

Association for Information Systems

## AIS Electronic Library (AISeL)

---

ICIS 2022 Proceedings

Human Computer /Robot Interaction

---

Dec 12th, 12:00 AM

### Implementing Choices in Chatbot-initiated Service Interactions: Helpful or Harmful?

Elizabeth Han

*Georgia Institute of Technology*, [elizabeth.han@scheller.gatech.edu](mailto:elizabeth.han@scheller.gatech.edu)

Dezhi (Denny) Yin

*University of South Florida*, [dezhiyin@usf.edu](mailto:dezhiyin@usf.edu)

Han Zhang

*Georgia Institute of Technology*, [han.zhang@scheller.gatech.edu](mailto:han.zhang@scheller.gatech.edu)

Follow this and additional works at: <https://aisel.aisnet.org/icis2022>

---

#### Recommended Citation

Han, Elizabeth; Yin, Dezhi (Denny); and Zhang, Han, "Implementing Choices in Chatbot-initiated Service Interactions: Helpful or Harmful?" (2022). *ICIS 2022 Proceedings*. 13.

[https://aisel.aisnet.org/icis2022/hci\\_robot/hci\\_robot/13](https://aisel.aisnet.org/icis2022/hci_robot/hci_robot/13)

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICIS 2022 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# Implementing Choices in Chatbot-initiated Service Interactions: Helpful or Harmful?

Completed Research Paper

**Elizabeth Han**

McGill University  
1001 rue Sherbrooke Ouest  
Montreal, Quebec, Canada  
elizabeth.han@mcgill.ca

**Dezhi Yin**

University of South Florida  
4202 E. Fowler Avenue  
Tampa FL, USA  
dezhiyin@usf.edu

**Han Zhang**

Georgia Institute of Technology  
800 West Peachtree St., NW  
Atlanta GA, USA  
han.zhang@scheller.gatech.edu

## Abstract

*Chatbots are increasingly equipped to provide choices for customers to click and choose from when communicating with the chatbots. This research investigates when and why implementing choices enhances or impairs customers' service experience. Based on the concept of fluency, we posit that the implementation of choices is beneficial only after a conversational breakdown occurs because the value of choice provision for facilitating fluency may not be recognizable or realized in the absence of service breakdowns. We further propose that the implementation of choices is counterproductive when the choice set is perceived as incomprehensive because it decreases the perception of fluency. We conducted several experiments to test these hypotheses. By illuminating when and why choice implementation may help or harm customers during a chatbot-initiated service interaction, we augment the current understanding of a chatbot's role in customers' service experience and provide insights for the deployment of choice-equipped chatbots in customer service.*

**Keywords:** chatbot, customer service, choice, conversational breakdown, choice comprehensiveness, fluency

## Introduction

Firms are increasingly adopting artificial intelligence (AI) powered applications to streamline various business processes thanks to continuous advances in technology. As one of the most widely adopted AI-powered applications for interacting with users, the chatbot—a text-based conversational agent—is projected to reach a global market size of over \$100 billion by 2026 (Mordor Intelligence 2022). Chatbots have been vastly used in customer service, where chatbots interact with customers to provide a wide range of service tasks, from answering simple questions to giving recommendations and advice (Markets and Markets 2019). The implementation of service chatbots increases the efficiency of service delivery processes and reduces both physical and emotional labor costs for frontline employees. Thus, the role of chatbots in customer service, especially the way they communicate with customers, has been of vital interest to both researchers and practitioners (Crolc et al. 2022; Fotheringham and Wiles 2022; Huang and Rust 2021; Luo et al. 2019).

Although chatbots are increasingly developed based on natural language processing (NLP) technologies capable of understanding and speaking human languages to a certain extent, such technologies are far from perfect (Ashktorab et al. 2019; Benner et al. 2021). When customers interact with a conversational agent such as a chatbot, they often expect the technology-induced service to provide a smooth and seamless

experience (Ostrom et al. 2021). To prevent or reduce the likelihood of breakdowns that often happen to chatbots at a low cost, firms often employ structured message templates. These structured templates typically involve implementing choices in the form of a guided conversation, during which customers can select one of the provided pre-determined options as their input message (Klopfenstein et al. 2017). Such feature can also guide customers on how to start or continue a conversation with a chatbot (Schuetzler et al. 2021). The implementation of choices during a service interaction by chatbots is deemed especially suitable for routine and standardized service tasks which occur commonly and do not require sophisticated solutions, such as answer questions about products or processing orders and transactions (Huang and Rust 2021; Li et al. 2020).

Although the implementation of choices in chatbots is prevalent in the industry (e.g., Airbnb's bot, Domino's Facebook Messenger) (Li et al. 2020), there is not much empirical evidence for its impact on service outcomes. Human-based service interactions tend to involve natural conversations, and providing choices in this process may be unnecessary and break the natural flow of conversations. Thus, providing choices can be a unique characteristic of chatbot-based service interactions. While the popularity of chatbots with choice implementation indicates a generally favorable view of this unique feature from both chatbot developers and users, choice implementation may also have unintended consequences, and its value may not be realized under certain situations.

To shed light on the impact of this crucial practice, we examine when the implementation of chatbot-initiated choices during a service interaction is beneficial or counterproductive and why. The primary reason for implementing choices in practice (especially for routine and standardized service tasks) is to enhance the fluency of a service process, where fluency is defined as the ease of processing ongoing tasks or information (Oppenheimer 2008). Because customers' perception of fluency influences service outcomes (Fernández-Sabiote and López-López 2020), we focus on two contextual variables that are especially relevant to the fluency of chatbot-initiated service interactions: conversational breakdowns and choice comprehensiveness. Conversational breakdowns often occur during the interaction with chatbots due to their imperfect capability to understand users' messages (Ashktorab et al. 2019). The benefit of implementing choices might especially materialize in a service interaction in which disfluency is salient. In contrast, after conversational breakdowns disrupt a service process, implementing choices can heighten customers' perception of fluency and enhance subsequent service outcomes. Some research suggests providing choices as one of the repair strategies after conversational breakdowns during an interaction with a chatbot (Ashktorab et al. 2019; Benner et al. 2021), but there was no empirical evidence exclusively focusing on its effect. In addition, the structure of a choice set affects decision-making (Thaler and Sunstein 2008). Choice comprehensiveness, which is one of the major characteristics of a choice set, may influence how customers perceive the provided choices and service evaluations accordingly. For instance, when a service task is extremely complex, a predefined set of choices would be less likely to encompass all the necessary options. In such cases, choice implementation may backfire, decreasing customers' perception of fluency and deteriorating service outcomes.

We tested these predictions using a series of experimental studies in which participants engaged in a hypothetical customer service scenario and chatted with a chatbot to resolve a service issue. The studies provided consistent evidence supporting our hypotheses. Our theoretical framework and findings contribute to the literature on chatbots' role in customer service and the broader literature on human-AI interaction. Specifically, this work provides a comprehensive, more nuanced picture of when and why choice implementation (a unique conversational feature of a chatbot) improves or impairs service outcomes. Our research also extends customer service literature by illuminating the benefits and drawbacks of technology-induced service interactions. Finally, we bolster the literature on fluency by identifying boundary conditions that can either augment or deteriorate people's perception of fluency. We also provide practical implications for firms on the deployment of choice-providing service chatbots.

## **Theoretical Development and Hypotheses**

### ***Service Chatbots and Choice Provision***

As chatbots' capabilities advance, they are increasingly deployed for various tasks, from seeking simple information to engaging in intimate conversations with users. Many firms adopt chatbots to be at the frontline when interacting with customers. Acknowledging such trends, researchers have been investigating

how to enhance customers' interactions with chatbots. To facilitate a social and interpersonal environment for such customer-chatbot interactions, recent research has emphasized the need for equipping chatbots with the abilities to have natural and human-like conversations (Fotheringham and Wiles 2022; Huang and Rust 2021; Schanke et al. 2021). While adding a human touch in customer-chatbot interactions is crucial, at the same time, customers tend to seek quick, efficient, and task-oriented interactions during technology-based service encounters (Meuter et al. 2000). Thus, for efficiency and speed, practitioners often adopt structured message templates to generate a guided conversation (Klopfenstein et al. 2017). These structured templates commonly incorporate menu-based interfaces which allow users to choose options provided by the chatbot, such as providing multiple options for possible service issues after the chatbot first greets customers. This feature is commonly deployed by businesses to deal with routine, systematic tasks without incurring much cost of applying a more advanced technology (Klopfenstein et al. 2017; Li et al. 2020).

