

The interaction effect of self-service technology experience and facilitating conditions on co-created value: A service-dominant logic perspective

A Dissertation Presented to the Faculty of the
Conrad N. Hilton College of Hotel and Restaurant Management
University of Houston

In partial fulfillment of a Ph.D. in Hospitality Administration for the University of Houston.

Wooseok Kwon

August 2020

The interaction effect of self-service technology experience and facilitating conditions on co-created value: A service-dominant logic perspective

A Dissertation Presented to
the Faculty of the
Conrad N. Hilton College of Hotel and Restaurant Management
University of Houston

Approved by:

Dennis Reynolds, PhD
Dean, Conrad N. Hilton College

Ki-Joon Back, PhD
Associate Dean for Research and Graduate Studies

Minwoo Lee, PhD
Chair of Committee/Advisor

John Bowen, PhD
Dissertation Committee Member

Ki-Joon Back, PhD
Dissertation Committee Member

Kyung Young Lee, PhD
External Dissertation Committee Member

Wooseok Kwon
August 2020

Acknowledgments

The image of a narrow dark tunnel has represented my mind in pursuit of a degree under the COVID-19 crisis. This unprecedented event with full uncertainty has continuously hindered my progress in research.

What could finally drag me out of being stuck in the darkness is attributed to my advisors' ongoing patience and support. Dr. Minwoo Lee and Dr. Ki-Joon Back, two heroes have shared their excellent knowledge and given assistance to overcome so many difficulties through which I have gone for years. It is also my fortune that I could have great committee members. Dr. John T. Bowen brought his masterful insight into my dissertation. I will miss his warm smiles. Dr. Kyung Young Lee did not only have an in-depth knowledge but also gave me thankful encouragements.

I give my greatest thanks and regrets to Haeyong Lee, my wife, who had to struggle more than me, devoting herself to take care of a family. This dissertation would not be possible without her sacrifice. For the period of my study, my beloved girl, Jaeyi, has grown up from a baby to a four-year-old girl whose resilience was superior to her parents. She has been unbelievably able to restrain herself and never stopped giving the giggles to us while staying at home for several months.

The end of one chapter leads to the entrance of another. I am happy to be on the route. A dim light is out there. The dissertation is dedicated to my mother and father, who gave me birth, and my other mother and father, who gave my lover birth, for their unlimited stand-by.

Contents

Acknowledgments.....	3
Abstract	7
CHAPTER 1	9
Introduction.....	9
Statement of problem.....	11
Purposes and objectives.....	13
Model and hypotheses	13
Significance of study	15
Definition of terms.....	16
CHAPTER 2	18
Literature Reviews and Hypothesis Development.....	18
Value.....	18
Traditions of value discussion.....	18
Definitions of value in prior literature.....	19
The trade-off perspective of value	20
The experiential perspective of value.....	22
Tourism and hospitality research on the value.....	24
Co-created value in service-dominant logic	34
Self-service technology experience	37
Self-service technology experience and co-created value-in-use	44
Self-service technology experience and co-created value-in-interaction.....	44
Self-service technology experience and co-created value-in-involvement.....	45
Self-service technology experience and co-created value-in-experience	46
Facilitating conditions	47
Facilitating conditions between self-service technology experience and co-created value-in-use	48
Facilitating conditions between self-service technology experience and co-created value-in-interaction	49
Facilitating conditions between self-service technology experience and co-created value-in-involvement	50
Facilitating conditions between self-service technology experience and co-created value-in-experience	51
Behavioral intentions.....	51
Co-created value and behavioral intentions	52
Proposed model	55
CHAPTER 3	56
Research methodology.....	56
Research design	56
Study 1: Development of co-created value scale.....	57
Specify the domain of the construct.....	57
Generate a sample of items	58
Purify measure.....	59

Assess construct validity	60
Study 2. An empirical study for hypothesis testing.....	61
Measurement scales.....	61
Data collection.....	61
Data analysis	62
References	64
CHAPTER 4	87
Development and validation of a co-created value scale: A mixed-method approach.....	87
Abstract.....	87
Introduction	88
Literature Review	90
Co-created value.....	90
Co-created value-in-use.....	91
Co-created value-in-interaction.....	92
Co-created value-in-involvement.....	94
Co-created value-in-experience.....	95
Measures of value in previous literature.....	96
Scale development and validation	98
Specify the domain of the construct.....	100
Generate a sample of items	100
Purify measure.....	107
Assess construct validity	110
Discussions and implications.....	116
Limitations and further research.....	119
References	120
CHAPTER 5	129
The interaction effect of self-service technology experience and facilitating conditions on co-created value: A service-dominant logic perspective	129
Abstract.....	129
Introduction	130
Literature Review	131
Self-service technology experience.....	131
Co-created value.....	137
Self-service technology experience and co-created value-in-use	139
Self-service technology experience and co-created value-in-interaction.....	140
Self-service technology experience and co-created value-in-involvement.....	141
Self-service technology experience and co-created value-in-experience	142
Facilitating conditions.....	142
Facilitating conditions between self-service technology experience and co-created value-in-use	144
Facilitating conditions between self-service technology experience and co-created value-in-interaction	144

Facilitating conditions between self-service technology experience and co-created value-in-involvement	146
Facilitating conditions between self-service technology experience and co-created value-in-experience	146
Behavioral intentions.....	147
Research Method	150
Measurement scales.....	151
Data collection.....	151
Data analysis	152
Result	153
Discussions and implications.....	160
Limitations and further research.....	163
References	165
CHAPTER 6	178
Summary and Conclusion	178
Major findings and a summary of results	180
Limitations and further research.....	187
References	189
Appendices.....	192
Appendix A. Approval of Institutional Review Boards	192
Appendix B. 43 Candidate items initially generated (The final 15 items in bold.).....	195
Appendix C. Scenario manipulation.....	197

Abstract

Self-service technology (SST) (e.g., a kiosk at a hotel lobby or a touch screen tablet at a restaurant) has been increasingly introduced into the hospitality industry, which leads to changes in the way that customers gain experience of service in a service encounter. However, this change has not drawn much attention from researchers who have more focused on the determinants of customers' acceptance or intention to use SST. Thus, it is not well known what happens through the use of SST in the service encounter and what role service firms need to play during the process. SST requires the active involvement of customers to implement the service. To cast a light on understanding customers' participating role in SST and its subsequent effects, this study adopts the concept of value co-creation from the service-dominant (S-D) logic paradigm. Specifically, the study develops a theoretical framework based on the resource-based view underpinned by S-D logic to explore the relationship between SST experience and co-created value, and the moderating effect of facilitating conditions (FC).

Although value co-creation is the core concept of S-D logic that delineates how value is determined, how customers genuinely appraise the value in the sphere of the co-creation is not fully operationalized, which challenges the empirical research on S-D logic. Thus, study 1 conceptualizes co-created value from the S-D logic perspective and proposes a 15-item scale with four multidimensional constructs consisting of value-in-use, value-in-interaction, value-in-involvement, and value-in-experience. This study used a mixed-method approach to scale development. Rather than purely depending on qualitative data garnered through interviews, the study integrated rich text sources from relevant articles and online reviews into the item generation process by using text mining and machine learning techniques. A rigorously designed process checks, including reliability, convergent validity, discriminant validity, and concurrent validity, were conducted.

Study 2 investigates hypotheses that the current study proposes, by adopting the scale developed in study 1. The study conducted a scenario-based survey and analyzed 292 samples using latent moderated structural equation modeling in which an interaction effect can be tested at a construct level without the violation of normality. Findings show that SST experience is closely related to co-created value. Moreover, the interaction effect of FC on the relationship between SST experience and co-created value is statistically supported. From the resource integration point of view, the result implies that customers can incorporate multiple resources more efficiently by a high level of FC allowed even when SST experience is good enough.

This study contributes to the existing research as follows. First, it developed a new consolidated scale for co-created value, which will lead to the extended domain of empirical research on S-D logic and co-created value. Second, it shifted the view of SST from "attribute-oriented" to "customer experience-oriented," which will provide new insights into the way of understanding SST not only theoretically but also practically. For example, the availability of service employees is required, not merely for the case when customers have a challenge of using SST. For the co-created value, a seamless service design will be needed to harmonize the roles of service employees and SST. Third, the study employed advanced methodologies such as a mixed-method of item generation and the latent moderated SEM. They will contribute to the rigor of future research.

CHAPTER 1

Introduction

Since proposed in 2004, service-dominant (S-D) logic (Vargo & Lusch, 2004) has gained full recognition from academia due to its shift of a marketing paradigm toward service (Halliday, 2016; Madhavaram, Granot, & Badrinarayanan, 2014). S-D logic has immersed into various marketing research areas such as service innovation (Ordanini & Parasuraman, 2011), customer engagement (Vivek, Beatty, & Morgan, 2012), customer value in the hotel industry (FitzPatrick, Davey, Muller, & Davey, 2013), and information technology in tourism (Cabiddu, Lui, & Piccoli, 2013).

S-D logic argues that service is the fundamental basis of exchange, while goods or services are just a service delivery tool (Vargo & Lusch, 2004, 2008). Value is not embedded in products or services or exchanged by purchase but determined when customers use them (Vargo & Lusch, 2008). As firms cannot create or deliver value through the exchange, all they can do is propose resources (i.e., all things that firms provide) that contain future value potential (Chandler & Vargo, 2011). Customers integrate their own resources (e.g., knowledge, skills) into available resources provided by firms to create value ultimately. As no single person can create value without resources from others, and value creation contains a fundamental interdependence of multiple resources, S-D logic declares that value is always co-created with the collaboration of customers (Vargo & Lusch, 2018). This new conceptualization of service and value co-creation (VCC) has brought plenty of discussions in the services marketing field.

Despite increasing interest in VCC, it remains unclear how value derived from VCC can be appraised by customers (Busser & Shulga, 2018; Merz, Zarantonello, & Grappi, 2018). In line with it, Gummerus (2013) suggests that there needs to be a clear conceptualization of co-created

value (CCV) distinctive from VCC. For example, VCC is executed in the network joined by multiple actors, whereas CCV is determined by a single individual (Gummerus, 2013). Whereas previous research has proposed measures for the VCC process (Ranjan & Read, 2016) and VCC behavior (Yi & Gong, 2013), how to operationalize the actual shape of value derived from co-creation is not sufficiently addressed. As a result, research that studies CCV from the S-D logic perspective borrowed scales from the general term of customer value, which do not typically contain the concept of co-creation. To fill this research gap, the first study aims to develop the scale of CCV as the outcome perceived by customers through the S-D logic lens.

Recently, the inducement of self-service technology (SST) has been augmented in the hospitality industry. Marriot and Hilton have deployed SST kiosks in their hotel lobby to expedite check-in and check-out processes (Wei, Torres, & Hua, 2017). Restaurant chains such as Chili's and Applebee's placed e-table devices on the tables to facilitate the menu order and payment (Ahn & Seo, 2018). Hospitality firms have introduced SST with an intention to lower labor costs (Lin & Hsieh, 2011), increase efficiency (Dabholkar, 1996), minimize service failure (Kucukusta, Heung, & Hui, 2014), or promote customized service (Ahn & Seo, 2018).

Increasing SST has brought a drastic change in customer experience in the service encounter. Customers have had more choices to implement the service process (Kim & Qu, 2014). They may use SST alone instead of receiving human service or use SST with support from service employees, which should provide a different kind of impression on their experience. Thus, SST fundamentally transforms the traditional human-to-human based hospitality service encounter into the technology-supported service encounter (Kandampully, Bilgihan, & Zhang, 2016; Wang, Harris, & Patterson, 2012). This creates the need for firms to develop a strategy to engage customers by helping them take active roles in VCC through SST

(Kandampully et al., 2016). An in-depth understanding of customer experience in the SST encounter will significantly help service managers orchestrate their service design.

Despite recent adopting the experiential view to SST research (e.g., Kelly, Lawlor, & Mulvey, 2017; Wei et al., 2017), however, it is not clearly discussed how SST experience in the service encounter may impact future customer behavior. Most of the research on SST has been interested in customers' acceptance to use SST based on the technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989) or technology readiness (TR) (Parasuraman, 2000). In that sense, its focus has been naturally placed on attributes of SST or individual attitudes before customers use SST.

SST has the nature of VCC because it requires customers' active involvement in the realization of service (Scherer, Wunderlich, & Wangenheim, 2015). To cast a light on understanding customers' SST experience, this study investigates the mechanism of VCC through SST by adopting the S-D logic as a theoretical framework. Specifically, customers' role in resource integration, as mentioned above, becomes an essential part of interpreting CCV based on SST experience. Moreover, how a firm can better play a facilitating role is also explored from the resource-based view. To sum up, the first study reconceptualizes CCV and develops the scale to measure CCV in hospitality management, and the second study takes advantage of the developed concepts and scales as an anchor to examine the interaction mechanism of SST experience and facilitating conditions of resources on CCV in the context of SST.

Statement of problem

S-D logic paradigm has provided a great insight into marketing research, arguing that value is not embedded in the products or services but determined during the process of the use (Vargo &

Lusch, 2004, 2008). Many hospitality and tourism studies adopted S-D logic to delineate how value is co-created between service firms and customers (e.g., Guan, Xie, & Huan, 2018; Morosan, 2018). However, despite a lot of discussions about VCC, how customers appraise actual CCV as a result of the VCC has gained less attention from the previous literature (Leroi-Werelds, Streukens, Brady, & Swinnen, 2014). Moreover, as the operationalization of CCV is under-developed, despite the progress of conceptualization, current studies tend to borrow the conventional measures of customer value that does not contain the concept of co-creation. Therefore, the development of a new CCV scale, reflecting the S-D logic perspective should be essential to contribute to empirical studies on VCC.

In the hospitality industry, SST might be one of the best examples of services through which VCC is maximized because customers are required to participate in the service provision (Kelly et al., 2017). While previous studies have mainly focused on what aspects affect customers' intention to use the SST, the idiosyncrasy of VCC in SST is not much discussed. Further, customers gain a different kind of experience when they use SST instead of getting a service from employees (Wang et al., 2012) because they can create self-customized service independently from the human employees (Meuter, Bitner, Ostrom, & Brown, 2005). The prior focus on the determinant features for accepting SST also leaves room that this study attempts to address with the view of customers' experience and its subsequent effects.

Moreover, it is common to see customers who use SST want additional support from service employees who stand next to SST kiosks for help. This phenomenon indicates that SST does not merely replace the traditional service interaction between service employees and customers (Larivière et al., 2017). Customers often require them to come into play in the VCC process mediated by SST. Studying the role of firms' FC, including resources and employee

support for the VCC through SST, will enrich an understanding of customer behavior in the service encounter (Ostrom et al., 2015).

Purposes and objectives

The purposes of this study are to develop a scale to measure CCV in a hospitality service setting (study 1) and empirically test CCV in the context of SST by examining the relationships between SST experience and CCV, and the interaction effect of SST experience and FC in the service encounter on value (study 2). The specific objectives of the study are:

1. To develop a reliable and valid co-created value scale for the hospitality industry
2. To identify dimensions of co-created value not covered in the previous literature
3. To examine the effect of self-service technology experience on the co-created value
4. To investigate the interaction effect of facilitating conditions on the relationship between self-technology experience and co-created value.
5. To test the impact of co-created value on behavioral intentions

Model and hypotheses

The research model shown in Figure 1 demonstrates the relationship between SST experience and CCV and the interaction effects of FC that service providers support on CCV.

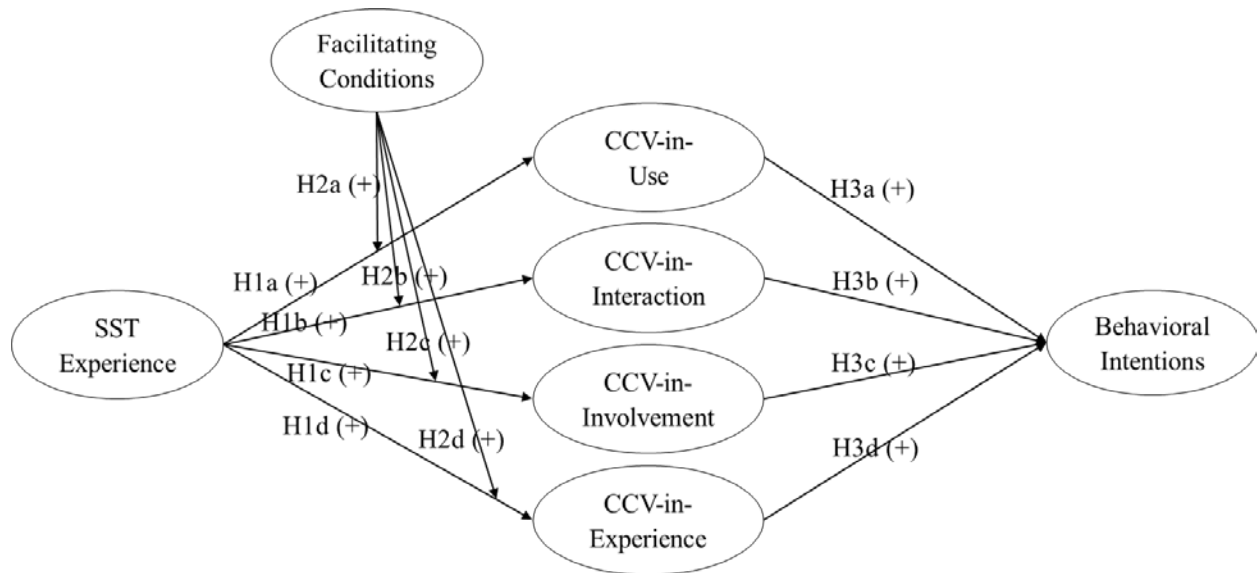


Figure 1. Conceptual framework

The objectives of this study are achieved by testing the following hypotheses:

- H1a. Self-service technology experience is positively related to co-created value-in-use.*
- H1b. Self-service technology experience is positively related to co-created value-in-interaction.*
- H1c. Self-service technology experience is positively related to co-created value-in-involvement.*
- H1d. Self-service technology experience is positively related to co-created value-in-experience.*
- H2a. The relationship between self-service experience and co-created value-in-use is stronger when facilitating conditions are high.*
- H2b. The relationship between self-service experience and co-created value-in-interaction is stronger when facilitating conditions are high.*
- H2c. The relationship between self-service experience and co-created value-in-involvement is stronger when facilitating conditions are high.*

H2d. The relationship between self-service experience and co-created value-in-experience is stronger when facilitating conditions are high.

H3a. Co-created value-in-use is positively related to behavioral intentions.

H3b. Co-created value-in-interaction is positively related to behavioral intentions.

H3c. Co-created value-in-involvement is positively related to behavioral intentions.

H3d. Co-created value-in-experience is positively related to behavioral intentions.

Significance of study

This study conceptualizes multidimensional constructs of CCV and develops the scales to measure them. By doing so, the study greatly contributes to the empirical studies on CCV and S-D logic. The newly designed constructs delineate the concept of CCV in a holistic manner, retaining the resource-based approach in S-D logic as a core theoretical foundation. Moreover, the study uses a mixed-method approach for scale development, including a thorough literature review, interviews, text mining, and quantitative analysis. Particularly, to the author's best knowledge, this study would be one of the early works that machine learning is incorporated into the scale development process. Additionally, the study conducted a methodologically robust analysis with a full of rigor. For example, it elaborated on the violation of normality in confirmatory factor analysis, and interaction effects at a latent variable level. Thus, the study introduces methodological improvement into hospitality research.

The study applies S-D logic to the empirical model to test the relationships between SST experience and CCV. By doing so, it extends the theoretical boundary of SST from intention to use SST to customer post-use experience and value. Previously, studies on SST have been limited to the domain of service firms rather than customers in that they have focused on features

of SST to inspire intention to use it. By shifting the view to what occurs in a service encounter, the study provides the chance to extend to more in-depth research from the customer side.

Practically, the study helps managers consider the role of SST as a value enabler rather than a function-provider or a cost-cutter. While customers use SST, there takes place in various interactions, including service employees' involvement. Thus, managers need to implement better service management under the SST environment by understanding the post-experience of SST. Further, they will be able to facilitate customers as a value co-creator by acknowledging the multiple interactions in the service encounter.

Definition of terms

- **Value:** value is referred to as "a customer's perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitates (or block) achieving the customer's goals and purpose in use situations" (Woodruff, 1997, p. 142).
- **Perceived value:** perceived value is defined as "the customer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml, 1988, p. 14).
- **Co-created value:** co-created value is an appraisal of meaningfulness of service through the integration of resources to realize the benefit in use in a given context (Vargo & Lusch, 2018).
- **Self-service technology:** self-service technology is defined as a technological interface through which customers are able to produce services independent of direct involvement of service employees (Meuter, Ostrom, Roundtree, & Bitner, 2000).

- **Self-service technology experience:** self-service technology experience refers to the responsive outcome as customers act, sense, and think during the use of self-service technology (Åkesson, Edvardsson, & Tronvoll, 2014; Gummerus, 2013).
- **Facilitating conditions:** facilitating conditions refer to the customers' perceptions of the availability of resources and support needed to engage in a behavior (Venkatesh, Thong, & Xu, 2012).
- **Behavioral intentions:** behavioral intentions are defined as “the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior” (Warshaw & Davis, 1985, p. 214).

CHAPTER 2

Literature Reviews and Hypothesis Development

The present chapter provides theoretical justifications for developing the scale to measure CCV and testing a model that investigates SST experience and CCV from the S-D logic perspective. Specifically, the chapter addresses a theoretical review of value and CCV from the S-D logic standpoint, followed by the review of SST experience, FC, and BI.

Value

Value is one of the most essential but complex concepts used in marketing research. Despite agreement on its significant role in customer behavior, literature has discussed the inconsistency of conceptualization and measurement. With this regard, many researchers have attempted to operationalize the concept of value, yet there is a continuous call for more explicit conceptualization and measures (Boksberger & Melsen, 2011; Leroi-Werelds et al., 2014). Not only used in the various terms (e.g., value, perceived value, customer value, consumer value, CCV), its definition and explanation were also diverse based on different theoretical approach (Boksberger & Melsen, 2011; Gallarza et al., 2017; Gordon, Dibb, Magee, Cooper, & Waitt, 2018).

Traditions of value discussion

The conceptualization of value stems from the traditions of either political economy or philosophy. While philosophy seeks for motivational perspective about how and why we determine our choices to make, the political economy provided a utilitarian perspective, which was associated with ‘use-value’ or ‘exchange value’ (Woodall, 2003). A customer perspective of value inheriting the tradition of political economy was expressed as the countable number in a

value-price-cost framework (Bowman & Ambrosini, 2000; Hoopes, Madsen, & Walker, 2003) or a customer lifetime value in customer relation management, so-called CRM research.

Meanwhile, marketing and strategy research at the early stage regarded value as something that firms should create and deliver to customers. For instance, emphasizing the value chain that encompasses the entire value transmitting process from firm to customers, Porter & Millar (1985) argued that added value to products should become an effective strategy to differentiate firms from competitors to retain a competitive advantage. The classic marketing mix represented by '4P' also inherited the view that value is embedded in products from the utilitarian perspective (Vargo & Lusch, 2004).

Definitions of value in prior literature

Due to the various conceptualization of value (Woodall, 2003), little consensus exists in definitions, dimensions, and measurement scales (Boksberger & Melsen, 2011; Gallarza et al., 2017). There exist many differential points of view regarding the definition (see Table I), but three perspectives of value concepts have been mainly discussed, that is, a trade-off perspective of value, an experiential perspective of value, and a co-created perspective of value.

Table I. A summary of the definition of value

Author	definition
Zeithaml (1988, p. 14)	“the customer's overall assessment of the utility of a product based on perceptions of what is received and what is given.”
Patterson & Spreng (1997, p. 416)	“a ratio or trade-off of total benefits received to total sacrifices.”
Holbrook (1999, p. 5)	“interactive relativistic preference experience.”
Woodruff (1997, p. 142)	“a customer's perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitates (or block) achieving the customer's goals and purpose in use situations.”
Woodall (2003, p. 21)	“any demand-side, personal perception of advantage arising out of a customer’s association with an organization’s offering, and can occur as reduction in sacrifice; presence of benefit (perceived as either attributes or outcomes); the resultant of any weighted combination of sacrifice and benefit (determined and expressed either rationally or intuitively); or an aggregation, over time, of any or all of these.”
Woodruff & Flint (2006, p. 185)	“a customer's meaning attached to product/service bundles relative to a user context.”
Vargo & Lusch (2018)	“an indication of benefit, a net exchange in the wellbeing of a customer. The contextual nature of value is experiential, holistic, and influenced by the availability, integration, and use of other combinations of resources and exchanges and interactions with other actors.”
Busser & Shulga (2018, p. 72)	“the actors’ appraisal of the meaningfulness of service by assessing what is contributed and what is realized through collaboration.”

The trade-off perspective of value

In the early literature, the value was not distinct from the attribute of quality (Sánchez-Fernández et al., 2009). For example, added value in products or services denotes a specific attribute embedded in the product. As the customer perspective was more adopted, research acknowledged customers as a subject perceiving quality on which value is based. The value was thus considered the trade-off between quality and price (Dodds & Monroe, 1985). Zeithaml

(1988) further conceptualized value distinctively from an attribute-based quality based on the means-end theory. According to the means-end theory, customers' use of products or services is to accomplish their favorable ends, and therefore, value is a cognitive representation underlying customers' needs (Khalifa, 2004). Retaining the previous trade-off perspective, Zeithaml (1988) referred value as the perceived utility of a product based on what is received (e.g., volume, high quality, convenience) in response to what is given (e.g., money, time, effort). The study, in a service setting, converted attributes of quality to an abstractive form of perceived quality and extended the monetary price to sacrifices taken by customers.

The existence of two components (i.e., “received” and “given”) that value includes raised slightly different approaches to measure the value. Some research (e.g., Agarwal & Teas, 2001; Cronin, Brady, & Hult, 2000) separately estimated perceived quality (numerator) and sacrifice (denominator) and calculated the ratio between them. Nonetheless, the general trade-off perspective has supported a unidimensional construct with multiple items, as Dodds et al. (1991) shows. Despite its ease of implementation, the unidimensional approach is known to be too simplistic to capture the complexity of value (Mathwick et al., 2001; Sánchez-Fernández et al., 2009) since it omits many possible attributes of quality; and managers find it difficult to derive actionable initiatives from results. Another critique has been sparked regarding its less attention to interaction and relationship between customers and suppliers (Khalifa, 2004) as the trade-off perspective is explicable in prompt perception rather than ongoing consumption of service experience. Meanwhile, its cognitive understanding of value was also questioned. For example, Payne, Storbacka, & Frow (2008) exerted that customers do not always rationally calculate benefits versus costs. Cronin (2016) argued that the relative benefits to price are not distinctive.

The experiential perspective of value

In contrast to the cognitive trade-off view of value, some literature (see Gallarza et al., 2017; Mathwick et al., 2001; Sánchez-Fernández et al., 2009; Sheth et al., 1991; Sweeney & Soutar, 2001) focused on the experiential consumption of products and services. Despite selective adoption, the research advocating this experiential perspective of value typically followed Holbrook's (1999) framework. He suggested three dichotomy dimensions of value (i.e., intrinsic vs. extrinsic, self-oriented vs. other-oriented, and active vs. reactive) and thereby having eight (2x2x2) categories such as efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality. Holbrook (1999) defined consumer value as “interactive, relativistic performance and experience” (p. 5). Despite different dimensions based on contexts, there were distinctively common dimensions of value repeatedly addressed, namely, functional value (Sweeney & Soutar, 2001), economic value (Payne & Holt, 1999), emotional value (Sheth et al., 1991), and social value (Sánchez-Fernández et al., 2009).

Functional value referred to “the utility derived from the perceived quality and expected performance of product” (Sweeney & Soutar, 2001, p. 211). It was created by attributes and seen as aspects of quality. Some scholars (e.g., Sheth et al., 1991) considered functional value trade-off between quality and price, similar to Zeithaml's (1988) suggestion. Still, the others (e.g., Sweeney & Soutar, 2001) maintained that price should be separate from functional value because they are separately influential. In other words, price is extrinsically motivating and benefit-oriented (Gordon et al., 2018). Economic value refers to “the utility derived from the product due to the reduction of its perceived short term and longer-term costs” (Sweeney & Soutar, 2001, p. 211). As mentioned above, economic value denotes price value and is more relevant to low-income customers (Gordon et al., 2018). Also, it is extrinsic and self-oriented and often used as

an overall dimension to encompass functional value (Gallarza et al., 2017). Emotional value refers to “the utility derived from the feelings or affective states that a product generates” (Sweeney & Soutar, 2001, p. 211). It is also known as a hedonic value that may occur in the process through which customers experience service (Mohd-Any, Winklhofer, & Ennew, 2015). Social value refers to “the utility derived from the product’s ability to enhance social self-concept” (Sweeney & Soutar, 2001, p. 211). It is related to the relationship with others, such as social recognition, reputation, or belongingness (Busser & Shulga, 2018). Social value is one of the crucial motivators that encourage customers to purchase a prestigious product (Hwang, Han, & Choo, 2015).

The tendency to rely solely on Holbrook’s typology has the following limitations. First, the dichotomies used in the typology – intrinsic vs. extrinsic, self-oriented vs. other-oriented, and active vs. reactive – are not classifiers in common. For example, Mathwick et al. (2001) discarded the category of self-oriented vs. other-oriented, and in most studies, the division of active vs. reactive often appeared void. Besides, status value and esteem value were hardly captured distinctly (Gallarza et al., 2017). Second, this stream does not adopt the recent contribution of service research about value-in-use or value co-creation and fails to scrutinize the role of interactions in service settings. In this regard, Leroi-Werelds et al. (2014) argue that direct personal interactions between customers and service providers are more important than a core provision of service offerings and should be measured as a source of value. Third, due to the complicated structure and inconsistent use of dimensions, this typology is rarely used to estimate the value as a mediator or a dependent variable.

In sum, depending on the conceptual view of value, the dimensions and measures of value are diverse. The trade-off perspective of value is usually measured by a unidimensional

scale (e.g., Dodds et al., 1991). The experiential view of value is multi-dimensional. Babin et al. (1994) divide value into utilitarian value and hedonic value. Sweeney & Soutar (2001) and Petrick (2002) develop multiple dimensions, including price, quality, and emotional dimensions. In the meantime, significant studies that advocate the experiential perspective follow Holbrook's (1999) eight dimensions of typology that contains efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality (e.g., Mathwick et al., 2001, Sánchez-Fernández, 2009, Gallarza et al., 2017).

Tourism and hospitality research on the value

While studies on value have remarkably increased in the last decade, most value studies come out of the tourism sector. In the early period, tourism research mainly shows interest in the relationships of value with the other traditional behavioral constructs such as service quality or customer satisfaction (e.g., Petrick, 2004). But the emphasis has moved to various facets of value, although the detailed dimensions are incongruent. For example, Prebensen, Kim, & Uysal (2016) examine the role of functional value, value for money, social value, novelty, and emotions to increase customer satisfaction and Carlson, Rosenberger, & Rahman (2016) add epistemic value and convenience value to the multi-dimensions. However, minimal research exists in the restaurant and foodservice context. Using the unidimensional model, Jung & Yoo (2017) examines how value mediates the effect of customers' health concern on behavioral intention. Instead, Yang & Mattila (2016) used a multi-dimensional model, including financial value, to investigate the impact of value on purchase intention in luxury restaurants.

According to Gallarza, Arteaga, Del, & Gil-saura (2015), the multidimensional model emphasizes the nature of complex value concepts. In contrast, the unidimensional model mainly

uses mean-end models and has been developed to empirically examine relationships with other values, such as service quality and satisfaction. Interestingly, when used as an outcome variable, value tends to adopt a unidimensional scale derived from Zeithaml (1988)'s trade-off perspective. On the contrary, when used as a determinant variable, it is measured with multi-dimensional scales based on experiential perspective (see table II).

With this regard, determinant variables and outcome variables of value in the previous hospitality literature show similar patterns. Specifically, the value from the trade-off perspective is in most cases seen as a mediator between “quality,” and “satisfaction” or “behavioral intentions” or both (Bonson Ponte, Carvajal-Trujillo, & Escobar-Rodríguez, 2015; Chua, Lee, Goh, & Han, 2015; Eid & El-Gohary, 2015; Gallarza et al., 2015; Kim, Woo, & Uysal, 2015; Pandža Bajs, 2015; Prebensen & Xie, 2017; Wu & Li, 2017; Yen & Teng, 2015). When it comes to value from an experiential perspective, it usually works as the determinant variable impacting “satisfaction” or “behavioral intentions.” In the meantime, despite the recent growth of studies adopting value co-creation in S-D logic, measuring value in terms of co-creation is not yet fully developed.

Further, prior research on the value in hospitality management research has acknowledged an affective aspect of value. For example, Ryu, Lee, & Kim (2012) demonstrate that the effects of both hedonic and utilitarian value on satisfaction are positive in fast-casual restaurants. Teng & Chang (2013) argue that customer affective responses are a better representative of value due to an interactive characteristic of the restaurant dining experience. In addition to this dichotomous (hedonic vs. utilitarian) dimension of value, some studies investigate more diverse experiential aspects such as functional, hedonic, symbolic, and financial

value (Yang & Mattila, 2016) or aesthetics, escapism, service excellence, food excellence, customer return on investment (Taylor, DiPietro, & So, 2018).

Most empirical studies examine value partly in the chain of Q (quality) – V (value) – S (satisfaction) or B (behavioral intentions) in their research model. Focusing on quality as an ancestor of value, Ryu et al. (2012) investigate the effect of three quality dimensions (physical environment, food, and service), and Teng and Chang (2013) examine the impact of task performance and food quality on perceived value. Meanwhile, other studies reveal the effects of value factors on satisfaction (e.g., Ryu, Han, & Kim, 2008) and behavioral intentions (e.g., Ha & Jang, 2010; Lu & Chi, 2018; Ryu, Han, & Jang, 2010; Ryu et al., 2008; Yang & Mattila, 2016). Recent research tends to have more interests in value in the specific context of restaurants, for instance, a luxury restaurant (Yang & Mattila, 2016), an organic restaurant (Lu & Chi, 2018), an ethnic restaurant (Liu, Li, DiPietro, & Levitt, 2018), a pop-up restaurant (Taylor et al., 2018), and a food truck (Shin, Kim, & Severt, 2019).

Table II. Prior studies of value in the hospitality and tourism management literature

Author	Perspective of value	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Main findings
Jensen & Hansen (2007)	Experiential	N/A	N/A	N/A	Restaurant	Interview / Grounded theory	This study reveals dimensions of value within the context of the meal experience in a la Carte restaurants. The production of negative emotions as a dimension of destructive value can also have a strong influence on satisfaction.
Nasution & Mavondo (2008)	Trade-off	Hotel class (prime hotel vs. standard hotel)	- Reputation for quality - Value for money - Prestige		Hotel	Survey / CFA and ANOVA	A survey was conducted toward two separate groups of respondents (managers and customers). The perception of value from the managers' side is very different from that from the customers' side.
Ryu, Han, & Kim (2008)	Trade-off	Restaurant image	- Satisfaction - Behavioral intentions	Perceived value	Restaurant	Survey / Regression	Overall, restaurant image in a quick restaurant is positively related to perceived value that has a positive relationship with satisfaction and behavioral intentions.
Wu & Liang (2009)	Experiential	- Restaurant environment elements - Interaction with service employees - Interaction with other customers	Satisfaction	Experiential value - Return on investment - Excellent service - Aesthetics - Escapism	Restaurant	Survey / SEM	This study investigates the relationship between customers' recognition of service encounter elements (restaurant environment, interaction with service employees, and interaction with other customers) and experiential value. Additionally, experiential value mediates the relationship between restaurant environment elements and interactions with other consumers and satisfaction.

Author	Perspective of value	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Main findings
Chen & Hu (2010)	Experiential	- Coffee quality - Service - Food and beverage - Atmosphere - Extra benefit	- Symbolic value - Functional value		Restaurant	Survey / Regression	In a coffee outlet setting, extra benefits positively relate to symbolic value and service relate to functional value. In contrast, coffee quality and food/beverage relate to both symbolic and functional value.
Ha & Jang (2010)	Experiential	- Hedonic value - Utilitarian value	Behavioral intentions	Satisfaction (Med) Familiarity (Mod)	Coffee outlet	Survey / SEM	For American customers of Korean restaurants, utilitarian value has a more substantial impact on customer satisfaction and behavioral intentions than hedonic value does. The familiarity level moderates the relationship between value (hedonic and utilitarian) and behavioral intentions.
Ryu, Han, & Jang (2010)	Experiential	- Hedonic value - Utilitarian value	Behavioral intentions	Satisfaction	Restaurant	Survey / SEM	Utilitarian value plays a more significant role in satisfaction and behavioral intentions than hedonic value does. Satisfaction mediates the relationship between value (hedonic and utilitarian) and behavioral intentions.
Ryu, Lee, & Kim (2012)	Trade-off	- Quality of the physical environment - Quality of food - Quality of service	- Perceived value - Satisfaction	Restaurant image	Restaurant	Survey / SEM	This study investigates the role of value as an outcome of quality constructs. Moreover, value impacts satisfaction and behavioral intentions.

