *completely agree*) with the statement "I tipped the way I did because I did not want to look cheap." Participants then indicated the extent to which they agree (on a scale from 1, *completely disagree*, to 7, *completely agree*) with the following items: "Choosing 0%/No Tip makes me feel cheap," "Choosing 0%/No tip means that the service was bad," and "Choosing No Tip feels less negative than choosing 0% tip." Finally, participants answered a manipulation check item (asking them to recall the total bill amount), reported if they themselves ever received tips, and indicated their household income level, gender, and age.

Figure 2: Stimuli used in Study 5

Results

Manipulation Check. Overall, 92.7% of participants passed the manipulation check (91.1% in the zero present condition and 94.4% in the zero absent condition). Results remained the same when including and excluding those who failed the manipulation check; therefore, we report results for the full sample.

Tip Rate. Overall, 73.7% of participants tipped. Logistic regression showed that the likelihood to tip did not differ as a function of zero presence (b = 1.18, SE = .90, 95% CI = (.19, 7.03), p = .85), or bill mount (b = 1.55, SE = .91, 95% CI = (.25, 9.31), p = .630). The interaction between bill amount and presence of zero on likelihood to tip was not significant (b = 1.24, SE = .60, 95% CI = (.38, 4.03), p = .721).

Tip Percentage for Full Sample. A two-way ANOVA with bill amount and presence of zero on total tip amount for the full sample revealed a significant main effect of zero presence ($F(1, 243) = 7.03$, p = .009, η^2 = .03), with tips being significantly higher in the zero presence condition (M = 15.86%, SD = 21.03) compared to the no-zero condition (M = 10.28%, SD = 6.90). The effect of bill amount was not significant ($F(1, 243) = 2.41$, p = .121, η^2 = .01), and neither was the interaction ($F(1, 243) = .04$, p =.847, $\eta^2 < .01$). See Figure 3 for a presentation of results.

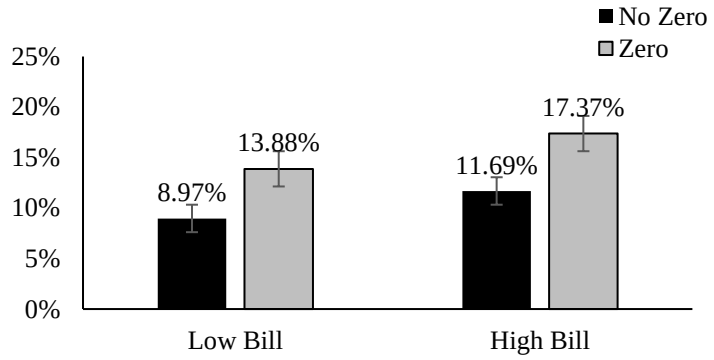

Figure 3. Tip amount presented as % as a function of presence of zero and bill amount.

Tip Percentage Among Tippers. Looking at the sample who tipped, the two-way ANOVA showed similar results, with a significant main effect for zero presence ($F(1, 175) = 18.72$, $p < .001$, $\eta^2 = .10$), with participants giving higher tips in the zero condition ($M = 23.51\%$, $SD = 21.81$) than in the no-zero condition ($M = 13.28$, $SD = 4.62$). The main effect of bill amount was not significant ($F(1, 175) = .423$, $p = .516$, $\eta^2 < .01$), and neither was the interaction ($F(1, 175) = .049$, $p = .824$, $\eta^2 < .01$).

Default Tip Option Chosen. In order to specifically examine which options participants were nudged towards in the set, we calculated the likelihood to choose each tip option in the choice set as a function of presence of zero. Since we did not find a main effect of bill amount on total tips or an interaction, we collapsed across this variable and present only the results for the presence of zero variable.

15% Tip. Cross-tabulation on the likelihood to choose the 15% tip options showed a significant effect of zero, such that the effect was driven by greater likelihood to choose this option in the zero condition (40.7% %) compared to the no-zero condition (27.4%: $\chi^2(1, N = 247) = 4.81$, $p = .020$).

20% Tip. Cross-tabulation on the likelihood to choose the 20% tip options showed a directional but non-significant effect of zero, such that participants did not differ in the likelihood to choose the 20% tip between the zero present condition (10.6%) and the zero absent condition (7.3%; $\chi^2(1, N = 247) = .83$, $p = .245$).

Custom Tip. The likelihood to choose the custom tip option was marginally greater in the zero present condition (16.2%) compared to the zero absent condition (8.8%) as a function of the presence of zero ($\chi^2(1, N = 247) = 3.07$, $p = .059$). Importantly, the custom tip amount left by

those in the zero present condition (M = 47.08%, SD = 35.67) was significantly larger than in the zero absent condition (M = 15.03%, SD = 10.18; $t(29) = 2.89$, $p = .007$, $d = 1.22$).

