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An update on customer value: state of the art, revised typology, and research agenda

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Abstract

Purpose – The context of marketing and service research is rapidly changing as a result of advances in academic research and business practice. This has implications for our understanding of customer value. The purpose of this paper is to provide an update on customer value given today's context (including recent advances such as technologies, human contact, collaborative consumption, service ecosystems and transformative service research); to revise Holbrook's value typology; and to propose a research agenda.
Design/methodology/approach – This paper uses a conceptual approach that is rooted in the service and marketing literature.
Findings – The contribution of this paper is threefold. First, this paper presents an evolved view on customer value which accounts for recent advances in academic research and business practice. Second, this paper updates Holbrook's value typology by revising existing value types as well as identifying additional value types; and offers guidelines for measuring and modeling customer value. Third, this paper proposes a research agenda to guide and stimulate future value research.
Originality/value – This paper provides an update on customer value, which is one of the most fundamental concepts in service and marketing research. This updated perspective has been approved and applauded by Morris B. Holbrook, one of the founding fathers of value research.

Keywords Value, Customer value, Value creation, Perceived value
Paper type Conceptual paper

Introduction

More than 30 years ago, Zeithaml (1988) laid the foundations of one of the most universally accepted definitions of customer value as a trade-off between benefits and costs. A few years later, Holbrook (1994) proposed one of the most often used value typologies. Although their notions of value may still be valid, our perspective on customer value needs an update since the context of marketing and service research has changed (and is continuously changing) as a result of advances in academic research as well as business practice. Specifically, the groundbreaking article of Vargo and Lusch (2004) on service-dominant logic (SDL) fundamentally changed service and marketing researchers' mindset and lexicon. It also changed our theoretical understanding of value and value creation. Furthermore, in 2010 Transformative Service Research (TSR) was introduced (Anderson, 2010) which focuses on well-being outcomes related to service and has become a fruitful area of service research gaining more and more researchers' attention. Besides these academic advances, technological developments are transforming all service sectors (Wirtz *et al.*, 2018) and collaborative consumption (e.g. Uber, Airbnb) is fundamentally changing existing business models (Andreassen *et al.*, 2018).

These fundamental changes in academia as well as practice require us to rethink our understanding of customer value, which can be considered one of the cornerstones of marketing and service research. Hence, the aim of this paper is to present an update on

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customer value. The contribution of this paper is threefold. First, this paper presents an evolved perspective on customer value which accounts for recent advances in academic research and business practice. Specifically, this paper focuses on the impact of new technologies, human contact, collaborative consumption, service ecosystems and TSR on our understanding of value. Second, starting from these advances, this paper revises Holbrook's value typology by updating existing value types and identifying additional value types. Furthermore, this papers offers guidelines for measuring and modeling customer value. Third, this paper proposes a research agenda to guide and stimulate future value research.

State of the art

The fundamental nature of customer value

Customer value is one of the most fundamental concepts – maybe even *the* most fundamental concept – in marketing and service research (Cronin, 2016; Gallarza *et al.*, 2011). For many years, it has been recognized as a key source of competitive advantage (Woodruff, 1997) and the heart of business strategy since "the creation of customer value must be the reason for the firm's existence and certainly for its success" (Slater, 1997, p. 166). The strategic role of customer value is also highlighted by Osterwalder's work on the Business Model Canvas. Osterwalder and Pigneur (2010, p. 14) define a business model as "the rationale of how an organization creates, delivers, and captures value." Value for the customer is at the core of the Business Model Canvas since it is the reason customers choose one company over another (Osterwalder and Pigneur, 2010).

Furthermore, customer value has been recognized as a key determinant of customers' decision making and evaluative judgments (Gallarza *et al.*, 2011). Specifically, prior research demonstrates the pre-purchase significance of customer value by relating customers' expected value of a product or service to key outcomes such as willingness to buy (Sweeney *et al.*, 1999) and intention to use (Kleijnen *et al.*, 2007). Besides its crucial role in decision making, customer value plays a key role in the post-purchase phase since customers evaluate the value of the product or service, which determines their satisfaction, repurchase intentions and word-of-mouth (Leroi-Werelds *et al.*, 2014; Willems *et al.*, 2016).

The significance of customer value for marketing and service research is accentuated by both SDL and service logic (SL). In their first SDL article, Vargo and Lusch (2004) mention value more than 50 times. In their latest update, they even mention it more than 100 times and value plays a central role in three of the five axioms (Vargo and Lusch, 2016). In a similar vein, SL emphasizes the significance of customer value "in establishing the service perspective on marketing" (Grönroos and Voima, 2013, p. 133).

Foundational characteristics

Based on an extensive investigation of the value literature, six foundational characteristics (FCs) can be derived (see Table I). A seventh FC will be added after the discussion of SDL and SL (see further).

First, customer value involves an interaction between a subject (the customer) and an object (Holbrook, 1999; Woodruff, 1997). The object can be a product (Leroi-Werelds *et al.*, 2014), a restaurant (Sánchez-Fernandez *et al.*, 2009), a hotel (Gallarza *et al.*, 2017), mobile services (Kleijnen *et al.*, 2007), a supermarket (Willems *et al.*, 2016), a parcel locker (Vakulenko *et al.*, 2018), but also customer participation (Chan *et al.*, 2010), co-production (Etgar, 2008) or gamification (Hammedi *et al.*, 2017).

Second, one of the most fundamental and most often cited definitions of customer value is the one proposed by Zeithaml (1988, p. 14) describing it as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given."

Throughout the history of the concept, several authors (Cronin, 2016; Kleijnen *et al.*, 2007; Woodruff, 1997) have emphasized that customer value involves a trade-off between benefits and costs. The benefits are the positive consequences whereas the costs are the negative consequences of using a product, encountering a service, visiting a store, engaging in co-production, etc. (Leroi-Werelds *et al.*, 2014; Woodruff and Gardial, 1996).

Third, customer value is experiential which implies that it is not inherent in an object, but in the experiences derived from the object (Leroi-Werelds *et al.*, 2014). This is consistent with the notion of value-in-use which means that "value is not created and delivered by the supplier but emerges during usage in the customer's process of value creation" (Grönroos and Ravald, 2011, p. 8). Cronin (2016) recently stated that value should not only be considered in the usage stage, but also in other stages of the customer journey including search, purchase and even disposal. For instance, if during search, the customer's search time is reduced because useful information is provided by the firm, this can also be valuable for the customer. "Even if a purchase is not made and product use does not take place, there is a benefit to the customer in the time saved and the information acquired that informs future purchases" (Cronin, 2016, p. 263). In a similar vein, disposal can affect the value of a product. The reuse, repurposing and recycling of a product can create additional benefits or costs for the customer (Cronin, 2016). However, this all relates to the notion that "customer value is not inherent to the object, but the experiences derived from the object." The information provided by the firm can also be considered an object. This information is not inherently valuable, but only valuable if the customer uses it. Furthermore, the disposal of a product relates to the experiences derived from the product, in this case the disposal experience.

Fourth, customer value is determined by the customer. Hence, it is the customer who decides if an object is valuable; not the supplier (Leroi-Werelds *et al.*, 2014; Woodruff, 1997). This implies that customer value is subjective and personal. Each customer has its own perception of value based on personal characteristics such as needs, knowledge, skills, previous experiences and/or financial resources (Holbrook, 1999). The personal nature of value also involves customer values, i.e. "centrally held and enduring beliefs about right and wrong, good and bad that cut across situations and products or services" (Woodruff, 1997, p. 141). Although customer value and customer values are distinct concepts, there is a two-way relationship between them (Holbrook, 1999; Woodruff, 1997). On the one hand, customer values (e.g. security, status) are personal characteristics that impact customers' perceptions of value. On the other hand, customer value can be a means to accomplish customer values. For example, a person that strives for security and status can accomplish these values by buying a safe and status-enhancing car.

Fifth, customer value not only depends on the customer, but also on the situation, including the circumstances, time frame or location (Holbrook, 1999). Customer value is thus context-specific. "The level of value derived through use reflects social, spatial, temporal,

Foundational characteristic (FC)
1. Customer value implies an interaction between a subject (the customer) and an object (e.g. a product, service, store, technology, activity, etc.)
2. Customer value involves a trade-off between the benefits and costs of an object
3. Customer value is not inherent in an object, but in the customer's experiences derived from the object
4. Customer value is personal since it is subjectively determined by the customer
5. Customer value is situation-specific
6. Customer value is multidimensional and consists of multiple value types
7.[a] Customer value is (co-)created by the customer by means of resource integration

Note: [a]This foundational characteristic was added after reviewing SDL and SL

Table I.
Foundational characteristics of customer value

and physical contexts in which usage takes place, and it depends as well on how these aspects of the usage context change" (Grönroos and Voima, 2013, p. 144).

Finally, customer value is multidimensional, which implies that it consists of multiple value types (Gallarza *et al.*, 2017). Although considerable agreement exists on the multidimensional nature of customer value, divergence of opinion exists on the exact conceptual content and types that should be used. As a result, several value typologies have been proposed throughout the years (see Gallarza *et al.*, 2017 for an overview).

Holbrook's value typology

Although several typologies have been proposed, the one developed by Holbrook (1994) has been recognized as the most influential one (Gallarza *et al.*, 2017). It is considered to be "the most comprehensive approach to the value construct, because it captures more potential sources of value than other conceptualizations do" (Sánchez-Fernández *et al.*, 2009, p. 97). Furthermore, it better describes the richness of the concept compared to other typologies (Gallarza *et al.*, 2011, 2017) and even encompasses other typologies (Leroi-Werelds *et al.*, 2014).

Holbrook's (1999) value typology is based on three underlying dimensions: extrinsic vs intrinsic value; active vs reactive value; self-oriented vs other-oriented value. By combining these dimensions, Holbrook discerns eight value types: efficiency, excellence, status, esteem, play, aesthetics, ethics and spirituality (see Table II).