Author	Perspective of value	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Main findings
Ha & Jang (2013)	N/A	N/A	N/A	N/A	Restaurant	Interview/content analysis	This study develops a hierarchical value map based on restaurant segments. - attributes of fast food restaurant: convenience, success, and economic value - attributes of casual dining restaurant: emotional, and belonging value - attributes of fine dining restaurant: emotion, quality life value
Teng & Chang (2013)	Experiential	- Task performance - Food quality	Perceived value	Affective response	Restaurant	Survey / SEM	This study is focused on customer affective response to formulate a value in a restaurant setting. Results show that customer affective responses mediate the relationships between task performance/food quality and perceived value.
Jeong & Jang (2015)	Experiential	- Hedonic value - Utilitarian value	- Positive attitudes - Purchasing intentions	- Message frame - Gender	Restaurant	Experimental design / ANCOVA	Customers who focus on hedonic value construe information at an abstract level, whereas those who focus on utilitarian value construe information at a concrete level. Moreover, the hedonic value is more effective when an advertising message is about long-term benefits. In contrast, the utilitarian value is more effective when the message is about the short-term benefits.

Author	Perspective of value	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Main findings
Morosan & DeFranco (2016)	Co-creation	- Novelty seeking - Habit	Perceived value of co-creation	Degree of co-creation	Hotel	SEM	By drawing on service-dominant logic, this study empirically validates the model of value co-creation in using mobile devices in hotels. The mobile commerce habit influences the degree of consumer co-creation, which in turn affects the perceived value of co-creation behavior.
Worsfold et al. (2016)	Trade-off	- Employee job satisfaction - Guest service satisfaction - Guest product satisfaction	Perception of value	N/A	Hotel	Survey / SEM	This study investigates the determinants of value from both guest and employee perspectives. Guest service satisfaction positively relates to perceptions of value, but guest product satisfaction and employee job satisfaction are not. The relationship between value and return intentions is not statistically significant.
Yang & Mattila (2016)	Experiential	- Functional value - Hedonic value - Symbolic/ Expressive value - Financial value	Purchase intention	N/A	Restaurant	Survey / Regression	In a luxury restaurant context, customers' functional, hedonic, financial have a positive relationship with purchase intention. However, symbolic value does not influence purchase intention. This result is different from the substantial influence of symbolic value revealed in luxury goods research.

Author	Perspective of value	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Main findings
Jin, Line, & Lee (2017)	Trade-off	- Health concern - Emotion - Quality of restaurant	Behavioral intentions	Perceived value	Restaurant	Survey / SEM	In a health restaurant setting, perceived value has a mediating role between health-conscious customers' perceived quality and emotion and behavioral intentions.
Dedeoglu et al. (2018)	Experiential	- Substantive staging of hotel servicescape - Communicative staging of hotel servicescape	- Revisiting intention - WOM intention	- Novelty value (Med) - Emotional value (Med) - Previous experience (Mod)	Hotel	Survey / SEM	Servicescape factors positively affect hedonic value perceptions, and hedonic value perceptions positively affect behavioral intentions. Substantive staging of servicescape is more influential for first-time tourists, whereas emotional value is more effective for revisiting tourists.
Ge, Almanza, Behnke, & Tang (2018)	Trade-off	Portion size	Perceived value	Perceived quality	Restaurant	Experimental design / ANOVA	When a consumer has a low purchase intention or perceived quality, changes in portion size do not affect the consumer's perceived value of the food. But when purchase intention or perceived quality is high, a reduced portion positively contributes to the perceived value of the food.
Guan, Xie, & Huan (2018)	Co-creation	- Customer expertise - Organizational relationship orientation - Employee adaptiveness	Perceived economic value	Customer knowledge sharing	Hotel	Hierarchical linear modeling	Customer knowledge sharing is important for value co-creation. Customer expertise, organizational relationship orientation, and employee adaptiveness have positive effects on the perceived economic value

Author	Perspective of value	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Main findings
Liu et al. (2018)	Trade-off	Perceived authenticity	Perceived value	Perceived quality	Restaurant	Survey / SEM	In mainstream restaurants, authenticity has a positive influence on perceived value. Respondents who have familiarity with or interest in Italian culture show the strong relationship between perceived authenticity and perceived value.
Lu & Chi (2018)	Experiential	Consumer involvement	- Satisfaction - Behavioral intentions	- Hedonic value - Utilitarian value	Restaurant	Survey / Regression	Involvement with organic food is a significant antecedent of perceived value (hedonic and utilitarian value) that leads to increased behavioral intentions via satisfaction.
Morosan (2018)	Co-creation	- Trust - Perceived personalization - Personal innovativeness - Need for interaction	Co-creation intentions	Involvement	Hotel	SEM	The study conceptualizes consumers' involvement as the key ancestor of co-creation intentions. Besides, it identifies various variables that influence the involvement in an m-commerce setting at hotels.
Taylor, DiPietro, & So (2018)	Experiential	- Aesthetics - Escapism - Service excellence - Food & Beverage excellence - Customer return on investment	Relationship quality	- Generation - Variety seeking - Involvement	Restaurant	Survey / SEM	Experiential value in pop-up restaurants is positively related to relationship quality, which leads to a positive influence on behavioral intentions. Furthermore, generation, variety seeking, and involvement moderate the relationships.

Author	Perspective of value	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Main findings
Wu & Yang (2018)	Experiential	- Utilitarian value - Symbolic value - Hedonic value - Relational value - Financial value	Purchase intention	N/A	Hotel	Survey / regression	Hedonic, financial, and utilitarian values are revealed to influence the purchase intention of Chinese luxury hotels, whereas symbolic and relational values are not related.
Shin, Kim, & Severt (2019)	Experiential	- Hedonic value - Utilitarian value	Intention	Attitude	Restaurant	Survey / SEM	While hedonic value influences consumers' intentions both directly and indirectly, utilitarian value impacts consumers' intention indirectly only through a positive attitude toward food trucks.

Co-created value in service-dominant logic

Vargo & Lusch (2004) announced a service-dominant (S-D) logic in which they called distinguishing goods from services (plural) a goods-dominant logic that sees that value is embedded in products to be delivered in exchange. On the contrary, S-D logic asserts that service (singular) is the fundamental basis of exchange, whereas services and goods are the conveying mechanism of the service (Vargo & Lusch, 2004, 2008). As both services and products have no difference as conveyors, the separate boundary of goods marketing and services marketing becomes blurred.

Service denotes the application of one's resources for the benefit of another party (Chandler & Vargo, 2011; Vargo, Maglio, & Akaka, 2008). S-D logic classifies categories of resources into operand resources and operant resources (Vargo & Lusch, 2004, 2008). Operand resources are resources "on which an operation or act is performed to produce an effect." In contrast, operant resources are resources "which are employed to act on operand resources" (Vargo & Lusch 2004, p. 2). Operand resources (e.g., raw materials) are physical and static, but operant resources (e.g., knowledge and skills) are informational and dynamic (Edvardsson, Tronvoll, & Gruber, 2011). Value is not embedded in goods or services but determined by customers when they use the products or services by applying their operant resources to operand resources (Vargo et al., 2008). As such, firms can only offer value proposition and value is "always" co-created with collaboration with the beneficiary, that is, customers (Gummesson, 2014; Vargo & Lusch, 2004, 2008).

VCC is the core objective of exchange, and the interactive concept of VCC is the central part of S-D logic (Hilton, Hughes, & Chalcraft, 2012; Payne et al., 2008; Vargo & Lusch, 2017). Prahalad & Ramaswamy (2004, p. 8) first defined VCC as "the joint creation of value by the company and the customer." Their arguments imply that firms need to encourage customers to

participate in the firms' value co-creation process. Before S-D logic, researchers of VCC regard the customer as the co-producer, rather than the subject of value creator (Vargo & Lusch, 2018). Therefore, this concept of co-creation is based on firms' initiatives such as the design, development, and customization of new goods and services with customers' participation (Ramaswamy & Ozcan, 2018). VCC has augmented attention from the service marketing field, including tourism and hospitality research. For instance, many studies from the tourism sector have recently explored VCC from the S-D logic point of view (e.g., Camilleri & Neuhofer, 2017; Frías Jamilena, Polo Peña, & Rodríguez Molina, 2017; Kelly et al., 2017).

Through the lens of resource integration, the concept of CCV can be bolstered by various underlying factors, that is, CCV-in-use, CCV-in-interaction, CCV-in-interaction, and CCV-in-experience. First, CCV-in-use is the most fundamental factor that distinguishes S-D logic from other value co-creation theories. The concept of value co-creation was defined first by Prahalad & Ramaswamy (2004) as "the joint creation of value by the company and the customer" (p. 8). Their view of value co-creation is that value is co-created by collaboration between firms and customers. Therefore, it is conceptually close to the value co-production of which process is led by firms. In contrast, by the notion of CCV-in-use in the S-D logic, the role of firms can be changed to the facilitator. CCV-in-use is a decisive mechanism of how customers determine value, which is directly related to the actual process of their resource integration. Thus, CCV-in-use in this study refers to customers' appraisal of the meaningfulness of using a service.

Second, CCV-in-interaction reflects the mutual aspect of CCV. VCC in the service encounter is the ongoing process of exchange. However, what is exchanged is not value. It is the resources that service employees and customers trade. Hence, interaction is needed to integrate others' resources (Vargo & Lusch, 2018). In this regard, VCC is a function of reciprocal

interaction between firms and customers (Grönroos and Voima, 2013). CCV-in-interaction entails mundane practices, accommodating relationships between firms and customers. Moreover, customers' operant resources are not used up, but rather it is reinforced by the interaction with others (Vargo & Lusch 2018). CCV-in-interaction in this study refers to customers' appraisal of meaningfulness of their interactions and communications with service employees.

Third, CCV-in-involvement pertains to the customer provision of his/her own resources (typically the operant resources) to co-create value. Vargo & Lusch (2016) stress that "operant resources are the fundamental source of strategic benefits" (p.8). Operant resources exist only in a form of potential to contribute to value. It is customers who apply operant resources to the operand resources to realize the potential (Lusch & Vargo, 2014). Although customers' deep involvement is not a mandatory cause to co-create value, how much customers can dedicate their resources for the operand resources are closely related to CCV (Vargo & Lusch, 2018). As such, CCV-in-involvement in this study refers to customers' appraisal of meaningfulness of their participation and involvement in service provision.

Fourth, CCV-in-experience contains the experiential attribute of value. Whereas CCV-in-experience shares a common with the traditional experiential perspective of value, the difference lies in that the CCV-in-experience is always in the process of resource integration. CCV-in-experience must be subjective because customers' operant resource utilization is subjective, and resource integration is contextual (Chandler & Vargo, 2011). Vargo & Lusch (2016) suggest that "value is always uniquely and phenomenologically determined by the beneficiary (customer)" (p. 8). Hence, CCV-in-experience in this study refers to customers' appraisal of the meaningfulness of their personal and subjective experience.

Self-service technology experience

SST is defined as a technological interface through which customers can produce services independent of the direct involvement of service employees (Meuter et al., 2000). For example, SST ranges check-in and check-out kiosks and room service ordering systems in a hotel context (Kucukusta et al., 2014), tablet computers in a restaurant context (Wei, Torres, & Hua, 2016), and check-in kiosks in an airline setting (Lee, Castellanos, & Choi, 2012). In recent years, hospitality firms have introduced SST that is increasingly appealing to customers (Ahn & Seo, 2018; Wei et al., 2017).

By the deployment of SST, traditional human-based “high-touch and low tech” (Bitner, Brown, & Meuter, 2000, p. 138) has been replaced or supplemented by technology-induced “low-touch and high-tech” service encounter (Shin & Perdue, 2019; Wang et al., 2012). Indeed, scholars have identified the role of SST to extend customer interaction and paid attention to the new changes in interactions driven by SST. For example, customers happen to interact with multiple entities in the service encounter through multiple channels (Ostrom et al., 2015). Larivière et al. (2017) argue that not only a traditional service employee but also SST should be considered as a vital element of the service encounter, calling it “service encounter 2.0”. Accordingly, employees must adapt to a new service delivery model, including support for the seamless service of SST (Kucukusta et al., 2014).

Previous SST literature in hospitality and tourism is grouped into two main archetypes. First, most research has focused heavily on the determinants of customers’ intention to use SST, drawing on the technology acceptance model (TAM) (Davis et al., 1989) or technology readiness (TR) (Parasuraman, 2000). For example, they attempted to examine many independent factors, including a customer characteristic factor such as technology readiness, technology anxiety, and

demographic characteristics (e.g., Lee et al., 2012; Kim, Christodoulidou, & Brewer, 2012); a customer attitudinal factor such as the need for interaction, and technology trust (e.g., Oh, Jeong, Lee, & Warnick, 2016); the feature of SST such as usefulness, ease of use, compatibility, risks, enjoyment, and customization (e.g., Ahn & Seo, 2018; Kim & Qu, 2014); or a situational factor such as a waiting line and service complexity (e.g., Kokkinou & Cranage, 2015; Oh et al., 2016).

Meanwhile, the other archetype of literature pays more attention to the consequences of using SST. For example, some scholars in their experimental research have examined actual outcomes with a comparison between SST and a service employee. Hanks, Line, & Mattila (2016) demonstrate that customers less participate in the donation program solicited by a tableside tablet than the program asked by a service employee. In their simulation study, Kokkinou & Cranage (2013) estimate total waiting time and service level when customers choose to use SST other than service employees for service. However, there are only a small number of studies that focus on customers' experiences, attitudes, and behaviors regarding SST (Hanks et al., 2016). For example, Wang, So, & Sparks (2017) show that customers' technology readiness plays a moderating role in the relationship between perceived quality and satisfaction. Wei et al. (2016) investigate how customers' evaluation of SST experience can have effects on customer commitment. Table III summarizes the existing SST literature in hospitality and tourism management.

To conceptualize the SST experience used in this study, it may be worthwhile to grasp its distinctiveness from the aggregated notion of customer experience. While studies have typically addressed total customer experience (Helkkula, 2011), customer experiences occur throughout all the consumption chain in which the customer encounters with the product (Mascarenhas, Kesavan, & Bernacchi, 2006) whether the experience is favorable or not (Gentile, Spiller, &

Noci, 2007). Indeed, good, bad, or even indifferent experiences occur whenever there is a direct or indirect interaction (Brakus, Schmitt, & Zarantonello, 2009). Carù & Cova (2003) argue that each experience at a consumption stage should be separately studied from the total customer experience. While using SST, customers gain a continuous flow of experiences, some of which are memorable (Åkesson et al., 2014), and some are not. Building on the discussion above, SST experience in this study refers to the responsive outcomes as customers act, sense, and think during the use of self-service technology (Åkesson et al., 2014; Gummerus, 2013).

Previous studies suggest that SST has evolved to provide better customer experiences. Compared to traditional self-service kiosks at restaurants, recent SST provides various services beyond food ordering, for instance, interactive information-browsing, playing games, and even listening to music (Ahn & Seo, 2018). Verhoef et al. (2009) suggest more studies to investigate SST experience that requires customers' active participation to improve understandings of change in the service encounter induced by SST. In the hospitality setting, Wei et al. (2016) examine how SST experience can be linked with customer commitment.

Table III. Prior studies of self-service technology in the hospitality and tourism management literature

Author	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Theory	Main findings
Lee, Castellanos, & Choi (2012)	Technology readiness	Intention to use kiosk	- Attitudes toward using kiosk - Attitudes toward service provider	Airlines	Survey (SEM)	TR	Technology readiness has a positive effect on the intention to use a self-service kiosk mediated by both attitudes toward a kiosk and attitudes toward a service provider.
Kim, Christodoulidou, & Brewer (2012)	- Role clarity - Ability - Extrinsic motivation - Intrinsic motivation - Gender - Education - Age - Previous experience - Need for interaction	Likelihood of using SST	N/A	Lodging	Survey (SEM)	TAM	Grounded in technology acceptance model, this study explores various factors to influence self-service kiosks in the lodging industry. Intrinsic motivation has the most substantial effect.
Kokkinou & Cranage (2013)	- Number of available resources - Number of customer arrivals - Processing speed of SST - Failure rate of SST	- Total waiting time - Service level	N/A	Hotel	Simulation and ANOVA	Queuing theory	This study tests the simulation of the whole waiting time. All IVs impact DVs. Specifically, slower SST processing speed and higher failure rate led to longer waiting times when customers have high demand.
Kucukusta, Heung, & Hui (2014)	- Relative advantage - Ease of use - Communicability - First trial - Psychological risks - Product efficiency - Product veracity - Product risk	Choice of a luxury hotel	- Gender - Age - Region - Education level	Hotel	Survey (Regression and ANOVA)	Diffusion of innovation	Different demographic and cultural factors have different effects on perceptions toward deploying SST in luxury hotels

Author	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Theory	Main findings
Beldona, Buchanan, & Miller (2014)	e-tablet vs. traditional menu	- Order information quality - Menu usability - Ordering satisfaction	Past patronage	Restaurant	Experimental design (Multivariate GLM)	N/A	the e-tablet menu is revealed to be superior to the traditional menu in terms of order information quality, menu usability, and ordering experience satisfaction.
Kim & Qu (2014)	- Perceived usefulness - Perceived ease of use - Compatibility - Perceived risks	Intention to use	- Satisfaction - Attitude toward using SST	Hotel	Survey (SEM)	TAM	This study examines the traditional IVs in TAM. Usefulness, ease of use, compatibility, and risks are all related to travelers' attitudes to using SST. Some mediation
Kokkinou & Cranage (2015)	- Waiting for SST - Waiting for employee	Selection of the SST	N/A	Hotel	Experimental design (Logistic regression)	N/A	This study tests selection of SST in the comparison of two conditions (e.g., the waiting line for SST and the waiting line for service employees). The result shows that customers are more motivated to use SST when the waiting line for the service employee becomes longer
Oh, Jeong, Lee, & Warnick (2016)	- Waiting line - Service complexity - Technology trust - Technology anxiety	Intent to use SST	- Ease of use - Usefulness	Hotel	Experimental design (SEM)	TAM	This study explores attitudinal and situational determinants of SST adoption. For the determinants, TAM is used as a structured dependent process. Perceived ease of use and perceived usefulness mediate the main effects.

Author	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Theory	Main findings
Wei, Torres, & Hua (2016)	- Evaluation of extrinsic attributes - Evaluation of intrinsic attributes	- Affective commitment - Temporal commitment - Instrumental commitment	Transcendent customer experience	Hotel and restaurant	Survey (SEM)	N/A	This study is focused on SST experience. Customers' evaluation of experience with SST positively related to their commitment. The effect is mediated by transcendent customer experience
Hanks, Line, & Mattila (2016)	Donation matching	Donation	Tablet or the presence of others (server, friends)	Restaurant	Experimental design (ANOVA)	Costly signaling	The likelihood to participate donation program is lower when the solicitation is made via tableside tablet than when it is made in the presence of others
Wang, So, & Sparks (2017)	Perceived quality of technology-enabled services	Satisfaction with technology-enabled services	Technology readiness	Airlines	Survey (PLS path modeling)	TR	Technology-enabled service quality followed by satisfaction with the service leads to not only overall satisfaction but also future behavior. Technology readiness moderates the effects in each phase.
Kelly et al. (2017)	N/A	N/A	N/A	Airlines	Qualitative (interview)	Service-dominant logic	Suggest six customer roles in SST encounters from the service-dominant logic perspective
Kaushik & Rahman (2017)	- Perceived ease of use of SST - Optimism - Innovativeness - Insecurity of SST - Discomfort of SST	Intention toward SST adoption	- Need for interaction - Perceived usefulness of SST	Tourism	Survey (SEM)	TAM, TR	The need for interaction and perceived usefulness have a mediating role between factors of technology readiness and acceptance model and intention to adopt SST.

Author	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Theory	Main findings
Wei, Torres, & Hua (2017)	- Extrinsic attributes - Intrinsic attributes	Transcendent Service Experience	Satisfaction with SST	Hotel and restaurant	Survey (Path analysis)	- TCV (Theory of Consumption Value) - EVS (Experiential Value Scale)	Both extrinsic and intrinsic experiences of SST have a positive relationship with customer satisfaction. Notably, the impact of the extrinsic experience is stronger.
Lee & Cranage (2018)	- SST failure - Employee failure - Firm policy failure	- Locus of causality - Stability - Controllability	Technology anxiety	Restaurant	Experimental design (ANOVA)	TR	Customers rated causal attributions as the lowest in an SST failure. They consider SST failure the least controllable compared to employee failure or firm policy failure.
Ahn & Seo (2018)	- Functionality - Enjoyment - Design - Customization	- Approach behavior - Avoidance behavior	- Affective state - Cognitive state	Restaurant	Survey (SEM)	Stimulus-organism-response	Utilitarian stimuli of SST influence affective and cognitive state, but hedonic stimuli of SST do not. The affective and cognitive states lead to increased positive behavior and decreased avoidance behavior.
Liu, Hung, Wang, & Wang (2019)	N/A	N/A	N/A	Hotel	Qualitative (interview)	N/A	This study explores the adoption of SST from the organization's perspective (hotel).
Shin & Perdue (2019)	N/A	N/A	N/A	N/A	Bibliometrics	N/A	The bibliometric analysis identifies foundational articles, turning point articles, and article clusters regarding SST

Self-service technology experience and co-created value-in-use

Chathoth, Altinay, Harrington, Okumus, & Chan (2013) state that “the increasing use of information technology is undoubtedly changing the nature of customers’ input into the co-creation process in ways that may influence their perception of the whole service experience (p. 15).” From the S-D logic perspective, technology is “the application of useful knowledge” applied as a form of service (Vargo & Lusch, 2017). SST device itself is an operand resource to be applied by an operant resource for the transformation into value. The SST device does not provide any value until customers apply their knowledge and skill to the device to create any benefit for themselves.

The current check-in kiosks in hotels or payment tablets in restaurants contain various aspects of functionality, which is an integral part of service providers to enhance customer experience (Ku & Chen, 2013). When the utility that customers derive from SST experience is meaningful, their SST experience will lead to producing CCV effectively. Therefore, the present study posits the following hypothesis.

H1a. Self-service technology experience is positively related to co-created value-in-use.

Self-service technology experience and co-created value-in-interaction

The acknowledgment of CCV-in-interaction captures the interactive nature of services. When a firm delivers a service to a customer, the customer is always in the same sphere of service delivery, and consumption of the service is not separable. CCV occurs through this interactive process in which firms need to provide resources that fulfill customer needs (Chathoth, Altinay, Harrington, Okumus, & Chan, 2013).

SST is an operand resources to be applied by customers' activities. Yet, at the same time, SST can be conceptualized as an operant resource, because it also applies its functionalities to other resources, that is, inputs from customers (Akaka, Vargo, & Lusch, 2013). For example, modern SST devices do not merely provide information in one direction but reciprocally communicate with customers. They respond to the customers' request; ask questions to gather information from customers; provide selective options; and even suggest new ideas to customers to co-create value. Thus, SST is a value co-creation platform that enables customers to customize their service experience and expand a way to interact with service providers (Shin & Perdue, 2019).

H1b. Self-service technology experience is positively related to co-created value-in-interaction.

Self-service technology experience and co-created value-in-involvement

According to Zhang, Gordon, Buhalis, & Ding (2018), experience mediated by technology is critical for CCV. SST, by nature, requires customers to involve in the realization of the service. SST allows customers to be empowered by taking in charges during the process of SST (Zhu, Nakata, Sivakumar, & Grewal, 2013). Moreover, customers' participation level of SST experience positively influences value perceptions (Mohd-Any, Winklhofer, & Ennew, 2015). Thus, customers' proactive role during the process of using SST followed by favorable outcomes gives self-efficacy (Meuter et al., 2003), which will facilitate to co-create value attributed to involvement. Moreover, Dong, Evans, & Zou (2008) argue that a higher level of customer participation brings positive feeling, which relates to CCV. Firms no longer solely provide value

just by providing SST service. Customers are those who are actively engaged in a better experience of using SST, which leads to CCV (Hilton, Hughes, Little, & Marandi, 2013).

Therefore, this study suggests the hypothesis below.

H1c. Self-service technology experience is positively related to co-created value-in-involvement.

Self-service technology experience and co-created value-in-experience

VCC occurs through resource integration, and customers are resource integrators within a service ecosystem. In other words, VCC comes true through customers' subjective experience, and the experience embraces the value in nature. Experience always occurs whenever there is an interaction between service providers and customers (Åkesson et al., 2014; Edvardsson et al., 2011). On the contrary, the value does not always happen with experience. It takes place only when the experience has meaningfulness to customers.

Although value is co-created, it is appraised by a particular customer (Vargo & Lusch, 2018). CCV-in-experience does not reflect a specific feature of SST. For instance, customers who do not notice the modification of the function of SST may be able to have favorable or unfavorable SST experiences (Brooks & Hestnes, 2010). In this regard, while using SST, customers gain a continuous flow of experiences, some of which can be memorable (Åkesson et al., 2014). Collier, Sherrell, Babakus, & Horky (2014) reveal that specific experience (i.e., perceived control and perceived convenience) of SST is positively related to value. Therefore, the study posits the following hypothesis.

H1d. Self-service technology experience is positively related to co-created value-in-experience.

Facilitating conditions

Facilitating conditions (FC) refers to the customers' perceptions of the availability of resources and support, including information, knowledge, and human support needed to engage in a behavior (Bobbitt & Dabholkar, 2001; Venkatesh et al. 2012). FC is conceptually related to behavioral control in the theory of planned behavior (TPB) (Ajzen, 1991) in which the availability of resources is essential to execute a behavior successfully (Chiu & Hofer, 2015; Venkatesh, Morris, Davis, & Davis, 2003). According to Collier & Sherrell (2010), when an individual has less perceived behavioral control, FC is sought. Venkatesh et al. (2003) propose a unified theory of acceptance and use of technology (UTAUT) building on previous models, including TPB and TAM. In their study, UTAUT includes FC as a critical component that directly affects the actual behavior beyond behavioral intentions alone.

FC was typically accepted as the underlying mechanism that supports employees' desire to use technology in an organization. For example, Chowdhury, Patro, Venugopal, & Israel (2014) argue that resource availability, including both physical and human resources, influences a positive attitude towards accepting new technology. In an SST setting, previous research has also pursued to reveal the relationship between FC and intention to accept technology. For example, Chiu & Hofer (2015) validate the difference of FC toward the intention to use SST, depending on the market. For instance, in their study, the impact of FC is significant in a collective, emerging market context (Taiwan), not in an individualistic, advanced market context (Austria).

Yet, in their extended version of UTAUT (so-called UTAUT2), Venkatesh et al. (2012) present FC as a determinant that impacts customer use behavior of technology. In using technology, FC also denotes the nature of collaboration in terms of resources (Brown, Dennis, & Venkatesh, 2010). Moreover, scholars argue that FC influences not only the intention to use technology, but also initial use, and post use of technology (Alapetite, Andersen, & Hertzum, 2009; Pynoo et al., 2011).

Facilitating conditions between self-service technology experience and co-created value-in-use

Since technology is naturally networked with other resources, FC is also applied to collaboration in technology use (Brown, Dennis, & Venkatesh, 2010). Because CCV is determined in use through resource integration, FC makes an impact on the VCC process. In an SST setting, customers can co-create value by integrating the resource from SST with their operant resources. In other words, they attempt to use all the available resources, including their own knowledge and information gained from other actors.

When there is a prompt, satisfactory outcome in SST experience, customers' perception of meaningfulness plays an essential role while the outcome is transformed into CCV. Customers' operant resources help in the process of forming meaningfulness. For example, customers who already have a knowledge of the menu is bound to make the VCC process more effective than those who do not. Moreover, if there is a supportive manual next to the SST device on the table or an available service employee, customers will have more chances to find the meaningfulness of the outcome of using the SST device. When more resources to facilitate the technology are available, it will lead to a positive impact on the CCV process.

H2a. The relationship between self-service experience and co-created value-in-use is stronger when facilitating conditions are high.

Facilitating conditions between self-service technology experience and co-created value-in-interaction

The advent of SST in service encounters imposed a new interdepending role of service employees (Larivière et al., 2017). For example, in coordinating with SST, service employees can provide any information not covered during the process of using SST (Ostrom et al., 2015). Moreover, noble information that SST produces often leads customers to seek assistance (Kumar & Telang, 2012). According to S-D logic, all actors in service ecosystems are involved in the value co-creation (Axiom 2 – value is co-created by multiple actors, always including the beneficiary) (Vargo et al., 2008). Thus, under the condition of triadic interactions among customers, service employees, and SST, customers who use SST become the actor who leads the collaboration and resource integration. SST and other facilitating factors become resource providers culminating in the value co-creation process.

Coordinating with SST, service employees can provide any information not covered during the process of using SST (Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015). The outcomes of experience of SST can be various, depending on the service employee assistance (Reinders, Dabholkar, & Frambach, 2008). For example, when customers try and test e-tablet devices on the table in the restaurant, they are generally limited to maximize value because unfamiliarity with SST lessens customers' capability of integrating resources (i.e., information or an expected output). Service employees' assistance facilitates the resource integration process from which customers can derive more outputs that will increase perceived benefits from

interactions. When it is easier to access resources through interactions, customers have a greater opportunity for resource integration (Lusch & Nambisan, 2015). Hence, as FC is greater, their integration process will be smoother; and thus, the outcome will have a better chance to be realized to co-create value. Therefore, the present study proposes the following hypothesis.

H2b: The relationship between self-service experience and co-created value-in-interaction is stronger when facilitating conditions are high.

Facilitating conditions between self-service technology experience and co-created value-in-involvement

CCV-in-involvement denotes customers' appraisal of meaningfulness of the result of participation and involvement in service provision. In other words, it is related to the response about the dedication of investing their own operant resources (e.g., knowledge, skills, and information). According to Im & Qu (2017), customers who have a higher level of knowledge tend to engage in VCC activities more.

Fulfillment of involvement in self-service is normally derived from good SST experience. That fulfillment may be led to CCV-in-involvement. If customers have more confidence in their own knowledge, information, and skills, then the effect of SST experience on CCV-in-involvement will be more activated. Moreover, the combination of other resources provided by firms (e.g., information, environmental support, and assistance from service employees) will facilitate customers' dedication to the VCC process (Im & Qu, 2017).

H2c. The relationship between self-service experience and co-created value-in-involvement is stronger when facilitating conditions are high.

Facilitating conditions between self-service technology experience and co-created value-in-experience

CCV is generated in various ways by the varied combination of multiple resources, and thus, its process is heterogeneous, and thus, CCV is phenomenologically determined by customers (Vargo & Lusch, 2018). As resource availability increases, the variety of resource integration will increase, which will be led to reinforce the uniqueness of CCV-in-experience. Individual customer's overall sense of SST experience is also related to their operant resources. Based on the level of their resource availability, subjectively appraised CCV-in-experience will increase. Moreover, in the process that customers appraise the meaningfulness of SST experience, their FC level will come into play. In other words, the variation is partly driven by the availability of multiple resources. If more availability is given, subjectively appraised CCV will be reinforced.

H2d. The relationship between self-service experience and co-created value-in-experience is stronger when facilitating conditions are high.

Behavioral intentions

Behavioral intentions (BI) is defined as “the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Warshaw & Davis, 1985). BI has been regarded as an essential indicator to measure customer loyalty. Customer loyalty is a crucial component of a company's long-term viability or sustainability and is, therefore, a vital goal for the consumer marketing community (Chen & Chen, 2010). To examine customer

loyalty, the previous research has generally focused on attitudinal loyalty because actual behavioral loyalty is hard to measure (Dedeoğlu, Balıkçioğlu, & Küçükergin, 2016). For example, as tourists' actual revisit to the destinations that they have already visited rarely happens, it is adequate to measure BI to the destination rather than the behavioral loyalty (Pandža Bajs, 2015). Accordingly, BI has been specified as proxies of surrogated actual behavioral loyalty (Keiningham, Cooil, Aksoy, Andreassen, & Weiner, 2007).

According to Hyun & Kang (2014), BI somewhat loosely consists of “intention to revisit,” “intention to recommend,” and “positive word of mouth.” Zeithaml, Berry, & Parasuraman (1996) suggest that BI has five indicators: saying positive things about the company, recommending the company or service to others, remaining loyal to the company, spending more with a company, and paying a price premium to the company. Suggesting three distinct phases to the intention concept: initiation, implementation, and termination, Oliver (2010) argues that the literature does not distinguish various nuances of BI. Thus, although BI is widely used to measure loyalty, it is worthwhile to know that BI does not capture the whole picture of loyalty.

Co-created value and behavioral intentions

According to Oliver (2010), BI does not have an explicit theoretical foundation because BI exists in the versatility of pre-actions from internal cognition to external commitment. Thus, BI has been explained in a pragmatic boundary when the literature investigates the relationship with other focal variables such as service quality, satisfaction, and value. Indeed, many studies have empirically tested the causal relationships of service quality, satisfaction, and value with BI (Chen & Chen, 2010; Cronin et al., 2000). At the early stage, scholars verified the positive effect

of service quality on BI, but the role of value as an ancestor has become considered more explicit because value incorporates SQ as well as sacrifice and explains the variance of BI better (Cronin, Brady, Brand, Hightower, & Shemwell, 1997).

As aforementioned, value adopted as a predictor of BI reflects the concept of perceived value from the trade-off perspective, encompassing perceived quality and sacrifices. Two distinctive arguments exist based on whether value directly or indirectly affects BI through satisfaction (Pandža Bajs, 2015). Traditionally, satisfaction was already proven to have a positive effect on BI (Oliver, 2010). Thus, it was often proposed that value influences satisfaction, which, in turn, leads to BI. However, it was also questioned whether satisfaction could sufficiently become an ancestor of BI (Pandža Bajs, 2015). The early research model of the perceived value (Dodds & Monroe, 1985; Dodds et al., 1991) suggested the direct linkage between value and BI. This view argues that value can directly influence in the absence of satisfaction (Lu & Chi, 2018).

The direct impact of value on BI has been examined in the previous hospitality and management literature, such as in a hotel setting (Han & Hwang, 2013; Oh, 1999; Wu & Yang, 2018), a restaurant setting (Ha & Jang, 2010; Lu & Chi, 2018; Yang & Mattila, 2016), a tourism setting (Chen & Chen, 2010; Pandža Bajs, 2015), and a cruise setting (Duman & Mattila, 2005). Recent literature has attempted to reveal the relationship between multiple value constructs and BI. For example, Lu & Chi (2018) show that both utilitarian value and hedonic value influence BI. Yang & Mattila (2016) and Wu & Yang (2018) demonstrate that utilitarian value, hedonic value, and financial value are related to BI, while the symbolic value is not.

Drawing on the view that satisfaction is not a full determinant of BI and value has a direct impact, this study postulates that CCV can directly contribute to BI. Compared to

perceived value limited to the overall assessment of the utility of services, CCV means the more comprehensively appraised meaningfulness with the realization of benefit (Vargo & Lusch, 2018). Thus, CCV may act as a switching barrier to moving to other service providers (Cossío-Silva, Revilla-Camacho, Vega-Vázquez, & Palacios-Florencio, 2016). Hence, customers who have experiences that they appraise as valuable are more likely to have positive BI (Ha & Jang, 2010). Congruent with the previous literature on the positive relationship between value and BI, customers' CCV can be assumed to lead to higher BI. Based on the proceeding discussion, the present study proposes the following hypothesis.

H3: Co-created value is positively related to behavioral intentions.

Proposed model

Figure 2 illustrates the proposed model. Self-service technology (SST) experience is the exogenous variable, and co-created value (CCV)-in-use, CCV-in-interaction, CCV-in-involvement, and CCV-in-experience, and behavioral intentions (BI) are the endogenous variables. Facilitating conditions (FC) are the moderating variable between SST experience and CCV-in-use, CCV-in-interaction, CCV-in-involvement, and CCV-in-experience.

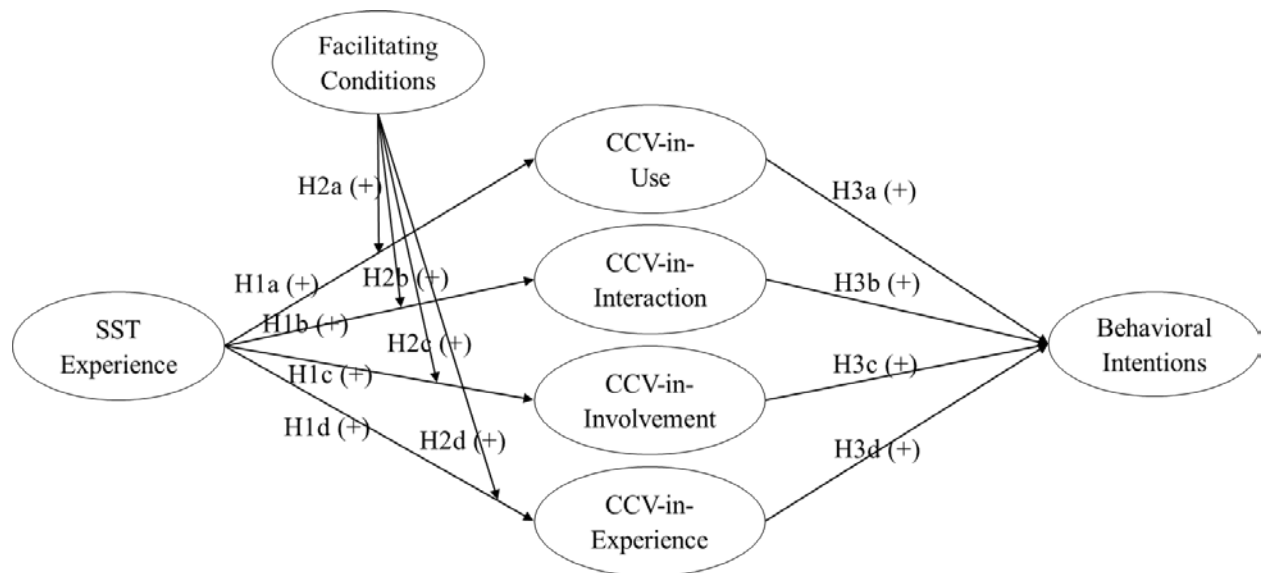


Figure 2. A proposed model

CHAPTER 3

Research methodology

Research design

The entire research consists of two studies: study 1 for CCV scale development and study 2 for the empirical study of the relationships abovementioned. For the scale development, study 1 uses a mixed-method approach, including both qualitative and quantitative methods, to explore such complicated concepts of CCV. The study adopts the procedural guidance of the scale development recommended by Churchill (1979) and So, King, & Sparks's (2014) research design. Specifically, it is comprised of three phases. First, it conducts using qualitative analysis, including a content analysis of previous literature and interviews with practitioners (phase 1). Second, it analyzes a vast amount of online customer reviews, using machine learning technology (phase 2). Third, it develops scales and performs validation of measure items (phase 3). Study 2 examines the role of SST experience in value and the interaction effect of SST experience and FC on CCV. It conducts a scenario-based survey and utilizes the scales developed in the first study to measure CCV (see Figure 3).

