



Opportunities and challenges of value co-creation: the role of customer involvement in hotel service development

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**Opportunities and challenges of value co-creation: the role
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4 **Opportunities and challenges of value co-creation: the role of customer involvement in**
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6 **hotel service development**
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29 **Abstract**
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32 **Purpose** –The purpose of this paper is to identify the double-edged sword of customer
33 involvement (perceived relationship quality and coordination cost) in new service
34 development (NSD) in the hotel industry and to explore when customers should be involved
35 from the service provider’s view.
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41 **Design/methodology/approach** – A total of 252 valid questionnaires are collected from hotel
42 managers, and ordinary least squares regression analysis is conducted to test the hypotheses.
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47 **Findings** –Results show that customer involvement causes higher coordination cost but also
48 shows no direct positive effect on perceived relationship quality. Furthermore, this study finds
49 that service climate reduces the negative effect of customer involvement and enhances its
50 positive effect. By contrast, customer complexity intensifies the negative effect of customer
51 involvement.
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4 **Practical implications** –Managers should realize that customer involvement creates a tension
5
6 between benefits and costs. Such tension can be magnified or relieved according to the hotel’s
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8 internal service climate or external customer complexity.
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11 **Originality/value** –This study empirically examines the double-edged sword of customer
12
13 involvement and tests the boundary conditions associated with hotel back and front office
14
15 factors (service climate versus customer complexity).
16

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18 **Keywords** Customer involvement, Coordination cost, Perceived relationship quality, Value
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20 co-creation
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22 **Paper type** Research paper
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1. Introduction

Involving customers in new service development has become integral to most service industries in the past decade (Lusch and Nambisan, 2015; Ordanini and Parasuraman, 2011), especially in experiential services such as hospitality and tourism (Sigala, 2012). Hotels in particular have increasingly been encouraged to design new and customized services *with* their customers rather than *for* their customers (Jeon *et al.*, 2016). This reflects the growing ferocity of competition in the hotel sector (Chathoth *et al.*, 2013) and continuously changing customer needs and expectations, related to growing demographic complexity and rapid technological innovation.

However, no consensus has emerged about the benefits (and costs) of customer involvement for service providers. Some studies have argued that customer involvement is effective for value co-creation (Vargo and Lusch, 2004) and that it could help deliver customer insight that helps to retain existing customers (Carbonell *et al.*, 2009; Chan *et al.*, 2010). Conversely, other research has found that customer involvement might generate redundant information because many customers struggle to accurately articulate their needs (Hoyer *et al.*, 2010; von Hippel, 1994). In addition, customers might offer widely conflicting views on the same service issue, resulting in information overload (Bogers *et al.*, 2010). Some customers might also see customer involvement as an opportunity to publicly communicate negative opinions about brands, as Starwood Hotels found out after inviting customers to help design its Aloft brand (Chathoth *et al.*, 2013). Therefore, any benefits associated with customer involvement must be considered in relation to the investments that firms make to manage the customer involvement process (Plé and Cáceres, 2010). Given the inconsistency

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4 in the literature, this paper responds to the calls for “*more empirical and analytical studies*
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6 *are warranted on the trade-offs between the benefits and costs of co-creation....and on how*
7
8 *can a firm respond to the challenges (of co-creation)” (Hoyer et al., 2010, p 293).*

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11 Our study focuses on how to optimally involve customers in new service development
12
13 (NSD), which refers to the introduction of new ways of managing customer experiences and
14
15 enhancing service quality (Lusch and Nambisan, 2015). We look at this issue from a hotel
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17 management perspective (Cui and Wu, 2016) because boundary-spanning hotel managers are
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19 well positioned to judge customer-related activities and outcomes given that they have access
20
21 to formal and informal customer information (Kralj and Solnet, 2010) and insight into
22
23 organization-level factors that might influence the relationship between customer involvement
24
25 and perceived relationship quality. Customer involvement is conceptualized as a form of co-
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27 creation, which reflects the extent to which a firm invites and listens to customers to help
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29 NSD (Carbonell et al., 2009; Ordanini and Parasuraman, 2011). Perceived relationship quality
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31 is defined as the perception of customer trust, commitment, and loyalty to the service provider
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33 (Mitreğa, 2012; Solnet, 2007). We propose that customer involvement in NSD increases
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35 perceived relationship quality but incurs coordination costs depending on the mechanisms
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37 (external and internal factors) that a firm can use to understand and manage its customers.
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47 This study makes three contributions to extant customer involvement literature. First, it
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49 informs the service-dominant logic (SDL) perspective by examining the challenges of co-
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51 creation, which complements existing SDL studies that mainly stress its value-adding
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53 opportunities (Fang, 2008; Morosan and DeFranco, 2016). Specifically, we propose that
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55 customer involvement in NSD not only enhances perceived relationship quality (a benefit of
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4 co-creation), but also increases coordination costs (a challenge of co-creation).
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7 Second, this paper adds nuance to customer co-innovation literature by exploring the
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9 boundary conditions for customer involvement in NSD. Although prior studies have
10
11 suggested advantages and disadvantages of involving customers in the innovation process
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13 (Hoyer *et al.*, 2010; von Hippel, 1994), there is a dearth of research examining the internal
14
15 and external contextual factors which help us better understand the conditions in which
16
17 customer involvement is more or less likely to lead to positive outcomes for firms. This study
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19 attempts to bridge this research gap by taking service climate and customer complexity as
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21 contingent variables to balance the tension between the cost and benefits incurred by
22
23 customer involvement. Doing so helps to clarify when and how the firms should involve
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25 customers in hospitality NSD.
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32 Third, this paper contributes to hospitality-related research. Scholars have examined the
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34 importance of customer involvement in the hospitality industry in relation to several aspects
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36 of services, including: service delivery (Chathoth *et al.*, 2013; Morosan and DeFranco, 2016);
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38 self-service technologies (Dong *et al.*, 2015); and social media marketing (Park and Allen,
39
40 2013). To date, the role of customer involvement in NSD in the hospitality industry has been
41
42 largely ignored. Unlike other co-creation studies that focus on customer experience (Jeon *et*
43
44 *al.*, 2016), customer involvement in NSD is characterized by intensive information provision
45
46 and human (customer-employee) interaction (Lusch and Nambisan, 2015; Ordanini and
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48 Parasuraman, 2011). This study goes beyond prior research by examining when hotel
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50 customers should be involved in NSD, and when they should not.
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2. Theory and framework

2.1 Opportunities of value co-creation

Value co-creation reflects the benefits associated with customers' interaction and involvement with service providers, such as mutual relationship enhancement and increased profits (Plé and Cáceres, 2010). It is a central tenet of SDL that focuses on the role of customers as active participants in service delivery (Vargo and Lusch, 2004). Co-creation value relies on the successful integration of operant (i.e., skill, knowledge, or competency) and operand resources (i.e., tools, equipment, or other goods) (Lusch and Nambisan, 2015). Existing research assumes that customers can provide operant resources with various knowledge and skills, and a firm can offer both operant and operand resources to manage the co-creation process (Vargo and Lusch, 2004).

