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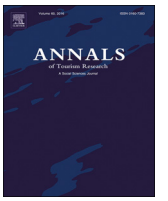

Research article

Affordances for tourism service design☆

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ABSTRACT

This paper argues that the concept of affordance, which captures the relations between one's abilities and the properties of one's environment, can help in aligning the elements of a tourism service with intended service experiences. We start with a general review of its conceptual basis in ecological psychology and design research, and then elaborate on the concept's potential applications in the context of tourism service design. The application of an affordance-centred framework is illustrated through a case study which examined a group of tourists with and without visual impairment on a holiday to an international destination. Finally, we offer four propositions to guide the use of the affordance concept in tourism service design.

Introduction

Designing tourism services stands at the intersection of two realms (Pearce and Zare, 2017). On the one hand, there are the tourism operations, where physical and social settings are organized to deliver services that affect tourists' experiences (Pearce and Zare, 2017; Tussyadiah, 2014). On the other hand, there are tourists' experiences, which in contemporary research have been conceptualized as intangible, personal and subjective (e.g., Larsen, 2007; Scott and Le, 2017; Uriely, 2005). While both realms have been studied extensively, critical barriers exist which limit the degree to which tourism operations and the "world of the mind" of tourists' experiences can be aligned (Haldrup and Bærenholdt, 2010; Pierskalla and Lee, 1998). The notion of affordance was first introduced by psychologist James J. Gibson to describe the potentialities for action afforded by the features of the environment to individuals (Gibson, 2015; Heft, 1989). The inherent complementarity of humans and the environment has made affordance a useful concept for the growing discipline of design science, where it was popularized by Norman (1988). Indeed, industrial designers have recognized the usefulness of the concept to bridge the properties of a designed artefact with its subsequent uses (Withagen et al., 2012). Further, interaction designers expanded the use of the term for considering elements of human-computer interfaces including digital ones (Albrechtsen et al., 2001; Burlamaqui and Dong, 2015; Hartson, 2003).

There is limited research discussing the application of affordances within the area of tourism design (Haldrup and Bærenholdt, 2010). Recently, Fesenmaier and Xiang (2017) listed affordance as one of the six components of the "experience production system." However, it appears that the concept has not yet received a careful, systematic examination in terms of how it is connected to various aspects of design in tourism. This paper takes a step forward by discussing the concept's usefulness in aligning the elements of tourism services and the expected service experiences of tourists, in facilitating the creative process of service design, in preventing

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discrepancies between intentional and actual uses of service elements and in addressing the diversity of tourists. To illustrate its application within tourism, we present a case study wherein we used the concept of affordance to analyze the service experiences in an organized holiday for a group of tourists with and without visual impairment. In particular, the nature of this unconventional, unique tourism service, which involved a variety of otherwise common tourism activities undertaken by people with diverse visual abilities, illustrates the potential of the affordance concept in tourism service design arising from the variations of tourists' abilities and perceptions. The goal of this article is to define and demonstrate the use of the affordance concept in addressing the complexity in tourists' interactions with their physical and social environments during the consumption of a tourism service. Further, it offers a set of propositions to guide the use of the affordance concept in the tourism design process.

The concept of affordance

The concept of affordance was first introduced as a response to the increasing dominance of dualism (of the physical and mental worlds) in psychology and as an alternative to the classical Cartesian thought on perception as the subjective mental representation of input in the form of physical stimulation (Costall, 1995; Heft, 1989, 2010). Today, affordance is a prominent concept in ecological psychology, wherein it serves as a crucial element of its ontology (Chemero, 2003) but was first popularized in the field of design in Norman's (1988) influential book "*The Psychology of Everyday Things*". The simplest definition of affordance, as given by Gibson, is "what it [the environment] offers the animal, what it provides or furnishes, either for good or ill" (Gibson, 2015). A classic example used to illustrate affordance is that of a chair: a typical dining chair affords Anna, an adult woman with 170 cm of height and common motor abilities and skills, "sit-ability". The same chair also affords Anna "step-ability", when she, for example, wants to reach a high shelf. For Anna's three-year-old son George, the same chair does not afford either of these actions, but it affords him "climb-ability". Changing the properties of the chair, such as altering the horizontal surface, will affect the affordances for both Anna and George.