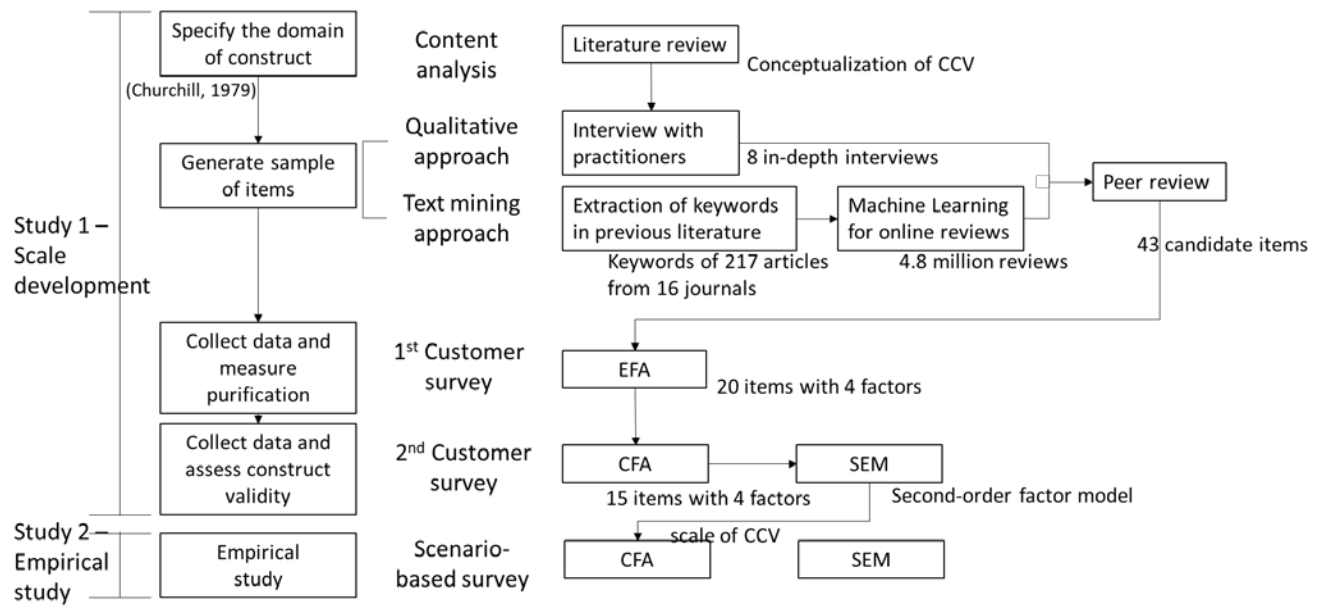


Figure 3. Procedure of methodology

Study 1: Development of co-created value scale

This study follows Churchill's (1979) framework for the scale development process, that is, (1) specify the domain of construct, (2) generate a sample of items, (3) collect data for measure purification, (4) purify measure, (5) collect data for scale validity, and (6) assess reliability and validity. For the assessment of the scale, the study adopted Anderson & Gerbing's (1988) recommendation, including exploratory factor analysis for preliminary scales and confirmatory factor analysis for dimensionality and construct validity using different samples. The study confirms concurrent validity using structural equation modeling.

Specify the domain of the construct

In this step, the research specifies the domain of the construct to include and exclude (Churchill, 1979). CCV is an appraisal of meaningfulness of service through the integration of resources

provided by multiple actors to realize the benefit in use in a given context (Vargo & Lusch, 2018). CCV in this study is limited in a physical service encounter in the hospitality industry. It involves interaction and customer notion of benefit through the process of service use, namely, resource integration, collaboration, and value-in-use based on S-D logic (Vargo & Lusch, 2004, 2008, 2016, 2017). It does not include off-site interaction, such as on-line interaction or indirect brand interaction.

Generate a sample of items

In this step, a preliminary list of CCV items was generated based on the review of S-D logic and VCC literature, interviews with experiential practitioners, and a text mining of online reviews. For the study of S-D logic and VCC literature, the research collected papers from leading journals using Web of Science. Search keywords such as “service-dominant logic,” “value co-creation,” “co-creation,” “cocreation” or “co-created value” were used for finding relevant studies. Through the literature reviews, the researcher identified how CCV was defined previously and what kind of dimensions it has (Churchill, 1979).

Interviews with experiential practitioners were conducted to gain ideas from phenomena and insights into what VCC and CCV are about (Churchill, 1979). The researcher collected eight participants who currently work or previously worked as a frontline service employee in the hotel or restaurant industry. Some examples of questions were such that: (1) Can you recall any specific event when customers expressed their good experiences? (2) What was your role in that event? How did you help them have a great experience? (3) In what circumstance do you think customers co-create value when they use your restaurant/hotel? In other words, what made them

actively participate in the value co-creation process? And (4) Please tell me what's in your mind when I mention customer CCV.

To stimulate the insights of CCV, this study analyzed online customer reviews in which they voluntarily share their experiences. The study enhanced understandings of how customers perceive CCV by using a word embedding method with Word2vec (Mikolov, Sutskever, Chen, Corrado, & Dean, 2013). This machine-learning algorithm identifies similar words and semantic similarities in contexts based on the establishment of word vectors. Since CCV is an academic word not used by generic customers, the study instead used representative keywords of CCV derived from previous literature such as: “engaging,” “involvement,” “participation,” and “interaction.” The researcher generated candidate items, and six graduate students in hospitality management further refined them. After the list and definition of the construct were presented, they discussed how well representative each item is toward the construct definition, and remove unrelated, redundant, ambiguous items.

Purify measure

An online survey was developed to reduce the set of VCC items and purify the items (1st survey) through Prolific.co (<https://www.prolific.co>), the company that has a pool of 70,000 online participants for the survey. Due to their filtering system, the participants are known to be more trustworthy than others from competitors (e.g., Amazon MTurk) (Peer, Brandimarte, Samat, & Acquisti, 2017). Samples were at the age of 18 or older. Respondents were asked to recall a hotel at which they have stayed within the last six months. Items retained from the group discussion were included in the questionnaire and evaluated using a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Following Churchill's (1979) framework, the

study conducted exploratory factor analysis (EFA) and coefficient alpha using R 3.6 to refine measure items with data collected in the previous step.

EFA identified the initial number of conceptualized dimensions of CCV and items through an iterative process with modification of items. The Kaiser-Meyer-Olkin (KMO) test was performed to verify the appropriateness of the sample, and Bartlett's test of sphericity was conducted to check the existence of multiple co-relationships between variables. The study used the oblique rotation with Oblimin. The items of which standardized factor loading is over 0.5 remained, and others were removed. Communality levels were also checked if it exceeded an overall cut-off point (.50). To ensure the reliability, the study checked if a coefficient alpha of each factor calculated by internal correlation under the factor was over .70.

Assess construct validity

A new sample of data was collected for testing construct validity (2nd survey). The survey collected samples of randomly selected customers through Prolific.Co. Samples were at the age of 18 or older. They were asked to recall a restaurant that they have visited within the last six months. Participants also responded to items of customer satisfaction and behavioral intentions for concurrent validity testing. A confirmatory factor analysis (CFA) was conducted for testing construct validity using Mplus 7.4. The study validated convergent validity by analyzing standardized factor loadings (loading > .70 and z-statistic > 1.965), composite reliability (CR > .70), and average variance extracted (AVE > .50). Discriminant validity was confirmed where each AVE of two latent variables is higher than squared correlation coefficients (Fornell & Larcker, 1981).

The study also tested concurrent validity to ensure that the scales developed can predict other constructs, such as customer satisfaction and behavioral intentions. The three-item satisfaction scale by Cronin et al. (2000) and the three-item behavioral intention scale (Namkung & Jang, 2010) were included in a questionnaire with a five-point Likert scale. After the evaluation of the convergent validity and the discriminant validity through CFA, the study analyzed the structural model in structural equation modeling (SEM) to verify the impact of CCV on satisfaction and behavioral intentions. The two-tier construct model in which CCV is the second-order variable containing sub-dimensional factors was also examined as an alternative model.

Study 2. An empirical study for hypothesis testing

Measurement scales

All the constructs are operationalized with multi-items on a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). To accommodate the study's context of SST, each construct in the model was adopted from prior research, for example, three items of self-service experience (Wei et al., 2016); 15 items with four dimensions of CCV scale developed by study 1; four items of facilitating conditions (Venkatesh et al., 2012); and three items of behavioral intentions (Namkung & Jang, 2010). To test the proposed hypotheses, this study performed structural equation modeling.

Data collection

For scale development, study 1 collected multiple data sources. First, it recruited eight interviewees who have working experience as front-line service employees. Moreover, it

collected 217 papers on S-D logic and VCC to extract keywords that would be used to explore customers perceptions about CCV. For this purpose, 4,799,240 reviews from Yelp.com were used. The study collected samples through Prolific (<http://www.prolific.co>) that is known for having many accessible participants who are trustworthy. Participants were 18 years or older age who have experienced SST in hotels or restaurants over the past six months. A total of 223 samples were used for item purification. They voluntarily participated in the survey after reading a recruitment letter, which contained the purpose of the survey, information of questionnaire, anticipation, and incentives equivalent to \$1.27. Further, new 248 samples of data were collected for item validation.

Study 2 once collected samples from Prolific to test hypotheses. Samples were at the age of 18 or older who had the experience of using self-service technology (e.g., a self-service kiosk or a self-service kiosk) at hotels or restaurants over the past six months. The pilot questionnaire was created via Qualtrics.com linked with the Prolific through which participants would be recruited. Participants were randomly assigned to one of the scenarios in which an even quota was given. After reading the scenario carefully, the participants answered questions within the imagination that they are in the scenario. A total of 1,038 samples were collected, and 899 samples were left after the elimination of incomplete data. With the elimination of outliers, finally, a total of 848 samples were used for the test.

Data analysis

This study used a mixed-method to develop items. In addition to qualitative interviews and text mining for keyword extraction from previous research, the study used the Word2vec machine learning algorithm to identify customers' perceptions related to CCV. These methods were used

to generate items. Next, the study followed Anderson & Gerbing's (1988) two-step approach. CFA was conducted to assess the measurement model that confirmed the goodness-of-fit statistics, contingent validity, and discriminant validity. Next, the analysis of the structural model was undertaken to assess the hypothesized relationships among SST experience, CCV, FC, and BI.

To test hypotheses among SST, FC on CCV, study 2 used a scenario-based approach in which participants were randomly assigned to answer the questions under the controlled one of eight conditions. To confirm participants' following scenario, manipulation checks were conducted. For the test of interaction effects, latent moderated structural equation modeling with quasi-maximum likelihood estimation (Klein & Muthén, 2007) by using Mplus 7.4. This approach exempts a non-linear issue derived from interactions of latent variables. All the regression weights between latent variables were verified by z-statistic.

References

- Agarwal, S., & Teas, R. K. (2001). Perceived value: mediating role of perceived risk. *Journal of Marketing Theory and Practice*, 9(4), 1–14.
- Ahn, J. A., & Seo, S. (2018). Consumer responses to interactive restaurant self-service technology (IRSST): The role of gadget-loving propensity. *International Journal of Hospitality Management*, 74(January), 109–121. <https://doi.org/10.1016/j.ijhm.2018.02.020>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Åkesson, M., Edvardsson, B., & Tronvoll, B. (2014). Customer experience from a self-service system perspective. *Journal of Service Management*, 25(5), 677–698. <https://doi.org/10.1108/JOSM-01-2013-0016>
- Alapetite, A., Andersen, H. B., & Hertzum, M. (2009). Acceptance of speech recognition by physicians: A survey of expectations, experiences, and social influence. *International journal of human-computer studies*, 67(1), 36-49.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103(3), 411–423.
- Babin, B. J., Darden, W. R., & Griffin, M. (1994). Work and/or fun: measuring hedonic and utilitarian shopping value. *Journal of Consumer Research*, 20(4), 644–657. <https://doi.org/DOI: http://dx.doi.org/10.1086/209376>
- Beldona, S., Buchanan, N., & L. Miller, B. (2014). Exploring the promise of e-tablet restaurant menus. *International Journal of Contemporary Hospitality Management*, 26(3), 367–382. <https://doi.org/10.1108/IJCHM-01-2013-0039>

- Bitner, M. J., Brown, S. W., & Meuter, M. L. (2000). Technology Infusion in Service Encounters. *Journal of the Academy of Marketing Science*, 28(1), 138–149.
<https://doi.org/10.1177/0092070300281013>
- Bitner, M. J., Ostrom, A. L., & Morgan, F. N. (2008). Service blueprinting: A practical technique for service innovation. *California Management Review*, 50(3), 66–94.
- Bobbitt, L. M., & Dabholkar, P. A. (2001). Integrating attitudinal theories to understand and predict use of technology-based self-service: The Internet as an illustration. *International Journal of Service Industry Management*, 12(5), 423–450.
- Boksberger, P. E., & Melsen, L. (2011). Perceived value: a critical examination of definitions, concepts and measures for the service industry. *Journal of Services Marketing*, 25(3), 229–240. <https://doi.org/10.1108/08876041111129209>
- Bonson Ponte, E., Carvajal-Trujillo, E., & Escobar-Rodríguez, T. (2015). Influence of trust and perceived value on the intention to purchase travel online: Integrating the effects of assurance on trust antecedents. *Tourism Management*, 47, 286–302.
<https://doi.org/10.1016/j.tourman.2014.10.009>
- Bowman, C., & Ambrosini, V. (2000). Value Creation Versus Value Capture: Towards a Coherent Definition of Value in Strategy. *British Journal of Management*, 11, 1–15.
- Brakus, J. J., Schmitt, B. H., & Zarantonello, L. (2009). Brand Experience: What Is It? How Is It Measured? Does It Affect Loyalty? *Journal of Marketing*, 73(3), 52–68.
<https://doi.org/10.1509/jmkg.73.3.52>
- Brown, S., Dennis, A., & Venkatesh, V. (2010). Predicting collaboration technology use: Integrating technology adoption and collaboration research. *Journal of Management Information Systems*, 27(2), 9–53. <https://doi.org/10.2753/MIS0742-1222270201>

- Busser, J. A., & Shulga, L. V. (2018). Co-created value: multidimensional scale and nomological network. *Tourism Management*, 65, 69–86. <https://doi.org/10.1016/j.tourman.2017.09.014>
- Cabiddu, F., Lui, T. W., & Piccoli, G. (2013). Managing Value Co-Creation In The Tourism Industry. *Annals of Tourism Research*, 42, 86–107.
<https://doi.org/10.1016/j.annals.2013.01.001>
- Camilleri, J., & Neuhofer, B. (2017). Value co-creation and co-destruction in the Airbnb sharing economy. *International Journal of Contemporary Hospitality Management*, 29(9, SI), 2322–2340. <https://doi.org/10.1108/IJCHM-09-2016-0492>
- Carlson, J., Rosenberger, P. J., & Rahman, M. M. (2016). A hierarchical model of perceived value of group-oriented travel experiences to major events and its influences on satisfaction and future group-travel intentions. *Journal of Travel and Tourism Marketing*, 33(9), 1251–1267. <https://doi.org/10.1080/10548408.2015.1117407>
- Carù, A., & Cova, B. (2003). Revisiting consumption experience A more humble but complete view of the concept. *Marketing Theory*, 3(2), 267–286.
<http://journals.sagepub.com/doi/pdf/10.1177/14705931030032004>
- Chandler, J. D., & Vargo, S. L. (2011). Contextualization and value-in-context: How context frames exchange. *Marketing Theory*, 11(1), 35–49.
<https://doi.org/10.1177/1470593110393713>
- Chathoth, P., Altinay, L., Harrington, R. J., Okumus, F., & Chan, E. S. W. (2013). Co-production versus co-creation: a process based continuum in the hotel service context. *International Journal of Hospitality Management*, 32(1), 11–20.
<https://doi.org/10.1016/j.ijhm.2012.03.009>

- Chen, C., & Chen, F. (2010). Experience quality , perceived value , satisfaction and behavioral intentions for heritage tourists. *Tourism Management*, 31(1), 29–35.
<https://doi.org/10.1016/j.tourman.2009.02.008>
- Chen, P. T., & Hu, H. H. (2010). The effect of relational benefits on perceived value in relation to customer loyalty: An empirical study in the Australian coffee outlets industry. *International Journal of Hospitality Management*, 29(3), 405–412.
<https://doi.org/10.1016/j.ijhm.2009.09.006>
- Chiu, Y.-T. H., & Hofer, K. M. (2015). Service innovation and usage intention: a cross-market analysis. *Journal of Service Management*, 26(3), 516–538. <https://doi.org/10.1108/JOSM-10-2014-0274>
- Chowdhury, I. R., Patro, S., Venugopal, P., & Israel, D. (2014). A study on consumer adoption of technology-facilitated services. *Journal of Services Marketing*, 28(6), 471–483.
<https://doi.org/10.1108/JSM-04-2013-0095>
- Chua, B., Lee, S., Goh, B., & Han, H. (2015). Impacts of cruise service quality and price on vacationers ' cruise experience: Moderating role of price sensitivity. *International Journal of Hospitality Management*, 44, 131–145. <https://doi.org/10.1016/j.ijhm.2014.10.012>
- Churchill, G. A. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research*, 16(1), 64. <https://doi.org/10.2307/3150876>
- Collier, J. E., & Sherrell, D. L. (2010). Examining the influence of control and convenience in a self-service setting. *Journal of the Academy of Marketing Science*, 38(4), 490–509.
<https://doi.org/10.1007/s11747-009-0179-4>

- Collier, J. E., Sherrell, D. L., Babakus, E., & Horky, A. B. (2014). Understanding the differences of public and private self-service technology. *Journal of Services Marketing*, 28(1), 60–70. <https://doi.org/10.1108/JSM-04-2012-0071>
- Cossío-Silva, F. J., Revilla-Camacho, M. Á., Vega-Vázquez, M., & Palacios-Florencio, B. (2016). Value co-creation and customer loyalty. *Journal of Business Research*, 69(5). <https://doi.org/10.1016/j.jbusres.2015.10.028>
- Cronin, J. J. (2016). Retrospective: a cross-sectional test of the effect and conceptualization of service value revisited. *Journal of Services Marketing*, 30(3), 261–265. <https://doi.org/10.1108/JSM-11-2015-0328>
- Cronin, J. J., Brady, M. K., Brand, R. R., Hightower, R., & Shemwell, D. J. (1997). A cross-sectional test of the effect and conceptualization of service value. *Journal of Services Marketing*, 11(6), 375–391. <https://doi.org/10.1108/08876049710187482>
- Cronin, J. J., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), 193–218. [https://doi.org/10.1016/S0022-4359\(00\)00028-2](https://doi.org/10.1016/S0022-4359(00)00028-2)
- Dabholkar, P. A. (1996). Consumer evaluations of new technology-based self-service options: An investigation of alternative models of service quality. *International Journal of Research in Marketing*, 13(1), 29–51. [https://doi.org/10.1016/0167-8116\(95\)00027-5](https://doi.org/10.1016/0167-8116(95)00027-5)
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: a Comparison of Two Theoretical Models. *Management Science*, 35(8), 982–1003. <https://doi.org/http://dx.doi.org/10.1287/mnsc.35.8.982>

- Dedeoğlu, B. B., Balıkcıoğlu, S., & Küçükergin, K. G. (2016). The Role of Tourists' Value Perceptions in Behavioral Intentions: The Moderating Effect of Gender. *Journal of Travel and Tourism Marketing*, 33(4), 513–534. <https://doi.org/10.1080/10548408.2015.1064062>
- Dodds, W. B., & Monroe, K. B. (1985). The effect of brand and price information on subjective product evaluations. *Advances in Consumer Research*, 12, 85–90.
- Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. *Journal of Marketing Research*, 28, 307–319.
- Duman, T., & Mattila, A. S. (2005). The role of affective factors on perceived cruise vacation value. *Tourism Management*, 26(3), 311–323. <https://doi.org/10.1016/j.tourman.2003.11.014>
- Edvardsson, B., Ng, G., Min, C. Z., Firth, R., & Yi, D. (2011). Does service-dominant design result in a better service system? *Journal of Service Management*, 22(4), 540–556. <https://doi.org/10.1108/09564231111155114>
- Edvardsson, B., Tronvoll, B., & Gruber, T. (2011). Expanding understanding of service exchange and value co-creation: a social construction approach. *Journal of the Academy of Marketing Science*, 39(2), 327–339. <https://doi.org/10.1007/s11747-010-0200-y>
- Eid, R., & El-Gohary, H. (2015). Muslim Tourist Perceived Value in the Hospitality and Tourism Industry. *Journal of Travel Research*, 54(6), 774–787. <https://doi.org/10.1177/0047287514532367>
- FitzPatrick, M., Davey, J., Muller, L., & Davey, H. (2013). Value-creating assets in tourism management: Applying marketing's service-dominant logic in the hotel industry. *Tourism Management*, 36, 86–98. <https://doi.org/10.1016/j.tourman.2012.11.009>

- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39–50.
- Frías Jamilena, D. M., Polo Peña, A. I., & Rodríguez Molina, M. Á. (2017). The Effect of Value-Creation on Consumer-Based Destination Brand Equity. *Journal of Travel Research*, 56(8), 1011–1031. <https://doi.org/10.1177/0047287516663650>
- Gallarza, M. G., Arteaga, F., Del Chiappa, G., Gil-Saura, I., & Holbrook, M. B. (2017). A multidimensional service-value scale based on Holbrook's typology of customer value. *Journal of Service Management*, 28(4), 724–762. <https://doi.org/10.1108/JOSM-06-2016-0166>
- Gallarza, M. G., Arteaga, F., Del, G., & Gil-saura, I. (2015). Value dimensions in consumers' experience: Combining the intra- and inter-variable approaches in the hospitality sector. *International Journal of Hospitality Management*, 47, 140–150. <https://doi.org/10.1016/j.ijhm.2015.03.007>
- Ge, L., Almanza, B., Behnke, C., & Tang, C. H. (Hugo). (2018). Will reduced portion size compromise restaurant customer's value perception? *International Journal of Hospitality Management*, 70, 130–138. <https://doi.org/10.1016/j.ijhm.2017.10.026>
- Gentile, C., Spiller, N., & Noci, G. (2007). How to Sustain the Customer Experience:. An Overview of Experience Components that Co-create Value With the Customer. *European Management Journal*, 25(5), 395–410. <https://doi.org/10.1016/j.emj.2007.08.005>
- Gordon, R., Dibb, S., Magee, C., Cooper, P., & Waitt, G. (2018). Empirically testing the concept of value-in-behavior and its relevance for social marketing. *Journal of Business Research*, 82(November 2016), 56–67. <https://doi.org/10.1016/j.jbusres.2017.08.035>

- Guan, X. H., Xie, L., & Huan, T. C. (2018). Customer knowledge sharing, creativity and value co-creation: A triad model of hotels, corporate sales employees and their customers. *International Journal of Contemporary Hospitality Management*, 30(2), 961–979. <https://doi.org/10.1108/IJCHM-09-2016-0539>
- Gummerus, J. (2013). Value creation processes and value outcomes in marketing theory: strangers or siblings? *Marketing Theory*, 13(1), 19–46. <https://doi.org/10.1177/1470593112467267>
- Gummesson, E. (2014). Commentary on “The role of innovation in driving the economy: Lessons from the global financial crisis”. *Journal of Business Research*, 67(1), 2743–2750. <https://doi.org/10.1016/j.jbusres.2013.03.025>
- Ha, J., & Jang, S. C. (2010). Perceived values, satisfaction, and behavioral intentions: the role of familiarity in Korean restaurants. *International Journal of Hospitality Management*, 29(1), 2–13. <https://doi.org/10.1016/j.ijhm.2009.03.009>
- Ha, J., & Jang, S. C. (2013). Attributes, consequences, and consumer values: a means-end chain approach across restaurant segments. *International Journal of Contemporary Hospitality*, 25(3), 383–409. <https://doi.org/10.1108/09596111311311035>
- Halliday, S. V. (2016). User-generated content about brands: understanding its creators and consumers. *Journal of Business Research*, 69(1), 137–144. <https://doi.org/10.1016/j.jbusres.2015.07.027>
- Han, H., & Hwang, J. (2013). Multi-dimensions of the perceived benefits in a medical hotel and their roles in international travelers’ decision-making process. *International Journal of Hospitality Management*, 35, 100–108. <https://doi.org/10.1016/j.ijhm.2013.05.011>

- Hanks, L., Line, N. D., & Mattila, A. S. (2016). The Impact of Self-Service Technology and the Presence of Others on Cause-Related Marketing Programs in Restaurants. *Journal of Hospitality Marketing and Management*, 25(5), 547–562.
<https://doi.org/10.1080/19368623.2015.1046536>
- Helkkula, A. (2011). Characterising the concept of service experience. *Journal of Service Management*, 22(3), 367–389. <https://doi.org/10.1108/09564231111136872>
- Hilton, T., Hughes, T., & Chalcraft, D. (2012). Service co-creation and value realisation. *Journal of Marketing Management*, 28(13–14), 1504–1519.
<https://doi.org/10.1080/0267257X.2012.736874>
- Hilton, T., Hughes, T., Little, E., & Marandi, E. (2013). Adopting self-service technology to do more with less. *Journal of Services Marketing*, 27(1), 3–12.
<https://doi.org/10.1108/08876041311296338>
- Holbrook, M. B. (1999). *Consumer value: A framework for analysis and research*. London: Routledge.
- Hoopes, D. G., Madsen, T. L., & Walker, G. (2003). Guest Editors' Introduction to the Special Issue: Why Is There a Resource-Based View? Toward a Theory of Competitive Heterogeneity. *Strategic Management Journal*, 24, 889–902.
<https://doi.org/10.1002/smj.356>
- Hwang, J., Han, H., & Choo, S. (2015). A strategy for the development of the private country club: focusing on brand prestige. *International Journal of Contemporary Hospitality*, 27(8), 1927–1948. <https://doi.org/10.1108/IJCHM-07-2014-0353>
- Hyun, S. S., & Kang, J. (2014). A better investment in luxury restaurants: Environmental or non-environmental cues? *International Journal of Hospitality Management*, 39, 57–70.
<https://doi.org/10.1016/j.ijhm.2014.02.003>

- Jeong, E. H., & Jang, S. C. (2015). Healthy menu promotions: A match between dining value and temporal distance. *International Journal of Hospitality Management*, 45, 1–13.
<https://doi.org/10.1016/j.ijhm.2014.11.001>
- Jensen, Ø., & Hansen, K. V. (2007). Consumer values among restaurant customers. *International Journal of Hospitality Management*, 26(3), 603–622.
<https://doi.org/10.1016/j.ijhm.2006.05.004>
- Jin, N. (Paul), Line, N. D., & Lee, S. M. (2017). The health conscious restaurant consumer: understanding the experiential and behavioral effects of health concern. *International Journal of Contemporary Hospitality Management*, 29(8), 2103–2120.
- Jung, J. H., & Yoo, J. J. (2017). Customer-to-customer interactions on customer citizenship behavior. *Service Business*, 11(1), 117–139. <https://doi.org/10.1007/s11628-016-0304-7>
- Kandampully, J., Bilgihan, A., & Zhang, T. (2016). Developing a people-technology hybrids model to unleash innovation and creativity: The new hospitality frontier. *Journal of Hospitality and Tourism Management*, 29, 154–164.
<https://doi.org/10.1016/j.jhtm.2016.07.003>
- Kaushik, A. K., & Rahman, Z. (2017). An empirical investigation of tourist's choice of service delivery options: SSTs vs service employees. *International Journal of Contemporary Hospitality Management*, 29(7), 1892–1913. <https://doi.org/10.1108/IJCHM-08-2015-0438>
- Keiningham, T. L., Cooil, B., Aksoy, L., Andreassen, T. W., & Weiner, J. (2007). The value of different customer satisfaction and loyalty metrics in predicting customer retention, recommendation, and share-of-wallet. *Managing Service Quality: An International Journal*, 17(4), 361–384. <https://doi.org/10.1108/09604520710760526>

- Kelly, P., Lawlor, J., & Mulvey, M. (2017). Customer Roles in Self-Service Technology Encounters in a Tourism Context. *Journal of Travel & Tourism Marketing*, 34(2), 222–238.
<https://doi.org/10.1080/10548408.2016.1156612>
- Khalifa, A. S. (2004). Customer value: a review of recent literature and an integrative configuration. *Management Decision*, 42(5), 645–666.
<https://doi.org/10.1108/00251740410538497>
- Kim, J. (Sunny), Christodoulidou, N., & Brewer, P. (2012). Impact of Individual Differences and Consumers' Readiness on Likelihood of Using Self-Service Technologies at Hospitality Settings. *Journal of Hospitality & Tourism Research*, 36(1), 85–114.
<https://doi.org/10.1177/1096348011407311>
- Kim, M., & Qu, H. (2014). Travelers' behavioral intention toward hotel self-service kiosks usage. *International Journal of Contemporary Hospitality Management*, 26(2), 225–245.
<https://doi.org/10.1108/IJCHM-09-2012-0165>
- Kim, H., Woo, E., & Uysal, M. (2015). Tourism experience and quality of life among elderly tourists. *Tourism Management*, 46, 465–476. <https://doi.org/10.1016/j.tourman.2014.08.002>
- Klein, A. G., & Muthén, B. O. (2007). Quasi-maximum likelihood estimation of structural equation models with multiple interaction and quadratic effects. *Multivariate Behavioral Research*, 42(4), 647–673. <https://doi.org/10.1080/00273170701710205>
- Kokkinou, A., & Cranage, D. A. (2013). Using self-service technology to reduce customer waiting times. *International Journal of Hospitality Management*, 33(1), 435–445.
<https://doi.org/10.1016/j.ijhm.2012.11.003>

- Kokkinou, A., & Cranage, D. A. (2015). Why wait? Impact of waiting lines on self-service technology use. *International Journal of Contemporary Hospitality Management*, 27(6), 1181–1197. <https://doi.org/10.1108/IJCHM-12-2013-0578>
- Ku, E. C. S., & Chen, C.-D. (2013). Fitting facilities to self-service technology usage: Evidence from kiosks in Taiwan airport. *Journal of Air Transport Management*, 32, 87–94. <https://doi.org/10.1016/j.jairtraman.2013.07.001>
- Kucukusta, D., Heung, V. C. S., & Hui, S. (2014). Deploying Self-Service Technology in Luxury Hotel Brands: Perceptions of Business Travelers. *Journal of Travel and Tourism Marketing*, 31(1), 55–70. <https://doi.org/10.1080/10548408.2014.861707>
- Kumar, A., & Telang, R. (2012). Does the Web Reduce Customer Service Cost? Empirical Evidence from a Call Center. *Information Systems Research*, 23(3, 1), 721–737. <https://doi.org/10.1287/isre.1110.0390>
- Larivière, B., Bowen, D., Andreassen, T. W., Kunz, W., Sirianni, N. J., Voss, C., ... De Keyser, A. (2017). “Service Encounter 2.0”: An investigation into the roles of technology, employees and customers. *Journal of Business Research*, 79, 238–246. <https://doi.org/10.1016/j.jbusres.2017.03.008>
- Lee, W., Castellanos, C., & Choi, H. S. C. (2012). The effect of technology readiness on customers’ attitudes toward self-service technology and its adoption; the empirical study of us airline self-service check-in kiosks. *Journal of Travel & Tourism Marketing*, 29(8), 731–743. <https://doi.org/10.1080/10548408.2012.730934>
- Leroi-Werelds, S., Streukens, S., Brady, M. K., & Swinnen, G. (2014). Assessing the value of commonly used methods for measuring customer value: A multi-setting empirical study.