Table 1 summarizes typical value co-creation literature in relation both to products and services, and compares our study with previous ones. In the product management literature, co-creation is characterized by cooperative activities (e.g., customer participation, customer interaction, and customer co-development) and is associated with positive strategic outcomes such as relational performance (Athaide and Zhang, 2011), financial performance (Fang, 2008), and product-related performance (Bonner, 2010). The value co-creation process is determined by mutual relationships, customer knowledge, product characteristics, and the external environment (Bonner, 2010; Fang *et al.*, 2015).

[Insert table 1 about here]

Compared with the product management literature, service literature focuses more on why and how individual consumers participate in the co-creation process. In service management

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2
3 literature, co-creation involves “a high level of customer participation in customizing the
4 service” (Chathoth *et al.*, 2013, p 13) and is positively related to customer satisfaction, trust,
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6 employee satisfaction, sales performance, and organizational innovation (Morosan and
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8 DeFranco, 2016; Ordanini and Parasuraman, 2011; Park and Allen, 2013). Such positive
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10 outcomes depend on customers’ individual characteristics, firms’ support and culture, and
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12 employees’ involvement (Cha *et al.*, 2016; Grisseman and Stokburger-Sauer, 2012).
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19 Customers are more likely to participate in service co-creation in experiential services
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21 (Jeon *et al.*, 2016). Hotels collaborate with customers to co-create value in relation to service
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23 delivery, service improvement, and service sustainability (Morosan and DeFranco, 2016;
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25 Ordanini and Parasuraman, 2011; Sigala, 2014). In our research, customer involvement is the
26
27 extent to which customers are perceived to be involved in the NSD process and involves
28
29 extensive interaction between customers and frontline employees, with the purpose of
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31 generating ideas relevant to NSD (Cui and Wu, 2016).
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36 Most co-creation studies, especially in the hospitality literature, study the antecedents and
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38 outcomes of co-creation from the customers’ point of view (Cha *et al.*, 2016; Jeon *et al.*,
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40 2016; Morosan and DeFranco, 2016). Focusing only on the customer perspective is
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42 potentially myopic because customers have limited insight into the managerial factors that
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44 also influence the relationship between customer involvement and its strategic outcomes.
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46 Studying co-creation of value from a service provider’s perspective therefore complements
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48 existing consumer-focused studies because service providers have greater insight into the
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50 complexity of co-creation and the organizational mechanisms that might help manage the
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52 tension between the opportunities and challenges that co-creation presents to firms (Cui and
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3 Wu, 2016).

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6 *2.2 Challenges of value co-creation*

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9 Despite its various benefits, researchers have speculated that co-creation might involve
10 substantial costs for service providers. For example, co-innovation outcomes can disappoint
11 “because customers have limited knowledge about new technologies/materials and are
12 therefore not necessarily well placed to predict the kinds of innovation that should be pursued,
13 or envisage the future usages of these innovations” (Plé and Cáceres, 2010, p 433). Customer
14 involvement might also diminish a firm’s control over its strategic planning and management
15 of consumer data and ideas (Hoyer *et al.*, 2010, p 287), in turn increasing a firm’s need to
16 invest various resources to coordinate customers and internal actors during the co-creation
17 process (Wong *et al.*, 2016). However, there is limited empirical examination of these
18 negative consequences of customer involvement for services (Plé and Cáceres, 2010), with
19 most existing studies relying on anecdotal evidence (Hoyer *et al.*, 2010; von Hippel, 1994).
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36 It is possible that by involving customers in NSD, firms might incur substantial
37 coordination costs, which are defined as the resources used by a firm to communicate
38 externally with its customers and internally with its employees across various departments to
39 disseminate consumers’ insights and ideas (Gulati and Singh, 1998; Kim *et al.*, 2009; Wong
40 *et al.*, 2016). Wong *et al.* (2016) make a distinction between external and internal
41 coordination costs. Regarding external coordination costs, customer heterogeneity in the hotel
42 sector often necessitates costly personalization, which limits the scope for more efficient
43 standardization of service delivery (Chathoth *et al.*, 2013). Therefore, further involving
44 customers in NSD might result in the generation of overabundant and complex information
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4 that potentially precludes firms from making effective decisions. In addition, customer
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6 involvement potentially increases the risk of the communication of hostile information about
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8 the brand through websites or social media. Because this type of information can possibly
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10 damage their brand image (c.f. Plé and Cáceres, 2010), hotels must invest resources in
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12 monitoring and responding to customer comments and handle any subsequent public relations
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14 issues.
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20 Even before involving customers in NSD, internal coordination costs in hotels tend to be
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22 high, relative to other services. In hotels there are complex intra- and inter-departmental
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24 communication processes involving the reception desk, housekeeping, food and beverage,
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26 marketing and sales, purchasing and inventory, and so on. For customer-facing hotel
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28 employees in particular, communicating with customers tends to involve a high degree of
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30 psychological stress and emotional labor (Chan *et al.*, 2010), largely due to their perceived low
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32 social status relative to customers who are treated as “God” (reflecting China’s high power
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34 distance culture). This tends to require hotels to invest resources in coordinating with
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36 employees. Therefore, involving customers in NSD potentially complicates the internal
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38 communication process even further, requiring more resources to deal with (Hoyer *et al.*,
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40 2010).
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49 *2.3 Internal and external boundary conditions of customer involvement*