According to Gibson (2015), affordances are neither objective nor subjective. They are defined by the properties of the environment relative to the subject, and yet they are independent of the subject's current needs and of the subject's recognition. Chemero (2003) proposes defining affordances as *relations* between the subject and the features of a situation. That is, even if an individual and a feature of a situation in the environment do not interact, the affordance exists independent of the mind of the individual as long as this individual with appropriate abilities exists. As such, affordances are conceptualized as properties of the animal-environment system rather than that of the environment itself (Schmidt, 2007; Stoffregen, 2003). Returning to the previous example, this means that "sit-ability", representing a link between Anna and the dining chair, exists even if Anna is not aware of the chair's existence, up until the abilities of Anna or the properties of the chair change. The broader view of the whole situation rather than discrete objects in the environment also considers the context, which implies that "sit-ability" for Anna exists while the chair is standing on display inside a furniture shop but does not when another person sits on it.

Affordances provide the range of possible actions for humans, but they do not *cause* behaviour (Costall, 1995; Gibson, 2015). When perceived by an individual, affordances may lead to actions depending on the functional characteristics of the environment, the abilities of the individual, the history of their interaction, and learning in a social context (Heft, 1989). In addition, evolutionary processes, the amount of effort it takes to act on an affordance, as well as cultural and personal history, influence the extent to which one affordance is more "inviting" than others (Withagen et al., 2012). In general, affordances both enable certain actions and prevent those that are not afforded, unless humans modify the environment and thus create new affordances (e.g. through design).

As both the environment and the subject change over time, affordances can be seen as dynamic, relational, culture-, experience- and skill-relative (Dohn, 2009). The notion that affordances may not only be instinctive but also depend on the cultural learning of the subject has also been captured in the similar concepts of culturally selected affordances (Loveland, 1991), canonical affordances (Costall, 1997), and social affordances (Schmidt, 2007). The first two attempt to describe those affordances that are selected by humans over others based on cultural conventions, e.g. throwing an envelope with a letter into a letter box rather than throwing in garbage. Through the concept of social affordances, Schmidt (2007) emphasizes the role of learning and past interactive experiences on the emergence of affordances. Similarly, Dohn (2009) posits that the existence of affordances is dependent on past experiences (i.e. *Erfahrung*), as the latter become part of the person's "abilities" that define the affordance together with the properties of the environment.

Affordance within a service design context

The tourist experience is the result of the tourist interacting with the external environment (Larsen, 2007; Ryan, 2010; Selstad, 2007). The tangible and intangible spaces where these interactions take place are often referred to as an experiencescape (Chen et al., 2019). When tourist experiences are considered at the service level (i.e. service experiences), the environment is commonly referred to as the servicescape. Originally, the term was introduced to capture the tangible settings of a service (Bitner, 1992), but more recently the notion of "expanded servicescape" has been used to take into consideration all social, symbolic, and natural stimuli that provide an environment for service production and consumption, including consumer-to-service-provider and consumer-to-consumer relations (Rosenbaum and Massiah, 2011). The service provider may expect that optimally arranging and managing the controllable elements of the servicescape will result in positive (and profitable) customer experiences. This approach lies at the core of service design in contrast to other new service development approaches (Fesenmaier and Xiang, 2017; Tussyadiah, 2014; Yu and Sangiorgi, 2018).

Affordances in the servicescape

If services are seen as the interaction of a tourist with the expanded servicescape, then the servicescape can be re-conceptualized as the multitude of affordances that allow a range of activities and, at the same time, do not allow others. The activities, which occur as actualized affordances, i.e. the affordances that the tourists choose to act on, then, constitute the service experience. This view is represented in the following expression adapted from Maier and Fadel (2009):

$$Servicescape \Rightarrow Affordances \Rightarrow Service\ experience \quad (1)$$

This expression helps to describe the role that affordances can play in service design depending on its purposes. When the purpose is to design a new service, information should be first collected about the target users and the activities and reactions that should be afforded and those that should be constrained to lead to a positive service experience. To create these selected affordances, the service designer and/or the service provider will then construct the tangible (e.g. physical spaces) and intangible (e.g. organizational procedures) elements of the servicescape. Here, it is important to emphasize that an affordance itself is not limited to one type of design. The previously discussed "sit-ability" for Anna can exist with various designs of horizontal surfaces, be it a chair or something else. Similarly, the affordance broadly described as a "warm welcome" can be constructed not only by training staff to express certain utterances and facial expressions but also by placing an attractive self-service kiosk which is easy to find and has an intuitive interface. As a result, the creativity of the process is not limited to designing the most suitable chair or choosing the most friendly personnel, but is focused on finding solutions for affordances such as "sit-ability" or "warm welcome" for the customers.