- Journal of the Academy of Marketing Science*, 42(4), 430–451.
<https://doi.org/10.1007/s11747-013-0363-4>
- Lin, J. S. C., & Hsieh, P. L. (2011). Assessing the Self-service Technology Encounters: Development and Validation of SSTQUAL Scale. *Journal of Retailing*, 87(2), 194–206.
<https://doi.org/10.1016/j.jretai.2011.02.006>
- Liu, C., Hung, K., Wang, D., & Wang, S. (2019). Determinants of self-service technology adoption and implementation in hotels: the case of China. *Journal of Hospitality Marketing and Management*, 29(06), 1–26. <https://doi.org/10.1080/19368623.2020.1689216>
- Liu, H., Li, H., DiPietro, R. B., & Levitt, J. A. (2018). The role of authenticity in mainstream ethnic restaurants: Evidence from an independent full-service Italian restaurant. *International Journal of Contemporary Hospitality Management*, 30(2), 1035–1053.
<https://doi.org/10.1108/IJCHM-08-2016-0410>
- Lu, L., & Chi, C. G. (2018). An examination of the perceived value of organic dining. *International Journal of Contemporary Hospitality Management*, 30(8), 2826–2844.
<https://doi.org/10.1108/IJCHM-05-2017-0267>
- Lusch, R. F., & Nambisan, S. (2015). Service Innovation: A Service-Dominant Logic perspective. *MIS Quarterly*, 39(1), 155–175.
- Madhavaram, S., Granot, E., & Badrinarayanan, V. (2014). Relationship marketing strategy: an operant resource perspective. *Journal of Business & Industrial Marketing*, 29(4), 275–283.
- Mascarenhas, O. A., Kesavan, R., & Bernacchi, M. (2006). Lasting customer loyalty: a total customer experience approach. *Journal of Consumer Marketing*, 23(7), 397–405.
<https://doi.org/10.1108/07363760610712939>

- Mathwick, C., Malhotra, N., & Rigdon, E. (2001). Experiential value: Conceptualization, measurement and application in the catalog and Internet shopping environment. *Journal of Retailing*, 77(1), 39–56. [https://doi.org/10.1016/S0022-4359\(00\)00045-2](https://doi.org/10.1016/S0022-4359(00)00045-2)
- Merz, M. A., Zarantonello, L., & Grappi, S. (2018). How valuable are your customers in the brand value co-creation process? The development of a Customer Co-Creation Value (CCCV) scale. *Journal of Business Research*, 82, 79–89. <https://doi.org/10.1016/j.jbusres.2017.08.018>
- Meuter, M. L., Bitner, M. J., Ostrom, A. L., & Brown, S. W. (2005). Choosing Among Alternative Service Delivery Modes: An Investigation of Customer Trial of Self-Service Technologies. *Journal of Marketing*, 69(2), 61–83. <https://doi.org/10.1509/jmkg.69.2.61.60759>
- Meuter, M. L., Ostrom, A. L., Roundtree, R. I., & Bitner, M. J. (2000). Self-service technologies: understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*, 64(3), 50–64.
- Mikolov, T., Sutskever, I., Chen, K., Corrado, G., & Dean, J. (2013). Distributed representations of words and phrases and their compositionality, 1–9. <https://doi.org/10.1162/jmlr.2003.3.4-5.951>
- Mohd-Any, A. A., Winklhofer, H., & Ennew, C. (2015). Measuring users' value experience on a travel website (e-value): what value is cocreated by the user? *Journal of Travel Research*, 54(4), 496–510. <https://doi.org/10.1177/0047287514522879>
- Morosan, C. (2018). An Empirical Analysis of Intentions to Cocreate Value in Hotels Using Mobile Devices. *Journal of Hospitality and Tourism Research*, 42(4), 528–562. <https://doi.org/10.1177/1096348015597034>

- Morosan, C., & DeFranco, A. (2016). Co-creating value in hotels using mobile devices: A conceptual model with empirical validation. *International Journal of Hospitality Management*, 52, 131–142. <https://doi.org/10.1016/j.ijhm.2015.10.004>
- Namkung, Y., & Jang, S. C. (Shawn). (2010). Effects of perceived service fairness on emotions, and behavioral intentions in restaurants. *European Journal of Marketing*, 44(9), 1233–1259. <https://doi.org/10.1108/03090561011062826>
- Nasution, H. N., & Mavondo, F. T. (2008). Customer value in the hotel industry: what managers believe they deliver and what customer experience. *International Journal of Hospitality Management*, 27(2), 204–213. <https://doi.org/10.1016/j.ijhm.2007.02.003>
- Oh, H. (1999). Service quality, customer satisfaction, and customer value: A holistic perspective. *International Journal of Hospitality Management*, 18(1), 67–82. [https://doi.org/10.1016/s0278-4319\(98\)00047-4](https://doi.org/10.1016/s0278-4319(98)00047-4)
- Oh, H., Jeong, M., Lee, S. (Ally), & Warnick, R. (2016). Attitudinal and Situational Determinants of Self-Service Technology Use. *Journal of Hospitality & Tourism Research*, 40(2), 236–265. <https://doi.org/10.1177/1096348013491598>
- Oliver, R. L. (1999). Whence consumer loyalty? *Journal of Marketing*, 63(SUPPL.), 33–44. <https://doi.org/10.2307/1252099>
- Oliver, R. L. (2010). *Satisfaction: A behavioral perspective on the consumer* (2nd ed.). New York: ME Sharpe.
- Ordanini, A., & Parasuraman, A. (2011). Service Innovation Viewed Through a Service-Dominant Logic Lens: A Conceptual Framework and Empirical Analysis. *Journal of Service Research*, 14(1), 3–23. <https://doi.org/10.1177/1094670510385332>

- Ostrom, A. L., Parasuraman, A., Bowen, D. E., Patrício, L., & Voss, C. A. (2015). Service research priorities in a rapidly changing context. *Journal of Service Research*, 18(2), 127–159. <https://doi.org/10.1177/1094670515576315>
- Pandža Bajs, I. (2015). Tourist perceived value, relationship to satisfaction, and behavioral intentions: The example of the Croatian tourist destination Dubrovnik. *Journal of Travel Research*, 54(1), 122–134. <https://doi.org/10.1177/0047287513513158>
- Parasuraman, A. (2000). Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies. *Journal of Service Research*, 2(4), 307–320. <https://doi.org/10.1177/109467050024001>
- Payne, A. F., Storbacka, K., & Frow, P. (2008). Managing the co-creation of value. *Journal of the Academy of Marketing Science*, 36(1), 83–96. <https://doi.org/10.1007/s11747-007-0070-0>
- Payne, A., & Holt, S. (1999). A Review of the ‘Value’ Literature and Implications for Relationship Marketing. *Australasian Marketing Journal*. [https://doi.org/10.1016/S1441-3582\(99\)70201-6](https://doi.org/10.1016/S1441-3582(99)70201-6)
- Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, 70, 153–163. <https://doi.org/10.1016/j.jesp.2017.01.006>
- Petrack, J. F. (2002). Development of a multi-dimensional scale for measuring the perceived value of a service. *Journal of Leisure Research*, 34(2), 119–134.
- Petrack, J. F. (2004). The roles of quality, value, and satisfaction in predicting cruise passengers’ behavioral Intentions. *Journal of Travel Research*, 42(May), 397–407. <https://doi.org/10.1177/0047287504263037>

- Porter, M. E., & Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review*, 63(4), 149–160.
- Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5–14. <https://doi.org/10.1002/dir.20015>
- Prebensen, N. K., Kim, H. (Lina), & Uysal, M. (2016). Cocreation as Moderator between the Experience Value and Satisfaction Relationship. *Journal of Travel Research*, 55(7), 934–945. <https://doi.org/10.1177/0047287515583359>
- Prebensen, N. K., & Xie, J. (2017). Efficacy of co-creation and mastering on perceived value and satisfaction in tourists ' consumption. *Tourism Management*, 60, 166–176. <https://doi.org/10.1016/j.tourman.2016.12.001>
- Pynoo, B., Devolder, P., Tondeur, J., Van Braak, J., Duyck, W., & Duyck, P. (2011). Predicting secondary school teachers' acceptance and use of a digital learning environment: A cross-sectional study. *Computers in Human behavior*, 27(1), 568-575.
- Ramaswamy, V., & Ozcan, K. (2018). What is co-creation? An interactional creation framework and its implications for value creation. *Journal of Business Research*, 84, 196–205. <https://doi.org/10.1016/j.jbusres.2017.11.027>
- Ranjan, K. R., & Read, S. (2016). Value co-creation: concept and measurement. *Journal of the Academy of Marketing Science*, 44(3), 290–315. <https://doi.org/10.1007/s11747-014-0397-2>
- Reinders, M. J., Dabholkar, P. A., & Frambach, R. T. (2008). Consequences of forcing customers to use technology-based self-service. *Journal of Service Research*, 11(2), 107–123.

- Robertson, N., McDonald, H., Leckie, C., & McQuilken, L. (2016). Examining customer evaluations across different self-service technologies. *Journal of Services Marketing*, 30(1), 88–102. <https://doi.org/10.1108/JSM-07-2014-0263>
- Ryu, K., Han, H., & Jang, S. S. (2010). Relationships among hedonic and utilitarian values, satisfaction and behavioral intentions in the fast-casual restaurant industry. *International Journal of Contemporary Hospitality Management*, 22(3), 416–432. <https://doi.org/10.1108/09596111011035981>
- Ryu, K., Han, H., & Kim, T. H. (2008). The relationships among overall quick-casual restaurant image, perceived value, customer satisfaction, and behavioral intentions. *International Journal of Hospitality Management*, 27(3), 459–469. <https://doi.org/10.1016/j.ijhm.2007.11.001>
- Ryu, K., Lee, H. R., & Kim, W. G. (2012). The influence of the quality of the physical environment, food, and service on restaurant image, customer perceived value, customer satisfaction, and behavioral intentions. *International Journal of Contemporary Hospitality Management*, 24(2), 200–223. <https://doi.org/10.1108/09596111211206141>
- Sánchez-Fernández, R., Iniesta-Bonillo, M. Á., & Holbrook, M. B. (2009). The conceptualisation and measurement of consumer value in services. *International Journal of Market Research*, 51(1), 93–113. <https://doi.org/10.2501/S1470785308200328>
- Scherer, A., Wunderlich, N. V., & Wangenheim, F. Von. (2015). The Value of Self-Service: Long-Term Effects of Technology-Based Self-Service Usage on Customer Retention1. *MIS Quarterly*, 39(1), 177–200.
- Sheth, J. N., Newman, B. I., & Gross, B. L. (1991). Why we buy what we buy: A theory of consumption values. *Journal of Business Research*, 22, 159–171.

- Shin, H., & Perdue, R. R. (2019). Self-Service Technology Research: A bibliometric co-citation visualization analysis. *International Journal of Hospitality Management*, 80(November 2018), 101–112. <https://doi.org/10.1016/j.ijhm.2019.01.012>
- Shin, Y. H., Kim, H., & Severt, K. (2019). Consumer values and service quality perceptions of food truck experiences. *International Journal of Hospitality Management*, 79(July 2018), 11–20. <https://doi.org/10.1016/j.ijhm.2018.12.008>
- So, K. K. F., King, C., & Sparks, B. (2014). Customer Engagement With Tourism Brands: Scale Development and Validation. *Journal of Hospitality & Tourism Research*, 38(3), 304–329. <https://doi.org/10.1177/1096348012451456>
- Solomon, M. R., Surprenant, C., Czepiel, J. A., & Gutman, E. G. (1985). A role theory perspective on dyadic interactions: The service encounter. *Journal of Marketing*, 49(1), 99–111. <https://doi.org/10.2307/1251180>
- Sweeney, J., & Soutar, G. (2001). Consumer perceived value: the development of a multiple item scale. *Journal of Retailing*, 77(2), 203–220. [https://doi.org/10.1016/S0022-4359\(01\)00041-0](https://doi.org/10.1016/S0022-4359(01)00041-0)
- Taylor, S., DiPietro, R. B., & So, K. K. F. (2018). Increasing experiential value and relationship quality: An investigation of pop-up dining experiences. *International Journal of Hospitality Management*, 74(January 2017), 45–56. <https://doi.org/10.1016/j.ijhm.2018.02.013>
- Teng, C. C., & Chang, J. H. (2013). Mechanism of customer value in restaurant consumption: Employee hospitality and entertainment cues as boundary conditions. *International Journal of Hospitality Management*, 32(1), 169–178. <https://doi.org/10.1016/j.ijhm.2012.05.008>
- Teo, T. (2010). Examining the influence of subjective norm and facilitating conditions on the intention to use technology among pre-service teachers: A structural equation modeling of

- an extended technology acceptance model. *Asia Pacific Education Review*, 11(2), 253–262.
<https://doi.org/10.1007/s12564-009-9066-4>
- van Beuningen, J., de Ruyter, K., Wetzels, M., & Streukens, S. (2009). Customer self-efficacy in technology-based self-service: Assessing between- and within-person differences. *Journal of Service Research*, 11(4), 407–428.
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1–17. Retrieved from
<http://journals.ama.org/doi/abs/10.1509/jmkg.68.1.1.24036>
- Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, 36(1), 1–10. <https://doi.org/10.1007/s11747-007-0069-6>
- Vargo, S. L., & Lusch, R. F. (2017). Service-dominant logic 2025. *International Journal of Research in Marketing*, 34(1), 46–67. <https://doi.org/10.1016/j.ijresmar.2016.11.001>
- Vargo, S. L., & Lusch, R. F. (2018). *The SAGE Handbook of Service-dominant Logic*. SAGE Publications Limited.
- Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26(3), 145–152.
<https://doi.org/10.1016/j.emj.2008.04.003>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly*, 27(3), 425–478.
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36(1), 157–178.

- Verhoef, P. C., Lemon, K. N., Parasuraman, A., Roggeveen, A., Tsiros, M., & Schlesinger, L. A. (2009). Customer Experience Creation: Determinants, Dynamics and Management Strategies. *Journal of Retailing*, 85(1), 31–41. <https://doi.org/10.1016/j.jretai.2008.11.001>
- Vivek, S. D., Beatty, S. E., & Morgan, R. M. (2012). Customer Engagement: Exploring Customer Relationships Beyond Purchase. *The Journal of Marketing Theory and Practice*, 20(2), 122–146. <https://doi.org/10.2753/MTP1069-6679200201>
- Wang, C., Harris, J., & Patterson, P. G. (2012). Customer choice of self-service technology: the roles of situational influences and past experience. *Journal of Service Management*, 23(1), 54–78. <https://doi.org/10.1108/09564231211208970>
- Wang, Y., So, K. K. F., & Sparks, B. A. (2017). Technology Readiness and Customer Satisfaction with Travel Technologies: A Cross-Country Investigation. *Journal of Travel Research*, 56(5), 563–577. <https://doi.org/10.1177/0047287516657891>
- Warshaw, P. R., & Davis, F. D. (1985). Disentangling behavioral intention and behavioral expectation. *Journal of Experimental Social Psychology*, 21(3), 213–228. [https://doi.org/10.1016/0022-1031\(85\)90017-4](https://doi.org/10.1016/0022-1031(85)90017-4)
- Wei, W., Torres, E., & Hua, N. (2016). Improving consumer commitment through the integration of self-service technologies: A transcendent consumer experience perspective. *International Journal of Hospitality Management*, 59, 105–115. <https://doi.org/10.1016/j.ijhm.2016.09.004>
- Wei, W., Torres, E., & Hua, N. (2017). The power of self-service technologies in creating transcendent service experiences. *International Journal of Contemporary Hospitality Management*, 29(6), 1599–1618. <https://doi.org/10.1108/IJCHM-01-2016-0029>

- Woodall, T. (2003). Conceptualising ‘Value for the Customer’’: An Attributional, Structural and Dispositional Analysis.’ *Academy of Marketing Science Review*, 12(5), 1–42.
- Woodruff, R. B. (1997). Customer value: the next source for competitive advantage. *Journal of the Academy of Marketing Science*. <https://doi.org/10.1007/BF02894350>
- Woodruff, R. B., & Flint, D. J. (2006). Marketing’s service-dominant logic and customer value. In Robert Frank Lusch & S. L. Vargo (Eds.), *The service-dominant logic of marketing: Dialog, debate, and directions* (pp. 183–195). Armonk, NY: M.E. Sharpe.
- Worsfold, K., Fisher, R., McPhail, R., Francis, M., & Thomas, A. (2016). Satisfaction, value and intention to return in hotels. *International Journal of Contemporary Hospitality Management*, 28(11), 2570–2588. <https://doi.org/10.1108/IJCHM-04-2015-0195>
- Wu, B., & Yang, W. (2018). What do Chinese consumers want? A value framework for luxury hotels in China. *International Journal of Contemporary Hospitality Management*, 30(4), 2037–2055. <https://doi.org/10.1108/IJCHM-08-2016-0466>
- Wu, C. H., & Liang, R. (2009). Effect of experiential value on customer satisfaction with service encounters in luxury-hotel restaurants. *International Journal of Hospitality Management*, 28, 586–593. <https://doi.org/10.1016/j.ijhm.2009.03.008>
- Wu, H. C., & Li, T. (2017). A study of experiential quality, perceived value, heritage image, experiential satisfaction, and behavioral intentions for heritage tourists. *Journal of Hospitality and Tourism Research*, 41(8), 904–944.
- Yang, K., & Forney, J. C. (2013). The moderating role of consumer technology anxiety in mobile shopping adoption: Differential effects of facilitating conditions and social influences. *Journal of Electronic Commerce Research*, 14(4), 334–347.

- Yang, W., & Mattila, A. S. (2016). Why do we buy luxury experiences? Measuring value perceptions of luxury hospitality services. *International Journal of Contemporary Hospitality Management*, 28(9), 1848–1867. <https://doi.org/10.1108/IJCHM-11-2014-0579>
- Yen, C., & Teng, H.-Y. (2015). Celebrity involvement, perceived value, and behavioral intentions in popular media-induced tourism. *Journal of Hospitality & Tourism Research*, 39(2), 225–244. <https://doi.org/10.1177/1096348012471382>
- Yi, Y., & Gong, T. (2013). Customer value co-creation behavior: Scale development and validation. *Journal of Business Research*, 66(9), 1279–1284. <https://doi.org/10.1016/j.jbusres.2012.02.026>
- Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), 22. <https://doi.org/10.2307/1251446>
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing*, 60(2), 31. <https://doi.org/10.2307/1251929>
- Zhu, Z., Nakata, C., Sivakumar, K., & Grewal, D. (2013). Fix it or leave it? Customer recovery from self-service technology failures. *Journal of Retailing*, 89(1), 15–29. <https://doi.org/10.1016/j.jretai.2012.10.004>
- Zhu, G., So, K. K. F., & Hudson, S. (2017). Inside the sharing economy: Understanding consumer motivations behind the adoption of mobile applications. *International Journal of Contemporary Hospitality Management*, 29(9), 2218–2239. <https://doi.org/10.1108/IJCHM-09-2016-0496>

CHAPTER 4

Development and validation of a co-created value scale: A mixed-method approach

Abstract

This study aimed to develop the scale of co-created value from the service-dominant logic perspective. Although the service-dominant logic has great attention from academia, empirical research on the co-created value is nascent partly because how customers perceive the co-created value is not distinctively measured yet. The current study conceptualized the co-created value as an appraisal of the meaningfulness of services. It developed the second-order scale consisting of four dimensions: value-in-use, value-in-interaction, value-in-involvement, and value-in-experience.

The study adopted text-mining techniques to analyze two sources of texts, including keywords used in previous literature and on-line customer reviews, to generate items that comprehensively address the concept of co-created value. In addition to the rigorous process of scale development in psychometric research, reliability and validity were confirmed to demonstrate that the items and dimensions are organized well and work predictively with other constructs. The scale proposed does not only contribute to the subsequent empirical research but also helps practitioners assess their level of service management as well as marketing strategies from a co-creation perspective.

Keywords: co-created value, scale development, service-dominant logic, mixed-method, machine-learning

Introduction

Since proposed in 2004, service-dominant (S-D) logic (Vargo & Lusch, 2004) has gained wide recognition from academia due to the shift of a marketing paradigm toward service (Halliday, 2016; Madhavaram, Granot, & Badrinarayanan, 2014). S-D logic has immersed into various marketing research areas such as service innovation (Ordanini & Parasuraman, 2011), customer engagement (Vivek, Beatty, & Morgan, 2012), customer value in the hotel industry (FitzPatrick, Davey, Muller, & Davey, 2013), and information technology in tourism (Cabiddu, Lui, & Piccoli, 2013). S-D logic argues that service is the fundamental basis of exchange, while goods or services are just a service delivery tool (Vargo & Lusch, 2004, 2008). Value is not embedded in products or services but determined by customers when they use the products or services (Vargo & Lusch, 2008). Thus, firms can only offer value proposition with resources that contain future value potential (Chandler & Vargo, 2011), and customers integrate their own resources (e.g., knowledge, skills) with the resources provided by firms to create value for themselves.

According to S-D logic, value is always co-created with collaboration with others because customers require not only their own resources but also other resources provided by firms (Vargo & Lusch, 2018). In other words, value co-creation (VCC) is imperative since VCC does not occur without this combination of multiple resources, including resources from others (e.g., a service provider). This new conceptualization of service and value creation has invoked a lot of discussions in the services marketing field.

Despite increasing interest in co-creation in hospitality and tourism research, it remains unclear how the value, as an outcome of co-creation, can be appraised (Busser & Shulga, 2018; Merz, Zarantonello, & Grappi, 2018). In line with it, Gummerus (2013) suggests that there needs to be a clear distinction between VCC as a process and co-created value (CCV) as an outcome of VCC. For example, VCC is done in the network joined by multiple actors, whereas CCV is

determined by a single individual (Gummerus, 2013). In other words, VCC conceptualizes the underlying mechanism of how multiple actors (e.g., service employees and customers) collaborate for value creation but does not reveal an actual co-created outcome that customers perceive. As a result, research that studies CCV from the S-D logic perspective borrowed scales from the general term of customer value, which do not typically contain the concept of co-creation. With the nascent phase, no CCV scale is substantially used in hospitality management research, which may hamper empirical research on S-D logic.

Traditionally, the scale development process has been dependent on the survey-oriented method with the items generated after qualitative data collection, including focus group interviews or individual interviews. While this process is well structured and analytically rigorous, it suffers from a limited resource to collect abundant opinions needed to generate multi-dimensional items (Tsao et al., 2020). In other words, an item generation requires an exploratory process of literature searches and experience surveys (Churchill, 1979), which is time and effort-consuming. Particularly, collecting ideas of a wide range of concepts in an initial stage is a challenging task. By adopting computational text-mining techniques, this study presents a supplementary methodology to facilitate the item generation. First, keywords frequently used in previous literature on S-D logic are investigated and utilized as a set of seed words. Second, semantically similar words based on the set of seed words are identified from on-line customer reviews. Third, these words are combined with qualitative interviews for item generation, which further purified through a customer survey. The proposed mixed method of scale development in the study retains the rigor in the scale development process, while it adds value to an exhaustive search for information.

Literature Review

Co-created value

Vargo & Lusch (2004) announced S-D logic as a new paradigm that has sensationally drawn attention from academics. This trend continues to shift the marketing paradigm from a traditional goods-dominant (G-D) logic, which allegedly distinguishes goods from services (plural) and implies that value in products is delivered in exchange. S-D logic asserts that service (singular) is the fundamental basis of exchange, whereas services and goods are the conveying mechanism of the service (Vargo & Lusch, 2004, 2008). In other words, the human exchange is to provide service to obtain reciprocal service other than goods (Vargo & Lusch, 2017). As both services and products have no difference as conveyors, the separate boundary of goods marketing and services marketing are blurred. Accordingly, the traditionally accepted idiosyncrasy of services represented by intangibility, heterogeneity, inseparability, and perishability needs to be re-conceptualized by centering service (singular) as a fundamental basis of exchange (Gummesson, Lusch, & Vargo, 2010; Vargo & Lusch, 2017).

The concept of VCC is the central part of S-D logic, and before S-D logic, researchers of VCC regard the customer as the co-producer, rather than the subject of value creator (Vargo & Lusch, 2018). Specifically, the concept of co-creation is based on firms' initiatives such as the design, development, and customization of new goods and services with customers' participation (Ramaswamy & Ozcan, 2018). However, S-D logic argues that VCC is not an optional but unavoidable process because no single actor can create value without other actors' provision of resources. VCC has augmented attention from the service marketing field, including tourism and hospitality research. For instance, many studies from the tourism sector have recently explored VCC from the S-D logic point of view (e.g., Camilleri & Neuhofer, 2017; Frías Jamilena, Polo Peña, & Rodríguez Molina, 2017; Kelly, Lawlor, & Mulvey, 2017).

However, while S-D logic focuses on VCC as a process to explain the mechanism of how value is derived, the CCV as an outcome that customers subjectively appraise is not sufficiently discussed (Gummerus, 2013). S-D logic generally gives a broad definition of value, such as an indication of benefit in the wellbeing of a customer with a holistic view (Vargo & Lusch, 2018). Leroi-Werelds, Streukens, Brady, & Swinnen (2014) argue that this approach is so overarching that the narrower conceptualization and operationalization of CCV is critical to understand the real value that customers perceive. The following sections conceptualize various dimensions of CCV followed by each definition based on the analysis of previous literature, interviews with practitioners, and text mining of online customer reviews, as will be explained later in detail.

Co-created value-in-use

A contradictory view of value-in-use against value-in-exchange has a long way back to its origin. The concept of value-in-use dates back to Aristotle (4th century B.C.), who believed that value is perceived as a collection of qualities through *use*, and this view was supported by utilitarianists such as Jeremy Bentham and John Stuart Mill (Vargo et al., 2008; Woodall, 2003). On the contrary, Karl Marx's *labor theory of value* represents the view of value-in-exchange that value is inherent in the product and can be exchanged (Holbrook, 1999). The 20th-century neoclassical economists who followed Adam Smith also focused on value embedded in goods, though Smith in *The Wealth of Nations* was neutral between value-in-use and value-in-exchange (Vargo, Maglio, & Akaka, 2008).

The value-in-exchange view originated from economists continued in marketing (e.g., Kotler, 1972) and strategy (e.g., Porter, 1996) in the field of subsequent business administration. For instance, Kotler considers creating and delivering value as the fundamental task of marketing

(Kotler, 1972). Further, Porter sees delivering maximum value as a competitive strategy and calls the process of delivering value to customers a “value chain” (Porter, 1996). However, as the notion of customers’ decisive role in purchase spreads, the concept of value-in-use drew attention from scholars. Woodruff (1997) argues that firms should look beyond the attribute-based buying criteria by learning about the consequences of customers’ use situations. Likewise, the recent view of value perceptions (e.g., the perceived value in Zeithaml (1988), the experiential value in Holbrook (1999), value creation in Grönroos & Voima (2013)) advocates value-in-use. However, by clear distinction from value-in-exchange, S-D logic considers value-in-use an essential component of value conceptualization, which leads to CCV through integrating resources provided by other actors (Vargo & Lusch, 2018). In sum, the notion of locus of value has changed from “added value” that is created in the production process and delivered to customers to “perceived value” that is created in the production process and perceived by customers in the use process. Currently, it has evolved into “co-created value” that is co-created during the use process in collaboration with multiple actors. Based on the conceptualization illustrated above, CCV-in-use is defined as customers’ appraisal of the meaningfulness of their use of a service.

Co-created value-in-interaction

Value-in-exchange perspective regards a resource as a valuable, rare, imperfectly imitable, and non-substitutable entity that can produce a competitive advantage for the firm (Barney, Wright, & Ketchen, 2001). A firm gains a competitive edge by the effective and efficient applications and the combinations of valuable resources that include capabilities, organizational processes, firm attributes, and information and knowledge (Singaraju, Nguyen, Niininen, & Sullivan-Mort,

2016). This “resource-based view of the firm theory” (Barney, 1991) sees resources as static objective agents of which firms take advantage. Extending the concept of resource to the customer domain, “resource-advantage theory” (Hunt & Morgan, 1997) explicates that the competitive advantage encompasses business networks in which customers are involved (Singaraju et al., 2016). According to the resource-advantage theory, resources are categorized as physical resources (e.g., raw materials), human resources (e.g., the skills and knowledge of individual employee), organizational resources (e.g., controls, routines, cultures, competences), informational resources (e.g., knowledge about market segments, competitors, and technology), and relational resources (e.g., relationships with competitors, suppliers, and customers) (Madhavaram & Hunt, 2008). While physical resources belong to operand resources, the other resources belong to operant resources that provide an interface in which firms and customers mutually interact through resource exchange (Singaraju et al., 2016).

The conceptualization of CCV-in-interaction captures the interactive nature of services. When a firm delivers a service to a customer, s/he is always in the same sphere of service delivery, and consumption of the service is not separable. CCV occurs through this interactive process in which firms need to provide resources that fulfill customer needs (Chathoth, Altinay, Harrington, Okumus, & Chan, 2013). Accordingly, the role that the firms play is to facilitate customers’ participation in the co-creation process by proposing a favorable experience environment. Therefore, CCV-in-interaction refers to Customers’ appraisal of meaningfulness of their interactions and communications with service employees.

Co-created value-in-involvement

According to S-D logic, resources including both static (operand) resources (e.g., natural materials) and dynamic (operant) resources (e.g., skills or knowledge) are awaiting the intervention of human knowledge and action (Vargo & Lusch, 2018). In other words, whether operand or operant resources, they exist only as potential resources until humans recognize and exercise them. Lusch & Vargo (2014, p. 121) define resources as “anything, tangible or intangible, internal or external, operand or operant, that the actor can draw on for increase viability.” Resources proposed by an actor are left as potential resources until another actor applies it (Vargo & Lusch, 2016). To co-create value, the realization of resources needs to satisfy two conditions: they should pre-exist as objects (whether tangible or intangible) and should be appraised and utilized subjectively by actors (Vargo & Lusch, 2018). Accordingly, even if the same objects are used, the degree of VCC is different based on how actors apply the objects through the integration of other operant resources (e.g., skills, knowledge, or experiences). Resource integration is, thus, the essential concept to explicate value co-creation. Since the resource integration occurs among multiple actors (actor-to-actor) who integrate multiple resources, including their own, value co-creation is always derived through resource integration (Kleinaltenkamp et al., 2012).

CCV-in-involvement pertains to the customer provision of his/her own resources (typically the operant resources) to make value come true. Whereas involvement in consumer research has been considered perceived importance or interest that customers have regarding a stimulus, the involvement in S-D logic is referred to as a behavioral aspect (Hunt, Geiger-Oneto, & Varca, 2012). CCV requires a certain degree of customer-driven involvement that reflects the customer’s own proactiveness in the interactive process because s/he should employ her/his

resource. Therefore, CCV-in-involvement refers to customers' appraisal of meaningfulness of their participation and involvement in service provision.

Co-created value-in-experience

It has been long discussed that value is associated with customers' experiential consumption of products and services (Holbrook & Hirschman, 1982). With the view of experience, a value can be explained in a holistic way, including cognitive and hedonic factors through multiple interactions across touchpoints (Bolton et al., 2018). The concept of CCV-in-use fundamentally reveals that CCV is experiential in nature. S-D logic (Vargo & Lusch, 2016) further declares the "phenomenological" nature of value (Axiom 4 – "Value is always uniquely and phenomenologically determined by the beneficiary"). The ontological recognition of the phenomenological perspective of CCV advocates value determined in subjective experience from which customers can draw meaningful benefits (Vargo & Lusch, 2018).

Further, the resources integrated are not limited to those in the service encounter, but rather include those beyond the service encounter, such as social context. Helkkula, Kelleher, & Pihlstrom (2012, p. 66) state that "value in the experience is not an objective measure of customer (perceived) value but is based on individual sense-making in a social context." With the extended notion of experience based on social context, Helkkula et al. (2012) outline four theoretical propositions about value-in-experience: first, value-in-experience is individually intrasubjective and socially intersubjective; second, it can be both lived and imaginary; third, it is constructed based on previous, current, and future experiences and is temporal in nature; and fourth, it emerges from individually determined social contexts. As such, value-in-experience in the S-D logic is phenomenological as well as contextual, which is distinguished from the prior

experiential view of value. Firms do not provide experience at all. Instead, customers subjectively determine value through the resource integration that is also intersubjectively influenced by social contexts. Therefore, CCV-in-experience is defined as customers' appraisal of meaningfulness of their personal and subjective experience.

Measures of value in previous literature

Depending on the conceptual view of value, the dimensions and measures of value are diverse. The trade-off perspective of value is usually measured by a unidimensional scale (e.g., Dodds, Monroe, & Grewal, 1991). The experiential view of value is multi-dimensional. Babin et al. (1994) divide value into utilitarian value and hedonic value. Sweeney & Soutar (2001) and Petrick (2002) develop multiple dimensions, including price, quality, and emotional dimensions. However, most studies that advocate the experiential perspective follow Holbrook's (1999) eight dimensions of typology or derivative form that contains efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality (e.g., Gallarza, Arteaga, Del Chiappa, Gil-Saura, & Holbrook, 2017; Mathwick, Malhotra, & Rigdon, 2001; Sánchez-Fernández et al., 2009).

S-D logic has focused on the mechanism of value co-creation and paid less attention to the actual conceptualization of value. Gummerus (2013) suggests that there needs to be a distinction between value outcomes as CCV from value co-creation as a process in terms of how value assessment is made. In their empirical research, Leroi-Werelds et al. (2014) contend that it has been unknown what types of value come to play when the value is co-created. In tandem with those diagnoses, a new operational framework for value co-creation has recently drawn attention from the service marketing field, but scales of CCV rarely exist. To author's best knowledge, only Busser & Shulga (2018) provide five dimensions of CCV: meaningfulness, collaboration, contribution, recognition, and affective response. Meaningfulness means the

degree to which individual believes the importance and worth of services; collaboration means a sense of cooperation for mutual benefits between actors; the contribution is the degree that actors share their own resources; recognition is beneficiary's acknowledgment on being recognized; and affective response is an emotional reaction to VCC (Busser & Shulga, 2018). In their research, they attempt to combine the theory of value and S-D logic so that dimensions and measures are not fully circumscribed with the S-D logic.

Ranjan & Read (2016) generate measures of VCC, emphasizing a process of value creation rather than customers' perceived outcome brought by the process. The measures consist of two sub-dimensions, including co-production and value-in-use; co-production has three sub-constructs such as knowledge, equity, and interaction, and value-in-use contains experience, personalization, and relationship. Merz et al. (2018) propose a brand value scale from the VCC perspective. They suggest a higher-order model of operationalization, consisting of customer-owned resources and customer motivation. The former includes brand knowledge, brand skills, brand creativity, and the latter provides brand passion, brand trustworthiness, and brand commitment. Their typology of brand CCV, as the authors revealed, is conceptually similar to brand equity. The typology of the existing measures of value is shown in Figure 1.

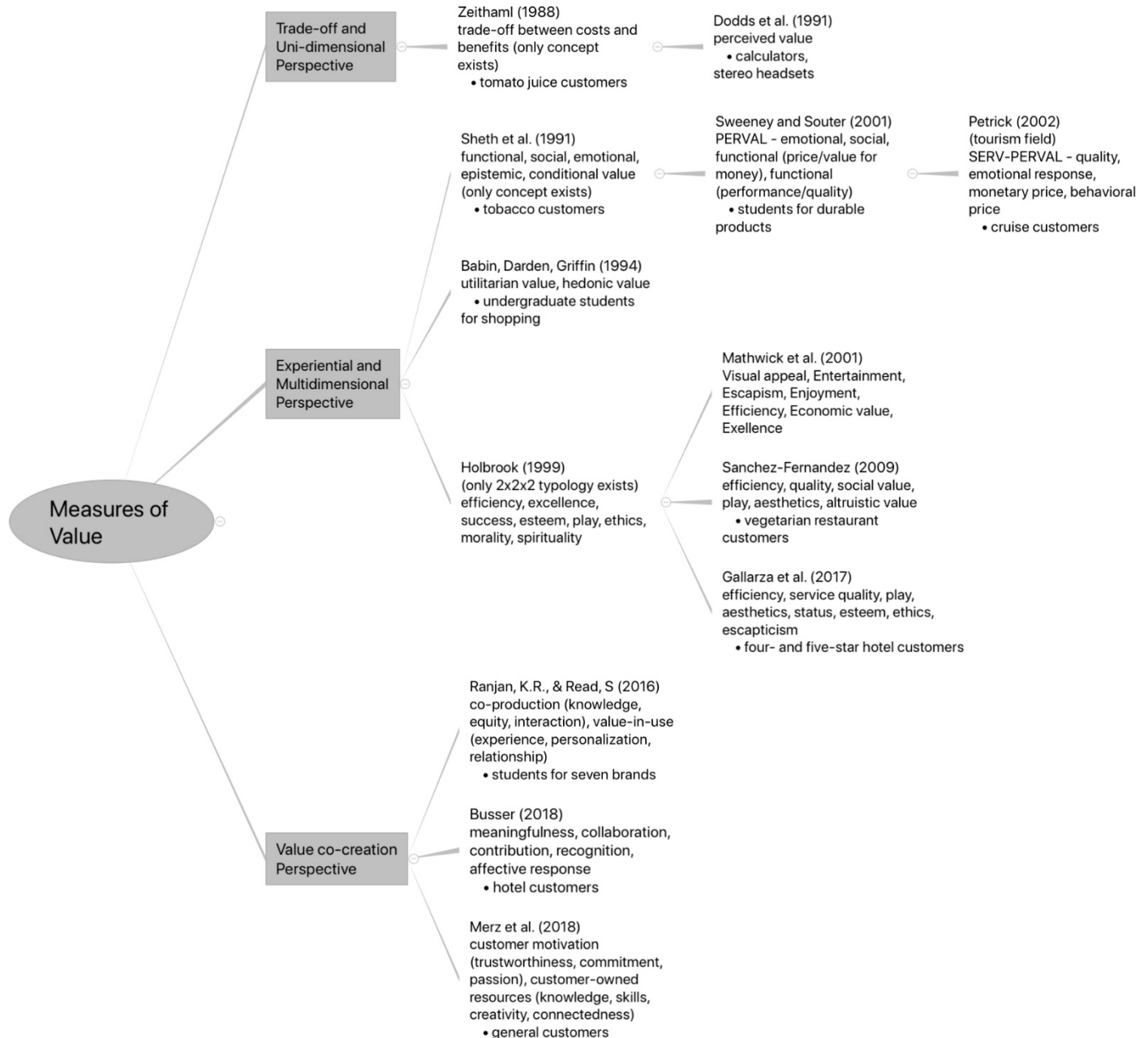


Figure 1. Measures of value in previous research

Scale development and validation

The study adopts the procedural guidance of the scale development recommended by Churchill (1979) and So, King, & Sparks's (2014) research design. Since the concept of CCV is complicated, a conventional approach that depends on a small number of qualitative sources such

as interviews and literature reviews may not address items in a holistic view. Thus, this study uses a mixed-method approach, including both qualitative and quantitative methods, to explore various sources to develop items of CCV that prior research less studied. Specifically, the development process is comprised of four phases. First, it conducts the content analysis for a thorough review of S-D logic literature (phase 1). Second, it performs interviews with practitioners to collect their experience as service employees and text-mining, including keyword analysis and machine learning techniques, to garner information from the customer side to generate comprehensive candidate items (phase 2). Third, it conducts exploratory factor analysis (EFA) of the first customer survey data to purify measure items (phase 3). Fourth, it conducts confirmatory factor analysis (CFA) and structural equation modeling (SEM) to assess the construct validity through the second customer survey (phase 4). Figure 2 illustrates the process of scale development.

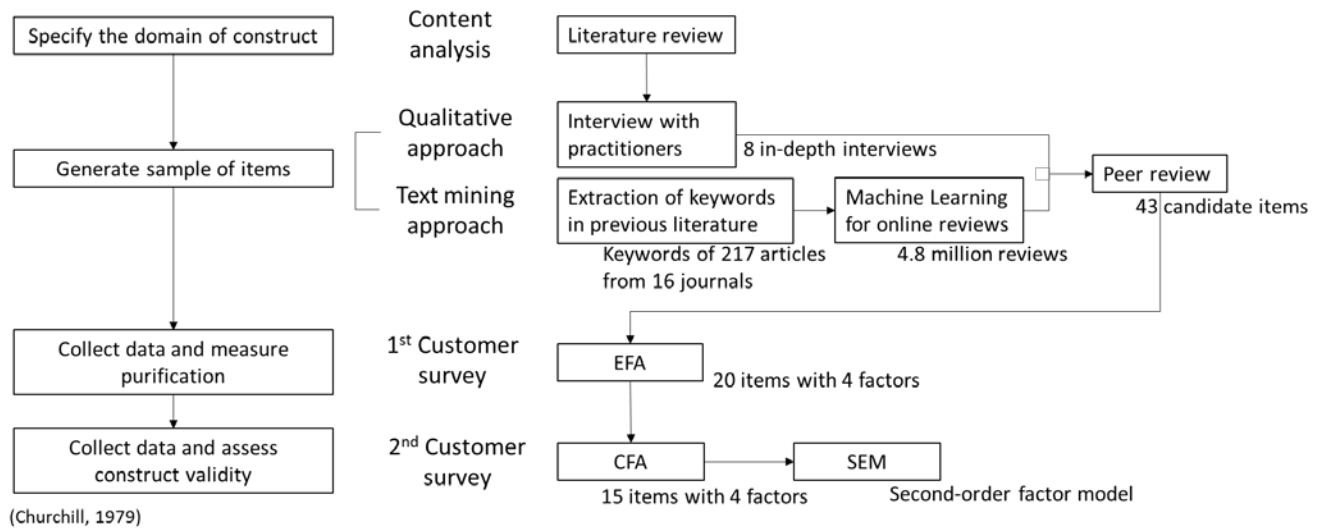


Figure 2. Scale development process applied in this study

Specify the domain of the construct

In this step, the research specifies the domain of construct to be included and excluded (Churchill, 1979) based on the review of S-D logic literature. CCV is an appraisal of meaningfulness of service through the integration of resources to realize the benefit in use in a given context (Vargo & Lusch, 2018). CCV in this study is limited in a physical service encounter in the hospitality industry. It involves interaction and customer notion of benefit through the process of service use, namely, resource integration, collaboration, and value-in-use based on S-D logic (Vargo & Lusch, 2004, 2008, 2016, 2017). It does not include off-site interaction, such as on-line interaction or indirect brand interaction.

