Assertive or submissive? – How consumers respond to different dominance patterns in smart voice-based service encounters

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Abstract

Purpose - Marketing research has demonstrated that consumers tend to attribute human-like roles to smart voice-interaction technologies (SVIT), such as Amazon's Alexa. However, smart service research has largely ignored the effects of such role attributions on service evaluations. Consequently, this study explores how role attributions in service encounters with SVIT affect consumers' service satisfaction and re-use intentions. Understanding such effects aids service researchers in estimating the impact of role attributions in smart service encounters and helps marketers to design more purposeful smart services.

Methodology - A series of two online experiments was conducted. In Study 1, a Wizard-of-Oz approach was employed to examine the direct effect of role attribution on service satisfaction and re-use intention. Study 2 then focused on the contextual influence of personal relevance on this effect. Across all studies, consumers engaged in fictional and scripted yet biotic service encounters with SVIT.

Findings – Our analyses provided support for the impact of role attributions on (voice-based) service encounters. In both Studies, we found that a service provided by a SVIT that is perceived to be submissive had a positive effect on service satisfaction. Study 2 demonstrated that this effect is robust across contexts. Building upon these findings, future research should examine whether these effects persist when the outcome of the service encounter is of high stake or if a highly personal context, such as a patient-doctor

interaction, yields different results. In such cases, users may require a professional guiding hand rather than a submissive counterpart.

Originality – This work introduces a role-centered perspective on smart voice-based service encounters. It empirically demonstrates that the roles consumers attribute to SVIT significantly impact service satisfaction. By shedding light on the implicit effects of SVIT in service triads (user–SVIT–provider), we explicate how marketers can prime role perceptions to enhance customer experience. The findings offer implications for empathic and customer-oriented voice-based service design that incorporates paternalistic aspects.

Key Words: role attribution / smart services / assertiveness / submissiveness / smart voice interaction technology / context

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1. Introduction

Alongside their growing prominence among consumers, smart voice-interaction technologies (SVIT), such as Amazon's Alexa and Apple's Siri, have attracted substantial attention among service researchers (Foehr and Germelmann, 2020; Huang and Rust, 2021; Pantano and Scarpi, 2022). Thereby, service research has been particularly occupied with SVIT's own impact on customers, including factors such as re-use intentions, anthropomorphism, emotional arousal, service experience perceptions, or SVIT's influence on (frontline) service employees (for example, in terms of service augmentation, productivity enhancement, and human-SVIT collaboration or replacement) (Bagozzi *et al.*, 2022; Garry and Harwood, 2019; Lu *et al.*, 2020; McLeay *et al.*, 2021; Xiao and Kumar, 2021). Yet, there is a surprising paucity of knowledge on the side- or meta-effect of SVIT, such as the impact of tonality in an interaction between SVIT and human customers.

Gaining such insight is imperative, as organizations are increasingly implementing voice-based self-service technology such as SVIT, either as a means of reducing costs or to compensate for skill shortage (Cuoto *et al.*, 2023). Frequently, this deprives customers of the option to interact with a human frontline service employee while the service performance of these voice-based technologies regularly tends to fall short of consumers' expectations (e.g., Johnson *et al.*, 2008). Moreover, despite the transformative impact of SVIT on service encounters evidenced in extant service research, most work in the field builds on a simplified, if not simplistic, perception of consumers' relationship with SVIT (Choi *et al.*, 2021; Uysal *et al.*, 2022). While service researchers have mostly ignored consumers' and service employees' *individual* relationships with SVIT,

literature in marketing and consumer research indicates that people tend to form interpersonal, often human-like relationships with anthropomorphic technology, especially with SVIT, driven by the natural vocal interaction mode (Foehr and Germelmann, 2020; Guerreiro and Loureiro, 2023; Hoffman and Novak, 2018; Novak and Hoffman, 2019; Pitardi and Marriott, 2021). These relationships frequently result in humans attributing specific roles to SVIT (Novak and Hoffman, 2019), which may reflect those attributed to human counterparts (Abboud et al., 2021). For instance, the intense branding of numerous SVITs (Vernuccio et al., 2021), has led consumers to experience difficulty in distinguishing their service counterparts in service encounters with smart technology (Foehr and Germelmann, 2020; Pitardi and Marriott, 2021). Hence, consumers are likely to misattribute service perceptions in service encounters with SVIT. In practice, consumers may thus ascribe a successful service provision (e.g., asking the SVIT to play music) to the perceived personality of the SVIT (e.g., Alexa) rather than to the original service provider (e.g., the provider of the music streaming service). To ensure that consumers attribute service perceptions correctly, it is necessary to consider role attributions such as the assertiveness or submissiveness of voice-based technologies (e.g., SVIT).

The role attributed to a service counterpart can influence consumer perceptions of service interactions, as evidenced by role theory (Solomon et al., 1985) and script theory (Mohr and Bitner, 1991). Additionally, the Computers are Social Actors paradigm (CASA) (Nass et al., 1994) suggests that SVIT can also be considered social service counterparts. However, if SVIT can fulfill the appropriate role in the appropriate context, potential issues related to individual human personalities can be mitigated, allowing for the delivery of the optimal service experience to consumers.

So far, however, service research has mostly investigated the impact of relationships in dyadic consumer-service provider constellations (Hess et al., 2003). Thus, the influence

of SVIT as intermediaries in smart service encounters, and the roles consumers attribute to SVIT in these encounters, have been neglected to date.

