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# Engaging Customers in Coproduction Processes: How Value-Enhancing and Intensity-Reducing Communication Strategies Mitigate the Negative Effects of Coproduction Intensity

Coproduction offerings, in which customers engage in the production of goods and services, are ubiquitous (e.g., ready-to-assemble products, self-service technologies). However, although previous research has predominantly identified beneficial aspects of coproduction in contrast to traditional firm production, the pivotal role of coproduction intensity within coproduction processes has largely been neglected. Furthermore, little is known about strategies that firms can employ to positively influence customers' perceptions of coproduction processes. Drawing on a large field experiment with 803 customers engaging in actual coproduction processes, the current study makes a first attempt to address these research voids. The results show that coproduction intensity negatively affects customers' satisfaction with the coproduction process. Furthermore, the study offers first insights into how firms can mitigate these negative effects by employing corporate communication strategies that either emphasize specific coproduction value propositions (value-enhancing communication strategies) or highlight additional coproduction service supplements (intensity-reducing communication strategies).

*Keywords*: coproduction, customer satisfaction, communication strategies, field experiment

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In the past two decades, firms have increasingly begun to encourage customers to engage in coproducing goods and services (Dabholkar 1996; Prahalad and Ramaswamy 2000). Nowadays, coproduction is ubiquitous: customers self-assemble new furniture from prefabricated kits, follow the directions on convenience food packages to prepare a meal, scan and bag their own groceries at supermarkets, use online banking, and check themselves in at hotels and for flights. This proliferation of coproduction has also stimulated academic interest in examining the implications of customer participation in coproduction processes (e.g., Bendapudi and Leone 2003; Bitner et al. 1997; Etgar 2008; Mochon, Norton, and Ariely 2012; Troye and Supphellen 2012).

Previous research on the consequences of customers' engagement in coproduction processes has predominantly investigated differences between situations of coproduction, in which consumers actively participate in the production of goods and services, and situations of firm production, in which consumers have no part in the production process (see Table 1). These studies show that in contrast to traditional firm production, the active engagement of customers in coproduction processes enhances their evaluation of the resulting product or service (e.g., Atakan, Bagozzi, and Yoon 2014; Norton, Mochon, and Ariely 2012; Troye and Supphellen 2012) and alters their evaluation of the firm (Bendapudi and Leone 2003; Meuter et al. 2000).

Although these studies offer vital documentation of the beneficial aspects of coproduction in contrast to traditional firm production, the role of coproduction intensity—defined as customers' subjective perception of the extent of effort and time invested within a specific process of coproducing a

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**TABLE 1**
**Empirical Research on the Consequences of Customers' Engagement in Coproduction Processes**

| Study | CP Research Focus | Managing CP Processes | Outcome Dimension | Research Design | Data Set (n) | Theoretical Foundation |
|---|---|---|---|---|---|---|
| Atakan, Bagozzi, and Yoon (2014) | Coproduction versus firm production | — | CP product | Laboratory experiment | n = 197[c] | Person–object relationship |
| Bendapudi and Leone (2003) | Coproduction versus firm production | Customer choice between firm production and coproduction | CP process, firm | Scenario-based experiment | n = 259[c] | Attribution theory |
| Dong, Evans, and Zou (2008) | Coproduction versus firm production | — | CP service | Scenario-based experiment | n = 223 | Self-enhancement |
| Meuter et al. (2000) | Sources of (dis) satisfaction with CP experiences | — | CP process, firm | Critical incident technique | n = 823 | Attribution theory |
| Mochon, Norton, and Ariely (2012) | Coproduction versus firm production | — | CP product | Laboratory experiment | n = 330[c] | "IKEA effect" (self-enhancement) |
| Norton, Mochon, and Ariely (2012) | Coproduction versus firm production | — | CP product | Laboratory experiment | n = 315[c] | "IKEA effect" (self-enhancement) |
| Troye and Supphellen (2012) | Coproduction versus firm production | — | CP product | Scenario-based experiment, laboratory experiment | n = 412[c] | "I made it myself effect" (associative self-anchoring) |
| Current study | Coproduction intensity | Communication strategies (value-enhancing, intensity-reducing) | CP process, CP product[a] | Field experiment[b] | n = 803 | Equity theory |

[a]Additional analysis.
[b]Validated by additional laboratory and scenario-based experiments.
[c]Total n across multiple studies.
Notes: CP = coproduction.

product or service—as a core dimension within coproduction processes has largely been neglected (see Table 1). This neglect is surprising, as customers' perceived effort and time investment should play a pivotal role in their evaluation of a coproduction process. Specifically, there are good reasons to assume that greater perceived coproduction intensity may negatively affect customers' evaluation of a coproduction process, because consumers generally view effort and time as cost factors to minimize in the process of obtaining a good or service (e.g., Berry, Seiders, and Grewal 2002; Etgar 2008).[1] Thus, gaining a deeper understanding of the importance of customers' perceived coproduction intensity and its consequences for their evaluation of coproduction processes is essential for both academics and practitioners.

Given the possibility that greater coproduction intensity might have detrimental effects, it is crucial to explore strategies for positively affecting customers' evaluation of coproduction processes. However, influencing these processes is difficult because customers engaging in coproduction often perform coproduction activities without direct service employee involvement and are thus mostly beyond the marketer's direct control (Meuter and Bitner 1998; Troye and Supphellen 2012). Therefore, it is important to explore strategies that firms can employ to shape customers' perceptions of coproduction processes.

In light of these research gaps, this study aims to offer a better understanding of the potentially negative effects of coproduction intensity as well as new insights into how firms can mitigate these effects by using strategies to influence customers' perceptions of coproduction processes. We build on equity theory to develop a conceptual framework in which we analyze how coproduction intensity affects customers' satisfaction with the coproduction process. Furthermore, to mitigate the potential negative effect of coproduction intensity, we propose the use of communication strategies that either emphasize specific coproduction value propositions (value-enhancing communication strategies) or draw attention to coproduction service supplements (intensity-reducing communication strategies).

[1]Note that we focus on coproduction processes with standardized product kits and service devices that lead to rather fixed target outcomes and do not focus on mass customization settings (e.g., design your own shoes, watch, T-shirt, cereals) in which increasing effort and time investments might also influence preference fit with the outcome (Franke and Schreier 2010).

To test our conceptual model, we conducted a large-scale field experiment with 803 customers engaging in real coproduction processes. The results support the hypothesis that coproduction intensity decreases satisfaction with the coproduction process. Furthermore, the findings offer first insights into how this negative effect of coproduction intensity can be mitigated by means of value-enhancing and intensity-reducing communication strategies.

Overall, the current study contributes to marketing research and management in several ways. First, it is the first attempt to investigate consequences of coproduction intensity in a field study among actual customers engaging in real coproduction processes. The study advances previous research on coproduction by showing that increasing levels of perceived coproduction intensity can harm customers' satisfaction with the coproduction process. Thus, this finding indicates the importance of marketers' awareness of intense coproduction processes' detrimental effects.

Second, the study extends knowledge on coproduction by showing how marketers can effectively manage negative effects of coproduction intensity. Specifically, we show that value-enhancing and intensity-reducing communication strategies can mitigate the negative effects of coproduction intensity. The findings of the study thereby offer a practical way for firms to influence customers' evaluation of coproduction processes that are thought to be "beyond the marketer's control" (Troye and Supphellen 2012, p. 34).

Third, the study contributes to research on relational customer goals (Epp and Price 2011) by investigating how firms can enhance relational customer value in the context of utilitarian consumption settings such as coproduction processes. In particular, the results show that corporate communication strategies can mitigate negative effects of coproduction intensity by pointing out that coproduction processes can be used to satisfy relational needs by engaging in coproduction together with important relational partners such as friends or family. Thus, the study's findings imply that it might be a fruitful approach for marketers of utilitarian goods and services to identify and stress additional benefits that customers may derive from consumption in the company of relational partners.

Fourth, this study connects research on coproduction and inoculation mechanisms in marketing. Whereas previous marketing research has focused on inoculation strategies that strengthen customers' brand beliefs (e.g., Bechwati and Siegal 2005; Szybillo and Heslin 1973), this investigation emphasizes the effectiveness of inoculation to strengthen customers' resistance to setbacks in coproduction settings. Specifically, we find that inoculating customers against setbacks alleviates potentially negative effects of coproduction intensity and thereby enhances customers' satisfaction with coproduction processes.

## Conceptual Framework and Hypothesis Development

### *The Concept of Coproduction*

Coproduction departs from the traditional transactional perspective in which firms produce goods and services that customers can then acquire (Etgar 2008). In coproduction, customers play a more active role, as they perform part of the traditional functions of the firm on their own (Lusch and Vargo 2012; Prahalad and Ramaswamy 2000), while the firm is often limited to a more facilitative and supportive role, such as providing tool kits or devices (Troye and Supphellen 2012). In this sense, coproduction has been defined as customers' active participation in the creation of the core offering itself within parameters defined by the focal organization and independent of direct service employee involvement (Atakan, Bagozzi, and Yoon 2014; Bolton and Saxena-Iyer 2009; Etgar 2008; Lusch and Vargo 2006, 2012; Meuter and Bitner 1998; Ostrom et al. 2010; Van Doorn et al. 2010).

In line with this definition, customers may act as coproducers of both goods and services (Auh et al. 2007; Etgar 2008). To indicate whether the outcome of a coproduction process is a good or a service, researchers have used the term "self-production" to refer to coproduction process in which the outcome of the production process is a good (e.g., furniture assembly; see, e.g., Atakan, Bagozzi, and Yoon 2014; Troye and Supphellen 2012) or "self-service" to refer to coproduction processes in which the outcome of the process is a service (e.g., pumping gas at a gas station; see, e.g., Fitzsimmons 1985; Lovelock and Young 1979).

