

## CUSTOMER TIPPING BEHAVIOR IN ONLINE FOOD DELIVERY SERVICES

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This study examined factors influencing customer tipping behavior in online food delivery (OFD) services. An online survey of 551 U.S.-based participants was analyzed using confirmatory factor analysis and structural equation modeling. Customer satisfaction—shaped by factors including food quality, safety, hygiene, control, convenience, service, and fulfillment—was found to predict tipping behavior significantly. Age and income had a positive moderating effect on this relationship. Findings suggest that improving customer satisfaction through service quality and food safety can enhance tipping behavior. These insights can guide OFD companies and restaurants in refining their service strategies to enhance customer loyalty and employee satisfaction.

**Keywords:** Online service delivery; online food delivery; food quality; tipping; customer satisfaction

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**INTRODUCTION**

Technology has transformed our lives by creating remarkable tools and resources that have made information readily accessible. Technology in the 21st century has been characterized by the proliferation of portable, high-powered, multifunctional devices, such as smartwatches and smartphones (de Waal Malefyt, 2017; Voogt et al., 2013). It is incredible how people can communicate instantaneously, regardless of distance, through instant messaging applications (apps) and social media platforms, enabling communication in mere microseconds. Technological advancements have been instrumental in revolutionizing and elevating numerous aspects of human life, despite the inevitable challenges and trade-offs they may entail.

Consequently, in recent times, there has been an increasing awareness and adoption of online services as people are gradually overcoming mistrust and embracing a new era of digital services (Ye et al., 2020). Technological advancements have benefited numerous industries immensely, ranging from banking and education to marketing and even religious institutions (Voogt et al., 2013). The food industry, in particular, has been immensely impacted by technology (Demirkesen et al., 2010). The growth of online food

delivery (OFD) services has increased dramatically over the last decade (Collison, 2020; Li et al., 2020), and this trend accelerated further during the COVID-19 pandemic (Chaplin, 2020; Mehorolia, Alagarsamy, & Solaikautty, 2020; Li et al., 2020). During this challenging time faced by the food industry, OFD proved to be a lifeline, enabling most restaurants to remain in business despite empty dining rooms. Consequently, many small and large restaurants had to adapt quickly, making changes to compensate for the decline in dine-in customers. With OFD, customers could easily order food online and have it delivered to their homes quickly and conveniently.

Many studies have explored the relationship between OFD services and consumer satisfaction (Annaraud & Berezina, 2020a; Cho et al., 2019; Handoko, 2016; Mehmood & Najmi, 2017; Ribeiro, 2018; Suhartanto et al., 2019a). They report that consumers are driven towards using OFD services because they believe these services save more time and effort than conventional options. Some studies go further, investigating how these experiences influence the continued use of OFD (Annaraud & Berezina, 2020a; Cho et al., 2019; Handoko, 2016; Lee et al., 2019; Mehmood & Najmi, 2017; Ribeiro, 2018; Suhartanto et al., 2019a). Despite the convenience and popularity of OFD services, there remain areas that warrant further enhancement, such as service quality, timely delivery, and mitigating the inevitable deterioration of food quality compared to direct in-person purchases from restaurants (Ribeiro, 2018; Dwivedi & Desai, 2020). Some service quality issues arise from concerns about food safety and personal hygiene with OFD services. There has been a rise in reports of drivers tampering with consumers' food, either intentionally or unintentionally, by handling it with bare hands and paying little attention to timeliness in delivery, as well as temperature abuse (Beach, 2017; Darrah, 2019; Jeff Wagner, 2019; Hodges, 2020). Restaurants are subject to stringent regulations, such as Hazard Analysis and Critical Control Points (HACCP). They are monitored by regulatory authorities at the local, state, and federal levels to ensure adherence to food safety and hygiene practices. Failure to comply with these rules can result in legal sanctions. However, auxiliary food delivery companies often operate under less stringent regulations or, in some cases, are not regulated with the same level of scrutiny (VanRenterghem, 2020; Hodges, 2020). This discrepancy raises significant concerns for public health. Undoubtedly, as OFD services have evolved, consumer satisfaction has become increasingly contingent upon their perception of drivers' adherence to food safety and personal hygiene standards. Ultimately, customers tend to express their appreciation through tipping for services rendered (Lynn, 2015), a practice that has traditionally been observed in restaurants, where servers receive gratuities from customers (Azar, 2011; Becker et al., 2012; Futrell, 2015; Hilkenmeier & Hoffmann, 2021; Lynn, 2015; Lynn et al. 2012b). A similar trend has emerged in the OFD industry, with drivers being the recipients of tips (Lynn, 2021).

While some OFD apps have built-in tipping features, customers often have their personal preferences on how they want to tip, if at all

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(Chen et al., 2021; Furunes & Mkono, 2019). For instance, some customers may prefer to tip in person upon delivery, as the speed of the delivery can influence the amount of the tip (Chen et al., 2021).

This study has a twofold objective: firstly, to identify the factors that influence customer tipping behavior in OFD services, and secondly, to explore how these factors have evolved in relation to customer satisfaction since the onset of the COVID-19 pandemic. The primary components of customer satisfaction examined in this study encompass perceived control, service convenience, customer service, and service fulfillment (Annaraud & Berezina, 2020), as well as food quality, food safety, and personal hygiene. Furthermore, this study will investigate how age and income moderate the relationship between customer satisfaction and tipping behavior in the context of OFD services.

## LITERATURE REVIEW

There has been a dramatic increase in OFD services worldwide over the last decade (Annaraud & Berezina, 2020a; Cho et al., 2019; Ribeiro, 2018), from raw farm produce in grocery stores and markets to ready-to-eat foods in restaurants. Many food enterprises facilitate transactions between businesses and consumers with just a single click. This is often done via iOS - and Android-friendly apps that consumers can download on their phones (Dwivedi & Desai, 2020; Tribhuvan, 2020). These apps help restaurants and OFD operators communicate with their delivery drivers to ensure that food is delivered to consumers. The increasing dynamism in consumer needs, particularly the demand for convenience and time-saving options, has driven this surge in OFD services. The flexible way in which OFD services function allows consumers to choose from a variety of restaurants and store their payment information for convenient reuse (Annaraud & Berezina, 2020; Bin et al., n.d.; Murat Alagoz & Hekimoglu, 2012; Suhartanto et al., 2019). Additionally, consumers can reorder from frequently patronized restaurants without the hassle of browsing through menus. This significantly reduces the time consumers spend ordering (Alalwan, 2020; Kimes, 2008; Reddy & Aradhya, 2020). Technology has been crucial in enabling coordination between restaurants and OFD providers to consumers. Statista (2021) suggests that in the United States (US) alone, with reference to gross merchandise value, revenue from OFD services amounted to US \$44.1 billion and US \$56.9 billion in 2020 and 2021 respectively; and is expected to surge to a whopping, US \$66.5 billion by the end of 2022.

