The Dark Side of Customer Participation: When Customer Participation in Service Co Development Leads to Role Stress

Markus Blut
Professor of Marketing
Aston University Business School, Aston University
Aston Triangle, Birmingham, B4 7ET, UK
Tel. +44 (0)121 204 4704 – Email: m.blut@aston.ac.uk

Nima Heirati*
Senior Lecturer in Marketing
School of Business and Management, Queen Mary University of London
Bancroft Building, Mile End Road, London, E1 4NS, United Kingdom
Tel. +44 20 7882 6612 - Email: n.heirati@qmul.ac.uk

Klaus Schoefer
Professor of Marketing
Newcastle University Business School, Newcastle University
5 Barrack Road, Newcastle upon Tyne, NE1 4SE, United Kingdom
Tel. +44 (0) 191 208 1681 – Email: Klaus.Schoefer@ncl.ac.uk

* Nima Heirati is the corresponding author.

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While numerous studies have examined the benefits of customer participation (CP), understanding of the dark side of involving customers in service firms' processes is limited. This study proposes that the changing role of customers who actively participate in service co-development can cause role stress and negative feelings, which may, in turn, reduce customer satisfaction and the perceived value of participation. We develop and test a comprehensive role theory-based framework for CP–role stress. Using a video-based experiment, behavioral lab experiment, and field study, we find that greater CP leads to heightened role stress, including role conflict, role overload, and role ambiguity. These adverse effects occur contingent on customers' prior participation experience and firm-provided support. Furthermore, role stress effects vary across service co-development types depending on (a) the scope of the task (i.e., open task, closed task) and (b) the beneficiary of participation (i.e., customer, general market). Specifically, adverse effects are stronger for open than for closed tasks, and they also tend to be stronger when the beneficiary is the general market rather than the individual customer. These findings emphasize the need for more cross-context theorizing in CP research. Managers should consider these adverse effects and implement measures that reduce role stress.

Keywords: Customer participation, service co-development, role stress, negative feelings, dark side

It is increasingly critical for service firms to allow customers to participate in their processes, because this may give firms a competitive edge and increase organizational productivity, efficiency, and service performance (Haumann et al. 2015; Teichmann et al. 2016). Customer participation (CP) refers to the extent to which customers contribute effort, preferences, knowledge, or other inputs to the various service process stages, including service development, production, delivery, and recovery (Dong and Sivakumar 2017). For example, the U.S. Postal Service encourages customers to submit ideas for shipping and mail services via its website, which are then used to develop new postal services (Chang and Taylor 2016). Despite the growing interest in the benefits of CP (so-called bright side), some studies indicate that CP is not always beneficial, and has a dark side (e.g., failed co-developed services; Haumann et al. 2015; Chowdhury et al. 2016). Chowdhury et al. (2016, p. 97) explain that "a limited number of studies have touched upon the dark side" of CP. Studying the dark side is important, because it elucidates why extant studies have found not only positive effects of CP on various service outcomes but also nonsignificant and negative effects (Haumann et al. 2015). For example, a meta-analysis by Chang and Taylor (2016) examines the association between CP and new product/service performance and reports substantial variation therein. The authors reason that firms find it challenging to leverage CP because customers experience difficulties with their assigned roles, which may lead to inefficient service development processes and unsuccessful projects.

Several theories have been employed to understand CP's effects on service outcomes, including the person–job fit theory and product experience theory (Dong et al. 2008, 2015). We use role theory to explore the dark side of CP and examine how and when its adverse effects on service outcomes occur. Specifically, we use this theory to develop a comprehensive role theory-based framework for CP–role stress. Role theory asserts that individuals experience stress when engaging in a specific role—such as CP—and that they may face problems while

coping with the associated demands (Lazarus 1993). Role stress refers here to stress resulting from so-called role stressors, including conflicts, high workloads, and ambiguities regarding the customer's changing role (Eatough et al. 2011). Grönroos (2011) explains that customers can participate in various activities, including service development, production, and delivery. Because these activities traditionally fall into the provider's sphere, customers may struggle to understand new responsibilities when participating, and hence experience role stress. Studies on role theory from other domains argue that role stressors may induce negative feelings (i.e., tension, anxiety; Tubre and Collins 2000). Therefore, role stressors and negative feelings could be important mediators that help in explaining the adverse effects of CP.

Few extant studies examine the relationships between CP, role stressors, and negative feelings (see Table 1 for an overview). While some studies examine single role stressors (mainly role ambiguity), they usually do not assess all role stressors proposed by role theory. This is problematic, because role theory indicates that dealing with each role stressor individually depletes individuals' coping resources (Gilboa et al. 2008; Hobfoll 2001); thus, dealing with all role stressors simultaneously is even more stressful. It is therefore important to understand whether CP is associated with only one role stressor, or all three. The existing CP studies neglect examining mediating mechanisms and moderating factors. Studying CP from a role-theoretical perspective may provide insights into the mediating mechanisms, which helps to disentangle the adverse effects of CP. Mende et al. (2017) emphasize the need to study mediators—such as role stressors—between CP and service outcomes; they stress that "[m]arketers do not yet fully understand the psychological processes related to customer participation" (p. 140).

Besides examining how CP may lower service outcomes, we use role theory to assess when the occurrence of these effects is most likely. Dong and Sivakumar (2017) call for more studies testing interactions between CP and customer-related and provider-related factors. We

respond to this call by examining whether the effects of CP on role stressors depend on individual differences (i.e., prior experience) and organizational factors (i.e., firm support). Extant CP–role stress studies do not examine these interaction effects (see Table 1). Dong et al.'s (2008) study is most similar to ours; however, although it examines the influence of CP on role clarity in a service co-recovery context, it does not assess moderators of this relationship.[1] We therefore assess the influence of two moderators proposed by role theory because this theory highlights the importance of individual differences and organizational factors for role perception (Grant and Langan-Fox 2007). Specifically, we consider the moderating influences of the customer's prior experience and firm support. Testing these moderators indicates which customers are most likely to face role stress, and to what extent firms can prevent it.

We develop and test this study's framework in a service co-development context. Customers frequently co-develop services by improving services as part of firms' new service-development efforts (Dong and Sivakumar 2017), or when customizing services to fit their personal preferences (Dong et al. 2015; Franke et al. 2009). Scholars indicate that role issues may be particularly prevalent in this context. For example, Chang and Taylor (2016) argue that customers find service co-development challenging, because it requires them to be creative and express their latent needs. The authors also emphasize that customers in this context often have difficulties in understanding the firm's expectations toward them. CP in other stages of the service process (i.e., production) can be less demanding as it often requires less cognitive effort and creativity (see also Dahl and Moreau 2007; Hildebrand et al. 2014).[2] We discuss the selection of this context in the literature review section. Within the service co-development context, we also assess whether role stress effects vary across different types of service co-development, using two criteria to characterize different service co-development types. While

[1] The terms "role clarity" and "role ambiguity" are used interchangeably in the role theory literature.
[2] While creativity is considered essential for service co-development (i.e., new service development; Chang and Taylor 2016), it also matters in other CP stages. For example, customers who co-create service recovery must also be creative. Its importance also depends on the flexibility of the service script in other CP stages.

Charness and Grieco (2018) emphasize the CP task *scope* (i.e., open versus closed task), Dong and Sivakumar (2017) encourage scholars to consider the *beneficiary* of participation (i.e., customer versus general market). Some studies give customers closed tasks, where constraints are imposed while customers co-develop services (e.g., online insurance configurator), whereas other studies give open tasks with few restrictions (e.g., online idea-generation platforms; Dahl and Moreau 2007). Furthermore, customers in some studies co-develop services for the general market (e.g., Starbucks's service idea hub), whereas in other studies they co-develop services for themselves as part of a specific transaction (e.g., customizing their own vacation; Teichmann et al. 2016). These differences have not yet been tested, as scholars usually examine one CP type without considering the generalizability of their findings to other types. Dong and Sivakumar (2017) encourage scholars to theorize contextual differences and contrast different CP types.

Our study contributes to the literature by developing and assessing the proposed framework in a service co-development context. The findings reveal the usefulness of role theory for understanding the adverse effects of CP on service outcomes in this context. We examine different role stressors simultaneously. Specifically, we find that CP is related to all three role stressors proposed by role theory, but the effects are stronger for role conflict and role overload than for role ambiguity. Moreover, role stressors are found to induce negative feelings that lower service outcomes (effects that have not been considered in the existing CP–role stress studies). Our findings also advance the literature by assessing how customer-related and firm-related moderators influence the experience of role stress. While firm support was found to help customers in coping with their role demands, customer experience seems to enhance role stress. We also contribute to the literature by showing that CP is more likely to increase all role stressors when customers co-develop services for open rather than closed tasks. Further, we find that CP increases certain role stressors when co-developing services for the

general market rather than for their own benefit. These findings help managers to better understand the adverse effects of CP, which customers experience role stress, how to support them, and in which contexts CP is perceived to be conflicting, overloading, and ambiguous. Finally, we contribute to the literature by testing our model using a number of methodologies (e.g., lab experiment and field study) to validate the findings.

