Robot-Hosts' Soft Skills and Guests' Emotional Reactions: A Qualitative Study

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Abstract

The development of self-service technologies (SST) goes in different directions, one of which is anthropomorphist robots. In 2015, anthropomorphist robots were put into use as front office receptionists in a hotel in Japan, the first time anthropomorphist robot technology was used in the hospitality industry. With this hotel as a case, the aim of this paper is to examine robot-hosts' soft skills, understood as a hosting practice, and the guests' emotional reaction to this hosting practice, without examining causality between robot-host behavior and the human guests' emotional reactions Data were gathered from online reviews written by guests who have stayed at this, world's first robot hotel. The data show the robot-hosts are lacking soft skills. In a business context, hotels with AI-based anthropomorphist robots may get a competitive edge over hotels with SST technologies but without robots.

Key Words *Host-guest transaction, Hospitableness, Emotional quality, Communication, Online reviews*

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Introduction

In the 2010s, self-service technologies (SST), artificial intelligence, virtual reality, augmented reality, and robots evolved and were introduced in the hospitality and travel industries (EuroChrie, 2015). An early example of SST was airline self-service kiosks replacing traditional check-in desks (Kasavanna & Connally, 2005). Then, in 2015, it made the news around the world that in Japan robots had taken over the front desk at a hotel, the Henn-na Hotel (Rajesth, 2015).

In the period from 2005 to 2015, innovations in anthropomorphist robot technology resulted in improved animatronic and humanoid robots. It has been pointed out that there is a need for service practioners and researchers to explore how consumers experience these new technologies (EuroChrie, 2015). A human host has job skills (required to deliver the service) and sometimes also soft skills that are relevant for developing emotional bonds with guests.

With the world's first robot hotel as a case, the aim of this study is to examine robot-hosts' soft skills and the guests' emotional reaction from interacting with the robot-hosts, without examining causality between robot-host behavior and communication and the human guests' emotional reactions.

Robot-Hosts

Robots can be described as "intelligent physical devices" (Chen & Hu, 2013, p. 161), with a certain degree of autonomy, mobility, and sensory capabilities that allow them to perform intended tasks (IOS, 2012). Based on their intended use, robots can be categorized in one of two categories: industrial robots and service robots (IOS, 2012); hotel robots are an example of the latter category. Hotel robots can also be categorized based on their use; in hotels, there are front desk robots and concierge robots. Overall, these robots belong to the service robotics category (Ivanov et al., 2017), what is also termed social robotics. An aspect of social robotics is so-called embodiment or morphology, which encompasses whole body communication with both verbal communication and non-verbal behavior (Bihmasta & Kuo, 2019).

The Henn-na Hotel is staffed with different types of robots, most of which are service robots. This study will focus on the robots at the front desk of the hotel: when it opened in 2015, it was staffed with two anthropomorphist robots at the front desk: one humanoid female robot and one dinosaur robot (Osawa et al., 2017). It was reported that "The guest uses a touch panel beside the reception desk to proceed the check-in process. The reception robot performs actions based on the buttons that the guests presses. Speech recognition is not used" (Osawa et al., 2017). The receptionist robots' communicative abilities are very limited: the robots cannot engage in interactive communication (Bihmasta & Kuo, 2019). However, the robots can tilt their head and smile (Yu, 2018), that is, they can express some sort of emotion.

Research on the relationship between robots and guests in hospitality settings is in its early stages. In reality, it started with the Henn-na Hotel in Japan; however, little research on the Henn-na hotel has been carried out (Bihmasta & Kuo, 2019). In 2016, a research agenda for robots in hospitality was published. One of the suggestions was for research on Human Robot Interaction (HRI) with respect to personal service robots (Murphy et al., 2016). Subsequent research on HRI has focused on Henn-na Hotel: A study by Osawa et al. (2017) analyzed the work processes of the robots. A study by Tussyadiah and Park (2018) studied adoption of robot technology; adoption of service robots was the focus of Bihmasta and Kuo (2019), using Henn-na Hotel as the case, and of Ivanov et al. (2017), focusing on service robots in general. A study by Chung-En (2018) focused on consumers' perception of the behavior of humanlike robots and human staff. Yu (2019) carried out a study of the Henn-na robots, by data-mining YouTube comments about the hotel; that is, the source material was not written by the hotel's guests.

The Henn-na front desk robots have "consistently failed on tasks such as photocopying guests' passports" (Bihmasta & Kuo, 2019), that is, the robots failed with respect to their job skills. Therefore, they were taken out of service in 2019 (WSJ, 2019).