When the purpose is to improve an existing service, observing customers in a specific servicescape can help to identify affordances that afford behaviours resulting in negative emotions or other undesirable consequences and to elicit those affordances that are missing for enabling activities of the tourists' preference. This should then be followed by adjustments of the servicescape to avoid constraints and hazards. It must be noted that service experiences can be affected by many factors including the characteristics of the tourist and situational factors. Thus, the fundamental objective for service designers is to anticipate and address some of these factors in order to design affordances that enable and empower tourists resulting in satisfaction.

Affordances for tourism service design

To be practically relevant for design, in general, and tourism service design, in particular, affordances need to be complemented with other aspects of design artefacts. Flach et al. (2017) attempted to do this by proposing a three-dimensional view of design, where *affording* is used together with *specifying* and *satisfying*. The dimension of *affording* signifies each design's ability or inability to afford a specific action. The dimension of *specifying* considers the perceptibility of affordances and contains the interface which communicates the intended properties of the design artefact. *Satisfying* captures the potential outcome of the actualized affordance on the individual users depending on their interests and expectations.

Based on the intersections of the three dimensions, Flach et al. (2017) proposed six meaningful types of design, namely controllable opportunities, controllable hazards, hidden opportunities, hidden hazards, false opportunities, and false hazards (see Table 1). These design types are labelled from the perspective of the user experience. Thus, "controllable" reflects the abilities of the user to actualize an affordance upon need and desire, while "hidden" means that the information about the existence or purpose of the affordance is not perceivable by the user.

This framework aligns affordances with the critical aspects of perception and user needs; however, it also creates confusion between the perspective of the designer and that of the user. The designed (or expected) and the actual uses of an artefact often differ significantly, and this needs to be recognized and reconciled when discussing affordances in design. The designer might not be fully aware of all possible affordances provided by the artefact, and the users might recognize affordances in addition to those intentionally designed. Moreover, the user is able to change the design of an artefact through its use, especially in service settings such as tourism, which typically involves high levels of co-production (Mossberg, 2007; Prebensen and Foss, 2011; Redström, 2008).

To address this issue, it is helpful to see affordances through the lens of designed and non-designed purposes of the artefact (Burlamaqui and Dong, 2015). When designing for an affordance, the designer envisages that the user will choose to act on this affordance for a certain outcome. In reality, the user may choose to act on other affordances related to the artefact. This may happen due to the fact that the user does not recognize the designed affordance while finding other affordances more "inviting" relative to

Table 1
Summary of design types based on Flach et al. (2017).

Design type	Description (AF/NAF – affording/non-affording; ST/NST – satisfying/non-satisfying; SP/NSP – specifying/non-specifying)
Controllable opportunity	An action possibility (AF) that can lead to an outcome which is desirable by the user (ST) and is recognized by the user (SP)
Controllable hazard	An action possibility (AF) that can lead to an outcome which is undesirable by the user (NST) and is recognized by the user (SP).
Hidden opportunity	An action possibility (AF) that can lead to an outcome which is desirable by the user (ST) but is not recognized by the user (NSP).
Hidden hazard	An action possibility (AF) that can lead to an outcome which is undesirable by the user (NST) and is not recognized by the user (NSP).
False opportunity	An action constraint (NAF) that is recognized by the users (SP) as a possibility that can lead to a desirable outcome (ST).
False hazard	An action constraint (NAF) that is recognized by the users (SP) as a possibility that can lead to an undesirable outcome (NST).

his/her own abilities, situation and context. In analyzing observations of technology uses, van Osch and Mendelson (2011) thus distinguished between *designed affordances*, which had been consciously designed by the designer regardless of whether the users have recognized them or not, and *improvised affordances*, which have been acted on by the users (or at least recognized) but had not been designed consciously by the designer. Such distinction may be even more crucial for tourism services, where the role of the customer is essential for the production of the service and where customers may also create their own affordances or adapt existing ones. For example, a tourist may improvise by using a translator smartphone app for facilitating the communication with a service employee who does not speak his/her language.

Since affordance-based design frameworks, in general, have been developed based on artefacts of industrial or interaction design, they do not distinguish between affordances related to physical objects and social interactions. As tourism service experiences are heavily reliant on human relationships (Pearce, 2005; Trauer and Ryan, 2005), tourism design must take into consideration both tangible and intangible elements of the servicescape. Gibson (2015) argued that affordances to a human are provided not only by inanimate objects but also by other animals and humans. Apart from the usual physical affordances to each other, such as "touch-ability" or "hug-ability", humans also create more complex affordances that enable communication. Through a neuroscientific lenses, Schilbach et al. (2013) demonstrates how social (communicative) affordances provide possibilities for interactions, such as the perception of facial expressions leading to certain motor responses in studied subjects. As such, the social communicative affordances depend on the abilities of the subject, which include physical (e.g. being (un)able to perceive others' facial expressions or to hear tone and intonation of voice), mental (e.g., autistic spectrum leading to difficulties in processing social cues), and cultural abilities (e.g. understanding language, cultural conventions, etc.). However, due to the reciprocity and coordination between two or more subjects, social affordances are also more complex and even more dynamic than the physical affordances (Baron and Boudreau, 1987).