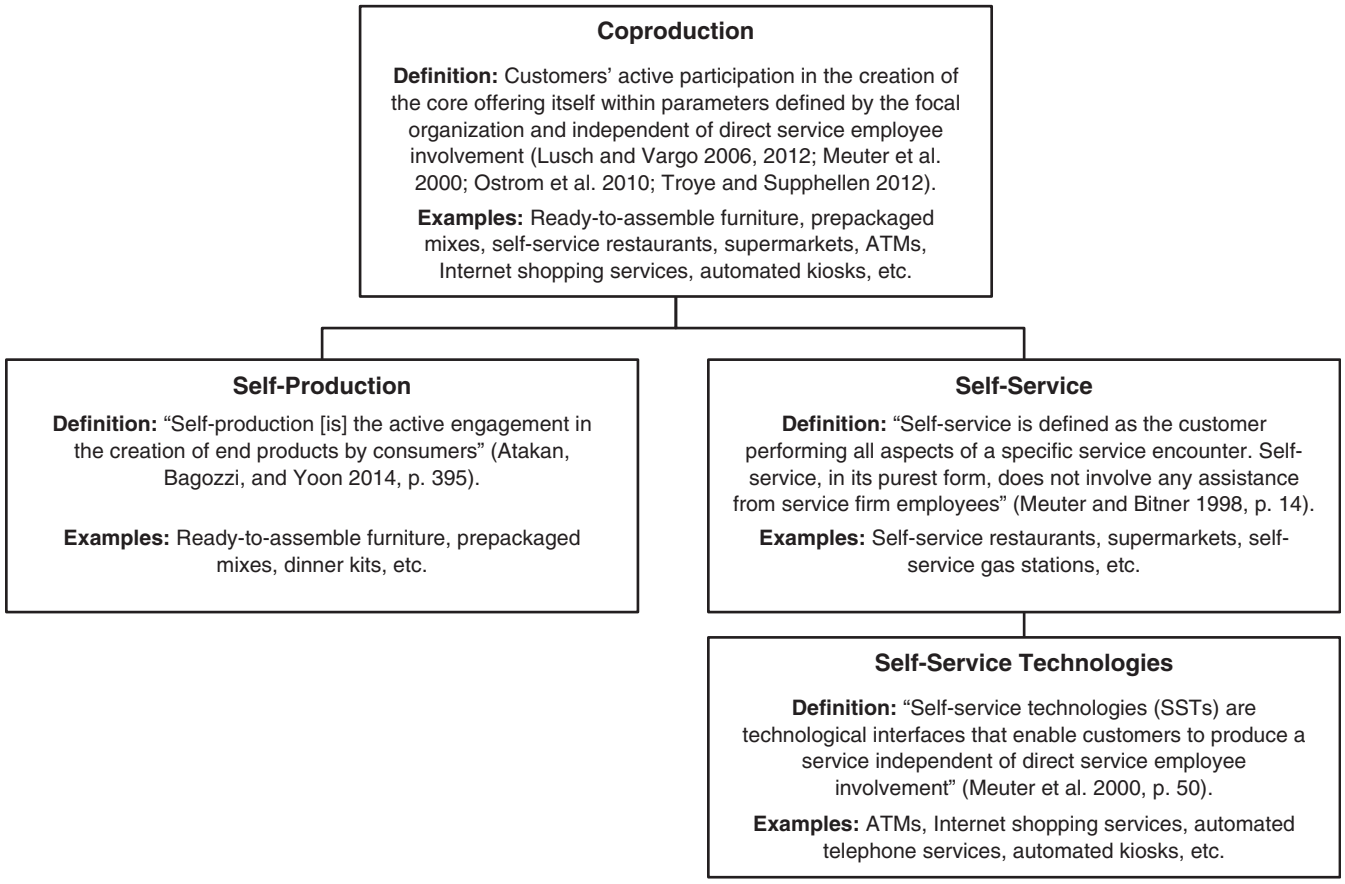
Although self-service can take place without technological devices, such as in a restaurant or supermarket (Regan 1960), self-service offerings involving a technological component, such as automated teller machines or Internet services, are increasingly proliferating (e.g., Bitner, Ostrom, and Meuter 2002; Dabholkar 1996). Because customers' use of self-service technologies (SSTs) implies coproduction of the service (Meuter et al. 2005; Van Beuningen et al. 2009), SSTs are generally viewed as a special form of coproduction in which customers engage in self-service using a technological interface (Dabholkar 1996; Meuter and Bitner 1998). Figure 1 presents an overview of the different types of coproduction processes and offers definitions and examples for each type.

### *Review of Previous Coproduction Literature*

Previous research on coproduction can be broadly categorized into three research themes. First, early conceptual research has primarily focused on the firm and elaborated on the benefits of engaging customers in the production process, in terms of lower production costs and productivity gains through the substitution of customer effort for employee labor (Mills, Chase, and Margulies 1983; Mills and Morris 1986). Building on this work, academics have further discussed the applications and limits of employee management models as a means to improve customers' efficiency in their role as "partial employees" (e.g., Bowen 1986; Bowen and Schneider 1985; Kelley, Donnelly, and Skinner 1990; Kristensson et al. 2008; Lengnick-Hall 1996; Payne, Storbacka, and Frow 2008).

The second research theme has focused on exploring why consumers decide to engage in coproduction activities (Dabholkar 1994, 1996; Dabholkar and Bagozzi 2002). Specifically, research in this theme shows consumers' willingness to participate in coproduction activities to be affected by their propensity for do-it-yourself projects (Bateson 1985;

**FIGURE 1**
**Forms of Coproduction: Definitions and Examples**




Dabholkar 1996); consumer readiness variables such as role clarity, ability, and motivation (Meuter et al. 2005; Parasuraman 2000; Zhu et al. 2007); and self-efficacy (Dong, Evans, and Zou 2008; Xie, Bagozzi, and Troye 2008).

More recently, a third research focus has shifted its attention to the psychological consequences arising from customers' participation in coproduction (Atakan, Bagozzi, and Yoon 2014; Bendapudi and Leone 2003). These studies typically compare consumers' evaluation of products and services across two conditions: one in which participants actively engage in a coproduction task by completing a product kit or service device (coproduction) and a second in which participants have no part in the production but are directly exposed to the finished product or service (firm production). This research finds that in contrast to firm production, engagement of consumers in the production process (coproduction) enhances their evaluation of the self-produced product (e.g., Mochon, Norton, and Ariely 2012; Troye and Supphellen 2012) and changes their attitudes toward the firm offering the coproduction (Bendapudi and Leone 2003).

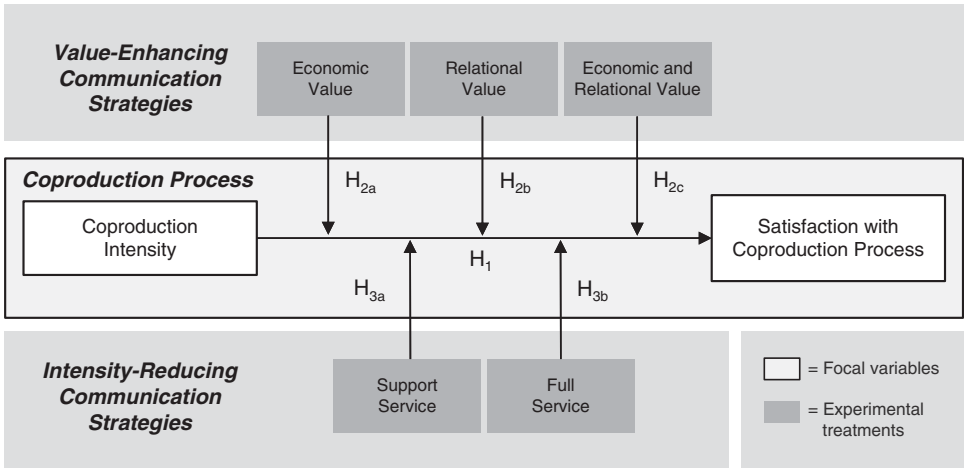
Although these studies have shed some light on differences *between* situations in which customers actively engage in the production of a good or service (coproduction) and situations in which customers do not take part in the production (firm production), little is known about the consequences of increasing customer inputs *within* coproduction situations. This research gap makes it difficult to draw strong conclusions about the consequences that arise from customers' engagement in coproduction processes. Thus, a central goal of this study is to address this neglect by investigating how customers' perceived input in a coproduction activity affects their satisfaction with this specific coproduction exchange process. Specifically, we focus on the role of customers' perceived coproduction intensity, which we define as customers' subjective perception of the extent of effort and time invested in a specific process of coproducing a product or service (for similar conceptualizations of customers' nonmonetary input in coproduction processes, see Atakan, Bagozzi, and Yoon 2014; Berry, Seiders, and Grewal 2002).[2]

### *The Pivotal Role of Coproduction Intensity: An Equity Theory Perspective*

We build on equity theory as an overarching theoretical framework to derive a conceptual model that investigates the role of perceived coproduction intensity in affecting

[2]We focus on perceived intensity instead of actual intensity to account for interindividual differences in the perception of coproduction intensity.

**FIGURE 2**
**Conceptual Framework**




Notes: Controls are coproduction ability, coproduction experience, coproduction enjoyment, coproduction expectations, time elapsed since coproduction, gender, age, and income.

customers' satisfaction with the coproduction process (see Figure 2). Equity theory (Adams 1963, 1965; Homans 1961) generates predictions about perceptional and behavioral consequences of outcome/input evaluations in buyer–seller exchange relationships (Huppertz, Arenson, and Evans 1978; Oliver and DeSarbo 1988) and thus provides a theoretical framework that is especially well suited to explore the implications arising from customers' perceptions of coproduction intensity.

Equity theory holds that people tend to strive for a fair distribution of outcomes and inputs between both parties of an exchange (Adams 1963; Homans 1961). Thus, an exchange is perceived as fair when a person's outcome/input ratio is equal to that of the exchange partner (Walster, Walster, and Berscheid 1978).[3] Conversely, when a person believes that his or her own outcome/input ratio is unfavorable or not equal to the ratio of the exchange partner, inequity results (Adams 1963; Pritchard 1969). The extent to which the exchange is perceived to be inequitable then determines feelings of distress or dissatisfaction with the exchange, which people will attempt to reduce by engaging in behavioral or psychological efforts to restore equity between exchange partners (Oliver and Swan 1989b). Not surprisingly, research in marketing has repeatedly shown that establishing exchange relationship equity is important to future customer behavior (Huppertz, Arenson, and Evans 1978; Oliver and Swan 1989a, b; Tax, Brown, and Chandrashekaran 1998).

When adopting the rationale of equity theory in the context of coproduction, customers' total input in the coproduction process is the sum of the monetary costs (i.e., price for firm-provided input product or service device) plus the nonmonetary costs in terms of perceived effort and time investments (i.e., coproduction intensity), with the outcome being the perceived value customers derive from the coproduction (Etgar 2008). Conversely, specific firm inputs are the costs for the provided input product or device, and a firm's direct outcome is the price paid by the customer. Therefore, according to equity theory, increasing levels of perceived coproduction intensity (i.e., nonmonetary costs) add to customers' total input into the coproduction process by increasing their perceived effort and time investments and thereby impair the favorability of their outcome/input ratio. Thus, higher levels of perceived coproduction intensity diminish customers' perceived equity of the exchange and lead to lowered satisfaction with the coproduction process. Thus, we propose the following:

$H_1$: Coproduction intensity is negatively related to satisfaction with the coproduction process.

### *Strategies to Mitigate the Negative Effect of Coproduction Intensity*

Given the possibility that higher levels of coproduction intensity might lead to less satisfactory coproduction experiences, the question arises as to how firms can influence customers' perceptions of coproduction processes. Managing coproduction is challenging because typically, customers perform tasks distant from firm facilities and detached from direct service employee involvement, limiting the possibilities for firm interventions in the process (Meuter et al. 2000). However, corporate communication strategies offer a way to influence customers engaging in processes that are removed from service employee involvement. Communication strategies are effective for sharing marketing messages and thereby proactively shape customers' perceptions of the firm and its offerings (Duncan and Moriarty 1998; Wagner, Lutz, and Weitz 2009). Thus, even though a firm may have limited

[3]Note that partners may also perceive an exchange as fair when both outcome/input ratios are not perfectly equal. This is due to an assimilation effect, according to which small deviations from perfect equity may be neglected (Oliver and DeSarbo 1988; Woodruff, Cadotte, and Jenkins 1983).

direct control over the coproduction process itself, it may be able to influence customers' perceptions of the process through communication strategies.