### **COVID-19 and the Rise of OFD Services**

When cases of COVID-19 were first confirmed in the US, a public health emergency was declared that urged people to stay at home (The White House, 2020). These events led to the proliferation of teleworking, e-commerce, and OFD services, and triggered many drastic changes in dining behaviors. Adults were twice as likely to contract COVID-19 after dining at a restaurant, even with reported social distancing and mask-wearing precautionary measures (Fisher et al., 2021). Consequently, many restaurant owners had to close their businesses entirely, while others utilized food delivery services to remain open. Some liaised with third-party companies, such as Uber Eats, DoorDash, Postmates, and Grubhub, to stay in business. Ordering meals either directly through a restaurant's website or using a third-party delivery service became more commonplace. Statistics indicate that consumer demand for OFD services increased by more than 200% during the COVID-19 pandemic in 2020 (MarketWatch, 2020; Statista, 2020).

### **Tipping and OFD Services**

The COVID-19 pandemic impacted everyone in the restaurant industry, including staff and customers. Consumers missed out on many things which make the in-house dining experience more pleasurable: the mood, setting and ambience of their favorite restaurants, having someone ask what they want, being served and not having to worry about washing dishes or tossing leftovers in the trash, and the experience of seeing people and having meals freely with others in an open space. Servers also felt the impact of not having customers walk through their doors on a daily basis. They missed out on the opportunity to provide services, and they were not only deprived of their "low" wages but also lost the extra money (i.e., tips) they typically receive from customers (Mackinnon & Fitzgerald, 2020; One Fair Wage, 2021). Research shows that more than 80% of restaurant workers admitted to receiving a drastic decrease in the tips they received from customers since the COVID-19 pandemic. Additionally, 66% report that the tips they received had decreased by at least 50% or more due to COVID-19 (Mackinnon & Fitzgerald, 2020). The COVID-19 pandemic reduced restaurant patronage, customer capacity due to social distancing, and work hours, while also leading to increased layoffs of restaurant workers. All these contribute to a decrease in the tipped wages servers receive (Brewster & Gourlay, 2021). It can be inferred from the literature that the consequent decline in in-house restaurant service tipping due to the pandemic is reflected in an increase in off-premises delivery services. However, the question of whether the tipping table turned in favor of drivers doing food deliveries is not entirely understood, although Lynn (2021) purports that the tip-per-order for food delivery services increased by US\$1.24 due to the COVID-19 pandemic. He reports that the tip-per-order for food delivery was low prior to the COVID-19 state of emergency declaration in the U.S. However, after the declaration, in-house restaurant dining decreased, while there was a simultaneous increase in patronage of OFD services. Furthermore, Alexander et al. (2017) suggest that customers who used app-based services, including delivery services, were more likely to increase their tip size when the companies suggested larger tip amounts through the apps.

### **Tipping, Customer Satisfaction, and Employee Performance**

Tipping has been identified as a form of incentive, presumed to be a sign that employees are providing quality customer service. Thus, restaurant managers tend to use tips to evaluate employee performance. Over the past decades, research on the relationship between tipping and service quality has been met with controversy. According to Lynn 2003, there is a weak relationship between tipping and service quality. This questions the concept of using tips as a measure of customer satisfaction and employee/restaurant performance. Delving deeper into using tip size as a measure of customer satisfaction, Lynn 2001 identifies a flaw contrary to the popular notion that big tips are synonymous with high customer satisfaction and small tips indicate customer dissatisfaction. A meta-analytic review of existing research on service tipping suggests that tips may be a poor indicator of customer satisfaction, as customers who rated the service as "excellent" sometimes left smaller tips compared to those who scored the service as "poor."

Nonetheless, tipping is a great tool that motivates employees at no cost to employers. Employees play a crucial role in the onward movement of any organization (Krumbiegel et al., 2018; Xiong & King, 2015; Zhu et al., 2015). Tipping as a result of customer satisfaction from an employee's service can help provide extra income for employees (extrinsic motivator) and/or provide job fulfillment (intrinsic motivator) both of which promote employee performance

according to the Two-factor Theory of job satisfaction (Goetz et al., 2012), and consequently, are good for employers' businesses.

- Hypothesis 8. Customer satisfaction positively and significantly influences tipping.

### **E-service Quality**

Prior studies look at e-service quality through the lens of service quality, which refers to a subjective evaluation of services rendered in relation to how they meet a customer's desires or perceived standards (Shi et al., 2018; Annaraud & Berezina, 2020). In this era of online marketing, the term online service or electronic service quality (e-service quality) as Suhartanto et al. (2019) prefer to call it, has become a more contextual term given technological advancements. Drawing from the concept of service quality, e-service quality looks at the degree to which services rendered through electronic platforms are judged to be satisfactory and meet consumers' desires or standards. Services delivered via online transactions depend heavily on the extent to which the technology (in the form of apps or websites) can match the standards of conventional, non-electronic services. Zooming in on OFD services, e-service quality encompasses how well an OFD app effectively and efficiently aids a consumer in exploring restaurants or food service options, selecting and purchasing food, and having their order(s) delivered in a manner that meets the consumer's expectations (Al-Tit, 2015; Al-dweeri et al., 2017; Shi et al., 2018; Suhartanto et al., 2019; Annaraud & Berezina, 2020). In relation to tipping, a meta-analytic study found that service quality significantly predicted the percentage of a bill that was tipped (Banks et al., 2018). To understand the relationship between e-service quality and tipping, this study will adopt the descriptors of perceived control, service convenience, customer service, and service fulfillment as measures of e-service quality (Suhartanto et al., 2019; Annaraud & Berezina, 2020).

### **Food Quality**

For this study, food quality encompasses the aroma, appearance and appeal, nutritional quality and variety, taste, freshness, and temperature of food and how these attributes meet a consumer's perceived expectations or standards of a restaurant experience (Konuk, 2019; Suhartanto et al., 2019; Annaraud & Berezina, 2020). In the context of OFD services, food quality refers to the ability of food delivered through these services to evoke similar emotions or appetites as it would if the same food were served at a restaurant. It is undeniable that food quality is one of the main determinants of why consumers dine outside of the home. Therefore, irrespective of the means through which food is ordered, the food must not be of low quality. When consumers use OFD services, they are already missing out on the dining experience of a restaurant environment, so it is doubly painful when food does not meet their perceived expectations. According to Annaraud & Berezina (2020), food quality is one of the primary reasons consumers purchase from a restaurant in the first place and can determine why one restaurant is preferred over another. When consumers perceive a restaurant's food quality as satisfactory, they become loyal customers and consciously or unconsciously influence others within their circle to patronize the same restaurant (Suhartanto et al., 2019). Food quality is more important to customers than service quality and environment (Almohaimmed, 2017; Konuk, 2019). Given the importance of food quality for the sustainability of the restaurant business, the array of food displayed on a restaurant's menu is largely determined by the quality of the food (Konuk, 2019). Research conducted by Suhartanto et al. (2019) and Annaraud & Berezina (2020) revealed that food quality has a positive impact on OFD satisfaction; it also positively influences consumers' perceived value and has a strong influence on consumers' intentions to re-use an OFD service (Al-Tit, 2015; Namin,

2017; Suhartanto et al., 2019). Similarly, in line with the above, it makes sense to predict a correlation between substandard food quality and consumer dissatisfaction. This study aims to delve deeply into the intricacies of how consumers' judgment of substandard food quality affects their dissatisfaction with using OFD services.