Throughout the years, several researchers adapted Holbrook's typology. First, status and esteem are connected in such a way that it is problematic to operationalize them separately (Leroi-Werelds *et al.*, 2014) because – as noted by Holbrook himself – "the active nature of status and the reactive nature of esteem tend to blur together in ways that render the two hard to distinguish" (Holbrook, 1999, p. 188). Hence, several empirical studies (e.g. Willems *et al.*, 2016; Leroi-Werelds *et al.*, 2014) combined status and esteem in an overarching value type called "social value" arising when the object serves as a means to influence other people. Alternatively, status and esteem can be operationalized separately, when esteem is regarded as "self-esteem." In that case "status" involves impression and reputation and "self-esteem" concerns self-worth and achievement (Gallarza *et al.*, 2017).

Second, some researchers (e.g. Doucé *et al.*, 2016; Willems *et al.*, 2016) combined ethics and spirituality in an overarching value type called "altruistic value." However, in a recent study by Holbrook (Gallarza *et al.*, 2017), spirituality was conceived as "escapism" which relates to relaxing and escaping reality. This can be relevant in some contexts (e.g. fashion retail or tourism).

Third, when the context relates to a mix of products and services (e.g. retailing), prior work (e.g. Doucé *et al.*, 2016; Willems *et al.*, 2016) divided Holbrook's "excellence" in service excellence and product excellence.

Value in service-dominant logic and service logic

Although providing a complete overview of SDL and SL goes beyond the scope of this paper, this section describes some relevant conceptual differences between them because they influence our understanding of customer value.

		Extrinsic	Intrinsic
Self-oriented	Active	Efficiency (O/I, convenience)	Play (fun)
	Reactive	Excellence (quality)	Aesthetics (beauty)
Other-oriented	Active	Status (success, impression management)	Ethics (justice, virtue, morality)
	Reactive	Esteem (reputation, materialism, possessions)	Spirituality (faith, ecstasy, sacredness)

Source: Holbrook (1999)

Table II. Holbrook's value typology

SDL states that "value is created through the actions of multiple actors, often unaware of each other, that contribute to each other's wellbeing" (Lusch and Vargo, 2018, p. 13). That is why – according to SDL – value is always co-created (Vargo and Lusch, 2004) and value co-creation is defined as "the integration of resources from a range of sources by multiple actors, always involving the customer, to realize benefit in use for the beneficiaries involved in a given context" (McColl-Kennedy, 2018, p. 59). Although value is always co-created, it is appraised by a particular beneficiary (Lusch and Vargo, 2018). For instance, if a customer buys and uses an electric car, it can be valuable for the customer (i.e. customer value), for the firm (i.e. firm value in terms of revenues), and for society (i.e. societal value in terms of environmental impact).

SL describes value creation as a process that enhances the customer's well-being, such that he/she is better off in some respect (Grönroos and Voima, 2013). Hence, SL focuses on value for the customer, and not on value for all beneficiaries involved (Grönroos and Ravald, 2011). "In particular, though value for the customer and financial value for the firm are two sides of the value creation coin […], we focus on value creation for the customer" (Grönroos and Voima, 2013, p. 134). According to SL, value creation involves customers' creation of value-in-use and value co-creation is a function of interactions between the customer and the service provider (Grönroos and Voima, 2013). Specifically, Grönroos and Voima (2013, p. 138) argue:

> Value-in-use implies that the customer, as the user, creates value and is the value creator, not just that he or she assesses or determines value. The customer creates and assesses value in a longitudinal and experiential process of usage […] the customer controls the experiential value creation process and may invite the service provider to join this process as a co-creator of value.

To enhance our understanding of the value creation process, Grönroos and Voima (2013) propose three value spheres: the provider sphere, the joint sphere, and the customer sphere (see Figure 1). The firm is responsible for the provider sphere where it produces resources that have potential value for customers. Hence, the firm facilitates customers' value creation and is thus considered a value facilitator. In the joint sphere, the firm and the customer interact which can result in value co-creation. However, not every interaction automatically implies value co-creation. The firm "may influence the customer's value creation positively or negatively, or no influence may occur" (Grönroos and Voima, 2013, p. 141). The customer sphere is closed to the provider since no direct interactions take place. In this sphere, the

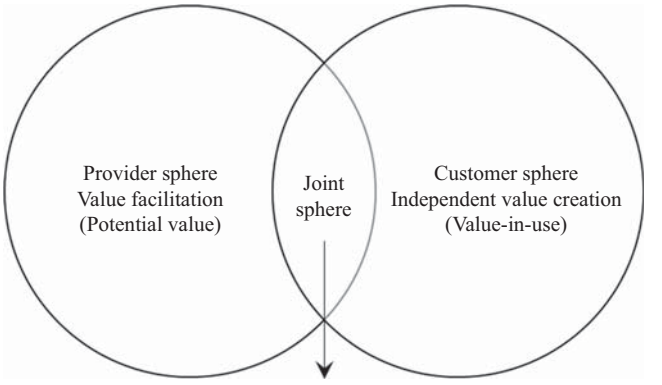

Figure 1.
Value spheres proposed by service logic

Source: Based on Grönroos and Voima (2013)

customer independently creates value by using the resources provided by the firm, integrating them with other resources and skills, and transforming the potential value of these resources into real value or value-in-use.

Although SDL and SL define value creation and value co-creation differently, they agree that the customer is an active player in the value creation process and not a passive recipient of value (as implied by Goods-Dominant Logic). The customer (co-)creates value by means of resource integration (Grönroos and Voima, 2013; Lusch and Vargo, 2018). This implies that the customer integrates the resources provided by the service provider (e.g. products, services) with other resources and skills to (co-)create value (Leroi-Werelds *et al.*, 2017). For instance, the value of a car is created by the customer's integration and combination of resources such as the car, fuel, public roads, car insurance, maintenance/repair service, as well as his own driving skills. Without these other resources and the necessary skills, the customer cannot (co-)create value from using the car (Grönroos and Voima, 2013). It is important to note that "resources themselves do not have intrinsic value, but become valuable within a specific context when applied or integrated with other resources" (Frow and Payne, 2018, p. 82). Because the notion of resource integration is fundamental to our understanding of customer value, FC7 was added to Table I.

Advances in academic research and business practice

This section describes recent advances in academic research and business practice that are relevant for updating our understanding of customer value and at the same time lead to fruitful research opportunities.

Technologies

Technological advances are marking a new age of automation and transformation – referred to as the "The Fourth Industrial Revolution" – where technologies augment and replace human employees based on promises of lower costs and higher productivity (Huang and Rust, 2018; Wirtz *et al.*, 2018). This revolution is fundamentally transforming the way services are designed, delivered and perceived (Wirtz *et al.*, 2018). While service encounters used to be a "game of people" between customers and frontline service employees, the infusion of frontline service technologies is changing service encounters as we know them (Larivière *et al.*, 2017). Frontline service technology involves "any combination of hardware, software, information and/or networks that supports the co-creation of value between a service provider and customer at the organizational frontline" (De Keyser *et al.*, 2019, p. 5).

In what follows, six frontline service technologies are described that are frequently mentioned in recent service research (Huang and Rust, 2017; Wirtz *et al.*, 2018) and found their way to business practice (Gartner, 2018). This list is not intended to be exhaustive. For each technology, relevant value types as well as other valuable insights are described.

Self-service technologies. Self-service technologies (SSTs) are interfaces that enable customers to deliver the service themselves, without assistance of human employees (Blut *et al.*, 2016). In comparison to the other technologies described in this section, a large amount of empirical studies is available on SSTs. Based on this prior work, Blut *et al.* (2016) conducted a meta-analysis to investigate the factors influencing SST acceptance. Their findings reveal the relevance of two of Holbrook's value types: play (i.e. the extent to which the SST is enjoyable to use) and efficiency (i.e. the extent to which the SST makes the customer's life easier). Furthermore, this study shows the relevance of two additional value types: effort (i.e. the effort required to use the SST) and risk (i.e. customers' concerns about privacy, security, performance, financial, physical risks). In addition, prior work (Kleijnen *et al.*, 2007; Collier *et al.*, 2014) mentions the benefit of control, which involves "the extent to which consumers can determine the timing, content, and sequence of a transaction" (Kleijnen *et al.*, 2007, p. 36).

Big data analytics. Big data analytics involves the use of analytic techniques to analyze large sets of data that comprise several data types to expose hidden customer preferences (Huang and Rust, 2017). Big data analytics can create a new type of value: personalization. Specifically, it can be used for so-called "static personalization" which implies that personalization is achieved by the analysis of cross-sectional like-minded customer data (Huang and Rust, 2017). For instance, an online retailer can use big data analytics to make personal recommendations to its online shoppers, based on what like-minded customers bought in the past.

Artificial Intelligence. Artificial Intelligence (AI) involves technologies that are able to do what human intelligence does, including visual recognition, speech recognition, problem-solving and learning (Huang and Rust, 2017, 2018). Huang and Rust (2018) describe four levels of AI relevant for service tasks: mechanical, analytical, intuitive and empathetic. Each level is related to specific types of customer value.

The value of mechanical AI lies in consistent and reliable service quality (e.g. it is free from human error) since it involves the consistent performance of simple routine tasks (Huang and Rust, 2018). This type of AI can also be used in the form of SSTs, for instance McDonald's "Create Your Taste" kiosks (Huang and Rust, 2018).

Analytical AI uses "algorithms to learn iteratively from data to find insightful information without being programmed where to look for a particular piece of information" (Huang and Rust, 2018, p. 158). It relates to the aforementioned big data analytics and thus allows for static personalization (Huang and Rust, 2017).

Intuitive AI concerns the ability to think in a creative way and adapt to new situations. Compared to analytical AI, intuitive AI can be used for "dynamic personalization" that adapts to the preferences of a specific individual customer based on observations of his/her behavior over time (Huang and Rust, 2017). Consequently, products, services, and experiences can be "hyperpersonalized" to the individual customer level by using individual customer data (Van Belleghem, 2017). Furthermore, intuitive AI can provide the ultimate convenience for customers (Van Belleghem, 2017). For instance, Starwood hotels use an app that texts the room number to a guest when he/she enters the hotel, asks the guest's finger print to check-in, and when the guest approaches the room, turns his/her smartphone into a virtual key to open the door (Huang and Rust, 2018).

Empathetic AI refers to "the ability to recognize and understand other people's emotions, respond appropriately emotionally, and influence others' emotions" (Huang and Rust, 2018, p. 159). According to Huang and Rust (2018), this type of AI would require "people skills" which is – and will remain for a long time – a key differentiator of humans vs machines.