Two basic strategies to alter customers' outcome/input ratio in the coproduction process directly derive from our equity theory framework: firms can (1) enhance customers' perceived outcomes or (2) reduce customers' relative input. Thus, we propose that marketing managers can attempt to influence customers' outcome/input perceptions through value-enhancing or intensity-reducing communication strategies. In particular, we aim to explore how value-enhancing and intensity-reducing communication strategies moderate the relationship between customers' perceived coproduction intensity and satisfaction with the coproduction process (see Figure 2).

*The role of value-enhancing communication strategies in mitigating the negative effect of coproduction intensity.* We consider two key value-enhancing communication strategies. Regarding the content of these strategies, we focus on two well-established value dimensions—economic and relational—that have been identified as central to customers in exchange processes (Chan, Yim, and Lam 2010; Gwinner, Gremler, and Bitner 1998; Sweeney and Soutar 2001). In the context of coproduction, economic value refers to the monetary benefits that customers realize through their participation in coproduction (i.e., perceived value of the outcome product or service less the monetary and nonmonetary costs expended). Relational value reflects the benefits customers derive from fulfilling relational goals within coproduction processes (Epp and Price 2011).

Firms can attempt to enhance customers' perception of economic value that can be derived from the coproduction process by employing a corporate communication strategy that relates to a core characteristic of the coproduction concept. Specifically, coproduction implies that firms are able to reduce their production costs by partially shifting production effort to the customer. These production cost savings enable firms to compensate customers for their increased effort in the coproduction process in the form of lower prices. An economic value-enhancing strategy can thus emphasize that customers' engagement in the coproduction process enables firms to offer lower prices for their products and services.

According to equity theory, such a strategy can mitigate the negative effect of coproduction intensity on customers' satisfaction with the coproduction process by reducing customers' perceived total input. Specifically, an economic value communication suggests that a firm compensates its customers for their effort and time invested in the coproduction process (i.e., nonmonetary input) by offering lower prices (i.e., monetary inputs) and thereby attempts to restore exchange equity. Thus, in situations with economic value communication, the negative effect of coproduction intensity should be lower than in situations with no economic value communication. Building on this rationale, we propose the following hypothesis:

$H_{2a}$: Economic value communication mitigates the negative effect between coproduction intensity and satisfaction with the coproduction process.

Moreover, firms can potentially enhance customers' perception of relational value that can be derived from the coproduction process through a communication strategy that addresses relational needs. Relational needs are fundamental to human nature (e.g., Baumeister and Leary 1995). However, although most people perceive the need to spend more time with important relational partners (e.g., friends, family), they may feel restricted by time constraints (Epp and Price 2008). Customers may therefore highly value consumption experiences that enable them to fulfill relational goals (Epp and Price 2011; Epp, Schau, and Price 2014; Schau, Muñiz, and Arnould 2009). A relational value communication strategy can address this issue by highlighting that customers can satisfy relational needs by engaging in coproduction together with significant relational partners (e.g., friends, family members). Thus, such a strategy points out that customers can enhance coproduction value by additionally fulfilling relational goals during the coproduction process.

From an equity theory perspective, a relational communication should mitigate the negative effect of coproduction intensity on satisfaction with the coproduction process by increasing customers' outcome perceptions. Specifically, a relational value communication suggests that customers can augment the overall value derived from the coproduction process by also fulfilling relational goals during the process. This additional relational value should thereby enhance customers' perceived outcome of the coproduction process. Thus, highlighting opportunities through which customers can satisfy relational needs while engaging in coproduction activities enhances their perceptions of the overall value that can be derived from these processes. Therefore, in situations with relational value communication, the negative effect of coproduction intensity should be lower than in situations with no relational value communication. Thus, we suggest the following:

$H_{2b}$: Relational value communication mitigates the negative effect between coproduction intensity and satisfaction with the coproduction process.

Importantly, these value communication strategies are not mutually exclusive but complementary. Therefore, we also investigate the efficacy of a combined communication strategy that expresses both the economic and relational value argument. Following the theoretical rationales of the preceding two hypotheses, we propose that a combined economic and relational value communication strategy offers two value arguments that mitigate the negative effect of coproduction intensity and should thus be more effective in ameliorating the negative effect of coproduction intensity than a single economic or relational value communication strategy. Therefore,

$H_{2c}$: Combining economic and relational value communication mitigates the negative effect between coproduction intensity and satisfaction with the coproduction process more effectively than a separate economic or relational communication strategy.

*The role of intensity-reducing communication strategies in mitigating the negative effect of coproduction intensity.* We examine two key intensity-reducing communication strategies aimed to lessen customers' perception of coproduction

intensity by offering additional firm services that enable customers to shift more production responsibility to the firm. Specifically, the provision of additional services can result in two situations: (1) joint production, in which the firm offers support services so that the customer and employee share production responsibility by interacting and participating in the production at the same time, and (2) firm production, in which the firm offers a full service that can take on the customer's coproduction activities and create the product or service without customer participation (Meuter and Bitner 1998).

To reduce customers' perceptions of coproduction intensity, firms can highlight possibilities for joint production by communicating additional free services that offer support in the coproduction process—for example, by providing additional input in the form of knowledge and expertise. A support-service communication strategy can thus emphasize that a firm is prepared to offer immediate help (through, e.g., a service hotline, an online forum) to customers who experience difficulties in the coproduction task to avoid overly high levels of coproduction intensity.

From an equity theory perspective, such a support-service communication strategy signals a firm's readiness to increase its input into the coproduction if the customer demands. Thus, a free support-service option assures customers that increases in coproduction intensity do not have to lead to unequal outcome/input ratios, because the firm offers additional input to the process in the form of active support, knowledge, and time investments and thereby reduces customers' relative input. Therefore, higher perceived coproduction intensity should have a less negative effect on customer satisfaction with the coproduction process in situations with support-service communication than in situations in which the firm offers no support to the customer.

Further theoretical substantiation for this hypothesis can be drawn from the concept of inoculation against setbacks (Janis 1983; Meichenbaum 1985). Specifically, inoculation enables people to anticipate potential setbacks and provides them with the ability to cope with these situations (Meichenbaum 1985; Vuori and Vinokur 2005). In the coproduction of a good or service, customers might experience setbacks that increase perceived coproduction intensity and decrease satisfaction with the coproduction process. In line with the notion of inoculation, a support-service communication is an attempt to make customers aware of the potential for setbacks and offers immediate help through a support service when they experience difficulties. Consequently, we propose that a support-service communication inoculates customers against possible setbacks and thereby enhances satisfaction with the coproduction process. Thus, on the basis of the previous lines of reasoning, we hypothesize the following:

$H_{3a}$: Support-service communication mitigates the negative effect between coproduction intensity and satisfaction with the coproduction process.

A second potential strategy for firms to reduce customers' perception of coproduction intensity is to draw attention to additional services that offer to take responsibility for the full production process for an additional charge. Although a full-service situation in which the firm takes on all the effort results in firm production rather than coproduction, presenting this option matters to customers because it makes the option of do-it-yourself versus firm production a visible choice. Specifically, this strategy communicates that the firm provides help for customers who do not want to engage in coproduction by offering a reasonably priced full service that can take over the production. Thus, such a strategy offers customers the option to substitute an additional paid service for their own coproduction effort.

We propose that a full coproduction service communication can mitigate the negative effect of coproduction intensity because it offers customers a visible choice between engaging in coproduction on their own (nonmonetary input) or paying for an additional service to complete the production (monetary input). Because customers might have different preferences for providing monetary or nonmonetary input, offering them both alternatives allows them to choose the option they perceive as more fair in terms of equitable outcome/input ratios in the exchange process. Thus, enabling customers to decide whether to invest monetary or nonmonetary costs should increase their perceptions of exchange equity and thereby mitigate negative effects of coproduction intensity.

Additional support for this reasoning comes from self-determination theory, which argues that people are generally more intrinsically motivated for activities over which they have greater self-determination (Ryan and Deci 2000; Zuckerman et al. 1978). In this vein, providing an opportunity to choose between two alternatives has repeatedly been shown to enhance task performance and process satisfaction (Iyengar and Lepper 2000; Reutskaja and Hogarth 2009). Applied to our context, these findings suggest that offering customers a visible choice between coproduction and firm production should enhance their satisfaction with the coproduction process. Therefore, we propose the following:

$H_{3b}$: Full-service communication mitigates the negative effect between coproduction intensity and satisfaction with the coproduction process.

# Method

### *Research Context and Sampling Procedure*

To test our hypotheses in the context of real coproduction processes, we conducted a large-scale field experiment. Participants were customers of a large multinational firm that sells standardized ready-to-assemble furniture that customers purchase in flat packages and assemble at home. Ready-to-assemble furniture should be especially well suited to the study of coproduction intensity because it has often been mentioned as a prototypical coproduction context in prior literature (Bendapudi and Leone 2003; Lusch and Vargo 2012; Troye and Supphellen 2012). Moreover, coproduction tasks within this context lead to fixed target outcomes (Dahl and Moreau 2007; Norton, Mochon, and Ariely 2012) and thus enable us to focus on the role of coproduction intensity

by ruling out other potentially confounding effects, such as increased preference fit through customization (Franke and Schreier 2010).

To collect data for our field experiment, we conducted a two-wave web-based survey among customers of the firm. Before the first contact, customers were randomly assigned to one of six groups (five experimental groups and one control group). Customers were then contacted by e-mail and asked to participate in the study. In the first wave ($t_0$), all respondents answered a brief online questionnaire on coproduction in general and provided demographic information. Participants in the experimental groups were also exposed to an advertisement poster that reflected a specific communication strategy. After six weeks, respondents were contacted again and asked to participate in a second survey ($t_1$). The challenge in collecting the data for our field experiment was to obtain a sufficient number of customers who bought and assembled a product between the first and the second wave. In summary, 803 customers (578 female; mean age = 37.05 years) who responded to both waves matched this criterion, yielding an effective response rate of 22%. We assessed possible nonresponse bias by comparing demographic information and study variables between early and late respondents and found no significant differences (see Web Appendix A).

### Experimental Materials

In line with previous research, we used corporate advertisement posters to operationalize our five communication strategies (e.g., Cavanaugh 2014; Dahl, Frankenberger, and Manchanda 2003; Pechmann and Knight 2002). We carefully designed five distinct advertisement posters to represent the intended communication strategies. Each poster comprised the same elements: a short informative text capturing the intended message on the left-hand side, a corporate picture that matched the verbal message content on the right-hand side, and the firm logo in the upper-right-hand corner.

Three posters reflected the value-enhancing communication strategies (economic value, relational value, and combined economic and relational value) and two posters reflected the intensity-reducing strategies (support service and full service). Specifically, the economic value communication pointed out that the effort the customer invests in coproduction enables the firm to offer lower prices. The advertisement poster reflecting the relational value communication strategy stressed that the coproduction task could be utilized to satisfy relational needs when customers collectively engage in coproduction activities (e.g., together with friends, family). The economic and relational value strategy combined these two value arguments in a single message.

With regard to the intensity-reducing strategies, our support-service communication strategy emphasized that customers who experience difficulties in the coproduction task can immediately be helped with a support hotline. Finally, the advertisement poster reflecting the full-service strategy emphasized that the company provides help to customers who do not want to engage in coproduction by referring them to a reputable, reasonably priced service partner that accomplishes the coproduction on their behalf. Appendix A provides a detailed overview of the communication strategies used in this study.