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51 Thus far, we have discussed literature on the benefits and costs associated with customer
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53 involvements in NSD. In this study, we develop a contingency model designed to help predict
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55 the boundary conditions that may intensify or attenuate the opportunities and challenges of
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4 customer involvement in NSD, according to back and front office factors of the service firm
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6 (i.e., service climate and customer complexity, respectively), as shown in Figure 1.
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9 [Insert figure 1 about here]

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11 The effectiveness of customer involvement for a hotel is influenced by back and front
12 office factors (Shostack, 1984). The front office is “the portion of ‘the service factory’
13 encountered by customers” (Lovelock and Yip, 1996, p 69) and typically involves customer
14 interaction with frontline employees, who are responsible for responding to customer needs.
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16 In contrast, the back office is mainly about a firm’s internal operations that customers rarely
17 (if ever) see (Shostack, 1984).
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21 Here, we introduce service climate and customer complexity as strategically important
22 contingent variables that hotel managers should consider when exploring when and how to
23 involve customers in NSD. Service climate is a back office factor that provides support and
24 resources for effective internal operations in order to respond to customers’ needs. It is
25 defined as the shared perceptions among employees concerning the skills, resources, and
26 effort required to ensure superior service quality (Jong *et al.*, 2004). Firms with a high service
27 climate have in place organizational policies and practices to allow for excellent service
28 delivery and customer satisfaction (Kralj and Solnet, 2010). In this paper, we propose that a
29 high service climate provides employees with enough resources to cope with the uncertainty
30 incurred by customer involvement in NSD.
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34 Customer complexity is a front office factor that reflects the extent to which a firm must
35 respond to diverse customer requirements (Schmitz and Ganesan, 2014). In the hotel industry,
36 there are different levels of customer complexity. For example, the needs of leisure customers
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4 are varied and difficult to predict, while business travelers tend to exhibit relatively low levels
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6 of complexity (Weaver and Oh, 1993). As customer complexity increases, so does
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8 uncertainty, which requires more of a firm's resources to manage.
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10 11 **3. Hypotheses**

12 13 14 *3.1 Effects of customer involvement on perceived relationship quality and coordination cost*

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16 During the NSD process, customers offer information and feedback on service-related issues
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18 and therefore mainly act as "knowledge providers rather than direct executors of tasks"
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20 (Ordanini and Parasuraman, 2011, p 6). Specifically, firms invite their customers to help
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22 design a service that better fits their preferences, sometimes providing monetary rewards for
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24 their contributions (Coviello and Joseph, 2012; Hoyer *et al.*, 2010). Involving customers in
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26 the NSD process can help enhance co-created value, such as relational quality, through the
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28 satisfaction of customers' economic value and intrinsic enjoyment (Hoyer *et al.*, 2010). For
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30 example, some travel firms reward their customers for designing travel routes, which helps to
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32 facilitate a more intimate relationship between firms and customers.
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40 Moreover, customer involvement increases communication and relationship building
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42 which help to satisfy customers' intrinsic values. Extensive online and offline interactions
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44 with employees help customers to realize social needs (e.g., belongingness) and hedonic
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46 needs (e.g., personal enjoyment) (Chan *et al.*, 2010). For example,
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48 "www.mystarbucksidea.com is a social network developed by Starbucks to enable customers
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50 to become actively involved in the firm's NSD processes by contributing, discussing, and (co-
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52) developing online their new service ideas" (Sigala, 2012, p 967). Although Starbucks'
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54 customers are not economically rewarded, they derive pleasure during the co-creation
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4 process, showing a high level of satisfaction with the firm (Sigala, 2012). The increase in
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6 customer satisfaction stemming from involvement in NSD leads customers to express their
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8 feelings via positive online reviews or offline interaction with employees (Melián-González *et*
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10 *al.*, 2013). Boundary-spanning hotel managers can collect this feedback, which gives them
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12 insight into customers' perceived relationship quality (He *et al.*, 2011). Here, we hypothesize
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14 the following:
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19 *H1a.* Customer involvement positively influences perceived relationship quality.
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24 During the NSD process, listening to customers and encouraging them to participate may
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26 shift the power and control over certain strategic issues from a firm to its customers (Bogers
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28 *et al.*, 2010; Chan *et al.*, 2010). Here, customers may think they are entitled to receive more
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30 status or respect, thereby leading to disagreement and conflicts between customers and the
31
32 firm (Wetzel *et al.*, 2013). In addition, customers are not under the direct control of the firm,
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34 and they lack specialized knowledge in developing hotel services, which in turn creates
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36 uncertainty and poor-quality information for hotels during NSD (Bogers *et al.*, 2010). More
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38 effort is needed to identify customers' useful ideas and to mitigate the problems caused by
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40 customer involvement (Coviello and Joseph, 2012).
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47 Furthermore, to communicate information about customer needs within the organization,
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49 firms must manage potentially complex and complicated inter-departmental communication
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51 channels and processes (Gulati and Singh, 1998). For example, in order for a hotel to improve
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53 a wedding banquet service, frontline employees must interact with customers to collect
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55 information about their needs, transmit the information from the bottom up, and then invest
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4 more effort to coordinate across other departments, including the kitchen, engineering,
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6 information system, and marketing. Therefore, the ability for a hotel to resolve the differences
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8 between customer needs and what service the firm currently provides requires greater internal
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10 coordination costs (Wong *et al.*, 2016). Here, we hypothesize the following:

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14 *H1b.* Customer involvement leads to higher coordination costs.
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19 3.2 Moderating effects of service climate and customer complexity