	10%	**15%**	**20%**	**Custom Tip**	**No Tip**
No Zero	33.9%	27.4%*	7.3%	8.8%	22.6%
	0%	**15%**	**20%**	**Custom Tip**	**No Tip**
Zero	7.5%	40.7%*	10.6%	16.2%	25.0%

Table 3. Proportion of chosen options. Study 5.

Likelihood of Choosing 0% vs. "No Tip" Option. Supporting H1b, among non-tippers in the zero condition (32.5%), only 7.5% chose the zero option, while the rest chose the "No Tip" option, a difference which is statistically significant ($\chi^2(1, N = 40) = 28.90$, $p < .01$), indicating people's reluctance to choose the zero option when choosing to not leave tips.

Likelihood of Choosing "No Tip" Option. A chi-square test was performed to examine the likelihood of choosing the "No Tip" option between the zero and no-zero conditions, showing a non-significant result ($\chi^2(1, N = 65) = .26$, $p = .264$), meaning that the presence of zero does not affect participants' likelihood to choose the "No Tip" option.

Mediation by Self-Image Concern. Finally, we examined whether image concerns mediated the effect of the presence of zero on tip amounts; we did not find significant results (b = -.15, SE = .74, 95% CI (-1.64; 1.31). However, using moderation analysis with 10,000 bootstrap samples (SPSS Macro PROCESS, Model 1), we found that self-image concerns moderate the relationship between the presence of zero and total tip amount, such that the effect is stronger

among those with higher image concerns (ΔR^2 = .01, $F(1, 247) = 5.42$, p = .02), with moderation values defying Jhonson-Neyman significance region 3.71.

Alternative Accounts. To evaluate alternative explanations, we conducted a paired-samples *t*-test on the items reporting perceptions of self-signal cheapness, signaling bad service, and negative affect. The difference between people's feeling cheap when choosing zero (M = 6.09, SD = 3.56) vs. when choosing "No Tip" (M = 6.08, SD = 3.50) was not significant ($t(246) = .18$, p = .856). In terms of signaling service quality, no difference was observed between the zero (M = 5.09, SD = 3.50) and "No Tip" conditions (M = 4.98, SD = 3.41; $t(246) = 1.15$, p = .250), indicating that people do not relate choosing zero to signaling lower service quality. Finally, in terms of negative affect, there was no difference between how negative people felt in choosing zero (M = 4.82, SD = 3.32) vs. "No Tip" (M = 4.86, SD = 3.03; $t(246) = -.98$, p = .327).

Discussion

Supporting H1**,** Study 5 replicated the results of the field experiment (Study 4) and showed that, across bill sizes, likelihood to tip did not differ across conditions; however, participants gave higher tips in the set where the zero was present. Specifically, those in the no-zero condition were more likely to choose lower options in the set (and leave lower custom tip options) compared to those in the zero condition. Furthermore, Study 5 provides evidence that 0% and "No Tip" options are perceived differently among those who choose to not tip. People are seemingly reluctant to choose the 0% option and prefer to choose an equivalent outcome in the form of "No Tip." This study further finds that choosing 0% does not seem to make participants feel cheaper compared to choosing "No Tip," nor does choosing zero signal low service quality or increase negative affect.

Finally, although image concerns did not mediate the effect, they were found to moderate the effect, such that the effect of the presence of zero is stronger for those who have high image concerns, suggesting that choosing zero might affect how people think they are perceived in the eyes of others.

Studies 4 and 5 used tip presentations via a POS system that allows for only three numerical options; as such, in the zero absent condition, consumers were presented with three non-zero numerical options, while in the zero present condition, they were presented with only two non-zero numerical options. We designed Study 6 to address these issues by presenting consumers the scale in a single row with identical numerical options. Moreover, we designed Study 6 to examine the unique role of 0% compared to a similarly low and nominal 1% tip.

STUDY 6: THE UNIQUE ASPECT OF THE NUMBER 0

Study 6 was designed to address concerns raised from Studies 4 and 5 regarding the scale used and the number of numerical options presented—specifically, the number of non-zero numerical options. Furthermore Study 6 examined whether the effect found was unique to the presence of zero or can be also found using a very low comparable option such as a 1% tip. According to the Automatic End Effect, the numbers 0 and 1 (in the absence of zero) represent the smallest members on the mental number line, which is defined as the neural system for magnitude representation (Dehaene 1992; Gallistel and Gelman 1992, 2000; Pinhas and Tzelgov 2012; Verguts, Fias, and Stevens 2005). Thus, examining the effect of zero compared to its closest neighbor (i.e., 1) would provide strong evidence that the effect is robust and unique to zero and not merely caused by a small-magnitude number in general.

Methods

Participants. The study included 315 mTurk participants (*M*age = 36.19, *SD* = 10.30; 38.7% females) who participated for monetary compensation.