A chatbot's provision of choices during a conversation indeed enables users to make a quick response, saving time, increasing efficiency, and minimizing the risk of errors, which may ultimately impact users' evaluations of a service. Moreover, the provision of choices reduces a user's cognitive load and increases the perception of autonomy by allowing the user to select his or her own action, as often achieved through menu-based interfaces of a traditional website (Nguyen et al. 2022). While these advantages are recognized by practitioners, there are not much empirical evidence on the impact of a chatbot providing choices. The advantage of providing choice is undoubted, but it is possible that such advantages are only realized in certain contexts. Furthermore, providing choices may be counterproductive depending on how it is presented, as the design of a choice set, also known as choice architecture, (e.g., the number of choices, presentation formats) has a significant role in a decision-making process (Thaler and Sunstein 2008). Thus, we aim to explore the impact of providing choices and illuminate the potential boundary conditions for such an impact.

### ***The Role of Fluency in Service Interactions***

A primary reason for implementing choices in a service chatbot is to achieve a frictionless interaction with customers. Also, technology-induced service encounters are typically expected to provide a seamless interaction from both a firm and a customer's perspectives (Bitner et al. 2000; Voorhees et al. 2017). Processing fluency, which refers to a subjective experience of how information or a task is easily processed, is known to significantly impact people's judgments and decision-making (Alter and Oppenheimer 2009; Schwarz 2004). Frequently, an individual's judgment based on certain stimuli is determined by how quickly and easily the stimuli are processed rather than the stimuli themselves (Schwarz et al. 1991).

Prior literature on customer service has also acknowledged the importance of fluency in crucial business outcomes, such as brand evaluation, service evaluation, and customers' emotions (Fernández-Sabiote and López-López 2020; Orth and Wirtz 2014; Shen et al. 2018; Sirianni et al. 2013). While fluency examined in customer service literature and the general fluency literature takes various forms (e.g., visual, linguistic, semantic), the underlying notion is that the perception of fluency is driven by the ease and the speed of processing stimuli (Alter and Oppenheimer 2009; Reber et al. 2004). A chatbot's provision of choices can facilitate fluency as it allows customers to make a quick response and enhance the ease of proceeding with the ongoing interaction and the service task.

However, the supposed positive effect of choice provision may not always materialize. Therefore, we focus on two boundary conditions for the impact of choices: conversational breakdowns and choice comprehensiveness. First, during a service interaction that is already flowing well, the effect of choice on the perception of fluency might not emerge. Instead, the value of choice is more likely to be recognized during an interaction experiencing disruptions. A common disruption in our context is a conversational breakdown due to chatbot failures (Ashktorab et al. 2019). Thus, when a conversational breakdown occurs, providing choices may restore the lost fluency. Second, how choices are structured can also influence their impact on fluency, similar to the role of choice architecture in rational decision-making (Thaler and Sunstein 2008). For instance, if the provided choices do not include anything that is compatible with what a customer needs or requests (e.g., when a customer is making a complicated or unique request), providing choices may undermine fluency. Next, we explain each of these boundary conditions and present our hypotheses.

## ***Choice Implementation After Conversational Breakdowns***

While we have observed chatbots' ever-increasing intelligence and capability, the technology is not mature yet. Due to the imperfect NLP technology and increasing sophistication in users' requests, high failure rates are expected and often observed (Ashktorab et al. 2019; Simonite 2017). Acknowledging their imperfection, several studies have generally investigated the impact of AI failures, but they provided mixed evidence. While some showed a negative impact of a service robot failure on responsibility attribution (Leo and Huh 2020), adoption intent (Sheehan et al. 2020), and service evaluation (Choi et al. 2020; Lee et al. 2010), others found that errors made by an AI can, in fact, humanize the AI and increase the perception of warmth and liking (Bluvstein et al. 2019; Mirmig et al. 2017).

One of the most prevalent failures of a chatbot is its inability to understand a user's input message (Ashktorab et al. 2019). Such failures can be technical errors due to an inherent problem with the chatbot's system or interaction failures due to "incomprehensible" user messages beyond the chatbot's capability. During a service encounter, such chatbot failures will incur a conversational breakdown, disrupting the flow of the communication and, ultimately, the service delivery process. When humans communicate with each other orally, speech disfluency is usually triggered by minor interruptions, such as pauses, delays, and utterances (Shriberg 2001). For a chatbot, a prominent source of communication disfluency comes from its inability to understand a message from humans. Such a breakdown can trigger a customer to anticipate a potential service failure, consequently impairing the perception of fluent service delivery. Similarly, errors made during a traditional human-delivered service create interruptions to the service flow and inhibit the fluent service delivery process (Froehle and White 2014; Sampson and Froehle 2006; Seshadri and Shapira 2001; Stewart and Chase 1999).

We argue that the provision of choices is more likely to be beneficial for service outcomes when conversational breakdowns occur. Because providing choices can guide customers back to a structured conversation, it can repair the disruption caused by conversational breakdowns. When conversational breakdowns occur and cause a salient disruption to a service process, the provision of choices can prevent future disruptions and improve the perception of fluency. Increased fluency can then be the basis of customers forming positive perceptions toward an entire service experience (Alter and Oppenheimer 2009). In this research, we focus on customers' perceptions of a service encounter because of their implications on designing and managing the service experience, which is directly linked to various business outcomes (Heskett et al. 1994; Zomerdijk and Voss 2010). In sum, we propose the following:

H1: When there are conversational breakdowns, providing choices will enhance service evaluations. In contrast, such an effect will disappear when there are no conversational breakdowns.

H2: When there are conversational breakdowns, the positive effect of providing choices will be driven by a customer's increased perception of fluency of the service interaction.

## ***The Comprehensiveness of Choice Set***

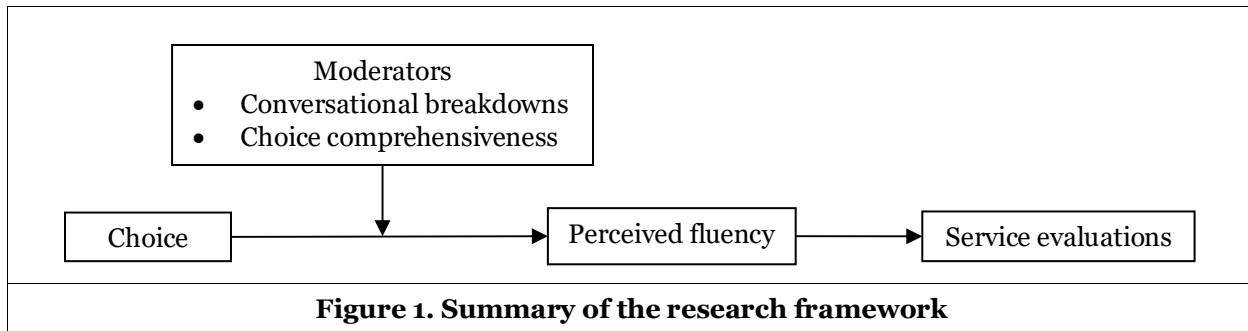
During rational decision-making, the structure of a choice set plays a significant role in people's decisions. The design of a choice set structure is also known as choice architecture, which is a vital driving force that can nudge a decision maker's behavior (Thaler and Sunstein 2008). Several elements compose choice architecture, such as the number of choices provided, the description of each choice in a choice set, and the presentation format of choices (Johnson et al. 2012). The impact of these elements is often not one-directional, and it may depend on various contextual and individual differences (Scheibehenne et al. 2010; Sunstein 2017). Among various elements for the structure of a choice set, we focus on the comprehensiveness of a choice set.

When choices are implemented, they are predefined in a system before an interaction begins and are not flexible enough to be changed during the interaction. Thus, from a practitioner's standpoint, it is essential to design choices that can satisfy every customer. However, it is unlikely that a predefined set of a limited number of choices encompasses every potential request. For instance, if a service task is very complex (e.g., when potential customers' demand is ambiguous and uncertain), it is very likely that a customer does not find a satisfying option from the predefined choice set. Such incomprehensiveness of a choice set driven by task complexity will deter the perception of fluency by causing difficulty in decision-making and increasing customers' cognitive loads (Alter and Oppenheimer 2009).

Moreover, how fluently an individual decides his or her subsequent action depends on the alignment of that action and any stimuli provided right before deciding and committing to that action (Chambon and Haggard 2012). Similarly, the extent to which a customer's anticipated action aligns with the provided choices may drive the fluency of the choice process. However, an incomprehensive choice set will deter fluency because none of the choices align with a customer's expected action. Such deterrence of fluency will drive a negative perception of an entire service experience (Alter and Oppenheimer 2009). Thus, we present our hypotheses below. Figure 1 summarizes our research framework.