LITERATURE REVIEW

CP in Service Co-Development

As described above, CP is the extent to which customers contribute effort, preference, knowledge, or other inputs to the different service process stages (Dong and Sivakumar 2017). This study focuses on CP in service co-development. Literature stresses that customers co-develop services by contributing effort, knowledge, or other inputs to (1) improve existing services or develop new services as part of firms' new service-development efforts (Dong and Sivakumar 2017), or (2) improve their own services by customizing them as part of a service transaction (Dong et al. 2015; Franke et al. 2009). Teichmann et al. (2016) highlight a major difference between these two types of service co-development: the person co-developing the service is not the end-user in the former case, while that person will consume the co-developed service himself/herself in the latter case. Oertzen et al. (2018) also review various studies on CP and classify them based on the primary beneficiary. Dong and Sivakumar (2017) emphasize that customers who configure their own services bring further improvements to service offerings (see also Dahl and Moreau 2007). For example, customers who configure their holiday via travel-booking websites invest time and effort to compare options (e.g., flights), add tour packages (e.g., fast-track attraction tickets), and make special requests (e.g., nonsmoking room) according to their preferences. This customized holiday is more likely to meet their needs than standard holiday packages (Dong and Sivakumar 2017). However, customers contribute to service co-development to a lesser extent when firms offer standard

service packages with few options to choose from (e.g., two hotels only), wherein customers do not need to invest much effort into configuring the service.

We examine role stress in the service co-development context for two reasons. First, empirical studies display substantial variance in the relationship between CP and important service outcomes such as customer satisfaction with the co-developed service. We assessed 20 studies on service co-development and identified 36 effects for the relationship of interest (Online Appendix A). While 28 of these effects are positive, eight (22%) are negative or nonsignificant. Thus, service co-development seems to be an appropriate context to investigate the adverse effects of CP. Chang and Taylor's (2016) meta-analysis supports this choice as they find that correlations between CP and new product/service performance vary between −.29 and .59. Thus, CP in service co-development may lead to negative service outcomes.

Second, Chang and Taylor (2016) highlight role problems as potential reasons for the relationship's varying strength and direction. They indicate that customers find service co-development difficult since they often lack creative ideas and struggle to articulate their needs. This rationale is supported by studies that suggest cognitive effort as a prerequisite of CP in service co-development (Hildebrand et al. 2014; Teichmann et al. 2016). When customers participate in other stages of the service process, less cognitive effort and creativity may be required, which makes participation less demanding. Chang and Taylor (2016) argue that customers in consumer industries (when compared with business customers) are more likely to display role problems, since they often have difficulties in understanding firms' expectations; they frequently display a low "level of mutual understanding of needs and expertise as well as a shared language" (p. 51). Similarly, customers often do not explicitly benefit from co-developing services for the general market; thus, firms struggle to motivate them to participate

and perform their assigned roles.[3] For other stages of the service process, this issue may be less challenging, because customers usually benefit from participation in service production, delivery, and recovery. Oertzen et al. (2018) also emphasize the need to differentiate between stages of the service process, since customers' cognitive involvement varies by stage.

Classification of Service Co-Development Types

We consider two criteria to classify service co-development types: beneficiary of CP (Dong and Sivakumar 2017) and scope of the task (Charness and Grieco 2018). The classical theory of performance suggests an individual's task performance to be the multiplicative function of ability and motivation (Stewart et al. 1996). Customers who benefit from CP are more motivated to succeed in their new role, and the task scope determines the likelihood that the customer's ability will be sufficient.[4] First, Dong and Sivakumar (2017) view *beneficiary of CP* as an important criterion for classifying participation behaviors. They argue that scholars should use the term "CP" only for activities that benefit customers, whereas activities that benefit the firm should be labeled "engagement." While we apply CP more broadly, covering different beneficiaries, we acknowledge the importance of different beneficiaries and consider the potential differences between them. Similarly, Teichmann et al. (2016) and Moreau et al. (2011) suggest using the beneficiary as a criterion when describing different types of CP. Thus, we differentiate between two types of service co-development by considering activities that benefit (a) the customer and (b) the general market. Ad (a): Customers often co-develop services for their own benefit as part of a specific transaction (Dong and Sivakumar 2017). For example, they may customize their tour plan (e.g., Antilog's vacation planning tool) or medical

[3] Chang and Taylor (2016) examine CP for the benefit of the general market. Our study also considers customers co-developing services for their own benefit. We hypothesize differential effects for the two CP types and test for differences depending on the beneficiary.

[4] Although some studies propose different classifications of CP, these studies are mainly conceptual. For example, Dong and Sivakumar (2015) differentiate CP types based on (1) outcome specificity (specific vs. generic output) and (2) process structure (structured vs. unstructured process).

treatment plan according to personal preference. Ad (b): Customers also co-develop services to benefit the general market beyond a specific transaction; they often contribute to the development of new services that firms then release to the market (e.g., logistics company DHL fosters co-development workshops). Because this service co-development type does not benefit the customer directly, firms sometimes have difficulties in motivating the customers to participate (King and Lakhani 2013). Owing to the importance of customer motivation for role performance, customers participating in these activities may be more prone to role stress (Schmidt and Spreng 1996).

Second, service co-development activities can also be classified according to the *scope of the task*. Extant studies differ regarding the specific tasks given to customers, with some focusing on closed tasks and others on open tasks (Online Appendix A). *Closed tasks* require less creativity and effort from customers; they refer to activities that impose constraints on the individual when co-developing services (e.g., users vote for shirt designs presented on Threadless website). Charness and Grieco (2018, p. 458) emphasize that "the open task requires the development of something new, without restrictions on what can be done; the closed task involves combining a set of elements, which also act as constraints." The creativity literature frequently uses open tasks to encourage customers to be creative (Lin and Lien 2013). In the service co-development context, customers can often only configure service specifications from a set of predefined options. For example, firms use online toolkits where customers configure their own vacation by selecting travel destinations, hotels, etc. from a list of given service specifications (Hildebrand et al. 2014). These tasks are not only used when the customer is the beneficiary of the developed service; firms also use them when conducting market research to help customers co-develop services for the general market (Moreau et al. 2011). *Open tasks* require more creativity and effort from customers allowing them to proceed in a much more unplanned manner (Charness and Grieco 2018). For instance, energy supplier E.ON initiated

open idea contests to identify new services through its online community (Oertzen et al. 2018). Customers engaging in open tasks often co-develop services by suggesting service specifications themselves without any predefined options (Moreau and Engeset 2016). Instead, customers must be creative and suggest the desired service specifications. Open tasks are used when customers co-develop services for themselves, or for the general market (Online Appendix A). For example, Starbucks encourages customers to submit novel service ideas directly to the firm. According to Dahl and Moreau (2007), open tasks differ from closed tasks in the extent of the effort and creativity required. Franke et al. (2010) explain that firms often use customization toolkits (a form of closed task) to reduce the effort required and to ease CP. Because of these differences, the task scope may be related to perceptions of role stress.

The above classification of service co-development types has not been assessed before and may provide new insights into the experience of role stress.

CP–Role Stress in Services

Literature argues that CP has a dark side, sometimes producing adverse effects on service outcomes (Haumann et al. 2015). For example, Bendapudi and Leone (2003) show the occurrence of adverse psychological impacts of CP in co-production due to self-serving bias. Moreover, Plé and Cáceres (2010) suggest that customer–firm interactions not only co-create value but can also lead to value co-destruction (i.e., failure to utilize customer contributions). Some studies argue that these adverse effects are caused by problems regarding the customer's role perception (Chang and Taylor 2016; Chowdhury et al. 2016). Against this background, we use role theory to better understand the adverse effects of CP. Role theory is based on a dramaturgical metaphor concerned with the appropriate enactment of a role as determined by reactions of fellow actors and observers (Solomon et al. 1985). Edvardsson et al. (2011, p. 331) discuss *customer roles* in the value co-creation context, explaining that the "term role refers to socially defined expectations of individuals' behaviors in particular social positions […] A role

provides an individual with a complex set of identities, which become the source of individual interpretations of social situations." Role perception has implications for how customers think and behave regarding CP. It is argued that CP instigates change in the "service consumption play" and thereby challenges actors' ability to perform their roles (Dong et al. 2015). Thus, this theory may explain why some customers have difficulties with their newly assigned roles when co-developing services. Table 1 summarizes previous research on CP–role stress.

[Table 1 here]

The existing studies examine either how CP impacts the role stress experienced by employees or the various role variables as perceived by customers (Guo et al. 2013; Dong et al. 2008; Yoo et al. 2012; Mende et al. 2017). While some studies collect data from both customers and employees, they still examine how CP affects employees' role perceptions (Chan et al. 2010; Yim et al. 2012). Regarding the CP stage, most studies are conducted in the co-production context (Yoo et al. 2012; Mende et al. 2017). While one study examines role variables in the service co-recovery context (Dong et al. 2008), role perception has not been assessed in the service co-development context (Dong et al. 2015). None of these studies examine the co-development of new services for the general market or compare different CP types (see CP comparison column in Table 1), despite calls for more cross-contextual theorizing in CP research (Dong and Sivakumar 2017). Most importantly, extant studies fall short regarding constructs proposed by role theory (i.e., mediators and moderators). While all studies in Table 1 measure at least one role variable, few examine whether, how, and when CP causes role stress. The reason pertains to a difference of focus. Although Yoo et al. (2012) investigate the effects of role conflict and role clarity on customer satisfaction, they do not assess the impact of CP on these role stressors, and they overlook role overload. Guo et al. (2013) examine role clarity's effects on service outcomes without considering the interrelationship with CP. Dong et al. (2015) propose a CP–role identification interaction effect

on customer satisfaction and quality perceptions. Mende et al. (2017) examine "eustress" rather than the role stressors proposed by role theory. Dong et al.'s (2008) study is the most similar to ours, because it examines whether CP impacts role clarity, which, in turn, influences the customer's intention toward future co-creation.