In general, affordances occurring within the tourism service context are extremely diverse and complex: they can be designed intentionally or uncovered and even created by tourists themselves; they spread across the spectrums of the tangible (physical) and the intangible (social); and, they can contribute to the experience both positively as opportunities and negatively as hazards or threats. Despite these complexities, affordances provide a language that can structure service experiences, better define the design problems and help in finding creative solutions. In the next section, we use a case study to explain how these different facets of affordances, including both those related to tangible elements of the servicescape and those enabling interactions among the service participants, are useful in guiding the design of a multiday holiday for travellers with diverse visual abilities.

Designing holidays for tourists with diverse visual abilities

Holidays wherein pairs of tourists each consisting of one person with visual impairment and one without (known as a sighted guide) explore the destination together, are a relatively recent form of tourism initiated in the UK in the early 1990s (Tomej, 2019). Such a format of tourism not only supports the accessibility of travel for persons with sight loss but also offers a unique sensorial experience to sighted participants. Inevitably, the diverse visual abilities of the holiday participants, which span from full vision to no vision, pose challenges for the organizers in offering an enjoyable experience for all customers. As such, since a holiday is a complex service that usually lasts several days and consists of a multitude of subcontracted services (e.g. hotels, tour guides, and attractions), the organizer must integrate all the holiday components into a consistent, seamless and pleasurable travel experience as it is marketed to the customers. This, in turn, requires close collaboration with its own employees and its partners.

One of the authors of the paper participated in one such organized holiday, a weeklong tour in Italy offered by a specialized tour operator in April 2017, to conduct observations with the goal of identifying areas where the service design could be adjusted to improve tourist satisfaction. The holiday involved a variety of common tourist activities including guided city tours, food tasting, a visit to a spa, group meals, and other impromptu ones. The group consisted of 19 participants including seven members with visual impairment, 11 sighted guides, and the tour group leader; most participants were residents in the United Kingdom, United States, and Canada. This setting allowed to capture how different types of design features enabled or constrained tourism service experiences in a unique context of very diverse visual perception abilities of the participants.

Data collection

The holiday group travelled from an airport in the United Kingdom to Italy and returned together. The researcher joined them upon the group's arrival in Italy and stayed with them throughout the holiday until the group was transferred to the airport for their return flight. Apart from the incidents of arrival and departure, the researcher participated in the tour as a regular tourist as well as an active sighted guide. To address the spatially dynamic format of the holiday, a mobile method of enquiry (Büscher and Urry, 2009) was chosen, which entailed observations by a full participant with an overt identity of a researcher. All tour group members were informed about the study before the holiday's start and were asked to sign an informed consent form. Observations related to three group members (all sighted guides), who had chosen not to sign the consent form, were not included in the analysis and therefore did not have any impact on the study findings.

The researcher paid attention to the interactions of the holiday participants within the expanded servicescape constructed by the holiday organizer. In order to reduce the negative effect of fatigue resulting from conducting observations on the data quality (Bowen, 2008), a wearable action video camera was worn by the researcher at chest level to document the moment-to-moment events in a video format. Under circumstances wherein the use of the camera was inappropriate such as at mealtimes, written notes were taken following the protocol suggested by Zeisel (2006). This protocol required not only the documentation of behaviours but also a rich description of immediate contexts such as the physical setting, involvements of significant others, and various relationships in

the environment including aural, visual, tactile, olfactory, and symbolic ones.

Data analysis with follow-up interviews

When documenting the observations, the interactions were captured at the level of participant behaviours rather than directly focusing on affordances, wherein the latter were derived through the subsequent data analysis process. After the completion of the tour, the notes and the video materials were reviewed and coded following the six types of design elements proposed by Flach et al. (2017). With the help of the interface of the *Simple Video Coder* open-source software tool (Barto et al., 2017), the researcher viewed the video files multiple times, focusing on situations of visible expressions of emotion such as surprise, disappointment or delight which would indicate satisfaction or dissatisfaction with the conduct of the holiday, as well as situations of likely microservice failures even if no emotions were visibly expressed. These situations were coded and supplemented with a short textual description. The written notes were coded similarly, but manually, without the use of software.