H3: When a choice set is incomprehensive, providing choices will hurt service evaluations. In contrast, such an effect will disappear when a choice set is comprehensive.

H4: When a choice set is incomprehensive, the negative effect of providing choices will be driven by a customer's decreased perception of fluency of the service interaction.



## Overview of Studies

We investigated our hypotheses through a series of experimental studies in which participants interacted with a service chatbot to resolve a service issue based on a hypothetical scenario. In a preliminary study, we explored whether providing choice has an impact on service evaluations during an “ideal” service interaction situation. In the first study, we examined the moderating role of conversational breakdowns for the effect of choice on service evaluations. In the second study, we examined the moderating role of choice comprehensiveness. In the main studies, we also explored the role of perceived fluency in the moderations. All three studies were conducted with a different pool of subjects.

### *Preliminary Study*

This preliminary study was conducted to explore the effect of providing choice on service evaluations during an “ideal” service interaction situation. As discussed before, providing choices tends to be desirable due to its efficiency and contribution to fluency (Klopfenstein et al. 2017). However, we are unsure whether the effect of choice is salient enough during an already fluent interaction. To shed light on this matter, we utilized a between-subjects design, manipulating the presence of choice during the interaction with a service chatbot and keeping all other aspects of the interaction identical. During the study, participants interacted with a service chatbot via virtual chat to resolve a hypothetical service issue. After the chat, participants evaluated the service provided by the chatbot and answered other questions.

### **Stimulus Materials**

We used a pre-designed script for the chatbot's messages to ensure that every aspect of the interaction remains identical, except for the presence of choice. The script included five messages from the chatbot, with two to four sentences within each message. We devised the script based on examples of best practices and canned responses for live chat from livechat.com, a popular platform that provides live chat software, and we slightly modified them to fit our setting. Each of these messages appeared automatically after participants responded to the prior message. The chat interface was implemented in JavaScript.

We manipulated the presence of choice by varying whether participants freely type in their messages or click and choose one of the options provided by the chatbot in their messages. For instance, when the chatbot asked participants to describe a service issue, those in the choice-absent condition would type in

their response and then see the subsequent message from the chatbot. To those in the choice-present condition, the chatbot provided three options: ‘Missing item,’ ‘Check order status,’ and ‘Return/exchange item(s).’ The participants could see the subsequent message from the chatbot only after they chose one of the options. Table 1 shows the predesigned scripts for the two conditions.

| <b>Choice-absent</b>  | <b>Choice-present</b>  |
|---|--|
| <p>Hello. This is Taylor, and I am a bot created by the customer service department. I am handling your request today. What brings you here?</p> <p style="text-align: right;"><i>Participant’s message</i></p>                           | <p>Hello. This is Taylor, and I am a bot created by the customer service department. I am handling your request today. What brings you here?</p> <ul style="list-style-type: none"> <li>• Missing item</li> <li>• Check order status</li> <li>• Return/ exchange items</li> </ul> <p style="text-align: right;"><i>Participant’s choice</i></p>                      |
| <p>I can help you with that. First, could you tell me why you need to replace or return this textbook?</p> <p style="text-align: right;"><i>Participant’s message</i></p>   | <p>I can help you with that. First, could you tell me why you need to replace or return this textbook?</p> <ul style="list-style-type: none"> <li>• Damage in the item</li> <li>• Need a different version or edition</li> <li>• Incorrect item delivered</li> </ul> <p style="text-align: right;"><i>Participant’s choice</i></p>                                   |
| <p>Got it. Could you input your order number below?</p> <p style="text-align: right;"><i>Participant’s message</i></p>  | <p>Got it. Could you input your order number below?</p> <p style="text-align: right;"><i>Participant’s message</i></p>   |
| <p>Alright. I will process your request. Please give me a moment.</p> <p style="text-align: center;">[Slight delay]</p>   | <p>Alright. I will process your request. Please give me a moment.</p> <p style="text-align: center;">[Slight delay]</p>  |
| <p>The 3<sup>rd</sup> edition is currently in stock. For your information, you need to pay \$50 more for the newer edition. Would you still like to exchange the book?</p> <p style="text-align: right;"><i>Participant’s message</i></p> | <p>The 3<sup>rd</sup> edition is currently in stock. For your information, you need to pay \$50 more for the newer edition. Would you still like to exchange the book?</p> <ul style="list-style-type: none"> <li>• Yes, I would like an exchange.</li> <li>• No, I don’t want an exchange.</li> </ul> <p style="text-align: right;"><i>Participant’s choice</i></p> |
| <p>Alright. I’ll process your request. Please give me a moment.</p> <p style="text-align: center;">[Slight delay]</p>   | <p>Alright. I’ll process your request. Please give me a moment.</p> <p style="text-align: center;">[Slight delay]</p>  |
| <p>I have processed your request. The issue is resolved. Please contact us again if you need further assistance. Bye.</p>   | <p>I have processed your request. The issue is resolved. Please contact us again if you need further assistance. Bye.</p>  |

**Table 1. Predesigned chat scripts for the conditions from Preliminary Study**

**Procedure and Measures**

One hundred and sixty-eight undergraduate students (92 female) from a U.S. university participated in the study in exchange for course credit. Participants were randomly assigned to either the choice-absent or the choice-present condition.

The cover story involved a hypothetical but realistic scenario that described a service-related issue in the online retail industry. We chose the online retail industry as the setting because virtual chats are commonly deployed in this industry to communicate with customers. For the service-related issue, we used one of the most common service issues in the online retail industry: exchanging an item. We chose such a standardized service task for practical and design reasons: first, most chatbots are deployed to handle standardized service tasks in practice, and second, using such a standardized task reduces the risk of a chatbot making inconsistent responses to participants and ensures procedure equivalence across conditions. The scenario described a recent order of a textbook, which needed to be exchanged for a newer edition. After the cover

story, participants saw the introductory message that they were connected to a bot created by the customer service department. The chat started on a new screen.

During the chat, as each message from the chatbot appeared, participants had to type in their response underneath or choose one of the options provided by the chatbot depending on the experimental condition they were assigned to before they could see the subsequent message. Throughout the chat, participants saw a reminder of the critical facts from the script next to the chat interface so that they would not forget the key details.

After the chat, participants evaluated the chatbot-provided service by reporting their perception of service quality and satisfaction with the service, two important service evaluation outcomes (Cronin et al. 2000). Customers' perception of service quality is critical for service providers because it is an overall evaluation of service outcome, interaction, and environment that is associated with vital organizational outcomes, such as customer loyalty, market share, and purchase intention (Brady and Cronin 2001). Customers' satisfaction is also essential as it is a key predictor of their intention to continue using the service (Oliva et al. 1992). Perceived service quality was measured using three items (e.g., "poor/excellent"). Satisfaction with the service was measured using three questions (e.g., "how satisfied or dissatisfied did your experience with the service agent leave you feeling?"). These measures were adapted from Brady and Cronin (2001). All these questions were measured on a seven-point semantic differential scale. Participants also answered two attention check questions, which were later used to ensure subject quality. As a manipulation check, participants were asked how often they clicked and chose from options provided during the chat on a five-point semantic differential scale ('never' equals 1; 'always' equals 5).

## Results

Out of 168 subjects, 149 subjects passed both attention check questions and were used in our analysis. We first conducted a manipulation check for the presence of choice. Analysis revealed that participants in the choice-present condition perceived that they had to choose options more often than those in the choice-absent condition ( $M_{present} = 4.03$  vs.  $M_{absent} = 1.12$ ,  $SDs = 1.02$  and  $.50$ ,  $t(147) = 22.004$ ,  $p < .001$ ). Therefore, our manipulation was deemed successful.

Next, we conducted a one-way ANOVA with the presence of choice as a between-subjects factor to test its effect on perceived service quality and satisfaction with the service. Results revealed no significant effect of choice on either the perception of service quality ( $M_{absent} = 5.97$  vs.  $M_{present} = 6.19$ ,  $SDs = 1.11$  and  $.98$ ,  $F(1, 147) = 1.596$ ,  $p = .21$ ) or satisfaction with the service ( $M_{absent} = 6.31$  vs.  $M_{present} = 6.45$ ,  $SDs = .94$  and  $.76$ ,  $F(1, 147) = 1.030$ ,  $p = .31$ ). Such a lack of effect refutes the conventional wisdom that providing choices will enhance customer service experience by streamlining a service process. It also alleviates the concern that choice will provide less interactive conversation.