In sum, most studies assess a single role stressor, and none assess CP's impact on role overload and role conflict from a consumer perspective. Because of their different foci, the existing studies do not investigate whether role stressors induce negative feelings as suggested by role theory, whether negative feelings mediate any relationship of CP, or whether the impact of CP on role stressors depends on the customer's prior experience or firm support (as role theory indicates). Against this background, we (1) develop a comprehensive role theory-based framework to assess the adverse effects of CP on service outcomes through role stressors and negative feelings, (2) test moderators related to the customer (i.e., prior experience) and the organization (i.e., firm support), and (3) examine CP in the service co-development context to assess whether the experience of role stress depends on the type of service co-development.

A ROLE THEORY-BASED FRAMEWORK FOR CP–ROLE STRESS

In this section, we develop a conceptual framework and then test it empirically using three studies (Figure 1). As suggested by Moeller (2008), we differentiate between the service co-development process and service outcomes. We propose that CP has positive direct effects on customer satisfaction and the perceived value of participation. As per role theory, we propose that CP displays adverse effects on these service outcomes through mediators, including role stressors and negative feelings. We also propose that CP–role stress effects are contingent on the specific service co-development types, customers, and organizational contexts.

Baseline Effect of CP on Outcomes

To contrast the adverse effects of CP proposed by role theory, we first examine the baseline effect of CP on two service outcomes. Literature suggests positive direct effects of CP on

customer satisfaction and value perception (Dong et al. 2015). For various service co-development types, scholars argue that CP enables customers to create value by providing information about unique insights from their own service usage when co-developing services, which helps firms' offerings to better meet the customer needs (Dong and Sivakumar 2017). In turn, services are more likely to satisfy customer expectations, and customers are more likely to value the co-developed services (Dong et al. 2008). Therefore, we propose that CP positively influences satisfaction and value perception. Thus,

H1: CP increases (a) customer satisfaction and (b) the perceived value of participation.

Role Stressors, Negative Feelings, and Outcomes

Role theory may provide insights into the mediating effects between CP and service outcomes. A number of studies on role theory exist in the occupational literature, which inform our research (e.g., Eatough et al. 2011). According to this literature, employees' roles in an organization are associated with certain expectations. Role stress occurs when demands placed on an individual increase, making it more difficult for that individual to perform according to the assigned role (Gilboa et al. 2008). Thus, individuals are subjected to stress when confronted with incompatible or ill-defined expectations (Eatough et al. 2011). Literature distinguishes between three role stressors (Gilboa et al. 2008): (1) role conflict, which describes contradictory expectations associated with a role that may result from work colleagues who interfere with one another and make it difficult to complete the task; (2) role overload, which reflects situations where individuals feel being subjected to excessive duties; and (3) role ambiguity, which arises when expectations toward the individuals are vague.

For the CP context, we propose that customers with greater participation are more likely to experience role conflict, role ambiguity, and role overload, regardless of the service co-development type. First, an important consideration is whether customers identify with their new roles (Büttgen et al. 2012). Customers often have a set of normative expectations regarding

what the service firm should do and what the customer should do. Customers may perceive their new role to be incompatible with the understanding of their current role (Dong et al. 2015). According to Lazarus (1993), individuals confronted with novel role demands are more likely to experience role conflict. This is also true when customers must cope with new responsibilities during participation. Second, customers who participate in service co-development may experience role overload. They may feel that their responsibilities are excessive because they perceive their time and effort as "cost factors" (Haumann et al. 2015). Changing the role description and making unfamiliar demands is likely to influence perceived role overload (Lazarus 1993). Third, role theory proposes that role changes may confuse the individuals regarding new demands and expectations (Lazarus 1993). When customers participate in service co-development, they often receive limited guidance about their role (Dong 2015). Hence, the insufficient information associated with the new role makes customers feel uncertain about the role's expectations. Thus,

H2: CP increases (a) role conflict, (b) role overload, and (c) role ambiguity.

Although we assume that CP affects role stressors, the strength of these relationships may differ across the stressor variables. We argue that role conflict and role overload are more strongly affected by CP than role ambiguity. Occupational role theory suggests that an individual's reaction to role stress differs across these stressors (Eatough et al. 2011). The differential effects are usually explained by the individual's threat appraisal. According to Yim et al. (2012), customers find their new roles threatening because they dwell on deficiencies that prevent them from performing well therein. Regarding the different role stressors, customers may perceive role ambiguity as less threatening, since they assume that they will learn more about the new role during participation (Dong et al. 2008). However, it is argued that customer roles change significantly, and new responsibilities often differ greatly from customers' current responsibilities (Grönroos 2011). Hence, CP is very likely to cause role conflict. Similarly,

changes in role descriptions lead to significantly different workloads for customers (Mende et al. 2017). We therefore hypothesize that role conflict and role overload are more strongly affected by CP than role ambiguity. Thus,

H3: The effects of CP on (a) role conflict and (b) role overload are stronger than the effect on role ambiguity.

We propose that role stressors mediate the relationship between CP and negative feelings. Yim et al. (2012) indicate that CP in financial services is directly related to customers' feelings (i.e., frustration). Besides this direct effect, we propose mediating effects of role stressors between CP and negative feelings, as the effects of role stressors on role-induced negative feelings have been investigated extensively, and several meta-analyses in the occupational literature provide support for these effects (Eatough et al. 2011). Tubre and Collins (2000) assert that studies on role theory often include measures of tension and anxiety, finding that role stressors display strong effects on these feelings. According to Gilboa et al. (2008), individuals consider different role stressors as threatening, which prevents them from behaving according to role expectations. The authors refer to the work of Lazarus and Folkman (1984) on stress appraisal to explain that individuals' immediate physiological responses to stressors include the display of negative feelings. Specifically, when customers perceive their new role as conflicting, overloading, or ambiguous, they display anxiety and discomfort. Therefore, role stressors mediate the CP–negative feelings relationship. Hence,

H4: (a) CP exhibits a positive direct effect on negative feelings, and this effect is mediated by (b) role conflict, (c) role overload, and (d) role ambiguity.

Moreover, we contend that negative feelings mediate the relationship between role stressors and service outcomes. Customer satisfaction and the perceived value of participation are the most frequently examined service outcomes of CP, and role theory proposes that they are related to role stress (Dong et al. 2015; Gilboa et al. 2008). Regarding the direct effect of

role stressors on these outcomes, we argue that customers who are uncertain about role expectations are less likely to perform well (role ambiguity) because they are unsure about how much time and effort to allocate to service co-development (Gilboa et al. 2008). Thus, the co-developed service is less likely to generate customer satisfaction and provide value. Likewise, customers who perceive their new role as incompatible with their current role (role conflict) are reluctant to dedicate time and effort to service co-development, since they perceive service co-development to be the firm's responsibility (Netemeyer et al. 1990). Finally, customers who are given excessive responsibilities (role overload) may find the given task challenging. Thus, they are less likely to invest time and effort into the task, such that role overload is negatively related to task performance (Gilboa et al. 2008).

Regarding the mediating role of negative feelings, the relationships between role stressors and role-induced negative feelings have been tested numerous times (Tubre and Collins 2000; Eatough et al. 2011). Negative feelings are associated with service outcomes because customers perform poorly in a given task, such as service co-development, when experiencing negative emotions. Customers must then cope with their immediate negative psychological reactions, such as anxiety and discomfort, instead of completing the task properly. They are more likely to spend time coping with their feelings than on completing the presented tasks, which thus lowers their task performance (Folkman 1984). Customers are consequently less satisfied and perceive their participation as less valuable. Mende et al. (2017) assert that customers who experience stress during participation in healthcare services may become dissatisfied. Significant stress and negative feelings make customers experience information overload, which narrows their perceptual attention and causes them to disregard available information, in turn lowering their task performance (Rizzo et al. 1970). Thus,

H5: (a) Role conflict, (b) role overload, and (c) role ambiguity exhibit negative direct effects on service outcomes, and (d) these effects are mediated by negative feelings.

Differential Effects of CP on Role Stressors by Service Co-Development Type

Scope of the CP task: Open versus Closed Task. We propose that the strength of the CP–role stressor relationship depends on the scope of the CP task, wherein levels of creativity and effort required from the individual vary. We therefore differentiate between closed and open tasks (Charness and Grieco 2018). Closed tasks require less creativity and effort because they typically provide a range of predetermined solutions, whereas open tasks require more creativity and effort because respondents must provide their own solution. In service co-development, customers can either choose from predefined service specifications, where constraints are imposed (closed task), or suggest new service specifications without restrictions (open task). Because open tasks require more creativity, they necessitate greater cognitive resources than closed tasks (Charness and Grieco 2018). Firms frequently use closed tasks to help customers cope with their new role in service co-development (Franke et al. 2010). Role theory provides some indication for differential role stress effects depending on the scope of the task. For example, Tubre and Collins (2000) observe that employee roles in an organizational context differ in the extent to which they induce role stress. The authors explain these differences in terms of variation in the scope of different roles. Thus, we assume that CP is more likely to lead to role stress for open than for closed tasks. Since closed tasks require less cognitive effort, customers may have fewer problems in understanding this service co-development type (Hildebrand et al. 2014). Customers find closed tasks less ambiguous as they are given service specifications to select from and they are less likely to feel that the firm should develop the service instead. Therefore, it is easier for customers to cope with the demands of closed versus open tasks. Thus,

H6: The effects of CP on (a) role conflict, (b) role overload, and (c) role ambiguity are stronger for open than for closed tasks.