Service robots. Service robots can be defined as "system-based autonomous and adaptable interfaces that interact, communicate and deliver service to an organization's customers" (Wirtz *et al.*, 2018, p. 909) and are based on AI (Huang and Rust, 2018). Wirtz *et al.* (2018) discern between physical service robots (e.g. Pepper) and virtual service robots which include voice-based assistants (e.g. Amazon's Alexa) and text-based assistants (e.g. chatbots).

The value of service robots especially lies in convenience, excellence and personalization. These benefits are also related to the aforementioned levels of AI. Service robots can perform functional tasks such as carrying groceries, answering questions or providing information. As such, they can be a source of convenience (Caic *et al.*, 2018; Van Belleghem, 2017). Service robots can also increase the level of service excellence by providing services in a more reliable and homogenous way compared to human employees (Wirtz *et al.*, 2018). If, for instance, a restaurant guest has questions about certain ingredients, a service robot will give reliable and specific information, which does not depend on human memory. According to Wirtz *et al.* (2018), service robots can be part of a bigger system which provides them with data and enables them to provide personalized experiences to customers. However, service robots are also linked to two negative value types: privacy and

security risks since robots are able to detect, process and record everything that happens around them (Wirtz *et al.*, 2018).

Finally, it is important to note that replacing human employees by service robots can destroy value for customers (Wirtz *et al.*, 2018). Specifically, it can reduce relational benefits since robots lack the authentic and genuine friendliness of a human being. Although service robots cannot feel or express real emotions, they are able to mimic them by means of body language or facial expressions. Since these emotions are programmed and thus not considered authentic, customers may not perceive them in the same way as real emotions of human employees (Wirtz *et al.*, 2018). Furthermore, prior research (De Keyser *et al.*, 2019; Wirtz *et al.*, 2018) states that the humanness of service robots positively impacts customer perceptions until it reaches a point where the robot becomes creepy which leads to discomfort. This is called "the uncanny valley effect."

Internet of Things. The Internet of Things (IoT) involves connected AI (Huang and Rust, 2018) and can be defined as "a network of sensors and actuators embedded into everyday objects and devices that can (1) collect, aggregate, and analyze a significant amount of data; (2) interact and communicate with each other – and with humans – on an ongoing basis; and (3) activate actions with complete autonomy" (Mani and Chouk, 2018, p. 780). Examples include smart refrigerators, smart watches and smart speakers. Furthermore, the aforementioned service robots can be based on IoT.

The main benefits of IoT include increased convenience (De Keyser *et al.*, 2019) and dynamic personalization (Ng and Wakenshaw, 2017). For instance, a smart watch can offer real-time and personalized information to the user about his/her heartrate, sleep, and activities. Furthermore, IoT can be a source of status (i.e. the "coolness" of IoT devices) as well as enjoyment (Shin, 2017). Van Belleghem (2017) also refers to the benefit of "proactive service" which means that IoT devices can solve the customer problem even before the customer notices there is a problem. For instance, your smart heating system can send you a WhatsApp message to let you know that it will break down in a week and that it will warn the repair service itself if you press OK (Van Belleghem, 2017). This has implications for our understanding of "service excellence."

Mani and Chouk (2018) focused on the negative side of IoT and discerned four main negative value types. Perceived complexity relates to the cognitive effort needed to use the technology. Perceived price involves the monetary sacrifice needed to obtain IoT (i.e. the cost of installation, maintenance and repairs). Physical risk relates to customers' worries about health issues (e.g. electromagnetic waves). Privacy risk refers to worries about losing control over one's personal information. Ng and Wakenshaw (2017) also refer to privacy risk, but also mention security risk, which involves customers' worries about losing personal data to hackers or criminals.

Virtual and augmented reality. Augmented reality (AR) involves "embedding virtual content into the customer's physical environment, interactively and in real-time" (Hilken *et al.*, 2017, p. 885). Virtual reality (VR) implies that the customer is totally immersed in a completely virtual world, which may or may not simulate elements of the real world (Loureiro *et al.*, 2018).

Empirical research on the value of these technologies is still in its infancy. Based on prior work (De Keyser *et al.*, 2019; Flavian *et al.*, 2018; Hilken *et al.*, 2017; Loureiro *et al.*, 2018), potential benefits for customers can be deduced. An often-mentioned benefit is that both AR and VR can offer a "try-before-you-buy" experience which offers convenience in the pre-purchase phase. For example, by using the IKEA Place AR app customers can virtually place a table in a real-time view of their dining room and Volvo enables customers to experience a VR test drive of its XC90 model. Additionally, AR can offer additional convenience by supporting customers during resource integration. For instance, the IKEA Assemble AR app helps customers assemble their furniture by showing how the different

pieces belong together. Furthermore, both AR and VR can be used to make the shopping experience more enjoyable (e.g. a VR climbing experience in The North Face stores). Finally, VR can be used to increase relational benefits by offering an aftermovie, which is especially applicable for hedonic services such as a festival or a museum. The most important negative value types mentioned in prior studies are the potential physical costs (i.e. nausea) when using VR, and the privacy risk when using AR.

Human contact

The infusion of frontline service technologies not only provides new sources of value, but also impacts the value of human contact. Human contact will become increasingly scarce and – based on the fundamental principles of scarcity – the human touch will become even more valuable in the future (Huang and Rust, 2018; Van Belleghem, 2017). If frontline service employees are increasingly replaced by technologies, this means that customers lose the opportunity to acquire human service (Huang and Rust, 2018) which can destroy the relational benefits of social interactions (Wirtz *et al.*, 2018).

Prior research (Huang and Rust, 2018; Wirtz *et al.*, 2018) emphasizes the value of human employees since technologies are not able to interact socially and emotionally at the same level humans can. According to Larivière *et al.* (2017, p. 241), employees are differentiators in a technology-infused business world, since "authentic human touch can help differentiate offerings in the marketplace and display unique brand-building behaviors."

Huang and Rust (2018) refer to the possibility of "dual service provision" which reflects a segmentation strategy based on the notion that some customers are willing to pay more for human interactions. A service provider can thus offer two options of service provision: the service delivered by machines or the service delivered by humans (at a premium price). For instance, banks can offer human services at a higher price than their automated services (e.g. ATMs; online/mobile banking). This thus implies that some customers value the human touch more than others.

Collaborative consumption

The proliferation of collaborative consumption – also referred to as the sharing economy or triadic business models (Andreassen *et al.*, 2018) – shows that the customer's value creation can be facilitated by peers instead of firms. Collaborative consumption (e.g. Uber, Airbnb) differs from traditional exchange since it is based on a triadic rather than a dyadic exchange (Andreassen *et al.*, 2018; Benoit *et al.*, 2017). Specifically, a customer is served by two actors: the platform provider and a peer service provider. The peer service provider gives access to a particular resource (e.g. an apartment), whereas the platform provider (e.g. Airbnb) provides the online marketplace for a particular collaborative consumption service (Benoit *et al.*, 2017).

The customer's decision to use collaborative consumption is based on the expected value of this option compared to its alternatives (Andreassen *et al.*, 2018). Prior research (Andreassen *et al.*, 2018; Benoit *et al.*, 2017) mentions several types of value. First, the price is an important driver of using collaborative consumption: an Uber taxi drive is much cheaper than a traditional one. Second, in some cases, social benefits can be created. For example, Airbnb positions itself as a community-based brand offering authentic travel experiences. Third, collaborative consumption can create status, for instance, when customers get access to a luxury villa that would otherwise be out of reach. Fourth, collaborative consumption is often related to increased convenience. Fifth, peer service providers are able to offer more personalized service interactions with customers compared to traditional service providers. Sixth, collaborative consumption can reduce financial risks associated with ownership, but can create performance and physical risks (e.g. a "bad" Uber driver can cause an accident). Finally, collaborative consumption can lead to ecological benefits as well as costs.

Specifically, collaborative consumption can have a positive effect on the environment because resources are more efficiently used, but using rather than owning can lead to the overuse of certain resources (e.g. cars) which has a negative effect on the environment.

Collaborative consumption also has implications for our understanding of the value creation process (Andreassen *et al.*, 2018). As mentioned before, collaborative consumption involves three actors: the customer, the peer service provider and the platform provider. In the value creation process, the customer interacts with the platform provider as well as the peer service provider. Both providers facilitate the customer's value creation process by offering resources that have potential value to the customer. Hence, the value creation process is not based on three spheres as mentioned by SL (see Figure 1), but seven spheres (see Figure 2).

Service ecosystems

The latest update on SDL (Vargo and Lusch, 2016) emphasizes the relevance of service ecosystems. A service ecosystem is "a relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange" (Vargo and Lusch, 2016, p. 10). This ecosystem perspective has implications for our understanding of value and the actors involved in the value creation process. Specifically, it emphasizes that: all actors are value co-creators; resource integration is the basis of value creation; value is uniquely and phenomenological determined by the beneficiary; and value co-creation is coordinated through actor-generated institutions, which can be considered the "rules of the game" (Frow and Payne, 2018).

By taking an ecosystem perspective "the unit of analysis shifts from dyadic encounters to a more complex interconnected view of resource integration within a marketing system" (Frow and Payne, 2018, p. 80). Traditionally, the customer value literature has been concerned predominantly with the customer-provider dyad, a micro-level customer value that involves customers' experiences with a specific focal object such as a product, a service, or a store. Notable exceptions are research streams focusing on "value constellations" (Patricio *et al.*, 2011) or "value fusion" (Larivière *et al.*, 2013).