Generate a sample of items

Due to the scarcity of research that delves deeply into CCV, this study adopted two approaches to collect data to generate sample items of CCV: a qualitative interview and text mining. First, interviews were conducted to gain ideas from phenomena and insights into what VCC and CCV are about (Churchill, 1979). It included eight in-depth interviews with people who have experienced working as front-line service employees in the hotel or restaurant industry at least three years or more to explain her/his own cases of the service experience. Each interview was conducted for 30-50 minutes. Questions were semi-structured, and some examples of questions were such as: (1) Can you recall any specific event when customers expressed their good experiences? (2) What was your role in that event? How did you help them have a great experience? (3) In what circumstance do you think customers co-create value when they use your restaurant/hotel? In other words, what made them actively participate in the value co-creation

process? And (4) Please tell me what's in your mind when I mention customer CCV. Participants were asked to answer the basic questions above, followed by sub-questions in detail.

A preliminary list of CCV items was generated based on the review of S-D logic and VCC literature, interviews with experiential practitioners, and a text mining of on-line reviews. For the study of S-D logic and VCC literature, the research collected papers from leading journals using Web of Science that included *Annals of Tourism Research*, *Cornell Hospitality Quarterly*, *International Journal of Contemporary Hospitality Management*, *International Journal of Hospitality Management*, *International Journal of Marketing Research*, *International Journal of Tourism Research*, *Journal of Business Research*, *Journal of Interactive Marketing*, *Journal of Marketing*, *Journal of Marketing Management*, *Journal of Service Management*, *Journal of Service Research*, *Journal of the Academy of Marketing Science*, *Journal of Travel Research*, *Managing Service Quality*, *Marketing Theory*, *Tourism Management*. Search keywords such as “service-dominant logic,” “value co-creation,” “co-creation,” “cocreation” and “co-created value” were used for finding relevant studies.

A total of 687 studies were extracted, and the author chose 217 papers after the manual reading of abstracts. Figure 3 shows the list of journals that most frequently published S-D logic literature. *Marketing Theory* is ranked as the highest, followed by *Journal of Business Research*. In the hospitality and management field, *International Journal of Contemporary Hospitality Management* most frequently published the S-D logic literature, followed by *Tourism Management* and *International Journal of Hospitality Management*.

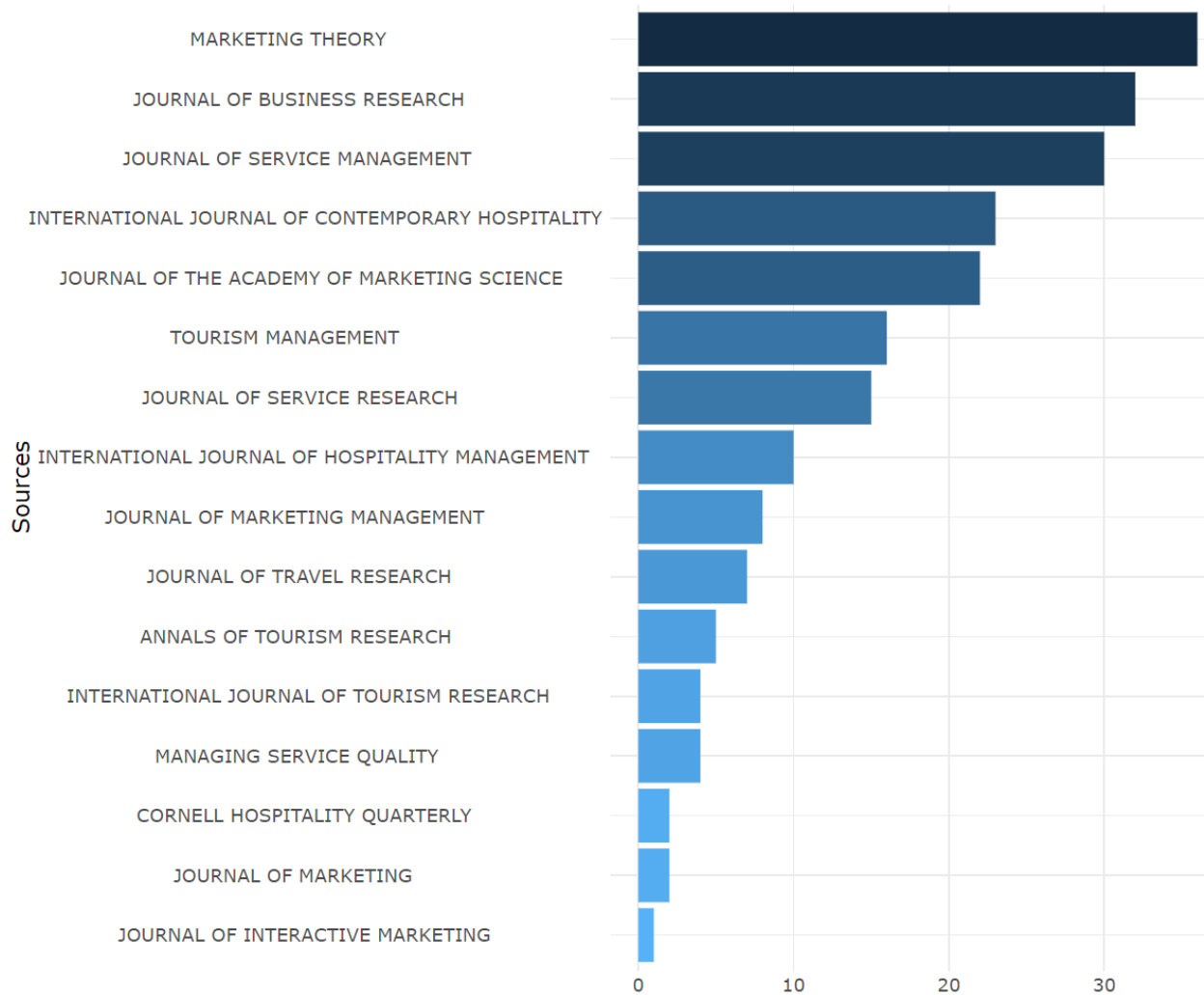


Figure 3. Journals that most frequently published S-D logic research

Using the Bibliometrix library in R3.6, the researcher extracted all keywords that authors set in the articles. As shown in Figure 4, service-dominant logic, value co-creation, co-creation, and value are the primary keywords that most commonly occurred in the literature. Other keywords are networked with either one or more of the primary keywords. Despite “value” and “customer value” often mentioned, CCV was not found as a keyword in the articles. The keywords here denotes salient concepts in S-D logic research. Many of them were theoretical terminology used in the S-D logic, such as value co-creation, co-creation, resource integration,

and operant resources. Some keywords pertained to a specific context, such as hotels, sharing economy, and healthcare, etc. There were also some generic words, such as experience and service. The researcher excluded those words and added “interaction” to the list of seed words, including “engaging,” “involvement,” “participation,” and “interaction.” They were used to identify conceptually similar words from the customer perspective that would provide conceptual ideas to generate sample items.

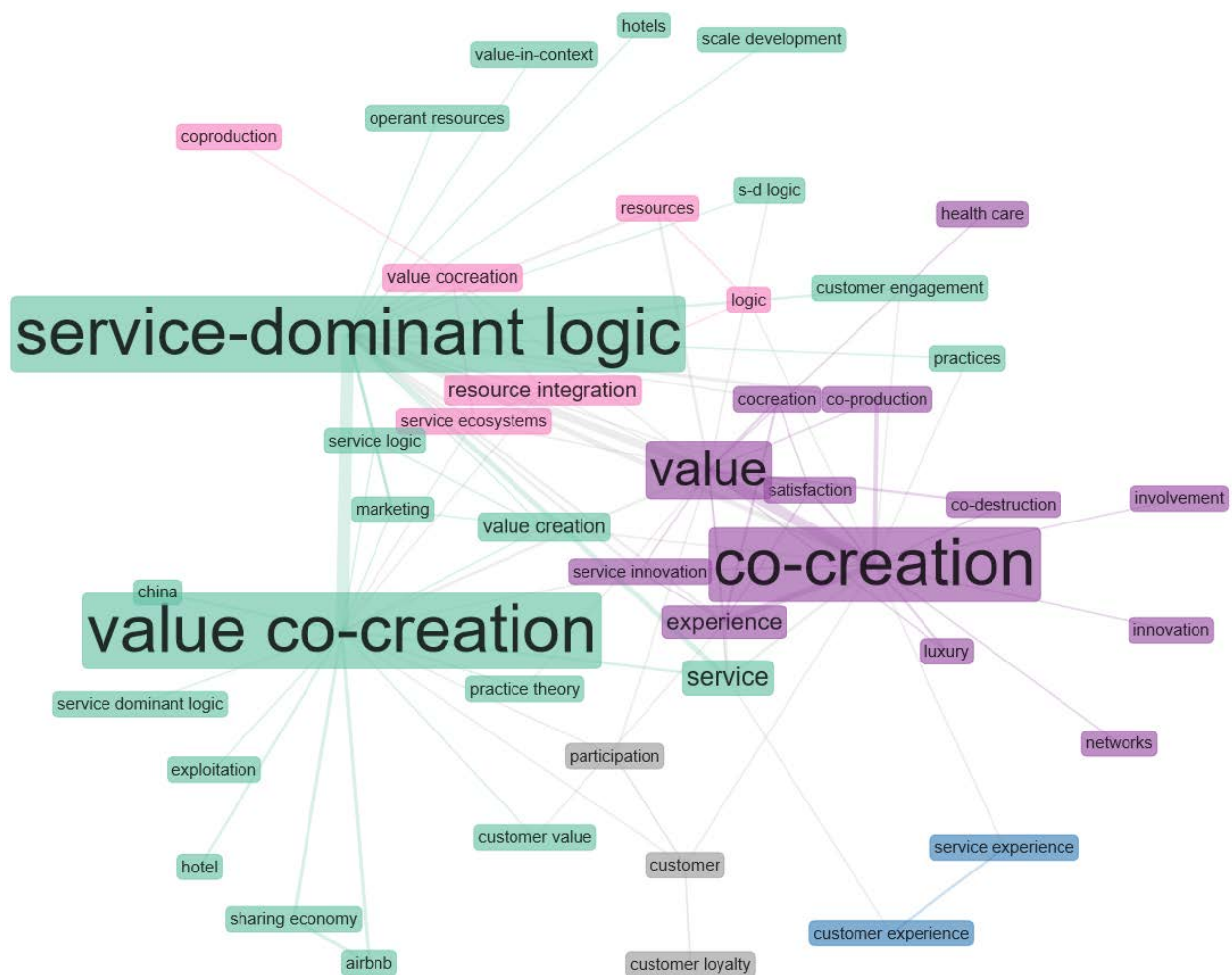


Figure 4. A keyword network in existing S-D logic literature

Next, this study analyzed on-line customer reviews posted on Yelp.com based on the seed words to stimulate the primitive establishment of candidate items. Yelp is one of the largest

social media through which customers share their experiences in a restaurant setting (Park and Nicolau, 2015; Xiang, Du, Ma, & Fan, 2017). The researcher selected the most populated 15 cities in the U.S. to avoid a potential geographic bias but ensure a sufficient volume. The data collection process lasted from December 2017 to January 2018, and the collected data accounted for 4,799,240 reviews since October 2004. To extract semantically similar words to the seed words from the previous literature, Word2vec (Mikolov, Sutskever, Chen, Corrado, & Dean, 2013) machine learning (ML) algorithm with Python 3.7 was used. Using cosine similarity among words in a vector space, the Word2vec enables researchers to identify customer perceptions about any given word sets. By inputting keywords selected from the keyword list, the algorithm identified semantically similar words used in the customer reviews. The terms extracted were projected into two dimensions using the t-SNE method (Maaten & Hinton, 2008), as shown in Figure 5.

The result shows a list of multiple similar words based on the seed words input. Since not all the words are used in the CCV context, it is necessary to confirm reasonable words manually. Through this process, the researcher identified the concepts of “attitude,” “communication & conversation,” “expertise & informativeness,” “enthusiasm & proactiveness,” and “personal experience.” Then, the words and concepts captured were utilized in the initial step of generating candidate items. For example, the researcher developed new items such as: “I was delighted with service employees’ proactiveness with sharing their knowledge,” “Service employees conveyed relevant information to me,” “I enjoyed communication with service employees,” “I perceived service as valuable to me because of service employees’ positive attitudes,” “Service employees were attentive and responsive,” “By actively participating in the service, the experience became

more meaningful,” “The service that I personally experienced is memorable,” etc. (Refer to appendix B).

Based on three kinds of approaches (e.g., interviews, keywords in literature, and CCV-related words from on-line customer reviews), sample items were developed. For confirming the face validity, six doctoral students were given a list of items with construct definition and asked to rate each item among “essential,” “useful but not essential,” and “not necessary,” depending on how well the item represented the definition. Items that gain above 80% of positive (“essential,” or “useful but not essential”) votes were secured, and thus, a total of 43 candidate items were developed.

Purify measure

An on-line survey was developed to reduce the set of VCC items and purify items (the first survey) through Prolific.co (<http://www.prolific.co/>) that is known for having many accessible participants who are trustworthy (Peer, Brandimarte, Samat, & Acquisti, 2017). Samples were at the age of 18 or older. They were asked to recall a hotel or a restaurant at which they had visited within the last six months. Items retained from the group discussion were included in the questionnaire and evaluated using a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). 223 out of the 270 respondents completed the survey. 54.7% were female, and 43.5% were male. Most participants were between 25 and 44 years of age (52.9%), followed by younger than 25 years of age (31.8%) and older than 44 years of age (15.2%). 56.5% were earning incomes below \$50,000.

Following Churchill’s (1979) framework, the study conducted exploratory factor analysis (EFA) and coefficient alpha. The researcher checked the multivariate normality, using Henze-Zirkler (HZ) test (Henze & Zirkler, 1990), which disclosed the violation of the normality (HZ statistic = 1.00, $p < 0.001$). Using GPArotation and psych package with R 3.6, EFA identified the

initial number of conceptualized dimensions of CCV and items through an iterative process with modification of items. The Kaiser-Meyer-Olkin (KMO) test was performed to verify the appropriateness of the sample. The initial KMO value was 0.93, which exceeded the recommended level of 0.70 (Kaiser, 1974). Additionally, Bartlett's test of sphericity was conducted to check the existence of multiple co-relationships between variables, and the result was highly significant ($\chi^2 (42) = 420.54, p = 0.000$). For the extraction method, the principal axis was used because it is less impacted by data with the non-normality (Costello & Osborne, 2005). While the orthogonal rotation does not allow factors to correlate, the oblique rotation allows for correlation, which is more realistic in social science (Reise, Waller, & Comrey, 2000). Accordingly, the study used the Oblimin, the representative method in the oblique rotation. To decide the number of factors, a scree plot and eigenvalue was considered. In other words, “elbow” points in the scree plot and the number of factors of which eigenvalue is over 1.0 hinted the four as an appropriate number of factors.

As such, the researcher conducted EFA with a four-factor solution and five-factor solution and compared the results. As factor loadings of the last factor in the five-factor model were low, the four-factor model was selected as supported by the scree plot and the eigenvalue cutoff. Then, 23 items were eliminated based on the small factor loadings or low communality values. Based on the factors determined, the proportion of the total variance explained was 55.30%. The items of which standardized factor loading over 0.5 remained, and others were removed, with one exception of the item (0.49) based on the researcher's judgment. As Table I shows, all the coefficient alphas calculated by internal correlation under the factor were over 0.70. The four factors included value-in-use (four items), interaction (five items), resource integration (seven items), and value-in-experience (four items).

Table I. Result of exploratory factor analysis

Items	Mean	S.D.	F1	F2	F3	F4	Alpha
I felt that using service at this hotel/restaurant was beneficial to me.	4.34	0.73	0.61				0.82
I felt that using service at this hotel/restaurant was meaningful to me.	3.74	0.99	0.68				
I felt that using service at this hotel/restaurant was important to me.	3.75	1.02	0.77				
I felt gratitude for this hotel/restaurant while I used their service.	4.02	1.05	0.49				
I was delighted with the service employees' proactiveness with sharing their knowledge.	3.79	0.95		0.63			0.84
I perceived service as valuable to me because of service employees' positive attitudes.	3.85	1.00		0.84			
I enjoyed communication with service employees.	3.99	0.92		0.62			
Service employees conveyed relevant information to me.	4.14	0.88		0.52			
When I interacted with service employees, I felt that I was importantly treated.	4.05	0.89		0.68			0.85
I applied my knowledge and skills to get better service.	3.11	1.08			0.63		
Multiple resources were integrated to make this service valuable, including my knowledge and skills.	3.19	1.06			0.74		
My previous experience was helpful for a better service experience.	3.74	1.07			0.58		
My involvement in the service process was worthwhile.	3.74	0.86			0.64		0.85
The proactive role I played during the process of service was fun to me.	3.25	1.04			0.64		
By actively participating in the service, the experience became more meaningful.	3.43	1.08			0.64		
Service employees and I collaborated on the outcome of service.	3.35	1.13			0.69		
Based on my previous experience, what I experienced here was special.	3.20	1.20				0.52	0.82
The service that I personally experienced is memorable.	3.41	1.21				0.47	
My personal experience at this hotel/restaurant was more special to me than other customers.	2.71	1.23				0.82	
Thanks to my unique taste, what I enjoyed is different from other customers.	2.83	1.25				0.71	

Note: N = 223, S.D. = Standard deviation, F1 = CCV-in-use, F2 = CCV-in-interaction, F3 = CCV-in-involvement, F4 = CCV-in-experience.

Assess construct validity

A separate sample of data was collected for testing construct validity (the second survey). The study collected 292 samples of randomly selected participants through Prolific. Samples were at the age of 18 or older and asked to recall a hotel or a restaurant that they have visited within the last six months. Participants were asked to respond to items of customer satisfaction and customer loyalty for concurrent validity test (Drost, 2011). After the elimination of missing data and outliers based on Mahalanobis' distance, a total of 248 observations were finally used for confirmatory factor analysis (CFA). 53.6% were female, and 46.0% were male. Most participants were between 25 and 44 years of age (44.8%), followed by younger than 25 years of age (43.1%) and older than 44 years of age (22.2%). 77.8% were earning incomes below \$50,000. As the data was not normally distributed (HZ statistic = 1.04, $p < 0.001$), Satorra-Bentler scaled estimation (Satorra & Bentler, 2001) was used other than maximum likelihood. One item from the value-in-experience factor and four items from the resource integration factor were additionally eliminated due to low factor loadings, resulting in 15 items for the four-factor model. CFA was conducted using Mplus 7.4.

As shown in Table II, CFA evaluated goodness-of-fit statistics based on the model in which all latent variables are correlated. The goodness-of-fit statistics included: chi-squared divided by the degree of freedom $\chi^2(84) = 163.69$, $p = 0.000$, $\chi^2/df = 1.95$, root mean square error of approximation (RMSEA = 0.06, 90% confidence interval = 0.05; 0.08), comparative fit index (CFI = 0.95), Tucker-Lewis index (TLI = 0.94), and standardized root mean square residual (SRMR = 0.05). The standardized factor loadings for all 15 items were between 0.65 and 0.90 with all z-statistic p -values = 0.000. Composite reliability was between 0.79 and 0.86.

The average variance extracted value was between 0.50 and 0.65. Thus, convergent validity was satisfied (Hair, 2009). As shown in Table III, discriminant validity was also confirmed where each AVE of two latent variables was higher than squared correlation coefficients (Fornell & Larcker, 1981).

Table II. Result of confirmatory factor analysis

Factors and items	Mean	S.D.	SFL	CR	AVE
CCV-in-use				0.80	0.50
I felt that using service at this hotel/restaurant was beneficial to me.	4.23	0.68	0.65		
I felt that using service at this hotel/restaurant was meaningful to me.	3.67	0.98	0.73		
I felt that using service at this hotel/restaurant was important to me.	3.70	0.90	0.71		
I felt gratitude for this hotel/restaurant while I used their service.	4.04	0.79	0.70		
CCV-in-interaction				0.86	0.55
I was delighted with the service employees' proactiveness with sharing their knowledge.	3.84	0.88	0.71		
I perceived service as valuable to me because of service employees' positive attitudes.	4.11	0.82	0.76		
I enjoyed communication with service employees.	4.19	0.84	0.76		
Service employees conveyed relevant information to me.	4.03	0.91	0.69		
When I interacted with service employees, I felt that I was importantly treated.	3.99	0.91	0.78		
CCV-in-involvement				0.79	0.56
My involvement in the service process was worthwhile.	3.56	0.84	0.66		
The proactive role I played during the process of service was fun to me.	3.31	0.89	0.76		
By actively participating in the service, the experience became more meaningful.	3.42	0.90	0.81		
CCV-in-experience				0.85	0.65
Based on my previous experience, what I experienced here was special.	3.42	1.06	0.90		
The service that I personally experienced is memorable.	3.42	1.11	0.82		
My personal experience at this hotel/restaurant was more special to me than other customers.	2.83	1.12	0.70		

Note: $N = 248$, Estimator = Satorra-Bentler corrections, $\chi^2 = 163.69$ ($p = .000$, $df = 84$), $\chi^2 / df = 1.95$, RMSEA = 0.06, 90% confidence interval = [0.05; 0.08], CFI = 0.95, TLI = 0.94, SRMR = 0.05, SFL = standardized factor loading, CR = composite reliability, AVE = average variance extracted; All z-statistic p-values = 0.000.

Table III. Correlation matrix and discriminant validity

Variable	CCV-in-use	CCV-in-interaction	CCV-in-involvement	CCV-in-experience
CCV-in-use	0.71			
CCV-in-interaction	0.61	0.74		
CCV-in-involvement	0.63	0.51	0.75	
CCV-in-experience	0.67	0.68	0.66	0.80

Note: $N = 248$; All the cross-construct correlation coefficients were statistically significant ($p = 0.000$); The square root of AVE is shown in the diagram on diagonal.

The researcher conducted CFA with a first-order model and a second-order model and compared the results to confirm multi-dimensional scales of CCV. As shown in Table IV, the model fit between the first-order model and the second-order model is not largely different. However, both Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) in the second-order model was slightly smaller than those in the first-order model, indicating that the second-order model is also considered to be an alternative (Kline, 2016).

Table IV. Model comparison

Model	χ^2	dF	RMSEA 90% C. I.	CFI	TLI	SRMR	AIC	BIC
One factor model	476.04	90	0.13 [0.12; 0.14]	0.75	0.71	0.09	8563.23	8721.33
First-order model (four factors)	163.69	84	0.06 [0.05; 0.08]	0.95	0.94	0.05	8219.28	8398.46
Second-order model	166.79	86	0.06 [0.05; 0.08]	0.95	0.94	0.05	8219.01	8391.17

Note: $N=248$; Estimator = Satorra-Bentler corrections, C. I. = confidence interval, AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.

The study also tested concurrent validity to ensure that the scales developed can predict other constructs, such as customer satisfaction. The three-item satisfaction scale by Cronin, Brady, & Hult (2000) was included in a questionnaire with a five-point Likert scale. After the

evaluation of the convergent validity and the discriminant validity through CFA, the study analyzed a structural model (a path model) in structural equation modeling (SEM) to verify how well new scales predict an outcome of satisfaction. As shown in Table V, The fit indices of the first-order model suggested that the model fits well ($\chi^2(125) = 249.78$, $p = 0.000$, $\chi^2/df = 2.00$, RMSEA = 0.063 with 90% confidence interval [0.052; 0.075], CFI = 0.95, TLI = 0.94, SRMR = 0.05). Moreover, Table VI indicate that all the path coefficients except for the path between CCV-in-inv and SAT were statistically significant and R^2 on satisfaction was 0.47. Comparatively, the second-order model showed similar fit indices, while RMSEA (0.056 with 90% C.I. [0.044; 0.067] and R^2 on satisfaction was 0.49. Therefore, both the first-order and the second-order model demonstrate the concurrent validity to predict other major constructs whereas the second-order model shows a slightly better model fit. Figure 7 illustrates the first-order and the second-order structural models and estimates.

Table V. Model comparison

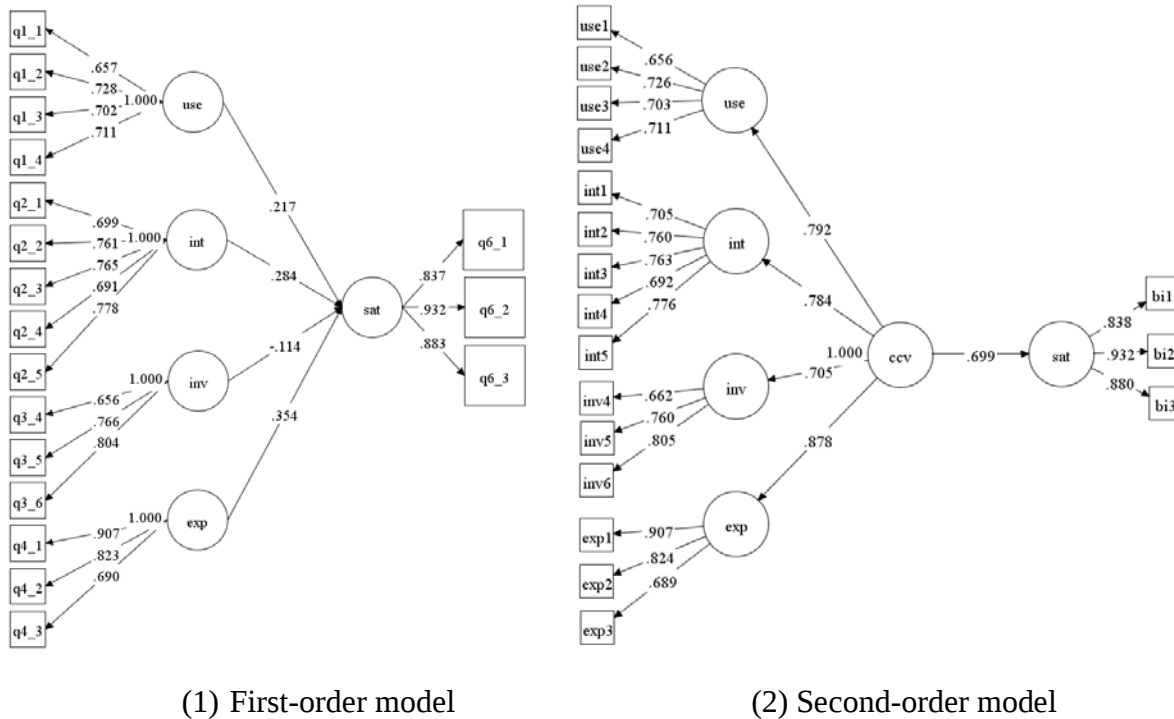
Model	χ^2	dF	RMSEA 90% C. I.	CFI	TLI	SRMR	AIC	BIC
First-order model (four factors)	249.78	125	0.063 [0.052; 0.075]	0.95	0.94	0.05	9297.48	9522.34
Second-order model	229.95	130	0.056 [0.044; 0.067]	0.95	0.94	0.05	9300.14	9507.43

Note: $N=248$; Estimator = Satorra-Bentler corrections, C. I. = confidence interval, AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.

Table VI. Results of a concurrent validity check

Structural relationship	Est.	S.E.	z-value	Std. Est.
(1) First-order model: CCV-in-use $\rightarrow$ SAT	0.31	0.14	2.14*	0.22
(1) First-order model: CCV-in-int $\rightarrow$ SAT	0.29	0.10	3.09**	0.28
(1) First-order model: CCV-in-inv $\rightarrow$ SAT	-0.13	0.11	-1.22	-0.11
(1) First-order model: CCV-in-exp $\rightarrow$ SAT	0.23	0.07	3.34**	0.35
(2) Second order model: CCV $\rightarrow$ SAT	1.13	0.16	7.79***	0.70

Note: CCV-in-use = Co-created value-in-use, CCV-in-int = Co-created value-in-interaction, CCV-in-inv = Co-created value-in-involvement, CCV-in-exp = Co-created value-in-experience, SAT = Satisfaction, * $p < 0.05$, ** $p < 0.01$, *** $p = 0.000$, R^2 for 1. SAT = 0.47, R^2 for 2. SAT = 0.49.



Note: use = CCV-in-use; int = CCV-in-interaction; inv = CCV-in-involvement; exp = CCV-in-experience; sat – satisfaction; all estimates are standardized estimates; all p-values = 0.000. path of inv is not significant.

Figure 7. The structural model for concurrent validity

Discussions and implications

This study developed CCV scales from the S-D logic perspective. Although VCC draws grown attention, how customers genuinely appraise value co-created in the sphere of VCC is not sufficiently discussed. As Gummerus (2013) notes, CCV needs to be separately conceptualized from VCC since VCC only explains how value is created rather than how value is perceived. Hence, research needs to consider CCV in the link with the concept of value that has already established psychometric achievements. Still, at the same time, the measure of CCV should be distinctively focused on the recently highlighted co-creation idea. The current study, therefore, starts with an extensive review of CCV from this vantage point.

This study conceptualizes CCV under the resource-centric view of CCV. Thus, the role of the customer as a resource integrator is captured based on S-D logic, and this notion leads to the multidimensional construct of CCV: value-in-use, value-in-interaction, value-in-involvement, and value-in-experience. These dimensions are considered the conceptual cruxes of S-D logic but were not clearly identified as measurable constructs. Value-in-use captures the nature of CCV that is determined during the process of use. Value-in-interaction implies that CCV in the hospitality service encounter emerges within the context of the interaction between service employees and customers. Value-in-involvement is focused on customers' role in integrating resources, including their own resources. Finally, CCV-in-experience states that CCV is derived from the experience that customers have. All the items reflect the individual assessment of meaningfulness under a given dimension. This multidimensional scale provides a holistic view of CCV.

The study actively used a mixed-method approach during the scale development process. Researchers generally collect qualitative data, and findings from the qualitative analysis are used to develop items for following quantitative design for validation (Harrison III, 2013). Rather than

purely depending on the qualitative data garnered through interviews, this study integrates rich text sources into the rigorously designed process of scale development proposed by Churchill (1979). First, in addition to a thorough review of S-D logic, the study used a Bibliometric approach to analyze the most salient concepts studied in the previous literature. Findings were used to explore customer perceptions about CCV through the ML algorithm. Since customer reviews contain a large amount of unstructured information, results may have some noises. Nonetheless, thematic clues identified from the new approaches significantly contributed to the generation of candidate items with a focus on central concepts.

Not only did this study adapt the ML-based new methodological approach in scale development, but it also demonstrated rigor in contemporary psychometric research. This study went through a step-by-step approach using rigorous methodologies. Different sources and samples used in this study reinforce the reliability and validity of the scale. Thus, new development and validation of items cast lights on future empirical research on S-D logic. According to Crawford & Kelder (2019), the maximum likelihood has been dominantly used without presenting data normality, though maximum likelihood has an underlying assumption of normality. The study conducted a robust Satorra-Bentler method to address the non-normality issue.

The high instruments of model fit in both the first-order and the second-order model imply that the CCV scale developed in this study is very applicable. However, the relationship between CCV-in-involvement and satisfaction in the first-order model was not statistically significant, and the second-order model fits slightly better. It does not immediately lead to the conclusion that the second-order model is superior. Instead, the reason may be inferred by the criterion of the outcome variable, the satisfaction that might be less associated with CCV-in-

involvement that pertains to customers' proactive participation. Other constructs, such as loyalty or trust, may yield a different result.

Hospitality firms need to position themselves better to attract customers, and VCC or CCV becomes one of the major concepts to which hospitality managers recently pay great attention. However, it conceptually exists in the hospitality firms so that they find it challenging to improve their readiness for it. For example, they are difficult to know if they provide good support for VCC. The development of the CCV scale will provide a systematic assessment of their competitive advantages and disadvantages in terms of VCC. Specifically, the periodic measurement of the scale will substantially enhance service management in the service encounter and marketing strategies.

Many firms pursue service innovation to attract more customers to be engaged in the co-creation process. However, new innovative features of services do not automatically transfer to the favorable evaluation of the services (Xu, Liu, & Lyu, 2018). Managers need to emphasize the meaningfulness or importance to customers. It is more salient to set up a circumstance under which customers are voluntarily involved in the process of using the service than to let them passively take the service delivered by employees. Even a certain level of investment that customers make may be useful in CCV. The conceptualization of CCV and the development of the scale unraveled the essence of the role that service employees play in the service encounter and the subjective aspect of customer experience. Managers need to educate employees on how to become more attentive to assist a co-creation process. In a nutshell, firms should be actively involved, and at the same time, encourage customers to be actively engaged in the co-creation network.

Limitations and further research

As all the contributions that research gives have a boundary, achievements that this study made leave limitations too. First, although the current study applied new methodologies to the scale development process, it still depended on the traditional method of purification and validation of a measure. While that approach is a double-edged sword, more active trials to take advantage of text mining may be considered in further research since ML-based techniques have speedily evolved. For example, ML-based natural language processing has come to extract critical themes and sentences from texts more accurately than ever before.

Second, the study recruited participants through the on-line platform, which might have brought a sampling bias. For instance, the ratio of the younger generation was higher than average, and the income level was low. Future diverse sampling will need to improve the external validity of the CCV scale by considering a different type of sample. Similarly, using more outcome variables for further studies will help confirm the concurrent validity.

Third, the S-D logic paradigm gradually extends to multiple actor-to-actor relationships of value co-creation. As the current research is focused on customers' views of CCV, the extended network to co-create value will be another good topic that future research may consider studying. CCV is accumulated through the repetitive process. Naturally, a longitudinal approach to the CCV study is encouraged.