## Discussion

This study explored whether a chatbot's provision of choice would have an impact when a service interaction is already fluent, and we did not find any evidence for such an effect. While firms implement a chatbot that provides choices to standardize service interactions and increase the speed of a service process, it might not necessarily enhance customers' evaluations of service. On the other hand, firms are increasingly utilizing NLP to emulate a service interaction with a human employee, and they may be concerned that a chatbot simply providing choices will disrupt generating a social and an interactive environment. However, we did not find any evidence that providing choices impairs service experience.

Although we did not find any evidence for the effect of a chatbot providing choice, it is possible that the provision of choice might be beneficial or harmful in certain situations. For instance, the choice provision might signal the restoration of fluency and work as a remedy when a customer experiences a disruption during a fluent service interaction (e.g., conversational breakdown). Alternatively, providing choices might harm the fluency of service interaction when the provided choice set is not complete. Thus, in the subsequent studies, we focused on two moderators commonly associated with a service chatbot and examined how those moderators influence the effect of choice on service evaluations.



## Study 1

The goal of Study 1 was to investigate whether a conversational breakdown moderates the impact of a chatbot’s choice provision on service evaluations as well as the role of customers’ perception of fluency, as proposed in Hypotheses 1 and 2. To do so, we manipulated the presence of choice and also the presence of conversational breakdowns in a between-subjects design. As in Preliminary Study, participants were engaged in a hypothetical task of using a service chatbot to resolve a service-related issue and then answered several questions.

### Stimulus Materials

While we used a similar predefined script for the chatbot’s messages from Preliminary Study, we switched to a different service issue to extend the generalizability. Participants were asked to request the delivery of a missing item from a recent order by interacting with a service chatbot. We also modified the script by manipulating the presence of conversational breakdowns. To manipulate the presence of conversational breakdowns, we inserted error messages that the chatbot could not understand the participant’s response. We used such error messages because misunderstanding a customer’s input message is one of the most common pitfalls of a chatbot that disrupts conversational flow (Benner et al. 2021). While those in the conversational breakdown condition encountered several error messages throughout the chat, those in the no-breakdown condition did not encounter any error messages. We slightly varied each of the inserted error messages, but overall, these error messages asked participants to rephrase what they had said right before. Then, the chat continued as in the no-breakdown condition.

We manipulated the presence of choice as in the preliminary study. The two no-breakdown conditions were similar to the choice-present and the choice-absent conditions from the preliminary study. In the breakdown, choice-present condition, choices were provided only after the conversational breakdown occurred, which follows the conventional practice. Also, the conversation that always provide choices is unlikely to result in a conversational breakdown. In the breakdown, choice-absent condition, the chatbot did not provide any choices after a breakdown, and participants had to respond after the breakdown by typing in their messages. Table 2 shows the predefined scripts for the two breakdown conditions.

| Choice-absent   | Choice-present  |
|---|---|
| Hello. This is Taylor, and I am a bot created by the customer service department. I am handling your request today. What brings you here? | Hello. This is Taylor, and I am a bot created by the customer service department. I am handling your request today. What brings you here? |
| <i>Participant’s message</i>  | <i>Participant’s message</i>  |
| I do not understand what you said. Can you try again?   | I do not understand what you said. Can you choose one of the options below?   |
| <i>Participant’s message</i>  | <ul style="list-style-type: none"> <li>• Missing item</li> <li>• Check order status</li> <li>• Return/ exchange items</li> </ul>          |
| I can help you with that. First, could you tell me your order number?   | I can help you with that. First, could you tell me your order number?   |
| <i>Participant’s message</i>  | <i>Participant’s message</i>  |
| Got it. Please allow me few seconds for pulling up your order.  | Got it. Please allow me few seconds for pulling up your order.  |
| [Slight delay]  | [Slight delay]  |
| Which item(s) is missing?   | Which item(s) is missing?   |
| <i>Participant’s message</i>  | <i>Participant’s message</i> <ul style="list-style-type: none"> <li>• Sweater</li> <li>• Jeans</li> <li>• Baseball cap</li> </ul>         |
| I don’t quite get what you’re saying. Please repeat.  | I don’t quite get what you’re saying. Please choose an option below.  |
| <i>Participant’s message</i>  |   |

|  |  |
|--|--|
| <p>Can you describe conditions of the rest of the items?</p> <p style="text-align: right;"><i>Participant's message</i></p> <p>I can't process your message. Please type again.</p> <p style="text-align: right;"><i>Participant's message</i></p> <p>Thank you for telling me. Meanwhile, I've identified the problem: there was a miscommunication in the packaging process. I can create a new order that will be delivered within a day, or I can refund for the missing item. What would you prefer?</p> <p style="text-align: right;"><i>Participant's message</i></p> <p>I cannot understand. Can you repeat?</p> <p style="text-align: right;"><i>Participant's message</i></p> <p>Alright. I'll process your request. Please give me a moment.</p> <p style="text-align: right;">[Slight delay]</p> <p>I have processed your request. The issue is resolved. Please contact us again if you need further assistance. Bye.</p> | <p style="text-align: right;"><i>Participant's choice</i></p> <p>Can you describe conditions of the rest of the items?</p> <p style="text-align: right;"><i>Participant's message</i></p> <p>I can't process your message. Please select one.</p> <ul style="list-style-type: none"> <li>• In a good condition</li> <li>• Not in a good condition</li> </ul> <p style="text-align: right;"><i>Participant's choice</i></p> <p>Thank you for telling me. Meanwhile, I've identified the problem: there was a miscommunication in the packaging process. I can create a new order that will be delivered within a day, or I can refund for the missing item. What would you prefer?</p> <p style="text-align: right;"><i>Participant's message</i></p> <p>I cannot understand. Can you choose from below?</p> <ul style="list-style-type: none"> <li>• Create a new order</li> <li>• Refund the item</li> </ul> <p style="text-align: right;"><i>Participant's choice</i></p> <p>Alright. I'll process your request. Please give me a moment.</p> <p style="text-align: right;">[Slight delay]</p> <p>I have processed your request. The issue is resolved. Please contact us again if you need further assistance. Bye.</p> |
| <p><b>Table 2. Predesigned chat scripts for the conversational breakdown conditions from Study 1</b></p>   |  |

### Procedures and Measures

Three hundred and thirty-nine undergraduate students (188 female) from a U.S. university participated in the study in exchange for course credit. Participants were randomly assigned to one of the four conditions: breakdown or no-breakdown and choice-present or choice-absent.

Participants first encountered the cover story now involving a different service issue from that in Preliminary Study. The scenario described a recent delivery from an online clothing store in which one of the items was missing. After the cover story, participants followed the same procedures as the prior study.

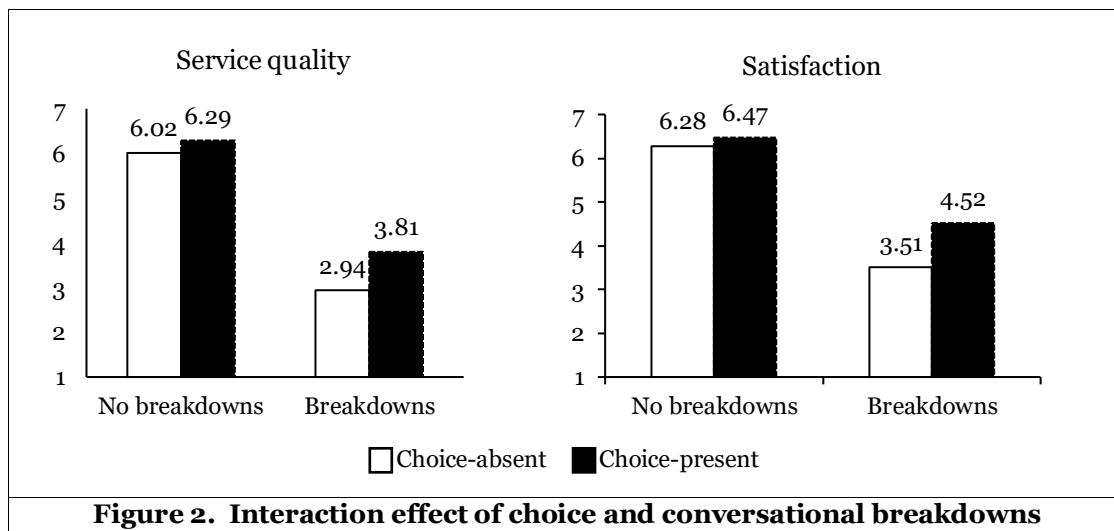
In addition to the measures used in Preliminary Study, we also measured participants' perception of fluency of their service experience using six items (e.g., flowing very unwell / flowing very well; very disfluent / very fluent) on a seven-point semantic differential scale (Graf et al. 2018). As a manipulation check for the presence of conversational breakdowns, participants were asked how often they thought their encounter with the chatbot was interrupted on a five-point semantic differential scale ('never' equals 1; 'always' equals 5) (Speier et al. 1999).