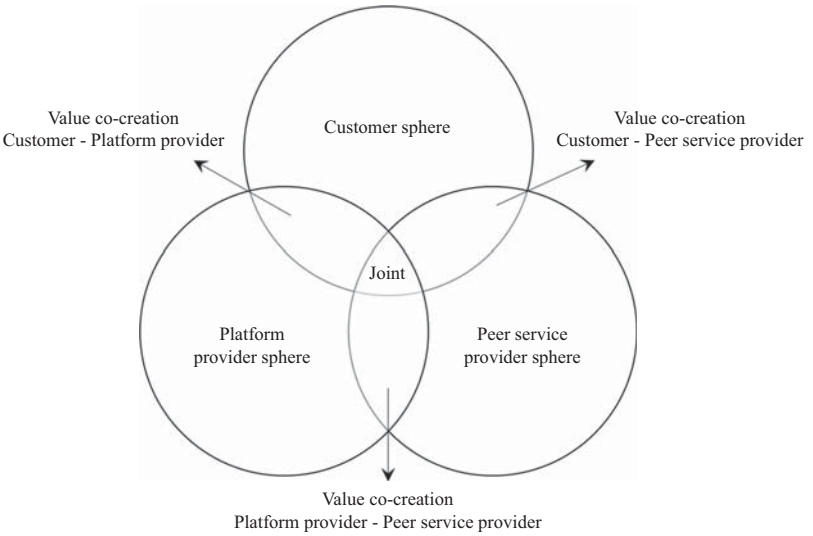

Figure 2.
Value spheres in case of collaborative consumption

Transformative service research

TSR investigates the well-being implications of service (Ostrom *et al.*, 2015) and represents research that focuses on on improving the lives of individuals, families, communities, society or the ecosystem (Anderson and Ostrom, 2015). Since the customer's value creation involves a process that increases the customer's well-being, such that he/she becomes better off in some respect (Grönroos and Voima, 2013), customer value is a promising concept for TSR. Three TSR domains are especially noteworthy from a value perspective: healthcare, the base of the pyramid (BoP) and sustainability.

Healthcare is a fruitful field for TSR given its relevance for individual and societal well-being (McColl-Kennedy *et al.*, 2017; Sweeney *et al.*, 2015). The last few years, several TSR studies have focused on value and healthcare (e.g. McColl-Kennedy *et al.*, 2017; Sweeney *et al.*, 2015) with a particular focus on the role of the customer (i.e. the patient) as a resource integrator in the value (co-)creation process. Furthermore, the study conducted by Dagger *et al.* (2007) on health service quality is especially noteworthy, because they refer to various value types that are relevant in a healthcare context (including interpersonal service quality, atmospherics and timeliness).

Prior value research (see Gallarza *et al.*, 2017) has mainly focused on medium- to high-income classes while research related to the BoP is scarce. The BoP constitutes the approximately two-thirds of the global population that live in poverty (Anderson and Ostrom, 2015). By conducting value research related to the BoP, researchers can make important contributions to research, practice, as well as society. For instance, Schaefers *et al.* (2018) investigated the value of access-based services to reduce nonconsumption at the BoP. Nonconsumption implies that BoP consumers are prevented from using products that could increase their well-being (e.g. power generators). Access-based services offer access (in return for an access payment) to these kinds of products without ownership, which reduces consumers' perceptions of price and risk.

Third, value research can contribute to sustainability research. Sustainability can be defined in many ways and relates to the impact of business practice on ecological and societal well-being (Sudbury-Riley and Kohlbacher, 2016). Recent studies (Nielsen, 2018; Sudbury-Riley and Kohlbacher, 2016) indicate that sustainability is increasingly valued by customers. This is also termed "ethical consumption" (Sudbury-Riley and Kohlbacher, 2016).

An updated perspective

The previous section described various advances in the service domain that require the attention of value researchers, especially with regard to the content of the value concept in terms of value types. This section offers an updated typology as well as guidelines on how to measure and model customer value.

An updated typology of customer value

Throughout this paper, it became evident that an update or elaboration of Holbrook's value typology is deemed necessary. Specifically, the value types proposed by Holbrook (1994, 1999) (see Table II) and applied in empirical studies (Gallarza *et al.*, 2017) are insufficient to capture the value related to the abovementioned advances.

This paper thus presents an updated typology of customer value which consists of 14 positive and 10 negative value types (see Table III). It should be noted that not all value types are relevant/applicable in every context. Remember that customer value is situation-specific (FP5). Hence, it is important to consider Table III as a list of potential value types and every value researcher should check which of these value types are relevant for his/her study (see further).

Although all value types proposed by Holbrook are still valid, five of them (i.e. efficiency, play, spiritualty, excellence and ethics) needed an update. Specifically, the terms "convenience" and "enjoyment" are preferred instead of "efficiency" and "play" because these are well-accepted in the literature (De Keyser *et al.*, 2019) as well as practice

Value type	Brief description	Source
Positive value types	*The (perceived) extent to which the object…*	
Convenience (efficiency)	makes the life of the customer easier	O, T, CC
Excellence	is of high quality. Depending on the context, this can relate to the quality of the product(s), service(s), or both. Depending on the context, this can include reliability, empathy, responsiveness, interactional quality, etc.	O, ES, T, HC
Status	makes a positive impression on others and thus leads to social acceptance	O, T, CC
Self-esteem (esteem)	positively affects the customer's attitude toward or satisfaction with oneself	O, ES
Enjoyment (play)	results in fun and pleasure	O, T
Aesthetics	is appealing. This involves the attraction of the object's design and atmospheric aspects such as layout, color, etc. This can be related to all the senses (sight, smell, touch, taste, hearing)	O
Escapism (spirituality)	allows the customer to relax and escape from reality or daily routine	O, ES
Personalization	is adapted to the individual customer	T, CC
Control	can be commanded or influenced by the customer. This can relate to the timing, content, and/or sequence of the service delivery process or outcome	T
Novelty	creates curiosity and/or satisfies a desire for knowledge (i.e. wanting to know more about it). This is only applicable for new objects (such as new technologies)	T
Relational benefits	results in a better relationship with the service provider	T, HC
Social benefits	results in a better relationship with other customers	CC
Ecological benefits (ethics)	has a positive impact on environmental well-being	O, TSR, CC
Societal benefits (ethics)	has a positive impact on societal well-being. This can involve CSR initiatives such as fair trade, community support, employee fairness, etc.	O, TSR
Negative value types	*The (perceived) extent to which the object…*	
Price	is expensive	ES, T, CC
Time	requires time to prepare, use, understand, etc.	ES
Effort	requires effort to prepare, use, understand, etc.	ES, T
Privacy risk	can result is a loss of privacy	T
Security risk	can result in security issues such as losing personal information to criminals or hacking	T
Performance risk	can result in a loss of performance: the object does not perform as expected or intended	T, CC
Financial risk	can result in a loss of money	T, CC
Physical risk	can result in health issues or injuries	T, CC
Ecological costs	has a negative impact on environmental well-being (e.g. pollution)	CC, TSR
Societal costs	has a negative impact on societal well-being. This can involve issues such as child labor, poor working conditions, etc.	TSR

Notes: O = Original value type mentioned by Holbrook; ES = update of original value type in empirical work using Holbrook's typology; T = value type related to technology; HC = value type related to human contact; CC = value type related to collaborative consumption; TSR = value type related to transformative service research

Table III.
An updated typology of customer value

(Van Belleghem, 2017), especially when related to new technologies. Furthermore, the term "escapism" is used instead of "spirituality," which is consistent with recent value research (Gallarza *et al.*, 2017) and is better aligned with business contexts.

Regarding excellence, prior studies already discerned between product and service excellence. However, the latter is often conceptualized and operationalized based on human employee behavior (Gallarza *et al.*, 2017; Willems *et al.*, 2016). Given the infusion of frontline service technologies, other aspects of service excellence should be included. For instance, some technologies such as IoT offer the potential for "proactive" service provision which entails solving the customer's problems even before the customer notices them.

Although ethics is included in Holbrook's original work (Holbrook, 1994, 1999), this value type has often been neglected in empirical studies (Gallarza *et al.*, 2017) and has been operationalized in various ways. Willems *et al.* (2016), for instance, focused on corporate social responsibility, whereas Gallarza *et al.* (2017) included environmental friendliness and transparent prices. To offer more guidance, this paper starts from the work of Sudbury-Riley and Kohlbacher (2016) on ethical consumption to discern between two types of ethical benefits: ecological and societal benefits. Ecological benefits involve positive effects on the environment, whereas societal benefits are related to CSR initiatives such as fair trade, community support or employee fairness (Sudbury-Riley and Kohlbacher, 2016).

Besides an updated version of five of Holbrook's value types, five "new" positive value types are included in the revised typology: personalization, control, novelty, relational benefits and social benefits. Personalization involves the adaptation of the service offering to the individual customer (Huang and Rust, 2017), which is especially relevant in the light of new technologies such as big data analytics, AI, IoT, and service robots. As mentioned before, there is a difference between static (i.e. based on data from other like-minded customers) and dynamic personalization (i.e. based on the individual customer's data).

Furthermore, the typology includes control which refers to the extent to which a customer can influence the service delivery process or outcome. This is especially relevant for technologies such as SSTs where the customer is in control and uses the technology to deliver the service him/herself.

Moreover, when customers are encountering completely novel experiences such as being served by a service robot or experiencing VR in a store, this can create curiosity, provide novelty, or satisfy a desire for knowledge. However, this novelty effect fades out when customers become accustomed to these new technologies (Flavian *et al.*, 2018; Loureiro *et al.*, 2018). This notion of novelty as a value type is consistent with "epistemic value" mentioned in the work of Sheth *et al.* (1991).

Relational and social benefits relate to the relationship a customer has with the firm or with other customers, respectively. Relational benefits can be linked to trust and rapport, and are mainly relevant for human interactions (Wirtz *et al.*, 2018). Social benefits are relevant in social contexts such as tourism (Gallarza and Gil-Saura, 2006), restaurants (Sánchez-Fernández *et al.*, 2009) and collaborative consumption (Benoit *et al.*, 2017).

Holbrook's typology mainly focuses on the positive side of value (i.e. the benefits) and the trade-off between benefits and costs is only implicitly included in "efficiency." Consequently, empirical work based on Holbrook's typology often includes price, time and effort as part of "efficiency" (e.g. Leroi-Werelds *et al.*, 2014; Willems *et al.*, 2016). However, Gallarza *et al.* (2017, p. 754) mention this positive bias as a main limitation of Holbrook's typology since "it does not include the research tradition of considering value as a trade-off" (see also FP2). Various authors (Cronin, 2016; Lin *et al.*, 2005; Woodruff, 1997) emphasize that value should be treated as a trade-off including both benefits and costs. Hence, the updated typology presented in this paper explicitly includes the negative side of the value trade-off (i.e. the costs). It is important to note that the negative value types are not just the opposites of the positive value types, but are distinct constructs worthy of their own investigation (Cenfetelli and Schwarz, 2011).