We discussed experimental treatments with corporate marketing managers to ensure content validity and confirm the authenticity of each poster advertisement. To further ensure that our experimental treatments followed the intended communication strategies, we asked customers about the content of the poster advertisement they examined. Specifically, we asked them to indicate the agreement between the message on the poster and three true statements about the company, of which only one was related to the message on the advertisement poster. For all posters, statements that matched the content of the particular communication strategy had significantly higher mean scores ($p < .01$) than unrelated statements (see Web Appendix B), indicating that the posters indeed had the intended effect of the specific communication strategies and that customers understood the content of the respective communication strategies well.

### Measures

We relied on well-established scales from the existing literature to measure the study's variables. Appendix B provides a complete list of measurement items and references for all variables used in this study.

*Study variables.* We measured customers' perceived coproduction intensity using five items adapted from previous research (Franke and Schreier 2010; Franke, Schreier, and Kaiser 2010; Troye and Supphellen 2012) that capture customers' subjective perception of the extent of effort and time invested in their last furniture assembly process. For the measurement of customers' satisfaction with the coproduction process, we relied on the scale employed by Bendapudi and Leone (2003).

*Control variables.* To test the robustness of our proposed relationships and control for extraneous influences, we also included several control variables in our model. First, to ensure that customers' satisfaction with the process is not affected by different customer expectations (e.g., Anderson and Sullivan 1993), we incorporated customers' expectations of coproduction intensity as a control variable in our framework. Because the literature suggests that customers' satisfaction with the process might also be affected by individual differences in coproduction ability or task–skill congruence, respectively (i.e., customers' perception of having the necessary skills and confidence required to perform a specific coproduction task) (e.g., Dong, Evans, and Zou 2008; Meuter et al. 2005), we also control for this relationship in our model. Furthermore, we control for the influence of customers' perceived enjoyment derived from a specific coproduction activity because this construct has been discussed as an important factor in determining customers' attitudes toward coproduction processes (Dabholkar 1994). In addition, we control for the effects of customers' perceived experience with the specific coproduction activity (Dellaert and Stremersch 2005). To control for the temporal structure of responses, we asked participants to state the absolute number of days elapsed between the coproduction process and the response to the postassembly survey.

Finally, we included demographic characteristics such as gender, age, and income as control variables in our model.

Table 2 summarizes the psychometric properties of the measures. Cronbach's alphas, composite reliabilities, and average variance extracted for all measurement scales indicate sufficient reliability and convergent validity of our operationalizations. Specifically, no coefficient alpha value is lower than .92 and no average variance extracted is lower than .66, thus exceeding the recommended thresholds (Bagozzi and Yi 1988). In addition, we tested for discriminant validity using the criterion proposed by Fornell and Larcker (1981), which suggests that discriminant validity is established if the average variance extracted exceeds the squared correlations between all pairs of constructs. All constructs met this criterion.

The use of self-report measurements may involve problems of common method variance (Campbell and Fiske 1959; Podsakoff and Organ 1986). Although experimental studies are unlikely to suffer from this issue (Podsakoff et al. 2003), we tested the robustness of our measurements by employing the single-common-method-factor approach as recommended in the literature (Podsakoff et al. 2003; Podsakoff, MacKenzie, and Podsakoff 2012). Results of this analysis reveal that common method variance is not an issue in our data set (see Web Appendix A).

### *Analytical Procedure*

To test our hypotheses, we employed a path-analytical approach (Kline 2011). We operationalized our experimental treatments by using a dummy variable coding approach (Aguinis 2004; Bagozzi and Yi 1989; MacKenzie 2001; Morhart, Herzog, and Tomczak 2009). Specifically, we selected our control group as the reference group and created five dummy variables, each representing one experimental treatment group (West, Aiken, and Krull 1996). In these five dummy variables, membership in the respective experimental group was coded as 1 while nonmembership was coded as 0 (Cohen et al. 2003; Morhart, Herzog, and Tomczak 2009). We calculated interaction terms between each dummy variable and the coproduction intensity measure to capture the moderating influence of our communication strategies on the perception of customers' coproduction intensity. We then incorporated the main effects as well as the five interaction terms in the model as predictors of customers' satisfaction with the coproduction process.

In this model, the main effect of coproduction intensity reflects the slope between coproduction intensity and customers' satisfaction with the coproduction process in the control group and can thus be used to test $H_1$. Each of the five interaction terms then indicates how the slope in the respective experimental group differs from the slope in the control group (Cohen et al. 2003). The coefficients of the interaction terms are thus the basis for testing $H_2$ and $H_3$. We mean-centered all continuous independent variables for ease of interpretation (Aiken and West 1991).

The use of dummy variables assumes a homogeneous error variance between the experimental groups (Bagozzi and Yi 1989). Therefore, we followed the recommendations of Aguinis and Pierce (1998) and controlled for this assumption using Bartlett's (1937) M test in conjunction with the empirically derived rule of thumb developed by DeShon and Alexander (1996). Both Bartlett's M Test (M = 1.33, n.s.) and DeShon and Alexander's rule of thumb (1:1.17 < 1.5) indicate that heterogeneity of error variances is not an issue in our data set.

## Results

### *Hypothesis Testing*

Table 3 presents the results of our analysis. $H_1$ suggests that perceived coproduction intensity is negatively related to customers' satisfaction with the coproduction process. The

**TABLE 2**
**Correlations and Psychometric Properties of Variables**

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Perceived CP intensity | (.96) | | | | | | | | | |
| 2. Satisfaction with CP process | −.43** | (.94) | | | | | | | | |
| 3. Perceived CP ability | −.17** | .27** | (.97) | | | | | | | |
| 4. CP enjoyment | −.25** | .41** | .57** | (.97) | | | | | | |
| 5. CP expectations | .41** | −.30** | −.30** | −.34** | (.92) | | | | | |
| 6. CP experience | −.16** | .21** | .85** | .46** | −.22** | — | | | | |
| 7. Time elapsed since CP | .12** | −.02 | −.09* | −.04 | .02 | −.10** | — | | | |
| 8. Gender | .02 | −.07 | .04 | −.11** | .07* | .04 | −.05 | — | | |
| 9. Age | −.10** | .02 | −.06 | −.08* | −.02 | −.10* | .12** | .20** | — | |
| 10. Income | .09* | −.12** | −.02 | −.12** | .04 | .03 | −.03 | .17** | .10* | — |
| M | 2.50 | 5.74 | 5.83 | 5.58 | 2.90 | 5.85 | 23.67 | .28 | 37.05 | 5.54 |
| SD | 1.59 | 1.22 | 1.23 | 1.47 | 1.30 | 1.33 | 23.27 | .45 | 11.00 | 1.86 |
| Composite reliability | .95 | .95 | .97 | .97 | .90 | — | — | — | — | — |
| Average variance extracted | .79 | .85 | .92 | .88 | .66 | — | — | — | — | — |

*$p < .05$.
**$p < .01$.
Notes: Cronbach's (1951) internal consistency reliability coefficients appear in parentheses on the diagonal. CP = coproduction. Gender: 0 = female, 1 = male; time elapsed since CP = number of days elapsed since the last CP; monthly income ranging from 1 = <€500 to 8 = >€3,500. Except for time elapsed since CP, gender, age, and income, all items were measured on seven-point Likert scales.

**TABLE 3**
**Results of Field Experiment**

| Relationship | Estimate | SE |
|---|---|---|
| **Effects of Coproduction Intensity** | | |
| CP intensity → Satisfaction with CP process ($\gamma_{11}$, $H_1$) | –.467*** | (.072) |
| **Effects of Coproduction Communication Strategies** | | |
| Economic value → Satisfaction with CP process | .177 | (.125) |
| Relational value → Satisfaction with CP process | .121 | (.116) |
| Economic and relational value → Satisfaction with CP process | –.046 | (.124) |
| Support service → Satisfaction with CP process | .159 | (.135) |
| Full service → Satisfaction with CP process | .124 | (.141) |
| CP intensity × Economic value → Satisfaction with CP process ($\gamma_{12}$, $H_{2a}$) | .264*** | (.091) |
| CP intensity × Relational value → Satisfaction with CP process ($\gamma_{13}$, $H_{2b}$) | .262*** | (.090) |
| CP intensity × Economic and relational value → Satisfaction with CP process ($\gamma_{14}$, $H_{2c}$) | .281*** | (.093) |
| CP intensity × Support-service communication → Satisfaction with CP process ($\gamma_{15}$, $H_{3a}$) | .275*** | (.102) |
| CP intensity × Full-service communication → Satisfaction with CP process ($\gamma_{16}$, $H_{3b}$) | .147* | (.088) |
| **Control Relationships** | | |
| CP expectations → Satisfaction with CP process | –.048 | (.034) |
| CP ability → Satisfaction with CP process | .047 | (.063) |
| CP experience → Satisfaction with CP process | –.017 | (.050) |
| CP enjoyment → Satisfaction with CP process | .238*** | (.038) |
| Time elapsed since last CP → Satisfaction with CP process | .001 | (.002) |
| Gender → Satisfaction with CP process | –.066 | (.084) |
| Age → Satisfaction with CP process | .002 | (.004) |
| Income → Satisfaction with CP process | –.022 | (.022) |

*$p < .1$.
***$p < .01$.
Notes: n = 803. Two-tailed tests of significance. Estimates show unstandardized coefficients. CP = coproduction. To avoid loss of respondents, we used multiple imputations to cope with randomly missing data in our control variables (Schafer and Graham 2002).

results show that the main effect of coproduction intensity on customers' satisfaction with the coproduction process is negative and highly significant ($\gamma_{11} = -.467$, $p < .01$) and thus offer strong support for $H_1$. Therefore, increased levels of coproduction intensity have a detrimental effect on customers' satisfaction with coproduction processes.

In light of the detrimental effect of coproduction intensity, we investigated the potential of value-enhancing communication strategies to mitigate the negative relationship between coproduction intensity and customers' satisfaction with the coproduction process. Specifically, $H_2$ proposes that an economic value communication strategy can mitigate the negative effect of coproduction intensity. Table 3 shows that economic value communication significantly ameliorates the negative effect of coproduction intensity on satisfaction with the coproduction process ($H_{2a}$: $\gamma_{12} = .264$, $p < .01$). Thus, $H_{2a}$ is supported.

Regarding our second value-enhancing strategy, $H_{2b}$ suggests that a relational value communication strategy can mitigate the negative effect of coproduction intensity. Our results show that the effect of relational value communication significantly mitigates the negative relationship between coproduction intensity and satisfaction with the coproduction process ($H_{2b}$: $\gamma_{13} = .262$, $p < .01$), thereby offering support for $H_{2b}$.