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21 Firms with a high service climate have sufficient operant and operand resources to satisfy
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23 their customers (Kralj and Solnet, 2010). Two fundamental ingredients for service climate
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25 exist: concern for customers (customer-oriented culture) and concern for employees
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27 (employees are well trained and supported by a firm) (Mechinda and Patterson, 2011). A high
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29 service climate encourages employees to be customer-oriented and committed to the delivery
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31 of excellent service quality (He *et al.*, 2011).
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36 Firms with a high service climate provide necessary training and support for their
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38 employees to develop the required skills to deliver excellent customer service (Schneider *et*
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40 *al.*, 1998). Likewise, when customers are involved in NSD in a firm with a high service
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42 climate, they are not only treated with better service but also with greater respect and courtesy
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44 (Kralj and Solnet, 2010). Furthermore, the firm has enough tangible and intangible resources
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46 to ensure service quality, thereby allowing employees to build and maintain a high level of
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48 relationship quality with the involved customers (Mechinda and Patterson, 2011). Thus, we
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50 hypothesize the following:
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56 *H2a.* Service climate positively moderates the relationship between customer involvement
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3 and perceived relationship quality.
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9 In firms with a high service climate, employees are trained to develop specialized
10 knowledge and skills required to deliver high service quality (Bowen and Schneider, 2014).
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12 Employees of a firm with a high service climate are therefore more likely to have the
13
14 necessary power and skills to mitigate disruptive customer behaviors that might arise when
15
16 customers are involved in NSD, such as coordination problems related to customers' sense of
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18 entitlement or lack of knowledge (He *et al.*, 2011).
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24 Moreover, service climate is the “shared perceptions concerning the practices, procedures,
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26 and kinds of behaviors that get rewarded and supported in a particular setting” (Schneider *et*
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28 *al.*, 1998, p 151). It unites employees' views on customers and neutralizes the fragmented
29
30 individual differences in customer orientation, thereby facilitating information flow between
31
32 customers and employees, and between employees across different departments (Jong *et al.*,
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34 2004). Here, customer compliance and smooth information communication reduce
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36 coordination costs caused by customer involvement in NSD. Thus, we hypothesize the
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38 following:
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44 *H2b.* Service climate negatively moderates the relationship between customer
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46 involvement and coordination cost.
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50 Customer complexity indicates a complicated customer environment in which customers
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52 have diverse and demanding needs, expect customized services, and have contact with
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54 various customer personnel in a firm (c.f. Schmitz and Ganesan, 2014). Customer complexity
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56 potentially makes customer involvement in NSD less efficient because diverse customer
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4 needs and greater requirement for customized services requires more of a firm's resources
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6 (e.g., time) to figure out solutions to satisfy the involved customers (Ingram, 2004).
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9 Conversely, at a low level of customer complexity, involved customers communicate in a
10
11 consistent voice, enabling firms to more efficiently identify and satisfy their needs, which
12
13 enhances their perceived relationship quality (Carbonell *et al.*, 2009).
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17 In addition, when customers are demanding and want to be treated uniquely, their
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19 expectations are relatively high and they are not easily satisfied, thereby making customer
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21 involvement less effective (Schmitz and Ganesan, 2014). Hotel services co-created with
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23 customers in the context of high customer complexity may be limited to their own use rather
24
25 than be generalized for the hotel's broader customer base (Ordanini and Parasuraman, 2011).
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27 For the firm, fulfilling customers' complex needs during NSD is challenging. Thus, the
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29 perceived relationship quality built by customer involvement may be attenuated by customer
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31 complexity.
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36 *H3a.* Customer complexity negatively moderates the relationship between customer
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38 involvement and perceived relationship quality.
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44 Customer complexity makes the employee-customer interaction process more challenging
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46 and difficult to coordinate. In a noncomplex customer environment, standardized procedures
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48 and service products are appropriate, whereas greater coordination effort is required in a
49
50 complex customer context with non-standardized services and procedures (Schmitz and
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52 Ganesan, 2014). For example, business customers' main needs include cleanness and
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54 convenience, which are relatively easy to satisfy, while leisure customers have more diverse
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4 and special needs (e.g., they request various entertainment amenities), which are difficult to
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6 standardize (Bilgihan *et al.*, 2011; Weaver and Oh, 1993). Customer complexity brings extra
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8 work to the firm in order to reconcile customers' often conflicting expectations, thereby
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10 needing more effort and resources to coordinate issues raised by customer involvement (Cui
11
12 and Wu, 2016; Schmitz and Ganesan, 2014). Furthermore, a complex customer environment
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14 needs extensive interaction with customers to understand their special requirements, thereby
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16 increasing the scope of employees' roles and responsibilities and perhaps leading to role
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18 conflict for employees (Schmitz and Ganesan, 2014). Reaching an agreement between
19
20 customers' needs and what the firm offers costs more time and investment to coordinate
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22 internally, with employees and between departments, and externally, with customers. Thus,
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24 we hypothesize the following:
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31 *H3b.* Customer complexity positively moderates the relationship between customer
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33 involvement and coordination cost.
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36 **4. Methodology**

37 *4.1 Sample and data collection procedures*

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42 The hypotheses were tested using survey data collected from managers working in the hotel
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44 industry in China. This context is suitable for testing our hypotheses for two main reasons.
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46 First, as a result of fierce market competition in China, hotels must design new services or
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48 improve current services with customers to maintain their competitive advantage¹. Second, in
49
50 the hotel industry, listening to customers, collecting information about their needs, and
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57 ¹ Chinabgao, China's hotel industry competitive analysis in 2014, <http://www.chinabgao.com/k/jiudian/12628.html>,
58 2014-08-25
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4 inviting some customers to become involved in hotel NSD, are widely implemented practices.