### Results

In our analyses, we used the responses from 303 subjects who passed the two attention checks. Analysis of the manipulation check for the presence of choice confirmed that participants in the choice-present conditions perceived that they had to choose options more often than those in the choice-absent conditions ( $M_{present} = 4.24$  vs.  $M_{absent} = 1.56$ ,  $SDs = .94$  and  $.96$ ,  $t(301) = 24.660$ ,  $p < .001$ ). The manipulation check for the presence of conversational breakdowns revealed that participants in the breakdown conditions perceived that conversational breakdowns occurred more frequently than those in the no-breakdown conditions ( $M_{breakdown} = 2.31$  vs.  $M_{no-breakdown} = 1.22$ ,  $SDs = 1.25$  and  $.69$ ,  $t(301) = 9.433$ ,  $p < .001$ ). Thus, we found both of our manipulations to be successful.

Next, to test our first hypothesis about the moderating impact of conversational breakdowns, we conducted a two-way MANOVA with the presences of choice and conversational breakdowns as between-subjects factors and perceived service quality and satisfaction with service as the two outcome variables. We observed significant main effects of both the presences of choice and conversational breakdowns, such that overall, the provision of choice led to greater perception of service quality ( $M = 5.05$  versus  $4.48$ ,  $F(1,299) = 14.261$ ,  $p < .001$ ) and satisfaction ( $M = 5.49$  versus  $4.89$ ,  $F(1,299) = 19.035$ ,  $p < .001$ ), while the presence of conversational breakdowns led to lower perception of service quality ( $M = 3.37$  versus  $6.16$ ,  $F(1,299) = 341.654$ ,  $p < .001$ ) and satisfaction ( $M = 4.01$  versus  $6.37$ ,  $F(1,299) = 294.128$ ,  $p < .001$ ).

Most importantly, we found a significant interaction effect of choice and conversational breakdowns on perceived service quality ( $F(1,299) = 3.987$ ,  $p = .047$ ) and on satisfaction ( $F(1,299) = 8.803$ ,  $p = .003$ ). Pairwise comparisons further showed that when there were no conversational breakdowns, providing choice did not have any significant effect on either perceived service quality ( $M = 6.29$  versus  $6.02$ ,  $F(1,299) = 1.600$ ,  $p = .2$ ) or satisfaction ( $M = 6.47$  versus  $6.28$ ,  $F(1,299) = .984$ ,  $p = .3$ ), just as what we observed in the preliminary study. On the other hand, when there were conversational breakdowns, providing choices significantly enhanced the perception of service quality ( $M = 3.81$  versus  $2.94$ ,  $F(1,299) = 16.495$ ,  $p < .001$ ) and satisfaction ( $M = 4.52$  versus  $3.51$ ,  $F(1,299) = 26.592$ ,  $p < .001$ ). These findings indicate that a chatbot's provision of choice benefits customers' service experience only after conversational breakdowns, thus confirming Hypothesis 1. Figure 2 depicts the interactions.



To examine the underlying mechanisms for the observed interaction, we also conducted a mediated moderation analysis using a PROCESS Model 8 with a bootstrapping approach and the two service evaluation variables as the dependent variables (Hayes 2013). The analysis showed that, when there were conversational breakdowns, the presence of choices significantly increased the perception of fluency, which led to higher perception of service quality (indirect effect =  $.70$ ; 95% CI =  $[.37, 1.05]$ ) and satisfaction (indirect effect =  $.61$ ; 95% CI =  $[.32, .90]$ ). However, when there were no conversational breakdowns, the indirect effects disappeared for both service quality (indirect effect =  $.09$ ; 95% CI =  $[-.16, .36]$ ) and satisfaction (indirect effect =  $.08$ ; 95% CI =  $[-.14, .32]$ ). Overall, these results confirmed Hypothesis 2.

## Discussion

Study 1 delved into a boundary condition for the impact of providing choice: conversational breakdowns. While finding evidence for the moderating effect of conversational breakdowns similar to the findings from Ashktorab et al. (2019), the study also revealed the role of perceived fluency as a driving force for such moderating effect. In sum, providing choices enhances service evaluations when provided after conversational breakdowns, because it amplifies a customer's perception of fluency that might have been disrupted due to a conversational breakdown.

While we discovered a boundary condition in which providing choice has a positive impact, it is also possible that the presence of choice engenders a negative impact by hurting the perception of fluency, for instance, when a given choice set is not comprehensive. We focus on this boundary condition in the subsequent study.

## **Study 2**

This study aimed to examine the moderating role of choice comprehensiveness for the impact of providing choice on service evaluations, as proposed in Hypothesis 3. Similar to Study 1, we also study whether the perception of fluency serves as an underlying mechanism for the moderation effect, as proposed in Hypothesis 4. Thus, in addition to the presence of choice, we manipulated the complexity of a service task for the operationalization of choice comprehensiveness in a between-subjects design. Task complexity can drive how customers evaluate information presentation formats (Jiang and Benbasat 2007). Similarly, the complexity of a service task may influence how customers process and react to choices provided by a chatbot. A task with high complexity often requires service technologies to personalize and be aware of specific demands (Xu et al. 2014), but choices provided by a chatbot, which are inflexible and predefined, will not be able to accommodate every personal need, thus resulting in an incomprehensive choice set.

As in prior studies, participants interacted with a service chatbot to resolve a hypothetical service-related issue and then answered several questions.

### **Stimulus Materials, Procedures, and Measures**

Two hundred and seventy-four undergraduate students (154 female) from a U.S. university participated in the study in exchange for course credit. Participants were randomly assigned to one of the four conditions: choice-present or choice-absent and high (leading to an incomprehensive choice set) or low (leading to a comprehensive choice set) task complexity.

We used a similar predesigned script for the chatbot's messages and a cover story from Preliminary Study because they enabled us to create a variation in the task complexity more efficiently. While we maintained the manipulation of choice, we showed different cover stories before interacting with the chatbot to manipulate the task complexity. Because task complexity is primarily determined by the amount of information relevant to a specific task (Wood 1986), we varied the number of requests to be made by participants to the service chatbot. In the low task complexity condition, participants read that they needed to request an exchange for a newer edition of the textbook they recently ordered. In high task complexity condition, participants were assigned to an additional task, which was requesting a free shipping label for sending the older edition back. Because a choice set is predefined and can include a limited number of options, there is a higher chance that the additional task is not compatible with the existing options.

During a chat, the chatbot first proceeded to process the exchange as in the Preliminary Study. After then, the chatbot asked if there is anything else needed. Those in the choice-absent condition could freely type their response. Those in the choice-present condition were provided with three options: 1) express shipping (\$15), 2) access to an e-book version, and 3) none. While those in the low task complexity condition could choose option 3), those in the high task complexity condition were not able to choose any because the options did not include their additional task of requesting a free shipping label, making the choice set incomprehensive. Except for these later messages, all other messages and the manipulation of choice remained the same as those in Preliminary Study.

Along with the measures used in the prior studies, we measured participants' perception of task complexity using three items (e.g., not at all complicated / very complicated) as a manipulation check for the task complexity (Campbell 1988). We also measured participants' perception of choice comprehensiveness provided using three items (e.g., sufficient for completing the task). The perception of choice comprehensiveness was measured only for those who were assigned to the two choice-present conditions. Both items were measured on a seven-point semantic differential scale.