Next, we tested the combined economic and relational value communication strategy. Specifically, $H_{2c}$ suggests that combining economic and relational value in a single communication strategy may ameliorate the negative effect of coproduction intensity on customers' satisfaction with the coproduction process more effectively than a separate economic or relational communication strategy. The results show that a combined value communication exerts the strongest mitigating impact on that relationship in our study ($\gamma_{14} = .281$, $p < .01$). However, this strategy does not significantly exceed the effectiveness of a separate economic or relational value communication strategy ($H_{2c}$: [$\Delta_{\text{Eco and Rel – Eco}}$]: $\gamma_{14} - \gamma_{12} = .017$, n.s.; [$\Delta_{\text{Eco and Rel – Rel}}$]: $\gamma_{14} - \gamma_{13} = .019$, n.s.). A possible theoretical explanation for this finding may be that the use of multiple arguments within a single communication strategy strains customers' cognitive capacity and therefore limits information processing (Eppler and Mengis 2004). Specifically, research on information overload suggests that both the amount and diversity of arguments within a communication may lead consumers to be highly selective about or even omit parts of the available information (Bawden and Robinson 2009; Edmunds and Morris 2000; Iselin 1988). In line with this rationale, combining economic and relational value arguments within a single communication may have induced selective information processing of relevant information and thereby hindered the overall effectiveness of this strategy.

We further examined whether intensity-reducing communication strategies can improve the way coproduction intensity relates to customers' satisfaction with the coproduction process. Specifically, $H_{3a}$ suggests that the negative effects of coproduction intensity can be mitigated by communicating the availability of a support service. Table 3 shows that support-service communication indeed significantly

ameliorates the negative effect of coproduction intensity ($H_{3a}$: $\gamma_{15} = .275$, $p < .01$). This result offers strong support for $H_{3a}$.

Moreover, $H_{3b}$ assumes that the negative effect of coproduction intensity can be mitigated by communicating a full-service option. We find that a full-service communication strategy is only marginally significant ($H_{3b}$: $\gamma_{16} = .147$, $p < .1$) in improving the relationship between coproduction intensity and satisfaction with the coproduction process, thereby offering moderate support for $H_{3b}$. A possible explanation for the limited effectiveness of a full-service strategy may be that the examined communication message referred customers to an external service partner, which may have induced the impression that this option brings additional effort of coordinating with a third party to the exchange process.

### Additional Analyses

We conducted a series of additional analyses to gain further insights and validate the robustness of our results. First, we performed several mediation analyses to gain deeper insights into the mediating relationships within the coproduction process. In particular, we first examined how perceived coproduction intensity relates to customers' evaluation of the coproduced outcome product. With regard to this question, we find evidence for a negative indirect effect of coproduction intensity on customers' satisfaction with the coproduced product through customers' process satisfaction (–.230, $p < .01$), implying that higher levels of coproduction intensity not only undermine customers' satisfaction with the process but also negatively spill over to customers' outcome evaluation.

To further illuminate how value-enhancing and intensity-reducing communication strategies influence customers' satisfaction with the coproduction process, we also tested possible mediators of these relationships. First, we examined coproduction enjoyment as a potential mediator and find that it significantly mediates beneficial effects of a relational value (.075, $p < .05$) and a full-service communication strategy (.088, $p < .05$) on customers' process satisfaction.

Furthermore, we considered the role of three key consumption value dimensions—social, price, and functional value—as potential mediators (Sheth, Newman, and Gross 1991; Sweeney and Soutar 2001).[4] The results show that customers' perceived social value marginally mediates the influence of the relational value communication on process satisfaction (.038, $p < .1$). Moreover, we find that perceived price value mediates the effect of an economic value communication strategy (.051, $p < .05$) and marginally mediates the effect of a combined (economic and relational) value communication strategy (.045, $p < .1$) on customers' process satisfaction. Finally, the results show that perceived functional value marginally mediates the link between a support-service communication strategy and process satisfaction (.041, $p < .1$). Overall, these mediation analyses offer further insights into how the communication strategies translate to customers' satisfaction with the coproduction process.

Second, to validate the results of the field study, we tested our hypotheses in a laboratory experiment in which the procedure was similar to that of the field experiment. Results from 821 participants of a student sample assembling a piece of furniture in a laboratory setting are in line with the results of the field experimental study and thus provide further evidence for the robustness of our findings (see Web Appendix C).

Within this laboratory experiment, we also tested an *internal* full-service communication strategy (i.e., full service offered as a service of the focal firm) because the full-service communication tested in our field study referred to an *external* service partner of the focal company, which might have unbalanced the rationale of equity theory in a bilateral exchange relationship. The results show a marginally mitigating impact of an internal full-service communication on the negative effect of coproduction intensity and no significant differences in the effectiveness between internal and external full-service communication strategies. Although surprising at first, these findings are in line with previous research, which suggests that customers perceive a service network (i.e., multiple service partners) as a whole and the service provision by multiple partners as a single process under the aegis of the focal brand (Morgan, Deeter-Schmelz, and Moberg 2007).

Moreover, we assessed the effectiveness of all six combinations of value-enhancing (economic, relational, and economic and relational) and intensity-reducing communication strategies (support service and full service). The results of the laboratory experiment reveal that all combinations significantly mitigate the negative effect of coproduction intensity on process satisfaction, but most are not significantly more effective than the respective single ones (see Web Appendix C). These findings are also supported by an additional field experimental study (see Web Appendix D) and offer further indication for the rationale that combining multiple arguments within a single communication may strain customers' cognitive capacity and lead to selective information processing (Eppler and Mengis 2004).

Third, to assess the generalizability of our findings to other coproduction contexts, we conducted multiple additional scenario experiments. Specifically, we tested our hypotheses in two goods-related and two service-related contexts, which previous research has referred to as prototypical coproduction contexts. With respect to the contexts in which consumers act as a coproducer of a good, we chose a context in which a consumer installs a ready-to-assemble barbecue set (e.g., Dahl and Moreau 2007) and one in which a consumer prepares an instant cake mix (e.g., Norton, Mochon, and Ariely 2012). With respect to the contexts in which consumers act as coproducers of a service, we investigated a situation in which a consumer installs and configures a router

[4]Perceived social value is defined as the perceived utility customers derive from the process's ability to enhance their important social connections to other people and was measured with eight items based on previous research (Chan, Yim, and Lam 2010; Sweeney and Soutar 2001). Perceived price value is defined as customers' perceived utility derived from the coproduction process that results from a reduction of its perceived monetary costs, and this was measured with a four-item scale adapted from Sweeney and Soutar (2001). Perceived functional value is defined as the utility customers derive from the perceived efficiency and convenience of the coproduction process and was measured with four items based on Sweeney and Soutar (2001).

(e.g., Dong, Evans, and Zou 2008) and a scenario in which a consumer uses a self-service checkout at the supermarket (e.g., Bendapudi and Leone 2003). Results from these additional scenario experiments are largely in line with the findings from the field and laboratory experiment (see Web Appendix E), thereby offering further support for the robustness of our findings and their generalizability to other relevant coproduction contexts.

# Discussion

Previous empirical research has predominantly shown that situations of coproduction, in which customers actively engage in the production of a product or service, yield more beneficial results than situations of traditional firm production, in which customers take no part in the production process. However, these studies have largely neglected the potentially negative consequences of customers' perceived coproduction intensity for their evaluation of the coproduction process. Moreover, little is known about how firms might manage coproduction processes that take place outside the marketer's direct control. Therefore, the main purpose of this study was to explore the potentially negative consequences of customers' perceptions of coproduction intensity and investigate how communication strategies can mitigate these effects.

To address these research questions, we conducted a large field experiment to investigate real customers' reactions to coproduction processes. In particular, we first explored the relationship between coproduction intensity and customers' satisfaction with the coproduction process. The findings support our assumption that coproduction intensity negatively affects customers' satisfaction with the coproduction process. Thus, the study provides a deeper understanding of the role of intensity in coproduction processes and sheds light on its adverse effects.

In a second step, we explored communication strategies firms might employ to mitigate these negative effects. Specifically, we focused on strategies that either enhance customers' perception of coproduction value or decrease customers' perceived intensity of the coproduction process. Our results suggest that both an economic and a relational value communication strategy help reduce the negative effects associated with higher coproduction intensity. Moreover, an effective strategy to reduce the negative effects of coproduction intensity is one that offers immediate support when customers experience difficulties within the coproduction process.

## *Theoretical Implications*

This study contributes to the academic marketing literature in several ways. First, it extends previous research by investigating how perceived coproduction intensity influences customers' satisfaction with the coproduction process. Although prior research has analyzed the consequences of consumers' participation in coproduction compared with firm production (e.g., Bendapudi and Leone 2003; Mochon, Norton, and Ariely 2012), little is known about the role of customers' perception of coproduction intensity and its implications. The present field study makes a first attempt to address this research void and provides key insights into how actual customers engaging in real coproduction processes evaluate these processes in terms of the effort and time they must invest to complete a product. Specifically, the study extends prior research by offering an equity theory perspective on coproduction that explains how coproduction intensity affects customers' evaluation of the coproduction process. Results of the empirical analysis of actual coproduction situations support these explanations and show how coproduction intensity negatively affects the evaluation of the coproduction process.

Second, the current research extends knowledge on coproduction by exploring strategies to manage coproduction processes that are beyond the firm's control. Specifically, the study is the first to offer an answer to the important question of how firms can influence coproduction processes that take place outside the marketer's direct control (Troye and Supphellen 2012) by showing that firms can influence customers' evaluation of coproduction processes by means of value-enhancing and intensity-reducing communication strategies.

Third, our study extends research on relational customer goals by providing further insights into how firms can stimulate relational customer value through coproduction processes. Qualitative research has shown that customers seek consumption activities that integrate individual, relational, and collective customer goals in hedonic consumption experiences (Arnould and Price 1993; Epp and Price 2011). We extend this research by empirically investigating whether firms can benefit from stimulating the relational value customers can derive from firm offerings of more utilitarian processes such as coproduction. Specifically, our results show that the communication of relational value arguments is effective in enhancing customers' value perceptions within coproduction processes, attenuating the negative effects of coproduction intensity. Thus, our study provides first evidence of the benefit to firms derived from addressing relational customer goals within utilitarian consumption settings such as coproduction processes.

Fourth, this study provides insights about inoculation strategies in coproduction processes. Specifically, the results show that a support-service communication strategy that inoculates customers against setbacks in coproduction processes and offers immediate help through a support hotline is highly effective in reducing negative effects of coproduction intensity. Prior marketing research has examined inoculation as a mechanism for generating customers' resistance to persuasive attacks of competitive advertising (Bither, Dolich, and Nell 1971; Szybillo and Heslin 1973), postpurchase uncertainty (Bechwati and Siegal 2005), or inconsistent firm behavior (Wagner, Lutz, and Weitz 2009). This examination extends that research by investigating inoculation against setbacks as a mechanism to strengthen customers' resistance to setbacks in coproduction processes.

## *Managerial Implications*

Our study holds several important implications for firms and marketing managers. First, our results imply that to avoid damaging equitable customer relationships, firms should

carefully consider the amount of production effort they shift to the customer. Specifically, marketing managers should be aware that greater perceived coproduction intensity can lead to lower satisfaction with the coproduction process and outcome.

In light of the detrimental effects of coproduction intensity, it is crucial for firms to develop strategies to positively influence customer experiences within coproduction processes. Whereas these processes have generally been viewed as outside the marketer's control (Troye and Supphellen 2012), the current study offers new insights into how managers can mitigate negative effects of coproduction intensity by means of value-enhancing and intensity-reducing communication strategies.