*Design and Procedure***.** This study employed a between-subjects design comparing the effect of lowest value (0% vs. 1%) in the set on tip frequency and amounts. Participants were asked to imagine that they were purchasing a few items at a coffee shop using their credit card for a total bill of $10.15. 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 would they leave as a tip by choosing one of the default options on the screen. Participants in the 1% condition saw 1% as the smallest option, whereas those in the zero condition saw 0%. In both conditions, the remaining options were 10%, 15%, 20%, and "Custom Tip," and "No Tip." Other exploratory items measuring *generosity* ("How generous do you feel your tip was?") and *perceptions of the options provided* ("How much did the tip options make you feel comfortable to choose from?"), *avoidance from feeling cheapness* ("How much did you tip to not feel cheap?) and *perceptions of the business* as a function of the tip options ("How much do you appreciate this coffee shop for the tip options they use?"). All were rated on a scale from 1, *not at all*, to 7, *very much*. Results are reported in the Web Appendix. Finally, participants were also asked to report whether they consider themselves tippers and to indicate their gender and age.

Results

Tip Rate. Overall, 90.3% of participants tipped. Logistic regression showed that the likelihood to tip did not differ as a function of the lowest value (b = 1.11, SE = .38, 95% CI = (.52, 2.36), p = .786).

Tip Percentage for Full Sample. Supporting H1, an independent-samples *t*-test showed a significant effect of lowest value on total tip amount, with tips being significantly greater in the

0% condition (M = 18.98%, SD = 21.92) compared to the 1% condition (M = 13.78%, SD = 14.37; $t(306) = 2.45$, $p = .015$, $d = .28$).

Tip Percentage Among Tippers. An independent-samples *t*-test among just the sub-sample who tipped showed a similar pattern, with a significant effect of lowest value on total tip amount, with tips being significantly higher in the 0% condition (M = 21.12%, SD = 22.12) compared to the 1% condition (M = 15.19%, SD = 14.36; $t(276) = 2.64$, $p = .009$, $d = .31$).

Tip Option Chosen. In order to specifically examine which options participants were nudged towards in the set, we calculated the likelihood to choose each tip option in the choice set as a function of the lowest value.

10% Tip. Cross-tabulation on the likelihood to choose the 10% tip options showed no effect of lowest value, such that participants were no more or less likely to choose the 10% tip option in the 0% condition (34.4%) compared to the 1% condition (31.6%; $\chi^2(1, N = 315) = .27$, $p = .345$).

15% Tip. Cross-tabulation on the likelihood to choose the 15% tip options showed a non-significant effect, with a people being comparably likely to choose it in the 0% condition (17.2%) and the 1% condition (20.3%: $\chi^2(1, N = 315) = .48$, $p = .291$).

20% Tip. Cross-tabulation on the likelihood to choose the 20% tip options showed a significant effect ($\chi^2(1, N = 315) = 6.32$, $p = .0109$), with significantly more participants choosing the 20% tip in the 0% condition (23.6%) than in the 1% condition (12.7%).

Custom Tip. The likelihood to choose the custom tip option did not differ as a function of the lowest value ($\chi^2(1, N = 315) = .13$, $p = .424$); however, an independent-samples *t*-test with lowest value as the independent variable and custom tip amount as the dependent variable showed a significant main effect ($t(38) = 2.33$, $p = .025$, $d = .74$), with custom tips being significantly

larger in the 0% condition (M = 60.71%, SD = 37.20) compared to the 1% condition (M = 36.06%, SD = 28.62).

Choosing 1% vs. 0%. We examined the difference in overall likelihood to choose the 0% vs. 1% options and observed a significantly lower likelihood to choose 0% (3.8%) compared to 1% (10.1%; $\chi^2(1, N = 315) = 4.81$, $p = .023$), indicating that participants are more reluctant to choose zero compared to an extremely low numerical comparison. This finding implies that, within the context of prosocial payments, the zero number holds a qualitatively different perception relative to other similarly low-magnitude numerical values.

Choosing 0% vs. "No Tip". The likelihood to choose zero (3.8%) was directionally but not significantly lower than the likelihood to choose "No Tip" (7.0%; $\chi^2(1, N = 16) = 2.25$, $p = .13$), indicating a directional support for H2.

Choosing 1% vs. "No Tip". We examined whether there was a difference between how consumers observe the 1% tip (which is nominally small, essentially being an alternative to zero, though is, importantly, not zero) and the standard "No Tip" opt-out option. Within the condition where both one percent and "No Tip" were present, there was no significant difference in the likelihoods to choose "No Tip" (15.8%) and 1% (10.1%; $\chi^2(1, N = 41) = 1.97$, $p = .160$), indicating that consumers may perceive a one percent tip as similar to no tip; however, directionally, consumers chose the "No Tip" at higher frequencies.

Discussion

Study 6 examined the effect of zero on tipping, showing that the effect was driven by participants choosing higher tip options in the set (the 20% option) and indicating higher custom tip options. Importantly, participants were less likely to choose the 0% option compared to the 1% option even though the monetary impact of these options on both the payer and the service

provider are equivalently minimal. This shows the unique quality of the number 0, which appears to be qualitatively different than any other number and is in line with recent findings from the numerical cognition literature (Zaks-Ohayon et al. 2021). Giving a 1% tip could essentially be seen as giving no tip at all, which is corroborated by our fining that the proportion of these who chose "No Tip" was not different than the proportion of those who chose one percent. With that, this current study suggests that even when comparing 0% to another unfamiliar and extremely low numerical entity, the effect of the number zero holds.