- Hypothesis 1. Food quality positively and significantly influences customer satisfaction.

### **OFD Services, Food Safety, and Personal Hygiene**

OFD services have highlighted the pivotal role played by OFD drivers in the supply chain, bringing it into sharp focus. As a result, there is an imperative need to ensure that these drivers receive comprehensive training and education on various aspects of food service, with a particular emphasis on food handling, safety, and hygiene practices. OFD drivers now represent the final touchpoint for consumers' food before it reaches their hands, mirroring the role of waitstaff in traditional restaurant settings. Just as servers in restaurants undergo rigorous training to uphold food safety standards, it is paramount that OFD drivers receive equally thorough training to safeguard the integrity of the food they deliver.

Food safety has become a significant concern, particularly in the wake of the COVID-19 pandemic (Mensah & Ofosu, 2020). This has influenced consumer purchasing behavior, particularly in the OFD sector. Consumers' perceptions are shaped by food safety-related risks, affecting their patronage of delivery services (Chandrasekhar et al., 2019a). While OFD services offer convenience, consumers are equally concerned about food safety issues, which have become a driving force behind their adoption of OFD services, especially during the COVID-19 pandemic when dining out posed a higher risk of exposure (Desai & Aronoff, 2020; Scallan et al., 2011). Adherence to food safety in the OFD sector is, therefore, increasingly important, as more people can fall prey to foodborne illnesses from poor food handling by OFD drivers.

At the restaurant level, strict regulations govern food sourcing, preparation processes, and hygiene practices, enforced by US agencies like the Food and Drug Administration (FDA), the Food Safety and Inspection Service (FSIS), the Environmental Protection Agency (EPA), and the National Marine Fisheries Service (NMFS) (Brown et al., 2015; Fung et al., 2018). For years, over 50 interagency agreements have been established to coordinate the activities of various agencies (Institute of Medicine & National Research Council, 1998). However, such stringent rules are often lacking for OFD services, particularly Platform-to-Consumer delivery (Hodges, 2020). Anyone in contact with food should be cognizant of the intricacies of safe food handling and hygiene. It is possible that even when restaurants strictly follow safety regulations to ensure food safety, a delivery driver's lack of knowledge about food safety could undermine those efforts, ultimately defeating the purpose of such regulatory interventions (Kwol et al., 2020). Alarmingly, Hodges (2020) found that over 65% of Platform-to-Consumer drivers lack formal food safety training, and many disregard handwashing and vehicle cleanliness requirements. Furthermore, issues such as drivers eating customers' orders, taking detours, and failing to adhere to temperature control guidelines for perishable items during delivery can compromise food safety. The length of time from pick up to delivery can influence critical control points of food, especially when drivers need to deliver multiple orders. Drivers must be aware of the maximum time perishable food items can remain unrefrigerated before spoiling, and understand how spoilage varies based on the type of food, as this can lead to food safety concerns (Davis et al., 2014). These practices not only violate consumer rights but also pose significant life-threatening risks due to potential food contamination resulting from unsafe handling.

The evidence suggests that the quality of OFD services has a direct and positive impact on customer satisfaction. Consequently, this heightened level of customer satisfaction is likely to influence tipping behavior among customers.

- Hypothesis 2. Food safety positively and significantly influences customer satisfaction.
- Hypothesis 3. Perceived hygiene positively and significantly influences customer satisfaction.

### Perceived Control

Generally, perceived control is characterized as confidence in one's ability to influence or manage circumstances or situations (Ly et al., 2019; Hu & Wise, 2020). The term has been linked to complete physical, mental, and social well-being and is said to be a determinant of success in an individual's life (Ly et al., 2019; Hu & Wise, 2020; Le et al., 2020). Initially, the term described an individual's self-efficacy and competence, which was said to be a fixed part of the individual's personality (Skinner, 2016). It was also considered a psychological process influenced by methodically manipulated environmental factors, thereby relating to the concepts of learned helplessness, mindfulness, and the illusion of control (Skinner, 2016). Despite the evolution of time the core concept of perceived control remains the same. In this study, perceived control is defined as the ease with which a consumer can navigate an OFD app or interact with it, and the consumer's evaluation of how much control they have from start (making an order) to finish (receiving the order) when patronizing OFD services. Simply, it refers to a consumer's display of mastery over OFD app technology and their ability to manipulate it to get food delivered to them. It also includes consumers' assessment of how much control they have over the OFD drivers' delivery of their order. It is therefore in the interest of OFD companies to develop OFD apps that are interactive and user-friendly (Suhartanto et al., 2019). Perceived control is one of the characteristics consumers value most about OFD apps, and it has been greatly linked with consumer satisfaction (Annaraud & Berezina, 2020a; Ribeiro, 2018). The opposite can therefore be inferred. Customer dissatisfaction with OFD services may be linked to a consumer's lack of perceived control.

- Hypothesis 4. Perceived control positively and significantly influences customer satisfaction.

### Service Convenience

The term "convenience" was first used in the marketing context by Copeland in 1923 (Annaraud & Berezina, 2020), where he referred to it as the amount of time and effort a person spends acquiring a product. Following this, the concept of service convenience quickly emerged. Berry et al. (2002) are referenced as the first to propose a five-dimensional conceptual model for service convenience. The five dimensions are access convenience (steps taken to request and receive a service); decision convenience (choosing to perform or pay for a service personally); transaction convenience (typically monetary activities related to receiving a service); benefit convenience (enjoying service benefits); and post-benefit convenience (more relatable to products—warranties, repairs and servicing, and replacements) (Annaraud & Berezina, 2020a; Gupta & Sharma, 2017; Ribeiro, 2018). They are defined in relation to time, effort, and the perceptions of a consumer who buys or uses a service (Annaraud & Berezina, 2020a; Gupta & Sharma, 2017; Ribeiro, 2018; Roy et al., 2016). Literature has demonstrated a relationship between service convenience and perceived value, as well as purchasing decisions and customer satisfaction (Annaraud & Berezina, 2020a; García-Fernández et al., 2018; Roy et al., 2016). In this study, service convenience is expressed as the amount of time and effort a consumer spends when using OFD services, including OFD apps, as well as the time it takes to receive the

food ordered via OFD services.

- Hypothesis 5. Convenience positively and significantly influences customer satisfaction.

### Customer Service

Customer service is one of the key factors contributing to consumer satisfaction. Cao et al. (2018), reiterate that it is the most significant determinant of consumer satisfaction in China, one of the world's biggest e-commerce hubs. Customer service refers to the prompt, credible, and reliable support that an organization provides to its customers before, during, or after they purchase the organization's products or services (Abd Ghani et al., 2017; Annaraud & Berezina, 2020a; Ribeiro, 2018). Customer service refers to how an organization's personnel address customer concerns and problems, and may include providing clarifying information about the organization through general customer enquiries (Ribeiro, 2018). One of the main inhibitors of consumer usage of OFD services is poor customer service (Annaraud & Berezina, 2020). In this study, customer service relates to online or in-person responsiveness and empathy provided by OFD drivers to customers prior to, during, or after food delivery.

- Hypothesis 6. Customer service positively and significantly influences customer satisfaction.