A first important value-enhancing communication strategy to overcome the negative effects of coproduction intensity is to underscore the economic value customers can derive from engaging in coproduction processes. Specifically, the study shows that customers who receive additional information in advance about the economic value of coproduction are less sensitive to the negative effects of coproduction intensity. Therefore, firms that offer products or services that require considerable coproduction effort from the customer should emphasize that this effort pays off in terms of lower prices. An additional advantage of this strategy is that it may also potentially help the firm attract more price-sensitive customers.

Firms can also benefit from a communication strategy that highlights the added value customers can derive from engaging in coproduction with relational partners. In particular, our findings show that coproduction intensity had a less detrimental effect among customers who were a priori advised of possibilities to fulfill relational goals within the coproduction process. As customers increasingly demand the fulfillment of relational needs in consumption experiences (Epp and Price 2011), an additional advantage of this strategy is that it might help firms differentiate themselves from competitors that neglect to address customers' relational needs.

Another highly effective communication strategy firms can employ is to limit customers' perception of intensity in coproduction processes by offering additional support-service options. Specifically, our results suggest that an efficient way to avoid intensity-related dissatisfaction is to point out potential difficulties in coproduction tasks and provide support to customers who experience difficulties by offering service hotlines, live chats, and other online tools. Such a strategy not only improves customers' evaluation of more intense coproduction processes but also may attract customers who are concerned that they may experience difficulties within the coproduction process by potentially reducing their perceived risk of negative coproduction experiences.

Another implication from our study relates to the customization of products and services in coproduction processes. Whereas this study shows that increasing time and effort have negative consequences within the coproduction process, leading to fixed target outcomes, research on user design has suggested that increasing effort in processes that provide possibilities for a product's customization may also raise customer evaluations by achieving a higher preference fit (Franke and Schreier 2010). Thus, offering additional possibilities for customization may be a way to mitigate the negative effect of coproduction intensity through the added value of preference fit. In the context of coproduction, a convenient way of enhancing customization aspects without changing the product or service itself could be the implementation of an online community, in which customers can exchange suggestions for modifying standardized goods or services (Schau, Muñiz, and Arnould 2009).

Our study also offers implications for marketing managers who attempt to integrate relational and collective customer goals into their offerings. Whereas previous research has emphasized incorporating customers' relational and collective goals into hedonic consumption experiences (Arnould and Price 1993; Epp and Price 2011), our findings suggest that customers also value the integration of relational goals into utilitarian processes, such as the coproduction of ready-to-assemble furniture. Thus, our findings imply that identifying and highlighting benefits of including relational network partners might be fruitful in both hedonic and utilitarian consumption settings.

### *Limitations and Directions for Further Research*

This study has limitations that may provide opportunities for further research. First, in our field experimental study we investigated the relationship between coproduction intensity and customers' satisfaction with the coproduction process and examined how value-enhancing and intensity-reducing communication strategies affect this relationship in the prototypical coproduction context of ready-to-assemble furniture. Although results from additional scenario experiments provide first indications that the study's findings may be generalizable to other coproduction contexts, further field research that replicates our results in other coproduction settings is needed.

Another opportunity for further research refers to adequate communication strategies that companies may employ to shape customers' perceptions of coproduction processes. In this research, we focus on two specific value-enhancing (i.e., economic and relational) and two specific intensity-reducing (i.e., support and full service) communication strategies. Although the study results show that both of the value-enhancing communication strategies as well as the intensity reducing support-service communication strategy are highly effective in mitigating negative effects of coproduction intensity, additional communication strategies may be applicable to coproduction contexts. The investigation of such additional communication strategies may be a promising avenue for further research.

Relatedly, it might be worthwhile to further investigate the effectiveness of a full-service communication strategy. The study results show only limited support for this strategy's efficiency in mitigating negative effects of perceived coproduction intensity. An explanation for this finding may be that customers expect this service to be associated with additional time and effort to coordinate with service personnel or to have excessive additional costs. If these explanations are true, it is likely that the effectiveness of a full-service strategy may depend on different contingency factors, such as customers' time constraints, budget constraints, or the specific

price for the full service in relation to that of the input product or device. Exploring such contingencies may offer further important insights into the efficacy of communicating full-service options in coproduction contexts.

Moreover, it might be fruitful to explore in greater detail how the combination of specific communication strategies affects customers' evaluations of coproduction processes. Specifically, we hypothesized that a communication strategy that combines economic and relational value communication is more effective than separate strategies that focus on only one value dimension. However, we did not find support for this assumption, which may be due to customers' selective information processing caused by cognitive overload when arguments from multiple strategies are combined. Testing whether this explanation holds true and investigating in more depth which combinations of communication strategies are most effective would contribute to a more complete understanding how companies may shape customers' evaluations of coproduction processes and thus may be a fertile direction for further research.

**APPENDIX A**
**Description of Communication Strategies (Experimental Treatments) Tested in the Study**

| Type of Communication Strategy | Focus of Communication Strategy | Content of Communication Strategy |
|---|---|---|
| Value-enhancing communication strategy | • Economic value ($H_{2a}$) | • Points out that the effort invested in the coproduction by the customer enables the company to offer lower prices (i.e., assembling by the customer enables the company to charge lower prices for the furniture). |
| | • Relational value ($H_{2b}$) | • Points out that the coproduction task can be used to satisfy relational needs by assembling products together with relational partners (e.g., friends, family). |
| | • Economic and relational value ($H_{2c}$) | • Points out that coproduction offers both economic and relational value (combination of strategies 1 and 2). |
| Intensity-reducing communication strategy | • Support service ($H_{3a}$) | • Points out that customers who experience difficulties in the coproduction task can immediately be helped to avoid an overly high coproduction intensity (i.e., customers who experience difficulties in assembling can call a hotline that helps them to solve the problem). |
| | • Full service (external)[a] ($H_{3b}$) | • Points out that the company provides help to customers who do not want to engage in coproduction tasks by referring them to a reputable, reasonably priced company that accomplishes the coproduction task (i.e., an assembly company that can come to the customer's home to assemble and install the products). |

[a]We also tested an internal full service strategy in multiple additional analyses. The internal strategy aligns with the content of the external full service strategy but refers to an internal assembly service.

# Appendix B: Measurement Scales

### *Perceived Coproduction Intensity*

Adapted from Franke and Schreier (2010), Franke et al. (2010), and Troye and Supphellen (2012) (1 = "strongly disagree," and 7 = "strongly agree")

Assembling the product was…

1. Effortful
2. Exhausting
3. Demanding
4. Time-consuming
5. Costly (in terms of time and effort)

### *Satisfaction with the Coproduction Process*

Adapted from Bendapudi and Leone (2003)

How satisfied are you with the overall coproduction process referring to the assembly of the furniture? The overall coproduction process was…

1. 1 ("dissatisfying") through 7 ("satisfying")
2. 1 ("displeasing") through 7 ("pleasing")
3. 1 ("terrible") through 7 ("delighting")

### *Perceived Coproduction Ability*

Adapted from Dong et al. (2008) (1 = "strongly disagree," and 7 = "strongly agree")

1. I am fully capable of assembling furniture.
2. I am confident in my ability to set up furniture.
3. Assembling furniture is well within the scope of my abilities.

### *Coproduction Enjoyment*

Adapted from Franke and Schreier (2010) (1 = "strongly disagree," and 7 = "strongly agree")

1. I enjoy assembling furniture.
2. Assembling furniture is interesting.
3. I think assembling furniture is quite enjoyable.
4. Assembling furniture is fun.

### *Coproduction Expectations*

Adapted from Franke and Schreier (2010), Franke et al. (2010), and Troye and Supphellen (2012); measured before the assembly process (1 = "strongly disagree," and 7 = "strongly agree")

I expect the assembly process of the product by [firm name] to be…

1. Effortful
2. Exhausting
3. Demanding
4. Time-consuming
5. Costly (in terms of time and effort).

### *Coproduction Experience*

Adapted from Dellaert and Stremersch (2005) (1 = "strongly disagree," and 7 = "strongly agree")

I have a lot of experience in assembling furniture.

### *Time Elapsed Since Last Coproduction*

How many days have elapsed since you assembled the product?

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# Web Appendix

## Engaging Customers in Coproduction Processes: How Value-Enhancing and Intensity-Reducing Communication Strategies Mitigate the Negative Effects of Coproduction Intensity

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## Web Appendix A

## Test for Non-Response Bias & Common Method Bias

### Test for Non-Response Bias

We assessed possible nonresponse bias by comparing demographic information and study variables between early and late respondents (Armstrong and Overton 1977). Results presented in Table WA.1 reveal no significant differences, thereby indicating that non-response bias seem not to be an issue in the present data.

**Table WA.1**

| **Variable** | **Mean Difference (early – late)** | ***p*-value** |
|---|---|---|
| Co-production intensity | -.02873 | .882 |
| Satisfaction with the co-production process | .20730 | .156 |
| Gender | .008 | .871 |
| Age | -.544 | .686 |
| Income | -.211 | .347 |

Notes: Significance tests are based on two-tailed tests.

## Test for Common Method Bias

Although results from experimental studies are unlikely to be affected by common method variance (Podsakoff et al. 2003), we additionally tested the robustness of our measurements by employing the single-common-method-factor approach as recommended in the literature (Podsakoff et al. 2003; Podsakoff, McKenzie, and Podsakoff 2012). Specifically, we conducted two confirmatory factor analyses including all multiple item measures employed in the study. In the first confirmatory factor analysis all items were allowed to load only on their respective constructs (i.e., a regular confirmatory factor analysis). In the second confirmatory factor analysis we included a latent common method factor (CMF) on which all items may additionally load.

Results from the second analysis shows that none of the factor loadings on the common method factor was significant at the 5% level and only one was significant at the 10% level, thereby offering first support that common method bias does not seem to be an issue in our study. In addition, we compared the correlations between the first confirmatory factor analysis to those from the second factor analysis which includes the common method factor. Table WA.2 shows the differences in the intercorrelations between both factor analyses (i.e., $r_{ij,\ Diff} = r_{ij,\ without\ CMF} - r_{ij,\ with\ CMF}$). As Table WA.2 shows differences in intercorrelations between both analyses are negligible offering further indications that our analysis is not affected by common method variance. In summary, these findings suggest that common method bias should not be a threat to the results and conclusions of the study.

**Table WA.2**

**Comparison of Correlations Between**
**Confirmatory Factor Analysis with and without a Latent Common Method Factor**

| Variable | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. CP intensity | – | | | | |
| 2. Satisfaction with CP process | .035 | – | | | |
| 3. CP ability | –.008 | <.001 | – | | |
| 4. CP enjoyment | .001 | –.001 | <.001 | – | |
| 5. CP expectations | –.055 | .024 | .039 | .050 | – |

Notes: CP = Co-Production; Note that in the analysis including the common method factor one residual covariance between two items needed to be specified.