In this study, even though the proportion of those who chose 0% was half that of those who chose "No Tip," we did not find statistical significance. The total proportion of tippers in this sample was very high (90.3% tipped), which much higher than the real-world observations in the field study (see Study 4). This potentially made it harder to reach significance levels due to insufficient proportion of non-tippers. That is, tipping likelihood was already at or near ceiling. The next study replicated Study 6 and further examined the effect of a zero opt-out as a function of the number of total opt-out options—that is, whether tip amounts are greater when the zero opt-out is the only opt-out in the set or when it is present in addition to the "No Tip" opt-out option.

STUDY 7: SINGLE VS. MULTIPLE OPT-OUT OPTIONS

Study 7 was design to examine how the number of opt-outs affects tips. We manipulated the presence of 0% (vs. 1%) in addition to the presence of "No Tip"—that is, when "No Tip" is present in the choice set vs. when it is not.

Methods

Participants. The study included 463 mTurk participants (*M*age = 37.24, *SD* = 10.37; 41.9% females;) who participated for monetary compensation.

Design and Procedure. This study employed a 2 (lowest value: 0% vs. 1%) × 2 ("No Tip": present vs. absent) between-subjects design. Similar to previous studies, participants were asked to imagine that they were purchasing a few items at a coffee shop using their credit card for a total bill of $10.15. The cashier swiped their credit card and turned her computer screen towards them to show them a tipping screen. They were then assigned at random to one of the four experimental conditions. Participants were asked to specify how much would they leave as a tip by choosing one of the default options on the screen. Participants in the 1% condition saw 1% as the smallest option, whereas those in the 0% condition saw 0%. In both conditions, the remaining options were 10%, 15%, 20%, and "Custom Tip." In the absent condition, participants saw one of these sets of just five options; in the present condition, participants saw one of these sets of five options in addition to a "No Tip" option as the last option in the set. When the "Custom Tip" option was chosen, participants were asked to indicate the tip amount (in USD) they would like to leave.

After indicating their tip choice, participants were asked to complete a comprehensive assessment of *impression goals concerns* (α = .85), comprising the four questions ("To what extent do you feel obligated to tip in coffee shops?", "To what extent do you tip in coffee shops in order to impress the server?", "To what extent do you tip in coffee shops in order to impress other customers?", and "To what extent do you feel embarrassed to not tip in coffee shops?"; all rated on a scale from 1, *not at all*, to 7, *very much*). Then participants completed the *perception of the business scale* (α = .86) which consisted of a five statements that asked them the extent to which they appreciate the coffee shop ("I appreciate this coffee shop for the tip options they are using,"

"I hold a positive view of this coffee shop," "The coffee shop treats its customers fairly," "The coffee shop cares about its employees," and "The coffee shop pays fair wages;" all rated on a scale from 1, *strongly disagree*, to 7, *strongly agree*). Finally, participants indicated their household income level, age, and gender.

Results

Tip Rate. Overall, 88.98% of participants tipped. A logistic regression procedure showed that the likelihood to tip was marginally significantly as a function of lowest value (b = .45, SE = .43, 95% CI = (.19, 1.06), p = .07), with a greater likelihood to tip in the 0% condition (92.5%) than the 1% condition (85.3%). The effect of likelihood to tip as a function of presence of "No Tip" option was not significant (b = 1.13, SE = .50, 95% CI = (.42, 3.05), p = .801). The interaction between bill amount and lowest value on likelihood to tip was not significant (b = 1.00, SE = .62, 95% CI = (.29, 3.42), p = .999).

Tip Percentage for Full Sample. A two-way ANOVA with lowest value and "No Tip" presence on total tip amount revealed a significant main effect of lowest value (F(1, 459) = 10.91, p = .001, η^2 = .02), with tips being significantly higher in the 0% condition (M = 16.99%, SD = 17.36) compared to the 1% condition (M = 12.60%, SD = 10.49). The main effect of "No Tip" was as well significant (F(1, 459) = 5.07, p = .025, η^2 = .01), with tips being higher when it was present (M = 16.31%, SD = 17.36) than when it was absent (M = 13.30%, SD = 10.55). The interaction was not significant (F(1, 459) = .49, p = .487, η^2 < .01). See Figure 4 for a presentation of the results.