### Service Fulfillment

In recent research, Annaraud & Berezina (2020) confirmed that service fulfillment has a connection with consumer satisfaction of OFD services. According to Ding et al. (2011), service fulfillment is the strongest dimension variable compared to perceived control, customer service, and service convenience of the e-SELQUAL scale in relation to predicting e-service quality, customer satisfaction, and loyalty. Service fulfillment refers to the accuracy of information on an organization's website regarding a product or service, enabling customers to rely on it for the safe and timely delivery of their orders (Parasuraman et al., 2005). Simply, the extent to which an organization fulfils tangibly what it states about its product or service online. Based on the literature established, service fulfillment in this study refers to the degree to which information on an OFD app reflects the reality of the OFD driver's service in terms of accurate, safe and timely delivery of orders.

- Hypothesis 7. Fulfillment positively and significantly influences customer satisfaction.

### Age and Income as Moderators of Customer Tipping Behavior with OFD Services

It has been established that tipping behavior is chiefly propelled by social norms (Azar, 2011; Conlin et al., 2003; Duhaime & Woessner, 2019; Lynn, 2011, 2012, 2018; Lynn & Williams, 2012a, 2012b). However, Lynn and Williams (2012) argue that the socioeconomic status (SES) of customers can influence tipping behavior. In their study where socioeconomic status was defined in terms of a customer's income and education, they found that participants with a lower SES had less knowledge of restaurant tipping norms compared to participants with a higher SES, such that as a participants' SES increased, so did tipping rates, along with knowledge of the dominant cultural norms. Furthermore, a high SES positively influenced the percentage of a bill tipped among White participants, whilst among Black participants, the level of SES made no difference in tipping behavior. Similarly, in a study conducted by Alexander et al. (2017) where race, education, and income were studied in relation to the frequency of tipping, they found that high-income participants tipped more frequently than participants with low incomes. In their study, income was put into five categories ranging from less than \$15,000 to greater than \$50,000.

The age of a customer had only a very small negative correlation with the percentage of the bill tipped (Banks et al., 2018). Also, Seiter et al. (2016) revealed that a customer's estimated age was not associated with tipping behavior. In a contrasting study by Conlin et al. (2003), which explored various factors influencing tipping behavior in a restaurant, researchers posited that the age of the customer had an impact on tipping behavior. It was also shown that teenagers and young adults usually tipped less than adults (Conlin et al., 2003; Shatnawi, 2019). However, Lynn, Jabbour, & Kim (2012), argue that older consumers are less likely than their younger counterparts to reward an unusually good service with large tips and often gave smaller tips to punish a bad service. Ultimately, differences in tipping behavior and tipping knowledge due to age could be confounded by other factors, including higher income levels, types of payment methods, and educational differences. For example, in a study by Lynn (2006), the relationship between higher knowledge of tipping norms and increasing respondent age was nonsignificant when other factors, such as education, income, and status, were taken into account. So far, the relationship between age and income, customer satisfaction and OFD services is not fully understood. In this study, age and income will be studied as moderators of customer satisfaction and tipping behavior with use of OFD services. As such, the following hypotheses are proposed:

- Hypothesis 9. Age moderates the relationship between customer satisfaction and tipping such that the higher the age, the stronger the relation.
- Hypothesis 10. Income moderates the relationship between customer satisfaction and tipping such that the higher the income, the stronger the relation.

## METHODOLOGY

### Sample Selection and Survey Instrument

The target population consisted of general consumers who were 19 years old or older, residing in the US, and had used online food delivery services within the past two weeks. The survey was posted on the Qualtrics platform and thus distributed online. The minimum sample size for this analysis was estimated to be equal to or greater than 500 respondents, with a 95% confidence level and a 4.38% confidence interval. Based on these assumptions, the sample size of 551 is adequate to generalize data within the US market and was determined to be sufficient. Two screening questions (i.e., What is your age? When was the last time you ordered food online?) were included to ensure that only participants who met these criteria were eligible for this study. Attention check questions were also embedded in the survey instrument to filter out participants who answered the survey questions carelessly. For instance, this survey included the question "what is 2+2" item that sought an obviously correct answer, "Please select 'five' for this item." because participants who read the instructions carefully would be able to answer this question, those with a wrong answer would be considered inattentive (Kung, Kwok, & Brown, 2018). We asked the questions, "What is your age?" and "What is your year of birth?" to compare the answers and eliminate those that did not match. After the filtering questions, all participants received questions about their perceptions of online-delivered food quality, convenience, control, fulfillment, hygiene, and safety. The survey also included questions to test participants' demographic information, tipping behavior, and their perceived satisfaction levels. The survey was primarily developed based on the previous literature and contained multiple sections. The researchers added items as needed. A food quality scale with five questions was adopted from Annaraud & Berezina, 2020, Cho et al., 2019, and uhartanto et al., 2019. The researcher added another question: "The food I order using the OFD app arrives unsealed and stale." This question was deemed necessary because

unsealed and stale food are indicators of poor food quality.

A control scale with three questions was adopted from Ribeiro (2018). The convenience scale with three questions, the customer service scale with three questions, and the fulfillment scale with four questions was adopted from Annaraud & Berezina, 2020 and Suhartanto et al., 2019. The four-choice hygiene scale was adopted from Hodges, 2020. The food safety scale adopted two questions from Mehrolia et al., 2021, and the researchers added four questions. These additional questions were added to understand the participants' perception of the drivers' knowledge of food poisoning, proper handwashing techniques, and if OFD employees deliver hot food hot and cold food cold. For tipping scales, we used the ranges of tipping, but we also asked the TIP amount if the order is worth \$50, and we added a percentage range for participants who like to tip with \$ amount. The variables were measured using a five-point Likert scale, with available responses ranging from 1) strongly disagree to 5) strongly agree.

### Content Validity

Before the analysis procedures, the content validity of the measurements was verified by two faculty members, five nutrition graduate students, and three experts in the foodservice industry. These individuals ensured that the questions and measures were appropriate for this study's target population. They also agreed to be interviewed by the researchers, which provided the researchers an opportunity to ask specific questions regarding specific content, comprehension, readability, and language usage.

### Pretesting of Instrument

A pilot test was conducted with 50 individuals recruited through the college listserv. The interitem reliability of the multi-item scales was evaluated using Cronbach's alpha, with the desired value of  $\alpha \geq 0.7$  (Cronbach, 1951). All the scales were deemed to be reliable. The questionnaire was revised based on the results of the pilot study.

### Data Collection and Sampling

The data for this study were collected in June 2021, during what is commonly referred to as the *post-COVID era*—a period following the height of the pandemic when many businesses, including foodservice operations, had adapted to ongoing public health considerations. While we do not suggest that COVID-19 has fully ended, this timeframe reflects a return to more stable consumer patterns and service operations compared to the early pandemic period. Participants were recruited through Amazon Mechanical Turk (AMT), an online data collection platform that compensates individuals financially for completing human intelligence tasks. Previous research supports the use of this platform as a valid method for collecting data, as participants recruited through AMT are demographically diverse (Wong, Newton, & Newton, 2016), and online panels offer lower levels of sample bias compared to traditional mail surveys (Dolnicar, Laesser, & Matus, 2009). A link to the online questionnaire was posted on AMT. The target sample size was set at a minimum of 500 to ensure comparability with the number of participants involved in previous studies in a similar context. Each participant was compensated at a rate of \$2.00. While Amazon Mechanical Turk (MTurk) is an international platform, we restricted participation to U.S.-based respondents by applying two measures. First, we used MTurk's built-in location qualification filter to allow only workers located in the United States to view and accept the task. Second, we included an attention check question that asked participants to confirm their state of residence, and we excluded any responses indicating a location outside the U.S. or those that failed the check. These steps ensured that our sample reflected the targeted U.S.

population.