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6 Before conducting the survey, a pilot study was conducted, involving semi-structured
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8 interviews with 10 hotel managers in China. During the pilot study, we asked the respondents
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10 about the role of customers in the NSD process. The questionnaire was also sent to these
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12 managers before the survey was launched, to check for clarity and reliability, and to ensure
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14 content validity.
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19 The survey was distributed across three channels: 1) Committee of National Hotel Stars
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21 Assessment, China National Tourism Administration (WeChat group²) in 2016, 2) Hotelier
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23 and manager affiliation (managers and experts WeChat group in the hospitality industry in
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25 China) in 2016, and 3) face to face at a hotel manager training seminar held in Beijing in
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27 2016. These three sources ensure responses from diverse hotel categories based on the service
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29 they provide.
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33 The online questionnaires were sent to the China National Star Hotel rating expert
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35 committee and to the hotelier and manager's affiliation through the WeChat group, and 101
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37 responses were collected. A total of 18 responses were eliminated for a lack of knowledge of
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39 the issues questioned in the survey and low response quality, resulting in 83 valid surveys,
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41 and a valid response rate of 80.20%. A total of 260 hard copies were distributed in the
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43 seminar, and 190 responses were collected. Responses with too much missing data and five
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45 responses that scored lower than four on the seven-point Likert scale of respondents'
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57 ²WeChat, an instant message app similar to WhatsApp, is a popular way for Chinese to communicate. The online
58 survey website based on Sojump was sent to the WeChat group.
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4 knowledge³ about the questionnaire were eliminated (Wang *et al.*, 2017); as a result, 169
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6 valid responses were collected, resulting in a valid response rate of 65%.
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9 Our sample (n = 252) is similar to the general distribution of hotels in China, according to
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11 data provided by the China National Tourism Administration⁴. Specifically, among the 252
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13 respondent hotels, 9.52% were luxury, 23.02% were upscale, 31.75% were mid-range,
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15 17.86% were economy, and 17.86% were budget. In terms of hotel ownership, state-owned
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17 hotels accounted for 27.38% of the sample, private hotels accounted for 56.35%, and the rest
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19 accounted for 16.27%. Chain hotels accounted for 47.62% of the sample, and the rest were
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21 independent hotels. Among the respondents, 86.51% were frontline managers (i.e., front
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23 office manager, market and sales manager, housekeeping manager), 4.36% were backline
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25 managers (i.e., engineering manager, security manager), and 9.13% were general managers.
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31 Harman's one-factor method was used to test common method variance (CMV), and the
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33 first factor explained 31% of the total variance, showing that CMV was not a threat.
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36 4.2 Measures

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38 The five constructs in the hypothesized model were measured using existing multi-item
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40 scales, each on a 7-point Likert scale (1 = "disagree strongly", 7 = "agree strongly").
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44 Customer involvement, which reflects how a firm listens to customer voice and uses
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46 customer information during the NSD process, was measured using four items adapted from
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48 Ordanini and Parasuraman (2011). Service climate, which refers to the resources and
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50 competency of a firm to ensure high service quality, was measured using three items from
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55 ³At the end of the survey, one item asked "how much do you know about the questionnaire referred above?" (1 =
56 "nothing at all", 7 = "very knowledgeable").

57 ⁴Statistical communiqué of 2015 national star hotel by China National Tourism Administration,
58 <http://www.cnta.gov.cn/zwgk/lvsj/201609/t20160902782543.shtml>, 2016-09
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4 Bowen and Schneider (2014). Customer complexity, defined as the extent to which a firm
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6 must respond to a diverse array of customer needs in NSD, was operationalized via four items
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8 from the scale of Schmitz and Ganesan (2014). To measure coordination cost, which is the
9
10 cost incurred to coordinate and communicate internally (i.e., between employees in different
11
12 departments) and externally (with customers) during the NSD process, we used 3 items from
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14 Kim *et al.* (2009). Perceived relationship quality, conceptualized as how front-line managers
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16 perceive customers' commitment to and satisfaction with service providers (Mitreğa, 2012;
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18 Solnet, 2007), was measured using three items adopted from Mitreğa's (2012) scale.
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24 Collecting data about perceived relationship quality from service providers, rather than
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26 customers, is an established practice in the services literature (Anderson and Weitz, 1992; He
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28 *et al.*, 2011; Jap and Ganesan, 2000; Mitreğa, 2012). Previous studies provide empirical
29
30 evidence of a significant correlation between customers' and service providers' perceptions of
31
32 relationship quality (Anderson and Weitz, 1992; Jap and Ganesan, 2000). For example, He *et*
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34 *al.* (2011) and Schneider *et al.* (1998) found that service providers' perceptions of customer
35
36 satisfaction with service quality in service contexts (hospitality and banking, respectively)
37
38 was significantly related to customers' perceptions. Customers send signals, either through
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40 online reviewers or offline communications, of their satisfaction, trust, and loyalty
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42 (relationship quality) to firms, which can be evaluated by service providers⁵. Thus, managers
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44 can provide accurate information of perceived relationship quality.
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51 We included seven control variables in our analyses, whose relationship with the
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55 ⁵Satisfied customers of independent hotels, while less likely to show repeated patronage than satisfied customers
56 of chain hotels, can nevertheless express their satisfaction through online reviews, which provides the firm enough
57 information to make judgment.
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4 dependent variable has been established in previous studies. Specifically, firm ownership type
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6 (a dummy variable, state-owned firm, is coded as 1, and 0 otherwise) is considered a control
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8 variable, as different ownership types may represent different operation systems that may
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10 affect coordination cost and perceived relationship quality (Li *et al.*, 2010). Chain hotels
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12 (chain coded as 1) have a consistent management control system that may influence the
13
14 effects of customer involvement on perceived relationship quality and coordination costs
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16 (Weber, 2000). Firm size is captured by the number of hotel rooms and is coded as 1 if the
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18 number of hotel rooms is higher than the mean value and is coded as 0 otherwise. A hotel's
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20 rating, on the international 5-star scale, signifies service quality, which may enhance
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22 perceived relationship quality and reduce coordination cost (Park and Allen, 2013).
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29 Business practice is the extent to which a hotel operates its business in accordance with
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31 business rules (Homburg *et al.*, 2013). Good business practice typically involves firms
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33 following customer- and employee-friendly policies, which may increase perceived
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35 relationship quality and reduce coordination costs (Homburg *et al.*, 2013). For our study, we
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37 adapted three items from the business practice scale developed by Homburg *et al.* (2013).
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39 Information communication, which is about whether information flows easily from frontline
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41 employees to the internal organization, was measured using four items adapted from Liang *et*
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43 *al.* (2012). Cross-functional integration refers to how different departments collaborate with
44
45 each other to finish tasks and was measured using three items from Jong *et al.* (2004). Both
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47 information communication and cross-functional integration facilitate information flow
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49 within the organization, which may influence relationship quality and coordination cost
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51 (Ordanini and Parasuraman, 2011).
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4.3 Measurement model and construct validity

Confirmatory factor analysis (CFA) was conducted using EQS 6.1 to test the measurement model. The CFA model included eight multi-item constructs, revealing an excellent fit with $\chi^2 (274) = 563.80$, non-normed fit index (NFI) = .97, comparative fit index (CFI) = .97, Bollen fit index (IFI) = .97, and root mean square error of approximation (RMSEA) = .07. All the item loadings were significant and exceeded the threshold value of .50. The average variance extracted (AVE) of all constructs was higher than the recommend value of .50 (ranging from .54 to .82), and all composite reliabilities were higher than .70 (ranging from .78 to .93), thereby showing satisfactory convergent validity.