Hosting Practice

The relationship between human employees and human customers is often referred to in research (Grönroos, 2015, p. 215). Compared to the majority of service industries, the relationship between staff and customers in the hospitality industry is close (Kandampully et al. 2014). To develop this relationship with guests, hosts have to have soft skills (cf. Weber, 2009) as well as job skills to the deliver the actual service. The soft skills are about people skills, social skills, and communication skills (Weber, 2009). In the hospitality industry, the staff typically have titles such has waiter and hotel receptionist which reflect their job function that require specific job skills. But their job may not just be about delivering a service but also about exercising the role of host, which is about developing a bond with guests (Vejlgaard, 2020). This can be done in different ways under the umbrella term hosting practice. An example of hosting practice that has been prescribed in commercial hospitality can be seen in Figure 1.This hosting practice reflects hospitality concepts, such as hospitality language (Blue & Harun, 2003), with specific speech acts (Searle, 1969) and emotional labor (Hochschild, 1984). In this study, the hosting practice in Figure 1 also reflects the soft skills that a hospitality employee should have in order to develop a bond with guests.

Figure 1. *Prescribed hosting practice in host-guest emotional bond development in commercial hospitality* (Vejlgaard, 2020).

Behavior: As host, take a pro-active role towards the guest; only in departure should you sometimes be re-active. Take the initiative in interacting with guests; take responsibility of the proceedings in courteous ways.

Form of address: Use the name of guests when appropriate; however, do not use the name incessantly.

Speech acts: Use courteous speech acts pro-actively. The exact speech acts used when greeting and saying goodbye can be varied based on how formal/informal/intimate you are/have become with the guest. Upon departure, some kind of verbal evaluative speech acts about the mutual experience are important.

Conversation: Small talk, relevant to the context, initiated by you, is essential.

Para-verbal language: Your tone of voice should be warm, the pitch natural to you, and the pacing of your speech unhurried.

Non-verbal language: Acknowledge the guest with body language when initiating contact, for instance, with a nod or a smile. Greet guest with a smile and appropriate body language. Smile when appropriate but not incessantly. Keep eye contact in an appropriate way when talking to a guest but do not prolong eye contact. Use appropriate body language and hand gestures when saying goodbye.

Objects: Use material and/or perishable elements, relevant to the situation.

Guests' Emotional Reactions

In this study, reaction is defined as "a response to some treatment" (Merriam-Webster, 2020). The reaction has two parts: first, a perception of the interaction with the host, and second, the feeling in the guest, based on his/her perception of the hosting practice.

Service quality is how a guest perceives the service delivery; emotional quality is how the guest perceives that a host exercises the role of host. The words that describe positive emotional qualities are adjectives, some of which can be seen in Table 1. The overall theme of these words is hospitableness, that is, these words are indicative of someone who exercises the role of host in a hospitable manner.

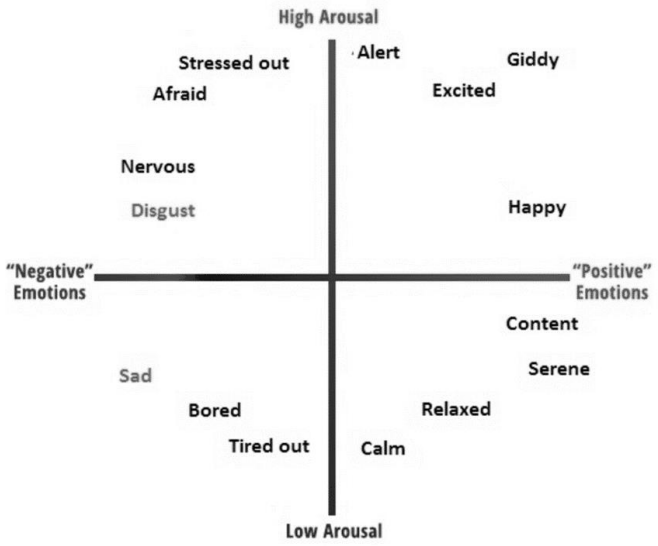
Table 1. *Examples of emotional qualities that reflect hospitableness* (Tasci & Semrad, 2015).