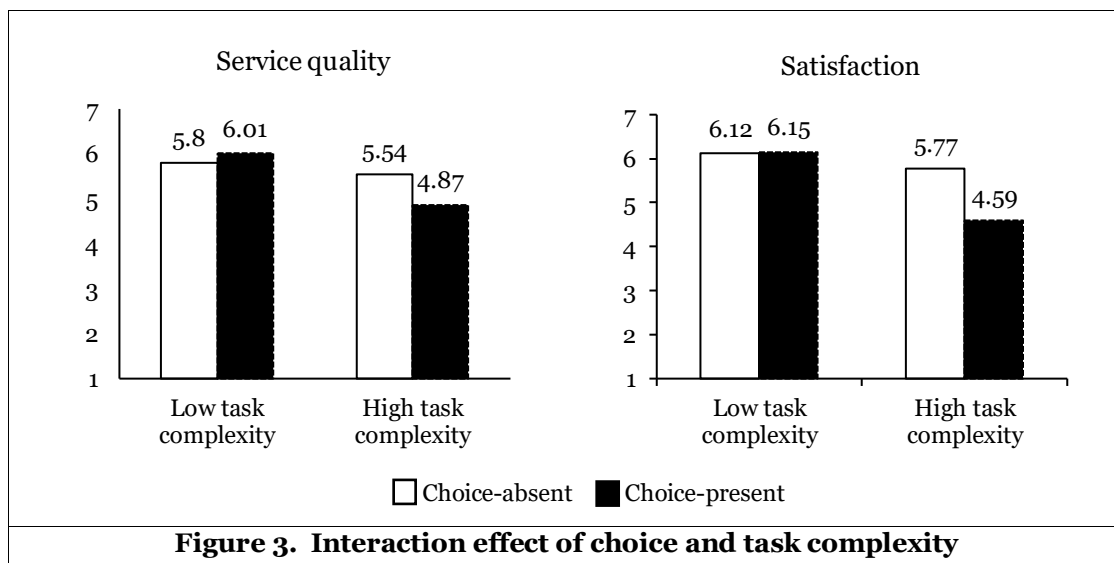
## **Results**

Two hundred and thirty-three subjects passed both attention checks and were used in the analyses. We first confirmed that the manipulation check of choice was successful by finding that participants in the choice-present conditions perceived that they encountered choices more frequently than those in the choice-absent

conditions ( $M_{present} = 4.10$  vs.  $M_{absent} = 1.21$ ,  $SDs = .91$  and  $.55$ ,  $t(231) = 29.656$ ,  $p < .001$ ). Next, we checked the manipulation of choice comprehensiveness by examining the perceptions of both task complexity and choice comprehensiveness. We found that those in the high task complexity conditions perceived their task to be more complex than those in the low task complexity conditions ( $M_{high} = 3.03$  vs.  $M_{low} = 2.67$ ,  $SDs = 1.32$  and  $1.42$ ,  $t(231) = 1.984$ ,  $p = .048$ ).<sup>1</sup> These results verify that our indirect manipulation of choice comprehensiveness through the manipulation of task complexity was successful.

To test our third hypothesis about the moderating effect of task complexity, we conducted a two-way MANOVA with the presences of choice and task complexity as between-subjects factors and the two service evaluation variables as the dependent variables. We observed a significant main effect of task complexity, such that overall, more complex task led to lower perception of service quality ( $M = 5.20$  versus  $5.90$ ,  $F(1,229) = 16.507$ ,  $p < .001$ ) and satisfaction ( $M = 5.18$  versus  $6.13$ ,  $F(1,229) = 27.993$ ,  $p < .001$ ). Meanwhile, the positive main effect of choice was observed only on satisfaction ( $M = 5.37$  versus  $5.94$ ,  $F(1,229) = 10.160$ ,  $p = .002$ ), but not perceived service quality ( $M = 5.44$  versus  $5.67$ ,  $F(1,229) = 1.804$ ,  $p = .181$ ).

Moreover, we found a significant interaction effect of choice and task complexity on perceived service quality ( $F(1,229) = 6.368$ ,  $p = .012$ ) and on satisfaction ( $F(1,229) = 11.494$ ,  $p = .001$ ). Pairwise comparisons revealed that, when task complexity was low (thus choices were comprehensive), choice did not have any impact on either perceived service quality ( $M = 6.01$  versus  $5.80$ ,  $F(1,229) = .697$ ,  $p = .4$ ) or satisfaction ( $M = 6.15$  versus  $6.12$ ,  $F(1,229) = .021$ ,  $p = .9$ ). However, when task complexity was high (thus choices were incomprehensive), choice hurt the perception of service quality ( $M = 4.87$  versus  $5.54$ ,  $F(1,229) = 7.472$ ,  $p = .007$ ) and satisfaction ( $M = 4.59$  versus  $5.77$ ,  $F(1,229) = 21.624$ ,  $p < .001$ ). These results confirm Hypothesis 3 by revealing a negative impact of a chatbot's provision of choice for complex tasks, which might lead to an incomprehensive choice set. Figure 3 illustrates the results.



To test the full mediated moderation, we used a PROCESS Model 8 with a bootstrapping approach and the two service evaluation variables as the dependent variables (Hayes 2013). The analysis revealed that, when task complexity was high, providing choices significantly decreased the perception of fluency, which led to lower perception of service quality (Indirect effect =  $-.41$ ; 95% CI =  $[-.78, -.03]$ ) and satisfaction (Indirect effect =  $-.40$ ; 95% CI =  $[-.76, -.04]$ ). For a less complex task, such effects were not observed for either service quality (Indirect effect =  $.05$ ; 95% CI =  $[-.21, .33]$ ) or satisfaction (Indirect effect =  $.05$ ; 95% CI =  $[-.20, .32]$ ). These findings altogether confirm Hypothesis 4.

<sup>1</sup> We also discovered that, among those who encountered choices during the interaction, those in high task complexity condition perceived the choices provided to be more incomprehensive than those in low task complexity condition ( $M_{high} = 4.42$  vs.  $M_{low} = 6.05$ ,  $SDs = 1.61$  and  $.92$ ,  $t(111) = 6.476$ ,  $p < .001$ ). This provides supplementary evidence that task complexity can influence the perception of choice comprehensiveness.

## **Discussion**

In Study 2, we examined another boundary condition for the impact of providing choice: choice comprehensiveness. The findings supported our hypotheses by illuminating the negative impact of providing choices on service evaluations for a more complex task (when a choice set becomes incomprehensible), and such a negative impact is due to reduced perception of fluency. Indeed, because chatbots are programmed to provide a predefined set of choices, it is very likely that they cannot flexibly incorporate more complex requests from customers. Facing a choice set that does not include the desired request, customers may feel interrupted, and the service process to be disfluent. This study, along with Study 1, underscores the role of fluency during a service interaction and how the contextual variables related to fluency can serve as boundary conditions for the impact of a service chatbot's provision of choice.

## **General Discussion**

This research investigates the role of a chatbot's provision of choices during a service interaction. Based on the notion of fluency (Alter and Oppenheimer 2009), we propose two boundary conditions—conversational breakdowns and choice comprehensiveness—for the impact of a chatbot providing choices on service evaluations. We hypothesize that the two boundary conditions moderate the impact of a chatbot providing choices by altering customers' perception on the fluency of a service experience. We propose that providing choices can enhance fluency and service outcomes only when conversational breakdowns occur. We further argue that providing choices may backfire when a choice set is perceived as incomprehensible—when a service task is very complex, for instance. We conducted a series of experimental studies and found support for these hypotheses.

## ***Theoretical Implications***

Although prevalent in practice, the implementation of choice on a service chatbot has not been studied extensively. Prior studies on a service chatbot have focused mostly on the impact of incorporating social factors, such as anthropomorphism and conversational behaviors that emulate interpersonal interaction (Crolic et al. 2022; Kim et al. 2019; Schanke et al. 2021). In contrast, choice provision is a conversational characteristic unique to a chatbot and may affect customers' perception of a chatbot and its performance. Such implementation of choices has been suggested as one of the repair strategies after chatbot failures (Ashktorab et al. 2019; Benner et al. 2021), but we are not aware of any empirical efforts investigating its effects. By exploring the impact of choice implementation and its boundary conditions, we provide a more complete picture of when and why implementing choices can be a boon or a bane. More importantly, we question the conventional wisdom that implementing choices is always better, thus extending the understanding of a prevalent conversational behavior of a service chatbot and its impact on users' assessment of a chatbot's performance.