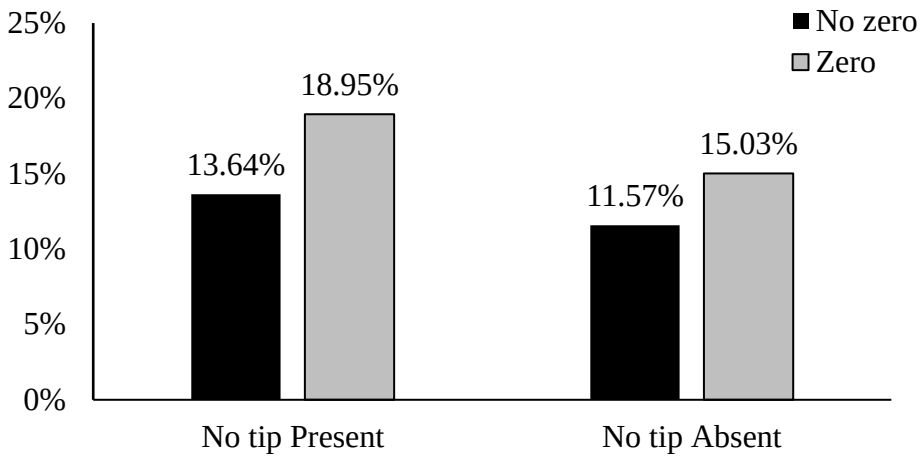

Figure 4. Tip amount presented as % as a function of presence of zero and "No Tip"

Tip Percentage Among Tippers. A two-way ANOVA among just the sub-sample who tipped revealed similar results, with a significant main effect for lowest value ($F(1, 422) = 10.34$, $p = .001$, $\eta^2 = .02$), with participants giving higher tips in the 0% condition ($M = 18.34\%$, $SD = 17.34$) than in the 1% condition ($M = 13.79\%$, $SD = 10.19$). The main effect of presence of "No Tip" was again significant ($F(1, 422) = 8.31$, $p = .004$, $\eta^2 = .02$), with tips being higher when it was present ($M = 18.20$, $SD = 17.53$) than when it was absent ($M = 14.09$, $SD = 10.34$). The interaction was not significant ($F(1, 422) = .005$, $p = .942$, $\eta^2 < .001$).

Tip Option Chosen. In order to examine which tip options consumers were nudged toward, we calculated the likelihood of choosing each tip option in the choice set as a function of the lowest and whether the "No Tip" opt-out option was present.

10% Tip. Cross-tabulation on the likelihood to choose the 10% tip options showed a significant effect of lowest value, such that participants were more likely to choose the 10% tip option in the 0% condition (38.4%) compared to the 1% condition (30.3%; $\chi^2(1, N = 463) = 3.33$, $p = .042$). There was also a significant effect of presence of "No Tip," with participants being more likely to choose the 10% option in when "No Tip" was absent (40.1%) than when it

was present (28.6%; $\chi^2(1, N = 463) = 6.80, p = .006$). The interaction was not significant ($\chi^2(1, N = 463) = 1.73, p = .124$).

15% Tip. Cross-tabulation on the likelihood to choose the 15% tip options showed no significant effect of lowest value ($\chi^2(1, N = 463) = .007, p = .55$), no significant effect of "No Tip" ($\chi^2(1, N = 463) = 1.35, p = .146$), and no significant interaction ($\chi^2(1, N = 463) = .08, p = .466$).

20% Tip. Cross-tabulation on the likelihood to choose the 20% tip option showed no significant effect of lowest value ($\chi^2(1, N = 463) = .35, p = .320$). There was a marginal effect of the presence of "No Tip," with a greater likelihood to choose the 20% tip when "No Tip" was absent (20.3%) than when it was present (14.7%; $\chi^2(1, N = 463) = 2.59, p = .068$). The interaction between lowest value and presence of "No Tip" was not significant ($\chi^2(1, N = 463) = 1.77, p = .134$).

Custom Tip. The likelihood to choose the custom tip option did not differ as a function of lowest value ($\chi^2(1, N = 463) = .54, p = .277$). There was a main effect of the presence of "No Tip," such that the likelihood to choose "Custom Tip" was greater when "No Tip" was absent (15.2%) than when it was present (8.6%; $\chi^2(1, N = 463) = 4.71, p = .021$). The interaction effect was not significant ($\chi^2(1, N = 463) = .002, p = .518$). A two-way ANOVA with lowest value and presence of "No Tip" as the independent variables and total custom tip as the dependent variable revealed a significant main effect of lowest value ($F(1, 51) = 18.97, p < .001, \eta^2 = .27$), with custom tips being significantly larger in the 0% condition ($M = 53.14\%, SD = 33.59$) than in the 1% condition ($M = 19.67, SD = 23.17$; $t(53) = 4.35, p < .001, d = 1.15$). The main effect of "No Tip" was not significant ($F(1, 51) = .07, p = .799, \eta^2 < .01$), and neither was the interaction ($F(1, 51) = 2.10, p = .153, \eta^2 = .04$).

Choosing 1% vs. 0%. We examined the difference in overall likelihood to choose the 0% vs. 1% options, finding that the likelihood to choose 0% (6.9%) was directionally but not significantly lower than the likelihood to choose 1% (9.1%; $\chi^2(1, N = 463) = .76, p = .242$).