Kind
Polite
Happy
Sincere
Honest
Flexible
Helpful
Friendly
Reliable
Sociable
Attentive
Courteous
Generous
Consistent
Welcoming
Personable
Respectful
Trustworthy
Professional
Considerate
Well-groomed
Open-minded
Accommodating
Dedicated to service

The guest's perception of how a host exercises the role of host, that is, the emotional quality, has an emotional outcome. The perception will create a feeling in the guest. Feelings are conscious experiences activated either by external stimuli or by various bodily states (Chaplin, 1985, p. 151). The host's behavior and communication are external stimuli of the guest (cf. Chaplin, 1985, p. 176); thus, the guest's perception of the stimuli affects how the guest feels.

Feelings are measured along two dimensions: positive-negative valance and high-low arousal, as can be seen in Figure 1. The guest's feelings may be inward (joy; awe) and outward (smiling; crying). When describing feelings, we use words such as, for instance, sad, bored, excited, happy, or calm.

Figure 1. The two dimensions of feeling: valance and arousal (Munoz-de-Escalona & Canas, 2017).



Method and Data-gathering

This study will use data from guests at the Henn-na robot hotel. However, since the robot-hosts are no longer in use, data can only be gathered retrospectively. Two studies, Bihmasta and Kuo (2019) and Yu (2019), have used datamining to study online reviews. This study will also use online reviews as data source; however, the present study is analogue and qualitative.

The author identified a number of videos about the Henn-na Hotel; the videos were made by guests and by journalists, showing the robot-hosts while they were in use (YouTube, 2020). The videos showed the robot-hosts had some properties that are comparable to those of human hotel receptionists; it was concluded that there was a basis for carrying out a study of robot-hosts' hosting practice.

Two websites (hotels.com, 2019; tripadvisor.com, 2019) were selected to be part of this study because they have reviews by guests who have stayed at the hotel in the period from August 2015 (when the hotel opened) to January 2019, when the robot staff was reduced. Online reviews are document data; Bowen has pointed out that documents "may be the most effective means of gathering data when events can no longer be observed or when informants have forgotten the details" (Bowen, 2009).

The reviews were written in the following languages: English, German, French, Spanish, Portuguese, Italian, Korean, Chinese, Japanese. Approx. 50% of reviews were written in Japanese. Reviews in other languages than English and German, were translated into English, either by a human translator and/or a machine (Google Translate and/or SDL Language Cloud). Quotes that ended up not making sense were excluded.

In the period, 162 reviews were written, of which 49 had content specifically referring to the robot-hosts at the front-desk of the hotel (reviews could also refer to other types of robots at the hotel). The 49 reviews were numbered. However, reviews that only mention the robot-hosts in passing were not used. This reduced the number of reviewers quoted in the present study to 26, that is, 16 percent of the original number of reviews.

The analytic procedure is based on Bowen (2009): finding, selecting, appraising (making sense of), and synthesing the data in the reviews, with the purpose of gaining understanding and develop empirical knowledge. The procedure is about identifying pertinent information and to separate it from that which is not pertinent (Corbin & Strauss, 2008). First, the reviews were read with the purpose of identifying examples of the hosting practice presented in Figure 1. Second, the reviews were read with the purpose of identifying hospitableness words and words that represent feelings expressed by the reviewer.

The same reviewer did not necessarily writte about all three themes; therefore, this study will not examine causal relations between the variables. References to service delivery and service quality were identified but not included in the analysis.

Analysis of Data

The robots speak Japanese, English, Chinese, and Korean. They can say speech acts relevant to arrival and departure in these languages. In departure, they can say, "Thank you for visiting. We look forward to seeing you again". However, the robots do not react pro-actively; the guest must push a screen bottom to activate them. The Hann-na front desk robots can tilt their head as a bow (YouTube, 2020).

The robots can say some pre-recorded speech acts, and they can express some basic non-verbal emotion. The robots can acknowledge the guest; however only in an automated, impersonal way.

Hosting practice: The comments about the hosting practice of the robots are mainly descriptive. Six reviewers write about how they were welcomed at the hotel; like this example: "Greeted by the dinosaur at the reception counter" (#40). Some reviewers describe specific verbal communication and speech acts: "They have a scripted welcome once you've completed check-in" (#12). "The robots [are] only able to speak few sentences" (#42). "the robot just repeats a sentence, for instance, 'Enter a name'. So we do not talk" (#35)."asked to press button 3, and the dinosaur says thanks" (#44).

Two reviewers comment on non-verbal communication: "When check-in has been completed, the robot bows 90 degrees" (#31). "The robot's service was smiley and warmer than I had expected" (#6).