In light of this research gap, this work explores the following research question:

> *To what extent do the roles consumers attribute to SVIT affect consumers' service satisfaction and intention to re-use the service in different contexts?*

By responding to this research question, this article contributes to the field of service theory by providing a role-centric perspective on smart, voice-based service encounters in smart service environments. More specifically, our objective is to elucidate the impact of consumers' anthropomorphic role attributions in voice-based service encounters that are mediated by SVIT. Moreover, we offer insights for practitioners to address potential human limitations in communication by providing a SVIT that is not influenced by emotions and therefore maintains its tonality. This should improve the service process design of practitioners to better communicate their offers using SVIT. Additionally, we contribute to the advancement of service practice by enhancing the discipline's comprehension of the often-overlooked consequences on service design processes provided on platforms with particularly strong brand recognition (e.g., Amazon Alexa).

2. Theoretical Background

2.1 Smart Voice Interaction Technology as an Intermediary in Service Encounters

While service technologies may manifest in various forms such as service robots or chatbots, this research explicitly focuses on voice-based interaction with SVIT, as voice is considered the most natural way of communication. SVIT have been defined as "internet-connected devices that, depending on their technical functionalities, incor-

porate some degree of autonomy, authority, and agency and allow for voice-based conversational interaction between consumers and technology [...]" (Foehr and Germelmann, 2020, p. 182). Throughout the last decade, service providers have increasingly implemented voice-technologies like SVIT as customer touchpoints and vehicles for service provision (Marinova *et al.*, 2017; Paluch and Wirtz, 2020). Service encounters with SVIT are essentially of a mediated nature, that is, SVIT transform and extend the dyadic consumer-service provider interaction into a triadic one through their voice-interface (Larivière *et al.*, 2017; Odekerken-Schröder *et al.*, 2022). In this service triad, the SVIT as an intermediary technically connects consumers and service providers (Beverungen *et al.*, 2019). However, the SVIT does not disappear in consumers' perception but, contrarily, alters consumers' service perceptions. That is, if a consumer buys a product or service via SVIT, the device instead of the service provider directly influences the consumer's service perception. More precisely, both Sands *et al.* (2021) and Larivière *et al.* (2017) have argued that smart technology impacts established service scripts by generating distance between consumers and service providers, thus potentially reducing perceived connection. In contrast, voice-based technologies provide potential benefits to consumers and service providers, such as customer engagement through social presence (Jörling *et al.*, 2019; van Doorn *et al.*, 2017). Consequently, the tonality of the voice-based service counterpart (i.e., SVIT) assumes an even greater significance. In short: the tonality of SVIT – whether calm, directive, or accommodating – not only reflects technical design choices, but also functions as a key social signal that can influence perceived authority, empathy, and trustworthiness.

Following media equation theory, the manner in which consumers interact with technology is analogous to their interactions with humans (Reeves and Nass, 2003). Consequently, technology should interact with humans in a manner that is consistent with

this analogy.

2.2 Service Satisfaction and Service Re-use Intention

Service satisfaction and re-use intention are well-established performance indicators for service success. Service marketing and consumer research have consistently demonstrated the relationship between consumers' service satisfaction and their intention for repeated service use (e.g., Anderson and Srinivasan, 2003; Zeithaml *et al.*, 1996; Zeithaml *et al.*, 2020). Smart voice-based services, such as those performed by SVIT, are becoming increasingly essential due to their rising performance and the integration of artificial intelligence (Gonçalves *et al.*, 2020; Grewal *et al.*, 2022). Consequently, the number of people using SVIT in service encounters is expected to increase. Therefore, high-level service satisfaction and strong re-use intention of services provided by SVIT are crucial for ensuring sustained performance in service provision.

Currently, companies frequently use text-based chatbots for service encounters. However, research indicates that services provided by chatbots are not evaluated as positively as those provided by human agents (Castelo *et al.*, 2023). This suggests that there is opportunity for improvement. Implementing SVIT, which can offer human-like speaking and intelligent service realization, could make consumers more comfortable with the service encounter, a key characteristic of which is being satisfied with the service. Thus, positive service evaluation, that is measurable through service satisfaction and re-use intention, provides valuable insights for companies on how to improve their service design processes (Castelo *et al.*, 2023).

From a broader perspective, service satisfaction-profit chain theory underlines the positive effects of consumers' service satisfaction on retention rates (based on their willingness to re-use a service) and corporate profitability (Anderson and Mittal, 2000). This

renders consumers' service satisfaction and re-use intention highly relevant objectives for long-term profitability. In line with that, Ajzen and Fishbein's (1977) theory of reasoned action posits that consumers' attitudes regarding service satisfaction and re-use intention (e.g., toward a service) affect their behavior. This means that behavior (e.g., buying a product or using a service) is driven by these factors and is therefore essential for optimizing service processes.

2.3 SVIT and Role Attribution

It is well established in Human-Computer Interaction (HCI) and Information Systems (IS) that consumers engage in social interactions with technological artifacts, even when aware of their artificiality. Nass and Moon (2000) demonstrated that consumers perceive technological devices with human-like features as social actors. Speech input and output are particularly effective in evoking human-like perceptions (Nass and Brave, 2005; Nass and Moon, 2000). Social roles are also important, with computers taking on and excelling in these roles (Nass and Steuer, 1993). The CASA paradigm, building on these findings, is a key theoretical foundation for understanding consumers' social interactions with smart technology, especially voice-based consumer interfaces with human-like voices (Nass and Brave, 2005). Central to this paradigm is that humans interact with computers as if they were social counterparts. This means that humans naturally revert to social norms and reactions, treating computers as if they possess human characteristics, despite being aware of the technology's non-human nature (Nass and Moon, 2000). This concept builds on the theory that humans have evolved to use automated behaviors and social rules in communication. Closely linked to this paradigm, but essentially different, is anthropomorphism theory, which explains

how and why consumers attribute human characteristics to non-human objects like computers (Epley *et al.*, 2007).