Data Cleaning

The original raw data set contained 863 responses, of which 204 were removed due to missing data. Further analysis resulted in the removal of 108 additional responses because they failed the attention check question, reducing the number of usable responses to 551. Reliability analysis, descriptive analysis, correlation analysis, and structural equation modeling were undertaken via SPSS version 24 and Amos 24.

Data Analysis

A reliability test was conducted on the final dataset. Cronbach’s alpha indicated all scales were reliable (e.g., delivery food quality (DFQ)  $\alpha = .72$ , customer satisfaction  $\alpha = .78$ , tipping behavior  $\alpha = .95$ ). Descriptive statistics, such as frequencies, means, and standard deviations, were used for all scaled questions to summarize the data. To test the conceptual model, we employed a two-step structural equation modeling (SEM) approach, as recommended by Anderson and Gerbing (1988). This involved first conducting a confirmatory factor analysis (CFA) to assess the measurement model, followed by structural model testing to evaluate the hypothesized relationships.

RESULTS

Demographic information of the respondents is presented in Table 1. Of the 551 usable samples collected, approximately 62% were from males. The participants' ages mostly fell within the 19–50-year-old category, with more than 82% falling into this range. Regarding education level, approximately 70% indicated that they hold a college degree. Additionally, approximately 6% reported having a high school degree or less, while 23% indicated having a graduate degree. In terms of income level, almost half (47.3%) of the participants fell into the US\$25,000-US\$69,999 income category. Of the participants, 30% reported that their annual income was in the range of US\$70,000-US\$99,999. Finally, approximately 15% of the participants reported an annual income of more than US\$100,000. A large portion of the participants were Caucasian (68.5%). Approximately 76% of the participants reported being married, and about 20% were married at the time they completed the survey. Almost 40% of the participants indicated that they were working in management, professional, and related fields. In terms of regional location classification, approximately 40% of the participants were from the South, another 30% were from the West, 20% were from the Midwest, and around 10% were from the Northeast.

Items, Measures, Descriptive Statistics, and Reliability

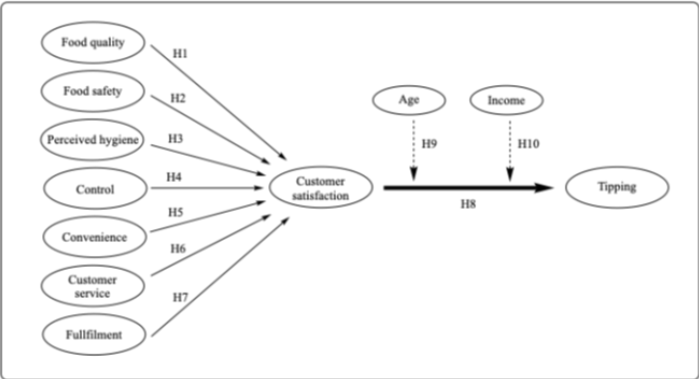
Garver and Mentzer (1999) and Hoelter (1983) proposed that the minimum sample size for structural equation modeling (SEM) should be approximately 200, which provides sufficient statistical power for a SEM model. A total of 551 responses were received. Data were checked for normality, skewness, kurtosis, and for outliers. Skewness and kurtosis indicated univariate normality and a mesokurtic distribution. Next, the reliability of the constructs was assessed. Cronbach's alpha was used to evaluate the internal consistency of the constructs in the proposed model. The alpha values ranged from 0.79 to 0.91, exceeding the minimum of 0.70 (Hair et al., 2010).

Measurement Model

Prior to testing the relationships proposed in the hypothesized model (Figure 1), as the first step in the SEM analysis, confirmatory factor analysis (CFA) was conducted to test the appropriateness of the measurement model (Anderson and Gerbing, 1988). The standardized maximum likelihood loadings and fit statistics that resulted are provided in Table 2.

The CFA results showed that the  $\chi^2/df$  was 1.871. Other indices of the model's fit included a comparative fit index (CFI) of 0.967, which range from zero to 1.00 with a value above 0.90 indicating good fit (Byrne, 2016), and a root mean square error of approximation (RMSEA) of 0.066, which should not exceed 0.1 and ideally lie between 0.05 and 0.08 (Hooper et al., 2008). These fit indices indicated that the measurement model had an acceptable fit, validating the underlying constructs prior to hypothesis testing.

Figure 1: Hypothesized Model



Validity and Reliability

Construct reliability was assessed using composite reliability (CR) values. CR values equal to or greater than 0.7 are recommended, although values approaching 0.90 indicate high levels of reliability (Kline, 2013). As shown in Table 2, the CR values of all constructs ranged from 0.72 to 0.84, indicating that all met the recommended

Table 2: Confirmatory Factor Analysis Results Including Standardized Loading Estimates

| Measure                                               | DFQ  | SAT  | TIP  |
|-------------------------------------------------------|------|------|------|
| DFQ1(Food quality)                                    | 0.84 |      |      |
| DFQ 2(Food safety)                                    | 0.79 |      |      |
| DFQ 3(Perceived Hygiene)                              | 0.75 |      |      |
| DFQ4(Control)                                         | 0.70 |      |      |
| DFQ 5(Convenience)                                    | 0.64 |      |      |
| DFQ 6(C.Service)                                      |      |      |      |
| DFQ 7(Fulfillment)                                    |      |      |      |
| SAT                                                   |      | 0.79 |      |
| TIP                                                   |      |      | 0.82 |
| Cronbach’s Alpha                                      | 0.84 | 0.79 | 0.82 |
| $\chi^2=447.169$ ; $df=239$ ; CFI:0.967; RMSEA:0.066. |      |      |      |

minimum criterion of 0.70 (Hair et al., 2010). The internal consistency of the measurements was examined using Cronbach’s alpha. Values ranged from 0.79 to 0.91, exceeding the suggested minimum cut-off of 0.70 (Kline, 2013) and reflecting internal consistency among the scale items. Convergent validity was evaluated using factor loading and average variance extracted (AVE) (Kline, 2013). All factor loadings from 0.63 to 0.85, exceeded the recommended minimum cut-off level of 0.5 (Hulland, 1999) and were significant at  $p<0.001$ . Moreover, an adequate convergent validity should contain <50% average variances extracted (AVE) (Fornell and Larcker, 1981). In other words, the AVE value should be 0.50 or above. As shown in Table 3, the AVE value for each construct is 0.55, 0.62, 0.67, 0.56 and 0.56.