The AVE of each construct exceeded the squared correlation with other constructs, thereby showing satisfactory discriminant validity. The correlation and descriptive statistics of the constructs are shown in Table 2.

[Insert Table 2 about here]

5. Regression results

We used ordinary least squares regression models to test the hypotheses and show the results in Table 3. First, to test the direct effects of customer involvement on coordination cost and perceived relationship quality, in Models 2 and 5, customer involvement positively influenced coordination cost (Model 5: $\beta = .40$, $p < .01$) but had no significant effect on perceived relationship quality. Thus, H1a was not supported and H1b was supported.

In addition, we tested the moderating roles of service climate and customer complexity. To reduce multicollinearity, the independent variables and moderating variables were mean centered. In testing the role of service climate, service climate positively moderated the effect

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4 of customer involvement on perceived relationship quality (Model 3: $\beta = .16$, $p < .01$) and
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6 negatively moderated the effect of customer involvement on coordination cost (Model 6: $\beta = -$
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of customer involvement on perceived relationship quality (Model 3: $\beta = .16$, $p < .01$) and negatively moderated the effect of customer involvement on coordination cost (Model 6: $\beta = -.12$, $p < .05$), thereby showing support for H2a and H2b. In testing the role of customer complexity, customer complexity aggravated the influence of customer involvement on coordination cost (Model 6: $\beta = .11$, $p < .05$), thereby showing support for H3b. However, we did not find a significant moderating effect of customer complexity on the relationship between customer involvement and perceived relationship quality, thereby failing to support H3a.

[Insert Table 3 about here]

Post-hoc analysis

To explore any possible alternative explanations of our research model, we constructed a competing model (shown in Figure 2). Our competing model proposes chain effects, that is, co-creation antecedents (service climate and complexity) \rightarrow customer involvement \rightarrow co-creation outcomes (perceived relationship quality and coordination cost). The fit indexes of the competing model are worse than those of the proposed model, as shown in Table 4.

[Insert Figure 2 and Table 4 about here]

Furthermore, as some prior studies on co-creation were tested in relatively upscale experiential firms (Ordanini and Parasuraman, 2011; Sigala, 2012), we found that the results were consistent with our hypothesized model after removing the samples of budget hotels. In addition, the results were robust after dropping the samples of upscale and luxury hotels.

6. Conclusion and discussion

6.1 Discussion

We empirically tested customer involvement in hotel NSD and observed interesting and original results. First, customer involvement results in an increase in coordination costs, which extends previous studies that focused only on the benefits of customer involvement (Fang, 2008; Morosan and DeFranco, 2016). Counter to H1a, the results show that customer involvement has no direct significant effect on perceived relationship quality. One possible reason why H1a is not supported is that the relationship depends on whether hotel employees have adequate resources and/or capability to satisfy their customers, as demonstrated by H2a. Similarly, we find customer involvement positively influences perceived relationship quality when hotels have the ability to deliver superior service (high service climate). This finding builds upon the study of Athaide and Zhang (2011), which find that the role of customer involvement on supplier performance depends on technological uncertainty.

Second, this is the first study to show that the effects of customer involvement on performance (e.g. perceived relationship quality and coordination cost) depend on the contingent factors associated with front and back office factors of a service firm, namely service climate and customer complexity. However, contrary to H3a, we did not find any evidence that customer complexity attenuated the positive effect of customer involvement on perceived relationship quality. A possible reason is that, in a competitive hotel environment, frontline managers have the chance to build the capability to deal with customers' diverse needs, which might attenuate the negative role of customer complexity on the relationship between customer involvement and perceived relationship quality.

6.2 Theoretical implications

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4 We contribute to SDL literature by finding the coexistence of opportunities and challenges of
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6 co-creation during the interaction process with customers. Prior SDL literature has mainly
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8 emphasized the benefits of co-creation, such as the enhancement of firms' relational and
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10 financial performance (Fang, 2008; Morosan and DeFranco, 2016). However, our results
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12 show that customer involvement also creates a dilemma for hotels, as it not only helps build
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14 relationship quality within a high service climate, but also incurs coordination costs. Here,
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16 firms must invest considerable time and effort to coordinate with internal actors (e.g., front-
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18 line employees and back office support) and customers.
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24 Our study also builds upon customer involvement literature by empirically examining the
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26 conflicting views of customer involvement by exploring its boundary conditions in NSD.
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28 Although anecdotal evidence shows that customer involvement may cause complexity and
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30 uncertainty in the NSD process, most prior studies are qualitative and lack external validity
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32 (Hoyer *et al.*, 2010; von Hippel, 1994; Wong *et al.*, 2016). We empirically present the
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34 challenges that firms confront with coordination efforts. Furthermore, our contingency model
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36 contributes to customer involvement literature by identifying methods to cope with the
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38 tension created by the costs and benefits that customer involvement creates. This situation is
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40 especially true for the highly interactive hospitality industry that involves factors related
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42 exclusively to the service industry (e.g., service climate and customer complexity), which is a
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44 good complement to the product development literature that stresses product modularity and
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46 technological capability (Fang *et al.*, 2015; Wang *et al.*, 2017).
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54 The findings also inform hotel-related literature by empirically exploring customer
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56 involvement in NSD in various hotel categories, which is essential given that increasingly
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4 fierce competition within and between hotel categories has put even greater pressure on firms
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6 to be customer-oriented and continuously commit to designing new services to maintain their
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8 competitiveness. Prior co-creation studies in hospitality-related literature focus on providing
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10 superior service to enhance customer experience at an individual level (Chathoth *et al.*, 2013;
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12 Dong *et al.*, 2015; Morosan and DeFranco, 2016; Sigala, 2014). We go beyond the role of
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14 individual customers (Cha *et al.*, 2016; Jeon *et al.*, 2016; Morosan and DeFranco, 2016) to
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16 examine organizational mechanisms needed for value co-creation to be successful at an
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18 organizational level.
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23 24 *6.3 Practical implications*