Our research also contributes to customer service literature, specifically to the stream about technology-induced service interactions (Barrett et al. 2015). The unique boundary conditions have emerged due to the advent of AI technologies. Because of the uncertainty of a service environment, the technology at the moment cannot perfectly avoid potential failures, and thus, conversational breakdowns are inevitable (Honig and Oron-Gilad 2018). Also, because chatbots and a predefined set of choices are not flexible enough to satisfy a complex request, always providing a comprehensive list of choices is challenging to achieve. Thus, it is crucial to understand how the implementation of choice interacts with these boundary conditions and why. Especially for conversational breakdowns, our research provides an effective solution that is not only cost-efficient but also has a higher chance of getting the conversation back to track and complete the service process satisfactorily. Other recovery strategies suggested by prior literature, such as making an apology or providing explanations for a failure (Choi et al. 2020), may restore the degraded perception of a chatbot, such as warmth, but they are implemented after the damage is already done, and they have a lower chance of ultimately completing a service process. In addition to revealing the interactions, we illuminated that the impact of the interactions on service outcomes occur because of the perception on the fluency of a service delivery process. These findings altogether add to the nascent literature on failures during a service encounter with AIs (Choi et al. 2020; Leo and Huh 2020; Sheehan et al. 2020) and expand the literature on the role of task complexity in customer service to its role in technology-induced service interactions (Xu et al. 2014).

Broadly, our research bolsters the literature on fluency. While cues for fluency can take various forms, ranging from visual, linguistic to semantic (Alter and Oppenheimer 2009), we present novel cues for fluency unique to the service context. Through the findings related to the interaction of choice implementation and the two contextual variables, we identify boundary conditions that can either augment or deteriorate people's perception of fluency. Furthermore, by revealing the mediating role of fluency on service evaluations, we highlight how the perception of fluency influences people's judgments of their service experience as suggested by the prior literature (Alter and Oppenheimer 2009).

### ***Practical Implications***

Our work presents valuable guidance for practitioners who have deployed or are considering deploying service chatbots. While intuition suggests that choice implementation streamlines a service delivery process and helps deliver a satisfactory service experience, it does not necessarily provide any value for customers during an 'ideal' service interaction. Its value is only recognized when the perception of fluency is impaired (e.g., conversational breakdowns). Choice implementation can, in fact, be treated as a recovery strategy to reduce the potential negative consequences of chatbot failures in general. From a firm's perspective, providing a choice not only alleviates the negative impact of conversational breakdowns but also leads to a more structured conversation and prevents further failures. Thus, unlike other recovery strategies studied in prior literature, such as making an apology or providing explanations (Choi et al. 2020), choice implementation can be a cost-efficient solution that provides a higher chance of getting the conversation back to track and complete the service process satisfactorily.

On the other hand, our findings alarm practitioners by highlighting how a chatbot's provision of choices can be counterproductive for a service task with high complexity. Providing choices has a limitation because a chatbot cannot accurately anticipate every request of customers and has to rely on a predefined, limited set of choices. Due to the likelihood of a choice set being incomprehensive, choice implementation can backfire when a customer wants to make a complicated or unique request, thus disrupting a service delivery. This implies that firms should not haphazardly implement choices to realize the potential value of mitigating the negative consequences of conversational breakdowns. Overall, we urge firms to carefully assess the right timing and occasion for providing choices to enhance the benefits, while weighing its potential costs before implementing choices during a chatbot-initiated service interaction.

### ***Limitations and Future Research***

Our work opens up several opportunities for future research. First, various factors related to a choice structure could affect the impact of choice. In this research, we focus only on the complexity of service tasks that can influence the perceived comprehensiveness of a choice set. However, there has been an extensive stream of research about how various aspects of choice architecture, such as presentation formats, the number of choices, and the categorization of choices, can influence people's decision-making (Thaler and Sunstein 2008). Future research can examine how these various characteristics of choices can affect customers' perception of a chatbot providing choices and the overall service evaluations.

Second, although our studies manipulated conversational breakdowns based on the most common form of chatbot failures (i.e., not understanding input messages), there may be other types of failures, such as misinterpreting a message, making nonsensical responses, not adhering to conversational norms, and so on (Benner et al. 2021). Conversational breakdowns caused by different types of errors may be processed differently by customers and may not have the same moderating effect as observed in this research. For instance, the choice may not be effective when a conversational breakdown is caused by social errors, such as violating conversational norms. Future studies can categorize conversational breakdowns based on their cause (for example, technical errors versus social errors) and examine if the impact of choice implementation depends on the type of conversational breakdowns.

Lastly, our manipulation of task complexity, which was used for operationalizing choice comprehensiveness has caused a service failure. This could have confounded the moderating impact of choice comprehensiveness. A future study that fixes a service task and vary the number of options may in fact eliminate such concern. Furthermore, while we only examined the moderating role of task complexity, other task-relevant characteristics may constitute additional boundary conditions. For example, choice implementation can be beneficial for a standardized, routine task, while it may be counterproductive for a

less common, unstandardized task. Or, in a broader sense, industry-relevant characteristics can be crucial moderators. For instance, in an industry that focuses on customer relationships and prioritizes social factors, such as healthcare or education, a chatbot simply providing choices may lack a human touch, leading to negative consequences. On the other hand, an industry that deals with functional, utilitarian tasks, such as banking, may realize the benefit of a chatbot that implements choices during an interaction with customers. Scholars can look into these various factors and how they influence customers' perception of choice and the performance of a chatbot.

## References

- Alter, A. L., and Oppenheimer, D. M. 2009. "Uniting the Tribes of Fluency to Form a Metacognitive Nation," *Personality and Social Psychology Review* (13:3), pp. 219-235.
- Ashktorab, Z., Jain, M., Liao, Q. V., and Weisz, J. D. 2019. "Resilient Chatbots: Repair Strategy Preferences for Conversational Breakdowns," in: *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, pp.1-12.
- Barrett, M., Davidson, E., Prabhu, J., and Vargo, S. L. 2015. "Service Innovation in the Digital Age: Key Contributions and Future Directions," *MIS Quarterly* (39:1), pp. 135-154.
- Benner, D., Elshan, E., Schöbel, S., and Janson, A. 2021. "What Do You Mean? A Review on Recovery Strategies to Overcome Conversational Breakdowns of Conversational Agents," *ICIS 2021*.
- Bitner, M. J., Brown, S. W., and Meuter, M. L. 2000. "Technology Infusion in Service Encounters," *Journal of the Academy of Marketing Science* (28:1), pp. 138-149.
- Bluvstein, S., Zhao, X., Barasch, A., and Schroeder, J. 2019. "'Hello! How May I Helo You?': How (Corrected) Errors Humanize a Communicator", *Working paper*.
- Brady, M. K., and Cronin, J. J. 2001. "Some New Thoughts on Conceptualizing Perceived Service Quality: A Hierarchical Approach," *Journal of Marketing* (65:3), pp. 34-49.
- Campbell, D. J. 1988. "Task Complexity: A Review and Analysis," *Academy of Management Review* (13:1), pp. 40-52.
- Chambon, V., and Haggard, P. 2012. "Sense of Control Depends on Fluency of Action Selection, Not Motor Performance," *Cognition* (125:3), pp. 441-451.
- Choi, S., Mattila, A. S., and Bolton, L. E. 2020. "To Err Is Human(-Oid): How Do Consumers React to Robot Service Failure and Recovery?," *Journal of Service Research* (24:3), pp.354-471.
- Crolic, C., Thomaz, F., Hadi, R., and Stephen, A. T. 2022. "Blame the Bot: Anthropomorphism and Anger in Customer-Chatbot Interactions," *Journal of Marketing* (86:1), pp. 132-148.
- Cronin, J. J., Brady, M. K., and Hult, G. T. M. 2000. "Assessing the Effects of Quality, Value, and Customer Satisfaction on Consumer Behavioral Intentions in Service Environments," *Journal of Retailing* (76:2), pp. 193-218.
- Fernández-Sabiote, E., and López-López, I. 2020. "Discovering Call Interaction Fluency: A Way to Improve Experiences with Call Centres," *Service Science* (12:1), pp. 26-42.
- Fotheringham, D., and Wiles, M. A. 2022. "The Effect of Implementing Chatbot Customer Service on Stock Returns: An Event Study Analysis," *Journal of the Academy of Marketing Science*, pp. 1-21.
- Froehle, C. M., and White, D. L. 2014. "Interruption and Forgetting in Knowledge-Intensive Service Environments," *Production and Operations Management* (23:4), pp. 704-722.
- Graf, L. K. M., Mayer, S., and Landwehr, J. R. 2018. "Measuring Processing Fluency: One Versus Five Items," *Journal of Consumer Psychology* (28:3), pp. 393-411.
- Hayes, A. F. 2013. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. New York, NY, US: Guilford Press.
- Heskett, J. L., Jones, T. O., Loveman, G. W., Sasser, W. E., and Schlesinger, L. A. 1994. "Putting the Service Profit Chain to Work," in: *Harvard Business Review*. pp. 164-174.
- Honig, S., and Oron-Gilad, T. 2018. "Understanding and Resolving Failures in Human-Robot Interaction: Literature Review and Model Development," *Frontiers in Psychology* (9).
- Huang, M.-H., and Rust, R. T. 2021. "Engaged to a Robot? The Role of Ai in Service," *Journal of Service Research* (24:1), pp. 30-41.
- Jiang, Z., and Benbasat, I. 2007. "The Effects of Presentation Formats and Task Complexity on Online Consumers' Product Understanding," *MIS Quarterly* (31:3), pp. 475-500.
- Johnson, E. J., Shu, S. B., Dellaert, B. G., Fox, C., Goldstein, D. G., Häubl, G., & Weber, E. U. 2012. "Beyond nudges: Tools of a choice architecture," *Marketing letters*, (23:2), pp. 487-504.