Drawing from both theories, recent research in marketing and consumer behavior has focused on consumers' role attributions in interactions with smart technologies, particularly SVIT. Consumers tend to attribute three main roles to SVIT: assertive master, cooperative partner, or submissive servant (Hoffman and Novak, 2018; Novak and Hoffman, 2019; Schweitzer *et al.*, 2019; Serigul, Schneider, and Utz, 2023). These roles influence how consumers interact with SVIT. For instance, Schweitzer *et al.* (2019) found that consumers interacted more frequently and willingly with SVIT identified as servants than with those identified as masters or partners. Vocal and linguistic cues play a crucial role in these attributions, with submissive roles being associated with compliance and assertive roles with dominance (Schweitzer *et al.*, 2019).

Novak and Hoffman (2019) further explored how consumers' relationships with smart technologies are influenced by the technologies' roles within a network of connected devices and physical contexts. Technologies with high agency are more likely to be seen as assertive, while those with high communality are seen as submissive. Moreover, role theory suggests that tailoring these roles to a firm's goals and brand personality is crucial for customer service evaluation. In this context, submissive roles can lead to higher service satisfaction (Solomon *et al.*, 1985; Webster and Sundaram, 2009), while assertive roles can enhance satisfaction when they align with consumer expectations (Mohr & Bitner, 1991).

In addition to role attributions, several other factors influence consumers' interactions with SVIT. An individual's attitude toward technology can shape their perception of service interactions (Elliott et al., 2012). A negative attitude toward service technologies can transfer to a negative perception of the service provided. Herzberg's (2002)

concept of "chronic reactance," based on psychological reactance theory (Brehm, 1966), suggests that when consumers' freedom of choice is restricted, they may resist performing a desired action. This reactance could influence how users perceive assertive service counterparts. Furthermore, consumers' "need for interaction" significantly affects service interactions and quality perceptions (Dabholkar, 1996). Those with a high need for interaction tend to avoid technology-enabled services, while those with a low need for interaction favor self-service technologies (Dabholkar and Bagozzi, 2002). Finally, experience with SVIT could affect how the SVIT's role is perceived, so that higher (i.e., more) experience could positively influence service evaluation (Guerreiro and Loureiro, 2023).

In summary, research indicates that consumers develop social relationships with voice-based devices, attributing specific roles based on the devices' functions and perceived social cues. Marketers can influence these role attributions through the design of SVIT. Additionally, consumers' attitudes toward technology, chronic reactance, and need for interaction are important factors to consider in service interactions.

Thus, *we hypothesize that if a SVIT is perceived as submissive, it more positively affects the influence of a service encounter with SVIT on service satisfaction than when it is perceived as assertive (H1)*. Building on service satisfaction-profit chain theory and theory of planned behavior we also *hypothesize that high service satisfaction positively influences the intention to re-use the service. (H2)*.

2.4 Context-specific SVIT use

Service satisfaction-profit chain theory and role theory suggest that the context of interaction could play a major role in the evaluation of voice-based services. Consumer research indicated that consumer involvement in products or services is context-depend-

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ent; high involvement situations are linked to higher personal relevance, while low involvement situations are associated with lower relevance (Petty and Cacioppo, 1981). In close connection, the elaboration likelihood model of persuasion describes two processing routes: (1) the central route with high involvement and cognitive effort, and (2) the peripheral route with low involvement and cognitive effort (Petty and Cacioppo, 1986). In high involvement situations, consumers invest more cognitive effort in evaluation, regardless of the argument style (e.g., submissive vs. assertive). In low involvement situations, evaluations are based on peripheral cues and therefore could be stronger influenced by the perceived communication style (e.g., submissive vs. assertive).

As a result of the above, we hypothesize that the relationship between role attribution and service satisfaction is moderated by the context of the service encounter (H3).

If the context of a SVIT service encounter has higher personal relevance, an assertive SVIT affects service satisfaction more positive than a submissive SVIT (H3a).

If the context of a SVIT service encounter has lower personal relevance, a submissive SVIT affects service satisfaction more positive than an assertive SVIT (H3b).

An overview of the most relevant literature and its findings, as well as its relevance to this research, is provided in Table 1. The conceptual framework for our studies, resulting from the hypotheses, can be found in Figure 1. All hypotheses were pre-registered using *aspredicted.org.*

*** PLEASE INSERT TABLE 1 HERE ***

Table 1: **Research base for hypothesized effects**

*** PLEASE INSERT FIGURE 1 HERE ***

Figure 1: **Conceptual frameworks for Studies 1 & 2**

3. Method

To test the hypotheses, a series of two experimental studies was conducted. The experiments aimed at assessing the impact of different role attributions on consumer satisfaction with the service provided by SVIT. More precisely, we conducted two studies that differed in two aspects: 1) In Study 2 the moderator "context" was added, and 2) we let the participants listen to an interaction instead of letting themselves interact with the SVIT.

To avoid confounding effects of pre-existing attitudes toward extant SVIT on the market (e.g., Amazon Alexa), a fictitious SVIT, named *Slesy*, was developed and introduced for both studies. The resemblance between the SVIT's name, "*Slesy*," and the pejorative English word, "sleazy," did not result in any bias, as the samples consisted of German-speaking individuals only, where "Slesy" has no particular meaning. The vocal sequences of *Slesy* speaking were generated using *Amazon Polly* text-to-speech software in Study 1 and *Google Cloud* text-to-speech software in Study 2. Both voices were of a similar quality, with no discernible differences. This allowed for a systematic manipulation of the content of *Slesy's* voice output.