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26 Our study informs hotel managers that customer involvement not only creates value for their
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28 firms but also incurs coordination costs. Typically, practitioners overemphasize the value of
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30 co-creating with customers, which may bias others to blindly involve customers in their firms.
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32 However, customer involvement is a double-edged sword and managers should understand
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34 internal capabilities of their hotels (e.g., service climate) and external environment (e.g.,
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36 customer complexity) in order to decide whether or not they can overcome challenges and
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38 gain positive returns from customer involvement. Managers should also realize that
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40 coordination costs incurred by customer involvement not only include internal coordination
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42 with employees, but also external coordination with customers.
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49 In addition, this study provides insights into the internal (high service climate) and
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51 external (low customer complexity) conditions that influence when hotels should decide to
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53 involve customers in NSD. Hotel managers can make organizational policies geared towards
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55 cultivating a high service climate, including rewarding employees for their excellent service
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4 delivery and providing sufficient resources and equipment for employees to provide superior
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6 service quality. Furthermore, hotel managers should also develop a full understanding of the
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8 complexity of their customers. Prior literature has shown that hotel customer segments differ
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10 in terms of their service requirements and expectations (Bilgihan *et al.*, 2011; Weaver and Oh,
11
12 1993). For example, the requirements of families tend to be more critical and demanding than
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14 those of solo and business customers. Hotels which target multiple segments will likely face
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16 greater customer complexity. Participation rules can be designed and implemented to solve
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18 the challenges brought by complex customer environments. For example, hotels can provide
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20 structured, or semi-structured procedures for customer involvement in complex environments.
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26 Our main analysis and the post-hoc analysis show that co-creation not only occurs in
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28 upscale hotels but also in ordinary hotels. Budget and economy hotels can also involve
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30 customers in NSD.
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33 34 *6.4 Limitations and future research*

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36 We investigated customer involvement in NSD from the perspective of hotel managers.
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38 Although we used Harman's one-factor method in order to find that CMV was not an issue,
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40 future research can collect data from multiple sources, such as employees, customers, or
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42 objective financial performance.
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46 Second, we conceptualize customer involvement broadly as a unidimensional construct. It
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48 is actually a multidimensional construct, involving participation as a co-producer, or an
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50 information provider (Fang, 2008). Future research can explore how different types of
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52 customer involvement influence the co-creation process and outcomes in the hospitality
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54 context.
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In addition, we mainly explore the tension produced after customers are involved in hotel NSD. Therefore, further research may examine the influencing factors of customer co-creation and investigate the main antecedents that encourage customers to participate in NSD from the customers' perspectives.

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Figure 1 Conceptual model

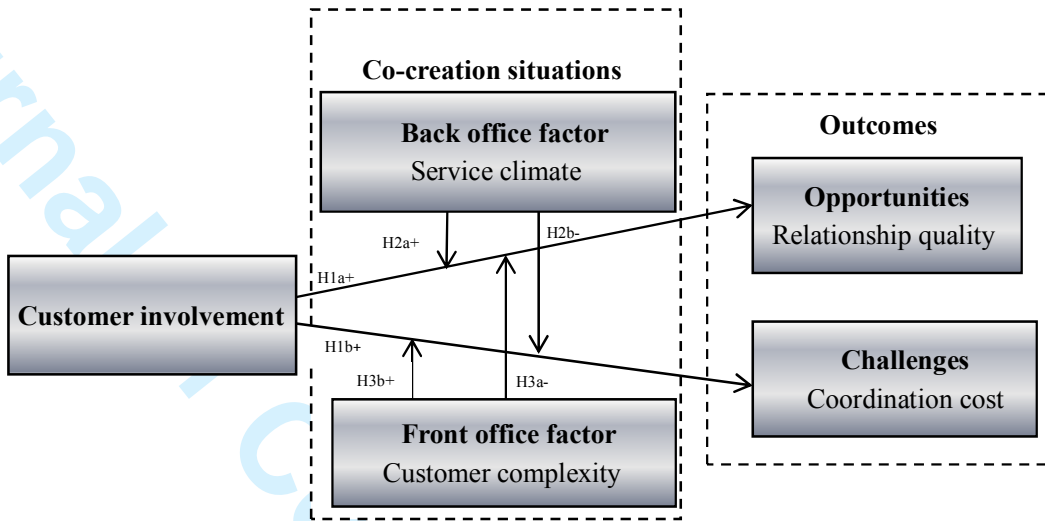


Table 1 Summary of selected literature on value co-creation

References	Context	Co-creation outcomes	Independent variables	Findings
<i>Value co-creation in the product industry</i>				
Fang (2008)	Co-creation between manufacturers and their customers	New product innovativeness, speed to market of the upstream firm	Customer participation, customer network connectivity, process interdependence	Customer participation enhances product performance depending on customer network connectivity and process interdependence.
Fang <i>et al.</i> (2015)	Co-creation between upstream biotech firms and downstream pharmaceutical firms	Financial performance	Equity governance, co-development stages, upstream and downstream technological capability, upstream and downstream market competitiveness	The timing of co-development alliances influences financial performance according to internal technological capability and external market competitiveness.
Athaide and Zhang (2011)	Co-create products between buyers and suppliers	Relationship satisfaction	Perceived buyer knowledge, product customization, innovation discontinuity, co-development, education, knowledge generation, technological uncertainty	Buyer-supplier collaboration contributes significantly to the relationship performance with the supplier.
Bonner (2010)	Co-creation in new product development context	New product performance	Customer interactivity, product newness, product embeddedness	Customer interactivity drives new product performance at a high level of product newness and product embeddedness.
<i>Value co-creation in the service industry (mainly including hospitality area)</i>				
Ordanini and Parasuraman (2011)	Co-creation in hotel context	Innovation outcomes and financial performance	Collaborative competences (customer collaboration and business partner collaboration), dynamic capability of customer orientation, knowledge interface	Customer collaboration enhances service innovation and financial performance.
Morosan and DeFranco (2016)	Co-creation in hotels using mobile devices	Perceived value of co-creation, perceived value of stay, intention to stay	Novelty seeking, habit, co-creation	Consumers actively interact with the firm and co-create value with the firm.
Park and Allen (2013)	Co-creation in hotel online reviews	Trust, communication quality, customer perceptions of engagement behaviors	Customer engagement valence, management responses	Hospitality firms need to respond to customers' online reviews according to the valence of the reviews.
Cha <i>et al.</i> (2016)	Co-creation in brand coffee shops	Service brand loyalty	Corporate social responsibility (CSR)-brand fit, customer participation, brand identification	Customer participation in CSR strengthens the formation of brand loyalty.
Grissmann and Stokburger-Sauer (2012)	Co-creation in travel agency context	Satisfaction with the company, loyalty, expenditures	Company support, degree of co-creation, satisfaction with the co-creation performance	Company support and co-creation enhance customer satisfaction depending on co-creation performance.
Chan <i>et al.</i> (2010)	Co-creation in financial service	Customer satisfaction, employee satisfaction, employee job performance	Customer participation, customer value creation (economic and relational value), employee value creation (relational value and job stress), culture	Customer participation not only creates value for customers and employees, but also causes job stress in employees.
This study	Co-creation in new service development of hospitality context	Customer involvement, service climate, customer complexity	Coordination cost, relationship quality	This is the first empirical study to test both the opportunities and challenges of customer involvement in the hospitality area, and to explore its boundary conditions from back office and front office of the service firm (service climate and customer complexity).