Discussion

Study 7 showed that the effect of zero is larger when it is added to the "No Tip" option compared when it is the only opt-out option in the set. It might be the case that with the presence of "No Tip" and 0%, consumers are nudged toward higher options in the set, whereas when only 0% is present, they are nudged into tipping, which leads to overall more tips, but not to higher tips (i.e., choosing higher options in the set). The higher tips were driven by significantly more people choosing the 10% option and by people giving significantly higher custom tips when both opt-outs were present. Furthermore, overall likelihood to tip was larger when the zero option was present in the choice set, both when the "No Tip" option was present and when it was absent. We observed no differences in the likelihood to choose 1% compared to 0% in this study, indicating that perhaps 1% is also an option which consumers are not in favor of choosing; however, when present, this option does not nudge people to higher tips.

GENERAL DISCUSSION

Across several studies, both field studies and lab experiments, we show that the presence of a zero option (i.e., 0%) on an electronic tipping screen results in higher average tipping by consumers. This is true both when the 0% option replaces the more traditional "No Tip" option (Studies 1, 2, 3, 7) and when it is included as an additional opt-out option along with "No Tip" (Studies 4, 5, 6, 7). In Studies 4, 5 and 6, this effect was driven not by how the presence of zero leads to greater likelihood to tip (because people could opt-out use "No Tip"), but by how it leads people to tip higher amounts, selecting the higher-value options (and even choosing higher

custom tips). In studies 1, 2, 3, when comparing the presence of zero (or a nominally small value) to "No Tip", we further found that the likelihood to tip and the tip amount were greater when the zero was present. This effect of zero leading to greater tips holds true when total bill amounts vary in range (Studies 3 and 4) and bill size (Studies 4 and 5); when the zero option (i.e., 0%) is compared to a nominal, non-zero tip option (i.e., 1%; Study 6 and 7); across different service contexts (Study 2); when the options are presented in descending (vs. ascending) order (Study 3); and when the 0% option is compared to other verbal empty sets ("No Tip" and "Not Today;" Study 1).

In Study 1, mediation analyses showed that the effects of zero was due to self-image concerns and empathic concerns. This suggests that social expectations could be driving the effects of zero: People do not want to be seen being stingy. Further analyses ruled out competing explanations for the observed effects. It could be that people choose to tip higher because they do not want to feel cheap, do not want to give an indication that service was poor, or do not want to feel bad about their tip. Study 5 examined these factors and found no evidence for their affecting participants' tipping choices. Thus, the evidence points to a true effect of zero.

Taken together, these findings suggest that the presence of a 0% option nudges people to tip higher amounts than they otherwise would have, presumably out of a desire to be more socially conscious. These findings are somewhat inconsistent with previous findings on charitable giving, which show that people go out of their way to avoid passing bell ringers so as to avoid donating (Anderoni et al. 2011). Participants in the current studies almost always had a non-zero opt-out option equivalent to avoiding the bell ringers (e.g., 1%, "No Tip"), yet they chose not to take it. Instead, they were shifted to more generous options in the set. Based on this we suggest

that seeing the number zero itself draws awareness to the situation and the norms governing it. This will be discussed further later.

In Studies 1, 2, and 3, when a zero option was the only opt-out option (i.e., 0% replaced "No Tip"), the observed effects of higher tipping in the non-zero condition were driven mostly by how the zero option led to more people choosing to give a tip rather than leading people to tip higher amounts. This is confirmed by analyses among just those who tipped, wherein the difference between the zero and non-zero conditions attenuated. These findings complement those of Studies 4–6 and show that zero can have a slightly different effect on tipping depending on whether it is the only opt-out option. Study 7 confirms this by showing that when zero is the only opt-out option, it nudges more people into tipping; when it is present along with another opt-out option, it nudges people (at least those who would tip) to tip higher. Moreover, these findings are consistent with Anderoni et al.'s (2011) findings of people's donations in the presence of bell ringers: When there is an easy opt-out option (i.e., exit through the door with no bell ringer; or, in our case, select "No tip"), more people will take it; however, when the only way of not giving would be to give nothing (i.e., walk past the ringers without donating; or, in our case, select 0%), donations (or, in our case, tip) amounts increase.

One explanation for this effect is how social norms of tipping interact with the presence of another opt-opt option and with how zero is perceived differently when represented verbally (e.g., "No Tip") vs. numerically (i.e., as a digit, e.g., 0%). Historically, tipping in coffee shops (and other contexts where service is minimal or absent altogether) is not a strong or consistent social norm, at least not compared to much more reliable and documented norms like tipping at restaurants. (That is, it might be expected to tip, but there is no established precedent for what that amount should be, as with the typical 15% in a restaurant; [The Emily Post Institute, n.d.].) As

such, many consumers may feel not comfortable choosing the 0% option, thereby being nudged to tip. Thus, when the zero option is the only opt-out option, they choose to tip but are not necessarily shifted to the larger options in the set, because they understand that it is fairly normal to give a nominal tip in such a situation. However, when the zero option is presented along with a "No Tip" option, even though the two options are identical in terms of their financial outcomes, the zero-ness of the zero option is more salient when contrasted with "No Tip": While it may be seen as socially acceptable to choose to give no tip (i.e., choose "No Tip"), it is socially unacceptable to choose to give a tip of nothing (i.e., choose 0%). This argument is consistent with the results of Ariely et al.'s study (2018), which showed that people exhibit more demand for a free product but take less of it, suggesting that social norms and considerations are not completely overpowered by the presence of a zero option and people's desire to be frugal. Similarly here, even when faced with an easy opt-out (i.e., "No Tip"), the zero option makes people socially conscious, thereby nudging them to tip higher than they would have otherwise—or to tip more than they would have otherwise.