References

- Babin, B. J., Darden, W. R., & Griffin, M. (1994). Work and/or fun: measuring hedonic and utilitarian shopping value. *Journal of Consumer Research*, 20(4), 644–657.
<https://doi.org/DOI: http://dx.doi.org/10.1086/209376>
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/https://doi.org/10.1177/014920639101700108>
- Barney, J., Wright, M., & Ketchen, D. J. (2001). The resource-based view of the firm: Ten years after 1991. *Journal of Management*, 27(6), 625–641. [https://doi.org/10.1016/S0149-2063\(01\)00114-3](https://doi.org/10.1016/S0149-2063(01)00114-3)
- Bolton, R. N., McColl-Kennedy, J. R., Cheung, L., Gallan, A., Orsingher, C., Witell, L., & Zaki, M. (2018). Customer experience challenges: bringing together digital, physical and social realms. *Journal of Service Management*, JOSM-04-2018-0113.
<https://doi.org/10.1108/JOSM-04-2018-0113>
- Busser, J. A., & Shulga, L. V. (2018). Co-created value: multidimensional scale and nomological network. *Tourism Management*, 65, 69–86. <https://doi.org/10.1016/j.tourman.2017.09.014>
- Cabiddu, F., Lui, T. W., & Piccoli, G. (2013). Managing Value Co-Creation In The Tourism Industry. *Annals of Tourism Research*, 42, 86–107.
<https://doi.org/10.1016/j.annals.2013.01.001>
- Camilleri, J., & Neuhofer, B. (2017). Value co-creation and co-destruction in the Airbnb sharing economy. *International Journal of Contemporary Hospitality Management*, 29(9, SI), 2322–2340. <https://doi.org/10.1108/IJCHM-09-2016-0492>
- Chandler, J. D., & Vargo, S. L. (2011). Contextualization and value-in-context: How context frames exchange. *Marketing Theory*, 11(1), 35–49.
<https://doi.org/10.1177/1470593110393713>

- Chathoth, P., Altinay, L., Harrington, R. J., Okumus, F., & Chan, E. S. W. (2013). Co-production versus co-creation: a process based continuum in the hotel service context. *International Journal of Hospitality Management*, 32(1), 11–20.
<https://doi.org/10.1016/j.ijhm.2012.03.009>
- Churchill, G. A. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research*, 16(1), 64. <https://doi.org/10.2307/3150876>
- Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation*, 10(7).
- Crawford, J. A., & Kelder, J. A. (2019). Do we measure leadership effectively? Articulating and evaluating scale development psychometrics for best practice. *Leadership Quarterly*, 30(1), 133–144. <https://doi.org/10.1016/j.leaqua.2018.07.001>
- Cronin, J. J., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), 193–218. [https://doi.org/10.1016/S0022-4359\(00\)00028-2](https://doi.org/10.1016/S0022-4359(00)00028-2)
- Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. *Journal of Marketing Research*, 28, 307–319.
- Drost, E. A. (2011). Validity and reliability in social science research. *Education Research and Perspectives*, 38(1), 105–123.
- FitzPatrick, M., Davey, J., Muller, L., & Davey, H. (2013). Value-creating assets in tourism management: Applying marketing's service-dominant logic in the hotel industry. *Tourism Management*, 36, 86–98. <https://doi.org/10.1016/j.tourman.2012.11.009>

- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Frías Jamilena, D. M., Polo Peña, A. I., & Rodríguez Molina, M. Á. (2017). The effect of value-creation on consumer-based destination brand equity. *Journal of Travel Research*, 56(8), 1011–1031. <https://doi.org/10.1177/0047287516663650>
- Gallarza, M. G., Arteaga, F., Del Chiappa, G., Gil-Saura, I., & Holbrook, M. B. (2017). A multidimensional service-value scale based on Holbrook's typology of customer value. *Journal of Service Management*, 28(4), 724–762. <https://doi.org/10.1108/JOSM-06-2016-0166>
- Grönroos, C., & Voima, P. (2013). Critical service logic: Making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, 41(2), 133–150. <https://doi.org/10.1007/s11747-012-0308-3>
- Gummerus, J. (2013). Value creation processes and value outcomes in marketing theory: strangers or siblings? *Marketing Theory*, 13(1), 19–46. <https://doi.org/10.1177/1470593112467267>
- Gummesson, E., Lusch, R. F., & Vargo, S. L. (2010). Transitioning from service management to service-dominant logic. *International Journal of Quality and Service Sciences*, 2(1), 8–22. <https://doi.org/10.1108/17566691011026577>
- Hair, J. F. (2009). Multivariate Data Analysis. <https://doi.org/10.1016/j.ijpharm.2011.02.019>
- Halliday, S. V. (2016). User-generated content about brands: understanding its creators and consumers. *Journal of Business Research*, 69(1), 137–144. <https://doi.org/10.1016/j.jbusres.2015.07.027>

- Harrison III, R. L. (2013). Using mixed methods designs in the journal of business research, 1990-2010. *Journal of Business Research*, 66(11), 2153–2162.
<https://doi.org/10.1016/j.jbusres.2012.01.006>
- Helkkula, A., Kelleher, C., & Pihlstrom, M. (2012). Characterizing value as an experience: implications for service researchers and managers. *Journal of Service Research*, 15(1), 59–75.
- Helkkula, A., Kelleher, C., & Pihlström, M. (2012). Characterizing value as an experience: Implications for service researchers and managers. *Journal of Service Research*, 15(1), 59–75. <https://doi.org/10.1177/1094670511426897>
- Henze, N., & Zirkler, B. (1990). A class of invariant consistent tests for multivariate normality. *Communications in Statistics - Theory and Methods*, 19(10), 3595–3617.
<https://doi.org/10.1080/03610929008830400>
- Holbrook, M. B. (1999). *Consumer value: A framework for analysis and research*. London: Routledge.
- Hunt, D. M., Geiger-Oneto, S., & Varca, P. E. (2012). Satisfaction in the context of customer co-production: A behavioral involvement perspective. *Journal of Consumer Behaviour*, 11(5), 347–356. <https://doi.org/10.1002/cb.1370>
- Hunt, S. D., & Morgan, R. M. (1997). Resource-advantage theory: A snake swallowing its tail or a general theory of competition? *Journal of Marketing*, 61(4), 74–82.
<https://doi.org/10.2307/1252088>
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31–36.
<https://doi.org/10.1007/BF02291575>

- Kelly, P., Lawlor, J., & Mulvey, M. (2017). Customer Roles in Self-Service Technology Encounters in a Tourism Context. *Journal of Travel & Tourism Marketing*, 34(2), 222–238.
<https://doi.org/10.1080/10548408.2016.1156612>
- Kleinaltenkamp, M., Brodie, R. J., Frow, P., Hughes, T., Peters, L. D., & Woratschek, H. (2012). Resource integration. *Marketing Theory*, 12(2), 201–205.
- Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling* (4th ed.). New York, NY: The Guilford Press.
- Kotler, P. (1972). A generic concept of marketing. *Journal of Marketing*, 36(2), 46–54.
- Leroi-Werelds, S., Streukens, S., Brady, M. K., & Swinnen, G. (2014). Assessing the value of commonly used methods for measuring customer value: A multi-setting empirical study. *Journal of the Academy of Marketing Science*, 42(4), 430–451.
<https://doi.org/10.1007/s11747-013-0363-4>
- Lusch, R. F., & Vargo, S. L. (2014). *Service-dominant logic: Premises, perspectives, possibilities*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139043120>
- Maaten, L. V. D., & Hinton, G. (2008). Visualizing Data using t-SNE. *Journal of Machine Learning Research*, 9, 2579–2605. <https://doi.org/10.1007/s10479-011-0841-3>
- Madhavaram, S., Granot, E., & Badrinarayanan, V. (2014). Relationship marketing strategy: an operant resource perspective. *Journal of Business & Industrial Marketing*, 29(4), 275–283.
- Madhavaram, S., & Hunt, S. D. (2008). The service-dominant logic and a hierarchy of operant resources: developing masterful operant resources and implications for marketing strategy. *Journal of the Academy of Marketing Science*, 36(1), 67–82.
<https://doi.org/10.1007/s11747-007-0063-z>

- Mathwick, C., Malhotra, N., & Rigdon, E. (2001). Experiential value: Conceptualization, measurement and application in the catalog and Internet shopping environment. *Journal of Retailing*, 77(1), 39–56. [https://doi.org/10.1016/S0022-4359\(00\)00045-2](https://doi.org/10.1016/S0022-4359(00)00045-2)
- Merz, M. A., Zarantonello, L., & Grappi, S. (2018). How valuable are your customers in the brand value co-creation process? The development of a Customer Co-Creation Value (CCCV) scale. *Journal of Business Research*, 82, 79–89. <https://doi.org/10.1016/j.jbusres.2017.08.018>
- Mikolov, T., Sutskever, I., Chen, K., Corrado, G., & Dean, J. (2013). Distributed representations of words and phrases and their compositionality, 1–9. <https://doi.org/10.1162/jmlr.2003.3.4-5.951>
- Ordanini, A., & Parasuraman, A. (2011). Service Innovation Viewed Through a Service-Dominant Logic Lens: A Conceptual Framework and Empirical Analysis. *Journal of Service Research*, 14(1), 3–23. <https://doi.org/10.1177/1094670510385332>
- Park, S., & Nicolau, J. L. (2015). Asymmetric effects of online consumer reviews. *Annals of Tourism Research*, 50, 67–83. <http://dx.doi.org/10.1016/j.annals.2014.10.007>
- Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, 70, 153–163. <https://doi.org/10.1016/j.jesp.2017.01.006>
- Petrick, J. F. (2002). Development of a multi-dimensional scale for measuring the perceived value of a service. *Journal of Leisure Research*, 34(2), 119-134.
- Porter, M. E. (1996). What Is Strategy? *Harvard Business Review*, (4134).
- Priem, R. L. (2007). A consumer perspective on value creation. *Academy of Management Review*, 32(1), 219–235. <https://doi.org/10.5465/AMR.2007.23464055>

- Ramaswamy, V., & Ozcan, K. (2018). What is co-creation? An interactional creation framework and its implications for value creation. *Journal of Business Research*, 84, 196–205.
<https://doi.org/10.1016/j.jbusres.2017.11.027>
- Ranjan, K. R., & Read, S. (2016). Value co-creation: concept and measurement. *Journal of the Academy of Marketing Science*, 44(3), 290–315. <https://doi.org/10.1007/s11747-014-0397-2>
- Reise, S. P., Waller, N. G., & Comrey, A. L. (2000). Factor analysis and scale revision. *Psychological Assessment*, 12(3), 287–297. <https://doi.org/10.1037/1040-3590.12.3.287>
- Sánchez-Fernández, R., Iniesta-Bonillo, M. Á., & Holbrook, M. B. (2009). The conceptualisation and measurement of consumer value in services. *International Journal of Market Research*, 51(1), 93–113. <https://doi.org/10.2501/S1470785308200328>
- Satorra, A., & Bentler, P. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, 66(4), 507–514. Retrieved from <https://link.springer.com/content/pdf/10.1007%2FBF02296192.pdf>
- Singaraju, S. P., Nguyen, Q. A., Niininen, O., & Sullivan-Mort, G. (2016). Social media and value co-creation in multi-stakeholder systems: A resource integration approach. *Industrial Marketing Management*, 54, 44–55. <https://doi.org/10.1016/j.indmarman.2015.12.009>
- So, K. K. F., King, C., & Sparks, B. (2014). Customer Engagement With Tourism Brands: Scale Development and Validation. *Journal of Hospitality & Tourism Research*, 38(3), 304–329. <https://doi.org/10.1177/1096348012451456>
- Sweeney, J., & Soutar, G. (2001). Consumer perceived value: the development of a multiple item scale. *Journal of Retailing*, 77(2), 203–220. [https://doi.org/10.1016/S0022-4359\(01\)00041-](https://doi.org/10.1016/S0022-4359(01)00041-0)

- Tsao, H. Y. (Jody), Campbell, C. L., Sands, S., Ferraro, C., Mavrommatis, A., & Lu, S. (Qiang). (2020). A machine-learning based approach to measuring constructs through text analysis. *European Journal of Marketing*, 54(3), 511–524. <https://doi.org/10.1108/EJM-01-2019-0084>
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1–17. <http://journals.ama.org/doi/abs/10.1509/jmkg.68.1.1.24036>
- Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, 36(1), 1–10. <https://doi.org/10.1007/s11747-007-0069-6>
- Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: an extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, 44(1), 5–23. <https://doi.org/10.1007/s11747-015-0456-3>
- Vargo, S. L., & Lusch, R. F. (2017). Service-dominant logic 2025. *International Journal of Research in Marketing*, 34(1), 46–67. <https://doi.org/10.1016/j.ijresmar.2016.11.001>
- Vargo, S. L., & Lusch, R. F. (2018). *The SAGE Handbook of Service-dominant Logic*. SAGE Publications Limited.
- Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26(3), 145–152. <https://doi.org/10.1016/j.emj.2008.04.003>
- Vivek, S. D., Beatty, S. E., & Morgan, R. M. (2012). Customer Engagement: Exploring Customer Relationships Beyond Purchase. *The Journal of Marketing Theory and Practice*, 20(2), 122–146. <https://doi.org/10.2753/MTP1069-6679200201>

- Xiang, Z., Du, Q., Ma, Y., & Fan, W. (2017). A comparative analysis of major online review platforms: Implications for social media analytics in hospitality and tourism. *Tourism Management*, 58, 51–65. <https://doi.org/10.1016/j.tourman.2016.10.001>
- Woodall, T. (2003). Conceptualising ‘Value for the Customer’’: An Attributional, Structural and Dispositional Analysis.’ *Academy of Marketing Science Review*, 12(5), 1–42.
- Woodruff, R. B. (1997). Customer value: the next source for competitive advantage. *Journal of the Academy of Marketing Science*. <https://doi.org/10.1007/BF02894350>
- Xu, H., Liu, Y., & Lyu, X. (2018). Customer value co-creation and new service evaluation: the moderating role of outcome quality. *International Journal of Contemporary Hospitality Management*, 30(4), 2020–2036. <https://doi.org/10.1108/IJCHM-08-2016-0467>
- Yi, Y., & Gong, T. (2013). Customer value co-creation behavior: Scale development and validation. *Journal of Business Research*, 66(9), 1279–1284. <https://doi.org/10.1016/j.jbusres.2012.02.026>
- Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), 2–22. <https://doi.org/10.2307/1251446>

CHAPTER 5

The interaction effect of self-service technology experience and facilitating conditions on co-created value: A service-dominant logic perspective

Abstract

Although self-service technology is broadly used in the hospitality and tourism industry, existing research has typically paid attention to customers' intention to use self-service technology. Concentrating on the customers' actual experience of self-service technology, this study examines how customers' self-service technology experience relates to co-created value. Adopting service-dominant logic with the resource-based approach, the study uncovers the interaction effect of facilitating conditions on the focal relationship. A new perspective of SST this study proposes contributes to the current research on the self-service technology by shifting the focus on the feature of the self-service technology to customer behavior.

The study conducted a scenario-based survey and analyzed 848 samples using latent moderated structural equation modeling with quasi-maximum likelihood (QML) estimation. Based on the findings, implications of the self-service technology experience and facilitating conditions based on service-dominant logic were discussed.

Keywords: self-service technology, co-created value, service-dominant logic, facilitating conditions, behavioral intentions

Introduction

The inducement of self-service technology (SST) has been augmented in the hospitality industry with an aim to lower labor costs (Lin & Hsieh, 2011), increase efficiency (Dabholkar, 1996), minimize service failure (Kucukusta, Heung, & Hui, 2014), and promote customized service (Ahn & Seo, 2018). Marriot and Hilton have deployed SST kiosks in their hotel lobby to expedite check-in and check-out processes (Wei, Torres, & Hua, 2017). Restaurant chains such as Chili's and Applebee's placed e-table devices on the tables to facilitate the menu order and payment (Ahn & Seo, 2018). SST has fundamentally transformed the traditional human-to-human based hospitality service encounter into the technology-supported service encounter (Kandampully, Bilgihan, & Zhang, 2016; Wang, Harris, & Patterson, 2012).

SST enables customers to have more choices to implement the service process, which brings about the drastic change of customer experience in the service encounter (Kim & Qu, 2014). For example, customers may use SST alone instead of receiving human service or use SST with support from service employees, which may provide a different kind of impression on their experience. Service firms need a well-developed strategy to engage customers by helping them take active roles in value co-creation (VCC) through SST (Kandampully et al., 2016). An in-depth understanding of customer experience in the SST will significantly help service managers organize their service design.

However, despite the recent attempt to apply the experiential view to SST research (e.g., Kelly, Lawlor, & Mulvey, 2017; Wei et al., 2017), most existing research on SST has been interested in customers' intentions to use SST. It generally draws on the technology acceptance model (TAM) (Davis, Bagozzi, & Warshaw, 1989) or technology readiness (TR) (Parasuraman, 2000). In that sense, its focus has been naturally placed on the attributes of SST or individual characteristics that can influence the acceptance of SST. In terms of SST experience, however,

customers' active role in SST is the premise of service (Scherer, Wunderlich, & Wangenheim, 2015). Hence, research on SST experience requires a different approach, focusing on behavioral influences that customer experience may hold. This study aims to investigate whether SST experience can induce customers' positive behaviors and how firms can fuel this process.

To cast a light on interpreting customers' experience in SST and its subsequent effects, this study adopts a service-dominant (S-D) logic paradigm (Vargo & Lusch, 2004, 2008) and the concept of co-created value (CCV). CCV refers to customers' appraisal of meaningfulness of service through the integration of resources to realize the benefit in use in a given context (Vargo & Lusch, 2018). The study sees SST as an experience through which customers can derive CCV. Moreover, for a better understanding of interactions related to SST, the study builds on the view of resource integration underpinned by S-D logic and demonstrates that facilitating conditions (FC) can moderate the main effect of SST experience on CCV. The experience-centric perspective of SST with the S-D logic framework contributes to the expansion of SST research and interpretation of interactions between multiple actors, including SST, service employees, and customers in a service encounter.

Literature Review

Self-service technology experience

SST experience refers to the responsive outcomes as customers act, sense, and think during the use of self-service technology (Åkesson, Edvardsson, & Tronvoll, 2014; Gummerus, 2013). To discuss the SST experience, it may be worthwhile to grasp distinctiveness from the aggregated notion of customer experience. While previous studies have typically dealt with total customer experience (Helkkula, 2011), customer experiences occur throughout all the points where the customer encounters with the product (Mascarenhas, Kesavan, & Bernacchi, 2006) whether they

are favorable or not (Gentile, Spiller, & Noci, 2007). Indeed, good, bad, or indifferent experiences occur whenever there is a direct or indirect interaction (Brakus, Schmitt, & Zarantonello, 2009). Carù & Cova (2003) argue that each experience at a consumption stage should be separately studied from the total customer experience. Moreover, Laghari & Connelly (2012) four distinctive domains, including technological domain, human domain, contextual domain, and business domain, to delineate quality of experience.

In the hospitality setting, Wei, Torres, & Hua (2016) investigate how customers' evaluation of SST experience can have effects on customer commitment. Wang, So, & Sparks (2017) show that customers' technology readiness plays a moderating role in the relationship between perceived quality and satisfaction. Through the S-D logic lens, Kelly et al. (2017) suggest six customer roles in the SST encounter for VCC. Further, scholars have attempted to test actual customer behavioral result of SST use. In their simulation study, Kokkinou & Cranage (2013) estimate total waiting time and service level when customers choose to use SST other than service employees for the service process. Hanks, Line, & Mattila (2016) demonstrate that customers less participate in the donation program solicited by a tableside tablet than that requested by a service employee. Yet, the majority of SST research has been focused on the features of SST to impact customers' intention to use the SST. Table I summarizes the existing SST literature in hospitality and tourism management.

Table I. Prior studies of self-service technology in the hospitality and tourism management literature

Author	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Theory	Main findings
Lee, Castellanos, & Choi (2012)	Technology readiness	Intention to use kiosk	- Attitudes toward using kiosk - Attitudes toward service provider	Airlines	Survey (SEM)	TR	Technology readiness has a positive effect on the intention to use a self-service kiosk mediated by both attitudes toward a kiosk and attitudes toward a service provider.
Kim, Christodoulidou, & Brewer (2012)	- Role clarity - Ability - Extrinsic motivation - Intrinsic motivation - Gender - Education - Age - Previous experience - Need for interaction	Likelihood of using SST	N/A	Lodging	Survey (SEM)	TAM	Grounded in technology acceptance model, this study explores various factors to influence self-service kiosks in the lodging industry. Intrinsic motivation has the most substantial effect.
Kokkinou & Cranage (2013)	- Number of available resources - Number of customer arrivals - Processing speed of SST - Failure rate of SST	- Total waiting time - Service level	N/A	Hotel	Simulation and ANOVA	Queuing theory	This study tests the simulation of the whole waiting time. All IVs impact DVs. Specifically, slower SST processing speed and higher failure rate led to longer waiting times when customers have high demand.
Kucukusta, Heung, & Hui (2014)	- Relative advantage - Ease of use - Communicability - First trial - Psychological risks - Product efficiency - Product veracity - Product risk	Choice of a luxury hotel	- Gender - Age - Region - Education level	Hotel	Survey (Regression and ANOVA)	Diffusion of innovation	Different demographic and cultural factors have different effects on perceptions toward deploying SST in luxury hotels

Author	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Theory	Main findings
Beldona, Buchanan, & Miller (2014)	e-tablet vs. traditional menu	- Order information quality - Menu usability - Ordering satisfaction	Past patronage	Restaurant	Experimental design (Multivariate GLM)	N/A	the e-tablet menu is revealed to be superior to the traditional menu in terms of order information quality, menu usability, and ordering experience satisfaction.
Kim & Qu (2014)	- Perceived usefulness - Perceived ease of use - Compatibility - Perceived risks	Intention to use	- Satisfaction - Attitude toward using SST	Hotel	Survey (SEM)	TAM	This study examines the traditional IVs in TAM. Usefulness, ease of use, compatibility, and risks are all related to travelers' attitudes to using SST. Some mediation
Kokkinou & Cranage (2015)	- Waiting for SST - Waiting for employee	Selection of the SST	N/A	Hotel	Experimental design (Logistic regression)	N/A	This study tests selection of SST in the comparison of two conditions (e.g., the waiting line for SST and the waiting line for service employees). The result shows that customers are more motivated to use SST when the waiting line for the service employee becomes longer
Oh, Jeong, Lee, & Warnick (2016)	- Waiting line - Service complexity - Technology trust - Technology anxiety	Intent to use SST	- Ease of use - Usefulness	Hotel	Experimental design (SEM)	TAM	This study explores attitudinal and situational determinants of SST adoption. For the determinants, TAM is used as a structured dependent process. Perceived ease of use and perceived usefulness mediate the main effects.

Author	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Theory	Main findings
Wei, Torres, & Hua (2016)	- Evaluation of extrinsic attributes - Evaluation of intrinsic attributes	- Affective commitment - Temporal commitment - Instrumental commitment	Transcendent customer experience	Hotel and restaurant	Survey (SEM)	N/A	This study is focused on SST experience. Customers' evaluation of experience with SST positively related to their commitment. The effect is mediated by transcendent customer experience
Hanks, Line, & Mattila (2016)	Donation matching	Donation	Tablet or the presence of others (server, friends)	Restaurant	Experimental design (ANOVA)	Costly signaling	The likelihood to participate donation program is lower when the solicitation is made via tableside tablet than when it is made in the presence of others
Wang, So, & Sparks (2017)	Perceived quality of technology-enabled services	Satisfaction with technology-enabled services	Technology readiness	Airlines	Survey (PLS path modeling)	TR	Technology-enabled service quality followed by satisfaction with the service leads to not only overall satisfaction but also future behavior. Technology readiness moderates the effects in each phase.
Kelly et al. (2017)	N/A	N/A	N/A	Airlines	Qualitative (interview)	Service-dominant logic	Suggest six customer roles in SST encounters from the service-dominant logic perspective
Kaushik & Rahman (2017)	- Perceived ease of use of SST - Optimism - Innovativeness - Insecurity of SST - Discomfort of SST	Intention toward SST adoption	- Need for interaction - Perceived usefulness of SST	Tourism	Survey (SEM)	TAM, TR	The need for interaction and perceived usefulness have a mediating role between factors of technology readiness and acceptance model and intention to adopt SST.

Author	Independent variable	Dependent variable	Mediator / Moderator	Research context	Research method	Theory	Main findings
Wei, Torres, & Hua (2017)	- Extrinsic attributes - Intrinsic attributes	Transcendent Service Experience	Satisfaction with SST	Hotel and restaurant	Survey (Path analysis)	- TCV (Theory of Consumption Value) - EVS (Experiential Value Scale)	Both extrinsic and intrinsic experiences of SST have a positive relationship with customer satisfaction. Notably, the impact of the extrinsic experience is stronger.
Lee & Cranage (2018)	- SST failure - Employee failure - Firm policy failure	- Locus of causality - Stability - Controllability	Technology anxiety	Restaurant	Experimental design (ANOVA)	TR	Customers rated causal attributions as the lowest in an SST failure. They consider SST failure the least controllable compared to employee failure or firm policy failure.
Ahn & Seo (2018)	- Functionality - Enjoyment - Design - Customization	- Approach behavior - Avoidance behavior	- Affective state - Cognitive state	Restaurant	Survey (SEM)	Stimulus-organism-response	Utilitarian stimuli of SST influence affective and cognitive state, but hedonic stimuli of SST do not. The affective and cognitive states lead to increased positive behavior and decreased avoidance behavior.
Liu, Hung, Wang, & Wang (2019)	N/A	N/A	N/A	Hotel	Qualitative (interview)	N/A	This study explores the adoption of SST from the organization's perspective (hotel).
Shin & Perdue (2019)	N/A	N/A	N/A	N/A	Bibliometrics	N/A	The bibliometric analysis identifies foundational articles, turning point articles, and article clusters regarding SST

Co-created value

According to Vargo & Lusch (2004; 2008), a traditional goods-dominant (G-D) logic implies that value is embedded in products and delivered in exchange. However, S-D logic asserts that service (singular) is the fundamental basis of exchange and that services (plural) and goods are in common the conveying mechanism of the service (Vargo & Lusch, 2004; 2008). Service denotes the application of one's resources for the benefit of another party (Chandler & Vargo, 2011; Vargo, Maglio, & Akaka, 2008). There exist two types of resources. Operand resources are resources that require the application of other resources to them to produce an effect (Vargo & Lusch, 2004). For instance, raw materials such as natural resources are not effective until human being's operation is applied. Hence, their nature is physical and static (Edvardsson, Tronvoll, & Gruber, 2011). In contrast, operant resources are resources that are applied to operand resources (Vargo & Lusch 2004). Knowledge and skills belong to operant resources of which nature is informational and dynamic (Edvardsson, Tronvoll, & Gruber, 2011).

Value is not embedded in goods or services, but it is determined by customers when they use the goods or services by applying their operant resources to operand resources (Vargo et al., 2008). In other words, customers need to integrate effectively their own operant resources and operand resources provided by firms to co-create value. As such, resource integration is the prerequisite of CCV because no single actor can participate in the VCC process without other actors' provision of resources (Vargo & Lusch, 2018). Moreover, all that firms can do in the VCC process is offer value proposition by providing resources (Vargo & Lusch, 2004, 2008). Thus, the focus on the operant resources changed the view of how service providers and customers interact and how they co-create value (Brodie, Löbner, & Fehrer, 2019; Pohlmann & Kaartemo, 2017).

Through the lens of resource integration, the concept of CCV can be bolstered by various underlying factors, that is, CCV-in-use, CCV-in-interaction, CCV-in-interaction, and CCV-in-experience. First, CCV-in-use is the most fundamental factor that distinguishes S-D logic from other value co-creation theories. The concept of value co-creation was defined first by Prahalad & Ramaswamy (2004) as “the joint creation of value by the company and the customer” (p. 8). Their view of value co-creation is that value is co-created by collaboration between firms and customers. Therefore, it is conceptually close to the value co-production of which process is led by firms. In contrast, by the notion of CCV-in-use in the S-D logic, the role of firms can be changed to the facilitator. CCV-in-use is a decisive mechanism of how customers determine value, which is directly related to the actual process of their resource integration. Thus, CCV-in-use in this study refers to customers’ appraisal of the meaningfulness of using a service.

Second, CCV-in-interaction reflects the mutual aspect of CCV. VCC in the service encounter is the ongoing process of exchange. However, what is exchanged is not value. It is the resources that service employees and customers trade. Hence, interaction is needed to integrate others’ resources (Vargo & Lusch, 2018). In this regard, VCC is a function of reciprocal interaction between firms and customers (Grönroos and Voima, 2013). CCV-in-interaction entails mundane practices, accommodating relationships between firms and customers. Moreover, customers’ operant resources are not used up, but rather it is reinforced by the interaction with others (Vargo & Lusch 2018). CCV-in-interaction in this study refers to customers’ appraisal of the meaningfulness of their interactions and communications with service employees.

Third, CCV-in-involvement pertains to the customer provision of his/her own resources (typically the operant resources) to co-create value. Vargo & Lusch (2016) stress that “operant

resources are the fundamental source of strategic benefits” (p.8). Operand resources exist only in the form of the potential to contribute to value. It is customers who apply operand resources to the operand resources to realize the potential (Lusch & Vargo, 2014). Although customers’ deep involvement is not a mandatory cause to co-create value, how much customers can dedicate their resources for the operand resources are closely related to CCV (Vargo & Lusch, 2018). As such, CCV-in-involvement in this study refers to customers’ appraisal of meaningfulness of their participation and involvement in service provision.

Fourth, CCV-in-experience contains the experiential attribute of value. Whereas CCV-in-experience shares a common with the traditional experiential perspective of value, the difference lies in that the CCV-in-experience is always in the process of resource integration. CCV-in-experience must be subjective because customers’ operand resource utilization is subjective, and resource integration is contextual (Chandler & Vargo, 2011). Vargo & Lusch (2016) suggest that “value is always uniquely and phenomenologically determined by the beneficiary (customer)” (p. 8). Hence, CCV-in-experience in this study refers to customers’ appraisal of the meaningfulness of their personal and subjective experience.

Self-service technology experience and co-created value-in-use

Chathoth, Altinay, Harrington, Okumus, & Chan (2013) state that “the increasing use of information technology is undoubtedly changing the nature of customers’ input into the co-creation process in ways that may influence their perception of the whole service experience (p. 15).” From the S-D logic perspective, technology is “the application of useful knowledge” applied as a form of service (Vargo & Lusch, 2017). SST device itself is an operand resource to be applied by an operand resource for the transformation into value. The SST device does not

provide any value until customers apply their knowledge and skill to the device to create any benefit for themselves.

The current check-in kiosks in hotels or payment tablets in restaurants contain various aspects of functionality, which is an integral part of service providers to enhance customer experience (Ku & Chen, 2013). When the utility that customers derive from SST experience is meaningful, their SST experience will lead to producing CCV effectively. Therefore, the present study posits the following hypothesis.

H1a. Self-service technology experience is positively related to co-created value-in-use.

Self-service technology experience and co-created value-in-interaction

The acknowledgment of CCV-in-interaction captures the interactive nature of services. When a firm delivers a service to a customer, the customer is always in the same sphere of service delivery, and consumption of the service is not separable. CCV occurs through this interactive process in which firms need to provide resources that fulfill customer needs (Chathoth, Altinay, Harrington, Okumus, & Chan, 2013).

SST is an operand resource to be applied by customers' activities. Yet, at the same time, SST can be conceptualized as an operant resource, because it also applies its functionalities to other resources, that is, inputs from customers (Akaka, Vargo, & Lusch, 2013). For example, modern SST devices do not merely provide information in one direction but reciprocally communicate with customers. They respond to the customers' requests, ask questions to gather information from customers, provide selective options, and even suggest new ideas to customers to co-create value. Thus, SST is a value co-creation platform that enables customers to customize

their service experience and expand a way to interact with service providers (Shin & Perdue, 2019).

H1b. Self-service technology experience is positively related to co-created value-in-interaction.

Self-service technology experience and co-created value-in-involvement

According to Zhang, Gordon, Buhalis, & Ding (2018), experience mediated by technology is critical for CCV. SST, by nature, requires customers to involve in the realization of the service. SST allows customers to be empowered by taking in charges during the process of SST (Zhu, Nakata, Sivakumar, & Grewal, 2013). Moreover, customers' participation level of SST experience positively influences value perceptions (Mohd-Any, Winklhofer, & Ennew, 2015). Thus, customers' proactive role during the process of using SST followed by favorable outcomes gives self-efficacy (Meuter et al., 2003), which will facilitate to co-create value attributed to involvement. Moreover, Dong, Evans, & Zou (2008) argue that a higher level of customer participation brings positive feelings, which relates to CCV. Firms no longer solely provide value just by providing SST service. Customers are those who are actively engaged in a better experience of using SST, which leads to CCV (Hilton, Hughes, Little, & Marandi, 2013). Therefore, this study suggests the hypothesis below.

H1c. Self-service technology experience is positively related to co-created value-in-involvement.

Self-service technology experience and co-created value-in-experience

VCC occurs through resource integration, and customers are resource integrators within a service ecosystem. In other words, VCC comes true through customers' subjective experience, and the experience embraces the value in nature. Experience always occurs whenever there is an interaction between service providers and customers (Åkesson et al., 2014; Edvardsson et al., 2011). On the contrary, the value does not always happen with experience. It takes place only when the experience has meaningfulness to customers.

Although value is co-created, it is appraised by a particular customer (Vargo & Lusch, 2018). CCV-in-experience does not reflect a specific feature of SST. For instance, customers who do not notice the modification of the feature of SST may be able to have favorable or unfavorable SST experiences (Brooks & Hestnes, 2010). In this regard, while using SST, customers gain a continuous flow of experiences, some of which can be memorable (Åkesson et al., 2014). Collier, Sherrell, Babakus, & Horky (2014) reveal that specific experience (i.e., perceived control and perceived convenience) of SST is positively related to value. Therefore, the study posits the following hypothesis.

H1d. Self-service technology experience is positively related to co-created value-in-experience.

Facilitating conditions

Facilitating conditions (FC) refers to the customers' perceptions of the availability of resources and support needed to engage in a behavior (Venkatesh et al. 2012). Resources in FC include the resources provided by firms or owned by customers themselves. FC is conceptually related to

behavioral control in the theory of planned behavior (TPB) (Ajzen, 1991) in which the availability of resources is essential to execute a behavior successfully (Chiu & Hofer, 2015; Venkatesh, Morris, Davis, & Davis, 2003). According to Collier & Sherrell (2010), when an individual has less perceived behavioral control, she tends to seek for FC more. Venkatesh et al. (2003) propose a unified theory of acceptance and use of technology (UTAUT) building on previous models, including TPB and TAM. In their study, UTAUT includes FC as a critical component that directly affects the actual behavior beyond behavioral intentions alone.

FC was typically accepted as the underlying mechanism that supports employees' desire to use technology in an organization. For example, Chowdhury, Patro, Venugopal, & Israel (2014) argue that resource availability, including both physical and human resources, influences a positive attitude towards accepting new technology. In an SST setting, previous research has also pursued to reveal the relationship between FC and intention to accept technology. For example, Chiu & Hofer (2015) validate the difference of FC toward the intention to use SST, depending on the market. For instance, in their study, the impact of FC is significant in a collective, emerging market context (Taiwan), not in an individualistic, advanced market context (Austria).

Yet, in their extended version of UTAUT (so-called UTAUT2), Venkatesh et al. (2012) present FC as a determinant that impacts customer use behavior of technology. In using technology, FC also denotes the nature of collaboration in terms of resources (Brown, Dennis, & Venkatesh, 2010). Moreover, scholars argue that FC influences not only the intention to use technology, but also initial use, and post-use of technology (Alapetite, Andersen, & Hertzum, 2009; Pynoo et al., 2011).

Facilitating conditions between self-service technology experience and co-created value-in-use

Since technology is naturally networked with other resources, FC is also applied to collaboration in technology use (Brown, Dennis, & Venkatesh, 2010). Because CCV is determined in use through resource integration, FC makes an impact on the VCC process. In an SST setting, customers can co-create value by integrating the resource from SST with their operant resources. In other words, they attempt to use all the available resources, including their own knowledge and information gained from other actors.

When there is a prompt, satisfactory outcome in SST experience, customers' perception of meaningfulness plays an essential role while the outcome is transformed into CCV. Customers' operant resources help in the process of forming meaningfulness. For example, customers who already have a knowledge of the menu is bound to make the VCC process more effective than those who do not. Moreover, if there is a supportive manual next to the SST device on the table or an available service employee, customers will have more chances to find the meaningfulness of the outcome of using the SST device. When more resources to facilitate the technology are available, it will lead to a positive impact on the CCV process.

H2a. The relationship between self-service experience and co-created value-in-use is stronger when facilitating conditions are high.

Facilitating conditions between self-service technology experience and co-created value-in-interaction

The advent of SST in service encounters imposed a new interdepending role of service employees (Larivière et al., 2017). For example, in coordinating with SST, service employees

can provide any information not covered during the process of using SST (Ostrom et al., 2015). Moreover, noble information that SST produces often leads customers to seek assistance (Kumar & Telang, 2012). According to S-D logic, all actors in service ecosystems are involved in the value co-creation (Axiom 2 – value is co-created by multiple actors, always including the beneficiary) (Vargo et al., 2008). Thus, under the condition of triadic interactions among customers, service employees, and SST, customers who use SST become the actor who leads the collaboration and resource integration. SST and other facilitating factors become resource providers culminating in the value co-creation process.

Coordinating with SST, service employees can provide any information not covered during the process of using SST (Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015). The outcomes of experience of SST can be various, depending on the service employee assistance (Reinders, Dabholkar, & Frambach, 2008). For example, when customers try and test e-tablet devices on the table in the restaurant, they are generally limited to maximize value because unfamiliarity with SST lessens customers' capability of integrating resources (i.e., information or an expected output). Service employees' assistance facilitates the resource integration process from which customers can derive more outputs that will increase perceived benefits from interactions. When it is easier to access resources through interactions, customers have a greater opportunity for resource integration (Lusch & Nambisan, 2015). Hence, as FC is greater, their integration process will be smoother; and thus, the outcome will have a better chance to be realized to co-create value. Therefore, the present study proposes the following hypothesis.

H2b: The relationship between self-service experience and co-created value-in-interaction is stronger when facilitating conditions are high.

Facilitating conditions between self-service technology experience and co-created value-in-involvement

CCV-in-involvement denotes customers' appraisal of meaningfulness of the result of participation and involvement in service provision. In other words, it is related to the respond about the dedication of investing their own operant resources (e.g., knowledge, skills, and information). According to Im & Qu (2017), customers who have a higher level of knowledge tend to engage in VCC activities more.

Fulfillment of involvement in self-service is normally derived from good SST experience. That fulfillment may be led to CCV-in-involvement. If customers have more confidence in their own knowledge, information, and skills, then the effect of SST experience on CCV-in-involvement will be more activated. Moreover, the combination of other resources provided by firms (e.g., information, environmental support, and assistance from service employees) will facilitate customers' dedication to the VCC process (Im & Qu, 2017).

H2c. The relationship between self-service experience and co-created value-in-involvement is stronger when facilitating conditions are high.

Facilitating conditions between self-service technology experience and co-created value-in-experience

CCV is generated in various ways by the varied combination of multiple resources, and thus, its process is heterogeneous, and thus, CCV is phenomenologically determined by customers (Vargo & Lusch, 2018). As resource availability increases, the variety of resource integration

will increase, which will be led to reinforce the uniqueness of CCV-in-experience. Individual customer's overall sense of SST experience is also related to their operant resources. Based on the level of their resource availability, subjectively appraised CCV-in-experience will increase. Moreover, in the process that customers appraise the meaningfulness of SST experience, their FC level will come into play. In other words, the variation is partly driven by the availability of multiple resources. If more availability is given, subjectively appraised CCV will be reinforced.

H2d. The relationship between self-service experience and co-created value-in-experience is stronger when facilitating conditions are high.