Based on prior value research and the advances described before, ten negative value types are proposed: price, time, effort, privacy risk, security risk, performance risk, financial risk, physical risk, ecological costs and societal costs. The most-often mentioned negative value type is price (Gallarza *et al.*, 2017) which involves the monetary sacrifice related to an object. Time and effort involve, respectively, the time and effort required (Kleijnen *et al.*, 2007). Risk relates to "the subjective expectation of a loss" (Sweeney *et al.*, 1999, p. 81) and different types of risk have been mentioned in the literature (Andreassen *et al.*, 2018; Gallarza and Gil-Saura, 2006; Kleijnen *et al.* 2007; Wirtz *et al.*, 2018): financial, performance, physical, privacy and security risk (see Table III for a definition of each type of risk).

Finally, the typology incorporates ecological and societal costs, which relate to unethical actions of the service provider such as pollution or child labor. These are not just the opposites of ecological and societal benefits, and they should be considered as separate concepts since research shows that rejecting unethical behavior is not the same as rewarding ethical behavior (Sudbury-Riley and Kohlbacher, 2016).

Guidelines for measuring customer value

Several attempts have been made to develop a scale for measuring customer value. Sweeney and Soutar (2001) developed the PERVAL; Petrick (2002) proposed the SERV-PERVAL; Mathwick *et al.* (2001) established the EVS; Gallarza *et al.* (2017) developed a scale based on Holbrook's typology. Although there is some overlap between these scales, a universally accepted scale for measuring customer value could not be proposed. This lack of a clear measurement instrument for customer value is an often-mentioned point of criticism (Cronin, 2016; Gallarza *et al.*, 2017).

However, the fact that a generally applicable scale for measuring customer value could not and cannot be developed should not come as a surprise: Customer value is inherently situation-specific (see FP5). A notable example is Sweeney and Soutar's (2001) work which started from Sheth *et al.*'s (1991) study to develop the PERVAL scale. However, Sheth *et al.* (1991) examined the value of cigarettes, whereas Sweeney and Soutar (2001) investigated the value of durable goods. The findings show that the value types relevant for durable goods differ from the ones relevant for cigarettes. As a result, the same measurement instrument cannot be used for both objects. This is nicely summarized by Parasuraman (1997, p. 160): "In view of the construct's complexity and richness, operationalizing customer value in its entirety and developing one standard scale to capture all of these nuances may pose a challenge."

In light of the above, the use of a formative measurement index is recommended. Hence, this paper proposes the "Customer Value Index" or CVI to measure customer value. The CVI is a weighted composite of the relevant positive and negative value types related to a particular object. The proposition of a CVI is in line with the conceptualization of customer value: Not only does it take into account the situational nature of the construct (i.e. FC5) by adapting the content of the index (i.e. the relevant value types) to the context under study, it also considers the multidimensional nature of customer value (FC6) by operationalizing customer value as a formative construct formed by the relevant positive and negative value types. The formative multidimensional nature of customer value has been clearly demonstrated by Lin *et al.* (2005).

The proposition of the CVI is consistent with Cronin's (2016) claim that value is a "latent"[1] variable implying that customers do not directly assess the overall value of an object, but that their value perceptions are driven by perceptions of the relevant benefits and costs of the object. However, it is important to note that, although customer value is formed by relevant benefits and costs, these should not be considered as antecedents of value. Some prior value studies (e.g. Gallarza and Gil-Saura, 2006; Kleijnen *et al.*, 2007) have measured customer value in a unidimensional way (i.e. a reflective scale assessing overall value) and have considered the value types as antecedents of this overall value construct. This is not desirable, since it violates the conceptual foundations of the construct (Lin *et al.*, 2005).

As mentioned before, the CVI includes all relevant positive and negative value types. To determine which value types are relevant, exploratory qualitative research is advisable. For instance, the laddering technique (Leroi-Werelds *et al.*, 2014; Woodruff and Gardial, 1996) can be used and (potential) customers should be interviewed until no additional value types are mentioned. Furthermore, it is desirable to include the value types that are part of the value proposition of the object. This is especially relevant for new objects (such as a new technology), because customers do not yet fully understand the benefits and costs.

It should be emphasized that content validity is of paramount importance for the CVI, since each value type is only a component of the whole, and "the whole becomes incomplete if any components are missing" (Lin *et al.*, 2005, p. 324). It is therefore essential to use a combination of exploratory qualitative research, the value proposition and the list of potential value types provided in Table III. Table III can be considered "a menu card" researchers can use to tick off relevant value types for their own study. However, given fast and continuous evolutions in business practice and academic research, this "menu card" should be updated frequently.

Guidelines for modeling customer value

Empirical value studies often use structural equation modeling (CB-SEM or PLS-SEM) to investigate customer value and its relationships with key outcomes (e.g. purchase intention, satisfaction). In general, PLS-SEM has been preferred over CB-SEM because of the formative nature of some value types (Doucé *et al.*, 2016; Leroi-Werelds *et al.*, 2014; Willems *et al.*, 2016). Although PLS-SEM is a suitable method to investigate customer value, the way customer value has been modeled differs significantly across studies. Based on the proposed CVI and recommendations provided by recent PLS-SEM literature (Hair *et al.*, 2018), this paper provides guidelines for future research. Specifically, three potential models are proposed: an aggregate model, a disaggregate model and a simplified model (see Figure 3).

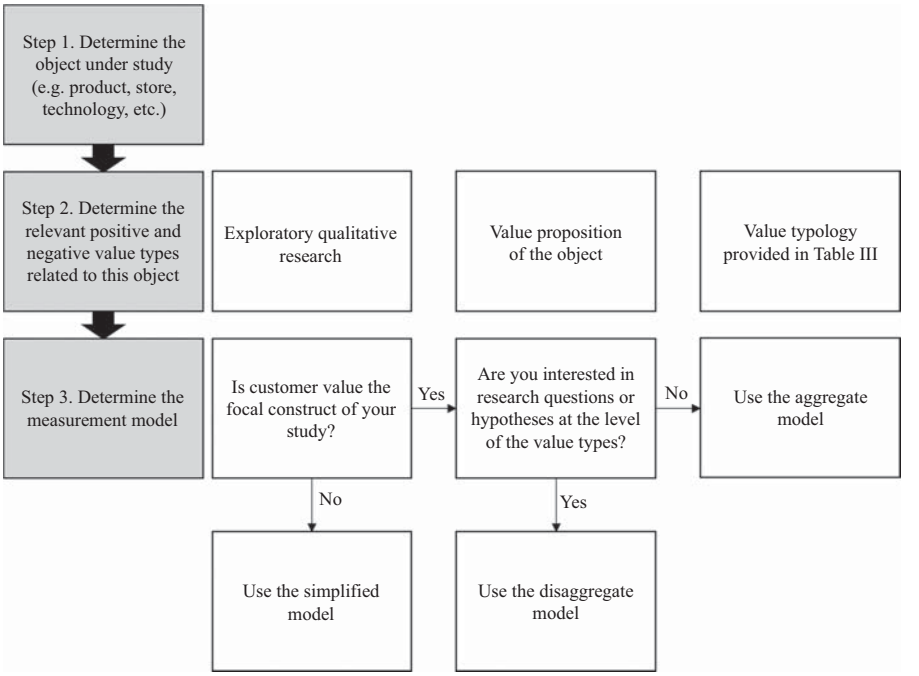

Figure 3.
Guidelines for measuring and modeling customer value in PLS-SEM

The aggregate model specifies customer value as a formative second-order construct with the value types as first-order constructs. For most value types validated scales are available (see Table AI for examples and references). These scales can be either reflective or formative in nature. For instance, status is commonly measured with a reflective scale (e.g. the scale proposed by Sweeney and Soutar, 2001); whereas aesthetics is often multifaceted requiring a formative scale (e.g. Leroi-Werelds *et al.*, 2014). Whether reflectively or formatively measured, it is important that first-order constructs are modeled correctly. Too often formative constructs are specified in a reflective way (see Table AI) which can lead to biased parameter estimates (Lin *et al.*, 2005).

From a conceptual point of view, the aggregate model is the most adequate and complete model, because it is able to best capture the complex nature of the value concept and offers – from a theoretical perspective – the most convincing structure (Lin *et al.*, 2005). However, sometimes this "ideal" model is practically infeasible. First, if the research questions or hypotheses concern relationships at the level of the value types instead of at the level of the overall value construct, a disaggregate model is advisable. For instance, Willems *et al.* (2016) examined whether customers' perceptions of various value types differ across retail formats and Pihlström and Brush (2008) tested relationships between value types and outcome variables. In these cases, the value types should be modeled as first-order constructs, without a higher-order overall value construct. This thus implies that the value types themselves are part of the structural model instead of an overall value construct. Again, the value types can have a formative or reflective measurement model.

Second, if customer value is not the focal construct of the study, a simplified model can be used. In this case, it is not suitable to use an aggregate CVI consisting of multiple value types each measured with multiple indicators, because of the length of the questionnaire. To combine the multidimensional nature of value with a rather short measurement instrument, the use of a formative measurement model where each relevant value type is covered with one item is recommended.

A research agenda

The aforementioned overview of recent advances in research and practice not only led to an updated perspective on customer value, but also resulted in promising avenues for further research. This section highlights potential research opportunities organized around six themes. A summary of specific research questions can be found in Table IV.

Application of the CVI

A first research opportunity relates to the application of the CVI – including all relevant value types – to assess the relative impact of the various value types in the pre-usage as well as post-usage phase.