At the next stage, each coded segment was examined to distinguish between designed and improvised affordances (van Osch and Mendelson, 2011). The identified situations were then used as the basis to develop a guide for conducting follow-up telephone interviews with six participants (three with and three without visual impairment). Each of the telephone interviews, which lasted around 1 h, was recorded and transcribed verbatim. The questions, phrased in general terms, reflected the affordances identified through analyzing the earlier observations with the aim to assess the importance of the affordances in affecting the participants' tour experiences. The initial analysis of situations was then adjusted and expanded based on the findings of the interviews.

Findings

Every situation contains a multitude of affordances for each individual manifested at multiple levels. Since it is neither possible nor practical to identify all present affordances, this section focuses on the dominant issues recognized as meaningful to tourism service design for the context of the chosen holiday. Specifically, the findings are organized into two broad categories, namely designed affordances and improvised affordances according to van Osch and Mendelson (2011).

Designed affordances

First, we consider those affordances that have been designed by the holiday provider or by the staff who implemented the holiday services, regardless of whether the tourists' actual experiences with these affordances were in line with the design expectations. The most notable *controlled opportunity* that was created by the organizers and was also pointed out by several interview participants was the permission to approach and touch the baptismal font in one of the cathedrals visited. All group participants, regardless of their visual abilities took the chance to touch it (i.e. they actualized the affordance), and many expressed excitement while interacting with the ornate carvings while listening to explanations of the tour guide. The interviews also revealed that it was not only the physical ability of touching that excited the tourists, but also because the baptismal font was normally sealed off to visitors. Thus, the affordance was “inviting” due to its exclusivity, which is part of the cultural learning of the tourists rather than an instinctive reaction.

Most of the situations identified in the study were classified as *hidden opportunities* and many of them caused dissatisfaction among the participants. While a tour guide intended to show the group the main highlights of the visited city along a downtown itinerary, her “follow-ability” in crowded narrow streets suffered due to the lack of her “visibility”. This constituted a *hidden opportunity* (i.e. followability was possible but not always recognizable) both in physical terms due to the big distance between the tour guide and the group members and in communicative terms (as the tour guide was not providing any verbal communication, e.g. with voice). It is also possible to look at this issue through the historic city centre's “traverse-ability” and the attractions' “discover-ability”, which remained similarly “hidden” to the tour participants.

Another *hidden opportunity* occurred when a different tour guide did not verbally describe her gestures that were supposed to show directions. As a result, participants with visual impairment as well as sighted participants, who did not have a clear view of the tour guide, did not receive this information. As the interviews revealed, participants with visual impairment did not notice such occurrences, but when they were informed about them by the researcher, they expressed their wish for a verbal accompaniment of meaningful hand gestures. Intonations used by the Italian tour guides for asking questions or expressing sarcasm (or humour) were also not always perceived correctly by the non-Italian group, which represents an example of a situation where the cultural “abilities” of the tourists were not considered.

On some occasions, tour guides offered participants to touch static three-dimensional replicas of buildings or handed out small tactile models or tactile maps (images with raised surfaces). As this process was poorly facilitated and the handling was rather chaotic, some participants, especially those with visual impairment, did not get to touch the artefacts (some did not even realize that these were available), as they were returned to the tour guide without making a full round through the group. This also represents an example of a *hidden opportunity*, wherein the affordance of “touch-ability” was designed into the service but was not always communicated to all group participants.

Another situation of *hidden opportunity* was related to the breakfast buffets at the hotel where the group was staying overnight. In the interviews, participants with visual impairment complained about the negative feelings caused by the need to ask sighted guides to describe the whole selection of dishes for the day and subsequently helping with serving them. This happened due to the lack of any information about the buffet offer, which was nevertheless changing (including the position of the dishes) every morning and thus causing additional difficulties for both participants with visual impairment and the sighted guides.

Even more problematic than hidden opportunities was the situation of *hidden hazard*, when the unplanned "spread-ability" of the group caused several tour members (both with and without visual impairment) lose the rest of the group during a guided tour in the historic centre of a city. The issue was further exacerbated by the *false opportunity* of the "lost" group members not being able to reach the tour group leader by phone. Another incidence of *false opportunity* was captured when the observations and interviews indicated that the quality of the tactile materials used and distributed by tour guides did not offer good representation of the focal monuments or objects. As explained by the interviewees with visual impairment, the offer of tactile materials did not reflect the most important elements of the environment or exhibit a level of detail that was suitable for obtaining a good understanding of the original artefact. As a result, while the presence of a tactile object served the purpose of communicating the possibility of interpreting a monument through touching, appropriate "represent-ability" was not actually possible (hence it was false).