Beneficiary of CP: Customer versus General Market. Literature provides diverse arguments concerning how the effects of CP on service outcomes depend on the beneficiary of participation. Accordingly, we propose two competing hypotheses. First, we propose that the CP's effects on role stressors are weaker when the customer is the beneficiary versus the general market. Chang and Taylor (2016) explain that it is more difficult to encourage customers to participate and fulfill the assigned role when they do not explicitly benefit from participation. Consumer research indicates that a person's motivation is directly related to his/her perceptions of benefit (Schmidt and Spreng 1996). When customers benefit from a certain activity (e.g., self-designed holiday), they are more motivated to invest time, search for information, and familiarize themselves with the activity. Customers may feel less motivation when there is no direct benefit of their participation (e.g., students participating in restructuring a degree syllabus for prospective students; Moreau and Engeset 2016). According to role theory, the extent to which role demands lead to role stress depends on the individual's coping resources (i.e., familiarity with the role; Gilboa et al. 2008), which help them in addressing demands associated with their new role and make these demands appear less threatening (Lazarus 1993). Because of the time and effort invested, customers may understand their new roles better and find them less conflicting. Customers are also less likely to find the demands associated with their new roles burdensome, since they personally benefit from service co-development. Thus,

H7: The effects of CP on (a) role conflict, (b) role overload, and (c) role ambiguity are weaker when the customer, rather than the general market, is the beneficiary.

Second, the literature provides an alternative argument concerning how the beneficiary may moderate the relationship between CP and role stressors. Consumer research indicates that

self-interest (maximizing one's own gain) is a primary motive for various behavior types (Corfman and Lehmann 1993). Regarding CP, one could argue that customers give more weight and care more about service co-development when they (versus the general market) are the entity benefiting therefrom. According to this rationale, customers are more concerned about their role performance when co-developing services for themselves (Corfman and Lehmann 1993). Thus, customers are more likely to experience role stress when they co-develop services for themselves. Thus, we propose the following competing hypothesis,

H8: The effects of CP on (a) role conflict, (b) role overload, and (c) role ambiguity are stronger when the customer, rather than the general market, is the beneficiary.

Differential Effects of CP on Role Stressors by Customer's Prior Experience

The experience of role stress may depend on customer-related characteristics. Occupational literature emphasizes the importance of the individuals' experience as a moderator (Tubre and Collins 2000). Grant and Langan-Fox (2007) explain that individual differences—such as experience—may exert moderating effects because they influence the appraisal of a situation as threatening. The transactional theory of stress and coping suggests that individuals scan the environment constantly to detect threats to their well-being (Folkman 1984). Yim et al. (2012) explain that while customers often perceive demands associated with CP as challenging or threatening, some customers are more capable than others to engage in CP, which impacts their perception of their new roles. We, therefore, propose that customers' prior participation experience may influence the occurrence of role stress (Büttgen et al. 2012), with customers appraising their participation as less threatening when they have prior experience. Dong et al. (2015, p. 164) argue that "when customers have high ability, customers are confident and competent in fulfilling their tasks," and emphasize that these customers struggle less with the demand–ability discrepancies. Customers' capabilities usually improve the more they engage in specific activities. Prior participation experience, therefore, helps customers to cope with the

demands of their new role. Inexperienced customers feel less comfortable with new demands and may have difficulties in coping because of the ability gap (Dong et al. 2015). Hence, we propose that the CP–role stressor relationships are weaker for experienced customers. Thus,

H9: Customer's prior experience weakens the effect of CP on (a) role conflict, (b) role overload, and (c) role ambiguity.

Differential Effects of CP on Role Stressors by Firm Support

The proposed model of CP–role stress also considers the influence of firm support. Occupational literature emphasizes the importance of organizational factors, including supervisor support, feedback provision, and employee development, in helping the employees to deal with stressful jobs (Eatough et al. 2011).[5] Service firms can also provide support to customers to help them understand their new roles better and increase their confidence (Büttgen et al. 2012; Moreau et al. 2011). Service literature encourages firms to empower customers, as this gives customers a sense of control over the service co-development process (Büttgen et al. 2012). Moreau et al. (2011) assert that firms can support customers before and during the CP process. A quote from a customer in Dong et al.'s (2015) study emphasizes the importance of support during CP: "I felt frustrated when I found myself left with the automated system alone, with no employee onsite to help" (p. 165). We argue that providing instructions for new roles and facilitating interactions with employees during participation helps customers better cope with role demands. Customers who receive support from the firm are less likely to perceive CP as threatening (Folkman 1984). Mende et al. (2017) explain that customers participating in healthcare services expect "that support will be available from the service organization when they need it to complete their […] task effectively and to deal with related stressful situations" (p. 146). Thus,

[5] These moderating effects are examined mainly for the role stressor–outcome relationship, and less for the role demand–role stressor relationship (Grant and Langan-Fox 2007).

H10: Firm support weakens the effect of CP on (a) role conflict, (b) role overload, and (c) role ambiguity.

EMPIRICAL STUDIES

We test the proposed role theory-based framework for CP–role stress using three studies (Figure 1). Marketing scholars frequently use sequentially ordered studies where earlier studies inform subsequent ones (i.e., Moreau and Engeset 2016). Study 1 examines the direct effects of CP on service outcomes and mediating effects (H1–H5) when customers are involved in various types of service co-development (different *scopes* and *beneficiaries*; H6–H8). Study 1 tests these hypotheses in the context of developing a travel insurance plan. Studies 2 and 3 extend Study 1. To reduce the complexity of these follow-up studies, we have chosen two CP archetypes for each. Study 2 reexamines the main effects tested in Study 1 (H1–H5) and further examines the moderating role of the customer's prior experience and firm support (H9–H10). Study 2 tests these hypotheses on customers developing a new travel insurance plan for the general market. In Study 2, customers are given an open task because the results of Study 1 suggest that customers find this specific task more difficult, which makes this context appropriate for testing the moderating influence of firm support. Study 3 reexamines the effects of Study 2 in a field study where customers have to co-develop banking services for their own benefit. We employ an experimental research design in Study 1 (video-based experiment) and Study 2 (lab experiment). This approach helps in controlling unmanageable variables and biases often associated with retrospective self-reports, such as rationalization tendencies and memory lapses (Dong et al. 2008). The experiments also allow us to create service offerings that are clearly distinct regarding the scope of the task and the beneficiary of CP. In Study 3, we conduct a field study to enhance the external validity and generalizability of our findings.

Study 1: Video Experiment Comparing Different Service Co-Development Types

Research design. We employed a video-based experimental approach to induce behavioral and psychological responses similar to real service settings (Victorino et al. 2012). We chose travel insurance as the context because customers can often choose between different insurance plans and customize them to cover the risks of various travel types, from sports activities to business trips (Dong et al. 2015).

Procedure. A total of 391 participants were recruited through an online crowdsourcing marketplace (61% women, average age 35 years). Each participant was randomly assigned to watch a video clip and complete a related task followed by a questionnaire (Online Appendix B). We used a 3×2 between-subjects design, manipulating the task (low CP, high CP/closed task, and high CP/open task) and the beneficiary of CP (customer benefit and benefit of general market). Respondents in the low-CP task had to choose between two travel insurance plans for themselves or recommend one for the general market (similar to Dong et al. 2015). Respondents in the closed task were asked to co-develop a service by selecting and writing down eight additional service features from a list of insurance items beyond the standard services provided. Respondents in the open task were not given any list of service features and were instead asked to suggest and write down eight additional insurance coverage items beyond the standard services provided.[6] We manipulated the beneficiary by indicating that customers were engaged in these tasks for the benefit of either themselves or the general market. We used established measures for the constructs in our model (Online Appendix C) and controlled for age and gender effects.

[6] When developing the experiment, we presented the scenarios to five researchers who assessed, on a 10-point scale, whether each activity could potentially lead to role conflict (M=8.00), role overload (M=9.00), or role ambiguity (M=7.00). We conducted qualitative pilot tests to improve the content validity and readability of scenarios.

Manipulation checks. We first assessed the degree of participation using a 5-point scale from Chan et al. (2010) (Online Appendix C). The manipulation was significantly different across tasks (M_{Low}=3.24; $M_{High\ (Closed\ task)}$=3.90, F=22.84; $M_{High\ (Open\ task)}$=3.81, F=18.13). We then employed several manipulation checks to assess whether the amount of effort and needed creativity differs depending on the scope of the specific task. Because Charness and Grieco (2018) suggest that open tasks are demanding and require more effort and creativity from customers than closed tasks, we assessed the degree of required creativity for different tasks using a 5-point scale from Gilson and Shalley (2004). Again, the manipulation was significantly different (M_{Low}=2.67; $M_{High\ (Closed\ task)}$=3.03, F=6.78; $M_{High\ (Open\ task)}$=3.32, F=22.92). We assessed the degree of customer effort by measuring the time required to complete different tasks and found significant differences (M_{Low}=100.7 seconds; $M_{High\ (Closed\ task)}$=200.7, F=79.21; $M_{High\ (Open\ task)}$=245.61, F=88.60). We found that the degree of creativity ($F_{Closed\text{-}Open}$=5.24) and time ($F_{Closed\text{-}Open}$=7.96) required were higher to complete the open versus the closed task. Furthermore, respondents assessed the complexity of scenarios on a 5-point scale ("the requested task is complex") and reported medium to low levels of complexity with no significant difference across scenarios (M_{Low}=2.91; $M_{High\ (Closed\ task)}$=3.08; $M_{High\ (Open\ task)}$=3.15, F=1.82). The beneficiary manipulation was assessed by asking about the main recipient of the travel insurance plan on a 10-point scale (customer=1; general market=10). The manipulation was also significantly different ($M_{Customer}$=3.15; $M_{General\ market}$=5.22, F=220.51). Finally, respondents assessed the realism of the scenarios on a 5-point scale ("this task is realistic"), indicating the described scenarios to be realistic (M>3.6).