Thus, these results provide novel insights to the field of consumer behavior concerning choice architecture and how the options presented to consumers affect their tipping behavior. As tipping is a growing, multi-billion-dollar industry (Azar 2011), and as modern technology continues to advance and electronic payments become increasingly prevalent (Khabir, Saidin and Ahmi 2015), consumers' use of such electronic POS systems will increase and businesses will be faced with decisions about how to implement such systems, making such findings increasingly important to businesses across the service sector, from large corporations to small shops.

Theoretical Implications

Prosocial Behavior and Participative Pricing. Previous research on participative pricing has shown that, rather than taking advantage of the opportunity to pay a minimal amount (or nothing at all), people tend to tip more and donate more (Gneezy et al., 2010; Jung et al. 2017; Kim et al., 2008) when given the option to choose how much they want to give, presumably due to image concerns (Akerlof and Kranton, 2000; Azar, 2004; Cox et al., 2018): People want to be seen as being generous and as adhering to social norms concerning giving tips and paying for goods and services. The present results add to this literature by showing how merely changing the frame of the opt-out option nudges them towards greater voluntary payments. This was true even for customers who tipped using the "Custom Tip" option (Studies 5, 6), which is the truest example of participative pricing, as costumers could leave any amount of tip they wanted through that option.

Perhaps the presence of a zero option makes people more aware of the outcome of their decision, reminding them that to not tip is equivalent to giving a zero percent tip. Thus, people, wanting to be socially conscious (and, perhaps more so, wanting to be seen being socially conscious), tip more.

Choice Architecture. Traditional, cash-based forms of tipping have allowed consumers to choose how much to give (e.g., leaving a tip on the table at a restaurant, putting money in a tip jar). Even certain card-based forms of tipping allow consumers to choose their tips, such as writing in a tip on the tip line of a receipt. However, in recent years, POS systems that present consumers with discrete options have become increasingly popular. The effect of defaults has been studied for decades, but as their use in electronic payment systems is a rather recent phenomenon, they have received little research attention from the consumer behavior field.

Previous research on choice architecture has observed several behavioral phenomena, such as the primacy effect (Mantonakis et al. 2009; Miller and Krosnick 1998), wherein people are biased towards the first option, and the recency effect (Teppan and Zanker 2015), wherein people are biased towards the final option. However, Mantonakis et al.'s (2009) study examined people's taste preferences for a series of wine samples, while Miller and Krosnick examined people's voting behavior when they had little knowledge of the race and the candidates. In such situations, people look to the order of presentation for information—or they just pick the first one, since that is a simple decision. Somewhat similarly, Teppan and Zanker (2015) examined product recommendations. Presumably, people look to such recommendation lists because they have insufficient knowledge; with no other information to guide their decision, the order of the list itself becomes a source of information. The present work shows that people do rely on the options provided to them but found no such primacy or recency effects; we observed no differences between the typical (i.e., increasing) and reverse-order presentation, showing that when it comes to payment decisions—at least for tips—the order of options does not affect consumer behavior.

Survey Methods

The range of response alternatives theory reported in the research on choice sets is how people are sensitive to the range of the options presented (i.e., Schwarz et al. 1985). The argument is that people use the provided response options as a way of gauging what is considered normal or expected, but only if the options are believable and when there is no memory bank to retrieve information about the behavior from (Menon, Raghubir and Schwarz 1995). Given that tipping norms have not been established for places like coffee shops, delis, farmer markets, and the like (unlike the well-established tipping norms at restaurants), when presented with several options on the payment screen, people may infer that these options indicate typical choices that other

consumers make and so make their decision accordingly: the higher the average value of the options, the higher the amount tipped. We do find indication that consumers use the options in the set as information when they form their tipping judgments, as consumers tipped more with presented with higher ranges (Study 4); however, it seems that consumers ignore the zero option altogether and do not include it in their consideration when forming an average norm from the numbers presented. In Study 4, consumers tipped more when the zero replaced a non-zero option, implying that people did not include zero when they averaged the tip options. Furthermore, as shown in Studies 6 and 7, when the three higher values were the same (10%, 15%, and 20%), people also tipped more in the condition when the lowest option was 0% condition than when it was 1%. That is, they might have taken the 1% in the calculations of the average, but not 0%, and so they tipped more when there was a zero option. We suggest this is because of a unique concept of zero: Given how people flexibly view zero as either a numerical value or an abstract concept (Zaks-Ohayon et al. 2021), people discount it when implicitly computing the average of the response options.