During mealtimes, some participants with visual impairment had difficulties when dealing with certain meat and seafood dishes. At first glance, the issue lied in their difficulty in recognizing the position of the food and in coordinating their movements with utensils accordingly, which could be described as another situation of *hidden opportunity*. However, focusing on the cultural context, where the organizer's choice of the venue and the related environmental cues (e.g. a formal table setup) coupled with the tourists' ability to recognize them as settings for formal dining with certain expected practices, revealed a situation of *false hazard*. The tourists with visual impairment felt being judged for not eating "properly" or making a mess in the formal dining settings. As the sighted participants expressed that they either did not notice such incidents or did not consider them problematic in any way, this hazard can be considered as false.

Improvised affordances

The experiences of the tour participants also involved actualized affordances that were not designed intentionally by the holiday organizer. Observing how they emerged from various contexts allowed the researcher (and also the service provider) to learn about the potential possibilities of creating new affordances or about the unintentional uses of the service elements. In response to a situation of hidden opportunity occurring when the tour guide failed to ensure tactile experiences for all participants, one sighted guide "uncovered" the opportunity of walking around a large three-dimensional replica of a cathedral complex in a circle ("walk-around-ability"), so that every participant could touch all the parts of the replica sequentially. On other occasions, some sighted guides "jumped in" with their own verbal descriptions when the tour guide or other sighted guides failed to explain something, thus acting upon the possibility of adding to the description in addition to simply listening or asking questions. Another interesting situation occurred during the waiting time for dinner. Here, a couple of group members acted upon the fact that while the smells were coming from the kitchen, but no menus were yet provided to the tourists, the situation afforded "guess-ability" of the dishes, thus they improvised a little game where they tried to guess the dishes and then compare it with the menu which was subsequently distributed.

Some of the improvised affordances contributed to the experiences in a negative way, which manifested itself during the guiding process between the participants with visual impairment and the sighted guides. The service provider had chosen to have little involvement in this regard, limiting itself to only sending out an electronic document with some broad guidelines on sighted guiding to the sighted guides prior to the commencement of the holiday. As a result, the group participants were left to "improvise" the interactions, and most of the criticisms expressed in the interviews and during the holiday itself related to this aspect.

It would have been possible to analyze each distinct situation of failure occurring during guiding – e.g. participants with visual impairment bumping into objects or other people, falling while getting off a train or simply being left alone. However, identifying the affordances on a broader level was more helpful in finding the root of the issue, and thus the situations were described through two different affordances, which differed in the sighted guides' "abilities". The first one involved those sighted guides, whose previous experiences with people with visual impairment (or lack thereof) resulted in perceiving their pairs with visual impairment affording an overwhelming and almost patronizing level of care. The second one involved sighted guides whose careless guiding was based on misunderstanding and underestimating the guided person's needs.

Design recommendations

A set of specific recommendations were developed based on this analysis to serve as design strategies for this specific type of holidays. In particular, it is posited that the instances of *designed controllable opportunities* should be expanded and improved. In the context of the holidays, this means using exclusive tactile experiences as the central part of the holiday. *Improvised opportunities* (improvised affordances resulting in positive outcomes) can be used as inspiration for new service elements and can be incorporated into the design. Different activities based on tactile, aural and olfactory experiences, such as the improvised "guess the smell" game, may be developed to entertain the holiday participants. In the case of *hidden opportunities*, the solution lies in improving their perceptibility and making them more "inviting". There are many conceivable strategies such as having a bright visible object to mark the current location of the guide and choosing less crowded streets for the walking itinerary; providing mobile devices or other tools to help navigating the cities; accompanying hand gestures with verbal descriptions; providing a better system for handling tactile materials (like the ones improvised by the holiday participants); and, communicating an overview of the dishes available for the meal services in advance and preferably in an electronic format, which is accessible to people with vision loss.

In the cases of *false opportunities*, the service designers have a choice of either removing the cues leading to a false perception of an opportunity or creating a real and apparent opportunity. Thus, to make the experience of their customers more pleasurable, the tour guides should choose (or even create) tactile materials based on their potential "(re)present-ability" with a level of specification that is appropriate for the group participants. *False hazards* should be removed. For example, creating more informal dining settings for

meals can make holiday participants less worried about table manners and enable them to enjoy their dishes (even those that are difficult to eat) comfortably.