# Web Appendix B

## Treatments and Manipulation Checks

### Table WB.1

### Communication Strategies (Experimental Treatments)

| Focus of Communication Strategy | Wording of Communication Stimuli |
|---|---|
| Economic value | **We do our part, you do your part.**<br>**Together we save money.**<br><br>Our concept starts with the idea of providing a range of home furnishing products for **affordable prices**.<br><br>In order to facilitate this, we ask you to get involved in many easy ways, **like taking care of the assembly of your furnishings**, so that we can save money together.<br><br>**Thus, by assembling your own furnishings you can save most money!** |
| Relational value | **Time to be together.**<br><br>It's always better to do things together, right?<br><br>So how about the idea of making your next **furniture assembly to a shared project with your friends or family members**?<br><br>**Together with friends or family, the assembly of your new furnishings will be more fun and you can have a good time with your loved ones.** |
| Economic & relational value | **Saving money together.**<br><br>To provide a range of home furnishing products for **affordable prices**, we ask you to get involved in many easy ways, **like taking care of the assembly of your furnishings**.<br><br>Thereby you're not only saving money, but can also have a god time. How? Just **make your next furniture assembly to a shared project with friends or family members**.<br><br>**Thus, by assembling your own furnishings you can not only save money, but also have a good time with your loved ones.** |
| Support service | **Help for your assembly.**<br><br>What can you do if you experience **difficulties with the assembly of your furnishings?**<br><br>Just relax. The [firm name] service hotline at [phone number] offers you **around the clock telephone support to solve your problems with the assembly**.<br><br>**Thereby we'll help you resolve your issues quickly and easily, getting you back to more important things, like enjoying your new furnishings.** |
| Full service (external)* | **You can do it yourself. But you don't have to.**<br><br>Did you know that **you don't have to assemble your new furnishings?**<br><br>As a convenient and time-saving alternative **we can recommend an experienced, reasonably priced service company to assemble your new furnishings** for your home.<br><br>**Therefore you can quickly get back to more important things, like enjoying your new furnishings.** |

* We also tested an internal full service strategy in multiple additional analyses. The internal strategy aligns with the content of the external full service strategy but refers to an internal assembly service.

## Table WB.2

## Manipulation Checks: Field Experiment (Main Study)

| Experimental Group | Statement related to Communication Strategy | Unrelated Statements | Means | | Mean Difference | t | *p*-value |
|---|---|---|---|---|---|---|---|
| | | | related | unrelated | | | |
| **Economic Value** | Customer assembly enables [firm name] to charge lower prices for their furnishings. | Furniture assembly is more fun together with friends and family. | 5.80 | 4.04 | 1.76 | 8.399 | <.001 |
| | | [Firm name] offers quick help when customers experience difficulties in the assembly process. | | 4.08 | 1.72 | 8.309 | <.001 |
| **Relational Value** | Furniture assembly is more fun together with friends and family. | [Firm name] offers quick help when customers experience difficulties in the assembly process. | 5.94 | 4.19 | 1.75 | 9.638 | <.001 |
| | | Customer assembly enables [firm name] to charge lower prices for their furnishings | | 4.73 | 1.19 | 6.355 | <.001 |
| **Combined Economic & Relational Value** | Customer assembly enables [firm name] to charge lower prices for their furnishings. | [Firm name] offers excellent guarantees. | 5.57 | 4.02 | 1.58 | 8.237 | <.001 |
| | | Furniture assembly is more fun together with friends and family. | | 5.47 | .095 | .779 | .437 |
| | Furniture assembly is more fun together with friends and family. | [Firm name] offers excellent guarantees. | 5.47 | 4.02 | 1.47 | 7.288 | <.001 |
| | | Customer assembly enables [firm name] to charge lower prices for their furnishings | | 5.57 | -.095 | -.779 | .437 |
| **Support Service** | [Firm name] offers quick help when customers experience difficulties in the assembly process. | Furniture assembly is more fun together with friends and family. | 5.97 | 3.73 | 2.25 | 8.085 | <.001 |
| | | Customer assembly enables [firm name] to charge lower prices for their furnishings | | 4.01 | 1.96 | 7.577 | <.001 |
| **Full Service (external)*** | [Firm name] can refer a service partner to take care of the assembly process. | [Firm name] offers excellent guarantees. | 6.35 | 3.04 | 3.31 | 10.465 | <.001 |
| | | Furniture assembly is more fun together with friends and family. | | 3.30 | 3.04 | 9.479 | <.001 |

* We also tested an internal full service strategy in multiple additional analyses. The item for the manipulation check of the internal full service communication was: [Firm name] offers an internal service that can take care of the assembly process.

# Web Appendix C
# Additional Lab Experiment

## Table WC.1
## Results of Additional Laboratory Experiment

| Relationship | Estimate | (S.E.) |
|---|---|---|
| ***Effects of co-production intensity*** | | |
| CP Intensity → Satisfaction with CP Process ($\gamma_{11,}$ $H_1$) | –.855*** | (.087) |
| ***Effects of co-production communication strategies*** | | |
| ***Main Effects of Dummy Variables*** | | |
| Economic Value → Satisfaction with CP Process | –.034 | (.211) |
| Relational Value → Satisfaction with CP Process | .224 | (.209) |
| Eco. & Rel. Value → Satisfaction with CP Process | .303 | (.226) |
| Support Service → Satisfaction with CP Process | –.060 | (.204) |
| Full Service *(external)* → Satisfaction with CP Process | .171 | (.220) |
| Full Service *(internal)* → Satisfaction with CP Process | .120 | (.255) |
| Eco. Value & Support Service→ Satisfaction with CP Process | .196 | (.239) |
| Eco. Value & Full Service[a] → Satisfaction with CP Process | .087 | (.279) |
| Rel. Value & Support Service→ Satisfaction with CP Process | .092 | (.287) |
| Rel. Value & Full Service[a] → Satisfaction with CP Process | –.137 | (.282) |
| Eco. & Rel Value & Support Service→ Satisfaction with CP Process | .355 | (.266) |
| Eco. & Rel Value & Full Service[a]→ Satisfaction with CP Process | –.050 | (.317) |
| ***Test of Core Communication Strategy Hypotheses*** | | |
| CP Intensity × Economic Value → Satisfaction with CP Process ($\gamma_{12,}$ $H_{2a}$) | .449*** | (.154) |
| CP Intensity × Relational Value → Satisfaction with CP Process ($\gamma_{13,}$ $H_{2b}$) | .490*** | (.163) |
| CP Intensity × Eco. & Rel. Value → Satisfaction with CP Process ($\gamma_{14,}$ $H_{2c}$) | .499*** | (.142) |
| CP Intensity × Support Service → Satisfaction with CP Process ($\gamma_{15,}$ $H_{3a}$) | .733*** | (.208) |
| CP Intensity × Full Service *(external)* → Satisfaction with CP Process ($\gamma_{16,}$ $H_{3b}$) | .229* | (.135) |
| ***Test of Additional Communication Strategy and Strategy Combinations*** | | |
| CP Intensity × Full Service *(internal)* → Satisfaction with CP Process | .295* | (.169) |
| CP Intensity × Eco. Value & Support Service → Satisfaction with CP Process | .456** | (.205) |
| CP Intensity × Eco. Value & Full Service[a] → Satisfaction with CP Process | .658*** | (.230) |
| CP Intensity × Rel. Value & Support Service → Satisfaction with CP Process | .483** | (.222) |
| CP Intensity × Rel. Value & Full Service[a] → Satisfaction with CP Process | .416** | (.200) |
| CP Intensity × Eco. & Rel Value & Support Service → Satisfaction with CP Process | .394** | (.174) |
| CP Intensity × Eco. & Rel Value & Full Service[a] → Satisfaction with CP Process | .705*** | (.181) |
| ***Control relationships*** | | |
| CP Expectations → Satisfaction with CP Process | .047 | (.060) |
| CP Ability → Satisfaction with CP Process | .025 | (.057) |
| CP Experience → Satisfaction with CP Process | –.025 | (.043) |
| CP Enjoyment → Satisfaction with CP Process | .134*** | (.036) |
| Gender → Satisfaction with CP Process | –.029 | (.098) |
| Age → Satisfaction with CP Process | .010 | (.013) |
| Income → Satisfaction with CP Process | –.031 | (.034) |

Notes: n = 821 * $p < .1$; ** $p < .05$; *** $p < .01$. Significance tests are based on two-tailed tests. Estimates show unstandardized coefficients. S.E. = standard error; CP = co-production; Eco. = economic; Rel. = relational. [a] Test of additional strategy combinations which include a full service strategy refer to the original test of the external full service. To avoid loss of respondents, we used multiple imputations to cope with randomly missing data in our control variables (Schafer and Graham 2002).

Note that the difference between the effectiveness of the external and internal full service communication strategy is not significant ($\Delta\gamma = |.229 – .295| = .066$, *n.s.*).

Note that besides two exceptions the combined communication strategies are not significantly more effective than each of the respective strategies alone. The first exception refers to the combined economic value, relational value, and full support service communication strategy which is significantly more effective than the full support service communication strategy alone ($p < .05$). The second exception refers to the combination of the combined economic value and the full support service strategy which is marginally more effective than the full support service communication strategy alone ($p < .1$).

# Web Appendix D
# Additional Field Experiment

## Table WD.1
## Results of Additional Field Experiment

| Relationship | Estimate | (S.E.) |
|---|---|---|
| ***Effects of co-production intensity*** | | |
| CP Intensity → Satisfaction with CP Process ($\gamma_{11,}$ $H_1$) | –.481*** | (.049) |
| ***Effects of co-production communication strategies*** | | |
| Full Service *(internal)* → Satisfaction with CP Process | .205** | (.104) |
| Eco. Value & Support Service→ Satisfaction with CP Process | .193* | (.100) |
| Eco. Value & Full Service[a] → Satisfaction with CP Process | .205* | (.111) |
| Rel. Value & Support Service→ Satisfaction with CP Process | .344*** | (.100) |
| Rel. Value & Full Service[a] → Satisfaction with CP Process | .101 | (.112) |
| Eco. & Rel Value & Support Service→ Satisfaction with CP Process | .123 | (.115) |
| Eco. & Rel Value & Full Service[a]→ Satisfaction with CP Process | .149 | (.101) |
| CP Intensity × Full Service *(internal)* → Satisfaction with CP Process | .125* | (.071) |
| CP Intensity × Eco. Value & Support Service→ Satisfaction with CP Process | .145** | (.070) |
| CP Intensity × Eco. Value & Full Service[a] → Satisfaction with CP Process | .191** | (.093) |
| CP Intensity × Rel. Value & Support Service→ Satisfaction with CP Process | .146** | (.073) |
| CP Intensity × Rel. Value & Full Service[a] → Satisfaction with CP Process | .141** | (.068) |
| CP Intensity × Eco. & Rel Value & Support Service→ Satisfaction with CP Process | .221*** | (.081) |
| CP Intensity × Eco. & Rel Value & Full Service[a]→ Satisfaction with CP Process | .196*** | (.071) |
| ***Control relationships*** | | |
| CP Expectations → Satisfaction with CP Process | –.016 | (.022) |
| CP Ability → Satisfaction with CP Process | .037 | (.037) |
| CP Experience → Satisfaction with CP Process | .020 | (.032) |
| CP Enjoyment → Satisfaction with CP Process | .150*** | (.026) |
| Time Elapsed Since Last CP → Satisfaction with CP Process | .001 | (.001) |
| Gender → Satisfaction with CP Process | –.091 | (.062) |
| Age → Satisfaction with CP Process | .005* | (.002) |
| Income → Satisfaction with CP Process | –.025* | (.014) |

Notes: n = 1,020; * $p < .1$; ** $p < .05$; *** $p < .01$. Significance tests are based on two-tailed tests. Estimates show unstandardized coefficients. S.E. = standard error; CP = co-production; Eco. = economic; Rel. = relational. [a] Test of additional strategy combinations which include a full service strategy are tested employing an external full service strategy. To avoid loss of respondents, we used multiple imputations to cope with randomly missing data in our control variables (Schafer and Graham 2002).