The highest number of reviewers who comment on hosting practice, write about the lack of communication: "I could not communicate with the reception robot" (#7)."The robot in the reception was interesting, but we did not have a dialogue, and mostly we had to use the side screen" (#47). This has to do with what another reviewer writes: "I could not ask […] questions" (#4). One reviewer did get a reaction; however not a satisfactory response and wrote that it is "necessary to arrange a system that can answer correctly" (#10).

The Hann-no front desk robots have a number of deficiencies with respect to the hosting practice they can perform. The robots' soft skills are very limited. They do not appear to addresses guests in any personalized way; their communication is scripted and banal. They cannot small talk. The robots can start out with a mechanical a smile and a recorded welcome but they cannot follow up on the verbal welcome: the robot-hosts do not exercise the role of host reflecting the prescribed hosting practice.

Emotional quality: The guests' perception of the hosting practice do not reflect hospitableness, no adjectives representing hospitableness were identified in the reviews. However, there were other words that describe how the guests perceived the robots. Often they seem to be descriptions of or reflections on their functionality. One reviewer use the word "friendly": "Check-in is carried out by a friendly dinosaur" (#34). However, this is likely a comment on the normally aggressive nature of dinosaurs, as represented in popular culture. One reviewer references the novelty of the robots: "The robots were a refreshing thing" (#8).

When describing the functionality of the robots, one was negative: "their reactions are poor" (#22). Another reflected: "This robot hotel badly needs some humanizing. It is best if you yourself are a robot!" (#37). "there

are several problems, like [the functionality]. On the other hand, I felt the value of human hospitality (#45). Other reflections were positive: “You get checked in and out by a robotic dinosaur and how freaking cool is that?” (#19). ”it was really cool” (#24). “The robots were a unique way to greet you” (#26).

Three reviewers write about the same theme: “We interacted with the robot, and it was interesting“ (#1). ”Being greeted by a robot in the reception was interesting” (#16). “it was an interesting and unique experience” (#40).

None of the examined reviews clearly references emotional qualities, probably because there was no interactive behavior or communication that could cause such references. The comments that relate to emotional qualities come from comments about the robots as an innovation, not as a characteristic of hosting practice, as perceived by the guests.

Emotional outcome: Many of the online reviews reference an emotional outcome, that is, how the guests were feeling after staying at the hotel. The feelings vary from thrill to disappointment.

The ecstatic part was not feelings of adults, but of children. Some parents arrived with their children; they *describe* their children’s reactions: “The child was ecstatic” (#33) and “the children were thrilled” (#31). For adults, the emotional experience was limited to a handful of reviewers who “got a kick” out of being received by robots. Some reviewers express positive outcomes: ”enjoyed the check-in with robot very much” (#13).

One reviewer wrote about “the robot feeling” (#36), which may reflect the experience of interacting with innovative technology. That this can be the case is also reflected in this reviewer’s comment: “the dinosaurs [were] a strong influence in the decision to book this hotel and we weren’t disappointed.” (#18). However, two reviewers were disappointed. One wrote: ”disappointed by the impersonal atmosphere” (#23). Another write: ”I felt it was not convenient” (#8).

Other outcomes can were confusion and surprise: ”I was a little confused […] but later I was OK” (#48). Another reviewer wrote: ”At first I was surprised” (#2).

Some reviewers did express how they felt after interacting with the robots; however, the majority of the comments that are not quoted did not write how they felt. The reviewers who wrote the most positive about feelings did not write about their own feelings, but about the feelings of their children. For the adults, there were positive expressions but they do not refer to the robot-hosts’ hosting practice; they reflect robots as innovations.

Concluding Comments

The robot-hosts at the Henn-na Hotel performed an elementary hosting practice in an automated, impersonal way. Reviewers did not reference emotional qualities of the robot-hosts from interaction with the robot-hosts, which is likely because the service intimacy was extremely low. Some reviewers wrote about their feelings in the reviews; however, they did not express emotions *about* the hosting practice, but about the robots as a new phenomenon in hospitality. As mentioned, the Henn-na front desk robots were fired for their lack of functionality. The robots-hosts’ soft skills were also lacking.

This study has highlighted the importance of human hosts and their hosting practice in the hospitality industry. In hotels, without human staff, there is no one to exercise the role of host and consequently there can be no emotional outcomes related to human-to-human interaction. However, the hotel industry is likely to be interested in knowing if robots can offer guests emotional experiences. Therefore, one should compare hotels with anthropomorphist robots with some social skills and hotels with SST/no human staff, not hotels staffed with humans: If robots’ hosting practice will be perceived by guests as having emotional qualities, hotels with AI-based anthropomorphist robots may get a competitive edge over hotels with SST technologies but without robots.

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