Given these factor loadings and AVE values, the measurement items met conditions for convergent validity. Adequate discriminant validity means that the indicators for different constructs should not be so highly correlated as to lead one to conclude that they are measuring

**Table 1: Demographic Profile of the Participants**

| Demographics           | N   | %    | Demographics                             | N   | %    |
|------------------------|-----|------|------------------------------------------|-----|------|
| <b>Gender</b>          |     |      | <b>Education</b>                         |     |      |
| Female                 | 205 | 37.1 | Lower than High school                   | 1   | 0.2  |
| Male                   | 346 | 62.7 | High school                              | 32  | 5.8  |
| <b>Ethnicity</b>       |     |      | Associate's degree                       | 33  | 6.0  |
| Caucasian              | 378 | 68.5 | Bachelor's degree                        | 357 | 64.7 |
| Black/ African         | 84  | 15.2 | Graduate                                 | 127 | 23.0 |
| N. American/ Alaskan   | 20  | 3.6  | Other                                    | 2   | 0.4  |
| Latina/Latino/Hispanic | 22  | 4.0  | <b>Marital Status</b>                    |     |      |
| Asian/Pacific Islander | 38  | 6.9  | Single                                   | 114 | 20.7 |
| Other                  | 8   | 1.4  | Married                                  | 422 | 76.4 |
| I prefer not to answer | 2   | 0.4  | Widowed                                  | 1   | 0.2  |
| <b>Occupation</b>      |     |      | Divorced                                 | 7   | 1.3  |
| Construction           | 40  | 7.2  | Separated                                | 5   | 0.9  |
| Farming, fishing       | 10  | 1.8  | I prefer not to answer                   | 3   | 0.5  |
| Government             | 16  | 2.9  | <b>Region</b>                            |     |      |
| Health/ wellness       | 41  | 7.4  | Northeast                                | 66  | 12   |
| Management related     | 218 | 39.5 | Midwest                                  | 114 | 20.7 |
| Transportation         | 39  | 7.1  | South                                    | 215 | 38.9 |
| Sales and Office       | 72  | 13.0 | West                                     | 157 | 28.4 |
| Service                | 51  | 9.2  | <b>Age</b>                               |     |      |
| Student                | 17  | 3.1  | 19–33 Millennium Gen.                    | 231 | 41.8 |
| Retired                | 11  | 2.0  | 34–49 Gen X                              | 226 | 40.9 |
| Unemployed             | 17  | 3.1  | 50–67 Baby boomer                        | 90  | 16.3 |
| Other                  | 20  | 3.6  | 68 and older                             | 5   | 0.9  |
| <b>Income</b>          |     |      | <b>OFD Services</b>                      |     |      |
| Under \$25,000         | 47  | 8.5  | DoorDash                                 | 357 | 64.7 |
| \$25,000-\$39,999      | 86  | 15.6 | UberEats                                 | 406 | 73.6 |
| \$40,000-\$54,999      | 84  | 15.2 | Grubhub                                  | 217 | 39.3 |
| \$55,000-\$69,999      | 90  | 16.3 | Yelp                                     | 33  | 6.0  |
| \$70,000-\$84,999      | 94  | 17.0 | Other                                    | 10  | 1.8  |
| \$85,000-\$100,000     | 71  | 12.9 | <b>TIP amount if order is worth \$50</b> |     |      |
| \$100,000-\$114,999    | 33  | 6.0  | 0%                                       | 3   | 0.5  |
| \$115,000-\$129,999    | 21  | 3.8  | 1% - 5%                                  | 7   | 1.2  |
| \$130,000-\$144,999    | 10  | 1.8  | 6% - 10%                                 | 145 | 26.7 |
| \$145,000-\$159,999    | 8   | 1.4  | 11% - 15%                                | 187 | 34.4 |
| Over \$160,000         | 8   | 1.4  | 16% - 20%                                | 155 | 28.5 |
|                        |     |      | 21% - 25%                                | 38  | 6.9  |
|                        |     |      | 25% and more                             | 8   | 1.4  |

the same thing (Henseler et al., 2015). For discriminant validity, the square root of the AVE of the construct should be greater than the correlation between the construct and other constructs (Fornell and Larcker, 1981). The AVE square roots of each construct exceeded the correlation values between a pair of constructs (as shown in Table 3).

**Table 3: Correlations Among Latent Constructs<sup>1</sup> (Squared)<sup>2</sup>**

| Measure   | DFQ            | SAT            | TIP  | AVE  |
|-----------|----------------|----------------|------|------|
| DFQ       | 1              |                |      | 0.55 |
| SAT       | 0.44<br>(0.19) | 1              |      | 0.62 |
| TIP       | 0.37<br>(0.13) | 0.75<br>(0.56) | 1    | 0.67 |
| Mean      | 3.67           | 3.74           | 3.50 |      |
| Composite | 0.76           | 0.72           | 0.75 |      |

Notes.

(1) Correlation coefficients were estimated using AMOS 22.

(2) Squared correlation values.

Thus, discriminant validity is achieved, indicating that each construct is statistically distinct from the others.

### Hypothesis Testing

In the second step of the SEM process, a structural model with the constructs was estimated using Maximum Likelihood (ML) through SPSS Amos 24. The relationships between each pair of variables, as suggested in the model, were examined using the Pearson correlation coefficient. Table 4 shows the results of the path analysis. The path between food delivery quality and customer satisfaction indicates that delivering quality food has a positive and significant influence on customer satisfaction. The analysis further suggests significant direct effects of customer satisfaction on customer tipping behavior. Therefore, the higher the level of customer satisfaction with the delivered food, the higher the tipping behavior.

To test whether age and income moderate the relationship between customer satisfaction and customer tipping behavior, a moderated

**Table 4. The interaction of customer satisfaction and age on tipping behavior**

| Variable           | Tipping behavior |       |      |       |        |       |        |
|--------------------|------------------|-------|------|-------|--------|-------|--------|
|                    | Step 1           |       |      |       | Step 2 |       |        |
|                    | B                |       | S.E. | ✓     | B      | S.E.  | ✓      |
| Satisfaction       | .41**            |       | .05  | .41** | .50**  | .05   | .50**  |
| Age                | .08*             |       | .05  | .08*  | .16**  | .08   | .16**  |
| R2                 |                  | .25** |      |       |        |       |        |
| Satisfaction × Age |                  |       |      |       | -.09** | .03   | -.11** |
| ΔR2                |                  |       |      |       |        | .02** |        |
| Overall R2         |                  |       |      |       |        | .28** |        |

Notes: VIF values ranged from 1.014 to 1.18; \*p<.05; \*\*p<.01.

regression analysis was conducted, which tests the hypotheses using a mean-centering procedure or standardization of the independent and moderating variables to minimize multicollinearity (Aiken and West, 1991). In the first step, two variables were included: 1) age 2) income. Then the interaction term between customer satisfaction and 1) age 2) income was included in the second step. Consistent with the results of the path analysis, while controlling for the effect of 1) age 2) income, customer satisfaction had a significant positive effect on tipping behavior [ 1) ( $\beta=.41$ ,  $p<.01$ ) 2) ( $\beta=.33$ ,  $p<.01$ ). The interaction between customer satisfaction and age on tipping behavior in step 2 was found to be significant ( $\Delta R^2=.02$ ,  $p<.01$ ), supporting Hypothesis 9. Aiken and West (1991) suggested plotting the interaction effects. Similarly, the interaction between customer satisfaction and income on tipping behavior in step 2 was significant ( $\Delta R^2=.02$ ,  $p<.01$ ), supporting Hypothesis 10.