Behavioral intentions

Behavioral intentions (BI) is defined as “the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Warshaw & Davis, 1985). In the previous literature, BI somewhat loosely consists of “intention to revisit,” “intention to recommend,” and “positive word of mouth” (Hyun & Kang, 2014). Therefore, while BI is widely used as a proxy to measure loyalty, it is worthwhile to know that BI does not capture the whole picture of loyalty. According to Oliver (2010), BI does not have an explicit theoretical foundation because BI exists in the versatility of pre-actions from internal cognition to external commitment. Accordingly, BI has been explained in a pragmatic boundary when the literature investigates the relationship with other focal variables such as service quality, satisfaction, and value. Indeed, many studies have empirically tested the causal relationships of service quality, satisfaction, and value with BI (Chen & Chen, 2010; Cronin, Brady, & Hult, 2000). At the early stage, scholars verified the positive effect of service quality on BI, but the role of value as an

ancestor has become considered more explicit because value incorporates SQ as well as sacrifice and explains the variance of BI better (Cronin, Brady, Brand, Hightower, & Shemwell, 1997).

As aforementioned, the value adopted as a predictor of BI is based on the concept of perceived value from the trade-off perspective, encompassing perceived quality and sacrifices. Two distinctive arguments exist depending on whether value directly or indirectly affects BI through satisfaction (Pandža Bajcs, 2015). Traditionally, satisfaction was already proven to have a positive effect on BI (Oliver, 2010). Thus, it was proposed that value influences satisfaction, which, in turn, leads to BI. However, it was also questioned whether satisfaction could sufficiently become an ancestor of BI (Pandža Bajcs, 2015). The early research model of the perceived value (Dodds & Monroe, 1985; Dodds, Monroe, & Grewal, 1991) suggested the direct linkage between value and BI. This view argues that value can directly influence in the absence of satisfaction (Lu & Chi, 2018).

The direct impact of value on BI has been examined in the previous hospitality and management literature, such as in a hotel setting (Han & Hwang, 2013; Oh, 1999; Wu & Yang, 2018), a restaurant setting (Ha & Jang, 2010; Lu & Chi, 2018; Yang & Mattila, 2016), a tourism setting (Chen & Chen, 2010; Pandža Bajcs, 2015), and a cruise setting (Duman & Mattila, 2005). In particular, recent literature has attempted to reveal the relationship between multiple value constructs and BI. For example, Lu & Chi (2018) show that both utilitarian value and hedonic value influence BI. Yang & Mattila (2016) and Wu & Yang (2018) demonstrate that utilitarian value, hedonic value, and financial value are related to BI, while the symbolic value is not.

Compared to perceived value limited to the overall assessment of the utility of services, CCV means comprehensively appraised meaningfulness in terms of benefit (Vargo & Lusch, 2018). As such, CCV may act as a switching barrier to moving to other service providers

(Cossío-Silva, Revilla-Camacho, Vega-Vázquez, & Palacios-Florencio, 2016). Hence, customers who have experiences that they appraise as valuable are more likely to have positive BI (Ha & Jang, 2010). Congruent with the previous literature on the positive relationship between value and BI, customers' CCV can be assumed to lead to higher BI. Sweeney, Danaher, & McColl-Kennedy (2015) argue that if customers exert efforts in VCC activities, they have more positive perceptions of the service outcome, which impacts their behavioral responses. Thus, customers who appraise higher CCV will have stronger BI. Based on the proceeding discussion, the present study proposes the following hypotheses.

H3a. Co-created value-in-use is positively related to behavioral intentions.

H3b. Co-created value-in-interaction is positively related to behavioral intentions.

H3c. Co-created value-in-involvement is positively related to behavioral intentions.

H3d. Co-created value-in-experience is positively related to behavioral intentions.

Figure 1 illustrates the proposed model. SST experience is the exogenous variable, and CCV and BI are the endogenous variables. FC is the moderating variable between SST experience and CCV.

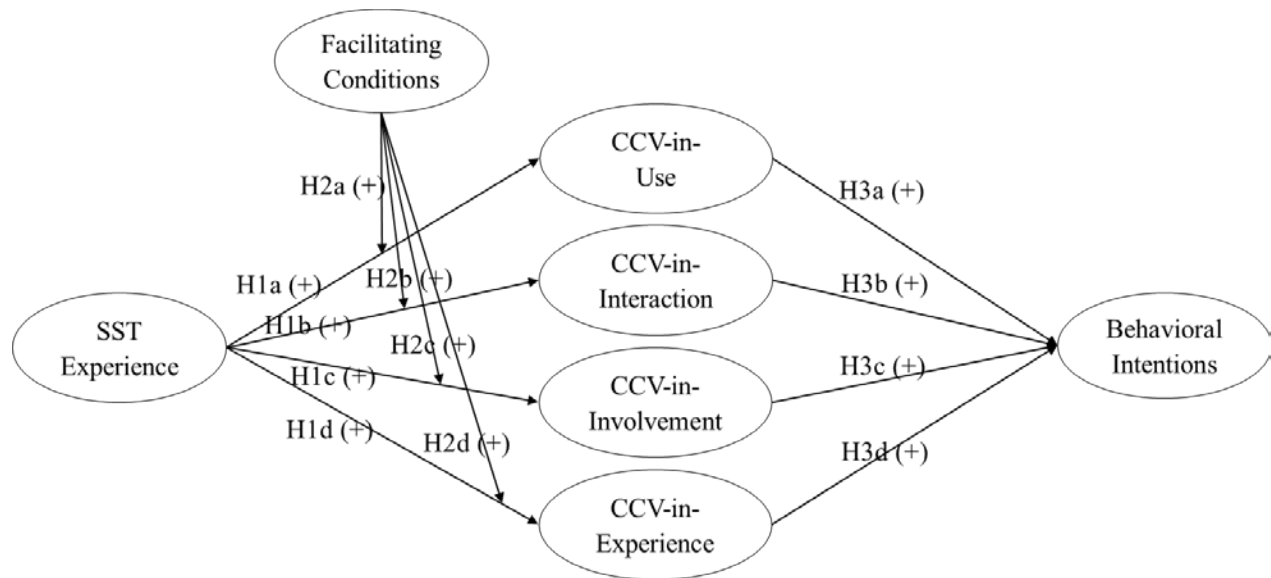


Figure 1. Proposed research model

Research Method

The scenario-based approach was applied in the survey because SST experience and FC need to reflect customers' experiences in the context of using SST. A total of eight written scenarios depicting different situations (i.e., Industry (hotel or restaurant), SST experience (positive or negative), and FC (high or low)) were developed. SST experience and FC were used as treated conditions to check manipulation, while industry was used merely for storytelling. To determine whether the scenarios appropriately reflect conditions, two doctoral students who are native English speakers, majoring in hospitality management reviewed, went through a process of revision.

During the survey, one of the scenarios was randomly displayed to a participant who was asked to read the scenario under which s/he was assumed that s/he was about to check-in for a hotel stay or place an order at a restaurant in an SST context. The survey questionnaire comprised three sections. The first section included a screening question about the previous

experience of SST. The second section showed the randomly assigned scenario as mentioned above and asked questions on four constructs (i.e., SST experience, FC, VCC, and BI). The last section collected respondents' socio-demographic information. Their answers to SST experience and FC were utilized for manipulation check, by matching the scenarios as described below.

Measurement scales

All the constructs are operationalized with multi-items on a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). To accommodate the study's context of SST, each construct in the model was adopted from prior research, for example, three items of SST experience from Wei et al.'s (2016) extrinsic attributes of SST experience, 15 items with four dimensions of CCV scale developed by study 1, four items of facilitating conditions (Venkatesh et al., 2012), and three items of behavioral intentions (Namkung & Jang, 2010) were used (see Table II).

Data collection

This study conducted an online survey through Prolific (<http://www.prolific.co>) that is known for having many accessible participants who are trustworthy (Peer, Brandimarte, Samat, & Acquisti, 2017). Samples were at the age of 18 or older who had an experience of using self-service technology (e.g., a self-service kiosk or a self-service kiosk) at hotels or restaurants over past six months. The author extended the period of the last experience to a six month, considering the pandemic crisis in summer, 2022. They voluntarily participated in the survey after reading a recruitment letter, which contained the purpose of the survey, information of questionnaire, anticipation, and incentives equivalent to \$1.27.

The pilot questionnaire was created via Qualtrics.com linked with the Prolific through which participants would be recruited. Participants were randomly assigned to one of the scenarios in which an even quota was given. After reading the scenario carefully, the participants answered questions within the imagination that they are in the scenario. A total of 1,038 samples were collected, and 899 samples were left after the elimination of incomplete data.

Data analysis

Before the analysis of data, 19 samples of which respondents spent less than 2 minutes answering the survey were eliminated because sufficient reading and understanding of the scenario were required (Prebensen & Rosengren, 2016). Next, 32 outliers detected by Mahalanobis distance were additionally removed. As a result, 848 samples were used for analysis. The author used one of the measure items from SST experience (“When using the SST I recalled above, I was able to do things fast”) and FC (“I could get help from others when I had difficulties using the SST”) for a manipulation check. Those two items were selected because scenarios used the same term (i.e., fast) or situation (i.e., getting help from others).

Table II. Manipulation check

	Treated scenario		<i>F</i> -value		Treated scenario		<i>F</i> -value
	Bad (N = 421)	Good (N = 427)			Low (N = 423)	High (N = 425)	
SST experience	2.09 (1.14)	4.40 (0.72)	1247***	Facilitating conditions	2.17 (1.13)	4.32 (0.84)	987***
<i>N</i> = 848, <i>p</i> ^(***) = 0.000							

As shown in Table II, participants in the good SST experience scenario, gave high ratings in SST experience ($M_{\text{Good}} = 4.40$, $M_{\text{Bad}} = 2.09$, $F(1, 846) = 1247$, $p = 0.000$). Participants in the high FC scenario also gave higher ratings ($M_{\text{High}} = 4.32$, $M_{\text{Low}} = 2.17$, $F(1, 846) = 987.2$, $p = 0.000$). The results indicate that the manipulations of SST experienced and FC were successful.

The subsequent analysis followed Anderson & Gerbing's (1988) two-step approach. CFA was conducted to assess the measurement model that would confirm the goodness-of-fit statistics, contingent validity, and discriminant validity. Next, the analysis of the structural model was conducted to assess the hypothesized relationships among SST experience, CCV, FC, and BI. The first-order model with four factors rather than the second-order model with a hierarchical model structure was preferably chosen to test the developed structural model based on hypotheses.

To test interaction effects among SST, FC on CCV, the study used latent moderated structural equation modeling with quasi-maximum likelihood (QML) estimation (Klein & Muthén, 2007) by using Mplus 7.4. Traditional maximum likelihood (ML) estimation has an assumption of normality that is violated by the non-normal distribution of an interaction factor. QML addresses the non-normality issue derived from the interactions of latent variables (Marsh, Wen, & Hau, 2004). All the regression weights between latent variables were verified by z-statistic.

Result

Sixty-four percent of the samples were female, and 34.7% were male. Most participants were between 25 and 34 years old (38.7%), followed by age between 35 and 44 (23.8%). 18.0% were earning incomes between \$30,000 and \$39,999 followed by 17.3% of income between \$20,000 and \$29,999. The multivariate static of Henzer-Zirkler (HZ) (Henze & Zirkler, 1990) showed

that the data was not normally distributed (HZ statistic = 1.09, $p < 0.001$), as usual as Likert-scale-based answers are not. Hence, Satorra-Bentler scaled estimation (Satorra & Bentler, 2001) was used to address the violation of normality instead of the maximum likelihood estimation.

CFA evaluated goodness-of-fit statistics based on the model in which all latent variables were correlated. Table III indicates the reasonably good model fit, including chi-squared divided by the degree of freedom $\chi^2(231) = 1124.16$, $p = 0.000$, $\chi^2/df = 4.87$, root mean square error of approximation (RMSEA = 0.068, 90% confidence interval = 0.064; 0.072), comparative fit index (CFI = 0.95), Tucker-Lewis index (TLI = 0.94), and standardized root mean square residual (SRMR = 0.05) (Hu & Bentler, 1999; Kline, 2016; MacCallum, Browne, & Sugawara, 1996). One item from FC, namely, “The SST was compatible with other technologies I used.” was removed due to a low value of factor loading (0.54), the narrowest standard deviation among all items (0.95), and less relevance to the resource-based standpoint. Finally, the factor loadings for all 24 items were between 0.57 and 0.97 with all z-statistic p -values = 0.000. Composite reliability was between 0.79 and 0.97. The average variance extracted (AVE) value was between 0.56 and 0.91. Thus, convergent validity was satisfied (Hair, 2009).

As shown in Table IV, each AVE of two latent variables was higher than squared correlation coefficients except CCV-in-use and CCV-in-involvement. As the discriminant validity between the two constructs was not satisfied (Fornell & Larcker, 1981), the author performed an alternative assessment of discriminant validity suggested by Segars’ (1997) recommendation. The constrained model in which the correlation between two constructs was fixed at zero, implying that the perfect discriminant validity, shows a worse model fit ($\chi^2(232) = 1940.31$, RMSEA = 0.093, CFI = 0.90, TLI = 0.89, SRMR = 0.221). Because the comparison

between two models showed a significant χ^2 difference ($\Delta\chi^2(1) = 816.15$), the discriminant validity of the test model was inferred, and the structural model test proceeded.

Table III. Result of confirmatory factor analysis

Factors and items	Mean (S.D.)	SFL	CR	AVE
SST Experience			0.88	0.73
When using the SST I recalled above, I found it convenient.	3.37 (1.47)	0.92		
When using the SST I recalled above, I was able to do things fast.	3.25 (1.50)	0.92		
When using the SST I recalled above, I was able to use self-service technology whenever I want.	3.62 (1.10)	0.57		
Facilitating Conditions			0.79	0.56
I had the resources necessary to use the SST.	3.77 (1.17)	0.81		
I had the knowledge necessary to use the SST.	3.82 (1.13)	0.76		
I could get help from others when I had difficulties using the SST.	3.25 (1.46)	0.70		
CCV-in-use			0.93	0.77
I felt that using service at this hotel/restaurant was beneficial to me.	3.35 (1.28)	0.87		
I felt that using service at this hotel/restaurant was meaningful to me.	2.83 (1.22)	0.89		
I felt that using service at this hotel/restaurant was important to me.	2.79 (1.21)	0.87		
I felt gratitude for this hotel/restaurant while I used their service.	2.85 (1.26)	0.86		
CCV-in-interaction			0.95	0.77
I was delighted with the service employees' proactiveness with sharing their knowledge.	3.00 (1.22)	0.88		
I perceived service as valuable to me because of service employees' positive attitudes.	3.04 (1.16)	0.88		
I enjoyed communication with service employees.	3.05 (1.18)	0.87		
Service employees conveyed relevant information to me.	3.14 (1.26)	0.89		
When I interacted with service employees, I felt that I was importantly treated.	3.15 (1.16)	0.87		
CCV-in-involvement			0.89	0.73
My involvement in the service process was worthwhile.	3.31 (1.11)	0.85		
The proactive role I played during the process of service was fun to me.	3.18 (1.26)	0.87		
By actively participating in the service, the experience became more meaningful.	3.01 (1.22)	0.84		
CCV-in-experience			0.84	0.64
Based on my previous experience, what I experienced here was special.	2.63 (1.15)	0.91		
The service that I personally experienced is memorable.	3.02 (1.20)	0.69		
My personal experience at this hotel/restaurant was more special to me than other customers.	2.34 (1.05)	0.79		
Behavioral Intentions			0.97	0.91
I would like to come back to this hotel/restaurant in the future.	3.52 (1.15)	0.94		
I would recommend this hotel/restaurant to my friends or others.	3.43 (1.20)	0.97		
I would say positive things about this hotel/restaurant to others.	3.49 (1.17)	0.95		

Note: $N = 848$, Estimator = Satorra-Bentler corrections, $\chi^2 = 1124.16$ ($p = .000$, $df = 231$); $\chi^2 / df = 4.87$; RMSEA = 0.068, 90% confidence interval = [0.064; 0.072]; CFI = 0.95; TLI = 0.94; SRMR = 0.048; SFL = standardized factor loading; CR = composite reliability; AVE = average variance extracted; All z-statistic p-values = 0.000

Table IV. Correlation matrix and discriminant validity

Variable	1	2	3	4	5	6	7
1. SST Experience	0.86						
2. Facilitating Conditions	0.54	0.75					
3. CCV-in-use	0.78	0.55	0.88				
4. CCV-in-interaction	0.34	0.69	0.48	0.88			
5. CCV-in-involvement	0.76	0.52	0.89	0.50	0.85		
6. CCV-in-experience	0.66	0.46	0.84	0.51	0.85	0.80	
7. Behavioral intentions	0.54	0.55	0.48	0.50	0.85	0.74	0.95

Note: $N = 848$; All the cross-construct correlation coefficients were statistically significant ($p = 0.000$); The square root of AVE is shown in the diagram on diagonal. *N.B.* The relationship between CCV and BI = 0.852, The square root of AVE of CCV = 0.855.

Since the structural model estimated by QML does not provide χ^2 -based model fit, this study follows Maslowsky, Jager, & Hemken's (2014) guideline to assess goodness-of-model fit. First, the researcher estimated the base model that does not include the latent interaction term. The goodness-of-fit statistics showed that the base model was slightly higher than the cut-off points ($\chi^2(239) = 1753.93$, $p = 0.000$, $\chi^2/df = 7.34$, RMSEA = 0.086 (90% confidence interval = 0.083; 0.090), CFI = 0.91, TLI = 0.90, and SRMR = 0.06) (Hu & Bentler, 1999; Kline, 2016; MacCallum et al., 1996). Next, the alternative model that included the interaction latent term was estimated. Then, two models were compared using the log-likelihood ratio test, as follows.

$$D = -2(LLB - LLA) = -2(-23842.26 - (-23824.19)) = 36.13$$

where LLB is the log-likelihood for the base model, and LLA is the log-likelihood for the alternative model. As D statistic follows χ^2 distribution, $\Delta\chi^2(4) = 36.13$ is statistically significant at $p = 0.000$. This result means that the alternative model that includes the latent interaction term shows a considerably better model fit than the base model.

Accordingly, the study assessed the hypothesized relationships. As shown in Table V, the relationships between SST experience and CCV-in-use was significant ($\gamma = 0.80, z = 6.02, p = 0.000$), CCV-in-involvement ($\gamma = 0.70, z = 5.53, p = 0.000$), and CCV-in-experience ($\gamma = 0.69, z = 4.46, p = 0.000$) were statistically significant. However, the relationship between SST experience and CCV-in-interaction was not significant. Hence, H1a, H1c, and H1d were supported. The interaction effects of SST experience and FC on CCV-in-use ($\gamma = 0.09, z = 3.36, p < 0.01$), CCV-in-experience ($\gamma = 0.11, z = 2.95, p < 0.01$) were statically significant, but not on CCV-in-interaction and CCV-in-involvement. Hence, H2a and H2d were supported. The relationships between CCV-in-use ($\beta = 0.20, z = 2.76, p < 0.01$), CCV-in-interaction ($\beta = 0.18, z = 6.14, p < 0.000$), and CCV-in-involvement ($\beta = 0.60, z = 6.61, p < 0.000$) and BI were statistically significant but the relationship between CCV-in-experience and BI was also significant. Hence, H3a, H3b, H3c were supported.

The study estimated the effect size (Cohen's f^2) of the interaction effect of FC, by comparing the difference of R^2 between the base model and alternative model (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014); and the f^2 value for H2a and H2c were 0.03 and 0.07, respectively. Based on Cohen's (1988) guideline to interpreting f^2 (0.02 = small; 0.15 = medium; 0.35 = large), the result demonstrated that the moderating effects were small but distinctive.

Moreover, the study conducted a robust check of interaction effects by using the conventional multigroup SEM. The multigroup SEM does not provide the size of interaction effects and increases the variance driven by transforming a continuous variable (FC) into a categorical variable. However, it can reveal a group difference in path coefficients by comparing χ^2 difference between the unconstrained model and the path-constrained model. As shown in Table VI, there were the group differences (i.e., Low FC vs. High FC) in the path between SST

experience and CCV-in-use, and the path between SST experience and CCV-in-experience, which supports the results of the test used in this study.

Table V. Results of a hypothesis test

Structural relationship	Est.	S.E.	z-value	Std. Est.	Hypothesis
H1a. SST → CCV-in-USE	0.80	0.13	6.02***	0.86	Supported
H1b. SST → CCV-in-INT	0.07	0.10	0.64	0.07	Not supported
H1c. SST → CCV-in-INV	0.70	0.13	5.53***	0.90	Supported
H1d. SST → CCV-in-EXP	0.69	0.16	4.46***	0.78	Supported
H2a. SST x FC → CCV-in-USE	0.09	0.03	3.36**	0.08	Supported
H2b. SST x FC → CCV-in-INT	0.03	0.03	1.29	0.03	Not supported
H2c. SST x FC → CCV-in-INV	-0.01	0.02	-0.52	-0.01	Not supported
H2d. SST x FC → CCV-in-EXP	0.11	0.04	2.95**	0.12	Supported
H3a. CCV-in-USE → BI	0.20	0.07	2.76**	0.20	Supported
H3b. CCV-in-INT → BI	0.18	0.03	6.14***	0.18	Supported
H3c. CCV-in-INV → BI	0.60	0.09	6.61***	0.52	Supported
H3d. CCV-in-EXP → BI	0.07	0.06	1.18	0.06	Not supported

Note: SST_EXP = Self-service experience, FC = Facilitating conditions, CCV = Co-created value, BI = Behavioral intentions. * $p < 0.05$, ** $p < 0.01$, *** $p = 0.000$. R^2 for CCV-in-USE = 0.87, R^2 for CCV-in-INT = 0.54, R^2 for CCV-in-INV = 0.87, R^2 for CCV-in-EXP = 0.73, R^2 for BI = 0.74.

Table VI. Multigroup SEM for the interaction effect test

	Std. Estimate		$\Delta\chi^2$	Hypothesis
	LOW FC	HIGH FC		
H2a. SST → CCV-in-USE (H1a path)	0.920	0.924	4.39	Supported
H2b. SST → CCV-in-INT (H1b path)	0.370	0.383	0.54	Not supported
H2c. SST → CCV-in-INV (H1c path)	0.921	0.946	0.13	Not supported
H2d. SST → CCV-in-EXP (H1d path)	0.829	0.847	7.64	Supported

Note: all $p = 0.000$.

Discussions and implications

As hospitality service providers increasingly bring SST to supplement or replace traditional service delivery channels (Kandampully et al., 2016), customers undertake a new experience through SST in the service encounter. This study investigates a new environmental change in the service encounter driven by SST, focusing on the actual experiences that customers gain.

Previous research was generally interested in customer intentions to use SST in various circumstances. TAM or TR provides the theoretical background to interpret what attributes of SST or individuals are decisive in acceptance of the SST. The present study addresses customer responses to the use of SST rather than the decision to use it. By employing the S-D logic paradigm for its conceptual framework, the study incorporated the nature of SST service that requires customers' participation in the arena of CCV.

Empirical findings in this study show that SST experience that customers have is closely associated with CCV-in-use, CCV-in-involvement, and CCV-in-experience. Technology is indispensable in modern service provision. Laghari & Connelly (2012) suggest technology as one of the major domains to delineate the quality of experience. The findings empirically show that customers' positive SST experience influences the overall CCV. They imply that customers' role in resource integration for CCV can be greatly facilitated by the functionalities of the modern SST devices. However, the result did not support the hypothesis that SST experience is positively related to CCV-in-interaction. Because the CCV-in-interaction mainly pertains to the interaction with service employees, it may be inferred that customers consider the interaction with service employees to be independent of the interactions mediated from SST.

The findings of the interaction effects of SST experience and FC on CCV also provided different results. Whereas the interaction effects on CCV-in-use and CCV-in-experience were statistically supported, those on CCV-in-interaction and CCV-in-involvement were not

supported. CCV-in-use and CCV-in-experience related to customers' comprehensive experience. Therefore, we may allude to the implication that FC intervenes with the overall process of VCC derived from SST experience and enhance the relations. As far as non-significant interaction effects concerned, the critical reason was found that only one of two endogenous variables related to the CCV-in-interaction and CCV-in-involvement each. For instance, the interaction effect on CCV-in-interaction was not valid because one focal variable, SST experience, was not related to the CCV-in-interaction, as mentioned above. In contrast, the interaction effect on CCV-in-involvement was not revealed because the FC was not correlated to the CCV-in-involvement at all. From the point of available resources, whereas FC exerts an effect on CCV-in-interaction, it has nothing to do with CCV-in-involvement. In other words, CCV-in-involvement was influenced by the SST device of its own but not by external factors.

Previously, the value was known for predicting BI (Cronin et al., 1997). However, to the researcher's best knowledge, this study is one of the first to examine whether CCV relates to the BI. The result shows that CCV-in-use, CCV-in-interaction, and CCV-in-involvement are determinants of customer BI. However, the relationship between CCV-in-experience and BI was not statistically significant because CCV-in-experience has a relatively high covariance with other CCV constructs, which may have resulted from controlled scenario-based research question items. Methodologically, this study attempted to control situations under which customers have SST experience as well as FC and conducted manipulation checks in research design. Moreover, unlike multi-group SEM analysis for addressing the moderating effect, the study used latent interaction term in a rigorous manner.

The result of the interaction effects of SST experience and FC is supported by the resource integration standpoint by S-D logic, implying that customers can incorporate resources

more efficiently by given FC. As value is subjectively determined (Vargo & Lusch, 2004; 2008), SST experience is not transformed to CCV in the same way, which is contingent on an individual customer. For example, based on their knowledge, dexterity, and previous experience, their CCV will have a different shape. For a specific feature of SST, some customers may find it valuable, and others may not. Shifting the focus from what functions the SST has toward what occurs during the use of SST in the service encounter will give a new insight into consumer behavior.

Self-service was thought of as transferring service employees' role of service provision to customers who co-produce the service. However, from the S-D logic and CCV perspective, changed is how customers create value by integrating multiple resources, including SST. All firms can do is propose value potential and facilitate the process of VCC (Vargo & Lusch 2004; 2008). This study captures SST as a form of a service experience to which customers become used, and that has the potential to form a favorable CCV. The finding, as well as a conceptual approach, will contribute to theoretical expansion in the research on not only SST but also technological innovation in the hospitality academia.

This shift also provides practical implications for managers in the hospitality and tourism industry. SST empowers customers to take charge of how they use the service (Wei et al., 2016). SST can contribute to the value that can be derived only in the case that customers can play a role in VCC. Therefore, managers need to consider the situations and circumstances under which customers can smoothly co-create value rather than simply enhance features inside SST.

In line with this notion, the role of service employees versus SST needs to be reexamined. If service firms consider SST only a task-processing device, it might be easy to replace the task of service employees with SST. However, the results indicate that service employees should be available not merely because customers struggle with using SST.

Customers who gain or wish for a better experience from using the SST may also co-create greater value when high FC is provided. This study supports the work of Ostrom et al. (2015) by suggesting that managers need to develop a service design regarding how to blend face-to-face service and SST-supported service, ensuring that a seamless service experience through multiple interaction channels (Ostrom et al., 2015). Moreover, service employees' roles in the SST-enabled service environment need to be revisited. With the complexity of the service encounter, including interactions among customers, SST, and service employees, managers need to build up a coordinating role of service employees that harmonize and facilitate SST experience (Bowen, 2016).

Limitations and further research

Like others, this research does not have any exception from limitations. Although this study attempted to control the research design by setting a scenario-based survey, including manipulation check, it should contain biases in that the scenarios do not mirror actual events of using SST. Additionally, the researcher used the CCV scale developed in this study, which leaves room to improve the generalizability by increasing the empirical evidence of the validity of the CCV scale. Specifically, although this study confirmed the overall discriminant validity, it was not distinct between CCV dimensions. It is supposed that the controlled scenario impacted the high relationships in a way that converges the construct, which may need further studies to be ensured. The current study used a parsimonious model that focuses on the relationship between SST experience and CCV, and the interaction effect of FC. Future research could build up more complex models studying various situations regarding the use of SST in the service encounter.

SST is on a continuum from low tech – self-service beverage – to high tech – computerized panels in hotel rooms. Hence, customers' experience will more vary, depending on

the advancement of SST. For instance, SST used to facilitate access to a hotel room versus SST used to enhance experiential products may be different. Future research needs to identify and explore those various occasions based on SST use. Moreover, based on the segments, the levels of FC need to be tackled differently. For instance, the following studies on the demographic difference of the required level of FC will deepen our understandings of customer behavior regarding SST.

References

- Ahn, J. A., & Seo, S. (2018). Consumer responses to interactive restaurant self-service technology (IRSST): The role of gadget-loving propensity. *International Journal of Hospitality Management*, 74(January), 109–121. <https://doi.org/10.1016/j.ijhm.2018.02.020>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Akaka, M. A., Vargo, S. L., & Lusch, R. F. (2013). The complexity of context: A service ecosystems approach for international marketing. *Journal of International Marketing*, 21(4), 1–20.
- Åkesson, M., Edvardsson, B., & Tronvoll, B. (2014). Customer experience from a self-service system perspective. *Journal of Service Management*, 25(5), 677–698. <https://doi.org/10.1108/JOSM-01-2013-0016>
- Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103(3), 411–423.
- Bitner, M. J., Ostrom, A. L., & Morgan, F. N. (2008). Service blueprinting: A practical technique for service innovation. *California Management Review*, 50(3), 66–94.
- Bobbitt, L. M., & Dabholkar, P. A. (2001). Integrating attitudinal theories to understand and predict use of technology-based self-service: The Internet as an illustration. *International Journal of Service Industry Management*, 12(5), 423–450.
- Bowen, D. E. (2016). The changing role of employees in service theory and practice: An interdisciplinary view. *Human Resource Management Review*, 26(1), 4–13. <https://doi.org/10.1016/j.hrmmr.2015.09.002>

Brakus, J. J., Schmitt, B. H., & Zarantonello, L. (2009). Brand experience: What is it? How is it measured? Does it affect loyalty? *Journal of Marketing*, 73(3), 52–68.

<https://doi.org/10.1509/jmkg.73.3.52>

Brodie, R. J., Löbner, H., & Fehrer, J. A. (2019). Evolution of service-dominant logic: Towards a paradigm and metatheory of the market and value cocreation? *Industrial Marketing Management*, 79, 3–12. <https://doi.org/10.1016/j.indmarman.2019.03.003>

Brooks, P., & Hestnes, B. (2010). User measures of quality of experience: Why being objective and quantitative is important. *IEEE Network*, 24(2), 8–13.

<https://doi.org/10.1109/MNET.2010.5430138>

Brown, S., Dennis, A., & Venkatesh, V. (2010). Predicting collaboration technology use: Integrating technology adoption and collaboration research. *Journal of Management Information Systems*, 27(2), 9–53. <https://doi.org/10.2753/MIS0742-1222270201>

Carù, A., & Cova, B. (2003). Revisiting consumption experience A more humble but complete view of the concept. *Marketing Theory*, 3(2), 267–286.

<http://journals.sagepub.com/doi/pdf/10.1177/14705931030032004>

Chandler, J. D., & Vargo, S. L. (2011). Contextualization and value-in-context: How context frames exchange. *Marketing Theory*, 11(1), 35–49.

<https://doi.org/10.1177/1470593110393713>

Chathoth, P., Altinay, L., Harrington, R. J., Okumus, F., & Chan, E. S. W. (2013). Co-production versus co-creation: A process based continuum in the hotel service context. *International Journal of Hospitality Management*, 32(1), 11–20.

<https://doi.org/10.1016/j.ijhm.2012.03.009>

- Chen, C., & Chen, F. (2010). Experience quality, perceived value, satisfaction, and behavioral intentions for heritage tourists. *Tourism Management*, 31(1), 29–35.
<https://doi.org/10.1016/j.tourman.2009.02.008>
- Chiu, Y.-T. H., & Hofer, K. M. (2015). Service innovation and usage intention: a cross-market analysis. *Journal of Service Management*, 26(3), 516–538. <https://doi.org/10.1108/JOSM-10-2014-0274>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale NJ: Lawrence Erlbaum.
- Collier, J. E., Sherrell, D. L., Babakus, E., & Horky, A. B. (2014). Understanding the differences of public and private self-service technology. *Journal of Services Marketing*, 28(1), 60–70.
<https://doi.org/10.1108/JSM-04-2012-0071>
- Cossío-Silva, F. J., Revilla-Camacho, M. Á., Vega-Vázquez, M., & Palacios-Florencio, B. (2016). Value co-creation and customer loyalty. *Journal of Business Research*, 69(5).
<https://doi.org/10.1016/j.jbusres.2015.10.028>
- Cronin, J. J., Brady, M. K., Brand, R. R., Hightower, R., & Shemwell, D. J. (1997). A cross-sectional test of the effect and conceptualization of service value. *Journal of Services Marketing*, 11(6), 375–391. <https://doi.org/10.1108/08876049710187482>
- Cronin, J. J., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), 193–218. [https://doi.org/10.1016/S0022-4359\(00\)00028-2](https://doi.org/10.1016/S0022-4359(00)00028-2)
- Dabholkar, P. A. (1996). Consumer evaluations of new technology-based self-service options: An investigation of alternative models of service quality. *International Journal of Research in Marketing*, 13(1), 29–51. [https://doi.org/10.1016/0167-8116\(95\)00027-5](https://doi.org/10.1016/0167-8116(95)00027-5)

- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8), 982–1003.
<https://doi.org/http://dx.doi.org/10.1287/mnsc.35.8.982>
- Dodds, W. B., & Monroe, K. B. (1985). The effect of brand and price information on subjective product evaluations. *Advances in Consumer Research*, 12, 85–90.
- Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. *Journal of Marketing Research*, 28, 307–319.
- Dong, B., Evans, K. R., & Zou, S. (2008). The effects of customer participation in co-created service recovery. *Journal of the Academy of Marketing Science*, 36(1), 123–137.
<https://doi.org/10.1007/s11747-007-0059-8>
- Duman, T., & Mattila, A. S. (2005). The role of affective factors on perceived cruise vacation value. *Tourism Management*, 26(3), 311–323.
<https://doi.org/10.1016/j.tourman.2003.11.014>
- Edvardsson, B., Ng, G., Min, C. Z., Firth, R., & Yi, D. (2011). Does service-dominant design result in a better service system? *Journal of Service Management*, 22(4), 540–556.
<https://doi.org/10.1108/09564231111155114>
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39–50.
- Gentile, C., Spiller, N., & Noci, G. (2007). How to sustain the customer experience: An overview of experience components that co-create value with the customer. *European Management Journal*, 25(5), 395–410. <https://doi.org/10.1016/j.emj.2007.08.005>

- Grönroos, C., & Voima, P. (2013). Critical service logic: Making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, 41(2), 133–150.
<https://doi.org/10.1007/s11747-012-0308-3>
- Gummerus, J. (2013). Value creation processes and value outcomes in marketing theory: strangers or siblings? *Marketing Theory*, 13(1), 19–46.
<https://doi.org/10.1177/1470593112467267>
- Gummesson, E. (2014). Commentary on “The role of innovation in driving the economy: Lessons from the global financial crisis”. *Journal of Business Research*, 67(1), 2743–2750.
<https://doi.org/10.1016/j.jbusres.2013.03.025>
- Ha, J., & Jang, S. (Shawn). (2010). Perceived values, satisfaction, and behavioral intentions: the role of familiarity in Korean restaurants. *International Journal of Hospitality Management*, 29(1), 2–13. <https://doi.org/10.1016/j.ijhm.2009.03.009>
- Hair, J. F. (2009). Multivariate Data Analysis. <https://doi.org/10.1016/j.ijpharm.2011.02.019>
- Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial Least Squares Structural Equation Modeling (PLS-SEM): An Emerging tool in Business Research. *European Business Review*, 26(2), 106–121.
- Han, H., & Hwang, J. (2013). Multi-dimensions of the perceived benefits in a medical hotel and their roles in international travelers’ decision-making process. *International Journal of Hospitality Management*, 35, 100–108. <https://doi.org/10.1016/j.ijhm.2013.05.011>
- Hanks, L., Line, N. D., & Mattila, A. S. (2016). The impact of self-service technology and the presence of others on cause-related marketing programs in restaurants. *Journal of Hospitality Marketing and Management*, 25(5), 547–562.
<https://doi.org/10.1080/19368623.2015.1046536>

- Helkkula, A. (2011). Characterising the concept of service experience. *Journal of Service Management*, 22(3), 367–389. <https://doi.org/10.1108/09564231111136872>
- Henze, N., & Zirkler, B. (1990). A class of invariant consistent tests for multivariate normality. *Communications in Statistics - Theory and Methods*, 19(10), 3595–3617. <https://doi.org/10.1080/03610929008830400>
- Hilton, T., Hughes, T., Little, E., & Marandi, E. (2013). Adopting self-service technology to do more with less. *Journal of Services Marketing*, 27(1), 3–12. <https://doi.org/10.1108/08876041311296338>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Hyun, S. S., & Kang, J. (2014). A better investment in luxury restaurants: Environmental or non-environmental cues? *International Journal of Hospitality Management*, 39, 57–70. <https://doi.org/10.1016/j.ijhm.2014.02.003>
- Im, J., & Qu, H. (2017). Drivers and resources of customer co-creation: A scenario-based case in the restaurant industry. *International Journal of Hospitality Management*, 64, 31–40. <https://doi.org/10.1016/j.ijhm.2017.03.007>
- Kandampully, J., Bilgihan, A., & Zhang, T. (Christina). (2016). Developing a people-technology hybrids model to unleash innovation and creativity: The new hospitality frontier. *Journal of Hospitality and Tourism Management*, 29, 154–164. <https://doi.org/10.1016/j.jhtm.2016.07.003>

- Kelly, P., Lawlor, J., & Mulvey, M. (2017). Customer roles in self-service technology encounters in a tourism context. *Journal of Travel & Tourism Marketing*, 34(2), 222–238.
<https://doi.org/10.1080/10548408.2016.1156612>
- Kim, M., & Qu, H. (2014). Travelers' behavioral intention toward hotel self-service kiosks usage. *International Journal of Contemporary Hospitality Management*, 26(2), 225–245.
<https://doi.org/10.1108/IJCHM-09-2012-0165>
- Klein, A. G., & Muthén, B. O. (2007). Quasi-Maximum Likelihood Estimation of Structural Equation Models With Multiple Interaction and Quadratic Effects. *Multivariate Behavioral Research*, 42(4), 647–673. <https://doi.org/10.1080/00273170701710205>
- Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling* (4th ed.). New York, NY: The Guilford Press.
- Kokkinou, A., & Cranage, D. A. (2013). Using self-service technology to reduce customer waiting times. *International Journal of Hospitality Management*, 33(1), 435–445.
<https://doi.org/10.1016/j.ijhm.2012.11.003>
- Ku, E. C. S., & Chen, C.-D. (2013). Fitting facilities to self-service technology usage: Evidence from kiosks in Taiwan airport. *Journal of Air Transport Management*, 32, 87–94.
<https://doi.org/10.1016/j.jairtraman.2013.07.001>
- Kucukusta, D., Heung, V. C. S., & Hui, S. (2014). Deploying self-service technology in luxury hotel brands: perceptions of business travelers. *Journal of Travel and Tourism Marketing*, 31(1), 55–70. <https://doi.org/10.1080/10548408.2014.861707>
- Kumar, A., & Telang, R. (2012). Does the web reduce customer service cost? Empirical evidence from a call center. *Information Systems Research*.
<https://doi.org/10.1287/isre.1110.0390>

- Laghari, K. U. R., & Connelly, K. (2012). Toward total quality of experience: A QoE model in a communication ecosystem. *IEEE Communications Magazine*, 50(April), 28–36.
<https://doi.org/10.1109/MCOM.2012.6178831>
- Larivière, B., Bowen, D., Andreassen, T. W., Kunz, W., Sirianni, N. J., Voss, C., ... De Keyser, A. (2017). “Service Encounter 2.0”: An investigation into the roles of technology, employees and customers. *Journal of Business Research*, 79, 238–246.
<https://doi.org/10.1016/j.jbusres.2017.03.008>
- Leroi-Werelds, S., Streukens, S., Brady, M. K., & Swinnen, G. (2014). Assessing the value of commonly used methods for measuring customer value: A multi-setting empirical study. *Journal of the Academy of Marketing Science*, 42(4), 430–451.
<https://doi.org/10.1007/s11747-013-0363-4>
- Lin, J. S. C., & Hsieh, P. L. (2011). Assessing the self-service technology encounters: Development and validation of SSTQUAL scale. *Journal of Retailing*, 87(2), 194–206.
<https://doi.org/10.1016/j.jretai.2011.02.006>
- Lu, L., & Chi, C. G. (2018). An examination of the perceived value of organic dining. *International Journal of Contemporary Hospitality Management*, 30(8), 2826–2844.
<https://doi.org/10.1108/IJCHM-05-2017-0267>
- Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. *MIS Quarterly*, 39(1), 155–175.
- Lusch, R. F., & Vargo, S. L. (2014). *Service-dominant logic: Premises, perspectives, possibilities*. Cambridge University Press.

- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149. <https://doi.org/10.1037/1082-989X.1.2.130>
- Marsh, H. W., Wen, Z., & Hau, K.-T. (2004). Structural Equation Models of Latent Interactions: Evaluation of Alternative Estimation Strategies and Indicator Construction. *Psychological Methods*, 9(3), 275–300. <https://doi.org/10.1037/1082-989X.9.3.275>
- Mascarenhas, O. A., Kesavan, R., & Bernacchi, M. (2006). Lasting customer loyalty: a total customer experience approach. *Journal of Consumer Marketing*, 23(7), 397–405. <https://doi.org/10.1108/07363760610712939>
- Maslowsky, J., Jager, J., & Hemken, D. (2014). Estimating and interpreting latent variable interactions: A tutorial for applying the latent moderated structural equations method. *International Journal of Behavioral Development*, 39(1), 87–96. <https://doi.org/10.1177/0165025414552301>
- Mohd-Any, A. A., Winklhofer, H., & Ennew, C. (2015). Measuring users' value experience on a travel website (e-value): What value is cocreated by the user? *Journal of Travel Research*, 54(4), 496–510. <https://doi.org/10.1177/0047287514522879>
- Namkung, Y., & Jang, S. C. (Shawn). (2010). Effects of perceived service fairness on emotions, and behavioral intentions in restaurants. *European Journal of Marketing*, 44(9), 1233–1259. <https://doi.org/10.1108/03090561011062826>
- Oh, H. (1999). Service quality, customer satisfaction, and customer value: A holistic perspective. *International Journal of Hospitality Management*, 18(1), 67–82. [https://doi.org/10.1016/S0278-4319\(98\)00047-4](https://doi.org/10.1016/S0278-4319(98)00047-4)

- Oliver, R. L. (2010). *Satisfaction: A behavioral perspective on the consumer* (2nd ed.). New York: ME Sharpe.
- Ostrom, A. L., Parasuraman, A., Bowen, D. E., Patrício, L., & Voss, C. A. (2015). Service research priorities in a rapidly changing context. *Journal of Service Research*, 18(2), 127–159. <https://doi.org/10.1177/1094670515576315>
- Pandža Bajs, I. (2015). Tourist perceived value, relationship to satisfaction, and behavioral intentions: The example of the Croatian tourist destination Dubrovnik. *Journal of Travel Research*, 54(1), 122–134. <https://doi.org/10.1177/0047287513513158>
- Parasuraman, A. (2000). Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, 2(4), 307–320. <https://doi.org/10.1177/109467050024001>
- Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, 70, 153–163. <https://doi.org/10.1016/j.jesp.2017.01.006>
- Pohlmann, A., & Kaartemo, V. (2017). Research trajectories of service-dominant Logic: Emergent themes of a unifying paradigm in business and management. *Industrial Marketing Management*, 63, 53–68. <https://doi.org/10.1016/j.indmarman.2017.01.001>
- Prebensen, N. K., & Rosengren, S. (2016). Experience value as a function of hedonic and utilitarian dominant services. *International Journal of Contemporary Hospitality Management*, 28(1), 113–135. <https://doi.org/10.1108/IJCHM-02-2014-0073>
- Reinders, M. J., Dabholkar, P. A., & Frambach, R. T. (2008). Consequences of forcing customers to use technology-based self-service. *Journal of Service Research*, 11(2), 107–123.

- Roy Chowdhury, I., Patro, S., Venugopal, P., & Israel, D. (2014). A study on consumer adoption of technology-facilitated services. *Journal of Services Marketing*, 28(6), 471–483.
<https://doi.org/10.1108/JSM-04-2013-0095>
- Satorra, A., & Bentler, P. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, 66(4), 507–514. Retrieved from
<https://link.springer.com/content/pdf/10.1007%2FBF02296192.pdf>
- Scherer, A., Wunderlich, N. V, & Wangenheim, F. Von. (2015). The value of self-service: Long-term effects of technology-based self-service usage on customer retention1. *MIS Quarterly*, 39(1), 177–200.
- Segars, A. H. (1997). Assessing the unidimensionality of measurement: A paradigm and illustration within the context of information systems research. *Omega*, 25(1), 107–121.
[https://doi.org/10.1016/S0305-0483\(96\)00051-5](https://doi.org/10.1016/S0305-0483(96)00051-5)
- Shin, H., & Perdue, R. R. (2019). Self-Service Technology Research: A bibliometric co-citation visualization analysis. *International Journal of Hospitality Management*, 80(November 2018), 101–112. <https://doi.org/10.1016/j.ijhm.2019.01.012>
- Solomon, M. R., Surprenant, C., Czepiel, J. A., & Gutman, E. G. (1985). A role theory perspective on dyadic interactions: The service encounter. *Journal of Marketing*, 49(1), 99–111. <https://doi.org/10.2307/1251180>
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1–17. <https://doi.org/10.1509/jmkg.68.1.1.24036>
- Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science*, 36(1), 1–10. <https://doi.org/10.1007/s11747-007-0069-6>

- Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: An extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, 44(1), 5–23.
<https://doi.org/10.1007/s11747-015-0456-3>
- Vargo, S. L., & Lusch, R. F. (2017). Service-dominant logic 2025. *International Journal of Research in Marketing*, 34(1), 46–67. <https://doi.org/10.1016/j.ijresmar.2016.11.001>
- Vargo, S. L., & Lusch, R. F. (2018). *The SAGE Handbook of Service-dominant Logic*. SAGE Publications Limited.
- Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26(3), 145–152.
<https://doi.org/10.1016/j.emj.2008.04.003>
- Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, 39(2), 273–315. <https://doi.org/10.1111/j.1540-5915.2008.00192.x>
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36(1), 157–178.
- Wang, C., Harris, J., & Patterson, P. G. (2012). Customer choice of self-service technology: the roles of situational influences and past experience. *Journal of Service Management*, 23(1), 54–78. <https://doi.org/10.1108/09564231211208970>
- Wang, Y., So, K. K. F., & Sparks, B. A. (2017). Technology readiness and customer satisfaction with travel technologies: A cross-country investigation. *Journal of Travel Research*, 56(5), 563–577. <https://doi.org/10.1177/0047287516657891>

- Warshaw, P. R., & Davis, F. D. (1985). Disentangling behavioral intention and behavioral expectation. *Journal of Experimental Social Psychology*, 21(3), 213–228.
[https://doi.org/10.1016/0022-1031\(85\)90017-4](https://doi.org/10.1016/0022-1031(85)90017-4)
- Wei, W., Torres, E., & Hua, N. (2016). Improving consumer commitment through the integration of self-service technologies: A transcendent consumer experience perspective. *International Journal of Hospitality Management*, 59, 105–115.
<https://doi.org/10.1016/j.ijhm.2016.09.004>
- Wei, W., Torres, E., & Hua, N. (2017). The power of self-service technologies in creating transcendent service experiences. *International Journal of Contemporary Hospitality Management*, 29(6), 1599–1618. <https://doi.org/10.1108/IJCHM-01-2016-0029>
- Wu, B., & Yang, W. (2018). What do Chinese consumers want? A value framework for luxury hotels in China. *International Journal of Contemporary Hospitality Management*, 30(4), 2037–2055. <https://doi.org/10.1108/IJCHM-08-2016-0466>
- Yang, W., & Mattila, A. S. (2016). Why do we buy luxury experiences? Measuring value perceptions of luxury hospitality services. *International Journal of Contemporary Hospitality Management*, 28(9), 1848–1867. <https://doi.org/10.1108/IJCHM-11-2014-0579>
- Zhu, Z., Nakata, C., Sivakumar, K., & Grewal, D. (2013). Fix it or leave it? Customer recovery from self-service technology failures. *Journal of Retailing*, 89(1), 15–29.
<https://doi.org/10.1016/j.jretai.2012.10.004>

CHAPTER 6

Summary and Conclusion

While the service-dominant (S-D) logic paradigm (Vargo & Lusch, 2004, 2008) and the value co-creation have gained intense attention from academia, co-created value (CCV), that is, the outcome of the value co-creation is less revealed. Likely, the co-created value from the S-D logic perspective was not well operationalized, which became one reason for limited empirical research on S-D logic. The first study aimed to develop a scale for CCV, and the second study applied the scale to examining self-service technology (SST) experience.

The study adopted the procedural guidance of the scale development recommended by Churchill's (1979) research guideline. Notably, it took a mixed-method approach for item generation, including both qualitative and quantitative methods. Following the rigorous process of item purification and validity assessment, it developed the multidimensional construct of CCV: value-in-use, value-in-interaction, value-in-involvement, and value-in-experience. The scale reflected the core concept of value in S-D logic and demonstrated the validity by testing an empirical model.

Adopting the CCV scale, the second study examined the relationships among SST experience, FC, CCV, and BI. Previous research typically focused on the relationship between the features of SST and customers' intention to use it. As such, it less attempted to interpret what occurs when customers use it. Given that SST brings a change of customer experience in a service encounter (Kim & Qu, 2014), and that SST is already widely induced in the hospitality and tourism industry, the focus on customer experience provides an insight into understanding customer behaviors on SST. To this end, the study adopted the S-D logic paradigm as a theoretical framework to interpret SST experience because SST is a service that requires

customers' proactive participation for CCV. Moreover, drawing on the concept of resource integration in S-D logic, the study tested model that included the interaction effect of facilitating conditions on the relationship between SST experience and CCV.

Applying S-D logic to the empirical research that investigates the SST experience rather than SST attributes will significantly contribute to the existing studies on both S-D logic and SST. Findings with a summary of the results are discussed in the next section.

Major findings and a summary of results

Scale development (study 1)

A preliminary list of CCV items was generated based on the review of S-D logic and VCC literature, interviews with experiential practitioners, and a text mining of on-line reviews. Six doctoral students rated each item, and a total of 43 candidate items were developed. The study conducted exploratory factor analysis (EFA) for those items. The initial KMO value was 0.93, which exceeded the recommended level of 0.70 (Kaiser, 1974). Additionally, Bartlett's test of sphericity was conducted to check the existence of multiple co-relationships between variables, and the result was highly significant ($\chi^2(42) = 420.54, p = 0.000$). Four-factor model with 20 items was identified, including value-in-use (four items), interaction (five items), resource integration (seven items), and value-in-experience (four items).

A separate sample of 248 observations was used for confirmatory factor analysis (CFA). The goodness-of-fit statistics included: chi-squared divided by the degree of freedom $\chi^2(84) = 163.69, p = 0.000$, $\chi^2/df = 1.95$, comparative fit index (CFI = 0.95), Tucker-Lewis index (TLI = 0.94), root mean square error of approximation (RMSEA = 0.06, 90% confidence interval = 0.05; 0.08), and standardized root mean square residual (SRMR = 0.05). The factor loadings for all 15 items were between 0.65 and 0.90 with all z-statistic p -values = 0.000. Composite reliability was between 0.79 and 0.86. The average variance extracted value was between 0.50 and 0.65. Thus, convergent validity was satisfied (Hair, 2009). Discriminant validity was also confirmed where each AVE of two latent variables was higher than squared correlation coefficients (Fornell & Larcker, 1981).

The study also tested concurrent validity of the first-order and the second-order CCV model to ensure that the scales developed can predict other constructs, such as customer satisfaction. The fit indices in the first-order model suggested that the model fits well ($\chi^2(125) = 249.78, p =$

0.000, $\chi^2/df = 2.00$, RMSEA = 0.063 with 90% confidence interval [0.052; 0.075], CFI = 0.95, TLI = 0.94, SRMR = 0.05). All the path coefficients except for path between CCV-in-inv and SAT were statistically significant and R^2 on satisfaction was 0.47. Comparatively, the second-order model showed similar fit indices, while RMSEA (0.056 with 90% C.I. [0.044; 0.067] and R^2 on satisfaction (0.49) were a little bit better. Therefore, both the first-order and the second-order model demonstrate the concurrent validity to predict other major constructs.

The relationship among study constructs (study 2)

In study 2, CFA evaluated goodness-of-fit statistics based on the model in which all latent variables are correlated. The reasonably good model fit was supported, including chi-squared divided by the degree of freedom $\chi^2(231) = 1124.16$, $p = 0.000$, $\chi^2/df = 4.87$, root mean square error of approximation (RMSEA = 0.068, 90% confidence interval = 0.064; 0.072), comparative fit index (CFI = 0.95), Tucker-Lewis index (TLI = 0.94), and standardized root mean square residual (SRMR = 0.05) (Hu & Bentler, 1999; Kline, 2016; MacCallum, Browne, & Sugawara, 1996). The factor loadings for all 24 items were between 0.57 and 0.97 with all z-statistic p -values = 0.000. Composite reliability was between 0.79 and 0.97. The average variance extracted (AVE) value was between 0.56 and 0.91. Thus, convergent validity was satisfied (Hair, 2009). Each AVE of two latent variables was higher than squared correlation coefficients except the case of CCV-in-use and CCV-in-involvement. However, the author ensured a discriminant validity by comparing the constrained and unconstrained model as an alternative assessment.

Since the structural model estimated by QML does not provide χ^2 -based model fit, this study follows Maslowsky, Jager, & Hemken's (2014) guideline to assess goodness-of-model fit. Except one for the measurement model, two more steps are required to estimate the structural

model. First, the researcher estimated the base model that does not include the latent interaction term. The goodness-of-fit statistics showed that the base model was acceptable ($\chi^2(239) = 1753.93$, $p = 0.000$, $\chi^2/df = 7.34$, RMSEA = 0.086 (90% confidence interval = 0.083; 0.090), CFI = 0.91, TLI = 0.90, and SRMR = 0.06) (Hu & Bentler, 1999; Kline, 2016; MacCallum et al., 1996). Next, the alternative model that included the interaction latent term was estimated. Then two models were compared using the log-likelihood ratio test, as follows.

$$D = -2(LLB - LLA) = -2(-23842.26 - (-23824.19)) = 36.13$$

where LLB is the log-likelihood for the base model, and LLA is the log-likelihood for the alternative model. As D statistic follows χ^2 distribution, $\Delta\chi^2(4) = 36.13$ is statistically significant at $p = 0.000$. This result shows that the alternative model that includes the interaction latent term has a relatively good model fit. The model tested the following twelve hypotheses.

H1a. Self-service technology experience is positively related to co-created value-in-use.

H1b. Self-service technology experience is positively related to co-created value-in-interaction.

H1c. Self-service technology experience is positively related to co-created value-in-involvement.

H1d. Self-service technology experience is positively related to co-created value-in-experience.

H2a. The relationship between self-service experience and co-created value-in-use is stronger when facilitating conditions are high.

H2b: The relationship between self-service experience and co-created value-in-interaction is stronger when facilitating conditions are high.

H2c. The relationship between self-service experience and co-created value-in-involvement is stronger when facilitating conditions are high.

H2d. The relationship between self-service experience and co-created value-in-experience is stronger when facilitating conditions are high.

H3a. Co-created value-in-use is positively related to behavioral intentions.

H3b. Co-created value-in-interaction is positively related to behavioral intentions.

H3c. Co-created value-in-involvement is positively related to behavioral intentions.

H3d. Co-created value-in-experience is positively related to behavioral intentions.

The relationships between SST experience and CCV-in-use was significant ($\gamma = 0.80$, $z = 6.02$, $p = 0.000$), CCV-in-involvement ($\gamma = 0.70$, $z = 5.53$, $p = 0.000$), and CCV-in-experience ($\gamma = 0.69$, $z = 4.46$, $p = 0.000$) were statistically significant. However, the relationship between SST experience and CCV-in-interaction was not significant. Hence, H1a, H1c, and H1d were supported. The interaction effects of SST experience and FC on CCV-in-use ($\gamma = 0.09$, $z = 3.36$, $p < 0.01$), CCV-in-experience ($\gamma = 0.11$, $z = 2.95$, $p < 0.01$) were statically significant, but not on CCV-in-interaction and CCV-in-involvement. Hence, H2a and H2d were supported. The relationships between CCV-in-use ($\beta = 0.20$, $z = 2.76$, $p < 0.01$), CCV-in-interaction ($\beta = 0.18$, $z = 6.14$, $p < 0.000$), and CCV-in-involvement ($\beta = 0.60$, $z = 6.61$, $p < 0.000$) and BI were statistically significant but the relationship between CCV-in-experience and BI was also significant. Hence, H3a, H3b, H3c were supported.

Discussions and implications

The conceptualization of CCV proposed in this study refers to the outcome of VCC perceived by the beneficiary in the service encounter, namely, the customer. Thus, the role of the customer as a resource integrator is understood based on the revision of resources theories. This notion leads to the multidimensional construct of CCV: CCV-in-use, CCV-in-interaction, CCV-in-involvement, and CCV-in-experience. CCV-in-use captures the nature of CCV that is determined during the process of use. CCV-in-interaction implies that CCV in the hospitality service encounter emerges within the context of the interaction between service employees and customers. CCV-in-involvement is focused on customers' role in integrating resources, including their own resources. Finally, CCV-in-experience states that CCV is appraised through the experience that customers have. These dimensions are considered the conceptual cruxes of S-D logic but were not clearly identified as measurable constructs.

Empirical findings in this study show that SST experience that customers have is closely associated with CCV-in-use, CCV-in-involvement, and CCV-in-experience. Technology is indispensable in modern service provision. Laghari & Connelly (2012) suggest technology as one of the major domains to delineate the quality of experience. The findings empirically show that customers' positive SST experience influences the overall CCV. They imply that customers' role in resource integration for CCV can be greatly facilitated by the functionalities of the modern SST devices. However, the result did not support the hypothesis that SST experience is positively related to CCV-in-interaction. Because the CCV-in-interaction mainly pertains to the interaction with service employees, it may be inferred that customers consider the interaction with service employees to be independent of the interactions mediated from SST.

The findings of the interaction effects of SST experience and FC on CCV also provided different results. Whereas the interaction effects on CCV-in-use and CCV-in-experience were statistically supported, those on CCV-in-interaction and CCV-in-involvement were not supported. CCV-in-use and CCV-in-experience related to customers' comprehensive experience. Therefore, we may allude to the implication that FC intervenes with the overall process of VCC derived from SST experience and enhance the relations. As far as non-significant interaction effects concerned, the critical reason was found that only one of two endogenous variables related to the CCV-in-interaction and CCV-in-involvement each. For instance, the interaction effect on CCV-in-interaction was not valid because one focal variable, SST experience, was not related to the CCV-in-interaction, as mentioned above. In contrast, the interaction effect on CCV-in-involvement was not revealed because the FC was not correlated to the CCV-in-involvement at all. From the point of available resources, whereas FC exerts an effect on CCV-in-interaction, it has nothing to do with CCV-in-involvement. In other words, CCV-in-involvement was influenced by the SST device of its own but not by external factors.

Methodologically, this study actively used a mixed-method approach during the scale development process. Rather than purely depending on qualitative data garnered through interviews, the study integrates rich text sources into the rigorously designed process of scale development. First, in addition to a thorough review of S-D logic, the study used a Bibliometric approach to analyze the most salient concepts studied in the previous literature. Then it identified semantically similar words from customer-generated online reviews, which were used as a source of candidate items. Moreover, the second study used latent interaction term to examine the interaction effect in a construct level to reduce the chance of Type I error, rather than conduct multi-group analysis.

The conceptualization of CCV and the development of the scale unraveled the essence of the role that service employees play in the service encounter and the subjective aspect of customer experience. Managers need to educate employees on how to become more attentive to assist a co-creation process. Specifically, SST empowers customers to take charge of how they use the service (Wei, Torres, & Hua, 2016). SST can contribute to the value that can be derived only in the case that customers can play a role in VCC. Therefore, managers need to consider the situations and circumstances under which customers can smoothly co-create value rather than simply enhance features inside SST.

In line with this notion, the role of service employees versus SST needs to be reexamined. If service firms consider SST only a task-processing device, it might be easy to replace the task of service employees with SST. However, the result debunks the thought that the availability of service employees is required merely in the case that customers struggle with using SST. Customers who can gain or probably wish for a better experience from using the SST may also co-create greater value when high FC is provided. Accordingly, managers need to develop a service design regarding how to blend F2F service and SST-supported service, ensuring that a seamless service experience through multiple interaction channels (Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015). Moreover, service employees' roles in the SST-enabled service environment need to be revisited. With the complexity of the service encounter, including interactions among customers, SST, and service employees, managers need to build up a coordinating role of service employees that harmonize and facilitate SST experience (Bowen, 2016).

Limitations and further research

As all the contributions that research gives have a boundary, achievements that this study made leave limitations too. The study recruited participants through the on-line platform, which might have a sampling bias itself. Future diverse sampling will improve the external validity of this study. Additionally, although this study attempted to control the research design by setting a scenario-based survey, including manipulation check, it should contain biases in that the scenarios do not mirror actual events of using SST. Therefore, researchers will need to consult with hotels or restaurants to gain the actual data from those who used SST. Qualitative research is also recommended to catch a specific situation regarding SST experience.

The author used the CCV scale developed in this study to test hypotheses, which has room to improve the generalizability by increasing the empirical evidence of the validity of the CCV scale. The current study used a parsimonious model that focuses on the relationship between SST experience and CCV, and the interaction effect of FC. Future research could build up more complex models studying various situations regarding the use of SST in the service encounter. Through blueprinting, the service process could identify areas to which SST could be applied – or the larger question of how SST could be implemented in the service delivery process.

The S-D logic paradigm gradually extends to multiple actor-to-actor relationships of value co-creation. For example, value can be co-created in the interactions among customers. As the current research is focused on the relationship between customers and service providers, the extended network to co-create value will be a good topic (e.g., customer-to-customer VCC, CCV through social media) that future research may consider studying. Ongoing development of SST and various occasions of using it will also bring many research opportunities to delve into a more complicated SST experience. Moreover, CCV is accumulated through the repetitive process.

That is, our mundane behaviors in a daily life co-create CCV or sometimes co-destruct it. Naturally, a longitudinal approach to the CCV study is encouraged.

References

- Bowen, D. E. (2016). The changing role of employees in service theory and practice: An interdisciplinary view. *Human Resource Management Review*, 26(1), 4–13.
<https://doi.org/10.1016/j.hrmr.2015.09.002>
- Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16(1), 64. <https://doi.org/10.2307/3150876>
- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 18(3), 382–388.
- Hair, J. F. (2009). Multivariate Data Analysis. <https://doi.org/10.1016/j.ijpharm.2011.02.019>
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31–36.
<https://doi.org/10.1007/BF02291575>
- Kim, M., & Qu, H. (2014). Travelers' behavioral intention toward hotel self-service kiosks usage. *International Journal of Contemporary Hospitality Management*, 26(2), 225–245.
<https://doi.org/10.1108/IJCHM-09-2012-0165>
- Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling* (4th ed.). New York, NY: The Guilford Press.
- Laghari, K. U. R., & Connelly, K. (2012). Toward Total Quality of Experience: A QoE Model in a Communication Ecosystem. *IEEE Communications Magazine*, 50(April), 28–36.
<https://doi.org/10.1109/MCOM.2012.6178831>

- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149. <https://doi.org/10.1037/1082-989X.1.2.130>
- Maslowsky, J., Jager, J., & Hemken, D. (2014). Estimating and interpreting latent variable interactions: A tutorial for applying the latent moderated structural equations method. *International Journal of Behavioral Development*, 39(1), 87–96. <https://doi.org/10.1177/0165025414552301>
- Ostrom, A. L., Parasuraman, A., Bowen, D. E., Patrício, L., & Voss, C. A. (2015). Service research priorities in a rapidly changing context. *Journal of Service Research*, 18(2), 127–159. <https://doi.org/10.1177/1094670515576315>
- Shin, H., & Perdue, R. R. (2019). Self-Service Technology Research: A bibliometric co-citation visualization analysis. *International Journal of Hospitality Management*, 80(November 2018), 101–112. <https://doi.org/10.1016/j.ijhm.2019.01.012>
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1–17. <https://doi.org/10.1509/jmkg.68.1.1.24036>
- Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science*, 36(1), 1–10. <https://doi.org/10.1007/s11747-007-0069-6>
- Wei, W., Torres, E., & Hua, N. (2016). Improving consumer commitment through the integration of self-service technologies: A transcendent consumer experience perspective. *International Journal of Hospitality Management*, 59, 105–115. <https://doi.org/10.1016/j.ijhm.2016.09.004>

Appendices

Appendix A. Approval of Institutional Review Boards



APPROVAL OF SUBMISSION

February 13, 2020

Wooseok Kwon

wkwon@uh.edu

Dear Wooseok Kwon:

On February 13, 2020, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	The interaction effects of self-service technology experience and facilitating conditions on co-created value: A service-dominant logic perspective
Investigator:	Wooseok Kwon
IRB ID:	STUDY00002040
Funding/ Proposed Funding:	Name: Hotel & Restaurant Management
Award ID:	
Award Title:	
IND, IDE, or HDE:	None

Documents Reviewed:	• Scale_development_recruitment.pdf, Category: Recruitment Materials; • PROTOCOL(SST_CCV)_modified.pdf, Category: IRB Protocol; • Questionnaires.pdf, Category: Study tools (ex: surveys, interview/focus group questions, data collection forms, etc.); • Interview_invitation.pdf, Category: Recruitment Materials; • HRP-502e - Consent_CCV.pdf, Category: Consent Form; • SST_CCV_recruitment.pdf, Category: Recruitment Materials; • HRP-502e - Consent_SST_CCV.pdf, Category: Consent Form; • HRP-502e - Consent_interview.pdf, Category: Consent Form;
---------------------	--

UNIVERSITY of
HOUSTON

DIVISION OF RESEARCH
Institutional Review Boards

Review Category:	Exempt
Committee Name:	Not Applicable
IRB Coordinator:	Sandra Arntz

The IRB approved the study on February 13, 2020 ; recruitment and procedures detailed within the approved protocol may now be initiated.

As this study was approved under an exempt or expedited process, recently revised regulatory requirements do not require the submission of annual continuing review documentation. However, it is critical that the following submissions are made to the IRB to ensure continued compliance:

- Modifications to the protocol prior to initiating any changes (for example, the addition of study personnel, updated recruitment materials, change in study design, requests for additional subjects)
- Reportable New Information/Unanticipated Problems Involving Risks to Subjects or Others
- Study Closure

Unless a waiver has been granted by the IRB, use the stamped consent form approved by the IRB to document consent. The approved version may be downloaded from the documents tab.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system.

Sincerely,

Research Integrity and Oversight (RIO) Office
University of Houston, Division of Research 713
743 9204
cphs@central.uh.edu
<http://www.uh.edu/research/compliance/irb-cphs/>

Appendix B. 43 Candidate items initially generated (The final 15 items in bold.)

I felt that using service at this hotel/restaurant was beneficial to me.
I felt that using service at this hotel/restaurant was meaningful to me.
I felt that using service at this hotel/restaurant was important to me.
When I used OOO service, the service was easy to use.
Service delivery of this hotel/restaurant was prompt.
The time I spent on the service provided by this hotel/restaurant was worthwhile.
I was delighted while I used service at this hotel/restaurant.
I felt gratitude for this hotel/restaurant while I used their service.
I was delighted with service employees' proactiveness with sharing their knowledge.
I enjoyed communication with service employees.
I was delighted with the service employees' response to my request.
I was delighted with the service employees' proactive attitudes to address my question.
Service employees conveyed relevant information to me.
I made an effort to interact and communicate with service employees.
When I interacted with service employees, I felt that I was importantly treated.
Service employees and I shared information about the service or product
I perceived service as valuable to me because of service employees' positive attitudes.
Service employees had professionalism.
Service employees were helpful.
Service employees were attentive and responsive.
Dialogue with service employees was gregarious.
I applied my knowledge and skills to get better service.
Multiple resources were integrated to make this service valuable, including my knowledge and skills.
My involvement in the service process was worthwhile.
The proactive role I played during the process of service was fun to me.
By actively participating in the service, the experience became more meaningful.

Service employees and I collaborated on the outcome of service.
My previous experience was helpful for a better service experience.
The various accessibility and usability of facilities were beneficial to me.
Their service met my individual needs.
The processes that I experienced were aligned with my expectations.
I could use their services under conditions that fit me well.
Based on my previous experience, what I experienced here was special.
The service that I personally experienced is memorable.
My personal experience of this hotel/restaurant was more special to me than other customers.
Thanks to my unique taste, what I enjoyed is different from other customers.
Service employees provided me with personalized service.
The service I received was better than average.
An even little experience made me feel that OOO's service was precious to me.
I appraised the benefit from the service based on my personal and social experiences
I could get a better experience of service by trying new things.
I could feel authenticity from their service.
I felt that I had a great experience while I stayed there.

Appendix C. Scenario manipulation

In this study, you are asked about your experience of using self-service technology at a hotel/a restaurant. Imagine you are in the scenario we show.

Please read the scenario about the experience presented on this page and answer the questions that follow.

Treatment 1. Hotel – High SST Experience – High FC

You are in the lobby of a hotel. You check-in using the self-service check-in kiosk. **You easily find the instructions for use** at the kiosk, and **a service employee stands by the kiosk to help you** while you use the self-service check-in kiosk. Check-in is done by touching the appropriate boxes on the screen. The self-service check-in kiosk **allows you to personalize your experience** (e.g., queen size bed, non-smoking room, etc.) and receive a room key. After you have finished checking-in, you can proceed directly to your room. The service process through the kiosk is **easy and fast**. You find it **enjoyable** to use the self-service kiosk.

Treatment 2. Hotel – High SST Experience – Low FC

You are in the lobby of a hotel. You check-in using the self-service check-in kiosk. **You cannot find any instructions for use** at the kiosk, and **no service employee is nearby to help you** while you use the self-service check-in kiosk. Check-in is done by touching the appropriate boxes on the screen. The self-service check-in kiosk **allows you to personalize your experience** (e.g., queen size bed, non-smoking room, etc.) and receive a room key. After you have finished checking-in, you can proceed directly to your room. The service process through the kiosk is **easy and fast**. You find it **enjoyable** to use the self-service kiosk.

Treatment 3. Hotel – Low SST Experience – High FC

You are in the lobby of a hotel. You check-in using the self-service check-in kiosk. **You easily find the instructions for use** at the kiosk, and **a service employee stands by the kiosk to help you** while you use the self-service check-in kiosk. Check-in is done by touching the appropriate boxes on the screen. The self-service check-in kiosk **has generic functions for check-in but does not allow you to personalize your experience** (e.g., queen size bed, non-smoking room, etc.). After you have finished checking-in, you **are required to go to the concierge to receive a room key**. The service process through the kiosk is **difficult and slow**. You find it **unpleasant** to use the self-service kiosk. **Fortunately, you may be able to promptly ask the service employee to help you check-in.**

Treatment 4. Hotel – Low SST Experience – Low FC

You are in the lobby of a hotel. You check-in using the self-service check-in kiosk. **You cannot find any instructions for use** at the kiosk, and **no service employee is nearby to help you** while you use the self-service check-in kiosk. Check-in is done by touching the appropriate boxes on the screen. The self-service check-in kiosk **has generic functions for check-in but does not allow you to personalize your experience** (e.g., queen size bed, non-smoking room, etc.). After you have finished checking-in, you **are required to go to the concierge to receive a room key**. The service process through the kiosk is **difficult and slow**. You find it **unpleasant** to use the self-service kiosk. **Further, you may not be able to promptly ask the service employee to help you check-in.**

Treatment 5. Restaurant – High SST Experience – High FC

You are at the table in a dining restaurant. You order from the menu using the self-service touch screen tablet. **You easily find the instructions for the use** of it on the table, and **a service employee is nearby to help you** while you use the self-service touch screen tablet. The order is placed by touching the appropriate boxes on the screen. The self-service touch screen tablet **allows you to personalize your experience** (e.g., the temperature of your steak, modifying ingredient, etc.) and make the payment. After you have finished the order, you can be served by a server. The service process through the tablet is **easy and fast**. You find it **enjoyable** to use the tablet.

Treatment 6. Restaurant – High SST Experience – Low FC

You are at the table in a dining restaurant. You order from the menu using the self-service touch screen tablet. **You cannot find any instructions for the use** of it on the table, and **no service employee is nearby to help you** while you use the self-service touch screen tablet. The order is placed by touching the appropriate boxes on the screen. The self-service touch screen tablet **allows you to personalize your experience** (e.g., the temperature of your steak, modifying ingredient, etc.) and make the payment. After you have finished the order, you can be served by a server. The service process through the tablet is **easy and fast**. You find it **enjoyable** to use the tablet.

Treatment 7. Restaurant – Low SST Experience – High FC

You are at the table in a dining restaurant. You order from the menu using the self-service touch screen tablet. **You easily find the instructions for the use** of it on the table, and **a service employee is nearby to help you** while you use the self-service touch screen tablet. The order is placed by touching the appropriate boxes on the screen. The self-service touch screen tablet **has generic functions for the order but does not allow you to personalize your experience** (e.g., the temperature of your steak, modifying ingredient, etc.). After you have finished the order, you **are required to ask a server to customize your order**. The service process through the tablet is

difficult and slow. You find it unpleasant to use the tablet. Fortunately, you may be able to promptly ask the service employee to help you order.

Treatment 8. Restaurant – Low SST Experience – Low FC

You are at the table in a dining restaurant. You order from the menu using the self-service touch screen tablet. **You cannot find any instructions for the use of it on the table, and no service employee is nearby to help you** while you use the self-service touch screen tablet. The order is placed by touching the appropriate boxes on the screen. The self-service touch screen tablet **has generic functions for the order but does not allow you to personalize your experience** (e.g., the temperature of your steak, modifying ingredient, etc.). After you have finished the order, you **are required to ask a server to customize your order.** The service process through the tablet is **difficult and slow. You find it unpleasant to use the tablet. Further, you may not be able to promptly ask the service employee to help you order.**