3.1 Study 1

Extant literature indicates that consumers' role attribution may be influenced by subtle cues. For example, consumers' perceived level of agency associated with the SVIT positively correlates with its assertiveness (Novak and Hoffman, 2019; Pitardi *et al.*, 2022; Tolmeijer *et al.*, 2021). Furthermore, HCI/IS literature suggests that role attributions in consumer interactions with SVIT, such as assertiveness and submissiveness, may be particularly influenced by verbal or linguistic cues in the SVITs' voice (Gnewuch *et al.*, 2020).

Hence, the objective of Study 1 is to ascertain the degree to which role attributions (assertive vs. submissive) influence perceived service satisfaction and, subsequently, their impact on service re-use intentions. To this end, the role attributed to the SVIT by users was manipulated by varying the wording employed by the SVIT during the interaction. Furthermore, only successful service encounters were considered.

Procedure A between-subjects design with two conditions (role attribution: assertive vs. submissive) was employed, using a Wizard-of-Oz experimental approach. This allows researchers to emulate consumers' interactions with a SVIT in a natural manner while simultaneously maintaining complete control over the technology's responses (Dahlbäck *et al.*, 1993). By confronting participants with direct interaction with the SVIT through the digitally generated 'wizard' interacting with the participant (Adler, Iacobelli, and Gutstein, 2016), this approach pragmatically allows the standardized and systematic variation, yet natural experience of mimicked interaction. Hence, this design enables a controlled *in vivo* exposure (Germelmann *et al.*, 2020) required for experimental research.

Upon opening the survey, the experiment introduced participants to the concepts "SVIT", "smart", and "skill". It was elucidated that an SVIT is a smart device that is utilized exclusively within the domestic environment and operated through voice commands. In this context, the term "smart" implies that electronic devices can be controlled at home with the assistance of the SVIT, information can be retrieved from the Internet, and online purchases can be made. Additionally, a smart assistant can access and execute what are commonly referred to as "skills," which, in the broadest sense, are analogous to "apps."

Subsequently, all participants were requested to complete an audio assessment to ascertain the functionality of their audio device. This entailed the participants filling in a common German saying with an uncommon word, as instructed vocally by the SVIT. Upon successful completion of this task, the interaction between the participant and *Slesy* commenced. *Slesy* was configured to respond verbally to participants' typed-in commands in the experimental survey (Vtyurina and Fourney, 2018). This design mimicked a real interaction between the participants and SVIT, which increased the participants' engagement during the assessment. The scripts for both conditions, translated into English, can be found in Appendix 3. The service context in Study 1 was set in a fictitious Italian restaurant that allows remote orders via SVIT from consumers' homes (as successfully implemented by Tassiello *et al.* 2021). In doing so, we built on Gnewuch *et al.* (2020), who demonstrated that vocal priming is an effective method for evoking a submissive and an assertive role attribution for SVIT. A pretest was conducted to evaluate (1) the efficacy of the proposed manipulations, (2) the reliability and validity of all implemented scales, and (3) the overall study flow. An overview of the experimental procedure for Study 1 is shown in Figure 2.

*** PLEASE INSERT FIGURE 2 HERE ***

Figure 2: **Experimental flow of Study 1**

Measures All items were measured using a seven-point Likert scale, with responses ranging from 1 (indicating "do not agree at all") to 7 (indicating "totally agree"). The items were derived from existing, validated scales and were adapted to align with the specific study context if necessary. The items were translated into German using a

forward-backward translation process. Service satisfaction was gauged using Iglesias'
(2009) three-item scale ($\alpha = .894$). To assess service re-use intention, the three-item
scale developed by Lee *et al.* (2005) was utilized ($\alpha = .941$). Furthermore, control variables were measured as follows: (1) A four-item scale for measuring the need for
interaction ($\alpha = .703$) was adapted from Dabholkar (1996), (2) a twelve-item chronic
reactance scale ($\alpha = .822$) was based on Herzberg (2002), and (3) an attitude toward
SVIT scale ($\alpha = .915$) was adapted from Dishaw and Strong (1999). Role manipulation
(assertive SVIT vs. submissive SVIT) was evaluated by inquiring about the participants'
perceptions of the SVIT (rated on a scale from 1 = submissive to 7 = dominant). For
further details, please refer to Appendices 1 and 2. Finally, during the testing phase, we
assessed participants' previous experience with SVIT by asking if they use such a device
at home.

Pretest A total of 100 fluent German speakers, 50 per condition, were recruited for the
pretest. As indicated, the scales demonstrated internal consistency, as evidenced by the
high Cronbach alpha coefficients. An independent t-test revealed a difference between
the submissive ($M = 4.04$, $SD = 1.12$) and the assertive conditions ($M = 5.64$,
$SD = 1.35$). This difference was statistically significant ($t(98) = -6.436$, $p < .001$,
95% CI [-2.09, -1.11]). Additionally, the open-text fields did not contain any comments
regarding issues with the study flow or the name "Slesy." These findings indicate a successful manipulation, which led us to utilize the interaction script for Study 1.

Participants Study 1 A total of 200 participants were recruited via *Prolific* who had to
meet sampling criteria: (1) they had to be 18 years old, and (2) needed to be fluent in
German. After data cleaning, only one participant had to be excluded due to two failed
attention checks. Thus, analyses were conducted with $n = 199$ (41.7% female, 56.8%

male, and 1.5% non-binary). Participants ranged in age from 18 to 69 years (M_{Age} = 28.3 years). Across all participants, n = 137 (72.5%) had no previous experience using SVIT and n = 52 (27.5%) had experience using SVIT. The survey had a median completion time of eleven minutes, and the data collection took place in September 2023.