We also tested this moderation effect using bootstrapping with a

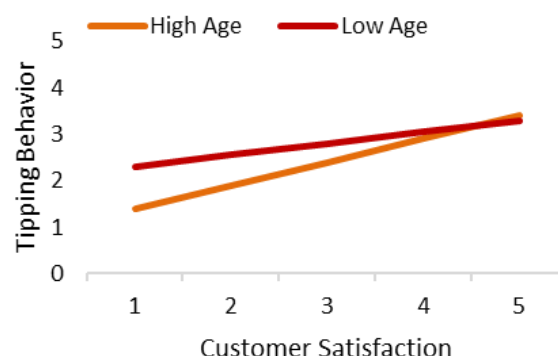
**Table 5. The Interaction of Customer Satisfaction and Income Level on Tipping Behavior**

| Variable              | Tipping behavior |      |      |       |        |       |        |
|-----------------------|------------------|------|------|-------|--------|-------|--------|
|                       | Step 1           |      |      |       | Step 2 |       |        |
|                       | B                |      | S.E. | ✓     | B      | S.E.  | ✓      |
| Satisfaction          | .33**            |      | .05  | .33** | .52*   | .05   | .512*  |
| Income                | .07*             |      | .05  | .07*  | .19*   | .07   | .19**  |
| R2                    |                  | .25* |      |       |        |       |        |
| Satisfaction × Income |                  |      |      |       | -.06*  | .03   | -.10** |
| ΔR2                   |                  |      |      |       |        | .02*  |        |
| Overall R2            |                  |      |      |       |        | .22** |        |

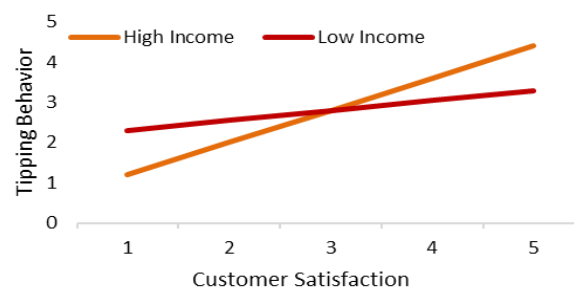
Notes: VIF values ranged from 1.014 to 1.18; \*p<.05; \*\*p<.01.

sample of 2,000 participants. Similar significant effects are revealed, confirming the strength of this moderation effect. We standardized our variables accordingly. The variance inflation factor for each regression coefficient is below 2 (1.011–1.14), which is below the usually recommended threshold of 10 (O'Brien, 2007), indicating that multicollinearity was not an issue. Fig. 3 uses a conditional effects plot

to illustrate the moderating effect of age on the relationship between customer satisfaction and customer tipping behavior. Similarly, Fig. 4 uses a conditional effects plot to depict the moderation effect of income on the relationship between customer satisfaction on customer tipping behavior.

**Figure 2: Effect of Interaction Between Customer Satisfaction and Age on Tipping Behavior**

The plot shows that the effect of customer satisfaction on customer tipping behavior was greater at higher age/income values. This interaction was further assessed using the Johnson-Neyman technique, which identifies regions of significance, or values within the range of the moderator, where the association between tipping and customer satisfaction differs from zero. Figures 2 and 3 plot the conditional effect (the middle line) of customer satisfaction on customer tipping behavior across the distribution of age and income measurements, including the upper and lower bounds of a 95% confidence interval for the conditional effect.

**Figure 3: Effect of Interaction Between Customer Satisfaction and Income Level on Tipping Behavior**

## DISCUSSION

Our research results confirmed our hypotheses (1-8), as there was a strong correlation between the individual variables that constitute customer satisfaction. Hence, delivering quality food positively and significantly influences customer satisfaction. Also, the higher the level of customer satisfaction with the delivered food, the higher the tip. These results are supported by Annaraud & Berezina, (2020) who determined that food quality, control, customer service, and service fulfillment affect customer satisfaction in OFD services. The study by Suhartanto et al. (2019) suggests that e-service quality and food quality significantly influence customer satisfaction and the frequency of OFD service use. Generally, studies by Azar (2010), Tse (2003), and Wang & Lee (2012) reveal that high customer satisfaction levels

positively influence tipping behavior. On the other hand, Azar (2008) disagrees, stating that only social and psychological motivations influenced tipping decisions, not service quality. These differences may be country-specific as his data was from Israel, and our study used participants in the US. Furthermore, our research examined service quality as one component among several variables that contribute to customer satisfaction. The study introduced the novel concept of food safety, which was not explored in previous models by Annaraud & Berezina (2020) and Suhartanto et al. (2019). The results demonstrated that maintaining proper food safety practices positively influenced customer satisfaction with online food delivery services. These findings highlight the critical importance of food safety measures taken by delivery drivers and employees responsible for food delivery. Consumers face a high risk of foodborne illnesses if food safety protocols are not strictly followed (Hodges, 2020). Since the intention to use OFD services reduces perceived risk for exposure to foodborne illness, it is imperative to prioritize the safety of OFD employees. Public policies on food safety should clearly outline best practices and necessary protective equipment for delivery personnel (Ali et al., 2022). As the online food delivery industry continues to grow, addressing food safety concerns related to the practices of delivery personnel is crucial for safeguarding public health and maintaining consumer confidence.

### **Age and Income**

In this study, age and income were examined as moderators, and they were found to have a positive impact on customer satisfaction and tipping behavior when using OFD services. Regarding age, the significance of these results is justified by Jewell (2018), whose research concluded that age is indeed one of the two most significant predictors of tipping behavior. Our results on income are supported by Bujisic et al. (2014), Lynn & Williams (2012), and Thomas-Haysbert (2002). The effects of satisfaction with OFD service on tipping were more substantial for older customers than for younger ones. OFD service is a relatively new concept that is more popular among the younger generation due to their ardent use of technology. Of course, with the emergence of the pandemic people of varying age categories resorted to the use of OFD services. However, regarding why age positively moderates the relationship between customer satisfaction and tipping, this could be attributed to familiarity. The Familiarity principle or Mere exposure effect developed by Robert Zajonc, opines that people have the tendency to develop a preference for something because they are familiar with it and more trusting of it however, the downside to this is that, with time and repeated exposure they tend to devalue it and do not regard it as novel (Zajonc, 1968, 2003). Younger people may be less likely to tip even after a good delivery service because they are more familiar with the use of technology which is the premise on which OFD operates.