Measurement Properties and Measurement Equivalence. We employed confirmatory factor analysis (CFA) to assess the reliability and validity of the measurements. The measurement model demonstrates good fit (χ^2/df=1.58, p<.01; CFI=.98; TLI=.98;

RMSEA=.04; SRMR=.03).[7, 8] The convergent validity is satisfactory, as the composite reliabilities (>.70) and average variances extracted (AVE>.50) exceed the recommended thresholds. Discriminant validity is satisfactory, as the square roots of AVE are greater than all individual correlations (Online Appendices D-E).[9]

We assessed measurement invariance of the scales with multigroup CFA as suggested by Steenkamp and Baumgartner (1998) and Patterson et al. (2016). Steenkamp and Baumgartner (1998) recommend testing for configural invariance, metric invariance, and factor variance invariance "when the purpose of the study is to relate the focal construct to other constructs in a nomological net" and "compare standardized measures of association (i.e., standardized regression coefficients)" across groups (p. 82). As suggested by Cheung and Rensvold (2002), we assessed invariance across models by examining the change in CFI (ΔCFI$\leq$.01). First, we performed these tests for the data across different task scopes (low CP, high CP/closed task, and high CP/open task). Overall fit statistics were satisfactory across all groups, and all freely estimated factor loadings were statistically significant (p<.01). Configural invariance was supported as the baseline model fits the data well (χ^2= 703.01, *df* =522, CFI=.971, RMSEA=.052). The tests of metric invariance ($\Delta\chi^2$= 35.53/30 *df*, ΔCFI= .001) and factor variance invariance ($\Delta\chi^2$= 60.72/30 *df*, ΔCFI= .005) reveal minor changes in CFI (ΔCFI$\leq$.01), indicating metric invariance and factor variance invariance across all groups. Second, we performed the same tests for different beneficiaries of CP (customer benefit and benefit of general market). Overall fit statistics were satisfactory across both groups, and all freely estimated factor loadings were statistically significant (p<.01). The baseline configural invariance model fits the data well (χ^2= 557.49, *df* =348, CFI=.969, RMSEA=.055). The results

[7] Structural model fit indices are reported in Tables 2 and 3.
[8] We employed a maximum likelihood (ML) estimator in Mplus. We ensured normality of data before using this estimator. We also employed an MLR estimator and found no significant difference in the results.
[9] We employed the HTMT approach to further assess the discriminant validity for Studies 1, 2, and 3 using SmartPLS (Voorhees et al. 2016). HTMT ratios are reported in Online Appendix E. The results meet $HTMT_{[.85]}$ and $HTMT_{[inference]}$ criteria, providing support for discriminant validity across all studies.

also demonstrate metric invariance ($\Delta\chi^2$= 18.86/15 *df*, ΔCFI= .000) and factor variance invariance ($\Delta\chi^2$= 14.26/15 *df*, ΔCFI= .000) across both groups.

Results. We employed structural equation modeling (SEM) to test hypotheses H1–H5 and multigroup analysis to test H6–H8.[10] First, we performed SEM for the complete sample. As shown in Table 2 and Figure 1, the results show that CP influences satisfaction (H1a; γ=.21, p<.01) and perceived value (H1b; γ =.15, p<.01), supporting H1a–b. CP influences role conflict (H2a; γ =.48, p<.01) and role overload (H2b; γ =.32, p<.01), supporting H2a–b. However, CP does not influence role ambiguity significantly (H2c; γ =.05, ns), rejecting H2c. We tested H3a–b using χ^2 difference tests and found that the effects of CP are stronger on role conflict and role overload than on role ambiguity (each p<.05).

[Figure 1 here]

We assessed the mediation effects (H4 and H5) simultaneously via SEM following the procedure suggested by Zhao et al. (2010) and Patterson et al. (2016). The indirect effects were assessed with a bootstrapping procedure with 5,000 bootstrap samples. The results show that CP significantly influences role stressors except for role ambiguity and that all role stressors significantly influence negative feelings, while the direct effect of CP on negative feelings is insignificant (rejecting H4a and H4d). The bootstrap analysis shows that the indirect effects of CP on negative feelings through role conflict and role overload are significant, as the confidence intervals (95% CI, role conflict [.12, .24], role overload [.04, .13]) of these effects do not include zero. Thus, the results provide evidence for the mediation effect of role conflict and role overload, supporting H4b and H4c. Regarding H5, the direct effects of role stressors on negative feelings and the effects of negative feelings on service outcomes are significant, while the direct effects of role stressors on service outcomes are insignificant, except for role ambiguity (rejecting H5a–b and supporting H5c). The bootstrap analysis shows that the indirect

[10] We found no evidence of common method bias using the marker–variable approach (Online Appendix F).

effects of role stressors on service outcomes through negative feelings are significant, as the CIs of these effects do not include zero. The results support H5d, as negative feelings mediate the effects of role conflict, role overload, and role ambiguity on service outcomes.

Second, we ran multigroup SEMs to contrast the findings for the closed task sample versus the open task sample (H6a-c). The closed task sample includes all respondents who participated in the closed task, whereas the open task sample includes respondents who participated in the open task. The low CP-task groups were used in both cases as a reference group. Table 2 shows the influence of CP on role conflict ($\gamma_{\text{Closed task}}$=.38, $\gamma_{\text{Open task}}$=.63), role overload ($\gamma_{\text{Closed task}}$=.18, $\gamma_{\text{Open task}}$=.50), and role ambiguity ($\gamma_{\text{Closed task}}$=−.09, $\gamma_{\text{Open task}}$=.19). The χ^2 difference tests demonstrate that the effects of CP on all three role stressors are significantly stronger for open than for closed tasks, supporting H6a-c.

Third, we performed multigroup SEMs to contrast the findings for the customer benefit sample versus the general market benefit sample (H7 and H8). Results in Table 2 indicate that the influence of CP on role ambiguity (γ_{Customer}=−.06, $\gamma_{\text{General Market}}$=.14) is significantly weaker when the customer, rather than the general market, is the beneficiary, supporting H7c (rejecting H8c). However, we found no significant differences for the effects of CP on role conflict (γ_{Customer}=.44, $\gamma_{\text{General Market}}$=.52) and role overload (γ_{Customer}=.28, $\gamma_{\text{General Market}}$=.36).

[Table 2 here]

Study 2: Behavioral Lab Experiment Testing Further Moderators

Research design. Study 2 extends Study 1 by investigating further moderating effects. Customers in this experiment had to develop a new travel insurance plan for the general market. They were given an open task, because the results of Study 1 suggest that respondents find this specific task more demanding than the closed task regarding the creativity and effort required. Thus, we employed a 2 (low CP/open task) × 2 (no/with firm support) between-subjects design to manipulate CP and firm support. We focus on the contingent effect of firm

support, as it may help customers cope with role stress. The customer's prior experience is operationalized as within-subject factor.

Procedure. Similar to Dong et al. (2015), we recruited 177 student participants for the behavioral lab experiment (47% women, average age 28). Consistent with Study 1, the participants were asked to read a scenario, complete a task, and answer a questionnaire. We used the same measures as before and included additional measures for CP and the customer's prior experience (Online Appendix C). To manipulate firm support, we randomly assigned respondents to "no firm support" and "with firm support" groups. The firm support group received a flyer providing general travel insurance guidance based on information provided by government websites (Online Appendix D).

Manipulation checks. As in Study 1, the CP manipulation worked as expected (M_{Low}=2.80, M_{High}=3.96, F=63.44). We examined the firm support manipulation using a 5-point scale from Büttgen et al. (2012). Perceived firm support was significantly different across scenarios (M_{Low}=2.36, M_{High}=3.74, F=103.51). As in Study 1, respondents assessed the complexity of scenarios and found the complexity to be medium to low, with no significant difference across scenarios (M_{Low}=3.02, M_{High}=3.24, F=1.78). Finally, respondents assessed the realism of scenarios and found them to be realistic (M>3.55).

Measurement Properties and Measurement Equivalence. The convergent and discriminant validity of all constructs are satisfactory, and the measurement model displays good fit (χ^2/df=1.28, p<.01; CFI=.96; TLI=.95; RMSEA=.04; SRMR=.05). We assessed the measurement invariance for the data across different task scopes (low CP and high CP). Overall fit statistics were satisfactory across both groups, and all freely estimated factor loadings were statistically significant (p<.01). Configural invariance for the baseline model is supported (χ^2= 692.61, *df* =.508, CFI=.908, RMSEA=.064). The results also demonstrate metric invariance ($\Delta\chi^2$= 26.86/18 *df*, ΔCFI= .005) and factor variance invariance ($\Delta\chi^2$= 20.82/18 *df*, ΔCFI= .001)

across both groups. We performed the same tests for the two firm support scenarios (no support and with support). Overall fit statistics were satisfactory across both groups, and all freely estimated factor loadings were statistically significant ($p<.01$). Again, configural invariance is supported ($\chi^2= 677.09$, *df* =508, CFI=.919, RMSEA=.061). The tests of metric invariance ($\Delta\chi^2=$ 33.44/18 *df*, ΔCFI= .007) and factor variance invariance ($\Delta\chi^2=$ 37.64/18 *df*, ΔCFI= .010) reveal minor changes in CFI.