Analysis and Results To test our hypotheses, we conducted independent t-tests, ANOVA, and Regression analysis using Hayes' Process (v4.0) Macro Model 4 (Hayes, 2018) for the analysis of the mediating effect of service satisfaction on re-use intention. The regression model is tested both, with and without covariates, that is attitude toward SVIT, chronic reactance, and need for interaction. First, a t-test was conducted to confirm the existence of differences in the manipulation of assertive (M = 5.28, SD = 1.18) and submissive (M = 4.13, SD = 1.06) SVIT. These results were statistically significant ($t(197)$ = -7.256, $p < .001$, 95% CI [-1.47, -.84]) with a very high effect size (d = -1.029, 95% CI [-1.32, -.73]).

To test H1, another t-test was conducted. The results indicate that service satisfaction is significantly lower when the SVIT is attributed as assertive (M = 4.56, SD = 1.40) vs. submissive (M = 5.31, SD = 1.21). This difference is statistically significant ($t(197)$ = 4.072, $p < .001$, 95% CI [.39, 1.12]), with a medium effect size (d = .577, 95% CI [.29, .86]). Therefore, H1 is supported.

Furthermore, an ANOVA was conducted to test H2. The results indicate that high service satisfaction significantly correlates with high re-use intention ($F(198)$ = 279.83, $p < .001$). Moreover, this result has a relatively high explanatory value (R^2 = .587). In light of the aforementioned evidence, it can be reasonably concluded that H2 is supported.

The final model tests the effect of role attribution on re-use intention through service satisfaction, employing Hayes' Process (v4.0) Macro Model 4 (Hayes, 2018). The direct effect of role attribution on re-use intention, controlled for service satisfaction, is not statistically significant ($b = -.105$, $SE = .170$, $p = .539$, 95% CI [-.44, .23]). Conversely, the indirect effect of role attribution on re-use intention, mediated by service satisfaction, demonstrates significant outcomes ($b = -.753$, BCa 95% CI [-1.13, -.39]). Therefore, the comprehensive explanatory model ($R^2 = .587$) shows that service satisfaction is a complete mediator of the influence of role attribution on re-use intention. In the subsequent analysis, which includes the covariates, the direct effect remains statistically non-significant ($b = -.028$, $SE = .152$, $p = .853$, 95% CI [-.33, .27]), while the indirect effect maintains its significance, albeit with a reduced strength ($b = -.456$, BCa 95% CI [-75, -.17]). Moreover, the covariates enhance the explanatory power of the model by 0.89 ($R^2 = .678$). Upon examination of the covariates chronic reactance ($R^2 = .589$, $p = .309$) and need for interaction ($R^2 = .593$, $p = .103$) in isolation, it becomes evident that they exert no significant influence on the model. This is because they fail to contribute to the extent that the independent variable explains the variation in the dependent variable. Consequently, their influence can be excluded. Conversely, the participant's attitude toward SVIT does significantly influence the model and increases its explanatory power ($R^2 = .659$, $p < .001$).

3.2 Study 2

As Study 1 demonstrated the significance of role attribution to SVIT on service satisfaction and the full mediation of service satisfaction on re-use intention, a second study was conducted (1) to assess the robustness of these effects with more realistic stimuli, and (2) to identify potential contextual influences. Accordingly, the context of the service

encounter was introduced as a moderation variable. The objective was to test whether a more involving service utilized via SVIT would yield disparate outcomes with regard to the effect of roles attributed to SVIT on users' service satisfaction and re-use intention. This contextual differentiation could potentially indicate the necessity for adjustments to the SVIT design in service encounters, contingent on the context in which they occur.

Procedure The methodology employed in Study 2 differed from that utilized in Study 1 in three key respects: (1) Instead of using a Wizard of Oz design, we used a more realistic scenario: interactions between a female human SVIT user and Slesy were recorded prior to the study, with particular attention paid to the consistency of the user's pronunciation. Participants then listened to this real-life interaction and were asked to answer questions about it. (2) Furthermore, a 2 (role attribution to the SVIT: assertive vs. submissive) x 2 (context of the service encounter: pizza order vs. healthy workout) between-subjects design without a control group was employed. (3) The duration of the recorded interaction was significantly reduced to prevent undue strain on the participants' concentration. We paid close attention to maintaining the submissive and assertive language cues in the SVIT's output proposed by Gnewuch *et al.* (2020).

To examine the various scenarios, it is essential to note that the objective of the pizza order scenario largely resembled that of Study 1. The interaction was reduced by one interaction round by eliminating the possibility of the user ordering additional items with the pizza. Additionally, the wording of the healthy workout scenario was aligned as closely as possible with that of the pizza order case (see Appendices 3-5).

Participants Study 2 A total of 459 participants were recruited via Prolific and were required to meet the same sampling criteria as in Study 1. During data cleaning, a total

of 78 participants had to be excluded due to failing more than 2 attention checks or in-complete surveys. Thus, the analysis was conducted with n = 381 (46.2% female, 52.5% male, and 1.0% non-binary). Participants ranged in age from 18 to 68 years (M_{Age} = 31.67 years). Across all participants, n = 233 (61.2%) had no experience using SVIT vs. n = 148 (38.8%) with experience. The survey had a median completion time of nine minutes, and the data collection took place from August 25th to August 26th, 2024.

Measures The entirety of the measures employed in Study 1 were replicated in the present study. However, a single item external construct was incorporated to assess the personal relevance of the contexts. This was achieved by inquiring of the participants the extent to which they perceived the context in the various scenarios to be personally relevant, with responses ranging from 1 (not relevant) to 7 (highly relevant).