Additionally, the familiarity principle can be examined from the perspective that younger people, even before the pandemic, have a greater tendency to dine out than older people. In accordance with a publication by the USDA in 2018, people aged 35-45 years more frequently eat away from home (Saksena et al., 2018); about 41% of our respondents were within this age range. The familiarity with dining out means having someone serve you food, which may be interpreted as not much different from having an OFD service. Hence, younger people are less likely not to tip relative to older people. In the same context, older people are particularly impressed by the ease of OFD services, as their use of this service was not as widespread in this group until the emergence of the COVID-19 pandemic. Their astonishment may drive contentment (customer satisfaction) and hence increase their tendency to compensate the service (tip). Additionally, existing research suggests that older people tend to be more grateful (Allemand et al., 2021; Chopik et al., 2019). This

inclination towards gratitude may be the driver of increased satisfaction and tipping among this group compared to the younger generation. Our results are consistent with those of Lynn (2006) and H. Shatnawi et al. (2019), who agree that older age groups had the highest intentions to give tips. However, the results of this study may seem contrary to that of Lynn, Jabbour, & Kim (2012b) who found that age had a negative effect on tipping. While both young and old rewarded good service with larger tips, younger customers tipped relatively higher. The researchers suggest the motives for this could be purely to appear good, rather than being directly related to their judgment of service quality. After all, a meta-analytic review by Banks et al. (2018) of tipping found only a minimal negative correlation between customer age and the size of the tips they gave. Additionally, these may vary per country.

The effects of satisfaction with OFD service on tipping were stronger for customers with higher incomes compared to those with lower incomes. An explanation for this could be supported by the notion that the more income one has, the more they feel empowered to give money to others; conversely, the less money one has, the thrifter they are. Research supports these assertions highlights that this relationship may be impacted by gender, race and/ or occupation (Azar, 2020; Jahan, 2018; Lynn, 2023a; Lynn & Thomas-Haysbert, 2003), especially when customers perceive closeness during service and view their server as a low-income earner (Azar, 2020). The more income one has the more disposable income they have, and they are more empowered to be generous. Ultimately, people with higher incomes may derive satisfaction from tipping. They may perceive tipping as a way to give back to society, hence using customer satisfaction as a premise for tipping. This is confirmed in studies by Conlisk (2022) and Lynn (2023), which suggest that middle- to higher-income earners are more likely to tip frequently and are less likely not to give a tip at all. Another reason could be that people with higher incomes may reward a service solely to conform to social norms and maintain their social status. Thus, society perceives people with high incomes as successful and accomplished. Even though this view may be stereotypical, it may put an expectation on people with higher incomes to tip after a service has been rendered. They may feel satisfied with a service but may not necessarily feel the need to tip; however, due to the societal expectation placed on them because of their income status, they would tip to maintain their social class (Connor et al., 2021; Durante & Fiske, 2017). Additionally, research conducted by Saayman & Saayman (2015) explored tipping behavior from an economic perspective, revealing that high-income levels and high-income occupations influence tipping decisions. They concluded that income plays a dominant role in consumers' decisions of how much and how frequently to tip. Our research contradicts the findings of Brewster & Nowak (2019) and Lynn (2011); however, these studies placed more emphasis on racial differences.

Our results highlight benefits for both restaurants and OFD companies. They provide a guide to developing strategies to improve food quality, food safety and hygiene, which will increase customers' positive perceptions of and satisfaction with OFD services. Since perceived hygiene and food safety were noted to be perfectly correlated with customer satisfaction, OFD companies can invest in creating a positive image of their drivers by empowering them with training programs and workshops on food safety and personal hygiene when handling customer food orders. In line with this, emphasis should be placed on encouraging drivers to use appropriate gear (including the use of food warmer bags—right from the point of food pickup) and ensure timely delivery. Restaurants can improve how they package and seal food orders, paying more attention to the intricacies of food safety protocols.

The results of this study on age and income can be helpful for OFD operators and restaurants in understanding customer tipping preferences. For instance, they can include pop-up questions that optionally request age and income levels of customers during account creation. Based on this, they could develop OFD applications that customize tipping suggestions for older customers and/or those with high income levels. Additionally, the data would be helpful in creating advertisements that appeal to these customers.

At the state and federal levels, this study highlights the need to revise current food safety regulations to include OFD services. From the results, the strong correlation between food safety/hygiene and customer satisfaction raises concerns beyond restaurants and OFD companies to include regulatory bodies that govern the food industry. Several studies have shown that although food safety guidelines, including HACCP, are mandated in food service establishments, Hodges' (2020) study highlights the need for these regulations to be clearly defined to cover OFD operations.

The results of our study strongly support the hypothesis that delivering quality food evokes a higher level of customer satisfaction and thereby encourages higher tipping behavior. This result confirms early studies that tipping behavior is a strong indicator of customer satisfaction. The prospective benefit of higher tipping is that employees will feel incentivized to stay in their jobs. Past research suggests that many employees look forward to tips as a supplemental form of compensation. In fact, according to Azar (2011), the US food industry alone estimates that tips amount to \$47 billion every year. Restaurants and OFD company operators can generate external funds through customer tips to support their employees by providing resources that enable the production of high-quality products and services. This is a win-win, as this does not affect fixed organizational budgets. It saves employers money that might be spent on salary increases, while encouraging employees to continue working.

Furthermore, higher tipping also increases motivation, which in turn lowers job turnover, enhances employee commitment to the work, and fosters a healthy drive to promote the OFD company brand. According to the Two-factor Theory of job satisfaction, which is premised on intrinsic and extrinsic motivators, when customers tip employees for quality services, employees feel a sense of achievement, fulfillment, and recognition (intrinsic motivator). The tip (pay), favorable working conditions (resources to deliver quality services), and interpersonal relationships with customers on the job serve as extrinsic factors that yield positive employee performance. This is beneficial for restaurants, OFD companies, and the food industry as a whole, as it creates a positive image of the underlying services we provide—hospitality.

#### Limitations and Future Research

This study presents several limitations that should be considered when interpreting the findings. First, the data were collected through self-reported online surveys, which are inherently susceptible to social desirability bias and inaccuracies in recall. Participants may have overstated their tipping behavior or satisfaction levels to appear more generous or socially favorable. Additionally, the sampling method—recruiting respondents through Amazon Mechanical Turk (MTurk)—may limit the generalizability of the results. While MTurk offers demographic diversity, its users tend to be younger, more tech-savvy, and more educated than the general U.S. population, which may skew the results, especially in studies centered on technology-based behaviors, such as online food delivery.

The cross-sectional nature of the study further restricts its ability to infer causality or track behavioral changes over time. Given the

evolving nature of consumer habits in the post-pandemic environment, a longitudinal approach would provide more robust insights. Another limitation involves the use of hypothetical scenarios to measure tipping behavior (e.g., tipping for a \$50 order). These responses may not accurately reflect actual decisions in real-world settings; observational or transactional data would provide more reliable behavioral insights.

Lastly, While the study examined age and income as moderators, it did not explore other potentially influential demographic or psychographic factors such as race, education level, familiarity with tipping norms, or geographic region, which may further shape consumer behavior. Moreover, the study's findings are limited to U.S. consumers and may not be generalizable to other cultural contexts where tipping norms, digital ordering practices, and perceptions of food safety differ significantly.

Future studies may want to explore other moderators, such as race, on the relationship between customer satisfaction and tipping. It will be interesting to know if age, income, and other variables moderate the intra-relationship between the constituents of customer satisfaction (service quality, perceived hygiene, food quality) and if this has any significant effect on tipping behavior. Again, obtaining drivers' perceptions on how their practices of food safety and hygiene influence customer satisfaction will provide a comprehensive outlook for both service providers and customers.

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