Table 2 Descriptive characteristics and correlation

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. Perceived relationship quality	5.83	.96	1										
2. Coordination cost	5.27	1.20	.36	1									
3. Customer involvement	5.47	1.08	.37	.61	1								
4. Service climate	6.03	.88	.44	.45	.50	1							
5. Customer complexity	5.42	1.29	.23	.55	.56	.37	1						
6. Ownership	.27	.45	.06	.05	.04	.11	.14	1					
7. Chain	.48	.50	.21	.35	.25	.06	.29	-.03	1				
8. Hotel category	2.88	1.22	.07	.15	.13	.10	.34	.31	.21	1			
9. Firm size	.55	.50	.21	.20	.25	.03	.35	.20	.49	.63	1		
1. Business practice	6.12	.88	.47	.33	.49	.65	.30	.13	.04	-.04	.00	1	
11. Cross-functional integration	5.71	1.28	.39	.35	.48	.38	.19	.05	.04	-.17	-.10	.47	1
12. Information communication	6.19	.95	.41	.27	.49	.52	.30	.10	.02	-.01	.00	.51	.62

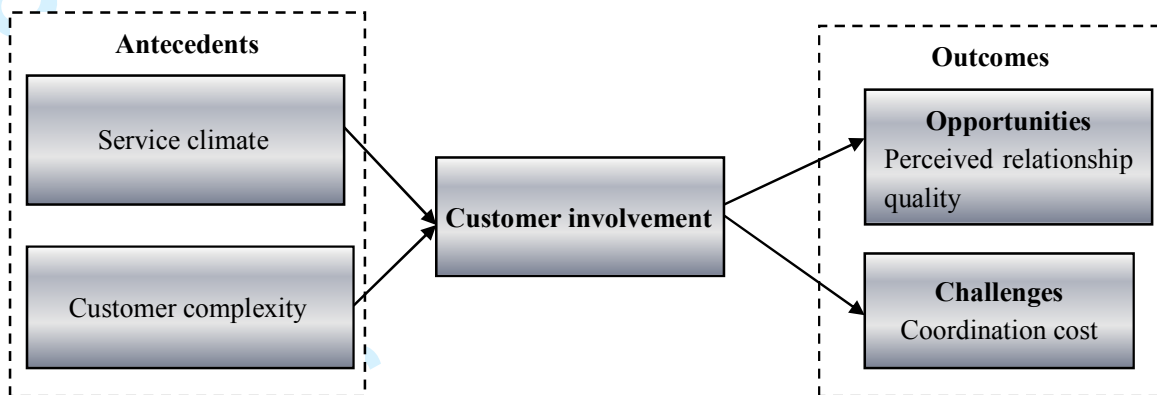
Note: S.D. is standard deviation. When the absolute value of the correlation coefficient is higher than .14, $p < .05$

Table 3 Effects of customer involvement on perceived relationship quality and coordination cost

Table 4 Fit indexes of competing model

Model	d.f.	χ^2	χ^2 /d.f.	Δ d.f.	$\Delta\chi^2$	NNFI	CFI	IFI	RMSEA
Proposed	1	3.35	3.35			.90	.99	.99	.09
Competing model	9	57.54	6.39	8	54.19	.74	.97	.97	.15

Figure 2 Competing model



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When revising your paper, please prepare this report explaining how you have responded to each reviewer's comments and suggestions specifically.

Dear Professor Xie,

Please find the enclosed the latest version of our IJCHM manuscript, entitled "Opportunities and challenges of value co-creation: the role of customer involvement in hotel service development". We appreciate the opportunity to resubmit the final version of the paper. The main changes that we have made are as follows:

- ✓ We shorted the article of the main body to 8825 words.
- ✓ We have strictly followed the guidelines of IJCHM to formalize our article.
- ✓ Finally, an English copy editor has helped us to revise the article in terms of grammar, sentence structure and clarity of discussion.

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Suggestions/comments from the Reviewer	Response from the Author(s)
1. Include Originality subsection in the structured abstract.	We followed ICCHM guidelines to include all originality subsections in the abstract.
2. Make sure to follow IJCHM author guidelines closely: http://emeraldgroupublishing.com/products/journals/author_guidelines.htm?id=ijchm For example, when there are three or more authors, you need to use Adam et al., XXXX (or Adam et al., XXXX) format for the first time and after.	We strictly followed IJCHM author guidelines to formalize the article.
3. Revisit the Discussion and Conclusions section one more time to better answer the "So What" question. There should be four sub-sections under this section: (1) Conclusions, (2) Theoretical Implications, (3) Practical Implications and (4) Limitations and Future Research	We have revisited the discussion and conclusion section to include the sub-sections (conclusions, theoretical implications, practical implications, limitations and future research) to answer the "so what" question.
4. Cross check all references within text with your reference list. You may like to add more recent and relevant references published in recent months/years.	We have added more recent references, and included about 10 articles from the last 2 years.
5. Run your article through iThenticate, Crosscheck or any similar software to check the similarity between your study and previous studies. Try to minimize similarity percentage below 1% with any previous study. After you run your article's final version through iThenticate or other similar software, you should upload the similarity report to the system for our records.	We have checked our study with previous studies, and the similarity is below 0.4%.
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