Analysis and results Given that the stimuli design differed from that of Study 1, a t-test was conducted to assess the difference in perceived assertiveness and submissiveness of the SVIT. This was tested in both contexts, namely, pizza order and healthy workout. In the context of the pizza order the submissive condition (*M* = 3.74, *SD* = 1.20) and the assertive condition (*M* = 4.96, *SD* = 1.44) are different in terms of perceived dominance. This difference is found to be statistically significant (*t*(193) = -6.40, *p* < .001, 95% CI[-1.59, -.84]), with a high effect size (*d* = -.92). Furthermore, for the healthy workout case, the submissive condition (*M* = 3.87, *SD* = 1.15) and the assertive condition (*M* = 5.18, *SD* = 1.21) are also significantly different in terms of perceived dominance (*t*(184) = -7.58, *p* < .001, 95% CI[-1.65, -.97]), with a very high effect size (*d* = -1.11). This suggests that the manipulation was even more effective than in Study 1. However, the perceived personal relevance between the pizza order case (*M* = 4.86,

SD = 1.56) and the healthy workout case (*M* = 4.60, *SD* = 1.75) does neither demonstrate significance (*t*(379) = 1.53, *p* = .127, 95% CI[-.07, .59]) nor does it demonstrate a notable effect size (*d* = .16). This result may be attributed to the fact that the participants were presented with a scenario-based survey, which did not necessitate any actual action on their part. Consequently, both means exhibited a slight tendency towards a lack of personal relevance.

To test H1 and to show the robustness of our effects, another t-test was conducted for both contexts as well as for the entire model. Regarding the pizza order case service satisfaction is higher in the submissive condition (*M* = 5.46, *SD* = 1.03) than in the assertive condition (*M* = 5,09, *SD* = 1.44). This effect is statistically significant (*t*(193) = 2.06, *p* < .041, 95% CI[.01, .72]), with a medium effect size (*d* = .30). Similarly, in the healthy workout case, service satisfaction in the submissive condition (*M* = 5.43, *SD* = 1.04) is higher than in the assertive condition (*M* = 4.81, *SD* = 1.55). This effect is also statistically significant (*t*(184) = 3.22, *p* < .002, 95% CI[.24, 1.01]), with a medium effect size (*d* = .47). The results indicate that, overall, service satisfaction is higher in the submissive condition (*M* = 5.45, *SD* = 1.03) than in the assertive condition (*M* = 4.95, *SD* = 1.50). This effect is highly significant (*t*(379) = 3.76, *p* < .001, 95% CI[.23, .75]), with a medium effect size (*d* = .38). These results add substantial evidence in support of H1 and thus warrant the acceptance of this hypothesis in the context of Study 2.

An ANOVA was conducted to test H2. The results demonstrate a strong positive correlation between service satisfaction and service re-use intention (*F*(379) = 619.72, *p* < .001), with a high level of explanatory power (R^2 = .621). This finding provides strong support for H2 that service satisfaction has a robust effect on re-use intention. Furthermore, Hayes' Process (v4.0) Macro Model 7 (Hayes, 2018) was employed to

test H3, H3a and H3b, excluding context variables. The results demonstrate that service satisfaction fully mediates the effect on re-use intention in the pizza order case (b = -.358, BSE = .17, BCa 95% CI [-.70, -.01]) and in the healthy workout case (b = -.60, BSE = .19, BCa 95% CI [-.97, -.23]), while controlling for context as a moderator. Thus, the indirect effect model with service satisfaction as mediator has a high explanatory power (R^2 = .622). Conversely, neither the interaction of role attribution and context (R^2 = .002, $F(377)$ = .93, p = .35) nor the moderated mediation of context on the indirect effect of role attribution on re-use intention (b = -.25, BSE = .25, BCa 95% CI[-.74, .25]) show significant effects. Therefore, H3 as well as H3a must be rejected. However, the results suggest that H3b is partially supported, as a submissive SVIT more positively influences service satisfaction than assertive SVIT (see H1). This result deviates from H1 in that the effect shown does not differ in terms of statistical significance of the means and standard deviations across contexts. Furthermore, looking at possible influences of the covariates, first chronic reactance has no significant effect on the explanatory power of the model (R^2 = .622, p = .454). In contrast, both need for interaction (R^2 = .626, p = .031) and attitude toward SVIT (R^2 = .691, p < .001) show a significant increase in the explanatory power of the model. Interestingly, by controlling for experience with SVIT, we found that experience mitigates the negative effect of an assertive SVIT across both contexts. When we split the data into experienced (n = 148) versus non-experienced (n = 233) users, the direct effect of role on service satisfaction was not statistically significant anymore.

As we did not find any difference over varying contexts and personal relevance of contexts, we performed a single-paper meta-analysis across studies 1 and 2 to examine the robustness of our results by focusing on the mean differences for both measures, service satisfaction and re-use intention (as proposed by McShane and Böckenholt,

2017). Consequently, the moderator variable was excluded, which divides Study 2 into two separate sub-studies that measure the same for different contexts: (1) for the context pizza, and (2) for the context workout. This division was used only for this meta-analysis to ensure that all variances, means and standard errors were included. Thus, a congruence effect size (using Cohen's *d*) was calculated for both measures. As both studies are based on the same construct, and as there is no significant difference in the outcomes over both contexts, in study 2 a meta-analysis is viable. The analysis demonstrates that the congruency effects were statistically highly significant for both measures across the studies including fixed and random effects (see Table 2).