A fruitful research avenue is to measure value at different levels. Most value research focuses on measuring value at the level of a product and/or service. The object under study can for instance be soft drinks (Leroi-Werelds *et al.*, 2014), mobile financial services (Kleijnen *et al.*, 2007) or supermarkets (Willems *et al.*, 2016). However, customer value can also be investigated at the level of a specific service encounter. For instance, Gallarza *et al.* (2017) asked hotel guests to evaluate their current hotel stay and Sweeney and Soutar (2001) asked respondents to recall the last time they were in a store and considered buying a durable product. Besides this rather holistic or cumulative evaluation of the value of a product or service, value research can also zoom in by measuring value at the level of a service interface, such as a human employee or a technology. Vakulenko *et al.* (2018), for instance, investigated the value of parcel lockers (i.e. a self-service tool used for the delivery and return of packages ordered online) and Hilken *et al.* (2017) investigated the value of AR for

Themes	Future research avenues
Application of the CVI	How can we measure new aspects of service excellence facilitated by new technologies (e.g. proactive service)? What is the relative impact of each value type on intention to use a technology? (i.e. pre-usage phase) What is the relative impact of each value type on satisfaction with a technology? (i.e. post-usage phase) Do risk perceptions and their relative impact on intention or satisfaction change over time? How can we measure the value of human contact? Does the scarcity of human interactions in service encounters impact the value of human contact? What are the relational benefits of interacting with humans vs technologies? In case of collaborative consumption, how can we measure the value facilitated by the peer service provider (e.g. the taxi drive) vs the value created by the platform provider (e.g. Uber)? What is the relative impact of each value type in driving collaborative consumption? (i.e. pre-purchase phase) What is the relative impact of each value type on satisfaction with collaborative consumption/the peer service provider/the platform provider? (i.e. post-purchase phase) Do customers' value perceptions of the peer service provider affect customers' value perceptions of the platform provider? If a person is a customer as well as a peer service provider, how does this affect his/her value perceptions? How can we measure value from a service ecosystem perspective? What is the value of healthcare services? What is the relative impact of various value types (e.g. service excellence, convenience, etc.)? What is the value of each of the aforementioned technologies for healthcare customers? What is the value of specific products and services for BoP customers? What is the value of each of the aforementioned technologies for BoP customers? How can we measure ecological benefits and costs? How can we measure societal benefits and costs? What is the relative impact of ecological benefits/costs on purchase intention? (i.e. pre-purchase phase) What is the relative impact of ecological benefits/costs on customer evaluations such as satisfaction and loyalty? (i.e. post-purchase phase) What is the relative impact of societal benefits/costs on purchase intention? (i.e. pre-purchase phase) What is the relative impact of societal benefits/costs on customer evaluations such as satisfaction and loyalty? (i.e. post-purchase phase) Does the relative impact of ecological costs and benefits on purchase intentions increases throughout the years (because of the increased attention for climate change)?
Relationships with key outcomes	Is the relationship between each of the value types and purchase intention linear or nonlinear? (i.e. pre-purchase phase) Is the relationship between each of the value types and satisfaction linear or nonlinear? (i.e. post-purchase phase) Is the relationship between each of the value types and loyalty linear or nonlinear? (i.e. post-purchase phase) Which combinations of value types (value recipes) lead to purchase intentions? (i.e. pre-purchase phase) Which combinations of value types (value recipes) lead to satisfaction? (i.e. post-purchase phase) Which combinations of value types (value recipes) lead to loyalty? (i.e. post-purchase phase) What is the relative impact of value types on customer engagement behaviors? Is this relationship linear or nonlinear? Which combinations of value types (value recipes) lead to customer engagement behaviors? What is the relative impact of value types on trust? Is this relationship linear or nonlinear? Which combinations of value types (value recipes) lead to trust?

Table IV.
An agenda for future customer value research

(*continued*)

Themes	Future research avenues
Relationships between value types	What are the relationships between different value types? (e.g. What is the relationship between ecological benefits and status?)
	Are these relationships linear or nonlinear?
Personal and situational factors	Which personal factors impact the value of technologies?
	Which situational factors impact the value of technologies?
	Which personal factors impact the value of human contact?
	Which situational factors impact the value of human contact?
	Which personal factors impact the value of healthcare services?
	Which situational factors impact the value of healthcare services?
	Which personal factors impact the value of products and services for BoP customers?
	Which situational factors impact the value of products and services for BoP customers?
	Which personal factors impact the value of sustainability?
	Which situational factors impact the value of sustainability?
	How can value researchers use IoT data to complement other types of data (e.g. questionnaires or interviews) to uncover personal and situational factors?
Value (co-) destruction	When and how can technologies destroy instead of create customer value?
	When and how can human contact destroy instead of create customer value?
	When and how can collaborative consumption destroy instead of create customer value?
	When and how can value be destroyed instead of created in a service ecosystem?
	What is the role of institutions in value (co-)destruction in a service ecosystem?
	When and how can value be destroyed for healthcare customers?
	When and how can value be destroyed for BoP customers?
Customer learning	How can customer learning facilitate the creation of value related to new technologies?
	How can customer learning facilitate the creation of value related to human contact?
	How can customer learning facilitate the creation of value related to collaborative consumption?
	How can customer learning facilitate the creation of value in a service ecosystem?
	How can customer learning facilitate the creation of value for healthcare customers?
	How can customer learning facilitate the creation of value for BoP customers?
	How can customer learning facilitate the creation of ecological benefits or the destruction of ecological costs?
	How can customer learning facilitate the creation of societal benefits or the destruction of societal costs?

Table IV.

online shopping. In light of aforementioned advances, future research should measure the value of technological as well as human interfaces.

Future research should also investigate customer value in collaborative consumption and service ecosystems. Prior value research mainly focused on dyadic relationships between customer and provider. However, in collaborative consumption and service ecosystems, multiple actors are part of the value creation process (Andreassen *et al.*, 2018). This has implications for measuring customer value and thus the application of the CVI. Specifically, in collaborative consumption, the service is provided by two actors: the peer service provider and the platform provider. Hence, customer value can be measured at a holistic level (i.e. the value of the Uber experience), but also for both service providers separately. For instance, Uber should be interested in the value of its online platform (e.g. Uber) but also in the value of the taxi drive (e.g. Uber driver). However, from a customer point of view, the value facilitated by each of these service providers is intertwined since "a bad experience with a single peer service provider may negatively impact a customer's willingness to use the platform provider in the future" (Benoit *et al.*, 2017, p. 223).

In a service ecosystem, this is even more complex, since there are even more actors involved in value (co-)creation. This paper calls for more research investigating value from a service ecosystem perspective, including its measurement, the value creation process, and the role of institutions in this process (Pop *et al.*, 2018).

Finally, the CVI offers interesting TSR opportunities, especially in healthcare, BoP and sustainability. In a healthcare context, measuring the value of medical services (e.g. a hospital or elderly home) can offer valuable insights. In a similar vein, the BoP offers promising research opportunities. As mentioned by Gebauer and Reynoso (2013), frameworks on value creation can be valuable for BoP research since they "can conceptualize the integration of resources among consumers, communities, and service providers at the BoP" (p. 494). More research is needed that increases our understanding of the value of objects for the BoP, which also offers relevant insights for business practice (Schaefers *et al.*, 2018).

Regarding sustainability, the value typology proposed in this paper explicitly includes societal benefits/costs and ecological benefits/costs. However, a first and critical step is the development of a valid measurement instrument that truly captures these four value types. Specifically, future research should unfold the different connotations needed to uncover the effect of the positive and negative side of sustainability. For instance, a company such as Tony's Chocolonely offers societal benefits as part of its value proposition (i.e. "100% slave free chocolate"), whereas Primark is often related to societal costs such as child labor and sweatshops. Hence, two different scales are necessary to capture both sides of the same ethical coin. Future research should test this claim and develop a valid measurement instrument. When a valid instrument is available, researchers are encouraged to include these ethical value types in their empirical work in order to investigate their relative impact on decision making (i.e. pre-purchase) as well as customer evaluations (i.e. post-purchase).

Relationships with key outcomes

When examining the relationships between value types and key outcomes, previous work (e.g. Gallarza *et al.*, 2017; Willems *et al.*, 2016) typically assumes linear and individual relationships. However, this might be more complex and future research can provide a deeper understanding of these relationships. Specifically, fruitful research avenues include the use of fuzzy-set qualitative comparative analysis (fsQCA) and the examination of nonlinearity.

fsQCA can be used to examine whether outcome variables are not influenced by individual value types, but by specific configurations of value types (Ordani *et al.*, 2014). This method offers a holistic and combinatorial perspective on the relationships between value types and key outcomes because it focuses on the "value recipes" (configurations of value types) instead of on the "ingredients" (individual value types) when relating value to key outcomes (Ordani *et al.*, 2014). Gonçalves *et al.* (2016) for instance, used a fsQCA to uncover six different combinations of value types that lead to green purchase behavior.

Nonlinearity relates to the form of the relationship between constructs. A linear relationship between a value type and an outcome is presented by a straight line (with a positive slope for positive value types and a negative slope for negative value types) when plotting the value type and outcome in a scatterplot, while a nonlinear relationship is presented by a curve (Hair *et al.*, 2018). Future studies should investigate the potential nonlinear relationships between the various value types and outcomes. For instance, future research could investigate whether – given the scarcity of time perceived by many customers – convenience is a "must-be" value type for particular services, which implies that it causes dissatisfaction when absent but has no significant impact on satisfaction when present (Streukens and Leroi-Werelds, 2017).

Besides further research on the relationships between value and key outcomes, additional research is needed with regard to the key outcomes itself. Specifically, most value research focuses on rather traditional outcomes such as intention, satisfaction or loyalty (Gallarza *et al.*, 2017). A fruitful avenue for further research is to examine other relevant and valuable outcomes such as customer engagement behaviors and trust.

Relationships between value types

Early value research already revealed the potential existence of relationships between value types. Specifically, Zeithaml (1988) and Dodds *et al.* (1991) demonstrated the positive relationship between price and quality perceptions. However, the majority of value research (see Gallarza *et al.*, 2017) focuses on inter-variable relationships (i.e. relationships between value and outcomes) and not on intra-variable relationships (i.e. relationships between value types). Hence, this paper calls for more research on this topic. For instance, based on prior work on ethical consumption (Gonçalves *et al.*, 2016; Sudbury-Riley and Kohlbacher, 2016), a positive relationship can be expected between ecological benefits and status as well as between ecological benefits and price. Future research could test these – and other – intra-variable relationships to enhance our understanding of value.

Personal and situational factors

Most prior value research assumes that value perceptions influence all customers in the same way, which is not realistic given the personal and situational nature of value (FP4 and FP5). More research is necessary on this topic.