Results. As shown in Table 3 and Figure 1, the results show that CP influences satisfaction (H1a; $\gamma=.30$, $p<.01$) and perceived value (H1b; $\gamma =.32$, $p<.01$), supporting H1a–b. CP influences role conflict (H2a; $\gamma =.31$, $p<.01$), role overload (H2b; $\gamma =.56$, $p<.01$), and role ambiguity (H2c; $\gamma =.34$, $p<.01$), supporting H2a–c. The conducted χ^2 difference test suggests that the effect of CP on role overload is stronger than its effect on role ambiguity ($p<.05$), supporting H3b. No differences were found for role conflict and role ambiguity, rejecting H3a. Table 3 also shows that CP influences role stressors and role stressors influence negative feelings (except role ambiguity), while the direct effect of CP on negative feelings is insignificant (rejecting H4a and H4d). The bootstrap analysis shows that the indirect effects of CP on negative feelings through role conflict and role overload are significant (95% CI, role conflict [.06, .33], role overload [.01, .55]). Thus, the results provide evidence for the mediation effect of role conflict and role overload, supporting H4b–c. Table 3 also indicates that the direct effects of role conflict and role overload on negative feelings and negative feelings on service outcomes are significant, while the direct effects of role conflict and role overload on service outcomes are insignificant (rejecting H5a–b). Although role ambiguity does not influence negative feelings, it is significantly related to both service outcomes (supporting H5c). The bootstrap results show that none of the indirect effects of role stressors on satisfaction and perceived value through negative feelings are significant, rejecting H5d.

To test the moderating effects of the customer's prior experience and firm support (H9–H10), we mean-centered these variables and created multiplicative interaction terms (CP×moderator). We used interaction terms for these tests to avoid the problems associated with dichotomization of a continuous variable (Iacobucci et al. 2015). As shown in Table 3, none of the variables moderates the effect of CP on role conflict (H9a–H10a) and role overload (H9b–H10b), contrary to our predictions. As expected, firm support (H10c; γ=−.14, p<.01) moderates the CP–role ambiguity relationship, supporting H10c.[11]

[Table 3 here]

Study 3: Field Study Testing Moderators

Research design. We conducted a field study to enhance the external validity and generalizability of our findings. Participants in this study were asked to answer questions regarding their most recent experience of co-developing financial/banking services for themselves (i.e., a personal investment plan). A total of 402 participants were recruited through an online crowdsourcing marketplace (39% women; average age 33 years). We used the same scales as in previous studies and added a measure for firm support.

Measurement Properties. The results show satisfactory convergent and discriminant validities (Online Appendices D-E). The measurement model also displays a good fit (χ^2/df=1.82, p<.01; CFI=.95; TLI=.94; RMSEA=.04; SRMR=.05).

Results. As shown in Table 3 and Figure 1, the results display that CP influences satisfaction (H1a; γ=.18, p<.01) and the perceived value (H1b; γ =.20, p<.01), supporting H1a–b. CP influences role conflict (H2a; γ =.18, p<.01) and role overload (H2b; γ =.18, p<.01), supporting H2a–b. However, CP does not influence role ambiguity significantly (H2c; γ =–.07, ns), rejecting H2c. According to the conducted χ^2 difference tests, the effects of CP are stronger

[11] Similar to Study 1, we also employed multigroup analysis to test H10 and found consistent results. The sample sizes for each group are rather small (each N=88) for multigroup analysis (Kline 2005). For this reason, we present the results of the model with interaction terms using the full sample.

on role conflict and role overload than on role ambiguity, supporting H3a-b. Table 3 also shows that CP significantly influences role stressors (except role ambiguity) and role stressors influence negative feelings, while the direct effect of CP on negative feelings is insignificant (rejecting H4a and H4d). The bootstrap analysis shows that the indirect effects of CP on negative feelings through role conflict and role overload are significant (95% CI, role conflict [.03, .13], role overload [.02, .09]). Thus, the results provide evidence for the mediation effect of role conflict and role overload, supporting H4b–c. The results also indicate that the direct effects of role stressors on negative feelings and the effects of negative feelings on service outcomes are significant. The direct effect of role conflict on perceived value is significant (partial support for H5a), while the direct effects of role overload on both service outcomes are insignificant (rejecting H5b). The direct effects of role ambiguity on both service outcomes are significant (supporting H5c). The bootstrap analysis shows that the indirect effects of role stressors on service outcomes through negative feelings are significant, as the CIs for these effects do not include zero. Thus, the results support H5d, as negative feelings mediate the effects of role conflict, role overload, and role ambiguity on service outcomes.

Regarding the moderating effects, the results reveal that the customer's prior experience positively moderates the effect of CP on role conflict (H9a; γ=.13, $p<.01$) and role overload (H9b; γ=.15, $p<.01$), contrary to our expectations. However, firm support moderates the effect of CP on role conflict (H10a; γ=−.12, $p<.01$) and role overload (H10b; γ=−.16, $p<.01$) as expected, supporting H10a−b.

DISCUSSION

Contributions to the Literature

This research used role theory to develop a comprehensive framework to gain insights on how and when adverse effects of CP on service outcomes occur. Our framework deepens the understanding of the mediating mechanisms between CP and service outcomes proposed by

role theory (role stressors and negative feelings), differences in CP-induced role stress across service co-development types (scope of the task and beneficiary of CP), customers (prior experience), and firms (firm support). Table 4 summarizes the empirical findings.

[Table 4 here]

First, we developed a framework built on role theory because some scholars identify this as a useful perspective from which to study adverse effects of CP (Chang and Taylor 2016). Since Mende et al. (2017) indicate that marketers do not fully understand the psychological processes related to CP, we tested several mediators suggested by role theory. Alongside finding support for positive direct effects of CP on satisfaction and perceived value of CP (the two outcomes in this framework), we find that *role stressors* intervene (Table 4). As discussed in our literature review, research on the CP–role stress relationship is scarce (see Table 1). Current studies rarely examine role stress from the customer perspective and assess only single role stressors. No extant study has assessed the impact of CP on role overload and role conflict, despite role theory proposing these effects. Our study clarifies that CP leads to role stress, such that customers will have problems dealing with demands associated with CP. In Studies 1–3, the main effects of CP on role conflict and role overload are significant. Except in Study 2, CP had the weakest (or insignificant) effect on role ambiguity. Customers seem to perceive the workload and conflicting expectations associated with CP to be more problematic than role ambiguity. The results underline the importance of considering the differential effects of CP on the three role stressors when studying service co-development. Testing these mediating mechanisms helps in disentangling the adverse effects of CP.

Second, we considered *negative feelings* as an additional mediator. Results suggest that role stressors largely do not impact service outcomes directly, but rather exert indirect effects through this mediator (except role ambiguity in all studies and role conflict in Study 3). We found that role stressors were strongly related to negative feelings, which then lowered

customer satisfaction and the perceived value of participation. This finding is important, because no extant CP–role stress study considers this variable, and findings are consistent across Studies 1 and 3. Negative feelings were less relevant as a mediator in Study 2. Scholars who ignore this potential mediator may not fully understand the adverse effects of role stressors on service outcomes. The identification of negative feelings expands our view of CP-related psychological processes. By testing negative feelings, our study responds to the research call for more mediator tests by Mende et al. (2017). Across all studies, we find that most of the tested role stressor–negative feelings relationships are significant. For the few insignificant relationships, cognitive rather than affective mediators are worth considering (i.e., customer confusion; Mitchell et al. 2005).

Third, we tested the role theory-based framework for different service co-development types and tried to expand it regarding contextual differences. Dong and Sivakumar (2017) recently called for more research on differences across CP types to clarify inconsistent findings of past empirical research and to better explain the generalizability of CP effects. We used two criteria to describe different service co-development types: *scope of the task* and *beneficiary of CP*. The findings suggest that both criteria should be considered to understand the adverse effects of CP. Regarding task scope, customers are sometimes given closed tasks that impose constraints when co-developing services or are given open tasks where few restrictions apply. Study 1 shows that CP is more likely to lead to role conflict, role overload, and role ambiguity in open tasks than in closed tasks, since the former requires greater creativity and effort from individuals. Scholars should consider these differences when studying CP effects, as tasks vary in their likelihood of leading to adverse effects. Regarding the beneficiary of CP, scholars should consider whether the customer or the general market is the beneficiary. Results of Study 1 suggest that CP is more likely to lead to role ambiguity when the general market is the beneficiary. When customers benefit from participation, they show a greater motivation to cope

with role demands than when participation is for someone else's benefit. It seems that motivational issues are important, particularly when the general market is the main beneficiary. By testing these service co-development types, scholars gain insights into the occurrence of adverse CP effects. These findings also emphasize the need for more cross-context theorizing in CP research.