Certain affordances can be created or adjusted not only by adapting the servicescape directly (i.e. the physical design of the settings, employee training) but also through adjusting the "abilities" of the customers. In the study, this possibility became apparent for the improvised affordances that led to negative outcomes in the sighted guiding process. Here, providing training, information and support, or potentially even certification of the sighted guides, could change the affordances that persons with visual impairment offer to the sighted guides and thus could lead to better guiding experiences. In other contexts, affordances can be created by augmenting the tourists' bodily abilities (e.g. night vision, augmented body parts, special costumes, etc.).

Developing affordance-based tourism service design

It is important to critically examine the concept and potential applications of affordances as both a theoretical lens and its practical application in tourism service design. Affordances link three main components together: *the service provider* (i.e., who may assume the role as an implicit designer) who creates the affordances, *the tourist* who will be exposed to the affordances and will be able to actualize them, and *the servicescape* which represents the physical and social environments of the tourist during the consumption of the service. Within the tourism service context, the tourism service provider and the tourist play crucial roles in the process of design. The case study adopted the lens of affordances to improve the design of the operations of an organized holiday for tourists with visual impairment. With this insight, we offer the following four propositions to guide tourism services design:

Proposition 1. Affordance-based thinking is essential to tourism service providers as it directs the design process towards satisfying the needs of specific customers.

Affordances offer a variety of utilities and, particularly, they help shift the focus from how to design certain functions which the servicescape should perform for serving unspecified customers, to the problems that need to be addressed to cater to the desires and abilities of specific tourists with their abilities, cultural backgrounds and skills. Affordance-based thinking thus directs the creative process by focusing on ideas that are relevant for the satisfaction of the tourist, while it remains open to a multitude of possible constructions and implementations. This is particularly important for tourism services because, while the tourism industry as a whole is characterized by disruptive innovations, the innovativeness of tourism service firms is unevenly distributed depending on a variety of factors with much attention on service standardization (López-Fernmarkández et al., 2011; Sundbo et al., 2007). As such, designing service experiences with affordance-based thinking offers a unique perspective to drive service and experiential innovations in tourism.

Proposition 2. Ongoing dialogue between the service designer and existing and/or potential tourists is essential to uncovering those affordances which sustain tourism experiences.

As affordances only exist when considering specific individuals in mind, it is crucial to involve them (in this case, tourists) in the process of design. The designer may want to avoid the problem of creating affordances that are not "inviting" enough and thus do not contribute towards tourist satisfaction. The level of user involvement in design differs depending on the adopted design philosophy; however, it is essential to maintain a dynamic, ongoing dialogue with existing or prospective tourists (Redström, 2006). Tourism service design is not a linear process, which means that the perspective of tourists is crucial at the early stages of service design, during prototyping, and during the actual operations of the service. Gaining an understanding of which affordances contribute to tourist satisfaction and how they are perceived and actualized may be done through generative and evaluative service design techniques, either directly from the customers or elicited through observations and analyses of past experiences.

While the case study did not directly reflect the dialogue between the service provider and the tourists, it was an important experience for the researcher to learn and understand the needs for creating such a dialogue after using the lens of affordance to uncover the issues that led to satisfaction or dissatisfaction. Also, although theoretically speaking each affordance is unique to a specific individual (and the individual's environment), tourists can still be grouped together into "segments" as the same affordances can exit for many individuals sharing similar abilities. As a result, service design techniques such as the ones known as "*personas*" (where segments are represented as relatable fictitious characters) can be relevant and useful within this context (Stickdorn et al., 2018). It remains critical not to exclude certain groups of customers based on their abilities, as it was illustrated in the case study for tourists with visual impairment.

Proposition 3. Cultural learning and the skills of tourists are essential aspects when considering potential affordances of design alternatives.

From a theoretical perspective, past experiences of an individual which are relevant to a certain environmental situation can be considered as part of the individual's "abilities". As a result, some affordances may not exist for individuals who lack certain skills or do not have certain experiences in the past, while, at the same time, gaining new skills and experiences results in new affordances. As tourism service design deals mostly with high-level affordances rather than simple instinctive ones, the consideration of the skills and so-called "cultural abilities" of the tourists becomes paramount – not only for physical elements of the servicescape but even more so for customer-to-customer and customer-to-service-provider interactions. Facial expressions, gestures, intonations and many other elements of verbal and non-verbal communications may provide communicative affordances to some tourists but not others, independent of the intentions of the service employees. Therefore, they must be well understood and meticulously chosen for a purposeful design based on the experience and socio-cultural background of each individual.

Proposition 4. Each design choice should be considered for the recognizability of its intended purpose, and for the possibility of unintended affordances.