- Kim, S. Y., Schmitt, B. H., and Thalmann, N. M. 2019. "Eliza in the Uncanny Valley: Anthropomorphizing Consumer Robots Increases Their Perceived Warmth but Decreases Liking," *Marketing Letters* (30:1), pp. 1-12.
- Klopfenstein, L. C., Delpriori, S., Malatini, S., and Bogliolo, A. 2017. "The Rise of Bots: A Survey of Conversational Interfaces, Patterns, and Paradigms," in *Proceedings of the 2017 Conference on Designing Interactive Systems*, pp. 555-565.
- Lee, M. K., Kiesler, S., Forlizzi, J., Srinivasa, S., and Rybski, P. 2010. "Gracefully Mitigating Breakdowns in Robotic Services," *2010 5th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pp. 203-210.
- Leo, X., and Huh, Y. E. 2020. "Who Gets the Blame for Service Failures? Attribution of Responsibility toward Robot Versus Human Service Providers and Service Firms," *Computers in Human Behavior* (113:106520).
- Li, C.-H., Yeh, S.-F., Chang, T.-J., Tsai, M.-H., Chen, K., and Chang, Y.-J. 2020. "A Conversation Analysis of Non-Progress and Coping Strategies with a Banking Task-Oriented Chatbot," in *Proceedings of the 2020 Chi Conference on Human Factors in Computing Systems*, pp. 1-12.
- Luo, X., Tong, S., Fang, Z., and Qu, Z. 2019. "Frontiers: Machines Vs. Humans: The Impact of Artificial Intelligence Chatbot Disclosure on Customer Purchases," *Marketing Science* (38:6), pp. 937-947.
- Markets and Markets. 2019. "Chatbot Market by Component (Solutions and Services), Usage (Websites and Contact Centers), Technology, Deployment Model, Application (Customer Support and Personal Assistant), Organization Size, Vertical, and Region - Global Forecast to 2024."
- Meuter, M. L., Ostrom, A. L., Roundtree, R. I., and Bitner, M. J. 2000. "Self-Service Technologies: Understanding Customer Satisfaction with Technology-Based Service Encounters," *Journal of Marketing* (64:3), pp. 50-64.
- Mirnig, N., Stollnberger, G., Miksch, M., Stadler, S., Giuliani, M., and Tscheligi, M. 2017. "To Err Is Robot: How Humans Assess and Act toward an Erroneous Social Robot," *Frontiers in Robotics and AI* (4:21).
- Mordor Intelligence. 2022. "Chatbot Market-Growth, Trends, Covid-19 Impact, and Forecasts (2022-2027)."
- Nguyen, Q. N., Sidorova, A., and Torres, R. 2022. "User Interactions with Chatbot Interfaces Vs. Menu-Based Interfaces: An Empirical Study," *Computers in Human Behavior* (128:107093).
- Oliva, T. A., Oliver, R. L., and MacMillan, I. C. 1992. "A Catastrophe Model for Developing Service Satisfaction Strategies," *Journal of Marketing* (56:3), pp. 83-95.
- Oppenheimer, D. M. 2008. "The Secret Life of Fluency," *Trends in Cognitive Sciences* (12:6), pp. 237-241.
- Orth, U. R., and Wirtz, J. 2014. "Consumer Processing of Interior Service Environments: The Interplay among Visual Complexity, Processing Fluency, and Attractiveness," *Journal of Service Research* (17:3), pp. 296-309.
- Ostrom, A. L., Field, J. M., Fotheringham, D., Subramony, M., Gustafsson, A., Lemon, K. N., Huang, M.-H., and McColl-Kennedy, J. R. 2021. "Service Research Priorities: Managing and Delivering Service in Turbulent Times," *Journal of Service Research* (24:3), pp. 329-353.
- Reber, R., Wurtz, P., and Zimmermann, T. D. 2004. "Exploring "Fringe" Consciousness: The Subjective Experience of Perceptual Fluency and Its Objective Bases," *Consciousness and Cognition* (13:1), pp. 47-60.
- Sampson, S. E., and Froehle, C. M. 2006. "Foundations and Implications of a Proposed Unified Services Theory," *Production and Operations Management* (15:2), pp. 329-343.
- Schanke, S., Burtch, G., and Ray, G. 2021. "Estimating the Impact of "Humanizing" Customer Service Chatbots," *Information Systems Research* (32:3), pp. 736-751.
- Scheibehenne, B., Greifeneder, R., and Todd, P. M., "Can There Ever Be Too Many Options? A Meta-Analytic Review of Choice Overload," *Journal of Consumer Research*, (37: 3), pp. 409-425.
- Schuetzler, R. M., Grimes, G. M., Giboney, J. S., & Rosser, H. K. 2021. "Deciding Whether and How to Deploy Chatbots," *MIS Quarterly Executive*, 20(1), pp. 1-15.
- Schwarz, N. 2004. "Metacognitive Experiences in Consumer Judgment and Decision Making," *Journal of Consumer Psychology* (14:4), pp. 332-348.
- Schwarz, N., Bless, H., Strack, F., Klumpp, G., Rittenauer-Schatka, H., and Simons, A. 1991. "Ease of Retrieval as Information: Another Look at the Availability Heuristic," *Journal of Personality and Social Psychology* (61:2), pp. 195-202.
- Seshadri, S., and Shapira, Z. 2001. "Managerial Allocation of Time and Effort: The Effects of Interruptions," *Management Science* (47:5), pp. 647-662.

- Sheehan, B., Jin, H. S., and Gottlieb, U. 2020. "Customer Service Chatbots: Anthropomorphism and Adoption," *Journal of Business Research* (115), pp. 14-24.
- Shen, X.-L., Li, Y.-J., Sun, Y., and Wang, N. 2018. "Channel Integration Quality, Perceived Fluency and Omnichannel Service Usage: The Moderating Roles of Internal and External Usage Experience," *Decision Support Systems* (109), pp. 61-73.
- Shriberg, E. 2001. "To 'Errrr' Is Human: Ecology and Acoustics of Speech Disfluencies," *Journal of the International Phonetic Association* (31:1), pp. 153-169.
- Simonite, T. 2017. "Facebook's Perfect, Impossible Chatbot," in *MIT Technology Review*.
- Sirianni, N. J., Bitner, M. J., Brown, S. W., and Mandel, N. 2013. "Branded Service Encounters: Strategically Aligning Employee Behavior with the Brand Positioning," *Journal of Marketing* (77:6), pp. 108-123.
- Speier, C., Valacich, J. S., & Vessey, I. 1999. "The influence of task interruption on individual decision making: An information overload perspective," *Decision sciences*, (30:2), pp. 337-360.
- Stewart, D. M., and Chase, R. B. 1999. "The Impact of Human Error on Delivering Service Quality," *Production and Operations Management* (8:3), pp. 240-263.
- Sunstein, C. R. 2017. *Human agency and behavioral economics: Nudging fast and slow*. Springer.
- Thaler, R. H., and Sunstein, C. R. 2008. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Yale University Press.
- Voorhees, C. M., Fombelle, P. W., Gregoire, Y., Bone, S., Gustafsson, A., Sousa, R., and Walkowiak, T. 2017. "Service Encounters, Experiences and the Customer Journey: Defining the Field and a Call to Expand Our Lens," *Journal of Business Research* (79), pp. 269-280.
- Wood, R. E. 1986. "Task Complexity: Definition of the Construct," *Organizational Behavior and Human Decision Processes* (37:1), pp. 60-82.
- Xu, J., Benbasat, I., and Cenfetelli, R. T. 2014. "Research Note—the Influences of Online Service Technologies and Task Complexity on Efficiency and Personalization," *Information Systems Research* (25:2), pp. 420-436.
- Zomerdijk, L. G., and Voss, C. A. 2010. "Service Design for Experience-Centric Services," *Journal of Service Research* (13:1), pp. 67-82.