Fourth, we tested whether the *customer's prior experience* and *firm support* should be considered in the framework. Surprisingly, we found a positive moderating effect of prior experience. According to the Dunning–Kruger effect discussed in occupational research, individuals with little experience are unable to recognize that they do not perform very well in their role, whereas individuals with more experience assess their own performance more accurately (Kruger and Dunning 1999). The former customers are more likely to display overconfidence in their own abilities and do not recognize any role problems. Furthermore, we assessed the influence of firm support on the CP–role stressor relationships. Results suggest that firm support helps customers cope with role demands. Testing these individual- and organization-related moderators improves understanding of the boundary conditions of role theory in the CP context.

Managerial Implications

Our findings offer important insights for managers in industries where there is a trend to involve customers in service co-development. Our study makes managers aware of the adverse effects of CP, improves their understanding of when these effects occur, and guides them in taking actions. First, managers should be aware of role stress and negative feelings experienced by customers, and preferably monitor the customer's experience and emotional state during CP. Understanding role stressors helps managers determine which specific activities are most likely to lead to role stress. Our results also reveal that, typically, CP is more likely to lead to role conflict and role overload than to role ambiguity. Customers perceive role ambiguity to be less

problematic, since they can clarify unclear role expectations during participation, whereas resolving role conflict and role overload is more difficult. Besides clarifying role expectations, managers should think about the amount of responsibility given to customers and how to approach them for engagement in service co-development. Managers may use persuasive techniques so that customers feel that CP is fun rather than work.

Second, managers should be aware of the differences in role stress for different types of service co-development. For example, we show that open tasks with few restrictions regarding service co-development are more likely to lead to role stress. Managers should consider using closed tasks (i.e., online toolkits) where possible and should employ open tasks only where necessary. Firms can also ease CP by using starting solutions architecture to combine open and closed task elements (Hildebrand et al. 2014). This approach allows customers to first select one starting solution from prespecified options and then develop the final service on that basis. This approach is employed by many financial advisors who enable customers to co-develop their investment portfolios; customers are offered starting solutions based on their risk orientation (i.e., cautious vs. adventurous), choose one solution, and tailor their portfolio according to market trends and advisor recommendations. We also find role stress differences based on the beneficiary of CP. Managers should, where possible, provide customers with incentives to increase their motivation. For example, customers may be promised a financial reward if their co-developed service is introduced to the general market.

Third, managers should consider customer differences when managing CP. We find that customers with little prior experience show an overconfidence in their capabilities. Managers have to inform customers about the required capabilities and how to assess their performance. Furthermore, managers should use intervention strategies to reduce CP’s effect on role stressors and provide support to empower customers to cope with potential role stress. For example, service firms can offer instructions, hotlines, and live chats to ensure that customers understand

their roles. Firms should use these measures to explain to customers what to expect during participation. Managing customer expectations ensures that customers will not be dissatisfied with their participation experience. Alongside offering written instructions to customers, service firms should train frontline employees about the customer's emotional state and how to provide the required support during service co-development.

Limitations and Further Research

Our study has several limitations that future studies should address. First, when developing our framework, we examined the main role stressors suggested by role theory. Some scholars propose additional stressors (task vs. relationship role conflict), which may be worth investigating (Simons and Peterson 2000). Second, investigating the effect of role stressors on psychological responses besides negative feelings and service outcomes would generate further insights into the dark side of CP. For instance, stressful participation may cause customers to err or demonstrate aggression toward employees. Third, we assessed role stress in the service co-development context. Future studies should assess the impact of CP on role stress elsewhere in the service process (e.g., service production, delivery, and recovery). Some role stressors may be more (less) important at certain CP stages. Fourth, literature would benefit from further testing CP–role stress boundary conditions beyond the customer characteristics and firm differences we examined. Specifically, service usage type (hedonic vs. utilitarian) or service experience (sacred vs. profane) may influence the CP–role stress association. Finally, we considered the customer or the general market as the most common beneficiaries of service co-development. Further research should address the possibility that the beneficiary would be someone else (e.g., gifting situation).

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Table 1. Literature Review on CP–Role Stress.

Source	Context	CP Stage	Role Stress Components	Perspective Taken	Comparison of CP Types	Relevant Findings
Hsieh and Yen (2005)	Restaurants	SP	Job stress, role conflict, workload	E	No	CP increases perceived job stress and workload.
Dong et al. (2008)	Online course registration, Internet setup	SR	Role clarity and customer ability	C	No	CP positively influences role clarity, perceived value, and satisfaction with service recovery. CP in service recovery is not a significant predictor of customer ability in future co-creation. Role clarity mediates the relationship of CP and customer ability.
Chan et al. (2010)	Financial services	SP	Job stress	C-E	No	CP increases employees' job stress and reduces their job satisfaction, particularly for employees with a higher individualist or a lower power distance value orientation.
Guo et al. (2013)	Financial counselling	SP	Role clarity, task mastery, goal congruence	C	No	Socializing consumers with their co-production role drives healthy behaviors and satisfaction. Three aspects of socialization (role clarity, task mastery, and goal congruence) have different effects on consumer co-production behaviors (compliance, individual initiative, and civic virtue).
Yim et al. (2012)	Financial services	SP	Job stress	C-E	No	Employees' participation enjoyment, job stress, and relational value mediate the effect of CP on employee job satisfaction. Customers' participation enjoyment, economic value, and relational value mediate the effect of CP on satisfaction.
Yoo et al. (2012)	Medical services	SP	Role conflict and clarity	C	No	Role conflict has a stronger effect on satisfaction than role clarity. Role clarity has a stronger effect on participation than role conflict.
Chen et al. (2015)	Insurance services	SP	Job stress	E	No	CP increases employees' job satisfaction only if such participation minimizes job stress and meets employees' relational needs.
Dong et al. (2015)	Tour design, Internet setup	SP	Customer readiness	C	No	The effects of CP on service quality and satisfaction are contingent on customers' readiness (perceived ability, benefits of participation, and role identification).
Mende et al. (2017)	Financial and medical services	SP	Eustress	C	No	Co-production workload increases compliance intentions for consumers with low service literacy. Co-production eustress is a mediator, such that positive service outcomes result from consumers appraising co-production tasks as positive and meaningful challenges. Organizational support mitigates positive effects of eustress as it triggers reactance.
Our study	Financial services	SD	Role conflict, role overload, role ambiguity	C	Yes	Role stressors and negative feelings are important mediators to explain adverse effects of CP in service co-development on service outcomes. These effects are conditional on the type of CP, customer's prior experience, and service firm support.

Table 2. Study 1 (Video Experiment) – Structural Results.

Relationships	Complete Sample	Scope of Task		Beneficiary of CP	
		Closed	Open	Customer	General Market
CP → Role conflict	**.48****	**.38**[a]	**.63**[a]	**.44****	**.52****
CP → Role overload	**.32****	**.18**[a]	**.50**[a]	**.28****	**.36****
CP → Role ambiguity	.05	-.09[a]	**.19**[a]	-.06[a]	**.14**[a]
CP → Negative feelings	-.03	-.06	-.07	.02	**-.14***
CP → Satisfaction	**.21****	**.20****	**.18****	**.23****	**.19****
CP → Perceived value	**.15****	**.16****	**.15****	**.18****	.13
Role conflict → Negative feelings	**.39****	**.50****	**.30****	**.51****	**.33****
Role overload → Negative feelings	**.25****	**.19****	**.39****	**.24****	**.29****
Role ambiguity → Negative feelings	**.23****	**.14****	**.24****	**.13***	**.30****
Role conflict → Satisfaction	.01	.07	-.02	-.04	.02
Role overload → Satisfaction	-.09	-.05	-.02	-.11	-.08
Role ambiguity → Satisfaction	**-.55****	**-.50****	**-.58****	**-.54****	**-.54****
Negative feelings → Satisfaction	**-.23****	**-.26****	**-.25****	**-.18****	**-.25****
Role conflict → Perceived value	.06	.04	.05	-.02	.08
Role overload → Perceived value	-.04	05	-.04	-.10	-.01
Role ambiguity → Perceived value	**-.50****	**-.44****	**-.53****	**-.49****	**.50****
Negative feelings→ Perceived value	**-.21****	**-.18****	**-.22****	**-.17***	**-.17****
Age → Role conflict	.01	.05	.02	-.02	.05
Age → Role overload	.07	**.11***	**.12****	.03	.10
Age → Role ambiguity	.01	.02	-.01	-.03	.05
Age → Negative feelings	-.01	.01	-.05	-.03	-.01
Age → Satisfaction	-.01	-.03	-.03	-.05	-.02
Age → Perceived value	-.04	-.05	.01	.06	-.09
Gender → Role conflict	-.02	-.07	-.01	.02	-.04
Gender → Role overload	**-.10****	**-.17****	-.07	-.05	**-.14***
Gender → Role ambiguity	.03	.02	.10	.05	.02
Gender → Negative feelings	.04	.05	-.01	.01	.09
Gender → Satisfaction	-.04	-.04	.01	-.03	-.06
Gender → Perceived value	-.04	-.04	-.01	-.03	-.07
R^2 Role conflict	.23	.16	.40	.20	.27
R^2 Role overload	.11	.07	.27	.08	.16
R^2 Role ambiguity	.01	.01	.05	.01	.02
R^2 Negative feelings	.28	.30	.35	.38	.27
R^2 Satisfaction	.44	.42	.45	.40	.45
R^2 Perceived value	.34	.29	.38	.33	.35

Notes: * p<.05, ** p<.01 (one-tailed). Significant effects are bold for visual clarity.
a. Indicates the parameter strength is significantly different across groups. Sample size=391.
Structural Model – Complete sample: χ^2/df=1.76, p<.01; CFI=.98; TLI=.97; RMSEA=.04; SRMR=.03.
Structural Model – Closed vs. Open task: χ^2/df=1.47, p<.01; CFI=.97; TLI=.97; RMSEA=.04; SRMR=.04.
Structural Model – Customer vs. General market: χ^2/df=1.53, p<.01; CFI=.96; TLI=.96; RMSEA=.05; SRMR=.04.