## Web Appendix E

## Additional Scenario Experiments

**Table WE.1**
**Description of Co-Production Contexts of the Additional Scenario Experiments**

| Co-Production Context | Scenario Description |
|---|---|
| Barbecue installation | The scenario describes a situation in which the consumer has bought a barbecue kit which needs to be installed by the consumer. |
| Preparation of cake mix | The scenario describes a situation in which the consumer has bought a cake mix which needs to be prepared by the consumer. |
| Internet setup | The scenario describes a situation in which the consumer needs to install and configure a wireless lan router to setup his/her internet connection. |
| Self-service checkout | The scenario describes a situation in which the consumer needs to use a self-service checkout system to bag and scan his/her groceries in a supermarket. |

## Table WE.2
## Results of Additional Scenario Experiment: Barbecue Installation

| Relationship | Estimate | (S.E.) |
|---|---|---|
| ***Effects of co-production intensity*** | | |
| CP Intensity → Satisfaction with CP Process ($\gamma_{11,}$ $H_1$) | –.692*** | (.041) |
| ***Effects of co-production communication strategies*** | | |
| Economic Value → Satisfaction with CP Process | .240** | (.113) |
| Relational Value → Satisfaction with CP Process | .261** | (.111) |
| Eco. & Rel. Value → Satisfaction with CP Process | .112 | (.110) |
| Support Service → Satisfaction with CP Process | .123 | (.110) |
| Full Service *(external)* → Satisfaction with CP Process | –.130 | (.114) |
| Full Service *(internal)* → Satisfaction with CP Process | .113 | (.110) |
| CP Intensity × Economic Value → Satisfaction with CP Process ($\gamma_{12,}$ $H_{2a}$) | .135** | (.064) |
| CP Intensity × Relational Value → Satisfaction with CP Process ($\gamma_{13,}$ $H_{2b}$) | .152** | (.060) |
| CP Intensity × Eco. & Rel. Value → Satisfaction with CP Process ($\gamma_{14,}$ $H_{2c}$) | .158*** | (.058) |
| CP Intensity × Support Service → Satisfaction with CP Process ($\gamma_{15,}$ $H_{3a}$) | .129** | (.060) |
| CP Intensity × Full Service *(external)* → Satisfaction with CP Process ($\gamma_{16,}$ $H_{3b}$) | .114* | (.061) |
| CP Intensity × Full Service *(internal)* → Satisfaction with CP Process | .128** | (.059) |
| ***Control relationships*** | | |
| CP Expectations → Satisfaction with CP Process | .053** | (.026) |
| CP Ability → Satisfaction with CP Process | .018 | (.031) |
| CP Experience → Satisfaction with CP Process | –.038 | (.024) |
| CP Enjoyment → Satisfaction with CP Process | .196*** | (.026) |
| Gender → Satisfaction with CP Process | .001 | (.073) |
| Age → Satisfaction with CP Process | –.005* | (.002) |
| Income → Satisfaction with CP Process | –.032** | (.015) |

Notes: n = 1,209; * $p < .1$; ** $p < .05$; *** $p < .01$. Significance tests are based on two-tailed tests. Estimates show unstandardized coefficients. S.E. = standard error; CP = co-production; Eco. = economic; Rel. = relational. To avoid loss of respondents, we used multiple imputations to cope with randomly missing data in our control variables (Schafer and Graham 2002).

## Table WE.3
## Results of Additional Scenario Experiment: Preparation of Cake Mix

| Relationship | Estimate | (S.E.) |
|---|---|---|
| ***Effects of co-production intensity*** | | |
| CP Intensity → Satisfaction with CP Process ($\gamma_{11,}$ $H_1$) | –.791*** | (.031) |
| ***Effects of co-production communication strategies*** | | |
| Economic Value → Satisfaction with CP Process | .098 | (.126) |
| Relational Value → Satisfaction with CP Process | .181 | (.116) |
| Eco. & Rel. Value → Satisfaction with CP Process | –.002 | (.116) |
| Support Service → Satisfaction with CP Process | .007 | (.117) |
| Full Service *(external)* → Satisfaction with CP Process | –.016 | (.120) |
| Full Service *(internal)* → Satisfaction with CP Process | .001 | (.122) |
| CP Intensity × Economic Value → Satisfaction with CP Process ($\gamma_{12,}$ $H_{2a}$) | .123** | (.050) |
| CP Intensity × Relational Value → Satisfaction with CP Process ($\gamma_{13,}$ $H_{2b}$) | .107** | (.047) |
| CP Intensity × Eco. & Rel. Value → Satisfaction with CP Process ($\gamma_{14,}$ $H_{2c}$) | .130*** | (.047) |
| CP Intensity × Support Service → Satisfaction with CP Process ($\gamma_{15,}$ $H_{3a}$) | .105** | (.050) |
| CP Intensity × Full Service *(external)* → Satisfaction with CP Process ($\gamma_{16,}$ $H_{3b}$) | .081* | (.046) |
| CP Intensity × Full Service *(internal)* → Satisfaction with CP Process | .091* | (.048) |
| ***Control relationships*** | | |
| CP Expectations → Satisfaction with CP Process | .049 | (.031) |
| CP Ability → Satisfaction with CP Process | .004 | (.029) |
| CP Experience → Satisfaction with CP Process | –.055** | (.023) |
| CP Enjoyment → Satisfaction with CP Process | .203*** | (.024) |
| Gender → Satisfaction with CP Process | .021 | (.078) |
| Age → Satisfaction with CP Process | –.006** | (.002) |
| Income → Satisfaction with CP Process | –.048*** | (.017) |

Notes: n = 1,230; * $p < .1$; ** $p < .05$; *** $p < .01$. Significance tests are based on two-tailed tests. Estimates show unstandardized coefficients. S.E. = standard error; CP = co-production; Eco. = economic; Rel. = relational. To avoid loss of respondents, we used multiple imputations to cope with randomly missing data in our control variables (Schafer and Graham 2002).

## Table WE.4
## Results of Additional Scenario Experiment: Internet Setup

| Relationship | Estimate | (S.E.) |
|---|---|---|
| ***Effects of co-production intensity*** | | |
| CP Intensity → Satisfaction with CP Process ($\gamma_{11,}$ $H_1$) | –.736*** | (.035) |
| ***Effects of co-production communication strategies*** | | |
| Economic Value → Satisfaction with CP Process | –.144 | (.118) |
| Relational Value → Satisfaction with CP Process | –.191 | (.123) |
| Eco. & Rel. Value → Satisfaction with CP Process | –.042 | (.122) |
| Support Service → Satisfaction with CP Process | .017 | (.116) |
| Full Service *(external)* → Satisfaction with CP Process | .131 | (.119) |
| Full Service *(internal)* → Satisfaction with CP Process | .151 | (.113) |
| CP Intensity × Economic Value → Satisfaction with CP Process ($\gamma_{12,}$ $H_{2a}$) | .151*** | (.055) |
| CP Intensity × Relational Value → Satisfaction with CP Process ($\gamma_{13,}$ $H_{2b}$) | .228*** | (.059) |
| CP Intensity × Eco. & Rel. Value → Satisfaction with CP Process ($\gamma_{14,}$ $H_{2c}$) | .170*** | (.059) |
| CP Intensity × Support Service → Satisfaction with CP Process ($\gamma_{15,}$ $H_{3a}$) | .178*** | (.056) |
| CP Intensity × Full Service *(external)* → Satisfaction with CP Process ($\gamma_{16,}$ $H_{3b}$) | .138** | (.055) |
| CP Intensity × Full Service *(internal)* → Satisfaction with CP Process | .116** | (.056) |
| ***Control relationships*** | | |
| CP Expectations → Satisfaction with CP Process | .060** | (.024) |
| CP Ability → Satisfaction with CP Process | –.029 | (.038) |
| CP Experience → Satisfaction with CP Process | –.025 | (.031) |
| CP Enjoyment → Satisfaction with CP Process | .116*** | (.027) |
| Gender → Satisfaction with CP Process | .159** | (.078) |
| Age → Satisfaction with CP Process | –.004 | (.003) |
| Income → Satisfaction with CP Process | –.034* | (.018) |

Notes: n = 1,115; * $p < .1$; ** $p < .05$; *** $p < .01$. Significance tests are based on two-tailed tests. Estimates show unstandardized coefficients. S.E. = standard error; CP = co-production; Eco. = economic; Rel. = relational. To avoid loss of respondents, we used multiple imputations to cope with randomly missing data in our control variables (Schafer and Graham 2002).

## Table WE.5
## Results of Additional Scenario Experiment: Self-Service Checkout

| Relationship | Estimate | (S.E.) |
|---|---|---|
| ***Effects of co-production intensity*** | | |
| CP Intensity → Satisfaction with CP Process ($\gamma_{11,}$ $H_1$) | –.809*** | (.025) |
| ***Effects of co-production communication strategies*** | | |
| Economic Value → Satisfaction with CP Process | .014 | (.102) |
| Relational Value → Satisfaction with CP Process | .163* | (.091) |
| Eco. & Rel. Value → Satisfaction with CP Process | .027 | (.096) |
| Support Service → Satisfaction with CP Process | .320*** | (.092) |
| Full Service *(internal)* → Satisfaction with CP Process | .204** | (.091) |
| CP Intensity × Economic Value → Satisfaction with CP Process ($\gamma_{12,}$ $H_{2a}$) | .235*** | (.049) |
| CP Intensity × Relational Value → Satisfaction with CP Process ($\gamma_{13,}$ $H_{2b}$) | .099*** | (.038) |
| CP Intensity × Eco. & Rel. Value → Satisfaction with CP Process ($\gamma_{14,}$ $H_{2c}$) | .155*** | (.042) |
| CP Intensity × Support Service → Satisfaction with CP Process ($\gamma_{15,}$ $H_{3a}$) | .082** | (.039) |
| CP Intensity × Full Service *(internal)* → Satisfaction with CP Process | .064* | (.036) |
| ***Control relationships*** | | |
| CP Expectations → Satisfaction with CP Process | .014 | (.024) |
| CP Ability → Satisfaction with CP Process | –.012 | (.030) |
| CP Experience → Satisfaction with CP Process | –.021 | (.021) |
| CP Enjoyment → Satisfaction with CP Process | .195*** | (.022) |
| Gender → Satisfaction with CP Process | .048 | (.069) |
| Age → Satisfaction with CP Process | –.005** | (.002) |
| Income → Satisfaction with CP Process | –.009 | (.015) |

Notes: n = 1,229; * $p < .1$; ** $p < .05$; *** $p < .01$. Significance tests are based on two-tailed tests. Estimates show unstandardized coefficients. S.E. = standard error; CP = co-production; Eco. = economic; Rel. = relational. To avoid loss of respondents, we used multiple imputations to cope with randomly missing data in our control variables (Schafer and Graham 2002).

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