Further research is needed to understand people's decision-making processes in such circumstances. Regardless of what the underlying mechanism is, these findings indicate that not all empty sets are the same and should not be used interchangeably. To a customer's eye—and in terms of their behavioral responses—"0%" and "No Tip" are very different options.

Specialness of Zero. As just discussed, our results show that not all empty sets are created equal. While the outcomes of selecting "0%" and "No Tip" are the same, consumers' perceptions of these choices are very different. Previous research has shown that people do not view the number zero as they view other positive whole numbers: At times, zero can be conceived of as a numerical value (i.e., as the lowest value on the mental number line); other times, however, it is perceived

more abstractly as the absence of quantity (Zaks-Ohayon, Pinhas, and Tzelgov 2021). While the present study did not probe participants' mental conceptions of zero, their behavioral results are consistent with this notion. Whereas to select "No Tip" is to choose to not give a tip, selecting a zero percent tip is choosing to give nothing (i.e., the absence of quantity) as a tip, which is a rather antisocial choice for a payment that is meant to be prosocial, hence why people avoid it: They do not want to be seen making an antisocial decision. This is corroborated by the fact that image concerns mediated the effect of a zero option.

This finding of the unique perception of zero adds to the existing literature and understanding of how people perceive zero. Shampanier et al. (2007) found that people find free products more attractive than their better-value counterparts, and Ariely et al. (2018) found that people exhibit more demand for free products. However, these products were indicated as free and, as such, were considered a gain to the consumer. However, we find that in a context where consumers suffer a loss (i.e., payment), the zero was less attractive and its demand was lower. Thus, consumer researchers must understand that not all zeros are created equal and that a zero in a gain frame is substantially different from a zero in a loss frame, particularly if that loss frame involves a prosocial behavior and people's desire to not appear cheap or selfish. But it is not merely the frame that makes zeros different; how they are expressed affects how people perceive them. The results from the present study show that people tip more in the presence of a numerical empty set (i.e., "0%") than in the presence of a verbal empty set (i.e., "No Tip"), suggesting that people view numerically empty sets as qualitatively unique. We show that the digit form of zero is unique compared to other verbal representation of it (Study 1) and compared to any other number, even comparably nominally small numbers (Studies 6 and 7).

Nonetheless, further research is needed to examine people's underlying mechanisms and decision-making processes when confronted with a zero option for tipping. Research is also needed to directly compare verbal and numerical empty sets in other consumer behavior domains, such as paying for goods and services (i.e., where there are no tips), to see if people perceive a qualitative distinction between "Free" and "$0" as they do between "No Tip" and "0%."

Managerial Implications

The present findings have profound implications for businesses in terms of how they decide to present their customers with requests for tips—what ranges they should use, what they should use as minimum values, etc.—especially as electronic payment systems continue to increase in popularity. This definitely is true for businesses that rely on tips: food service establishments, ride share apps, taxis, delivery apps, etc. Such businesses will want to optimize their payment systems—that is, optimize the options displayed on their payment systems—so as to boost their revenue and their employees' income. Namely, by including a zero option as part of the choice set, businesses can nudge consumers toward higher tips. Moreover, by replacing the traditional "No Tip" option with a zero option, they can further increase tips.

These implications apply to other consumer domains as well, particularly those that use the pay-what-you-want pricing strategy, which allows people to choose the price they want to pay. After all, this strategy has also been found to be affected by social norms (Azar 2004, 2007; Mengel 2008). Moreover, the findings on the unique effect of zero and how it is qualitatively different from a quantitatively identical empty set has significant implications for all sorts of financial transactions in all forms of voluntary payments, including donations. If we want to encourage people to make more generous choices, we should present them with options that indicate ungenerous choices: giving nothing (as opposed to not giving anything).

Future research is needed to determine how these effects bear out in other domains of consumer behavior. Is zero as potent in donation decisions as it is for tipping decisions? Does the numerical vs. verbal empty set difference translate to donation behavior and other to non-tip-based transactions? What is the optimal number of options businesses should use and how can they benefit from having more opt-out options? In order to optimize sales and enhance customer experience, we need a more thorough understanding of how people feel about and respond to the relatively new and already widely used electronic payment systems.

Conclusion

Across several studies, we show that, in the context of tipping, the number zero is qualitatively different from other verbal descriptions of it and from other numbers. People choose to tip higher when a 0% option is included on an electronic payment screen and when a 0% option replaces the more traditional "No Tip" option. These effects seem to be mediated by self-image concerns and empathic concerns, suggesting that the presence of a zero option heightens people's awareness of the prosocial nature of the transaction and inspires them to be more caring for others and more aware of how others perceive them. In today's increasingly technological society, as more payments shift to electronic forms and apps are used more frequently to moderate transactions, these findings of the effects of various choice architectures will continue to be increasingly important to businesses who want to stay on the leading edge of technology and not suffer financially.

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