Table 3. Study 2 (Lab Experiment) and Study 3 – Structural Results.

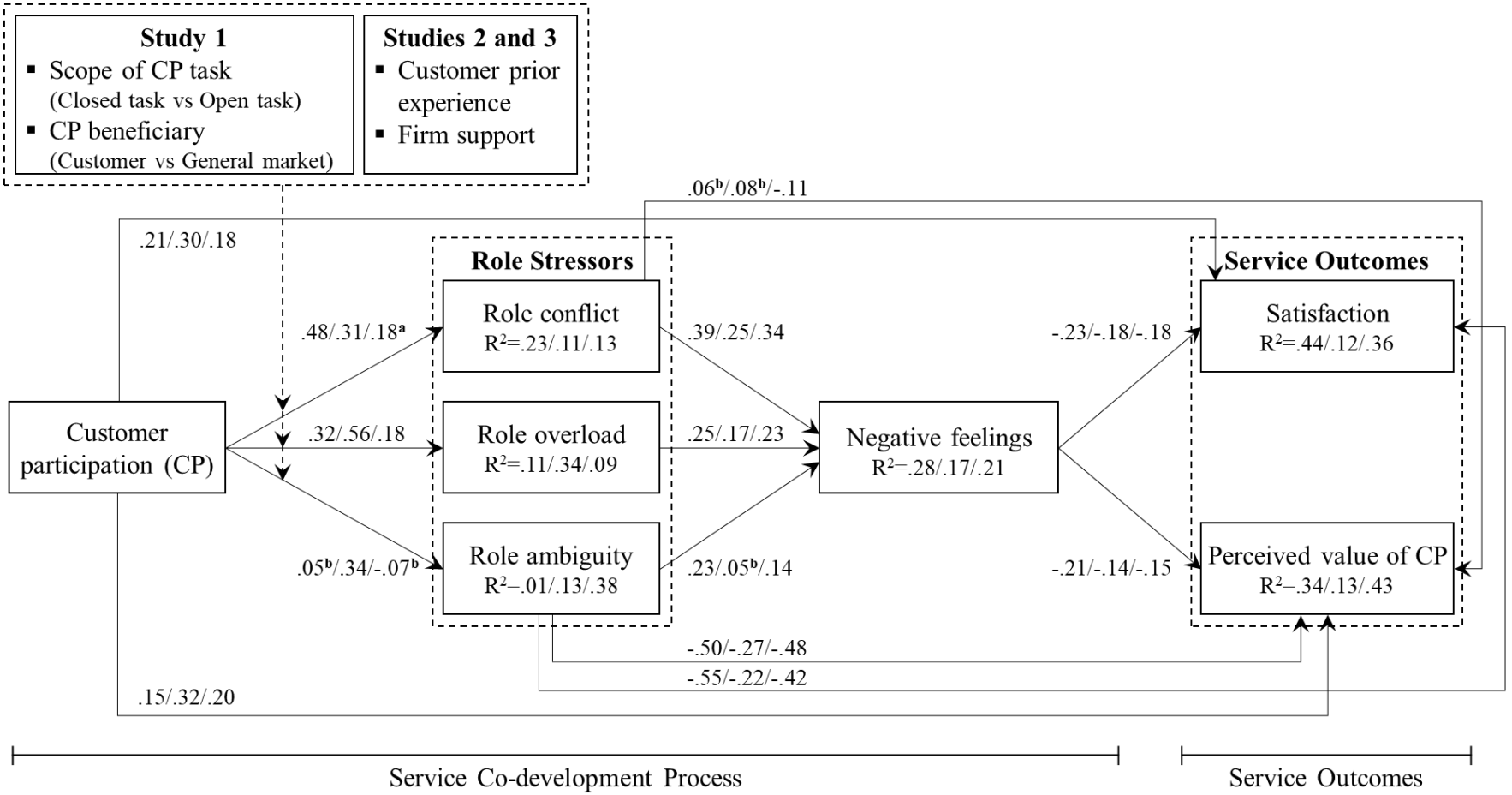
Relationships	**Study 2**	**Study 3**
CP → Role conflict	**.31****	**.18****
CP → Role overload	**.56****	**.18****
CP → Role ambiguity	**.34****	-.07
CP → Negative feelings	.11	-.02
CP → Satisfaction	**.30****	**.18****
CP → Perceived value	**.32****	**.20****
Role conflict → Negative feelings	**.25****	**.34****
Role overload → Negative feelings	**.17***	**.23****
Role ambiguity → Negative feelings	.05	**.14****
Role conflict → Satisfaction	.10	-.06
Role overload → Satisfaction	-.09	-.05
Role ambiguity → Satisfaction	**-.22****	**-.42****
Negative feelings→ Satisfaction	**-.18****	**-.18****
Role conflict → Perceived value	.08	**-.11****
Role overload → Perceived value	.01	.06
Role ambiguity → Perceived value	**-.27****	**-.48****
Negative feelings→ Perceived value	**-.14***	**-.15****
Prior experience → Role conflict	-.03	.07
Prior experience → Role overload	-.02	.05
Prior experience → Role ambiguity	-.05	**-.18****
Firm support → Role conflict	**-.48****	**-.34****
Firm support → Role overload	**-.22****	**-.28****
Firm support → Role ambiguity	**-.46****	**-.51****
CP × Prior experience → Role conflict	.02	**.13****
CP × Prior experience → Role overload	.02	**.15****
CP × Prior experience → Role ambiguity	.07	.02
CP × Firm support → Role conflict	-.06	**-.12****
CP × Firm support → Role overload	.04	**-.16****
CP × Firm support → Role ambiguity	**-.14****	-.06
Age → Role conflict	-.09	**-.08***
Age → Role overload	-.10	.01
Age → Role ambiguity	-.07	-.01
Age → Negative feelings	-.04	.05
Age → Satisfaction	-.02	.02
Age → Perceived value	-.03	.03
Gender → Role conflict	-.03	**-.08***
Gender → Role overload	.01	-.03
Gender → Role ambiguity	-.02	-.04
Gender → Negative feelings	.06	.06
Gender → Satisfaction	-.07	.06
Gender → Perceived value	-.03	.03
R^2 Role conflict	.11	.13
R^2 Role overload	.34	.09
R^2 Role ambiguity	.13	.38
R^2 Negative feelings	.17	.21
R^2 Satisfaction	.12	.36
R^2 Perceived value	.13	.43

Notes: * p<.05, ** p<.01 (one-tailed). Significant effects are bold for visual clarity.
Structural model fit:
Study 2: Sample=177. χ^2/df=1.31, p<.01; CFI=.95; TLI=.94; RMSEA=.04; SRMR=.06.
Study 3: Sample=402. χ^2/df=2.01, p<.01; CFI=.94; TLI=.93; RMSEA=.05; SRMR=.06.

Table 4. Summary of Findings.

Predictions	**Study 1**	**Study 2**	**Study 3**	**Contribution**
H1: CP increases (a) customer satisfaction and (b) the perceived value of participation.	Supported	Supported	Supported	—
H2: CP increases (a) role conflict, (b) role overload, and (c) role ambiguity.	Supported (a, b)	Supported	Supported (a, b)	New: CP related to all role stressors
H3: The effects of CP on (a) role conflict and (b) role overload are stronger than the effect on role ambiguity.	Supported	Supported (b)	Supported	New
H4: (a) CP exhibits a direct effect on negative feelings, and this effect is mediated by (b) role conflict, (c) role overload, and (d) role ambiguity.	Supported (b, c)	Supported (b, c)	Supported (b, c)	New
H5: (a) Role conflict, (b) role overload, and (c) role ambiguity exhibit direct effects on service outcomes, and (d) these effects are mediated by negative feelings.	Supported (c, d)	Supported (c)	Supported (a, c, d)	New
H6: The effects of CP on (a) role conflict, (b) role overload, and (c) role ambiguity are stronger for open tasks than for closed tasks.	Supported	—	—	New
H7: The effects of CP on (a) role conflict, (b) role overload, and (c) role ambiguity are weaker when the customer, rather than the general market, is the beneficiary.	Supported (c)	—	—	New
H8: The effects of CP on (a) role conflict, (b) role overload, and (c) role ambiguity are stronger when the customer, rather than the general market, is the beneficiary.	Rejected	—	—	New
H9: Customer's prior experience weakens the effect of CP on (a) role conflict, (b) role overload, and (c) role ambiguity.	—	Rejected	Rejected	—
H10: Firm support weakens the effect of CP on (a) role conflict, (b) role overload, and (c) role ambiguity.	—	Supported (c)	Supported (a, b)	New

Figure 1. Role Theory-Based Framework to CP-Role Stress.



Notes: The figure only displays those direct effects that are significant at least on a .05-level in one of the three studies. The results of moderator tests are not shown to ease the figure's readability. a. Estimates and explained variances are shown in the order of studies (Study 1/Study 2/Study 3). b. p>.05-level.