First of all, future research should investigate the moderating effect of personal and situational characteristics on the relationships between value types and outcomes. These moderating effects are especially relevant when considering the value of new technologies. Kleijnen *et al.* (2007), for instance, investigated the role of time consciousness (e.g. the extent to which a person is aware of the passing of time) when investigating the value of mobile financial services. A recent meta-analysis of Blut *et al.* (2016) on SST acceptance revealed the importance of service types when investigating the value of SSTs. Their findings showed that the effect of enjoyment is stronger for hedonic SSTs than for utilitarian SSTs and the effect of risk is stronger for public than for private SSTs. In a similar vein, Wirtz *et al.* (2018) emphasize that the value of service robots depends on the service context (e.g. a supermarket vs a hospital).

Furthermore, value researchers are encouraged to test for so-called "unobserved heterogeneity" which denotes that "differences between two or more groups of data do not emerge *a priori* from a specific observable characteristic or combination of several characteristics but become apparent in differences in structural path coefficients" (Hair *et al.*, 2018, p. 138). In contrast to the effect of moderators, the differences between groups are not hypothesized *a priori* but result from the data analysis itself (e.g. a FIMIX-PLS analysis). Floh *et al.* (2014), for instance, discovered three "unobserved" segments (which they label "rationalists," "functionalists" and "value maximizers") when examining the relationships between value types and repurchase intentions of continuously provided services (i.e. telecom and financial services).

Moreover, IoT can be used as an additional and complementary data source to uncover personal and situational factors. With IoT "information and visibility of consumers' actual behaviors and consumption routines (buying, consuming, storing, disposing) would become increasingly available" (Ng and Wakenshaw, 2017, p. 8). By using IoT, the situational and personal nature of value can be objectively examined, since sensors provide information about situational parameters such as time, location, or temperature, and even personal information such as the customer's heartrate (Ng and Wakenshaw, 2017). This information can create additional insights above and beyond traditional methods such as questionnaires and interviews.

Finally, qualitative research can be especially useful to uncover the personal and situational nature of customer value. Three research methods that are particularly suited for this purpose are diary studies, netnography and narrative inquiry. Diary studies "permit the examination of reported events and experiences in their natural, spontaneous context, providing information complementary to that obtained by more traditional designs" (Bolger *et al.*, 2003, p. 580). According to Bolger *et al.* (2003) diary studies are especially useful to investigate personal and situational differences, which makes this method especially beneficial for value research.

Netnography is "based on an ethnographic research approach to studying and understanding consumption-related aspects of customers' lives online" (Heinonen and Medberg, 2018, p. 657). Today, most customers are constantly connected to the internet and share their opinions, experiences, and activities online. As a result, a large amount of data about value perceptions is publicly available on the internet. Such netnographic data are "rich and naturalistic" and allow researchers to accurately describe the lived realities and experiences of customers (Heinonen and Medberg, 2018).

Narrative inquiry focuses on understanding the subjective individual experience and reconstructing this experience in relation to the context (Helkkula and Pihlström, 2010). There are various techniques of narrative inquiry that can be used, but the event-based narrative inquiry technique developed by Helkkula and Pihlström (2010) is especially suitable for investigating value (Helkkula *et al.*, 2012). This technique combines the use of events, narratives and metaphors to investigate how "customers individually and collectively make sense of lived and imaginary value experiences" (Helkkula *et al.*, 2012, p. 60). This allows researchers to investigate the personal and situational nature of value. Furthermore, by using metaphors (such as a magic wand, genie servant or ideal world) researchers can trigger imaginary experiences to discover the potential value of new technologies to enhance the service experience (Helkkula *et al.*, 2012).

Value (co-)destruction

While most value research focuses on the creation of value, research on the diminishment or destruction of value is rather scarce (Echeverri and Skalen, 2011). While the former implies that the customer is better off, the latter means that the customer is worse off (Grönroos and Voima, 2013). In the literature, both value destruction (Grönroos and Voima, 2013) and co-destruction (Echeverri and Skalen, 2011) have been used to indicate the fact that value for the customer is diminished in some respect.

Although value (co-)destruction can be examined in multiple settings (see Table IV for specific research questions), it especially offers fruitful research opportunities related to frontline service technologies. For instance, a recent study by Caic *et al.* (2018) indicates that using service robots in elderly care has the ability to create but also to destroy value for customers (i.e. elderly). Specifically, service robots can destroy value by deactivating the customer; decreasing social interactions with human caregivers; and intruding the life of the customer. This value (co-)destruction potential of service interfaces such as technologies (but also humans) is a fertile avenue for further research.

Customer learning

If customers (co-)create their own value by means of resource integration, "customers must acquire the necessary skills and knowledge to be effective resource integrators" (Hibbert *et al.*, 2012, p. 247). If the customer's skills and/or knowledge are insufficient, value will be insignificant. Hence, besides offering products and services to customers, another key role of the firm is to facilitate customer learning so that customers can effectively integrate resources in order to (co-)create value (Hibbert *et al.*, 2012).

It is important to note that customer learning is customer-controlled: customers are in control of their own learning processes and select which resources best meet their learning goals and situation (Hibbert *et al.*, 2012). Hence, organizations can provide learning resources (e.g. quick start guide, workshop), but this does not automatically mean that customers will use them. A fruitful avenue fur future research is to investigate customer learning; how it can support value creation; and which learning resources are most valuable for different types of customers and different types of situations.

Conclusion

This paper contributes to the marketing and service literature by providing an update on customer value. The paper started with a synthesis of previous value studies to summarize and clarify the state of the art in an attempt to establish and standardize the FCs of customer value (Table I). After describing various advances in academic research and business practice (technologies, human contact, collaborative consumption, service ecosystems and TSR), an updated perspective on customer value was provided. Specifically, this paper revised Holbrook's value typology (Table III) and presented guidelines on how to use this typology in terms of measuring and modeling (Figure 3). Finally, a research agenda was proposed (Table IV) to guide and stimulate further value research.

Overall, this update on customer value was needed to obtain a more unified and evolved perspective on the concept which can help researchers as well as practitioners to better understand one of the most fundamental concepts in our domain. To find support for this updated perspective on customer value even before the publication of this manuscript, Morris B. Holbrook – one of the founding fathers of value research – was asked to provide his opinion on this paper. I am delighted to read his statement: "Sara Leroi-Werelds has done a magnificent job of organizing, reviewing, and extending the research on consumer value that has begun to appear in proportions resembling an onslaught in recent years. Her command of the literature inspires admiration and a touch of envy from those of us who have been laboring in this area of inquiry. More importantly, her ability to structure this material in meaningful ways and to develop hitherto unrecognized insights makes her article a major gift to the field. I am flattered that Sara has used my own typology as a point of departure. And I greatly appreciate the ways in which she has extended my formulation so as to take account of recent developments in services marketing that have appeared since I first addressed these issues many years ago. I applaud her efforts to bring these topics up to date. And I predict that her work will make a powerful and lasting contribution."

Note

1. The term "latent variable" should not be confused with the term "latent model" used by Law *et al.* (1998) as well as Lin *et al.* (2005) to refer to a reflective multidimensional construct. A latent variable is a variable that is not directly observed but inferred from manifest variables that are directly measured (Hair *et al.*, 2018).

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Appendix

Table AI.
Examples of empirical studies for each of the value types

Value type	Reference	Context	Measurement	Example item
Convenience	Mathwick *et al.* (2001)	Online fashion store	Reflective	"Shopping from XYZ is an efficient way to manage my time"
	Petrick (2002)	Restaurant and tourism	Reflective	"This X is easily bought"
	Lin *et al.* (2005)	Online shopping	Formative[a]	"It is quick and easy to complete a transaction at this website"
	Gallarza and Gil-Saura (2006)	Tourism	Formative[a]	"The information received during the trip was efficient"
	Kleijnen *et al.* (2007)	Mobile services	Reflective	"Using mobile transactions would be convenient for me"
	Pihlström and Brush (2008)	Mobile services	Reflective	"Using this mobile service makes my life easier"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"You have promptly received your cheque and paid"
	Leroi-Werelds *et al.* (2014)	4 different products	Formative	"This product is easy to use"
	Floh *et al.* (2014)	Telecom and financial	Formative[a]	"This X is user-friendly"
	Willems *et al.* (2016)	Supermarkets	Formative	"This store has convenient opening hours"
	Doucé *et al.* (2016)	Physical fashion store	Formative	"This store is accessible"
	Gallarza *et al.* (2017)	Hotels	Formative[a]	"The location of the hotel is easy to reach"
	Hilken *et al.* (2017)	AR in online shopping	Reflective	"Using the app enhances my effectiveness in online shopping"
Product excellence	Sweeney *et al.* (1999)	Electric appliance	Reflective	"This product would be reliable"
	Sweeney and Soutar (2001)	Durable goods	Reflective	"This product is well made"
	Mathwick *et al.* (2001)	Online fashion store	Reflective	"When I think of XYZ, I think of excellence"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"The quality of the food served is very good"
	Koller *et al.* (2011)	Car	Reflective	"This car is very reliable"
	Leroi-Werelds *et al.* (2014)	4 different products	Reflective	"The quality of this product is excellent"
	Willems *et al.* (2016)	Supermarkets	Formative	"This supermarket offers well-known brands"
	Doucé *et al.* (2016)	Physical fashion store	Reflective	"This store is one of the best with respect to quality clothing"
Service excellence	Sweeney *et al.* (1999)	Electric appliance	Reflective	"The employees in this store gave me prompt service"
	Petrick (2002)	Restaurant and tourism	Reflective	"This X is very reliable"
	Lin *et al.* (2005)	Online shopping	Reflective	"The company is willing to respond to customer needs"
	Gallarza and Gil-Saura (2006)	Tourism	Formative[a]	"Employees were trustworthy, believable, and honest"
	Ruiz *et al.* (2008)	Various services	Reflective	"I would say that this company provides superior service"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"The service provided by the staff was up to standard"
	Chan *et al.* (2010)	Customer participation	Formative[a]	"My participation helps me receive higher quality services"
	Floh *et al.* (2014)	Telecom and financial	Formative[a]	"This X is very reliable"
	Willems *et al.* (2016)	Supermarkets	Formative	"The personnel are courteous to customers"
	Doucé *et al.* (2016)	Fashion store	Formative	"The store's is approachable"
	Gallarza *et al.* (2017)	Hotels	Formative[a]	"The employees make the effort to understand my needs"

(*continued*)

Table AI.