It is not only important to create the affordances contributing to tourists' satisfaction but also crucial that these affordances are recognizable for their existence and the outcome of their actualization. If an opportunity is hidden, the effort in designing it will be lost as it will not contribute to the tourists' experience. Unlike more traditional forms of design, affordance-based thinking considers the possibility that each design choice creates not only affordances intended by the designer but also a multitude of others which may or may not be anticipated by the designer. As a recent example, the use of face masks by hotel or restaurant staff apart from its intentional use of limiting the spread of the Covid-19 virus also constrains the ability of visitors with hearing loss in reading facial expressions and lip-reading (Betteley, 2020). With the addition of the face mask, some of the communicational affordances defined by facial expressions disappear, just as the "sit-tability" of the chair in the furniture shop disappears for Anna (from the early example) when another customer sits on it. Unintended affordances that are improvised by tourists can also contribute to the service experience positively, but as they remain beyond the control of the service provider, it is preferred to incorporate them into the design of the service. It is, nevertheless, unhelpful to think in terms of "correct" or "incorrect" uses as affordances exist as relations between individual tourists and their environment, of which the designers are not part.

Discussion and conclusions

This article argues that the concept of affordance provides an essential conceptual interface between elements of tourism services and the tourists' service experiences. By synthesizing the literature from psychology, philosophy, industrial and interaction design, it highlights characteristics of affordances and how they can be incorporated into the practice of tourism design. A case study is used to illustrate its application within a tourism service setting involving a group holiday of tourists with varying visual abilities. Finally, a set of propositions is formulated as guidance for the further development of affordance-based tourism service design.

Analytically deconstructing a tourism service into affordances as its building blocks provides a tourism design framework that sets itself apart from the notion of the experience economy (Pine and Gilmore, 1999), which emphasizes the "staged" aspect of experiences. The multitude of affordances existing in every situation offers an abundance of choices and broad possibilities for the tourists, and yet behavioural choices in general are constrained by the existing affordances. As a result, a successful design is only possible with a strong involvement of the tourists and their perspectives in the process of identifying and designing the relevant affordances. At the same time, affordance-centred service design is compatible with service-dominant logic (Vargo and Lusch, 2004), as the concept of affordance implies concurrent consideration of the servicescape and the tourist as well as the specific context, which fits into the notion of co-created value.

An affordance-based framework can help tourism designers to disentangle the complex relationships that exist in the interactions of tourists with their environments and thus guide and facilitate the creative process. While every individual tourist has a unique set of abilities which defines the possible affordances, tourists can also be grouped together based on their common abilities relevant for the specific service. Thus, the affordance-based approach can be combined with the "personas" service design technique, where the affordances will be considered for specific "personas", each representing a tourist segment (Stickdorn et al., 2018). Importantly, the affordance-based approach may be used both in the design of new services and the diagnostics of existing ones. While we did not distinguish between service delivery failures and design failures, we followed the logic of using design strategies to proactively address and avoid service failures (Dickinger and Leung, 2017). For both purposes, affordances can be integrated in the visual mapping of the service, such as in "service blueprints", where they can be used to link the customer process with the relevant onstage and backstage operational activities (Bitner et al., 2008).

We must acknowledge that there are some unresolved and long-debated issues in the conceptual understanding of affordances in general design and design science. One such fundamental issue is whether affordances need to be perceived in order to be actualized and whether individuals can act upon them while being unaware of the affordance itself (Volkoff & Strong, 2017). The answer to this question may have varying implications on interpreting the "controllable", "hidden" and "false" aspects of affordances presented in this article. Moreover, the specificity of the tourism context gives rise to domain-specific issues that require further discussions. One of these issues is the link between the different affordance-based design types and the emotions they evoke in tourists. Given the critical roles of emotions in tourist experiences, it would be insightful to evaluate whether there are stable patterns between certain actualized affordances and specific emotions.

As simplicity of use is often less important for tourism service providers than the hedonic value of the service experience, they may want their customers to uncover some less obvious features of the situation themselves in order to evoke the feeling of exploration and achievement. Furthermore, while false hazards may be seen as redundant in industrial or interaction design, tourism designers can often add "safe threats" that are intended to evoke thrills and pleasant surprises in the experience. The framework proposed by Flach et al. (2017), however, does not offer an answer to the question regarding whether designed "buried treasures" should be characterized as hidden opportunities or as controllable ones, while hazards are seen as contributing negatively to the user experience. These and many other issues provide avenues for future consideration as the concept of affordances is used to facilitate the emergence of memorable tourism experiences.

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