*** PLEASE INSERT TABLE 2 HERE ***

Table 2: **Single-Paper Meta-Analysis for submissive versus assertive SVIT across Studies 1 and 2**

4. Discussion and Contributions

The studies presented in this article demonstrate that irrespective of the stimulus utilized and the context in which the service encounter occurs, a successful service encounter with a SVIT that is attributed as submissive results in significantly higher service satisfaction in comparison to a service encounter in which the SVIT is considered assertive (H1). As hypothesized, the intention to re-use the service in an encounter mediated by a SVIT is found to be statistically significant and positively correlated with service satisfaction (H2). This finding aligns with role theory. Furthermore, the relationship between role attributions and service re-use intention is fully mediated by service satisfaction. Finally, contrary to our initial hypothesis, the context and its respective personal relevance did not moderate the relationship between role attribution and service satisfaction (H3). Therefore, satisfaction was not more positively affected in a context deemed more personal relevant (i.e., a healthy workout context) when the SVIT was attributed as assertive vs. when it was attributed as submissive (H3a). In conclusion, the context did not exert a significant influence on the observed effects, thus contradicting script theory. However, extending on H1, in both service contexts (pizza order and healthy workout), service satisfaction was higher when the SVIT was attributed as submissive than when it was attributed as assertive (H3b). For a comprehensive overview of the study results, please refer to Table 3.

*** PLEASE INSERT TABLE 3 HERE ***

Table 3: **Overview of study results**

Our findings revolving around consumers' role attributions of SVIT extend service

research in multiple ways. First, to the best of our knowledge, this work is among the first in service research that includes consumers' role attributions of SVIT in service encounters. While extant work on automated social presence (e.g., van Doorn *et al.*, 2017) has introduced the idea of consumers' anthropomorphic interpretations of smart technology to the service research domain, and many works have acknowledged the impact of anthropomorphism in service encounters with SVIT (e.g., Belanche *et al.*, 2020; Huang and Rust, 2021; Wirtz *et al.*, 2018), few have generated empirical evidence for this impact, let alone of the effect of consumers' role attributions in particular. Our findings are especially relevant in the context of technology paternalism, where technologies are not only mediators but act with implicit authority, potentially guiding or influencing consumer decisions (Rochi et al., 2024). As such, understanding how roles are attributed to SVIT and what effect they have, is not only a service design question but one with broader societal implications, touching on autonomy, trust, and influence in human-technology relations.

Second, literature on consumers' role attributions of SVIT has received considerable attention in marketing and consumer research (especially, Foehr and Germelmann, 2020; Hoffman and Novak, 2018; Novak and Hoffman, 2019; Pitardi and Marriott, 2021; Schweitzer *et al.*, 2019). Although some of these works could empirically demonstrate the existence of consumers' role attributions of SVIT, that is of a consumer-led process (e.g., Foehr and Germelmann, 2020; Pitardi and Marriott, 2021; Uysal *et al.*, 2022), most have remained ambiguous in terms of the purposeful evocation of these role attributions through marketers (e.g., in service encounters). We show that eliciting role attributions via linguistic primes present in interactions with SVIT is possible during service encounters. This highlights the importance of tonality – the perceived communicative attitude encoded in voice and language – as a central lever in shaping role

perceptions and emotional responses in voice-based service interactions. Furthermore, these role attributions are robust over different service contexts. Our results highlight the ethical importance of responsible voice-based service design, especially in environments where SVITs increasingly shape consumer behavior through subtle yet influential cues. This relevance is emphasized in light of AI-driven automated decision making by voice-based technologies like SVIT (Schultz, *et al.*, 2024). The results of our meta-analysis (see Table 2) respond to our research question by consolidating the results of the two studies, which implies that regardless of the service context, service providers and companies should be sensitive of their service design process. SVIT should not be designed as being perceived as assertive, especially in short-term service encounters like company-consumer interactions. However, most role attributions usually result from long-term relationships between consumers and SVIT (Foehr and Germelmann, 2020; Novak and Hoffman, 2019). This, moreover, raises the question of how much guidance a technology should be allowed to exert over time, as mirrored in the debate around technology paternalism (e.g., Rochi *et al.*, 2024). In long-term use, an assertive SVIT may offer stability or emotional support, while raising questions about the boundaries between assistance and control. It is therefore possible that role attribution effects may differ in long-term study setups, possibly resulting in an improved service perception in terms of service satisfaction when SVIT is attributed as assertive.

Additionally, different roles that could be positioned in between the polarizing roles of an assertive master and a submissive servant or even be totally different from the roles focused on in the present study (Giebelhausen *et al.*, 2014, Schweitzer *et al.*, 2019), were not covered here. Thus, there might be specific effects that could be evoked by more nuanced roles.

For marketing practitioners, our findings bear several implications: First, consumers ascribe roles to the voice interfaces of their SVIT, rather than to the specific service providers with whom they interact via SVIT (e.g., Pitardi and Marriott, 2021). Branding research indicates that the design of a SVIT to purposefully occupy a specific role should only be considered when it aligns with the associated brand personality (Aaker, 1997). Our findings highlight the necessity for marketing practitioners to acknowledge consumers' relationships with anthropomorphic smart technologies like SVIT and to strategically position themselves and their marketing efforts with regard to role attributions in service processes.

Additionally, our findings demonstrate that consumers' attitudes toward SVIT can influence their perceptions of service encounters with SVIT in general. Consequently, a negative attitude toward this technology may also result in lower satisfaction with the service provided by this device. However, given the rapid pace of technological advancement and the ever-changing technology landscape, it is possible that negative attitudes toward SVIT may dissipate over time. This, and the fact that submissive SVITs ensure a satisfactory service, could also lead to the identification of customer segments with positive attitudes towards SVITs to create personalized marketing strategies. Of course, such personalization requires scrutiny. Paternalistic design choices – though effective – may reinforce dependency or nudge behavior, which could raise concerns about the role of service designers in shaping consumer autonomy.