Value type	Reference	Context	Measurement	Example item
Status	Sweeney and Soutar (2001)	Durable goods	Reflective	"This product would help me to feel acceptable"
	Petrick (2002)	Restaurant and tourism	Reflective	"This X has status"
	Pihlström and Brush (2008)	Mobile services	Reflective	"Using this mobile service helps me to feel accepted by others"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"Your experience in the restaurant is important to your status"
	Koller *et al.* (2011)	Car	Reflective	"Colleagues and friends envy me for my car"
	Floh *et al.* (2014)	Telecom and financial	Reflective	"This X makes an impression on other people"
	Leroi-Werelds *et al.* (2014)	4 different products	Reflective	"This product makes a good impression on others"
	Willems *et al.* (2016)	Supermarkets	Reflective	"Shopping here could improve the way I am perceived"
	Doucé *et al.* (2016)	Physical fashion store	Reflective	"Shopping at this store gives me social approval"
	Gallarza *et al.* (2017)	Hotels	Reflective	"Staying in this hotel is considered prestigious"
Self-esteem	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"Your experience in the restaurant is important to your self-esteem"
	Gallarza *et al.* (2017)	Hotels	Reflective	"Staying in this hotel increases my sense of self-worth"
Enjoyment	Sweeney and Soutar (2001)	Durable goods	Reflective	"This product would give me pleasure"
	Mathwick *et al.* (2001)	Online fashion store	Reflective	"I shop from XYZ's internet site for the pure enjoyment of it"
	Petrick (2002)	Restaurant and tourism	Reflective	"This X gives me pleasure"
	Gallarza and Gil-Saura (2006)	Tourism	Reflective	"I enjoyed my free time"
	Pihlström and Brush (2008)	Mobile services	Reflective	"Using this mobile service gives me pleasure"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"You have enjoyed your visit to this restaurant"
	Chan *et al.* (2010)	Customer participation	Formative[a]	"My participation makes the service interaction more enjoyable"
	Koller *et al.* (2011)	Car	Reflective	"To drive my car gives me pleasure"
	Leroi-Werelds *et al.* (2014)	4 different products	Reflective	"This product makes me feel good"
	Floh *et al.* (2014)	Telecom and financial	Reflective	"This X is enjoyable"
	Willems *et al.* (2016)	Supermarkets	Reflective	"Shopping here is truly a joy"
	Doucé *et al.* (2016)	Physical fashion store	Reflective	"Shopping at this store makes me feel good"
	Gallarza *et al.* (2017)	Hotels	Formative[a]	"The possible activities organized by the hotel are great fun"
	Hilken *et al.* (2017)	AR in online shopping	Reflective	"The online shopping experience with the app is enjoyable"
Aesthetics	Mathwick *et al.* (2001)	Online fashion store	Reflective	"XYZ's internet site is aesthetically appealing"
	Gallarza and Gil-Saura (2006)	Tourism	Formative[a]	"The city, its streets, buildings were beautiful"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"You find the restaurant's design and decoration attractive"
	Leroi-Werelds *et al.* (2014)	4 different products	Formative	"This product has a beautiful design"
	Willems *et al.* (2016)	Supermarkets	Formative	"The products are presented in an appealing way"
	Doucé *et al.* (2016)	Physical fashion store	Formative	"The store's layout is appealing"

(*continued*)

Table AI.

Value type	Reference	Context	Measurement	Example item
	Gallarza *et al.* (2017)	Hotels	Formative[a]	"The furnishing of the hotel is aesthetically appealing"
Escapism	Mathwick *et al.* (2001)	Online fashion store	Reflective	"Shopping from XYZ's internet site 'gets me away from it all'"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"Going to this restaurant has served as a way of temporary escape for you"
	Gallarza *et al.* (2017)	Hotels	Reflective	"This hotel helps me to experience a state of total relaxation"
Control	Kleijnen *et al.* (2007)	Mobile services	Reflective	"I have control over the transaction when using the mobile channel"
	Chan *et al.* (2010)	Customer participation	Formative[a]	"My participation helps me receive more control over the service quality"
Personalization	Lin *et al.* (2005)	Online shopping	Formative[a]	"The level of personalization at this site is about right"
	Chan *et al.* (2010)	Customer participation	Formative[a]	"My participation helps me receive more customized services"
Relational benefits	Chan *et al.* (2010)	Customer participation	Formative[a]	"My participation helps me build a better relationship with the service provider"
Social benefits	Gallarza and Gil-Saura (2006)	Tourism	Reflective	"This trip reinforced my feeling of belonging to the group"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"Your experience in the restaurant is important to your social relationships"
Novelty	Pihlström and Brush (2008)	Mobile services	Reflective	"I used this mobile service out of curiosity"
Societal	Willems *et al.* (2016)	Supermarkets	Reflective	"This store is a socially responsible company"
benefits	Doucé *et al.* (2016)	Fashion store	Reflective	"This store makes a real difference through its socially responsible actions"
	Gallarza *et al.* (2017)	Hotels	Formative[a]	"The hotel collaborates in a social project (NGO or similar)"
Ecological benefits	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"Going to this restaurant has an ethical and moral interest for you, as you consider that the products have been ecologically produced"
	Koller *et al.* (2011)	Car	Reflective	"This car is environmentally friendly"
	Gallarza *et al.* (2017)	Hotels	Formative[a]	"The hotel is friendly to the environment (laundry, cleaning bathroom, etc.)"
Price	Sweeney *et al.* (1999)	Electric appliance	Reflective	"Considering the price of the product, would you say the price is very low/high compared to a (product) with similar features?"
	Sweeney and Soutar (2001)	Durable goods	Reflective	"This product is reasonably priced" (R)
	Mathwick *et al.* (2001)	Online fashion store	Reflective	"Overall, I am happy with XYZ's prices" (R)
	Petrick (2002)	Restaurant and tourism	Reflective	"This X is fairly priced" (R)
	Lin *et al.* (2005)	Online shopping	Reflective	"You feel that the product you purchased is expensive"

(*continued*)

Table AI.

Value type	Reference	Context	Measurement	Example item
	Gallarza and Gil-Saura (2006)	Tourism	Formative[a]	"Prices at the destination were high"
	Ruiz *et al.* (2008)	Various services	Formative	"The price charged to get this company's services is high"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"In general, you are happy with the prices of this restaurant" (R)
	Koller *et al.* (2011)	Car	Reflective	"This car is fairly priced" (R)
	Floh *et al.* (2014)	Telecom and financial	Reflective	"This X is fairly priced" (R)
	Leroi-Werelds *et al.* (2014)	4 different products	Formative	"The price of this X is high"
	Willems *et al.* (2016)	Supermarkets	Formative	"The prices that this supermarket charges for its products are high"
	Doucé *et al.* (2016)	Physical fashion store	Formative	"This store's offerings are reasonably priced" (R)
	Mani and Chouk (2018)	IoT banking services	Reflective	"It think that the smart bank service will be expensive"
Time	Lin *et al.* (2005)	Online shopping	Formative[a]	"The site does not waste your time" (R)
	Gallarza and Gil-Saura (2006)	Tourism	Formative[a]	"The cost of planning and preparing the trip was very low/high"
	Ruiz *et al.* (2008)	Various services	Formative	"The time required to receive this company's services is high"
	Sánchez-Fernández *et al.* (2009)	Restaurant	Formative[a]	"The time you have waited to be seated and to order has not been excessive"
	Leroi-Werelds *et al.* (2014)	4 different products	Formative	"Starting up the DVD player requires a lot of time"
	Willems *et al.* (2016)	Supermarkets	Formative	"The waiting time at the cash registers is long"
	Doucé *et al.* (2016)	Physical fashion store	Formative	"The waiting time at the cash registers is long"
Effort	Gallarza and Gil-Saura (2006)	Tourism	Formative[a]	"The mental effort made for leaving family and friends was very low – very high"
	Kleijnen *et al.* (2007)	Mobile financial services	Reflective	"It will take a lot of effort to understand how to use mobile transactions"
	Ruiz *et al.* (2008)	Various services	Formative	"The effort I expend to receive this company's services is high"
	Leroi-Werelds *et al.* (2014)	4 different products	Formative	"The effort I expend to receive X is high"
	Hilken *et al.* (2017)	AR in online shopping	Formative[a]	"Using the online retailer's app requires little effort" (R)
	Mani and Chouk (2018)	IoT banking	Reflective	"Learning to use smart bank services will be easy for me" (R)
Privacy risk	Lin *et al.* (2005)	Online shopping	Reflective	"You feel like your privacy is protected at this site" (R)
Security risk	Kleijnen *et al.* (2007)	Mobile financial services	Reflective	"I am worried that information will be delivered to wrong persons"
	Mani and Chouk (2018)	IoT banking	Reflective	"The risk of abuse of usage information (e.g. credit card number, bank account data) is high when using smart bank services"

(*continued*)

Table AI.

Value type	Reference	Context	Measurement	Example item
Performance risk	Sweeney *et al.* (1999)	Electric appliance	Formative[a]	"There is a chance that there will be something wrong with this product or that it will not work properly"
	Kleijnen *et al.* (2007)	Mobile services	Reflective	"As I consider using mobile transactions, I worry about whether the service will really perform as well as it is supposed to"
Financial risk	Sweeney *et al.* (1999)	Electric appliance	Formative[a]	"There is a chance that I will stand to lose money either because it won't work at all or costs more than it should to maintain it"
	Kleijnen *et al.* (2007)	Mobile services	Reflective	"Using mobile transactions could involve important financial losses"
Physical risk	Gallarza and Gil-Saura (2006)	Tourism	Formative[a]	"I feared a terrorist attack during the trip"
	Mani and Chouk (2018)	IoT banking	Reflective	"The use of smart banking services involves risks to my health"

Note: [a]The original study models this scale in a reflective way, but an evaluation of the items indicates a formative measurement model is more appropriate (R) reverse coded items