Our findings also indicate that the negative effect on service satisfaction of a SVIT perceived as assertive vs. as submissive, diminishes when customers have experience with SVITs. Therefore, marketers should focus on incentivizing consumers to try and use SVITs, allowing them to gain experience in communicating with these devices. This strategy would benefit service process designs, as consumer perceptions of the

SVIT's role become less critical to the service outcome with improved user experience. This is particularly important as the engagement level that an interaction with a SVIT requires or provides will increase in the future (Guerreiro and Loureiro, 2023). Consequently, understanding how consumers socially perceive SVITs and refining service design processes will become highly relevant.

Our findings suggest that consumer satisfaction with a service has implications for the likelihood of consumers reusing that service. In particular, our findings align with the service satisfaction-profit chain (Anderson and Mittal, 2000). Therefore, the data from both studies indicate that consumers who are dissatisfied with a service encounter are less likely to re-use the service. This issue becomes particularly salient in the context of service encounters via SVIT, where the majority of customer-service provider interactions do not adhere to the conventional format of a discrete, bounded service encounter with a distinct beginning and end. Alternatively, it has been proposed that service encounters via SVIT are continuous in nature, akin to touchlines rather than touch points (Decker & Stummer, 2017). Consequently, they offer significant business potential for marketers. If these touchlines are disrupted due to unsatisfactory service encounters, marketers may experience financial losses in customer lifetime value. Therefore, it is crucial for marketers to gain a comprehensive understanding of consumers' expectations regarding service interactions with SVIT and to possess a range of service recovery strategies (e.g., Hess *et al.*, 2003). Yet, the robustness of our results, (i.e., that context does not negatively affect service satisfaction) marketers could expand the use of SVIT, as long as it is designed submissively, across contexts and industries without risking decreasing service satisfaction. In addition, an incongruence between the roles intended by service providers and the role that is perceived by customers might occur (Hoffman and Novak, 2018). This did not occur in our case, as we

have built an assertive SVIT that was perceived as assertive and a submissive SVIT that consequently was perceived as submissive. However, future research could investigate if this differs when considering more nuanced roles.

5. Limitations and Future Research

The studies presented herein are subject to potential limitations. Despite the natural interaction mode introduced by the Wizard-of-Oz design, study participants had to engage in scripted interactions with the SVIT (see Study 1). However, the design of Study 1 ensured an interaction between the participant and the SVIT while in Study 2 the participants listened to a voice-based real-life interaction. Although, the stimuli represented realistic scenarios and interactive elements, we encourage the replication of our experiments in laboratory settings to replicate real-life interaction. In addition, our studies only tested consumers' short-term role attributions evoked through subtle primes. Therefore, its results need to be interpreted with caution regarding long-term effects of role attributions.

Moreover, our study scenarios did not include actual physical activity, which may have contributed to the lack of personal relevance. Despite this context not affecting service satisfaction with respect to role attributions in Study 2, future research should include consequences for participants in their studies to ensure that the engagement in the scenario reflects a realistic setting.

Additionally, service providers may want to strategically leverage existing consumer-brand relationships by intentionally priming micro-roles (e.g., coach, concierge, advisor, companion) that align with the brand's personality. In this context service design research may benefit from exploring how smart services can be designed not just for convenience and usability, but for enabling and maintaining relationship-building

through SVIT-mediated interactions.

Furthermore, researchers may gain insight by considering a more diverse array of roles that could be ascribed to SVIT by consumers. It is plausible that relationships, such as referring to SVIT as a partner, friend, or mentor, which reflect a human-SVIT connection, could either intensify or attenuate the observed effects. Investigating these relational dynamics may offer valuable insights into the evolving nature of human-technology relationships in voice-based services.

Since attitudes toward SVIT play a role in the consumer-SVIT interaction, further research should explore simple automated ways to detect such attitudes. Emotional or feeling AI (Huang and Rust, 2021) promises to have the potential to help service providers identify and respond appropriately to such a characteristic. However, emotional AI would first need to be trained on specific identifiers for these traits but could then offer enormous support to service providers.

6. Conclusion

This work set out to investigate the impact of roles attributed to a SVIT on consumers' service satisfaction. Adopting a role-centered perspective, we explored consumers' tendency to associate SVIT with human-like social roles. The studies' results show that service satisfaction – and in turn, the intention to re-use the service – is considerably higher when a SVIT is perceived as submissive rather than assertive. Notably, these effects remained stable across different service contexts, underscoring the robustness of role attribution as a determinant of the evaluation of voice-based services, as confirmed by a single-paper meta-analysis.

Our findings offer a novel contribution to service theory, as they indicate that consumers' associations of smart anthropomorphic technology with human-like roles can in-

fluence their perceptions of service encounters and subsequent evaluations of the services in question. While previous research has acknowledged that language can be used to shape how consumers perceive SVIT our study shows that even subtle linguistic cues can have systematic and replicable effects on consumer's service perception. This suggests that service providers can – and perhaps should – strategically design tonality and role attributions in customer-facing SVIT in ways that align with consumers' expectations and brand identity. The use of submissive tonality may not only enhance service satisfaction but also act as a form of benevolent or paternalistic guidance, raising the question of how much influence technology should exert over consumers. As SVIT become increasingly relevant in consumers' daily life, considering their social function, and designing them with both relational and ethical considerations in mind, will be essential to shaping positive, trustworthy service experiences.

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